


VLADIMIR MURZIN

THE TIGER MOTHS

of the
former
Soviet
Union

Insecta:
Lepidoptera:
Arctiidae

 PENSOFT.

THE TIGER MOTHS OF THE FORMER SOVIET UNION
(INSECTA: LEPIDOPTERA: ARCTIIDAE)

Vladimir S. Murzin

This page intentionally left blank

THE TIGER MOTHS OF THE FORMER SOVIET UNION

(INSECTA: LEPIDOPTERA: ARCTIIDAE)

Vladimir S. Murzin



Sofia-Moscow

2003

Vladimir S. Murzin
Editors: Oleg G. Gorbunov & Sergei I. Golovatch

THE TIGER MOTHS OF THE FORMER SOVIET UNION
(INSECTA: LEPIDOPTERA: ARCTIIDAE)

First published 2003
ISBN 954-642-133-2

Pensoft *Series Faunistica* No 23
ISSN 1312-0174

© PENSOFT *Publishers*

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form by any means, electronic, mechanical, photo copying, recording or otherwise, without the prior written permission of the copyright owner.

Pensoft Publishers, Acad. G. Bonchev Str., Bl. 6, 1113 Sofia, Bulgaria
Fax: +359-2-870-45-08, E-mail: pensoft@mbox.infotel.bg, www.pensoft.net

Printed in Bulgaria, May 2003

Contents

I. Introduction	1
II. General part	3
III. Special part	15
Subfamily Callimorphinae	15
1. Genus <i>Callimorpha</i> Latreille, 1809	15
1. <i>Callimorpha dominula</i> (Linnaeus, 1758)	15
2. <i>Callimorpha philippsi</i> Bartel, 1906	17
2. Genus <i>Euplagia</i> Hübner, 1820	18
3. <i>Euplagia quadripunctaria</i> (Poda, 1761)	18
4. <i>Euplaga splendidior</i> (Tams, 1922)	19
3. Genus <i>Eucallimorpha</i> Dubatolov, 1990	20
5. <i>Eucallimorpha principalis</i> (Kollar, 1844)	20
Genus <i>Aglaomorpha</i> Kôda, 19873	21
<i>Aglaomorpha histrio</i> (Walker, 1855)	21
4. Genus <i>Cymbalophora</i> Rambür, 1866	22
6. <i>Cymbalophora rivularis</i> (Ménétrières, 1832)	22
5. Genus <i>Carcinopyga</i> Felder, 1874	22
7. <i>Carcinopyga lichenigera</i> Felder, 1874	23
8. <i>Carcinopyga proserpina</i> (Staudinger, 1887)	23
9. <i>Carcinopyga gurkoi</i> Kautt & Soldaitis, 1997	24
6. Genus <i>Axiopoena</i> Ménétrières, 1842	26
10. <i>Axiopoena maura</i> (Eichwald, 1830)	26
11. <i>Axiopoena karelini</i> Ménétrières, 1863	27
7. Genus <i>Tyria</i> Hübner, 1819	28
12. <i>Tyria jacobaeae</i> (Linnaeus, 1758)	28
8. Genus <i>Dodia</i> Dyar, 1901	29
13. <i>Dodia diaphana</i> (Eversmann, 1848)	30
14. <i>Dodia albertae</i> Dyar, 1901	31
15. <i>Dodia kononenkoi</i> Tshistjakov & Lafontaine, 1984	33
16. <i>Dodia sasonovi</i> Dubatolov, 1990	34
9. Genus <i>Epimydia</i> Staudinger, 1892	35
17. <i>Epimydia dialampra</i> Staudinger, 1892	35
10. Genus <i>Lacydes</i> Walker, 1855	35
18. <i>Lacydes spectabilis</i> (Tauscher, 1806)	36
11. Genus <i>Spiris</i> Hübner, 1819	37
19. <i>Spiris striata</i> (Linnaeus, 1758)	37
20. <i>Spiris bipunctata</i> (Staudinger, 1892)	38
12. Genus <i>Coscinia</i> Hübner, 1819	38
21. <i>Coscinia cribraria</i> (Linnaeus, 1758)	39
13. Genus <i>Utetheisa</i> Hübner, 1819	40
22. <i>Utetheisa pulchella</i> (Linnaeus, 1758)	40
Subfamily Aretiinae	42
14. Genus <i>Stauropolia</i> Skalski, 1988	42
23. † <i>Stauropolia nekruutenkoi</i> Skalski, 1988	42
15. Genus <i>Parasemia</i> Hübner, 1820	43

24. <i>Parasemia plantaginis</i> (Linnaeus, 1758)	43
16. Genus <i>Hyphoraia</i> Hübner, 1820	46
25. <i>Hyphoraia aulica</i> (Linnaeus, 1758)	46
17. Genus <i>Pararctia</i> Sotavalta, 1965	48
26. <i>Pararctia lapponica</i> (Thunberg, 1791)	49
27. <i>Pararctia lemniscata</i> (Stichel, 1911)	50
28. <i>Pararctia tundrana</i> Tshistjakov, 1990	50
Genus <i>Sinoarctia</i> Dubatolov, 1987	51
18. Genus <i>Borearctia</i> Dubatolov, 1984	51
29. <i>Borearctia menetriesi</i> (Eversmann, 1846)	52
19. Genus <i>Acerbia</i> Sotavalta, 1963	52
30. <i>Acerbia alpina</i> (Quensel, 1802)	52
31. <i>Acerbia seitsi</i> (A. Bang-Haas, 1910)	53
<i>Acerbia kolpakofskii</i> (Alpheraky, 1882)	54
20. Genus <i>Platarctia</i> Packard, 1864	54
32. <i>Platarctia atropurpurea</i> (O. Bang-Haas, 1927)	54
21. Genus <i>Oroncus</i> Seitz, 1910	56
33. <i>Oroncus tancrei</i> (Staudinger, 1887)	57
34. <i>Oroncus urania</i> (Püngeler, 1904)	57
35. <i>Oroncus fasciata</i> O. Bang-Haas, 1927	58
36. <i>Oroncus alcaica</i> O. Bang-Haas, 1927	58
Genus <i>Orontobia</i> de Freina, 1997	59
Genus <i>Preparctia</i> Hampson, 1901	60
22. Genus <i>Arctia</i> Schrank, 1801	60
37. <i>Arctia intercalaris</i> (Eversmann, 1843)	62
<i>Arctia ladakensis</i> (O. Bang-Haas, 1927)	63
38. <i>Arctia caja</i> (Linnaeus, 1758)	63
39. <i>Arctia flavia</i> (Fuessly, 1779)	66
40. <i>Arctia rueckbeili</i> (Püngeler, 1901)	68
41. <i>Arctia olschwanzi</i> Dubatolov, 1990	68
23. Genus <i>Epicallia</i> Hübner, 1820	70
42. <i>Epicallia villica</i> (Linnaeus, 1758)	70
24. Genus <i>Eucharia</i> Hübner, 1820	71
43. <i>Eucharia festiva</i> (Hüfnagel, 1766)	71
44. <i>Eucharia interrogationis</i> (Ménétrières, 1863)	74
45. <i>Eucharia culoti</i> (Oberthür, 1912)	75
25. Genus <i>Pericallia</i> Hübner, 1820	76
46. <i>Pericallia matronula</i> (Linnaeus, 1758)	76
Subfamily Micrarctiinae	77
Genus <i>Micrarctia</i> Seitz, 1910	77
26. Genus <i>Divarctia</i> Dubatolov, 1990	78
47. <i>Divarctia diva</i> (Staudinger, 1887)	79
27. Genus <i>Tancrea</i> Püngeler, 1898	79
48. <i>Tancrea pardalina</i> Püngeler, 1898	79
28. Genus <i>Holoarctia</i> Ferguson, 1984	80
49. <i>Holoarctia cervini</i> (Fallou, 1864)	80
50. <i>Holoarctia marinae</i> Dubatolov, 1985	81
51. <i>Holoarctia puengeleri</i> (O. Bang-Haas, 1927)	82
29. Genus <i>Paelearctia</i> Ferguson, 1984	83
52. <i>Paelearctia (Paelearctia) mira</i> Dubatolov & Tshistjakov, 1989	84
53. <i>Paelearctia (Paelearctia) glaphyra</i> (Eversmann, 1843)	84
54. <i>Paelearctia (Paelearctia) dublitzkyi</i> (O. Bang-Haas, 1927)	86
55. <i>Paelearctia (Paelearctia) gratiosa</i> (Groum-Grshimailo, 1890)	87

56. <i>Palaearctia (Palaearctia) gracilis</i> Dubatolov, 1996	90
57. <i>Palaearctia (Palaearctia) golbecki</i> Dubatolov, 1996	91
58. <i>Palaearctia (Palaearctia) rupicola</i> (Groum-Grshimailo, 1890)	91
62. <i>Palaearctia (Palaearctia) wagneri</i> (Püngeler, 1918)	92
59. <i>Palaearctia (Palaearctia) erschoffi</i> (Alpheraky, 1882)	92
60. <i>Palaearctia (Palaearctia) ferghana</i> (Staudinger, 1887)	94
61. <i>Palaearctia (Centrarctia) mongolica</i> (Alpheraky, 1888)	96
62. <i>Palaearctia (Palaearctia) sarycola</i> de Freina, 1997	96
30. Genus <i>Sibirarctia</i> Dubatolov, 1987	97
63. <i>Sibirarctia kindermanni</i> (Staudinger, 1867)	98
64. <i>Sibirarctia buraetica</i> (O. Bang-Haas, 1927)	100
31. Genus <i>Chelis</i> Rambür, 1866	101
65. <i>Chelis maculosa</i> (Gerning, 1780)	102
66. <i>Chelis reticulata</i> (Christoph, 1887)	103
67. <i>Chelis caecilia</i> (Kindermann, 1853)	104
68. <i>Chelis dahurica</i> (Boisduval, 1832)	106
69. <i>Chelis ferghana</i> Dubatolov, 1988	107
70. <i>Chelis tianshana</i> Dubatolov, 1988	107
32. Genus <i>Grammia</i> Rambür, 1866	108
71. <i>Grammia quenseli</i> (Paykull, 1793)	108
72. <i>Grammia philippiana</i> Ferguson, 1985	109
73. <i>Grammia turbans</i> (Christoph, 1892)	110
33. Genus <i>Hyperborea</i> Grum-Grshimailo, 1899	110
74. <i>Hyperborea czekanoŵskii</i> Grum-Grshimailo, 1899	110
34. Genus <i>Diacrisia</i> Hübner, 1819	111
75. <i>Diacrisia sannio</i> (Linnaeus, 1758)	112
76. <i>Diacrisia irene</i> Butler, 1881	114
35. Genus <i>Rhyparioides</i> Butler, 1877	114
77. <i>Rhyparioides metelkana</i> (Lederer, 1861)	115
78. <i>Rhyparioides amurensis</i> (Bremer, 1861)	116
79. <i>Rhyparioides nebulosa</i> Butler, 1877	117
36. Genus <i>Rhyparia</i> Hübner, 1820	117
80. <i>Rhyparia purpurata</i> (Linnaeus, 1758)	117
37. Genus <i>Amurrhyparia</i> Dubatolov, 1985	119
81. <i>Amurrhyparia leopardinula</i> (Strand, 1919)	119
Genus <i>Gonerda</i> Moore, 1879	119
Subfamily Spilosomatinae	120
38. Genus <i>Ocnogyna</i> Lederer, 1853	120
82. <i>Ocnogyna parasita</i> (Hübner, 1790)	120
<i>Ocnogyna loewii</i> (Zeller, 1846)	121
83. <i>Ocnogyna armena</i> Staudinger, 1871	122
39. Genus <i>Tajigyna</i> Dubatolov, 1990	123
84. <i>Tajigyna gansonii</i> Dubatolov, 1990	123
40. Genus <i>Watsonarctia</i> de Freina & Witt, 1984	124
85. <i>Watsonarctia deserta</i> (Bartel, 1902)	124
41. Genus <i>Chionarctia</i> Kôda, 1988	125
86. <i>Chionarctia nivea</i> (Ménétrières, 1859)	125
42. Genus <i>Alphaea</i> Walker, 1855	126
87. <i>Alphaea melanostigma</i> (Erschoff, 1872)	126
43. Genus <i>Andala</i> Walker, 1855	126
88. <i>Andala guttata</i> (Erschoff, 1874)	127
89. <i>Andala transversa</i> (Moore, 1879)	127
44. Genus <i>Hyphantria</i> Harris, 1841	128

90. <i>Hyphantria cunea</i> (Drury, 1773)	128
45. Genus <i>Diaphora</i> Stephens, 1827	129
91. <i>Diaphora mendica</i> (Clerek, 1759)	129
46. Genus <i>Eudiaphora</i> Dubatolov, 1990	130
92. <i>Eudiaphora turensis</i> (Erschoff, 1874)	130
47. Genus <i>Spilosoma</i> Curtis, 1825	132
93. <i>Spilosoma lubricipedum</i> (Linnaeus, 1758)	132
94. <i>Spilosoma punctarium</i> (Stoll, 1782)	133
95. <i>Spilosoma urticae</i> (Esper, 1789)	134
96. <i>Spilosoma mandli</i> Schawerda, 1922	135
97. <i>Spilosoma streltsovi</i> Dubatolov, 1996	136
<i>Spilosoma album</i> Bremer & Grey, 1853	136
48. Genus <i>Spilarctia</i> Butler, 1875	137
98. <i>Spilarctia lutea</i> (Hüfnagel, 1766)	137
99. <i>Spilarctia seriatopunctata</i> (Motschulsky, 1861)	139
100. <i>Spilarctia obliquisonata</i> (Miyaki, 1910)	140
101. <i>Spilarctia subcarnea</i> (Walker, 1855)	140
49. Genus <i>Lemyra</i> Walker, 1856	141
102. <i>Lemyra boghaika</i> Tshistjakov & Kishida, 1994	141
103. <i>Lemyra jankowskii</i> (Oberthür, 1881)	142
50. Genus <i>Phragmatobia</i> Stephens, 1828	142
104. <i>Phragmatobia fuliginosa</i> (Linnaeus, 1758)	143
105. <i>Phragmatobia amurensis</i> Seitz, 1910	145
106. <i>Phragmatobia placida</i> (Frivaldzsky, 1835)	145
51. Genus <i>Epatolmis</i> Butler, 1877	146
107. <i>Epatolmis luctifera</i> (Denis & Schiffermüller, 1775)	146
Conclusions	147
Acknowledgements	148
IV. Addenda	149
V. Colour Plates	189

I. Introduction

Tiger moths, or the moth family Arctiidae, are usually small to medium-sized, of varying coloration, often light or bright. The pattern contains stripes, bands or spots on the wings and body. The wings hold roof-like while at rest.

Tiger moths are truly beautiful adornments of nature. At the same time, because of their great diversity coupled with profound variation, these moths are not only of aesthetical pleasure but also provide rich material for research and scientific generalizations. Unfortunately (or fortunately?), the tiger moth fauna of the Palaearctic, in particular of its bulk that covers the former Soviet Union, is still relatively poorly known. Hence, the need in a book like this one is clear, even though it is only a complete and richly illustrated overview of the fauna.

We have tried to get all available material and other information concerning this family, especially as regards its Palaearctic species. However, despite all efforts, this publication must be understood as provisional, still containing numerous lacunae and inaccuracies. This is not a revision but a review of the Arctiidae at a regional level, more specifically, written to attract attention, mainly that of the young, to this interesting group. Indeed, to illustrate the still relatively poor state of the art, a considerable number of new tiger moth taxa have lately been described from the territory of the former Soviet Union, and several new synonymies and combinations established. Surely, future studies are bound to reveal lots of further novelties.

Although most of the tiger moth species can be identified using external characters alone, there are some groups that require the examination of the genitalia for revealing their correct identity. So pertinent illustrations of the genitalia, both old and new, have always been provided wherever necessary.

Some tiger moths have long entered regional or general lists of protected species, e.g. the Red Data Book of the former Soviet Union (Borodin, 1984a, b), often without any serious reason for doing so. For example, *Utetheisa pulchella* (L.) is amongst such “endangered” forms. It is widespread over southern Europe and Asia, in Central Asia often abundant, also present in India, Japan, Africa, and even Australia. Such a vast distribution may be due to feeding on cotton plants recorded for this species in many places. So it can readily be referred to as a migrant.

Similarly, *Callimorpha dominula* (L.) and *Euplagia quadripunctaria* Poda also prove to be common, sometimes very common. According to our observations over the past 40 years, their numbers have not dropped in the least. Still another Red Data Book taxon, *Axiopoena maura* (Eichwald), currently understood as two distinct species, is common south of the northern range limit. Though the latter lies in the former Soviet Union, this tiger moth is pretty common and easily attracted by light traps in Turkmenistan and Transcaucasia in places where open rock denudations are present.

Like in most cases, the principal factor endangering the existence of these moths is, man’s economic activities, in particular, the application of chemicals. Fortunately, as all above species live totally or mainly beyond the places of active economic development, nothing really threatens them.

Among tiger moths, only few agri- and silvicultural pests are known. The most dangerous among these is the American white moth, or the fall webworm *Hyphantria cunea* (Drury), introduced from North America. This species seems one of the most omnivorous amongst pest insects, the larvae estimated as feeding on 636 plants worldwide. This number appears to be higher than the known records of the gypsy moth, *Ocneria dispar* (L.) (Lymantriidae). The gypsy moth seems to be limited by secondary plant metabolites but feeds on plants containing tannins. This factor does not seem to restrict the fall webworm.

The following main acronyms have been accepted:

ab. – aberration
Engl. – English
f. – form
Fr. – French
fw – forewing
Germ. – German
Gr. – Greek
hw – hindwing

IB SD RAS – Institute of Biology, Siberian Division of the Russian Academy of Sciences, Novosibirsk

Lat. – Latin

MSU – Moscow State University, Moscow

Rus. – Russian

ssp. – subspecies

TS – type species

TL – type locality

ZISP RAS – Zoological Institute of the Russian Academy of Sciences, St. Petersburg

ZMKU – Zoological Museum of the Kiev University, Kiev

ZMUM – Zoological Museum of the Moscow State University, Moscow

In the present contribution, the nomenclature accepted in Zaguljaev et al. (1981) is used.

II. General part

The Arctiidae belongs to a group of families constituting the superfamily Noctuoidea, suborder Ditrisia. Usually arctiids are placed between the families Lithosiidae and Hypsiidae or between Lithosiidae and Lymantriidae.

Up to now there are no universally shared views concerning arctiid higher or generic classification. Some authors accept the family in a very broad sense, incorporating therein a lot of what we believe to actually represent independent groups of comparable rank. For example, Heppner (1998) has proposed the following arrangement in this family, which also includes Ctenuchinae as a subordinate taxon.

Family Arctiidae
Subfamily Pericopinae
Tribe Pericopina
Subfamily Arctiinae
Tribe Lithosiina
Tribe Arctiina
Subfamily Ctenuchinae
Tribe Ctenuchina
Tribe Syntomina

Recent progress in the higher systematics of Lepidoptera that puts emphasis on the anatomy and structure of the muscular genital apparatus of the male (Kuznetsov & Stekolnikov, 2001) provides only few changes concerning the classification and assignment of Arctiidae.

Series Noctuiformes Latreille, 1809
Superfamily Notodontoidea Stephens, 1829
Family Doidae Donahue & Brown, 1987
Family Notodontidae Stephens, 1829
Superfamily Noctuoidea Latreille, 1809
Family Lymantriidae Hampson, 1893
Family Aganaidae Boisduval, 1833
Family Arctiidae Leach, 1815
Subfamily Lithosiinae Billberg, 1820
Subfamily Thyretinae Kiriakoff, 1990
Subfamily Arctiinae Leach, 1815
Subfamily Nyctemerinae Seitz, 1913

In the present work, the family is regarded as fully corresponding to the subfamily Arctiinae in the sense of Heppner (1998) as well as of Kuznetsov & Stekolnikov (2001).

In general, the classification of the tiger moths, which has undergone several attempts at a revision, can hardly be considered as final. Pinhey (1979), for example, divided the Arctiidae into three subfamilies, Lithosiinae, Arctiinae, and Nyctemerinae, while the tribe Micrarctiini, where that author also placed the genus *Phragmatobia* Steph., was referred to Lithosiinae. Both Callimorphini and Spilosomini (recte: Spilosomatini) were assigned to the subfamily Arctiinae.

In the present paper, the Lithosiidae is considered as a separate family, i.e. following, for example, Gershenson et al. (1981), while the scope of the Arctiidae is being accepted according to the recent works of Ferguson (1984) and Dubatolov (1987, 1990a).

Arctiidae can be characterised by the following combination of traits. Eyes mostly bare. In contrast to the close families Nolidae and Lithosiidae, additional simple ocelli present (Fig. 1), proboscis often abortive. Frenulum present (Fm, Fig. 2). On fws, vein M2 close to M3 at base (Fig. 2); on hws, group Sc+R1 beginning at different points in radial

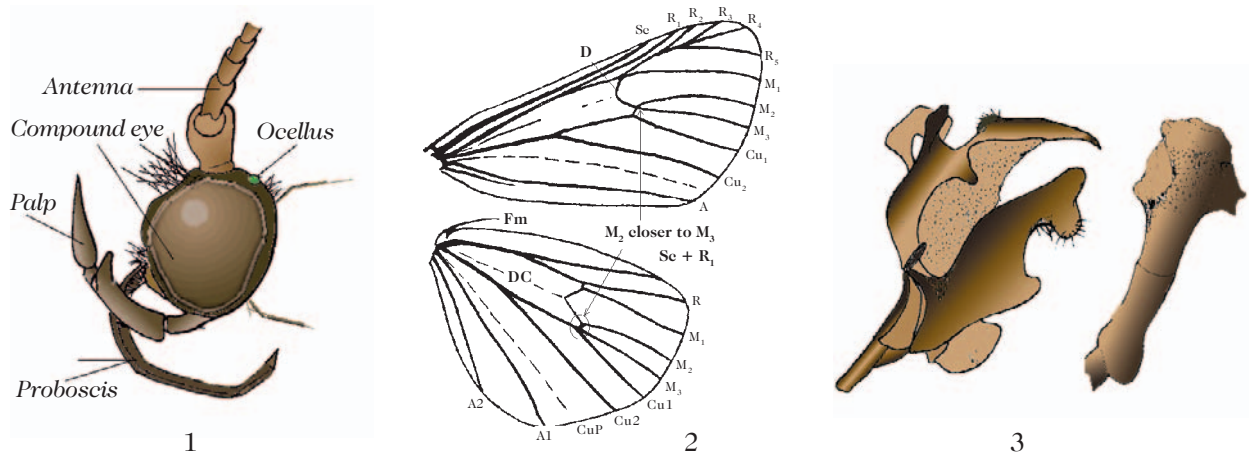


Fig. 1. Head of Arctiidae.

Fig. 2. Wing venation of Arctiidae.

Fig. 3. Male genitalia of *Amurrhynparia leopardinula* (Mén.) (Subfamily Micrarctiinae).

sector, depending on the genus. On fws, A3 at base of wings not merging with A2 (in distinction from Noctuidae, in which the extent of coalescence of veins is less, and A2 is with a fork)¹. Tympanic organs present, metathoracic, opening towards base of abdomen. Antennae of males largely but not always comb-like.

A key to the families deemed the closest to the tiger moths and included in the superfamily Noctuoidea is given below. This key does not hold for wingless females only, in which the systematics is not developed as yet. No genitalic characters appear necessary for family-level delimitations.

Superfamily Noctuoidea

A large, compact, apparently homogeneous group encompassing a few highly important moth families, including the family Noctuidae.

1. On hw, Sc+R1 missing, coinciding with R. Abdomen usually striate. Some of the moths resembling wasps. **Ctenuchidae**
- On hw, Sc+R1 separated from R at least beyond discoidal cell. 2
2. On hws, M2 arising closer to M3 than to M1. 3
- On hws, M2 arising not closer to M3 than to M1. **Agaristidae**
3. On hws, Sc sharply set off from R at base and then bridged with R over a short interval about the middle of cell, or connected with R by vein R1 at about the middle of cell. 4
- On hws, Sc not sharply set off from R at base, approaching there closely to R and then merging with R over a short interval, or paired with R from base up to the middle of cell, or even further. 5
4. Proboscis abortive or missing. Palpi usually short. Ocelli absent. Veins 1A+2A on fw without basal fork. Female abdomen with a stout bunch of hairs at the end. **Lymantriidae**
- Proboscis well-developed, labial palps long. Ocelli present. 1A + 2A on fw forming a basal fork. Female abdomen without compact tuft at the end. **Hypsiidae** (absent from the fauna of the former Soviet Union)
5. Sc+R1 of hw approaching R near base, then merging with R over a short interval but not beyond 1/3 cell; SA+R1 not inflated at base. **Noctuidae**
- On hw, Sc+R1 paired with R from base up to the middle of cell, or further; or if Sc+R1 separated from R about base and then merged with R up to 1/3 cell, then Sc+R1 inflated at base. 6
6. Ocelli absent. 7
- Ocelli present (Fig. 1). 8
7. Very small moths with triangular grayish fw characterised by areas of elevated scales. **Nolidae**
- Larger, usually narrow-winged moths with a slender abdomen, but without elevated scales. **Lithosiidae**
8. Labial palps not long. On hws, Sc+R1 swollen at base where merged with R. Usually broad-winged, robust, with dots over body. Fw frequently without areole. **Arctiidae** (part)
- Fws with an areole. **Arctiidae** (part), **Nyctemeridae** (absent from the fauna of the former Soviet Union)

¹ See Sotavalta, 1964: 1-42.

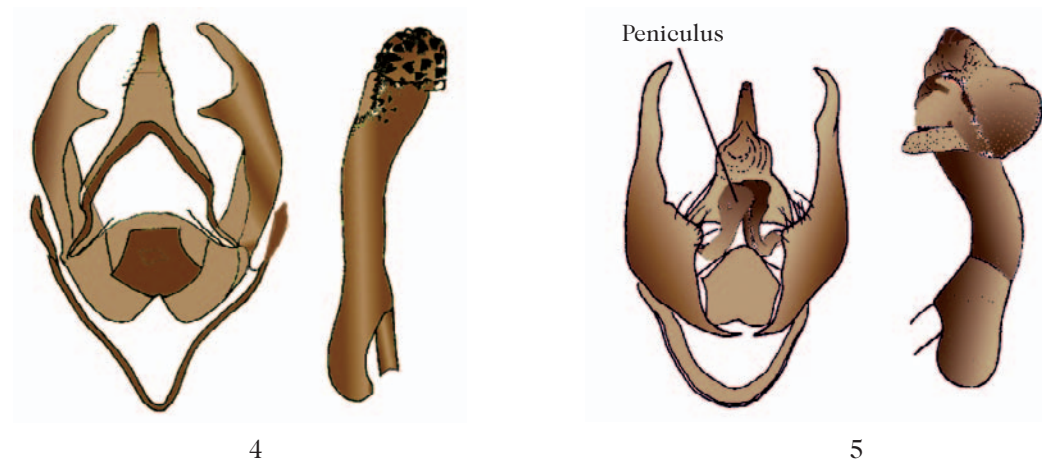


Fig. 4. Male genitalia of *Phragmatobia fuliginosa* (L.) (Subfamily Spilosomatinae).

Fig. 5. Male genitalia of *Arctia caja* L. (Subfamily Arctiinae).

Division of the tiger moths into subfamilies is based on the conformation of the male genital apparatus. A key to the subfamilies of Arctiidae is given below after Dubatolov (1990a).

1. Ventral edge of valves at apex of sacculus with a **membranous** part, usually even with a process termed “brachiola” (Fig. 6). **Callimorphinae**
- . Ventral edge of valves at apex of sacculus **sclerotised**. 2
2. Valve oval, strongly concave, declinate inside at edges, with a slender process at apex. Bases of transtillas with clear sclerotised basal processes termed “peniculus” (Fig. 5). **Arctiinae**
3. Valves short and broad, less than 2.5 times as long as wide, often with a process at costal edge. **Micrarctiinae**
- . Valves long, 3 or more times as long as wide, with fingers or benches at ventral edge (Fig. 4). **Spilosomatinae**

The following genera have been included into the subfamilies:

I. Callimorphinae:

Callimorpha Latr., *Euplagia* Hb., *Eucallimorpha* Dubatolov, *Aglaomorpha* Kôda, *Cymbalophora* Rbr., *Carcinopyga* Feld., *Axiopoena* Men., *Tyria* Hb., *Dodia* Dyar, *Lacydes* Wlk., *Spiris* Hb., *Coscinia* Hb., *Epimydia* Stgr., *Utetheisa* Hb.

II. Arctiinae:

Parasemia Hb., *Hyphoraia* Hb., *Pararctia* Sotav., *Sinoarctia* Dub., *Borearctia* Dub., *Acerbia* Sotav., *Platarctia* Pack., *Oroncus* Seitz, *Orontobia* de Freina, *Gonerda* Moore, *Preparctia* Hampson, *Arctia* Sehr., *Epicallia* HB., *Eucharia* Hb., *Pericallia* Hb.

III. Micrarctiinae:

Divarctia Dub., *Tancrea* Püng., *Holoarctia* Ferg., *Paleoarctia* Ferg., *Sibirarctia* Dub., *Chelis* Rbr., *Grammia* Rbr., *Hyperborea* Gr.-Gr., *Diacrisia* Hb., *Rhyparioides* Butl., *Rhyparia* Hb., *Amurhhyparia* Dub.

IV. Spilosomatinae:

Oenogyna Led., *Tajigyna* Dub., *Watsonarctia* de Freina, *Sinowatsonia* Dub., *Chionarctia* Kôda, *Alphaea* Wlk., *Andala* Wlk., *Hyphantria* Harris, *Diaphora* Steph., *Eudiaphora* Dub., *Spilosoma* Crt., *Spilarctia* Btl., *Areas* Wkr., *Lemyra* Wlk., *Phragmatobia* Steph., *Epatolmis* Btl.

The following key to arctiid genera occurring over the territory of the former Soviet Union can be proposed.

1. Vein M2 on hw absent; 5 veins but Sc originating from discoidal cell; moth medium-sized, alar expanse ≥ 32 mm, body slender 2
- Vein M2 on hw present though sometimes not quite well-developed, 6 veins but Sc originating from discoidal cell 3

2. Fws yellow with black longitudinal strokes
- Fws white with dark strips and spots
3. Areole (= additional cell) on fw present
- Areole on fw absent
4. Only one areole
- Two areoles on fw, latter white with a number of red and black spots; male antennae simple
5. R2 on fw branching from R1 and then merging with joint stalk R3-5, forming an areole. Fw black-brown with a red longitudinal band along costal edge; male antennae simple
- R2 branching from discoidal cell, pattern on fw different or absent
6. R2 connected with joint stalk R3-5, creating a thin areole
- R2 not connected so
7. Sc of hw merging with R at a distance less than 1/3 of its extent
- Sc of hw merging with R at least at 1/3 or more of its extent
8. Hind edge of fw dark, sometimes a semioval spot in basal part present
- A white band on hind edge of fw
9. Two large spots along hind edge of fw above vein A1 or two transverse belts across fw
- Four spots along hind edge of fw above vein 1
10. Areole originating from connection of stalk R2- R4 with R5; fw dusty gray with yellow unclear spots or fasciae, often degraded; hw yellow or whitish with a black discal spot; R and M1 starting from one point at apex of discoidal cell; Pamirs, Tian-Shan
- Areole originating from connection of stalk R2-R3 with R4; anal angle of male hw carrying a process with a black point
11. R2 of fw starting from discoidal cell and separated from R3; R3-R4 stalked, R5 beginning from low apex of radial-cubital cell
- Fw with veins R3-R5 stalked
12. Areole originating from connection of stalk R3-R5 with R2; M3 and Cu1 on hw beginning nearly from one point; fw black with white lines, latter forming an X-shaped pattern in outer part; spurs on tibia long; hw highly polymorphous in basic coloration
- M3 and Cu1 on hw starting from discoidal cell at a distance greater than interval between base of M2 and M3; spurs on tibia short
13. Moths large-sized, alar expanse more than 60 mm; fws rather wide, black, with a number of white spots of different size and shape; a small discal spot yellow; hw yellow with black spots; abdomen yellow with black rings
- Spiris* Transtilla of male genitalia with a strongly chitinised process, uncus concave at apex
- Coscinia* Transtilla of male genitalia without process, uncus slender and slightly expanded at apex
- 4 *Utetheisa*, *Tyria*,
Euplagia, *Callimorpha*,
Eucallimorpha,
Carcinopyga, *Argyna*
- 13
- 5
- Utetheisa* Uncus of male genitalia tapering at apex, without lamellae
- Tyria* (*T. jacobaeae*)
- 6
- 7
- 10
- 8
- 11
- 9
- Euplagia*
- Callimorpha*
- Eucallimorpha*
- Carcinopyga*
- Argyna* China
- Cymbalophora*
- 12
- Parasemia* Moths medium-sized (alar expanse 35 mm), abdomen slender; male genitalia: juxta rather narrow and asymmetrical, ventral portion of aedaeagus with numerous short spines
- Arctia* Uncus of male genitalia tapering at apex, without lamellae; sacculus without finger
- Aglaomorpha histrio* Male genitalia with costal process of valva developed

- Alar expanse less than 60 mm 14
14. R1-5 of fw on a stalk *Andala* 15
- Fw R1 starting from discoidal cell 15
15. Fw R2-5 stalked; R1 starting from discoidal cell 18 *Spilosoma, Lacydes*
- Fw with R3-R5 stalked; R1 and R2 starting from discoidal cell 16 *Grammia, Divarctia, Lemyra, Eucharia*
16. Fws dark with white longitudinal lines on veins and one sinuous transverse line in outer part of fw *Grammia* Tegumen of male genitalia shorter than uncus, juxta nearly crescentiform in ventral view, aedaeagus short and stout 17
- Pattern on fw different 17
17. Both wings yellowish white; male fw with dark brown spots; hw without spots; female wingless *Divarctia (D. diva)*
- Dark spots on fw weakly expressed, pale, often placed diagonally from apex of fw to middle of hind edge *Lemyra* Male genitalia: dorsum long and narrow, triangular in shape, uncus long, valve with a tripartite process/projection, aedaeagus with 1-2 groups of numerous long spines of cornuti
18. Fore tibia with a curved apical claw *Hyphantria* 19
- Fore tibia without curved apical claw 19
19. Eyes hairy 20
- Eyes smooth 21
20. M2 on hw abortive (short); medial spurs on hind tibia absent *Hyphoraia* Male genitalia valva with one apical process only 22
- M2 on hw normal *Sibirarctia* Valva of male genitalia with three apical dentiform processes 26
21. Eyes small, oval, each placed on a bare underblinker sclerite 22
- Eyes major, hemispherical, not placed on a bare underblinker sclerite 26
22. Male antennae two-combed; fw red-brown with transverse light fasciae and spots; veins not infusate *Pararctia* 23
- Male antennae simple or dentate 23
23. Male antennae simple with sparse black and white hairs; black hairs slightly shorter than diameter of antenna; fw black with a light band along costal edge, hw red or yellow *Oroncus* Hind tibia with 2 pairs of spurs, medial with one; proboscis present, underdeveloped; eyes oval, placed on sclerites devoid of scales; palp stout, directed forward; femora covered with red hairs from above 24
- Male antennae dentate 24
24. Fw dark gray with numerous, light, diffused spots; basal part of hw dark *Acerbia*
- Pattern on fw as wide infuscation along veins; male antennae dentate *Borearctia* Male genitalia: peniculus long, 3-4 times longer than wide 27
26. Fw violet brown with a pattern of yellow maculae *Platarctia*
- Coloration and pattern different 27

27. Thorax clothed with woolly hairs 31
 – Thorax smoothly scaled 28
28. Moths large, alar expanse 70-200 mm 30
 – Moths small to medium-sized, alar expanse less than 40 mm; wings gray 29
29. Antennae simple
 – Antennae pinnate
Dodia Cucculus at apex bifurcate (Figs 18-21)
Epimydia Uncus wide, only slightly longer than wide, narrowed toward apex
Pericallia Male genitalia: uncus with a protuberance
Axiopoena
30. Alar expanse less than 100 mm 32
 – Alar expanse greater than 150 mm; main colour of fw black without spots; hw black with a crimson basal part; hind tibia with two pairs of short spurs
Chelis Male genitalia symmetrical, valva trifid distally, uncus hook-like at apex
Holoarctia
31. Fw dark 33
 – Fw yellow or cream-coloured with black spots
Ocnogyna
32. Fw with five transverse bands 34
 – Less than five transverse belts or pattern on fw different
Paleoarctia Male genitalia asymmetrical, valve single, transtillas produced inwards
33. Fw gray with dark spots or dark with three lighter bands; female with short wings 35
 – Wings of female normal
Watsonarctia Male genitalia: uncus basally with a pair of large shield-shaped lamellae, aedaeagus with many spines on ventral margin
34. Fw with four transverse bands 36
 – Only one unbroken *transverse* band on fw, or transverse bands absent
Micrarctia, Epatolmis, Phragmatobia, Tancrea
Micrarctia Male genitalia: valva with a trigonal dentate process in medial or superior portion
35. Fw pink with a wide, dark brown, unbroken, transverse band in the middle of wing; submarginal band interrupted between R5 and Cu1; external edge of fw lighter; hw pink with a spot on discal vein and two marginal light brown spots 37
 – Transverse bands absent. 38
36. Fw black with light longitudinal stripes 39
 – Fw without pattern of lines or large spots; only short strips or points can be present
Phragmatobia Male genitalia: uncus rather slender and nearly straight, costa narrow and long
Epatolmis Male genitalia: uncus broad, valvae with teeth at ventral edge
37. Fw and hw of different colour 40
 – Fw and hw of same colour 46
38. Fw brown with black or red discal spots; hw crimson with a dark belt or row of spots at edge
 – Fw and hw uniform dark gray or black, except for a yellow anal part of hw
Tancrea
39. Background coloration of fw and hw same 41
 – Coloration of fws and hws different
40. Background colour ochre orange with black spots
 – Coloration entirely uniform

- | | |
|--|-----------------------------------|
| 41. Dusting thin; wings slightly translucent; male wings white or brown, female white | <i>Diaphora</i> |
| – Dusting dense | 42 |
| 42. Males and female wings of same brown colour with dark points; Central Asia | <i>Eudiaphora</i> Male genitalia: |
| | uncus broad, trigonal, |
| | valve straight, not |
| | furcated at apex |
| – Coloration yellow (pale yellow) or white | 43 |
| 43. Coloration yellow (pale yellow) | 44 |
| – Coloration white | 45 |
| 44. Fw of male yellow with a single spot on discal vein; hw of same colour (slightly lighter), with marginal and, sometimes, discal spots; female darker, with more strongly developed dark spots on hw; basal part dark | <i>Diacrisia</i> Male genitalia: |
| | juxta nearly rectangular, |
| | with a membranous area |
| | on its median portion in |
| | ventral view, no spinules |
| – Fw pale yellow with brownish or black patches; veins yellow; antennae two-combed | <i>Alphaea</i> Male genitalia: |
| | tegumen with small |
| | postero-subventral |
| | projections |
| 45. Wings white, usually without spots except for a dark discal vein on hw; abdomen white with red (yellow) and black spots; femora bright red (yellow) | <i>Chionarctia</i> Valvae very |
| – Wings white, usually with black spots; abdomen yellow or red with black spots; femora black or white | long |
| 46. Fw yellow or yellowish brown, hw usually crimson | <i>Spilosoma</i> Valvae |
| | moderately elongated |
| | 47 <i>Rhyparia</i> , |
| | <i>Rhyparioides</i> (differ in |
| | genitalia only) |
| – Hw usually ochre yellow; acrotegite of tegumen of male genitalia very well-developed, its subdorsal portion strongly expanded; lateral membranous area of abdominal segment 8 bearing a pair of valva-like secondary sclerites | <i>Spilarctia</i> |
| 47 Male genitalia: juxta semi-oval with numerous minute denticles on distal 1/2, aedaeagus strongly curved, valva with a semicircular process bearing numerous denticles | <i>Rhyparia</i> |
| – Male genitalia: juxta nearly rectangular with short denticles laterally in its apical 1/4-1/3, aedaeagus with minute spinules in apical portion | <i>Rhyparioides</i> |

The Aretiidae is a cosmopolitan family with about 10,000 species, mainly in the tropics. In the Palearctic, about 350 species are known, of which ~ 100 are encountered in the fauna of the former Soviet Union. Rather peculiar groups of tiger moths appear to be high-montane and/or Arctic, e.g. in the genera *Dodia*, *Oroncus*, *Pararctia*, *Orontobia* etc. Some of these are circumpolar in distribution, e.g. *Dodia* and *Pararctia*.

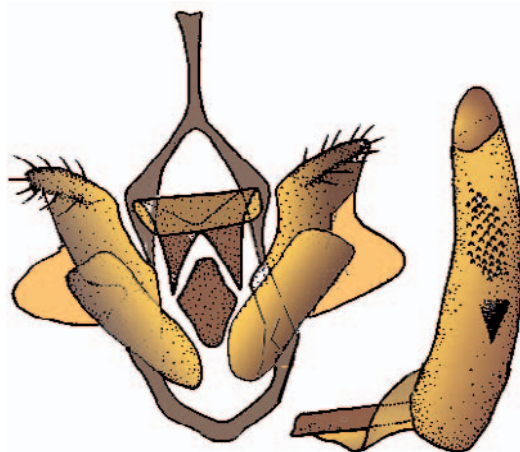


Fig. 6. Male genitalia of *Coscinia cribraria* (L.) (Subfamily Callimorphinae) (after Dubatolov 1990d).



Fig. 7. Tajikistan, Khorog, Botanical Garden, place of flight of *Eucallimorpha fedtschenkoi* Gr.-Gr. (photo by V. S. Murzin).

The family name derives from the shaggy, often brown, bear cub-like larva, or caterpillar (from the Greek “arktoz”, meaning “bear”). In English these are named “woolly bears”. The so looking caterpillars occur on some tussocks, in particular *Gynaephora* spp., with protruding glands on body segments 7 and 8.

The larvae feed on various herbaceous plants, less often arboreal ones, sometimes damaging crops. Some are inclined to preying on others. The American white moth, *Hyphantria cunea*, is a serious pest of garden and park cultures generally distributed in the southwest of the former Soviet Union, but potentially dangerous for other parts of European Russia. Larvae of many tiger moths prove to acquire toxicants, e.g. histamines and alkaloids, from their host plants. Others fabricate similar poisons by themselves. For this reason, many of the tiger moths become inedible to predators. In addition, usually they are brightly coloured, of a warning, aposematic coloration.

The patterns on the wings are manifold. In search of some regularities in these patterns, Sokolov (1936) (Fig. 8) offered a system, including the following lines: external (E3), medial lines M1 and M2, discal D1 and basal In, and also boundary and medial umbras. The pattern on the wings in tiger moths was also considered by Ferguson (1984). However, in each particular case finding these elements is difficult enough because of the numerous facts of their reduction, coalescence, shift or segmentation.

The existing patterns on the wings of tiger moths can be reduced to those observed in several reference lineages.

I. Type I

The pattern of the first type consists of a series of bands intersecting the wing in longitudinal and transverse directions (Fig. 9).

Tr1 (transversa No. 1), a short band beginning at the costal edge or apex of the wing and sometimes reaching E1.

Tr2, beginning at the costal edge and intersecting band E1; they often compose an X-shaped pattern.

Tr3-4 (sometimes Tr5), extending from the costal edge to longitudinal line Ls (longitudinal stroke). The line Ls runs from the base of the wing to the external edge.

Sp0-Sp4 (sprouts), approaching the inner edge of Ls.

The pattern is often supplemented by purification of the veins or is reduced as the result of loss of some elements.

A similar pattern can be seen in the tiger moth genera *Arctia*, *Callimorpha*, *Chelis*, *Divarctia*, *Hyperborea*, *Ocnogyna*, *Paelearctia*, *Pararctia* and *Parasemia*.

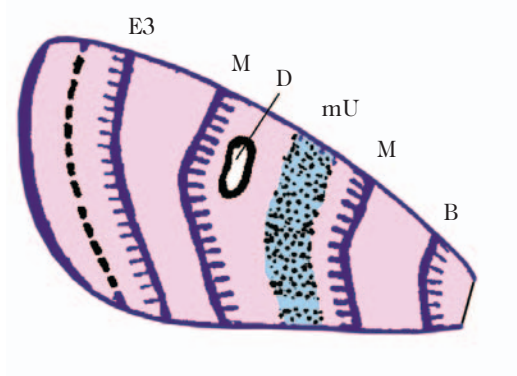


Fig. 8. Prototypic pattern in tiger moths (after Sokolov, 1936): E3 – externae, M – mediana, D – discalis, B – basalis, mU – umbra medialis.



Fig. 9. The patterns of fw in the tiger moths of Europe and northern Asia. I – Type I pattern, the most common. Band EI [external (E) – inner (I)] present, an arcuate band running from the middle of the external edge to the inner edge. II A, II B, II C and III – other types of pattern.

II. Type II: Fws are monochromous.

A. Fws with separate spots or points: *Spilosoma*, *Spilarectia*;

B. Fws with separate longitudinal bands: *Oroncus*, *Orontobia*, *Spiris*;

C. Fws without pattern: *Dodia*, *Epimydia*, *Phragmatobia*.

Type III: Fws with 4-6 transverse bands: *Carcinopyga*, *Rhyparia*, *Rhyparioides*, *Gonerda*, *Euplagia*, *Acerbia*, *Eucharia*.

Most of the species of our tiger moths display a pattern on the wings of type I. Type III is the closest to the initial pattern, as suggested by Sokolov.

Many species of tiger moths show considerable geographical and individual variability. In this connection, a number of forms, aberrations and subspecies have been described. All such modifications will be referred to as “forms” (f.) or “aberrations” (ab.). In contrast, geographically stable forms will be termed as subspecies (ssp.), though the degree of difference of similar forms from the typical one is not always appreciable.

Individual variability often arises as a result of environmental impacts, for example, under the influence of abnormal temperatures affecting some preimaginal stages of development. Most of the strongest modifications appear due to this cause, yet there are genetically determined forms as well. Rather often the red colour on the hws is changed to yellow or white, or vice versa. Such modifications occur in many species, for example, in the common *Arctia caja* L., the rib-grass tiger moths *Callimorpha dominula*, *Palearctia glaphyra* Ev., etc., all forming parallel series of forms devoid of geographical patterns.

The biology of numerous tiger moth species is still poorly-known. Most of these moths fly at night, but there are also diurnal examples, e.g., such high-mountainous species as *Oroncus tancrei* Stgr. and *Palearctia glaphyra* volant in the middle of day, or *P. erschoffi* Alph. appearing closer to the evening and volant up to the sunset. The same diurnal habits also concern subpolar species. Many tiger moths do not fly in the daytime, but are easy to spot in grass where they hide, e.g., *Diacrisia sannio* (L.), *Parasemia plantaginis* (L.), etc.

The mechanisms of defense in this family include certain types of behaviour that involve exposing the various highly coloured body parts. Thus, many species roll on their sides to reveal their bright abdomen. Other species, for example, *Utetheisa*, secrete a stinking acidic froth from their prothoracic glands or play dead.

An aposematic coloration is a very distinctive feature of this family, the garden tiger moth *Arctia caja* being only one example, as are both Mullerian and Batesian mimicry. A profound study of this phenomenon has been carried out by M. Rothschild (cited after Sbordoni & Forestiero, 1988: 153) using two Palearctic species of *Spilosoma*, one of which, *S. lubricipedum* (L.), is poisonous and acts as model for the other, *S. lutea* (Hfng.), which is quite edible. Superficially, these two species are very difficult to distinguish.

There is information that tiger moths active at night are capable of sensing the ultrasonic signals of bats and save themselves by sharply veering the flight or even falling to the ground. In the American tiger moth *Pyrrharcia isabella* (Smith, 1797) (Plate 24, Fig. 9), the existence of an “ultrasonic mimicry” has been revealed. In this case, the moth itself emits ultrasonic signals or “metal” notes of high frequency (Blest et al., 1963; Blest, 1964). As shown by Dunning, such signals are induced to stop or prevent a bat attack (Sbordoni & Forestiero, 1985). Actually, this tiger moth imitates the signals of other moth species that possess some means of chemical defence while the signals serve to warn and repel the bat.

Since 1983, the tympanic organ of *Empyreuma affinis* (Rothschild, 1912) has been studied intensively using acoustic stimuli of varying duration, from 3.5 ms to 5 s, without knowing for certain the behavioural significance of audition in this species. Both physiological and behavioural results suggested strongly that this species could use sound during its mating. Recently, strong sexual dimorphism, including the duration and repetition rate of the modulation cycles, has been demonstrated by recording both in field and wind-tunnel conditions the acoustic signals emitted by males and females (Dawson & Fullard, 1995).

Some experiments have been performed to understand the way of production of ultrasound by tiger moths. Certain Arctiidae have been shown to generate trains of high-frequency clicks from specialised structures (tymbals) on their thorax.

When stimulated either acoustically or actually, many species of arctiid moths rhythmically emit trains of clicks from metathoracic tymbals. Fullard & Dawson (1995) have tried to determine the location within the central nervous system (CNS) of the presumed tymbal central pattern generator (CPG) in *Cyenia tenera tenera* Hübner, 1818. Motor neuron impulses that underlie tymbal activation have been recorded extracellularly from the tymbal nerve while moths have been subjected to selective severing of the sub-oesophageal, prothoracic, pterothoracic and abdominal ganglia connectives. Motor output evoked by either acoustic or tactile stimulation originates from a common CPG because

tymbal nerve spikes in both cases are similar in amplitude, wave form and rhythmicity. The results show that (1) removal of the head decreased the responsiveness of the animal to acoustic stimulation; (2) severing the connectives between the prothoracic and pterothoracic ganglia abolished responses to acoustic stimuli and diminished responses to tactile stimuli. It has been concluded that although the minimal circuitry sufficient for activating the tymbals resides in the pterothoracic ganglion, the prothoracic and cephalic ganglia are required for the normal and, in particular, auditory-evoked operation of the tymbal CPG.

Assuming that bat detection is the primary function of moth ears, the ears of moths that are no longer exposed to bats should be deaf to echolocation call frequencies. To test this, Fullard et al. (1997) compared the auditory threshold curves of 7 species of Venezuelan day-flying moths (Notodontidae: Dioptrinae) to those of 12 sympatric species of nocturnal moths (Notodontidae (Dudusinae), Noctuidae and Arctiidae). Whereas two nocturnal species of dioptrines revealed normal ears, two other (day-flying) species had reduced hearing at bat-specific frequencies (20-80 kHz) and the remaining three ones (*Thimida* sp., *Polypoetes* sp., and *Xenorma* sp.) revealed pronounced to complete levels of high-frequency deafness. Although the bat-deaf ears of dioptrines could function for other purposes (e.g. social communication), the poor sensitivities of these species even at their best frequencies suggest that these moths represent a state of advanced auditory degeneration brought about by their diurnal life history. The phylogeny of the Notodontidae further suggests that this deafness is a derived condition and not the retention of a primitive, insensitive state.

Although social functions for the sounds have been demonstrated, debate continues on their anti-bat defensive role with aposematism, startle, and/or echolocation disruption being offered as to how the sounds operate. The controversy arises primarily from the near impossibility of observing natural, in-flight behaviour of moths and hunting bats. As a result, most of the experiments attempting to explain the sounds have used indirect methods to infer their actions. These studies include examinations of the structure of the sounds, stimulation of stationary moths with artificial bats, and stimulation of trained, laboratory bats with artificial moths. Other laboratories have attempted to exploit the

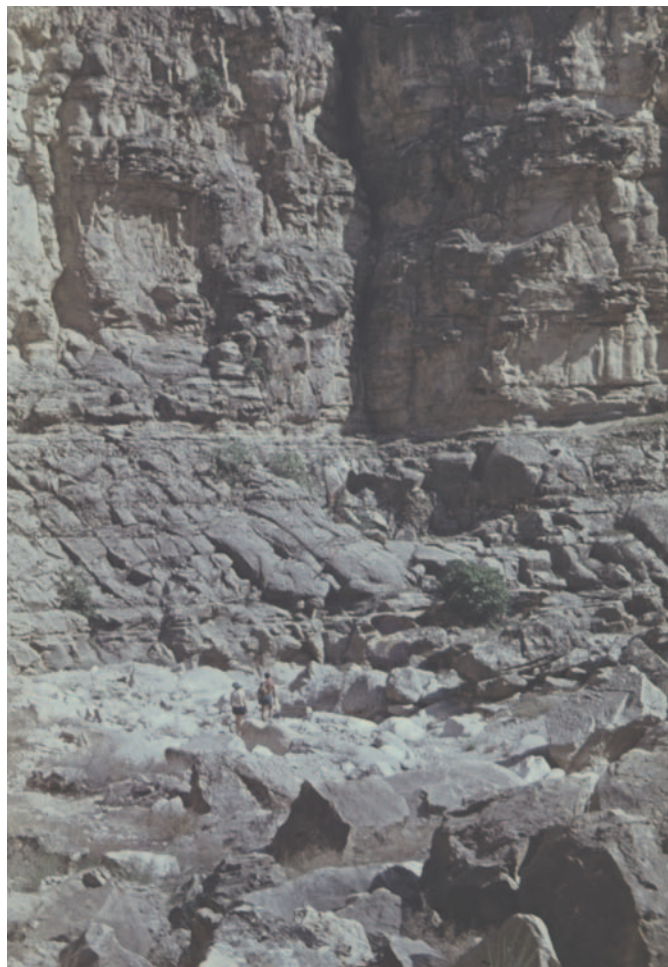


Fig. 10. Turkmenistan, Great Balkhan Mt. Range. *Axiopoena maura* extremely frequently occurring there (photo by V. S. Murzin).

foraging behaviour of wild bats in controlled conditions. These studies have not yet satisfactorily explained why arctiids talk, but one observation that has become clear is that the defenses of tiger moths, as with most animals, are directed against a variety of predators and that single explanations do not exist for complex behaviours (Coro et al., 1992; Fullard, 1994; Fullard et al., 1997).

It is noteworthy that larvae of *Empyreuma pugione* (Linnaeus, 1767) have been found to be responsive to sounds as well. Larvae respond to low-frequency sounds between 100 and 1000 Hz by either a violent jerking of the anterior half of the body or by the cessation of crawling. The behavioural responsiveness of denuded animals as well as the vibrational resonance of the setae are the sound receptors in this species. The frequency and the behavioural response are consistent with the idea that larvae are sensitive to the wing-beat frequencies of predatory and parasitic wasps. These very interesting observations require further investigations.

The majority of tiger moths hibernate at the stage of a caterpillar, sometimes the very first instar. However, there are species overwintering as the pupa. Some boreal and high-mountainous species can hibernate repeatedly.

A few fossil remains of tiger moths are currently known, in particular the Miocene *Stauropolia nekrutenkoi* Skalski, 1988, described from near Stavropol, North Caucasus and apparently belonging to the subfamily Arctiinae. In general, based on the fact that a highly advanced arctiine occurred as early as in the Miocene, Skalski (1988) considered that representatives of Arctiidae could have been relatively common and diverse in the Tertiary of Europe. However, a critical review of fossil Lepidoptera (Kozlov, 1988) questions virtually all previous records of arctiid moths by, e.g., Woodward (1879), Rebel (1898), Kernbach (1967) or Jarzembowski (1980).

III. Special part

Subfamily Callimorphinae

1. Genus *Callimorpha* Latreille, 1809

Callimorpha Latreille, 1809: 220, TS: *Phalaena dominula* Linnaeus, 1758
= *Panaxia* Tams, 1939: 73, TS: *Phalaena dominula* Linnaeus, 1758

Size medium, moth slender, wings prolate and brightly pigmented. Areole on fw existing. Proboscis well-developed. Antennae of both sexes simple, with two series of short setae located all along antenna. Eyes large, bare, with a well-marked ophthalmic sclerite. Palps short, bent upwards, coated with accumbent fluffs, with a reduced end segment. Thorax smooth with accumbent scales. Wing pattern of Type I.

Key to species of *Callimorpha*:

1. Only spots on fw. *C. dominula*
–. Only transverse bands on fw. *C. philippsi*

1. *Callimorpha dominula* (Linnaeus, 1758)

(Pl. 1, Figs 1-5, genitalia Pl. 25, Fig. 1)

Phalaena dominula Linnaeus, 1758, 1: 509, TL: Europe.

[= *domina* Hübner, 1803; *dominula* Mann, 1862; *insubrica* Wackerzapp, 1890; *lusitanica* Staudinger, 1894; *rhodanica* Kettlewell, 1943].

[*dominula* – small mistress (Lat.)]

[Scarlet tiger moth – (Engl.)]

[Harlequin – (Germ.)]

[Ecaille rouge – (Fr.)]

Kolenati, 1846: 95, *Callimorpha rossica*

Spuler, 1910, 2: 141, pl. 74, fig 4c, *Callimorpha dominula*

Seitz, 1913, 2: 101, pl. 18 row e, *Callimorpha dominula*

Dubatolov, 1996b: 40, *Callimorpha dominula*

Subspecies:

C. d. dominula (Linnaeus, 1758) (= *insubrica* Wackerzapp, 1890; *rhodanica* Kettlewell, 1943)

C. d. rossica Kolenati, 1846 (= *dominula lutea* Staudinger, 1861: 214)

C. d. teberdina Sheljuzhko, 1934

C. d. swanetica Reich, 1935

C. d. pompalis Nitzsche, (1925) (= *italica* Standfuss, 1884; *majjellica* Dannehl, 1929)

C. d. bithynica Staudinger, 1871 (= *balcanica* Daniel, 1951/52)

C. d. kurdistanica Thomas, 1983.

The species is included as threatened in the Red Data Book of the USSR (Borodin, 1984b).

Description. Alar expanse 45-55 mm. Antennae filiform. Fw black with greenish sheen, with rounded or oval yellow to pale yellow spots. Hw pink or carmine red with black marginal spots. Thorax black with greenish sheen and two yellow longitudinal stripes. Abdomen red with a black longitudinal stripe dorsomedially.

Variability. This is a highly variable species. Several dozen individual variations and geographical races have been described. Two subspecies, the nominotypical and the ssp. *rossica*, are known from the territory of the former Soviet Union. The latter subspecies (Pl. 1, Figs 1-2, 4-5) is distinguishable from the nominotypical one by the brilliant green sheen of the fw and by the yellow background coloration of the hw. However, some *rossica* populations are known, in which specimens with yellow or carmine red hw coexist (Pl. 1, Figs 4-5). The spots on the fw are almost clearly white. This subspecies is known to occur in the Caucasus and Transcaucasia.

The following forms/varieties can be distinguished:

- f. *hamelensis* Pflumer, 1879 – fw with partly merged white spots, hw red;
- f. *ochromaculata* Fuchs, 1890 – fw with ochre yellow spots;
- f. *paucimacula* Schultz, 1897 – fw uniform brown, almost without spots;
- f. *nigra* Spuler, 1910 – fw completely black;
- f. *radiata* Krodell, 1901 – underside of fw with two white stripes starting from base;
- f. *bimacula* Schultz, 1905 – with two (basal) spots only.

Callimorpha dominula is a classical example of polymorphism. This species is polymorphous at the genetic level for both alleles that control the number of white spots on the fw. The normal homozygote *dominula* has six main white spots distributed over the whole fw while the rare, also homozygote form *bimacula* has only two basal spots. If one studies closer the proportion of the different morphs of *dominula* at one and the same locality in different years, the frequency of occurrence of the forms can be seen as time-dependent. Thus, careful observations made annually in England showed significant variation in the share of the *bimacula* form. Its frequency rose from around 1 % in 1929 to over 11 % in 1940 and then gradually dropped back to its original level in 1955. In subsequent years, it fluctuated between 0.8 and 4.6%. The causes for this variation have not been clearly identified yet (Sbordoni & Forestiero, 1985).

Distribution. Pattern Euro-Siberian.

Within the former Soviet Union. Baltic republics; Belarus; Ukraine, Crimea; Moldova; European Russia up to 60°N (headwaters of Volga River, Nizhnii Novgorod, Ufa, Belaya River, South and Central Urals, Orel, Rostov-on-Don); Caucasus; Transcaucasia; southern Turkmenistan (Kushka).

Beyond the former Soviet Union. Europe (up to southern England and southern Scandinavia in the north, absent from the southern part of the Iberian Peninsula); Turkey; Iraq; Iran, Asia Minor.

Biology. Distribution patchy, often in ecotones, in the daytime in forest glades, at forest edges, etc. Occurring on flowers, e.g., of thistle, knapweeds, etc., or flying from tree to tree, resting in foliage. In many regions, very usual, for example, in Armenia (slopes of Mt. Aragats, Tsav, where the moths sometimes damage fruit-trees), North Caucasus, in the north of Moscow Region, in Lenkoran, Azerbaijan, etc. In the Crimea, it is rare, protected since 1990. Flight in one generation from the beginning of June and in July.

Caterpillar black with dark blue sheen. Thorax with a yellow stria changing in the last instar to yellow-gray maculae. Yellow spots discernible on each side. Fluffs in fascicles on dark warts, grayish, short. Larvae feeding on



Fig. 11. *Callimorpha dominula persona* ab.donna Esp (1) and hybrid *romanovi* Standfuss (2) (after Spuler, 1910).

The modest quality of the illustration is only due to the relatively poor quality of an old original picture.

Cynoglossum, *Fragaria*, *Fraxinus*, *Geranium*, *Lamium*, *Lonicera*, *Myosotis*, *Populus*, *Prunus*, *Ranunculus*, *Rubus*, *Salix*, *Ulmus*, *Urtica*, etc.

Caterpillars hibernating and pupating in May on the ground among grass. Pupa reddish brown, glossy. Cocoon thin, light, almost white.

This species was an object of manifold experimentation. A strong influence of pupal cooling on adult coloration was detected. Standfuss² crossed males of *C. dominula dominula* and females of *C. dominula persona* (Hübner, 1790). He obtained brightly pigmented large moths. Back crossings (female *dominula* and male *persona*) provided a different result, though the caterpillars were reared simultaneously and in identical conditions. This explorer obtained smaller moths with cinnabar and strongly infusate hws, as observed in the extreme aberration *domna* Esper, 1786. On the whole, the hybrids showed an appearance intermediate between the parents (hybrid *romanovi* Standfuss, 1899) (Fig. 11).

For reasons unknown, this rather common tiger moth was listed as threatened in the Red Data Book of the Soviet Union (Borodin, 1984b).

Similar species. *C. philippsi* Bartel, 1906, differs by the merged maculae on the fws, these maculae forming two transverse bands (Fig. 12).

2. *Callimorpha philippsi* Bartel, 1906

(Fig. 12)

Callimorpha philippsi Bartel, 1906: 41, TL: Kusch [= Turkmenistan, Kushka (?)].
[= *dominula persica* Le Cerf, 1913]

[philippsi – after Mr. Philipps (Lat.)]

Seitz, 1910: 101, *Callimorpha philippsi*

Draudt, 1933: 72, *Callimorpha philippsi*

Dubatolov, 1996b: 40, *Callimorpha dominula philippsi*

Description. Alar expanse 50-54 mm. Fw black with greenish tint and two transverse white bands. A white point on discal vein. Hw red with black spots as in *C. dominula*. Head and thorax dark, latter with two longitudinal yellow strokes. Abdomen from above orange red, with a series of black points.

Distribution. Pattern Transcaucasian (Hyrcanian).

Within the former Soviet Union. Kushka (?), Azerbaijan (Lenkoran). Despite extensive collectings in the region of Kushka (Morgunovka, Badkhyz Nature Reserve), we have failed to find this species.

The natural landscapes in the neighbourhood of Kushka (semidesert, riverine forest, steppe, *Pictacea* “savanna”) differ strikingly from those at Lenkoran (subtropical wet relict forest), where the moth has been refound (Lenkoran, Dashtatyuk, 19.VI.1984, leg. G. Miländer). Therefore, there are doubts concerning the provenance of the type locality as given in the original description.



Fig. 12. *Callimorpha philippsi* Bartel, Azerbaijan, Lenkoran, Dashtatyuk 19.VI.1984. G. Miländer leg. (photo by V. S. Murzin).

² Cited after Spuler, 1910: 140-141.

Beyond the former Soviet Union. Iran (?).

Similar species. *C. dominula* has on fw separate light spots, instead of bands.

2. Genus *Euplagia* Hübner, 1820

Euplagia Hübner, 1820: 180, TS: *Phalaena hera* Linnaeus, 1767 (= *quadripunctaria* Poda, 1761)

Antenna of male and female simple, in male with short aciculae all along; proboscis developed. Head large, palpi very long, reaching to middle of eye, directed upwards. Fw opaque, pattern consisting of oblique straight lines directed across and along the wing; back edge of wing widely clarified. Wing pattern of Type I.

3. *Euplagia quadripunctaria* (Poda, 1761)

(Pl. 1, Figs 6-7; genitalia in Pl. 25, Fig. 2)

Noctua quadripunctaria Poda, 1761: 89, TL: "Roes. Inf." (Inner Russia).

[= *hera* Linnaeus, 1767; *plataginis* Scopoli, 1763; *lutescens* Staudinger, 1901; *magna* Spuler, 1910; *latefasciata* Bubacek, 1915]

[*quadripunctaria* – four-dotted (Lat.)]

[Spanische Fahne, Russischer Bär – (Germ.)]

[Jersey Tiger – (Engl.)]

[Ecaille Chinée – (Fr.)]

Oberthür, 1896: 56, pl. 10, fig. 174, *Callimorpha hera fulgida*

Spuler, 1906: 141, pl. 74, fig. 8, *Callimorpha quadripunctaria*

Seitz, 1910: 101, pl. 18, row f, *Callimorpha quadripunctaria*

Daniel, 1953, *Euplagia quadripunctaria rhodosensis*

Dubatolov, 1996b: 41, *Callimorpha quadripunctaria*

Subspecies:

E. q. fulgida Oberthür, 1896.



Fig. 13. *Euplagia quadripunctaria* (Poda), ♂. Armenia, Mt. Aragats, Nor-Amberd, 2000 m, 12.IX.1971 (photo by V. S. Murzin).

Description. Alar expanse 50 mm. Fw black with white striae. Hind edge of fw white. A white, downward narrowed line 5-7 mm in length extending from base of fw to back edge. A white stria beginning at costal edge of fw ca. 1/3 extent off its base and directed towards back angle. One more stria stretching from costal edge to outside and merging with still another white stria passing parallel to external edge. Back angle of fw with a white field formed by additional, white, longitudinal, short lines, with a black round spot and 1-3 black points. Hw red from above, with a black round spot at centre and two submarginal maculae. Underside of fw and hw with basal parts red orange with a black spot, apex of both wings light. A black field between two median belts. Hw red orange with one submarginal black spot.

Variability. This species is highly variable both in individual size and coloration.

The following subspecies or forms are known from the former Soviet Union.

ssp. *quadripunctaria* – European part;

ssp. *fulgida* – this very large form with magnificent red-coloured hws and enlarged black maculae is distributed in the southern part of its geographical range: southern Turkmenistan, Transcaucasia, northern Iran, Turkey, Syria;

f. *lutescens* Staudinger – hw yellow;

f. *latefasciata* Bubacek – hw orange yellow.

Distribution. Pattern Euro-Caucasian.

Within the former Soviet Union. Baltia (Lithuania, Latvia); Belarus; Ukraine, Crimea; Moldova; European Russia, up to the Leningrad Region in the north, midflow region of Volga River, southern Urals; Caucasus; Transcaucasia; southern Turkmenistan (Kopetdagh Mts).

Beyond the former Soviet Union. Southern and Middle Europe, up to southern England in the north (except for the North Sea and Baltic coasts of Europe); Turkey; Syria; northern Iran.

Biology. Flight in August to September, can often be seen feeding on flowers. Caterpillar gray-brown or black with yellow orange hairs. A bright orange stria all along body. Each segment with 4 yellow warts with black edges. Sides with a light, neat, longitudinal band accompanied from above and on underside with warts. Last-instar caterpillar up to 55 mm in length. Larvae feeding on various herbaceous or partly woody plants (*Lamium*, *Epilobium*, *Corylus*, *Rubus*, *Lonicera*, *Sarothamnus*), hibernating.

For reasons unknown, this species was included in the Red Data Book of the USSR (Borodin, 1984b).

Similar species. *E. splendidior* (Tams, 1922), differs by the bright silky sheen of the fws and the larger size.

4. *Euplaga splendidior* (Tams, 1922)

(Pl. 2, Fig. 1)

Callimorpha splendidior Tams, 1922: 196, TL: Northwestern Persia (= Iran).

[= *quadripunctaria tkatshukovi* Sheljuzhko, 1935a]

[*splendidior* – more gorgeous (Lat.)]

Wiltshire, 1957: 51, pl. 1, fig. 1, *Callimorpha splendidior*

Dubatolov, 1996b: 41, *Euplaga splendidior*

Description. Alar expanse 55-60 mm. Pattern very similar to that of fw of *E. quadripunctaria*, but coloration of fw differing by brightly green silky glitter. Specimens from Armenia available to us showing a narrow white line extending from base of fw parallel to hind edge up to a white field in outer corner. In *E. quadripunctaria*, this line reduced closer than middle of fw. Underside coloration more saturated by red orange tint than in *E. quadripunctaria*.

Distribution. Pattern Anatolian-Iranian.

Within the former Soviet Union. southern Transcaucasia: Armenia (southern slopes of Mt. Aragats), Azerbaijan (Nakhichevan).

Beyond the former Soviet Union. Eastern Turkey; northern Iraq (Zagros Mts) [Wiltshire, 1957]; western Iran.

Biology. Flight in July at elevations about 1900-2000 m a.s.l., in sparse woodlands resting on tree trunks. Few records in Armenia (Collections of Tsvetaev of 1936 and 1974, and of Murzin of 1962). According to Wiltshire (1957), "The food plants are low plants in places, where there are trees".

Similar species. *E. quadripunctaria*, differs by the smaller size and the lack of metallic gleam of the fw.

Notes. This taxon is sometimes considered as a subspecies of the previous species. However, on the slopes of Aragats Mountains in Armenia, both *E. quadripunctaria* and *E. splendidior* can co-occur in one and the same place. Yet the time of flight is a little different there, with *E. quadripunctaria* flying from mid-August to the end of September.

3. Genus *Eucallimorpha* Dubatolov, 1990

Eucallimorpha Dubatolov, 1990c: 99, TS: *Callimorpha principalis fedtschenkoi* Grum-Grshimailo, 1902

Dubatolov (1990c) has established the genus based on some singular traits of male genitalic structure as well as the original external appearance.

Note. Dubatolov (1990c) also refers *E. equitalis* (Daniel, 1943) (Pl. 2, Fig. 2), from the Himalaya and some adjacent parts of China and India, to the same genus. Some further congeners among the Palaearctic taxa seem to be as follows: *Eucallimorpha similis* Moore, 1879a, from Nepal, *E. albipuncta* Wileman, 1910, *E. arizana* Matsumura, 1911, both from Taiwan, *E. lenzeni* Daniel, 1943a, from Yunnan, China, *E. nyctemerata* Moore, 1879a, *E. nephos* from Sichuan (Leech, 1899), Yunnan (Daniel, 1943; Fang, 1982, 1985) and Tibet (Fang, 2000), and *E. ochricolor* Alpheraky, 1897, from Sichuan.

There is a single species in the former Soviet Union. Its identification causes no difficulties.

5. *Eucallimorpha principalis* (Kollar, 1844)

(Pl. 2, Figs 2-6)

Euprepia principalis Kollar, 1844: 465, pl. 20, fig. 2, TL: Kashmir.

[*principalis* – *principal* (Lat.)]

Grum-Grshimailo, 1902: 197, *Callimorpha fedtschenkoi*
 Seitz, 1910: 102, pl.18, row g, *Callimorpha principalis*
 Seitz, 1910: 102, *Callimorpha principalis fedtschenkoi*
 Seitz, 1910: 102, *Callimorpha principalis regalis*
 Draudt, 1931: 281, *Callimorpha principalis ladakensis*
 Daniel, 1943a: 247, pl. 13, *Callimorpha equitalis*
 Kishida, 1992: 72, *Callimorpha principalis* f. *equitalis*
 Kishida, 1993: 66, pl. 79, fig. 4, *Callimorpha principalis*
 Dubatolov, 1996b: 41, *Eucallimorpha principalis*
 Fang Chenglai, 2000: 463, *Callimorpha principalis*

Subspecies:

E. p. fedtschenkoi (Grum-Grshimailo, 1902) (genitalia in Pl. 25, Fig. 3)

E. p. ladakensis (Reich, 1933): 234

E. p. regalis (Leech, 1889): 125.

Description. Alar expanse 75-80 mm. Fw dark with green lustre and small rounded or elongate yellow or white maculae. Hw yellow with well-marked black dusting on veins and several black maculae sometimes merged in a submarginal belt.

Variability. The typical form is distributed in the Himalaya. From Khorog, Pamirs, Tajikistan, the ssp. *fedtschenkoi* (Pl. 2, Figs 5-6) has been described as being smaller (60-70 mm), with bright green sheen on fw. Spots on fw lighter, hw light yellow, black dusting on veins almost completely missing. Only a black spot retained on discal vein as well as a series of transversely elongate submarginal maculae along outer edge of hw, and a black line between veins M3 and Cu1. Abdomen red with black points on dorsal side.

The following subspecies are known from the adjacent territories:

ssp. *ladakensis* – fw dark green with weak metallic lustre, spots white with weak yellowish tint; hws bright, yellow orange; black spots weakly expressed, veins devoid of black dusting; abdomen red without black maculae. Ladak, Tibet, 3700 m a.s.l., July;

ssp. *regalis* – more often larger and lighter; China, i.e. Zhejiang, Jiangxi, Sichuan, Shaanxi, Hubei, Hunan, Fujian (Fang, 2000).

Distribution. Pattern Central Asian.

Within the former Soviet Union. Pamirs (Khorog, Barvaz).

Beyond the former Soviet Union. Himalaya (Kashmir), China: Yunan (Tiger Leaping Gorge, Haba Mts, Zhongdian), Sichuan, Shaanxi, Hubei, Hunan, Fujian, Ladak (Tibet), northern Nepal (Mt. Annapurna).

Biology. Flight in July at elevations from 2000 m a.s.l. (Khorog, Pamirs) (Barvaz tract in Shakhdara Valley, 2800 m a.s.l.) up to 4200 m a.s.l. (Nepal, Annapurna), nocturnal. In the daytime, moths resting on the upper side of leaves in trees and shrubs, whence easily flushed.

Similar species. *E. equitalis*, from Nepal, is a little larger (up to 73-75 mm), hw white with a weakly expressed dark pattern. Abdomen from above black, underside white with a black reticulate pattern, red on each side.

Genus *Aglaomorpha* Kôda, 1987³

Aglaomorpha Kôda, 1987: 187, figs 21-24, TS: *Hypercompa histrio* Walker, 1855

= *Neocallimorpha* Dubatolov, 1990e: 100, fig 8, TS: *Hypercompa histrio* Walker, 1855

Fw dark with white, oval or angulated spots. Hind edge of fw not clarified. Veins on hw not infusate. Head and palps small, latter a little longer than head pilosity. Genitalia: Male uncus short, rather stout, pointed at apex, sacculus deeply cut longitudinally, its extremities of different form. Ventral process of valves (brachiola) membraniform, well-developed. Aedaeagus rather short, stout, without cornuti. Female ostium much wider than sexual papillae, signa on bursa elongate transversely (see description of *Neocallimorpha* by Dubatolov (1990e)).

Note. *Aglaomorpha plagiata* (Walker, 1855), from China and Nepal, belongs to this genus.

Aglaomorpha histrio (Walker, 1855)⁴

(Pl. 3, Fig. 1; genitalia in Pl. 25, Fig. 4).

Hypercompa histrio Walker, 1855: 654, TL: Shanghai (China).

[*histrio* – actress (Lat.)]

Seitz, 1910: 102, pl. 18, row g, *Callimorpha histrio*

Draudt, 1931: 281, *Callimorpha histrio*

Wang et al., 1983: 225, fig. 1654, *Callimorpha histrio*

Description. Alar expanse 72-76 mm. Fw black with numerous oval or angulated white and yellowish spots. Hw yellow with large black maculae. Abdomen yellow with a series of black lateral points and both dorsal and abdominal transverse strokes. Head black, epieranium yellow. Patagia black; thorax yellow with two large longitudinal maculae. Antennae simple.

Variability. Individual variation modest.

Two subspecies are known as verified:

ssp. *coreana* Matsumura, 1927 (= *chosensis* Bryk, 1949) – Korea

ssp. *formosana* Miyake, 1911 – Taiwan.

Distribution. Pattern East Asian.

Within the former Soviet Union. Not known, though an encounter in the south of Primorye, Russian Far East seems possible.

Beyond the former Soviet Union. North and South Korea (Sinpkho, Pyongyang) (S. Murzin), China (Taiwan, Sichuan, Gansu, Hubei (Fang, 1982), Yunnan (Fang, 1985)).

Biology. Flight in July in woodlands.

³ Only the genera recorded in the former Soviet Union are numbered.

⁴ Only the species recorded in the former Soviet Union are numbered.

4. Genus *Cymbalophora* Rambür, 1866

Cymbalophora Rambür, 1866: 231 (replacement name for *Tympanophora* Laboulbène, 1865), TS: *Phalaena pudica* Esper, 1784

= *Eyprepia* Ochsenheimer, 1810: 299, TS: *Phalaena caja* Linnaeus, 1758

= *Tympanophora* Laboulbène, 1865: 221, non *Tympanophora* White, 1841 (Orthoptera)

Antennae of male simple. A small accessory cell, or areole, on fw. Veins M2, M3 and Cu1 on fw and hw tightly connivent; starting from virtually one point at hind angle of discal cell. Veins Sc and R1 on hw paired with R on a very small field. A large tympanic organ at hind extremity of male thorax.

Note. *Cymbalophora pudica* (Esper, 1785), from Southern Europe, as well as several species from North Africa and East Asia belong to this genus. In North America, there are lots of species superficially very similar to the Palaearctic representatives of this genus.

6. *Cymbalophora rivularis* (Ménétrières, 1832)

(Pl. 3, Fig. 7)

Chelonia rivularis Ménétrières, 1832: 263, TL: Armenia, Helenendorf (=Lake Sevan).

[= *dannehli* Turati, 1929; *perversa* Dannehl, 1929; *connexa* Dannehl, 1929]

[*rivularis* – riverine (Lat.)]

Seitz, 1910: 80, pl. 16, row c, *Eyprepia rivularis*

Dubatolov, 1996b: 41, *Cymbalophora rivularis*

Description. Alar expanse 33-36 mm. Fw of male white or slightly yellowish, coated with numerous, narrow, black, triangular or round spots and short lines. Hw almost clean white. Head, prothorax and tegula coated with long light hairs; thorax dark. Abdomen light. Female short-winged, flightless.

Variability. A number of individual variations have been described. They are reduced to the fusion of markings along or across the wing (e.g. *dannehli*, *connexa*) or with maculae on the hw (f. *posteripunctata* Dannehl, 1929).

Distribution. Pattern Mediterranean.

Within the former Soviet Union. Caucasus (Daghestan), Transcaucasia: Armenia (Mt. Aragats, Lake Sevan, Dilijan), Nakhichevan.

Beyond the former Soviet Union. Central Italy; Balkans; Turkey (east of Lake Van), western Iran.

Biology. Flight in July-September, at least so in Armenia on the mountain slopes at 1900-2000 m a.s.l. Caterpillar black-gray, with neat, yellow, dorsal lines and dark maculae on them. Warts nitidous black, each with a short yellow fascicle of hairs. False legs red or red-and-white, thoracic legs gray or reddish. Head yellow-gray. Caterpillars living on *Galium*, *Asperula cynanchica*. Pupation on ground in a cocoon made of ground and hairs tied with silk strands. Pupa nitidous red-brown, hibernating.

Similar species. *Dixarectia diva* Staudinger, 1887, is much larger (alar expanse 42-45 mm), the male antennae are comb-bearing. *Cymbalophora pudica* (Esper, 1785), from southwestern Europe and absent from the former Soviet Union, shows a red abdomen.

5. Genus *Carcinopyga* Felder, 1874

Carcinopyga Felder, 1874: pl. 101, fig. 3, TS: *Carcinopyga lichenigera* Felder, 1874.

= *Euarctia* Staudinger, 1887a: 79, TS: *Euarctia proserpina* Staudinger, 1887a.

Antennae short, simple, eye small. Accessory cell on fw present, originating from connection of stalk R2-R4 with R5. Fw dusty gray with yellow unclear spots or fasciae, often degraded.

Key to species of *Carcinopyga* (based on males):

1. Hw infuscate, with 2 rows of submarginal spots. *C. lichenigera*
 –. Hw without submarginal spots. 2
 2. Spot on discal vein of hw present. 3
 –. Spot on discal vein of hw absent. *C. gurkoi*
 3. Hw white. *C. proserpina*
 –. Hw yellowish. *C. lindti*

Note. The female of *C. proserpina* shows the hw yellowish like in *C. lindti*.

7. *Carcinopyga lichenigera* Felder, 1874

Carcinopyga lichenigera Felder, 1874: pl. 101, fig. 3, TL: Ladak (India).

[lichenigera – lichen-bearing (Lat.)]

Seitz, 1910: 97, pl. 17, row g, *Carcinopyga lichenigera*

de Freina, 1982: 12, *Carcinopyga lichenigera nuytenae*

Dubatolov, 1996b: 42, *Carcinopyga lichenigera* (misidentification)

Description. Alar expanse 66-70 mm. Fw bluish gray with light transverse bands in a dark frame. Hw orange pink with several black maculae prolate in transverse direction.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Khorog, Ishkashim (?) (Kautt & Saldaitis, 1997: 139, map).

Beyond the former Soviet Union. Eastern Afghanistan, northern Pakistan, northern India (Kashmir, Ladak, Leh) (Thomas, 1989).

Variability. *C. lichenigera nuytenae* de Freina, 1982, differs by a lighter background of the hw. Pakistan, the Himalaya.

Biology. A high-montane species volant at heights more than 3000 m a.s.l. and recorded in alpine meadows and rock denudations. Flight in July to August.

Similar species. *C. proserpina*, differs by a strong dark dusting of the fw and a wider apex of the cucullus in the genital apparatus of the male. Hw without submarginal pattern.

8. *Carcinopyga proserpina* (Staudinger, 1887)

(Pl. 3, Figs 2-3; genitalia in Pl. 25, Fig. 5)

Euarctia proserpina Staudinger, 1887: 80, TL: "Prov. Samarkand".

[proserpina – the goddess of the nether world (Gr.)]

Seitz, 1910: 97, pl. 17, row g, *Carcinopyga proserpina*

Dubatolov, 1996b: 42, *Carcinopyga proserpina*

Subspecies:

C. p. lindti Černý, 1986: 31.

Description. Alar expanse of male 62-67 mm. A black-gray background coloration of fw formed from above by rich dusting of black scales. Light yellowish, transverse belts coming out against this background. At costal edge of fw these belts forming rather clear yellow maculae (altogether four). Hw white with a dark gray crescent spot on discal vein. Head and thorax black, abdomen of male yellow from above. Underside of wings white, with a black pattern consisting of spots at costal edge of fw. Hw with a large spot at costal edge and crescent at the centre. Abdomen on underside black except for yellow last segments. In female, hind half of abdomen black from above.

Variability. The nominotypical subspecies inhabits Pamirs (Vanchsky, Shughnansky, Shakhdarinsky, Hissar Mts, Pamirs-Alai).

The ssp. *lindti* Černý is a well-distinguished colour form originally described as a separate species from the Ugamsky Mt. Range, West Tian-Shan. The moth differs from *C. proserpina* by the yellowish hw and the same underside. It is distributed in the Kirghizsky (Aksu-Dzhebagly), Chatkalsky, Kuraminsky, Karzhantau and Ugamsky Mt. ranges in the West Tian-Shan, and near Lake Issyk-Kul, Central Tian-Shan. Indeed, this Tian-Shan form might prove to represent a separate species, as accepted by Dubatolov (1996b) and some other students. No area of sympatry of these two forms has been found.

Distribution. Pattern Central Asian.

Within the former Soviet Union. The western Tian-Shan: Chatkalsky, Karzhantau, Ugamsky and Pskemsky Mt. ranges; Kirghizsky Alatau Mts; central Tian-Shan: Lake Issyk-Kul, Kungey Alatau and Terskey Alatau Mts; northern Tian-Shan: Zailiisky Alatau; Jungarsky Alatau: Koksus; Pamirs-Alai: Alai and Transalai Mts, Hissar Mts; West Pamirs: Khorog, Ishkashim.

Beyond the former Soviet Union. Northeastern Afghanistan.

Biology. Flight in the end of summer and in autumn at 1300 up to 2500 m a.s.l. At greater elevations moths appearing in the middle of July, below in September on slopes of mountains covered by bush or sparse woodland. Both males and females flying to light. Caterpillars born in September to October, hibernation at instar 3, euryphages feeding on *Artemisia*, *Euphorbia*, Cruciferae, Umbelliferae, etc.

Eggs round, smooth, yellowish white, about 1.5 mm in diameter. Freshly hatched caterpillars brownish with dotted warts and sparse short hairs. Feeding at night. Caterpillars after the 6th molt reaching a length of up to 60 mm. Dorsum dark brown, venter and abdominal legs lighter. Each segment with eight large warts coated with fascicles of hairs, latter reddish on thorax, gray on each side. Two light yellow lateral maculae on each segment, one smaller below in front part of segment, the other larger behind and above. Head black and shining. When reared in culture, tree leaves not rejected by caterpillars. Pupation in an oval cocoon. Pupa dark brown, nitidous. Duration of pupal stage about three weeks.

Similar species. *C. lichenigera*, differs by a dark hw with submarginal belts. *C. gurkoi*, has no spots on the discal vein.

9. *Carcinopyga gurkoi* Kautt & Soldaitis, 1997

(Fig. 14)

Carcinopyga gurkoi Kautt & Soldaitis, 1997: 130, figs 12-21, TL: Western Pamirs (Rushan).

[*gurkoi* – in honour of Ukrainian entomologist V. Gurko]

Dubatolov, 1990b: 87, *Carcinopyga lichenigera* (misidentification)

Dubatolov, 1996b: 42, *Carcinopyga gurkoi*



Fig. 14. *Carcinopyga gurkoi* Kautt & Soldaitis (paratype). W. Pamir, Rushan District, 20.VII-1.VIII.2001, 3400 m a.s.l., leg. V. Gurko (photo by V. S. Murzin).

Description. (based on paratype, ♂, Fig. 14). Length of fw from base to apex 26 mm. Alar expanse up to 60 mm. Background coloration of fw gray. Upper side with several yellowish, transverse belts clear against this background. These belts consisting of separate, repeatedly interrupted, costal and inner series of maculae. Fringe gray-brown. Underside of fw pale yellow with four separate black maculae at costal edge. Hw from above pale yellow without spots; coloration of fringe varying from creamy white to gray-brown. Discoidal spot absent. Underside: background coloration



Fig. 15. Uzbekistan, W. Tian-Shan, Pskem Mt. Range, 700 m, place inhabited by *Divarctia diva* Stgr., *Carcinopyga lindti* Černy, *Arctia intercalaris* Ev., *A. caja tshimgana* Shel., *Eucharia festiva interposita* O. B.-H. (photo by V. S. Murzin).



Fig. 16. Tajikistan, W. Pamirs, Rushan Mt. Range and Pyanj River on Tajik-Afghan border, habitat of *Carcinopyga gurkoi* Kautt & Soldaitis (photo by A. Sotchivko).

and fringe as from above. Black spot in basal part of costal edge clearly expressed and reaching the discoidal cell. Discoidal spot vague, dark pollination of discoidal cell present. Head, forehead (epicranium) and palpi black. Antennae simple, brown-yellow. Patagia and tegula black. Dorsum dark gray to black. Venter gray-yellow. Legs dark brown with creamy white rings. Upper side of abdomen gray-yellow, a darker line partly discernible. Underside black with ochre borders of segments. Female unknown.

Distribution. Pattern Central Asian.

Within the former Soviet Union. West Pamirs (Rushan, Khorog)

Beyond the former Soviet Union. Northern Afghanistan (local).

Biology. Occurring in the alpine belt of western Pamirs between Rushan and Khorog, where the dry and continental climate of the Pamirs high mountains is softened by Pyanj River and its tributaries. There *C. gurkoi* fly over patches of talus between 3300 and 3500 m a.s.l. together with *C. proserpina* (Dubatolov, 1990b, as *C. lichenigera*).

Similar species. *C. proserpina*, differs by strong dark dusting of the fw, by the larger size and a wider apex of the cucullus in the genital apparatus of the male.

6. Genus *Axiopoena* Ménétriès, 1842

Axiopoena Ménétriès, 1842: 42, TS: *Bombyx maura* Eichwald, 1830.

Dubatolov, 1989a: 8-11, *Axiopoena*

Moth large, head small in comparison with body, covered with dense thick hairs. Eyes large, hemispherical, bare. Body rather wide, legs clothed with small, dense scales; fore tibia with a small epiphysis, medial tibia with a pair, hind tibia with 2 pairs, of very short thick spurs, or calariae. Wings opaque, rather wide. Vein R2 on fw starting from central cell. Fw black, hw black with a red or pink basal field. Male genitalia with a long, narrow, curved process at costal edge of valvae at their base, fastigium of valve with a wide membranous process. Sternite 8 of female with wide blade-like protuberances on each side, ductus like a wide sclerotised tube (Dubatolov, 1989a).

Key to species of *Axiopoena*:

1. Black band at base of hw on underside present. A pink spot close to border on upper side. *A. karelini*
- . Black band at base of hw on underside absent. No pink spot close to border on upper side. *A. maura*

10. *Axiopoena maura* (Eichwald, 1830)

(Pl. 4, Fig.1)

Bombyx maura Eichwald, 1830: 196, TL: Turkmenistan (eastern coast of the Caspian Sea, environs of Krasnovodsk).
[= *fluviatilis* Swinhoë, 1885]

[*maura* – gloomy (Lat.)]

Ménétriès, 1842b: 42, *Axiopoena maura*

Romanoff, 1884: 86, pl. 5, fig. 5, *Axiopoena maura*

Christoph, 1885: 171, pl. 15, fig. 3, *Axiopoena maura*

Christoph, 1887a: 55, *Axiopoena maura*

Hampson, 1901: 498, *Axiopoena maura*

Staudinger & Rebel, 1901: 371, *Axiopoena maura*

Seitz, 1910: 97, pl. 17, row g, *Axiopoena maura*

Lampert, 1913: 357, pl. 89, fig. 7, *Axiopoena maura*

Strand, 1919: 372, *Axiopoena maura*

Bang-Haas, O., 1927: 71, *Axiopoena maura maura*, *Axiopoena maura fluviatilis* Swinhoë

Draudt, 1931: 85, *Axiopoena maura* ab. *flava* O. Bang-Haas

Kuznetsov, 1960: 11, *Axiopoena maura*

Daniel, 1971: 654, *Axiopoena maura*

Daricheva, 1972: 72, *Axiopoena maura*
 Dubatolov, 1972: 72, *Axiopoena maura*
 Sviridov, 1972: 47, *Axiopoena maura*
 Ebert, 1973: 67, *Axiopoena maura*
 Dubatolov, 1977: 80, *Axiopoena maura*
 Krasilnikova, 1977: 80, *Axiopoena maura*
 Stshetkin, 1984: 292, *Axiopoena maura*
 Dubatolov, 1989: 8, *Axiopoena maura*
 Dubatolov, 1996b: 42, *Axiopoena maura*

Description. Alar expanse 100-110 mm. Fw coal black, hw dichromatic: external half black, basal pink. End of cell outside often with a pink spot. Underside coloration same but border of fw often clarified, pinkish, or from base of wing with an unclear, pink, short line.

Variability. Light pattern on hw varied. Dark marginal band sometimes occupying 2/3 wing, in other cases, when narrowed, then with a vague, black, dentate, transverse band separating pink spots from a black edge. Rarely, fw with traces of white spots.

Distribution. Pattern Anatolian-Iranian.

Within the former Soviet Union. Turkmenistan (Merw, Kopetdagh, Ashkhabad, Krasnovodsk, Nebit-Dagh, Balkhan Major), Azerbaijan (Caspian coast, Nakhichevan (east)).

Beyond the former Soviet Union. Southern Afghanistan (Swinhoe, 1885), Kurdistan, northeastern Iran.

Biology. Flight since July till September, with reports about spring finds. Moths associated with caves, deep clefts in rocks; both adults and caterpillars nocturnal. Repeatedly recorded in great numbers in caves. Flying to light, rather usual.

A description of the caterpillar was given by Christoph (1887b). "The single specimen of the caterpillar brought to me was 72 mm in length and 13 mm in width. It is black-brown, in interspaces of the segments and on the abdomen dark reddish brown. The head and the legs are black, shining. The legs are strong. The abdominal legs are well-developed, on the external side from above black. The strong, a little bluish warts are coated with black hairs of medium length.

In the daytime, the caterpillar hides in various rocks in clefts and crevices. Feeding only in the evening and at night. Food plants near Krasnovodsk are *Artemisia* and probably other herbs.

It pupates in May inside a very fragile cocoon; the pupa is lustrous, smooth, black-brown in colour. The moth appears approximately 14 days after pupation and escapes from the daytime...".

For reasons unknown, the species was included in the Red Data Book of the USSR (Borodin, 1984b).

Similar species. *A. karelini*, the underside of the hw with a dark basal belt; there is no black spot behind the base of vein Cu₂ (Dubatolov, 1989a).

11. *Axiopoena karelini* Ménétriès, 1863

(Pl. 4, Fig. 2; genitalia in Pl. 25, Fig. 6)

Axiopoena karelini Ménétriès, 1863: 160, pl. 17, fig. 5, TL: "Tifles" [= Georgia, Tbilisi].
 [= *maura transcaucasica* Sheljuzhko, 1926]

[karelini – after Russian entomologist G. S. Karelin]

Christoph, 1884: 109, *Axiopoena maura*
 Christoph, 1885: 171, *Axiopoena maura*
 Dubatolov, 1989: 10, fig. 1a, *Axiopoena karelini*

Description. Alar expanse 100-110 mm. Fw uniform black, hw pink at base, from outside black. Anal angle with a pink spot up to 5-15 mm in size. Underside coloration same but a transverse clinoid band running near base from fore edge of hw.

Variability. In available material, light anal spot of varying size. From the Caucasus, a form with a yellow, not red, pattern has been described: *Axiopoena maura* ab. *flava* O. Bang-Haas, 1927. This form belongs to *Axiopoena karelini* because *A. maura* is absent from the western Caucasus.

Distribution. Pattern Caucasian.

Within the former Soviet Union. Armenia (Yerevan, Dzhermuk, Megri, etc.), Nakhichevan, Georgia, Abkhazia, Sochi (?) (information from the 1930's, probably an isolated population; no records since are known to the author).

Beyond the former Soviet Union. Unknown.

Biology. Similar to the previous species. The caterpillar "...at Ardanuchi, in the pontic region, on leaves of *Centaurea*" (Christoph, 1885: 171).

"The vast, stubble hairy, black caterpillar of this species lives on sage-brush and mostly leads a nocturnal way of life, as well as the moth. In our fauna, this is a unique species closely associated with caves. In huge caves near Krasnovodsk, they have been discovered in great numbers. Undoubtedly, in connection with the character of the diurnal refuges is also the moth coloration; its nearest relatives are decorated with light belts over a dark background of the forewings. Occasionally, among *A. maura* there are specimens in which traces of these white bands are still preserved. Thus, melanism appears here as secondary and protective" (Rjabov, 1958: 358).

Rjabov, quoted above, erred in considering *A. karelini* and *A. maura* as one and the same species.

Similar species. *A. maura* on the hw underside has no dark basal belt; behind the base of vein Cu2 there is a black spot (Dubatolov, 1989a).

7. Genus *Tyria* Hübner, 1819

Tyria Hübner, 1819: 166, TS: *Phalaena jacobaeae* Linnaeus, 1758.

= *Hipocrita* Hübner, 1806 (rejected name).

= *Euchelia* Boisduval, 1829: 39, TS: *Phalaena jacobaeae* Linnaeus, 1758.

Proboscis weakly developed, antennae in both sexes thin. Fw with an accessory cell (areole), whence all R-veins (R3 and R4 on a common pedicel) originating. Veins R and M1 of hw also on a pedicel. Fw with a carmine red costal stria. Base of cucullus without harpa-process on interior side of valve.

A single representative in our fauna.

12. *Tyria jacobaeae* (Linnaeus, 1758)

(Pl. 3, Figs 6, 8; genitalia in Pl. 25, Fig. 7)

Phalaena jacobaeae Linnaeus, 1758: 511, TL: Sweden.

[= *confluens* Schultz, 1908; *senecionis* Godart, 1822]

[*jacobaeae*, *Senecio jacobaea* – foodplant of the larva (Lat.)]

[Cinnabar – crimson bear (Engl.)]

[Blutbär, Karmin Bär – bloody bear, carmine bear (Germ.)]

[Goutte-de-sang – drop of blood (Fr.)]

[Le Carmin – carmine bear (Fr.)]

Schultz, 1908: 183, *Tyria confluens*

Spuler, 1910: 141, pl. 74, fig. 8, *Hipocrita jacobaeae*

Seitz, 1910: 103, pl. 18, row h, *Hipocrita jacobaeae*

Dubatolov, 1996b: 42, *Tyria jacobaeae*

Description. Alar expanse 35-37 mm. Fw dark gray with a black fringe and a red band along costal edge. A similar narrow stria along hind edge of fw. Two red spots at external edge. Hw carmine red with a black fringe. Body black, antennae thin.

The moth is so peculiar in coloration that it is impossible to confuse with any other species.

Variability. A number of deviations from the typical form are known:

- ab. *confluens* Schultz, 1908 – red spots partly merged;
- ab. *flavescens* Theiry-Mieg, 1889 – flaxen colour instead of red;
- ab. *fulvescens* Spuler, 1910 – spots orange yellow;
- ab. *grisescens* Spuler, 1910 – hws gray;
- ab. *nigrana* Cabeau⁵ – hw black, only at base with a red spot;
- ab. *pallens* Cabeau⁶ – fw gray, red colour acyanotic;
- ab. *totonigra* Richter, 1917 – an extremely melanistic form.

Distribution. Pattern Euro-Siberian and Nearctic.

Within the former Soviet Union. Baltia; Belarus; Ukraine, Crimea; Moldova; European Russia [south of Vologda and Vyatka, Saratov, Samara and Middle Urals, Uralsk (Zhuravlev, 1909), Millerovo, Rostov on-Don]; Caucasus; Transcaucasia (Georgia, Armenia, western Azerbaijan); West Siberia south of 55°N (Tyumen, Kurgan, Tomsk), in the east apparently up to Krasnoyarsk, Minusinsk, Bratsk; mountains of eastern Kazakhstan; mountains of Central Asia (from Chimgan in the western Tien-Shan up to the eastern part of Zailiisky Alatau, Kirghizia and northern Tajikistan).

Beyond the former Soviet Union. Western Europe, up to Ireland in the north, southern parts of Scotland and Scandinavia; Asia Minor; China (Xinjiang); North America: since the end of the 1950's, introduced into Canada (British Columbia) and the USA (Oregon, California) (Nagel & Isaacson, 1974) as well as New Zealand, Tasmania and Australia.

Biology. Flight not very active, restricted to daytime or resting in grass on open places (meadows, steppe, alpine belt). Common. In the mountains of Central Asia (Chatkalsky Mt. Range, Chimgan Mts) reaching an altitude of 3000 m a.s.l. In lowlands, appearing in May (in Siberia, up to mid-June), in the mountains before the beginning of July. Eggs spherical, yellow; laid in clusters of ~50 eggs, usually on the underside of leaves. Freshly hatched larvae pale yellow, later instar caterpillars velvety black with black head and rather long hairs, body with alternating black and orange yellow rings. Food plants: *Senecio jacobaea*, *Petasites* and *Tussilago*. Early instars living on the underside of lower leaves, later stages migrating to the upper parts of plants, with feeding mainly on flowers. Fully fed caterpillars often migrating rather far for pupation, selecting dry places under stones or dead logs. Pupa reddish brown in a thin cocoon, hibernating; only one generation a year.

Notes. *Senecio jacobaea* is a plant species toxic to horses and cows. Yet it is a natural food plant of *Tyria jacobaeae* and, although caterpillars can feed on closely related *Senecio* species, they rarely occur there.

T. jacobaeae was introduced into New Zealand in 1929 as a biological control agent of *Senecio jacobaea* only after extensive host specificity tests had been performed to show that it did not pose a threat to any desirable plant. Likewise, the moth has been introduced deliberately into Australia from England several times since 1930, to control the weed.

Caterpillars reduce seed production by consuming flowers and, when they occur in sufficient numbers, they can totally defoliate *Senecio jacobaea*. However, by the end of March⁷ they all pupate, allowing some damaged plants time to regenerate before the end of the growing season. Extensive defoliation and defloration by *T. jacobaeae* caterpillars may induce plants that would have died at the end of their second year to become perennial, as can happen with plants that have been mown. When plants are under stress from other causes such as drought, feeding by *T. jacobaeae* caterpillars may kill them, however.

The Department of Conservation and Natural Resources of Australia spends approximately \$1.5-2.0 million annually on *Senecio jacobaea* control.

Similar species. A single species in our fauna.

8. Genus *Dodia* Dyar, 1901

Dodia Dyar, 1901: 85, TS: *Dodia albertae* Dyar, 1901 (by monotypy).

= *Hyalocoa* Hampson, 1901: 202, TS: *Lithosia diaphana* Eversmann, 1848

Strand, 1919: 103, 107, *Hyalocoa*

Bryk, 1937: 44, *Hyalocoa*

⁵ Cited after Draudt, 1931: 90.

⁶ Cited after Draudt, 1931: 90.

⁷ The species has changed its life cycle in the Southern Hemisphere. Flight in January to February.

Vasiurin & Tshistjakov, 1979: 95-105, *Dodia*

Lafontaine & Tshistjakov, 1984: 1550, *Dodia*

Tshistjakov, 1988: 632, *Dodia*

Tshistjakov, 1992, 149-154, *Dodia*

Tshistjakov, 2000: 253-266, *Dodia*

Wing pattern of Type II C, fws monochromous without pattern. Wings gray, semi-transparent, with weak, scattered, narrow scales. Veins visible. Venation strongly varied even in individuals of one species. R1 always removed from upper edge of radial-cubital cell. R5 branching off earlier R2-4 or starting from one point with R2 + R3 + R4. Sometimes R3 merging either with R2 or R4. M1 often situated on a common stalk with R2-5 or originating as an independent branch from apex of radial-cubital cell. Base of branches M2 and M3 always close to each other, hardly removed above inner angle of radial-cubital cell. On hw, Sc merging with R approximately over 1/3 extent of radial-cubital cell. M2 located far from M1, close to M3. Both M3 and Cu1 starting from one point of lower angle of radial-cubital cell. Antennae filiform. Proboscis not developed. Middle tibiae with one pair, hind tibiae with two pairs, of spurs, or calariae.

Notes. The genus *Dodia* was originally described from the north of Canada. The sole representative of this genus, *D. albertae* Dyar, was believed spread only in the north of North America. However, as shown by Lafontaine & Tshistjakov (1984), the type-species of the genus *Hyalocoa* Hampson, *H. diaphana* (Eversmann), distributed in Siberia, Mongolia and the Russian Far East, belongs to *Dodia*. Thus, *Hyalocoa* was suppressed as a junior synonym. Furthermore, both *H. atra* A. Bang-Haas, 1912 and *H. kozhantshikovi* Sheljuzhko, 1918, described from Siberia, are synonyms of *Dodia albertae*.

A new congener has recently been described from Canada: *Dodia verticalis* Lafontaine & Tshistjakov, 1999.

Key to species of *Dodia*:

1. Patagia, collar and abdomen yellow with dark spots both on upper- and underside. *D. diaphana*
- Abdomen gray. 2
2. Fw and hw uniform gray, semi-transparent, without pattern. 3
- Fw with a pattern of four transverse, whitish, sinuous belts weakly visible over a grayish background. .. *D. albertae*
3. Alar expanse of males more than 27 mm. *D. kononenkoi*
- Alar expanse of males less than 22 mm. Female with abortive wings, incapable of flight. *D. sasonovi*

13. *Dodia diaphana* (Eversmann, 1848)

(Pl. 4, Fig. 4; genitalia in Fig. 17 and Pl. 25, Fig. 8)

Lithosia diaphana Eversmann, 1848: 212, TL: Irkutsk.

[*diaphana* – transparent, translucent (Lat.)]

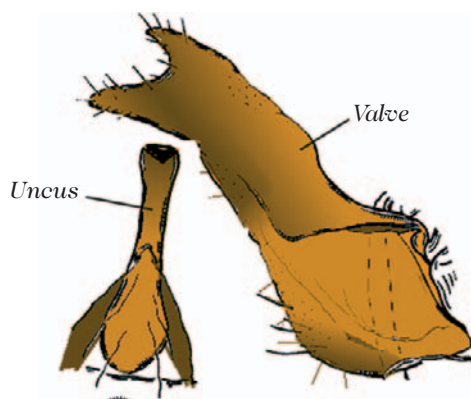


Fig. 17. Valve and uncus of *Dodia diaphana* (Ev.), specimens from Yakutsk (after Tshistjakov, 1988).

Herrich-Schäffer, 1853: 176, fig. 168, *Hyalocoa diaphana*
 Hampson, 1901: 202, *Hyalocoa diaphana*
 Strand, 1919: 107, *Hyalocoa diaphana*
 Draudt, 1931: 90, *Hyalocoa diaphana*
 Bryk, 1937: 45, *Hyalocoa diaphana*
 Tshistjakov & Lafontaine, 1984: 1549, *Dodia diaphana*
 Tshistjakov, 1988: 635, *Dodia diaphana arctica*
 Dubatolov, 1996b: 43, *Dodia diaphana*

Subspecies:

D. d. arctica Tshistjakov, 1988.

Description. Alar expanse 32-33 mm. Fw and hw gray, semi-transparent with weak dusting. Veins easily discernible over this background. Abdomen yellow with black spots. Patagia yellow. Female with an enlarged abdomen.

Variability. The nominotypical subspecies occurring in the southern part of the geographic range. From the upper reaches of Kolyma and Yana rivers, northeastern Siberia, a separate subspecies has been described:

ssp. *arctica* – “differs from the nominotypical subspecies by the more intense dusting of dark, almost black scales, and by the rather narrow forewings (the wing two times longer than wide”. Wings very dark, almost black. The holotype is in ZISP.

Distribution. Pattern Siberio-Mongolian.

Within the former Soviet Union. The mountains of South Siberia (Altai: Aktash, Kosh-Agach, Ukok Table-land; East Sayan), Transbaikalia and Stanovoy Mt. Range; Amur region; Sikhote-Alin Mts; central and eastern Yakutia; Magadan Region (upper Kolyma River, Omolon River).

Beyond the former Soviet Union. Northern Mongolia (Chovsoğol region), northwestern China.

Biology. On herb-clad slopes up to 2000 m a.s.l., flight in July. Uncommon.

Similar species. All other congeners with both abdomen and patagia gray, not yellow. *Epimydia dialampra* Staudinger, 1892b – small size, antennae pinnate.

14. *Dodia albertae* Dyar, 1901

(Genitalia in Fig. 18)

Dodia albertae Dyar, 1901: 85, TL: Calgary, Canada.

[= *kozshantshikovi* Sheljuzhko, 1918]

[Alberta – a province in Canada]

Bang-Haas, O., 1927: 77, *Hyalocoa diaphana* ab. *atra*

Tshistjakov, 1988: 638, fig. 5, *Dodia albertae eudiopta*

Dubatolov, 1996b: 43, *Dodia albertae*

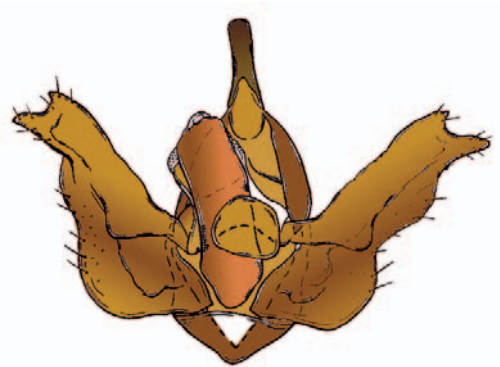


Fig. 18. Male genitalia of *Dodia albertae albertae* Dyar, ♂. Canada (after Tshistjakov, 1988).

Subspecies:

D. a. albertae Dyar, 1901

D. a. eudiopta Tshistjakov, 1988: 638

D. a. atra (A. Bang-Haas, 1912) [= *Hyperborea kozhantschikovi*].

Description. Alar expanse 25-30 mm. Fw wide, gray with a well-developed pattern of transverse whitish belts. Costal edge and median cell dusted dark. External and submarginal belts thin and sinuous. Pattern of female strongly diffuse. Male genitalia: uncus straight with a flat apex. Upper and lower distal processes of valve well-expressed, with a pointed apex.

Variability. The following subspecies have been described from Siberia:

ssp. *eudiopta* – lower flow of Lena River, differs from the nominotypical subspecies in the smaller size, lighter brownish pale wing coloration and details of genitalic structure: upper distal process of valve not expressed; lower wide, almost square, with an obtuse apex;

ssp. *atra* [= *Hyperborea kozhantschikovi*] – East Sayan, Transbaikalia, Yakutia, southern part of Magadan Region; northern Mongolia.

Distribution. Pattern Holarctic.

Within the former Soviet Union. The mountains of South Siberia from the East Sayan Mts to Transbaikalia and Stanovoy Mts; northern Siberia (northern Urals, southern Taimyr Peninsula, Yakutia; Magadan Region (upper reaches of Kolyma River).

Beyond the former Soviet Union. North Mongolia; Alaska; Canada, up to Quebec in the east.

Biology. Flight in the end of June, July. Moths occurring on gravel, taluses, with bushes of cedar elfin thickets and swampy larch forests (Tshistjakov, 1988).

Similar species. *D. diaphana* with the abdomen and patagia yellow, *D. kononenkoi* and *D. sazonovi* without pattern on the fw.



Fig. 19. Russia, Altai Mts, Ukok Table-land, 2900 m, habitat of *Dodia diaphana* (Ev.), *Epimydia dialampra* Stgr., *Pararctia lapponica* (Thunb.) and some others (photo V. S. Murzin).

15. *Dodia kononenkoi* Tshistjakov & Lafontaine, 1984

(Genitalia in Fig. 20)

Dodia kononenkoi Tshistjakov & Lafontaine, 1984: 1553, figs 5-9, TL: Magadan Region (Sibit-Tyellakh, Bolshoi Annachag Mt. Range). Holotype: ZISP.

[kononenkoi – in honour of Russian entomologist V. S. Kononenko]

Tshistjakov, 1988: 634, 636, figs 2, 3 (gen.), *Dodia kononenkoi transbaikalensis*, *Dodia kononenkoi sikhotensis*

Subspecies:

D. k. kononenkoi Tshistjakov & Lafontaine, 1984

D. k. transbaikalensis Tshistjakov, 1988

D. k. sikhotensis Tshistjakov, 1988.

Key to subspecies of *Dodia kononenkoi* (after Tshistjakov, 1988):

1. Apex of uncus reduced, flat. Upper distal process of valves like a small tubercle, smaller than lower process; latter like a wide blade with a smoothly rounded apex. *D. kononenkoi kononenkoi* (Fig. 20: 1)
- . Apex of uncus more or less enlarged, with a small hollow in the middle. Distal process of valve different in shape. .
..... 2
2. Valve with a trapezoidal protuberance at costal edge. Distal processes of valves subequal in size, widely separated.
..... *D. kononenkoi transbaikalensis* (Fig. 20: 2)
- . Valve without trapezoidal protuberance at costal edge. Upper distal process of valve strong and wide, 3 times broader than lower process; latter like a narrow triangular blade with a rounded apex. *D. kononenkoi sikhotensis*

Description. Alar expanse 34 mm. Body gray. Fw and hw wide, almost black with visible veins. Pattern missing. Female lighter.

Variability. The nominotypical subspecies occurring in northeastern Siberia, in Chukot Peninsula, Russia and Canada;

ssp. *transbaikalensis*, differs by the lighter colour infuscated at base and along the distal vein as well as by certain details of genitalic structure. Khमार-Daban and Yablonovyi Mt. ranges.

Holotype ♂: Irkutsk, 15 km south of Slyudyanka, Khमार-Daban Mts, h = 1850m, 16.VIII.1984, leg. Sinev, IB SD RAS;

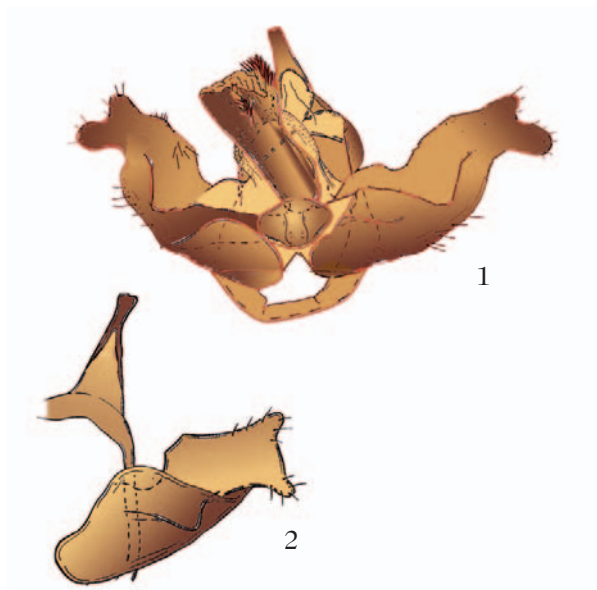


Fig. 20. Male genitalia of *Dodia kononenkoi*. 1. *D. k. kononenkoi* Tshistjakov & Lafontaine; 2. *D. k. transbaikalensis* Tshistjakov, uncus and right valve (holotype) (after Tshistjakov, 1988).

ssp. *sikhotensis*, differs by the slightly lighter and completely monochromous fw as well as by details of genitalie structure. Sikhote-Alin, Russian Far East.

Holotype ♂: Primorsky Reg., Mt. Golets, h=1450 m, 15.VII.1972, leg. Vasyurin, ZISP RAS.

Distribution. Pattern Holarctic.

Within the former Soviet Union. Baikal and Transbaikalian regions (Khamar-Daban, Chita: Sokhondo, Yablonoyi and Udokan Mts; Sikhote-Alin Mts; Magadan province (upper reaches of Kolyma River), Polar Ural, Norilsk.

Beyond the former Soviet Union. Yukon Territory, Canada.

Biology. Flight in July. Moth living on open places above the upper forest line (“goltsy”) and in moss-clad fir forests on southern slopes at about 1500 m a.s.l.

Similar species. *D. diaphana* with the collar and patagia yellow; *D. albertae* displays a pattern on the fw; *D. sazonovi* is noticeably smaller and lighter.

16. *Dodia sazonovi* Dubatolov, 1990

(Pl. 4, Figs 3, 6; Fig. 21)

Dodia sazonovi Dubatolov, 1990d: 148, fig. 2, TL: Altai, environs of Aktash, 2700-3000 m.

[sazonovi – after Russian amateur entomologist S. Sazonov]

Description. Fw of male slightly prolate, transparent, up to 11 mm in length, light gray with dark veins. A clear pattern of pallid belts. Hw wide, transparent, without pattern. Female with transparent short wings (fw about 5 mm, hw twice shorter). Body stout.

Variability inappreciable.

Distribution. Pattern South Siberian.

Within the former Soviet Union. Kuraisky Mt. Range, Altai Mts, Russia.

Beyond the former Soviet Union. Unknown.

Biology. Alpine taluses at more than 2700 m a.s.l. on slopes of western or southwestern exposition. Females resting under flat stones close to their freed cocoons, egg-laying events usually two, each carpet-like, up to 50 eggs in the first

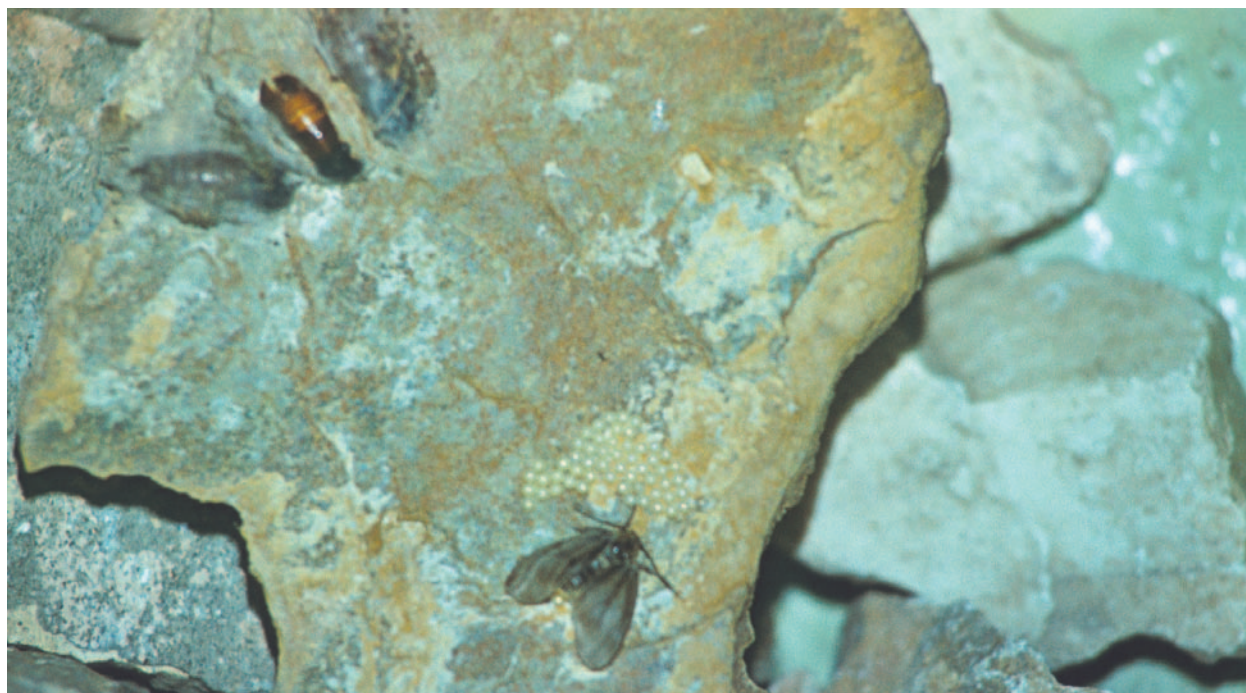


Fig. 21. Female, empty cocoons of male and an egg batch of *Dodia sazonovi*. Russia, Altai Mts, near Aktash, 2900 m a.s.l. (photo by V. S. Murzin).

clutch, less in the second. Males flying in the daytime above stones. Food plants of caterpillars: *Dryas*. Cultivation successful on *Taraxacum*. Larva gray or flesh-coloured with black warts on each segment. Sides with four warts with short wiry hairs. Dorsum with an axial yellowish line, paramedian warts with long setae (two rows). Caterpillars hibernating. In spring they probably do not eat, pupating shortly after snow melting. Males appearing at the end of June to July.

Similar species. *D. diaphana* with yellow abdomen, collar and patagia; *D. albertae* with a pattern on the fw; *D. kononenkoi* is much larger.

9. Genus *Epimydia* Staudinger, 1892

Epimydia Staudinger, 1892b: 346, TS: *Epimydia dialampra* Staudinger, 1892b.

= *Epimedia* Rothschild, 1910 (misspelling)

Head small, epicranium strongly setose, eyes large, palps very small. Male antenna pinnate, less than half as long as fw. Thorax and abdomen slender. Wing pattern of Type II C, fws monochromous without pattern.

A single species.

17. *Epimydia dialampra* Staudinger, 1892

(Pl. 4, Fig. 5; genitalia in Pl. 25, Fig. 9)

Staudinger, 1892b: 356, pl. 3, fig. 2, TL: "Kenteigebirge" [= Kentei Mountains in southern Siberia].

[*dialampra* – transparent (Gr.)]

Seitz, 1910: 74, pl. 13, row i, *Epimydia dialampra*

Strand, 1919: 107, *Epimydia dialampra*

Tshistjakov, 1988: 634, *Epimydia dialampra*

Description. Alar expanse about 25 mm. Fw narrow, triangular. Hw wider, rounded, uniform gray, semi-transparent (fw a little lighter than hw). Fringe rather infrequently consisting of long hairs. Head, thorax and abdomen black. Last segments of abdomen densely coated with yellow hairs.

Distribution. Pattern Siberian.

Within the former Soviet Union. Krasnoyarsk Region (Minusinsk), Altai (Aktash, Chagan-Uzun, Kosh-Agach, Ukok Plateau), Tuva, East Sayan (Mondy), Transbaikalia (Vitim Highway), Yakutia (Indigirka River).

Beyond the former Soviet Union. Mongolia.

Biology. Occurring locally on mountain meadows. Flight from early June up to mid-July at elevations up to 2000 m a.s.l.

Similar species. Superficially reminding of some species of the genus *Heterogynis* Rambür, 1866 (Heterogynidae) from Southern Europe and North Africa.

10. Genus *Lacydes* Walker, 1855

(Genitalia in Pl. 25, Fig. 10)

Walker, 1855: 685, TS: *Noctua spectabilis* Tauscher, 1806.

= *Acimba* Rambür, 1866: 235, TS: *Noctua spectabilis* Tauscher

= *Palparctia* Spuler, 1910: 133, TS: *Noctua spectabilis* Tauscher

= *Volgarctia* Alpheraky, 1908: 606, TS: *Noctua spectabilis* Tauscher

Seitz, 1910: 89, *Lacydes*

Fang, 1985: 32, *Lacydes*

Fang, 2000: 315, *Lacydes*

Pljusch & Kostjuk, 1988: 86, *Lacydes*

Fw with R2-R5 on a joint stalk, Sc of hw merging with R only closer to base (to a length less than 1/3 cell), R2-M1 and M3-Cu1 on joint stalks. Male genitalia: uncus very large, narrow at base and broadened to apical 1/3, with its tip like a hook-like process, tegumen in lateral view very large, slightly longer than uncus.

18. *Lacydes spectabilis* (Tauscher, 1806)

(Pl. 4, Figs 7-10; genitalia in Pl. 25, Fig. 10)

Noctua spectabilis Tauscher 1806: 212, TL: Volga (Volga River, Russia).

[= *Eyprepia intercissa* Freyer, 1842]

[*spectabilis* – remarkable (Lat.)]

Tauscher, 1811: 179, pl. 13, fig. 6, *Noctua spectabilis*

Herrich-Schäffer, 1843: 145, figs 9-10, *Chelmia spectabilis*

Staudinger & Wocke, 1871: 58, *Arctia spectabilis*

Erschoff, 1874: 32, pl. 2, fig. 28, *Arctia spectabilis*

Christoph, 1887b: 55, pl. 3, fig. 2, *Arctia spectabilis anellata*

Kirby, 1892: 951, *Lacydes spectabilis*

Hampson, 1901: 272, *Diacrisia spectabilis*

Seitz, 1910: 89, pl. 15, row i, *Lacydes spectabilis*

Fang, 1982: 212, fig. 1569, *Lacydes spectabilis*

Dubatonov, 1996b: 44, 70, 74, fig. 2a, *Lacydes spectabilis sheljuzhkoii*

Fang, 2000: 315, pl. 14, fig. 9, *Lacydes spectabilis*

Subspecies:

L. s. anellata Christoph, 1887b

L. s. sheljuzhkoii Dubatonov, 1996b.

Description. Alar expanse 32-37 mm. Wings rather narrow and sharp, background coloration light, almost white, with yellow tint. On fw, cream brown spots partly merged and creating bands, these at an angle of about 45° running to hind edge of wing. Hw of male with small brownish spots or a boundary belt. Hw of female darkened. Abdomen light with transverse lines on each segment. Antennae of male short, pinnate, in female simple.

Variability. Individual variability becomes apparent in the development of a dark pattern and colour intensity. In particular, the boundary belt on the hw sometimes vanishes.

The nominate form (Pl. 4, Figs 7-8) is distributed over the greater part of the range from the Ukraine up to southern Kazakhstan.

The ssp. *anellata* (Pl. 4, Figs 9-10) differs by a more contrasting pattern. Dark spots on fw often reduced in size and outlined by a thin black contour. Colour of hw yellow with or without dark boundary belt. This form has been described from the Kopetdağ, Turkmenistan and also occurs in the mountains of Great and Small Balkhan as well as in Iran. Some specimens from Khorog, Pamirs are lighter, with a white hw devoid of a pattern.

The ssp. *sheljuzhkoii* flies in southern Transcaucasia and northeastern Turkey. “The main character of the new subspecies is a clear yellowish, not whitish, background of the wings. On the fw being dark yellow, the spots are without grayish brown tint, which is typical of both other known species”. Holotype in ZMKU.

Distribution. Pattern southern Palaearctic.

Within the former Soviet Union. Southeastern Ukraine (Kharkov, Lisichansk, Novoalexandrovka); European Russia up to Penza and Vyatka in the north, Rostov-on-Don, Volgogradsk, Millerovo, Volga region, southern Urals; southern part of West Siberia (steppe and forest-steppe belts: Kurgan Region up to Iset River, Orenburg, Karasuk in the Novosibirsk Region, the Kulunda steppe in Altai Province, local in the West Altai); Kazakhstan (Dzhanybek, Uralsk, Aralsk); Tian-Shan (Issyk-Kul, Alma-Ata); Pamirs (Khorog), Turkmenistan (Kara-Kala, Ai-Dere); southern Transcaucasia (Azerbaijan, Armenia).

Beyond the former Soviet Union. East Turkey; North Iraq; Iran; Afghanistan; China (Xinjiang); South Mongolia.

Biology. Flight from early August (Orenburg, Lower Volga region) to the beginning of October (Khorog, Pamirs and Kopetdagh Mts). Mainly inhabiting dry steppe and semi-desert places, though in the Kopetdagh and West Pamirs flying massively on light in parks and gardens. Caterpillar dark gray-blue, clothed with yellow hairs. Body annulated yellow. A black line lying above legs, with a wide white stria above and red spiracles. Legs red-brown. Larvae appearing in autumn and hibernating; development completed in June or July. Food plants of caterpillars: different herbs, especially sagebrush (*Artemisia*).

Similar species. There seem to be no particularly similar species in our fauna.

11. Genus *Spiris* Hübner, 1819

Spiris Hübner, 1819: 169, TS: *Phalaena grammica* Linnaeus, 1758 [= *Phalaena striata* Linnaeus, 1758].

- = *Eyprepia* Ochsenheimer, 1810: 299, TS: *Phalaena grammica* Linnaeus
- = *Callopiis* Billberg, 1820: 91, TS: *Phalaena grammica* Linnaeus
- = *Eulepia* Curtis, 1825: 56, TS: *Phalaena grammica* Linnaeus
- = *Ctenia* Le Poeties, 1825: 650, TS: *Phalaena grammica* Linnaeus
- = *Emydia* Boisduval, 1829: 39, TS: *Phalaena grammica* Linnaeus
- = *Euprepia* Herrich-Schäffer, 1847: 141, TS: *Phalaena grammica* Linnaeus

Dubatolov, 1990f: 128, *Spiris*

Fang, 2000: 303, *Spiris*

Fw narrow, hw wide with vein M3 absent. Wing pattern of Type II B, fws monochromous, with separate longitudinal bands, palps small, directed down. Male genitalia: transtilla with a strong chitinised process, uncus concave at apex.

In our fauna, two species are present.

19. *Spiris striata* (Linnaeus, 1758)

(Pl. 4, Figs 11-13)

Phalaena striata Linnaeus, 1758: 502, TL: Germany (Saxony).

[=*Phalaena grammica* Linnaeus, 1758; *Phalaena processionea* Müller, 1774; *Phalaena palladia* Fourcroy, 1785; *Coscinia albida* Schulze, 1910; *Eyprepia nigra* Spuler, 1913; *Eyprepia xanthoptera* Oberthür, 1911, *Eyprepia incompleta* Oberthür, 1911; *Eyprepia extrema* Rocci, 1914; *Eyprepia pfeifferi* Stauder, 1920; *Eyprepia commerelli* Stauder, 1920; *Eyprepia aterrima* Gaede, 1923; *Eyprepia nigrociliata* Schawerda, 1929b; *Coscinia slovenica* Daniel, 1939; *Coscinia hospitali* Marten, 1948; *Coscinia chrysographis* Marten, 1948]

[*striata* – stripy (Lat.)]

[Feathered Footman – (Engl.)]

[La Chouette, Ecaille Chouette – (Fr.)]

[Strohhütchen, Gestreifer Grasbär – (Germ.)]

Hampson, 1901: 203-204, *Euprepia striata*

Seitz, 1913: 72, pl.13, row f, *Coscinia striata*

Dubatolov, 1990c: 128, *Spiris striata*

Fang, 2000: 303, pl. XIV, fig. 3a, b, *Spiris striata*

Description. Alar expanse 28-35 mm. Fw narrow. Hw wider, rounded. Coloration of fw consisting of longitudinal black and yellow (on veins) fasciae; discoidal cell of fw also filled by yellow. Discal vein on both wings black. Hw yellow except for a dark boundary belt at costal and outer edges and a crescent spot on transverse vein. Underside

coloration yellow with separate black spots on discoidal veins and often with short longitudinal lines on veins at external edge of fw.

Variability. Characterised by strong individual variability. The coloration of the fw varies from light yellow without pattern up to almost completely black.

f. *melanoptera* (Brahm, 1791) – hw monochromously black. This form has a dark underside of the hw and brown veins on the fw (Pl. 4, Fig. 13).

Distribution. Pattern Euro-Siberian.

Within the former Soviet Union. Baltia; Belarus (patchily); Ukraine, Crimea; European Russia [Moscow Region, in the north up to the environs of St. Petersburg (Luga, Krupeli) and the Upper Volga region)]; Caucasus (Teberda, Nalchik); Transcaucasia: Tbilisi, Borzhomi (Georgia), Azerbaijan; North and East Kazakhstan (steppe part); Siberia (south of 56 °N in the west and up to 60 °N in Yakutia): Kurgan, Tomsk, Krasnoyarsk, Biysk, Irkutsk, and central Yakutia; Transbaikalia (patchily).

Beyond the former Soviet Union. Southern and Central Europe (except for the North Sea coast and the western and southern parts of the Iberian Peninsula); Asia Minor; Syria; China (Xinjiang); in Mongolia patchily (Dood-Nur).

Biology. Flight in June-August in the daytime in dry herb-clad places. Caterpillar dark brown with red hairs on reddish warts. Dorsal bands yellow, lateral white; head black. Food plants of caterpillar: *Artemisia*, *Calluna vulgaris*, *Festuca ovina*, *F. lanceolata*, *Hieracium*, *Plantago*, *Salvia pratensis* and some other herbaceous plants. Caterpillar hibernating.

Similar species. *Spiris bipunctata*: fw lighter with two black points on discoidal vein. Black pattern on hw more strongly developed: black border merged with spot on transverse vein.

20. *Spiris bipunctata* (Staudinger, 1892)

(Pl. 4, Figs 14-16)

Emydia striata v. *bipunctata* Staudinger, 1892b: 345, TL: Transbaikalia (“Dauria”).

[*bipunctata* – two-pointed]

Eversmann, 1847: 73, *Euprepia funerea*

Dubatolov, 1985: 137, *Spiris bipunctata* f. *nigrina*

Description. Alar expanse 29-32 mm. Moth similar to the previous species, but edge of transverse cell with two black points.

Variability. Modest:

f. *funerea* – uniform black fw and hw (Pl. 4, Fig. 16).

Distribution. Siberian-Chinese.

Within the former Soviet Union. Siberia: Southern slopes of West Sayan Mts (the Sayano-Shushenskii Nature Reserve); Tuva; Transbaikalia; Upper Amurland, everywhere patchily.

Beyond the former Soviet Union. Central and Eastern Mongolia (Dood-Nur, frequently); China [Xinjiang, Qinghai, Shanxi, Heilongjiang (Fang, 2000)].

Biology and the preimaginal stages similar to the previous species.

Similar species. *S. striata*: fw darker without two black points on discoidal vein. Black pattern on hw weakly developed: a black border not merging with spot on transverse vein.

12. Genus *Coscinia* Hübner, 1819

(Genitalia in Pl. 25, Fig. 11)

Coscinia Hübner, 1819: 169, TS: *Phalaena cribrum* Linnaeus, 1761: 302.

Kirby, 1892: 343, *Coscinia*

Hampson, 1901: 203, *Coscinia*

Seitz, 1910: 71, *Coscinia*

In general, moths small with prolate fws and wide hws. Fw with 11 veins. Proboscis weakly developed, male antenna double-combed. Differs from *Spiris* by structure of the genitalia. Male genitalia: transtilla without process, uncus slender and slightly expanded at apex (Pl. 25, Fig. 10)

Six species.

21. *Coscinia cribraria* (Linnaeus, 1758)

(Pl. 4, Figs 17-18; genitalia in Fig. 6 and Pl. 25, Fig. 11)

Phalaena cribraria Linnaeus, 1758: 507, TL: southern Sweden.

[=*Bombyx cribrillum* Esper, 1786; *Bombyx colon* Hübner, 1792; *Bombyx chrysocephala* Hübner, 1804; *Bombyx punctigera* Freyer, 1834; *Emydia rippertii* Boisduval, 1834; *E. candida* Herrich-Schäffer, 1846; *E. inquinata* Rambür, 1858; *E. anglica* Oberthür, 1911; *E. leucomelas* Oberthür, 1911; *E. rondoui* Oberthür, 1911; *E. canigulensis* Oberthür, 1911; *E. vernetensis* Oberthür, 1911; *E. nevadensis* Oberthür, 1911, *Coscinia cribraria fumidaria* O. Bang-Haas, 1927; *Emydia cribraria nikitini* O. Bang-Haas, 1938]

[*cribraria* – latticed (Lat.)]

[Speckled Footman – (Engl.)]

[Le Crible – (Fr.)]

[Weißer Grasbär – (Germ.)]

Boisduval, 1834: 94, pl. 57, fig. 4, *Emydia rippertii*

Staudinger, 1892b: 346, *Emydia cribrum sibirica*

Seitz, 1910: 71, pl. 13, rows g-h, *Coscinia cribraria*

Bang-Haas, O., 1927: 58, pl. 8, fig. 3, *Coscinia cribraria fumidaria*

Bang-Haas, O., 1938: 179, *Emydia cribrum nikitini*

Bang-Haas, O., 1939: 54, pl. 1, fig. 11, *Emydia cribrum nikitini*

Fang, 2000: 301, *Coscinia cribraria*

Subspecies

C. c. candida (Herrich-Schäffer, 1787)

C. c. rippertii (Boisduval)

C. c. sibirica (Staudinger, 1892b)

C. c. nikitini (O. Bang-Haas, 1938)

C. c. fumidaria O. Bang-Haas, 1927.

Description. Alar expanse 40-45mm. Fw white. Series of black points or maculae arranged in transverse belts.

Variability. Individual variability great and becoming apparent in reduction of dark spots.

Several subspecies have been delimited:

ssp. *candida* – a large form with silvery white fws devoid of black spots, distributed in northern Spain and the southern Alps (Pl. 4, Fig. 18). Similar coloured forms occasionally appear in other regions;

ssp. *rippertii* – fw dark gray with translucent dark spots, Iberian Peninsula;

ssp. *sibirica* – black spots attenuated; Siberia, Altai, Transbaikalia (Pl. 4, Fig. 17);

ssp. *nikitini* – fw dark gray with two longitudinal stripes. Manchuria, Khingan Mts;

ssp. *fumidaria* – fw soot brown with light, poor strips along the costa, low part of cell and inner border. Hw dark with a white fringe. Tannuola Mts, Shavyr, 2000 m. a.s.l.

Distribution. Pattern Palearctic.

Within the former Soviet Union. Southern part of Siberia [Tyumen, Omsk, Novosibirsk, Krasnoyarsk, Tomsk, Altai (sometimes very common)] up to Yakutia and Khabarovsk; middle flow of Angara River, central Yakutia; very patchily in the Chita Region and in middle Amurland.

Beyond the former Soviet Union. South and Central Europe (except for the western and southern parts of Iberian Peninsula); Asia Minor; Syria; China (Xinjiang); Mongolia.

Biology. Flight in June-August in open places, sparse woodlands, fellings, on moors and dry slopes. Occurrences patchy. In the mountains reaching 2000 m a.s.l. (for example, Kuraisky Mt. Range, Altai). Eggs spherical, golden yellow.

Caterpillar dark gray-brown. Foodplants of larva: different herbaceous plants (*Phalaris arundinacea*, *Agrostis stolonifera*, *Festuca* sp., *Elytrigia repens*, *Elymus arenarius*, *Calluna vulgaris*, *Vaccinium uliginosum*). Caterpillar occurring from August till June, hibernating.

Similar species. In our fauna, similar species seem to be absent.

13. Genus *Utetheisa* Hübner, 1819

Utetheisa Hübner, 1819: 168, TS: *Tinea ornatix* Linnaeus, 1758.

- = *Deiopeia* Curtis, 1827: 169, TS: *Phalaena pulchella* Linnaeus, 1758
- = *Pitasila* Moore, 1877: 599, TS: *Pitasila leucospilota* Moore, 1877
- = *Atasca* Swinhoë, 1892: 139, TS: *Phalaena pellex* Linnaeus, 1758
- = *Exitelica* Turner, 1921: 160, TS: *Leptosoma aegrotum* Swinhoë, 1892

Hübner, 1824: pl. 181, *Utetheisa*; misspelling

Moore, 1860: 306, *Utethesia*; misspelling

Jordan, 1939: 251-291, *Utetheisa*

A cosmopolitan genus including many species of the same appearance, decently coloured (one of the species from Cuba with brightly crimson both hws and most of fws). On fw, two accessory cells formed by radial and median veins. Hws noticeably wider than fws. Proboscis well-developed. Valva with a pocket-like scent-gland.

Only one species occurring in our fauna. In Japan, China and further to the south, a close species, *U. lotryx* (Cramer & Stoll, 1779), is known to occur. Numerous congeners are known from other parts of the world: *Utetheisa bella* (Linnaeus, 1758); *U. ornatix* (Linnaeus, 1758); *U. aegrotum* (Swinhoë, 1892); *U. pellex* (Linnaeus, 1758); *U. okinawensis* Inoue, 1976; *U. abraxoides* (Walker, 1862); *U. leucospilota* (Moore, 1877); *U. pulchelloides* Hampson; 1907; *U. pectinata* Hampson, 1907 and many others (see Rothschild, 1914: 260).

22. *Utetheisa pulchella* (Linnaeus, 1758)

(Pl. 5, Fig. 1; Fig. 22)

Phalaena pulchella Linnaeus, 1758: 534, TL: Southern Europe.

[= *pulchra* ([Dennis & Schiffermüller], 1775); *amabilis* (Trost, 1801); *lepida* (Rambür, 1858); *completa* Weymer, 1908; *bicolor* Oberthür, 1911; *arcuata* Oberthür, 1911; *antennata* Swinhoë, 1914; *thytea* Rothschild, 1914; *papuana* Strand, 1919; *nigromaculata* Stetter-Stättermayer, 1939; *rubrior* Stetter-Stättermayer, 1939; *rufomarginata* Stetter-Stättermayer, 1939; *nigrolineata* Stetter-Stättermayer, 1939; *designata* Stetter-Stättermayer, 1939; *confluens* Stetter-Stättermayer, 1939; *dehnuata* Stetter-Stättermayer, 1939; *duplohumulata* Stetter-Stättermayer, 1939; *albosignata* Stetter-Stättermayer, 1939; *separata* Stetter-Stättermayer, 1939; *ochreomaculata* Stetter-Stättermayer, 1939; *brunneomarginata* Stetter-Stättermayer, 1939; *rubrogrisea* Stetter-Stättermayer, 1939; *albociliata* Stetter-Stättermayer, 1939; *depuncta* Stetter-Stättermayer, 1939; *unipunctata* Stetter-Stättermayer, 1939; *brunneocephala* Stetter-Stättermayer, 1939]

The large number of synonyms is the result of a very wide distribution. Most of the names belong to various minor deviations and only few can prove to represent forms of a higher rank.

[pulchella – pretty (Lat.)]

[Crimson-speckled Moth – (Engl.)]

[La Gentille, Ecaïlle Pointillée – (Fr.)]

[Grassteppen-Schönbär – (Germ.)]

Spuler, 1910: 148, pl. 74, fig. 12, *Utetheisa pulchella*

Seitz, 1910.: 73, pl. 13, row k, *Utetheisa pulchella*

Pinhey, 1979: 166, pl. 43, fig. 771, *Utetheisa pulchella*

Dubatolov, 1996b: 46, *Utetheisa pulchella*

Description. Alar expanse 35-40 mm. Thorax speckled, abdomen white. Fw white with rows of red and black dots; hw semi-transparent white with bluish tint and dark maculae at border.

Variability. A number of forms have been described, the main being as follows:

f. *thyter* Butler, 1877 – very light almost without black points on fw;

ab. *flava* O. Bang-Haas, 1927 – yellow instead of red maculae on fw, India; a similar form is known from Capri, Italy;

f. *bicolor* Oberthür, 1911 – without black maculae, occurring everywhere but rarely.

Distribution. Cosmopolitan.

Within the former Soviet Union. Ukraine, Crimea (last record in 1939: Efetov & Budashkin, 1987), southern part of European Russia, Lower Volga River region, Uralsk (Zhuravlev, 1909), Aralsk (Tschetwerikoff, 1984); Kazakhstan (Semipalatinsk, southern Kazakhstan up to Lake Balkhash in the east); Caucasus (Tbilisi, Borzhomi, Baku, Lenkoran); Turkmenistan; Tajikistan; Uzbekistan.

Moth migratory. In this connection, this species occasionally appearing in more boreal regions of Europe, e.g. northern Germany (Standfuss, 1896), southern England and southern Scandinavia, Latvia, Belarus, Karelia, Kama River region, southern part of the Moscow Region.

Beyond the former Soviet Union. Mediterranean (southern Europe, Madeira, Canary Islands, Crete, Cyprus); northern France; Asia [India, Philippines, Vietnam, China (Xinjiang) etc.]; Australia, America, Africa [including tropical and South Africa (Pinhey, 1979)].

Biology. Flight in May-June and in autumn. Eggs laid singly or in batches on the leaves of different plants. Larva dark gray with an irregular pale yellow dorsal line edged on both sides by a black stripe. Below the stripes, there is a series of red blotches margined ventrally by yellow spots and rather long star-shaped fascicles of blackish hair. Head yellow-brown with two black points. Last-instar caterpillar up to 30 mm in length.

Larvae feeding on heliotrope and various herbaceous plants, including plantain (*Plantago*), forget-me-nots etc. and, in the southern countries, on cotton plant. Pupating in a flimsy silk cocoon mixed with larval hairs, all tucked up comfortably in a folded leaf. The duration of the life cycle is a month or more. Caterpillar of the spring generation hibernating. In Europe, apparently 2-3 generations since May till September (Caradja, 1893). In the Crimea, three generations are known (Efetov & Budashkin, 1990), in southern Turkey up to four (Daniel, 1932). In northern Iran (Meshkhed), moths of the first generation appearing in the middle of April and flying till the end of May. The following



Fig. 22. *Utetheisa pulchella* (L.) resting on a stone. Turkmenistan, Badkhyz Nature Reserve, 16.IV.1969 (photo by V. S. Murzin).

generations flying since June. Moths of autumnal generation in September-October are most numerous (Stshetkin, 1960). According to Stshetkin (1960), moths of the spring generation in Tajikistan are rare, but in autumn they are usual. In Turkmenistan (Badkhyz), the author observed mass appearances of *U. pulchella* in April and September. In tropical countries, the moth flying the year round, in India at the end of December, in Guinea at the end of January.

The aposematic coloration of the moth apparently reflects its danger as prey to some predators. When disturbed, the moth excretes behind the head two drops of repellent fluid (pyrrolisidin alkaloids).

The moth is a potential pest of cotton (Pinhey, 1979). For reasons unknown, the species was included in the Red Data Book of the USSR (Borodin, 1984b).

Similar species. Only one species is known in our fauna.

Subfamily Arctiinae

14. Genus *Stauropolia* Skalski, 1988

Stauropolia Skalski, 1988: 22, TS: †*Stauropolia nekrutenkoi* Skalski, 1988.

This genus has been erected to encompass a fossil moth from the Miocene of Stavropol, North Caucasus.

23. †*Stauropolia nekrutenkoi* Skalski, 1988

†*Stauropolia nekrutenkoi* Skalski, 1988: 22, TL: “Stanitsa Sengileevskaia of Stavropol Territory”. Miocene.

[nekrutenkoi – after Ukrainian lepidopterist Y. P. Nekrutenko]

This example of good preservation allows a study to be made of fw venation and colour pattern, both resembling some representatives of *Acerbia*. A detailed description of the holotype is quoted below after Skalski (1988).

Holotype: Stanitsa Sengileevskaia, Stavropol Territory, outcrop 5 (collector B. F. Kaspiev). Besides a label reading “І È І” (= Paleontological Institute of the USSR Academy of Sciences, Moscow), the sample is supplied with a printed label reading “Geological Museum of Voroshilovski Ped. Institute”.

Description. Fw almost complete, slightly indentate at anal edge, lying on rock surface on dorsal side. Venation partly visible as a convex framework on wing surface (Fig. 23), especially Sc vein and cubital stalk Cu (1+2) with branching Cu1 and Cu2 at external edge. Pattern complete, preserved in good condition. Scales well appreciable. Wing coloration gray-brown, corresponding to rock colour, pattern monochromous brown (Fig. 24). Length of costal edge of wing 23 mm. Wing wide, greatest length to greatest width ratio 2.2. Costal edge straight, apex and tornus rounded, external edge convex. Length of Sc vein reaching 4/5 of costal edge. Length of radial vein, going parallel to costal edge, approximately equal to length of Sc. R4 (?) coming to external edge below apex. R5 branching 1/3 distance off between base of M1 and apex. A feeble frame similar to a vein (R1 ?) extended from radial vein to near M1 ramification between

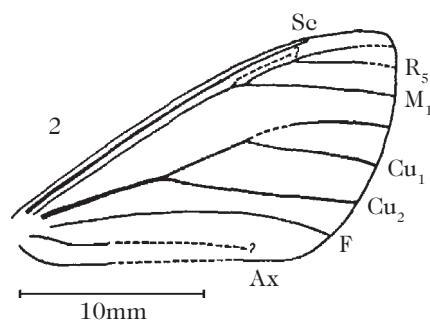


Fig. 23. Wing venation of *Stauropolia nekrutenkoi* Skalski (after Skalski, 1988).

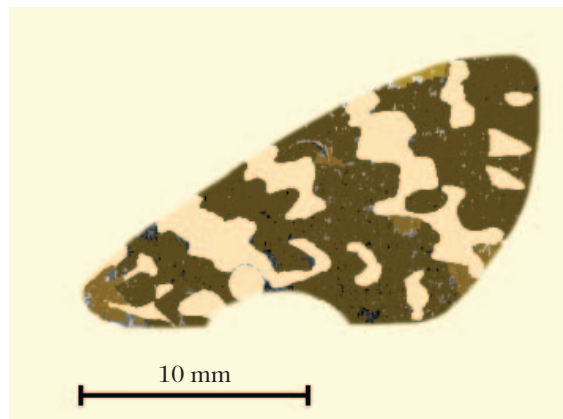


Fig. 24. Pattern of fore wing in *Stauropolia nekrutenkoi* Skalski (after Skalski, 1988) (colours arbitrary).

Sc and R. M1 branching off from radial vein at 2/3 wing length. A vein of medial sector (M²) between M1 and Cu1 most appreciable at external edge, branching off from the same point as Cu1 against the base of M1. Cu2 branched at 3/5 length of cubital vein; its base noticeably removed from the base of Cu1. A1 probably elongate, well discernible at the base of wing. A concave frame (F) resembling the anal vein An lying between cubital vein and A1, latter probably a wrinkle.

Pattern consisting of dark and wide bands contiguous to each other and binding a light background of wing by several fuzzy spots. Four largest bands forming bars running parallel to each other and starting from costal edge. Band between M1 and E+eU reaching the tornal part of external edge. Remaining bands ending in the middle part of wing. External, anal and basal fields with three prolate small spots (Fig. 24).

Geological age. Miocene, Karaġan horizon.

15. Genus *Parasemia* Hübner, 1820

(Genitalia in Pl. 25, Fig. 12)

Parasemia Hübner, 1820: 181, TS: *Phalaena plantaginis* Linnaeus, 1758.

= *Nemeophila* Stephens, 1828: 55, 72. TS: *Phalaena plantaginis* Linnaeus, 1758.

= *Chionophila* Guenée, 1865: 686. TS: *Phalaena plantaginis* Linnaeus, 1758.

= *Eupsychoma* Grote, 1865: 317. TS: *Eupsychoma geometrica* Grote, 1865

Moths of medium size, flying in daytime. Wing pattern of Type I. Distinguished by considerable sex dimorphism and polymorphism of males. Body slender, thorax coated with fragile hairs. Antennae of males with double plates, palps small, coated with bristly hairs. Tegula narrow. Fw with an additional cell. Male genitalia: juxta asymmetrical, ventral part of aedaeagus with numerous spines.

24. *Parasemia plantaginis* (Linnaeus, 1758)

(Pl. 5, Figs 2–13; genitalia in Pl. 25, Fig. 12)

Phalaena plantaginis Linnaeus, 1758: 501, TL: Sweden.

[= *alpicola* (Scopoli, 1763); *hospita* (Denis & Schiffermüller, 1775); *plantaginis* (Haworth, 1803); *matronalis* Freyer, 1843; *subalpina* Schawerda, 1906; *insularum* Seitz, 1910; *carpathica* Daniel, 1939; *thomanni* Kessler, 1951; *geometrica* Grote, 1865; *plantaginis* f. *geometrica* Holland, 1908; *macromera* Butler, 1881; *macromera leucomera* Butler, 1881; *plantaginis japonica* Inoue & Kobayashi, 1956; *P. p. caspica* Daniel, 1939]

[*plantaginis* – from ribwort (*Plantago*), the food plant of the larva (Lat.)]

[Wood Tiger – (Engl.)]
 [Ecaille du Plantain – (Fr.)]
 [Wegerichbär – (Germ.)]

Staudinger, 1884: 277, *Nemeophila plantaginis* var. *hospita* and var. *flocossa*
 Romanoff, 1884: 86, *Nemeophila plantaginis* var. *caucasica*
 Grum-Grshimailo, 1891: 462, *Nemeophila sifanica*
 Spuler, 1910: 141, pl. 74, fig. 10a, b, *Parasemia plantaginis*
 Seitz, 1910: 81, pl. 16, rows d, e, *Parasemia plantaginis*
 Sedykh, 1974: 149, *Parasemia plantaginis*
 Koch, 1984: pl. 2, fig. 56, *Parasemia plantaginis*
 Dubatolov, 1996b: 46, *Parasemia plantaginis*

Subspecies:

P. p. plantaginis (Linnaeus, 1758)
 [= *Phalaena hospita* ([Denis & Schiffermüller], 1775); *Parasemia plantaginis uralensis* Krulikovsky, 1904;
Parasemia plantaginis carpathica Daniel, 1939; *Parasemia insularum* Seitz, 1910; *P. p. hesselbarthi* de Freina, 1981]
P. p. caucasica (Ménétrières, 1832): 262 (*Chelonia caucasica*)
 [= *Parasemia plantaginis passanauriensis* Alberti, 1973]
P. p. sifanica (Grum-Grshimailo, 1891) (Figs 25, 26)
 [= *Parasemia plantaginis altaica* Seitz, 1910]
P. p. stoetzneri O. Bang-Haas, 1927: 59, pl. 8, fig. 11♂
P. p. nycticans (Ménétrières, 1859a: 217) (*Lithosia nycticans*)
 [= *Parasemia plantaginis trybomi* Bryk, 1942 (nom. nud.); *Nemeophila plantaginis ab. melas* Christoph, 1893;
 ssp. *flocossa* (Graeser, 1888) (*Nemeophila plantaginis floccosa*)]
P. p. sachalinensis Matsumura, 1927: 59
P. p. araitensis Matsumura, 1929: 168
 [= *Parasemia plantaginis paramushira* Bryk, 1942; *Parasemia plantaginis kamtschadalus* Bryk, 1942 (nom. nud.)]
P. p. kunashirica Bryk, 1942: 29, pl. 1, fig. 1
P. p. jezoensis Inoue, 1976a: 170, pl. 2, fig. 47



Fig. 25. Mating pair of *Parasemia plantaginis sifanica* (Gr.-Gr.), Russia, Altai Mts, 10 km E of Aktash, 50°19'N, 87°45'E, 2500 m, 15.VII.2000 (photo by O. G. Gorbunov).

P. p. melanomera (Butler, 1881): 5, *Nemeophila melanomera*

[= *P. p. japonica* Inoue & Kobayashi, 1956; *P. p. melanissima* Inoue, 1976a]

P. p. petrosa (Walker, 1855): 626, *Nemeophila petrosa*

[= *Nemeophila caespitis* Grote & Robinson, 1868; *Nemeophila cichorii* Grote & Robinson, 1868; *Platartia modesta* Packard, 1864, *Eupsychoma geometrica* Grote, 1865; *Nemeophila geddesi* Neumoegen, 1884; *Platartia scudderi* Packard, 1864; *Nemeophila sekeynii* H. Edwards, 1885].

Description. Male: alar expanse 35 mm. Fw black with a yellowish pattern consisting of intersecting bands (EI, Tr2), latter creating an X-shaped pattern in external part of fw, a rounded spot at apex of discoidal cell and a long stria (Ls) beginning at the base of wing and almost reaching the external edge. Hw yellow with black maculae at edge and dark pollination around cell and along anal vein.

Female. Alar expanse 30 mm. Pattern like in male but hw reddish with a more strongly infuscate base of wing.

Variability significant.

P. p. sifanica. Fw with a strongly developed black pattern, whereas both coloration and pattern of hw close to those of central Russian moths (Pl. 5, Figs 5-7). Pattern in female differing a little from that of the European form but hw yellow. Among the moths from the Altai, males rather often occur that are with yellow hws and a developed black pattern, and also with completely black hws (f. *nycticans* - Pl. 5, Fig. 9). Altai, southern Siberia; mountains of Mongolia, northern China.

P. p. floccosa. Moth with a strongly developed black pattern; female hw largely black. Middle Amurland, Primorye; Korea.

P. p. sachalinensis. Moth sharply differing from the other forms by white fws and hws of the male. On fw, the black pattern is strongly reduced, and on the hw there is only a black belt at the wing edge. Female with hws yellow with a black pattern, like in European specimens. (A similar pattern is also observed in the f. *confluens* Schawerda, 1906). Sakhalin.



26



27

Fig. 26. *Parasemia plantaginis sifanica* (Gr.-Gr.), ♂. Russia, Altai Mts, 10 km E of Aktash, 50°19'N, 87°45'E, 3000 m, 12.VII.2000 (photo by O. G. Gorbunov).

Fig. 27. *Parasemia plantaginis caucasica* (Mén.), ♂. Armenia, Mt. Aragats, Lake Kara-Gel, 3000 m, ex ovo, 19.VII.1986 (photo by A. Dantchenko).

P. p. araitensis. Differing by a black hw with an orange submarginal belt. Northern Kuril Islands and Kamchatka. Several other subspecies are known from the adjacent territories.

Distribution. Pattern Eurasian.

Within the former Soviet Union. Baltic countries; Belarus; northern Ukraine, Carpathians; European part of Russia [up to Arkhangelsk and Murmansk regions, Komi Republic (Syktyvkar, Ukhta, Polar Urals) in the north]; Middle and South Urals, missing from the steppe-clad areas of the North Caucasus and Crimea but occurring in the mountains of Caucasus (Maikop, Pyatigorsk) and in Transcaucasia (Armenia); Siberia south of ca. 60 °N: Altai, Saur, Kuznetskiy Alatau mountains, basin of Lake Baikal, Zeya River, Aldan, Yakutia, Magadan, Sakhalin, Kamchatka and Kuril Islands.

Beyond the former Soviet Union. Western Europe (except for southern Italy and southern Greece); Asia Minor; North Iran (Elburs Mts); Mongolia; China (Xinjiang, Qinghai, Sichuan [in northern Sichuan up to 3200 m a.s.l. (S. Murzin)], Shaansi); Korea; Japan (Hokkaido, Honshu); northern and western Canada; western USA.

Biology. Flight since May till July in open places. In the mountains reaching 2600 m a.s.l. In the daytime, moths are easy to flush from grass, performing short flights. Males often flying several metres up above ground.

Caterpillar black up to the fifth and after the tenth segment. Segments 5-10 dark testaceous red. Head black. Length of last instar caterpillar up to 35 mm. Larva feeding on various tree or herbaceous plants: *Betula* spp., *Polygonum* spp., *Rumex* spp., *Vaccinium myrtillus*, *V. uliginosum*, *Plantago* spp., *Silene*, *Melandrium* etc. since August till spring. Pupation on the ground or under stones in very thin gray-brown reticulate cocoons.

Similar species. There seem to be no similar species in our fauna.

16. Genus *Hyphoraia* Hübner, 1820

(Genitalia in Pl. 25, Fig. 13)

Hyphoraia Hübner, 1820: 182, TS: *Phalaena aulica* Linnaeus, 1758.

= *Hyphoraea* Agassiz, 1847 (misspelling).

Strand, 1919: 128, *Hyphoraia*

Seitz, 1910: 95, *Hyphoraia*

Fang, 2000: 320, *Hyphoraia*

Antennae of male double-combed, in female dentate. A fascicle of long hairs on forehead (epicranium). Palps short, proboscis not developed, eyes clothed with rather sparse long hairs. Male genitalia: valva with one apical process only.

25. *Hyphoraia aulica* (Linnaeus, 1758)

(Pl. 5, Figs 14-15; Fig. 28; genitalia in Pl. 25, Fig. 12)

Phalaena aulica Linnaeus, 1758: 505, TS: Europe.

[= *montana* Bergmann, 1953]

[*aulica* – courtier (Lat.)]

[Ecaille Civique – (Fr.)]

[Hofdame – (Germ.)]

Gillmer, 1905: 131, *Hyphoraia immaculata* [= *bicolor* Spuler]

Sovinsky, 1905: 109-110, *Arctia aulica testudinarioides*

Spuler, 1910: 136, *Arctia aulica* ab. *hamata*

Spuler, 1910: 136, *Arctia aulica* ab. *radiata*

Seitz, 1913: 95, pl.17, rows e, f, *Hyphoraia aulica*

Matsumura, 1927: 59, pl. 4, fig. 3, *Hyphoraia aulica rishiriensis*

Dubatolov, 1996b: 47, *Hyphoraia aulica*



Fig. 28. *Hyphoraia aulica* (L.), ♂. Russia, Orenburg Region, 8 km E of Podgornoe, 26.V.1998 (photo by O. G. Gorbunov).

Fang, 2000: 321, pl. 14, fig. 13, *Hyphoraia aulica*

Description. Alar expanse of male 31-35 mm, female larger (37-40 mm). Fw brown with a yellow pattern consisting of longitudinal short lines and points. Hw yellow with black spots and a darkened basal part. A large black spot on discoidal vein. Pattern of underside same, but black coloration of hw replaced by brown.

Variability. Basically connected with an increased or weakened yellow pattern. Moths from the Primorye are larger and lighter than European specimens.

f. *testudinarioides*. Differs by the development of yellow fields on the hws, this making the moth look similar to the West European *H. testudinaria* (Geoffroy, 1785).

f. *immaculata*. Monochromous brown fws and yellow hws without black maculae. A transitional form, *hamata* Spuler, 1910, is also known. One of the numerous deviations, f. *radiata* Spuler, 1910, shows fused yellow maculae situated along the hind edge of the fw. Such a trait is a constant feature of *H. dejeani* (Goddart, 1822), from Spain.

Distribution. Pattern Euro-Siberian.

Within the former Soviet Union. European part: Baltic countries; Belarus; Ukraine (in the Crimea not recorded); Moldova, European Russia south of 62 °N in the western part (southern Karelia and Kirov), up to 57 °N in the Urals; Uralsk (Zhuravlev, 1909); Caucasus and Transcaucasia (Georgia); in West Siberia from 55 °N down to northern Kazakhstan (Tyumen, Omsk, Novosibirsk, Minussinsk, Barnaul, Kuznetskiy Alatau, the middle flow of Angara River, Semipalatinsk), further to the east in southern Transbaikalia, in Amurland and Primorye.

Beyond the former Soviet Union. Central Europe (southern Belgium, southern Scandinavia and eastern France, Germany, in the south down to Austria, northern Balkans; northern Asia Minor; China (Xinjiang, Heilongjiang, Liaoning); Korea; Japan (Hokkaido).

Biology. Flight from the end of May to early July on warm slopes, wastelands, forest alleys and wet forest lawns. Occurrences patchy. Caterpillar black, coated with straw red hairs (Fig. 29). Last three segments with especially long black hairs. Head black. Length of last-instar caterpillar up to 50 mm.



Fig. 29. Caterpillar of *Hyphoraia aulica* (L.) (after Spuler, 1910).

Larvae feeding from August on various herbaceous plants: *Achillea*, *Euphorbia*, *Potentilla*, *Hieracium*, *Cynoglossum*, *Deschampsia*, *Plantago*, *Taraxacum*, *Calamagrostis* etc. Hibernation twice. Pupa black with red-brown grooves on abdomen in a thin white cocoon.

Similar species. There seem to be no similar species in our fauna.

17. Genus *Pararctia* Sotavalta, 1965

Pararctia Sotavalta, 1965: 173, TS: *Bombyx lapponica* Thunberg, 1791.

Moths of medium size. Wing pattern of Type I. Fw brown with a yellow pattern, hw yellow with dark spots. Eyes oval, antennae of male bipectinate, coated with hairs.

Distribution pattern circumpolar (Europe, Asia, North America, including Canada). From North America, the following species are known:

Pararctia yarowii (Stretch, 1873), *Pararctia subnebulosa* (Dyar, 1899), and several subspecies of *Pararctia lapponica*.

Keying the species based on external features is often difficult as the congeners are very similar and often show strong variability.

Key to species of *Pararctia*:

1. Fw light brown with small yellow maculae situated at costal and hind edges of wing. A discontinuous light stria along external edge. *P. lapponica*
- . Yellow maculae merged to form two transverse belts, latter bridged in middle part to form an X-shaped pattern in external part of wing. 2
2. Edge of hw yellow. Dark spots a little removed from edge. Alar expanse 44-46 mm. *P. lemniscata*
- . Edge of hw infuscate, with a dark band at edge. Alar expanse 34-36 mm. *P. tundrana*

26. *Pararctia lapponica* (Thunberg, 1791)

(Genitalia in Pl. 25, Fig. 14)

Bombyx lapponica Thunberg, 1791: 40, pl., fig. 7, TL: Lapponia, Sweden.

[= *festiva* Borkhausen, 1790; *avia* Hübner, 1804; *festiva rosea* Sheljuzhko, 1929].

[*lapponica* – Lapponian (Lat.)]

[Lappländischer Braunbär – (Germ.)]

Seitz, 1910: 95, pl. 17, row e, *Hyphoraia festiva*

Bang-Haas, O., 1927: 68, *Hyphoraia lapponica lapponica*

Dubatolov, 1996b: 47, *Pararctia lapponica*

Description. Alar expanse 37-39 mm. Wing coated with rather sparse scales. Fw red-brown with yellow prolate spots adjoining both costal and inner edges, and an irregular boundary band. Hw in basal part dark brown, in external part intensively yellow, with dark submarginal spots. External edge yellow.

Variability. This moth seems to be infrequent in collections. From the boreal coast of Kola Peninsula, Russia, the form *rosea* has been described as *Hyphoraia festiva rosea* Sheljuzhko, 1929. It is distinguished by pink red hws.

Distribution. Pattern circumpolar.

Within the former Soviet Union. Polar regions of European Russia: Kola Peninsula, Mesen, Kanin Peninsula, Polar Urals, Yamal Peninsula, Taimyr Peninsula, in the south down to Igarka; East Sayan Mts; the mountains of Transbaikalia, Stanovoi Mts., Yakutia; Magadan Region; Chukotka; Wrangel Island, Kamchatka.

Beyond the former Soviet Union. Northern Scandinavia, North America (Alaska; northwestern Canada to Quebec in the east). Two Nearctic subspecies have been discriminated: ssp. *hyperborea* (Curtis, 1835) and spp. *gibsoni* (O. Bang-Haas, 1927).

Biology. Flight at the end of June and in July in the tundra (Fig. 30). In woodlands, occurring over “goltsy” (= rocky denudations) and moors. Larva dark gray with a small black head and long blackish hairs. Feeding on *Betula nana*, *Vaccinium uliginosum*, *Rubus chamaemorus*.

Similar species. *P. lemniscata* Stichel, larger, the belts are much wider, the external part of the fw is with an X-shaped pattern; *P. tundrana* Tshistjakov, smaller, hws duller with a wide brownish border.



Fig. 30. Polygonal tundra in the region of Indigirka River, Taimyr Peninsula, Russia, with *Holarctia puengeleri* O. B.-H., *Pararctia tundrana* Tshist., *P. lapponica* (Thnb.), *P. lemniscata* (Stich.), *Acerbia alpina* (Q.) flying during a short polar summer (photo A. Grazhdankin).

27. *Pararctia lemniscata* (Stichel, 1911)

(Pl. 5, Figs 16, 18)

Arctia festiva lemniscata Stichel, 1911: 99, TL: Vilyui River, East Siberia, mountains of Yakutia.

[lemniscata – decorated with band (Lat.)]

Alpheraky, 1897: 198, pl.14, row 8, *Arctia festiva*Sheljuzhko, 1922: 286, pl. 5, fig. 5, *Hyphoraia lapponica lemniscata*Bang-Haas, O., 1927: 68, *Hyphoraia lapponica lemniscata*Dubatolov, 1996b: 48, *Pararctia lapponica lemniscata*

Description. Male: alar expanse 40-45 mm. Fw light brown with yellowish belts, latter in external part of wing forming an R- or X-shaped pattern. Centre of costal edge with a wide light spot. Hw yellow with several submarginal spots or striae, a large discoidal spot and a darkened hind edge. Basal part of hw gray.

Variability. *P. lemniscata* is often considered as a subspecies of *P. lapponica*. The status of a number of varieties described as forms of *P. lapponica* remains vague. The type locality of *P. lapponica* is the River Vilyui, Transbaikalia. Conditionally, as we have neither a sufficiently rich material nor enough observations to solve this problem, the following forms are being attributed to *P. lemniscata*:

f. *diplosema* Stichel, 1911: 98. Smaller, also it seems lighter because of strong downiness; postdiscal belts forming X- or R-shaped patterns;

f. *erythema* Stichel, 1911: 99. Described from a single female with intensively red hws; black spots on hws edged reddish brown.

Distribution. Pattern East Siberian.

Within the former Soviet Union. Mountains of eastern Yakutia (Suntar-Khayata and Cherskiy mountains), Vilyui River, Tunkinskie Belki, Sayan Mts, Irkutsk, Indigirka River (A. Grazhdankin leg.), Altai (L. Nikolaevskiy leg.).

Beyond the former Soviet Union. Unknown.

Biology. Flight from the end of June and in July in the northern taiga and forest-tundra.

Similar species. *P. lapponica*, *P. tundraana*. See the key above.

28. *Pararctia tundraana* Tshistjakov, 1990

(Pl. 5, Fig. 17)

Tshistjakov, 1990: 97, figs 1-3, TL: Chukotka.

[tundraana – living in the tundra (Lat.)]

Description. Alar expanse 35 mm. Fw brown with pale yellow, irregularly shaped striae and separate spots. In external part of fw, the intersecting belts forming an R-shaped pattern. Closer to the base of fw at its hind edge, a spot in the form of a lying letter y, and costal edge in the middle of fw with an l-shaped pattern. A similar pattern also at base of wing. A triangular light spot between these two l-shaped patterns. Hw yellowish with a pale brown-gray pattern; anal part of wing darkened, external edge of fw with a marginal belt (with a light spot below vein Cu₂) and a crescent spot on discal vein. Fringe light, body brown. The above description is given based on a specimen from Chukotka.

Variability. Details of wing pattern varying.

Distribution. Pattern North Siberian.

Within the former Soviet Union. Polar Urals; Yamal; Taimyr; Polar Yakutia; mountains of southern Yakutia (Stanovoy Mt. Range); Chukotka; northern Koryakia, Kamchatka.

Beyond former Soviet Union. Unknown.

Biology. Moths inhabiting the tundra belt, flight in July.

Similar species. *P. lapponica* and *P. lemniscata* show a light external edge of the hw; *P. lemniscata* larger (40-45 mm).

Note. Earlier, the North American species *P. subnebulosa* (Dyar, 1899) was considered as occurring over our territory. However, Tshistjakov (1990) has shown that our moths actually belong to *P. tundraana*, a Siberian vicariant of *P. subnebulosa*.

Genus *Sinoarctia* Dubatolov, 1987

Sinoarctia Dubatolov, 1987a: 30, TS: *Micrarctia kasnakovi* Dubatolov, 1987a.

“Eyes small, oval, bare, antennae of male two-combed, in female simple. Proboscis small. Body rather wide, coated in males with rich erect hairs, in female with decumbent scales. Fore tibiae with a short epiphysis, middle with one pair, hind with two pairs of thin spurs, which are not longer than diameter of tibiae...” (Dubatolov, 1987a: 30).

The following four species belong to this genus: *S. kasnakovi* (Dubatolov, 1987) (upper reaches of the Yantze River), *S. sieversi* (Grum-Grshimaïlo, 1891) (China, Qinghai, Amdo), *S. forsteri* (Daniel, 1943) (Sichuan), and *S. mussoti* (Oberthür, 1911) (Tibet).

Pattern of fw represented by longitudinal bands along veins R, Cu, Cu2 and A2 + A3, and also by a V-shaped spot in external field. In male, external edge infuscate. Hws pink, yellow or white with dark spots along external edge and on discal vein. Veins Cu1-2 and 2 + A3 darkened at base.

The holotype of *S. kasnakovi* was taken by Kozlov in the headstream of By-tchu River (probably near Ushu - 33° 06' N, 96° 48' E in Qinghai Province, eastern Tibet) at 4500 m a.s.l., 11. VII.1900, while the paratypes in the same area (Djagyngol River) by Kaznakov and Kozlov on 1-7.VII.1900, “on flowers on an Alpine aster” (?). Both the holotype and the paratypes are kept in ZISP.

S. sieversi (Grum-Grshimaïlo), a male and a female from China, see Pl. 24, Fig. 1, ♂, Fig. 2, ♀ (wingless, presumably the same species).

No representatives of this genus have hitherto been documented in the territory of the former Soviet Union.

18. Genus *Borearctia* Dubatolov, 1984

(Genitalia in Pl. 25, Fig. 15)

Borearctia Dubatolov, 1984: 337, TS: *Eyprepia menetriesi* Eversmann, 1846.

Dubatolov (1984) erected this genus on the basis of certain differences from *Callimorpha*.

Head small, palps short, coated with decumbent hairs. Proboscis developed, rolled into a spiral. Antennae of male saw-shaped, in female simple. Eyes small, oval, coated in hind part with light hairs. Middle tibiae with one, hind tibiae with two pairs of pointed spurs, or calariae. Wings semi-transparent.

Below, the original description of the genus is quoted:

“The genus *Borearctia*: head small, palpi small, hardly longer than downiness on face, coated with long semidecumbent hairs. Proboscis not reduced, coiled into a spiral, in full stretch reaching the apex of hind coxae. Antennae in male styliform, in female simple, filiform.

Face wide, beset with long erect hairs; eyes small, oval, eye width to eye height ratio 0.6-0.8, coated with light hairs, denser in hind part of eye, missing in fore part. Thorax and fore segments of abdomen coated with dense long hairs, remaining parts of abdomen with short decumbent setation. Coxae of legs with long, femora, tibiae and tarsi with short decumbent hairs. Middle tibiae with one, and hind tibiae with two pairs of pointed spurs, or calariae, latter equal in size to or slightly longer than diameter of tibiae. Wings semi-transparent, fw prolate toward apex.

Male genitalia: valve strongly sclerotised, oval, with basal edge declined inside and coated ... with short sparse hairs. Valve at apex with a long cylindrical process. Uncus cylindrical, without hairs. Branches of transtilla well-developed, covered with denticles at apices. A membranous basal process of valve missing. Female genitalia with strongly sclerotised side processes on antevaginal plate, latter scale-free, and with a large sinus vaginalis.

Palps in *Eyprepia menetriesi* coated with yellow or red hairs, at apex black. Face between eyes with black hairs, forehead (epicranium) and neck between and behind antennae clothed with red hairs. A small fascicle of black hairs between antennae. Patagia with black hairs, the hairs being white only at base but red at apex. Tegula outside downy white, inside with black hairs. Prothorax in the middle coated with black hairs, on each lateral side with white hairs. Abdomen yellow from above, each segment in central part with a large, transverse, black spot, underside of each abdominal segment black in front, yellow behind. Antennae black, legs from above black, underside yellow, only fore coxae and femora, as well as middle femora with red hairs; red fascicles of hairs at base of upper side of fw.

Fw yellow, bordered brown-black along veins. Hw orange yellow. Pattern of underside of wing same as on upper side, but more dull while costal edge of fw red.” Length of fw 30-35 mm.

Closest to *Pararctia* Sotavalta, with a single species involved.

29. *Borearctia menetriesi* (Eversmann, 1846)

(Pl. 6, Fig. 1)

Eyprepia [sic!] *menetriesi* Eversmann, 1846: 84, TL: "Songoria" (Dzhungaria=Jungaria).

[*menetriesi* – in honour of Ed. Ménétrières (1802-1861), Russia's first professional entomologist of French origin]

Dubatolov, 1984: 337-339, *Borearctia menetriesi*

Hori, 1926: 86-87, *Callimorpha menetriesi*

Description. Alar expanse 56-65 mm. Fw yellow bordered black, with brown-black striae on veins. Hw orange yellow with a red field at apex of wing and with black pollination on veins thinner than on fw. Antennae of males dentate, in female simple. On underside, pattern the same but costal edge of fw red.

Variability. The small series of specimens known to us is rather stable in appearance.

Distribution. Pattern Euro-Siberian. Based on the literature data, the moth ranges from Finland and Karelia (northwestern coast of Lake Ladoga) to Sakhalin, but is extremely rare in collections.

Within the former Soviet Union. Oktyabrskiy, Tyumen Region, Saur River, Altai (Lake Teletskoe, Artybash), East Sayan ("Stolby" Nature Reserve), Baikal (Bolshye Koty), Baikit (Podkamennaja Tunguska), environs of Yakutsk, Zeyskiy Nature Reserve, Sikhote-Alin, Sakhalin (after Dubatolov, 1984).

Beyond the former Soviet Union. Finland, northwestern China (Xinjiang).

Biology. Flight in July over taiga glades and "goltsy" (= mountain tundra). Flight prompt, rectilinear. Based on certain observations, the food plants of caterpillars are *Polygonum*, *Plantago*, *Taraxacum*.

Note. A revision of this species by Dubatolov (1984) was based on a study of 15 specimens (2 males and 13 females).

Similar species. There seem to be no similar species in our fauna, though some resemblance can be found with *Callimorpha principalis principalis* Kollar, 1844, in which the hw pattern reminds of that of *B. menetriesi*. However, the typical subspecies of *C. principalis* does not occur in our territory.

19. Genus *Acerbia* Sotavalta, 1963

Acerbia Sotavalta, 1963: 263, TS: *Bombyx alpina* Quensel, 1802.

Wing pattern of Type I. Fw dark gray with numerous, light, diffused spots. Basal part of hw dark. Eyes bare, antennae dentate.

30. *Acerbia alpina* (Quensel, 1802)

(Pl. 6, Fig. 1)

Bombyx alpina Quensel, 1802: 253, TL: Lappland.

[= *thulea* Dalman, 1823: 92]

[*alpina* – alpine (Lat.)]

Spuler, 1910: 137, *Arctia alpina*

Seitz, 1910: 95, pl. 17, row a, *Hyphoraia alpina*

Bang-Haas, O., 1927: 70, *Hyphoraia alpina sibirica*

Dubatolov, 1996b: 48, *Acerbia alpina*

Subspecies:

A. a. sibirica O. Bang-Haas, 1927

A. a. johanseni O. Bang-Haas, 1927.

Description. Alar expanse about 40 mm. Fw dark gray with medium-sized white spots, rounded and prolate along wing. Hw mainly dark gray. One-third of hw in its external part yellow, toward costal edge reddish. On a yellow field, spots of the same colour as basal field. On discal vein, a soft crescent spot. Scaly integument both on fw and hw rather sparse, the scales arranged in regular rows, not overlapping. Body black as well as head; collar and shoulders yellow. Legs black with yellow maculae. Antennae slender.

Variability. Coloration of hw varying from red to yellow.

The ssp. *sibirica* from the Altai (Pl. 6 fig. 5) slightly differs from the samples from Scandinavia. ("Wings thinner and prolate, colour of hw dingy rosy", cf. O. Bang-Haas, 1927).

The form from Alaska, the ssp. *johanseni*, is very close to the ssp. *sibirica*.

Distribution. Pattern circumpolar.

Within the former Soviet Union. North of Russia: Polar Urals, Yamal, polar areas from the Taimyr to Chukotka peninsulas, Wrangel Island, Altai, Sayan, Buryatia, Dzhugdzhur and Stanovoy Mt. ranges, eastern Yakutia.

Beyond the former Soviet Union. Fennoscandia; Mongolia (Chovsogol Region, Kharidullin Mt. Range); Alaska, Yukon, Canada.

Biology. In the Altai and other parts of Siberia, the moth inhabits alpine regions, where it can be seen in the daytime on screes while resting on stones. In the Altai Mts, it occurs at 2500-3000 m a.s.l.

Food plants of caterpillars: *Taraxacum*, *Vaccinium*, *Salix herbacea*.

Similar species. Superficially resembling *A. seitzi*, in which light spots on fw ochre-yellow, hw orange yellow with small darkening at base, and dark maculae more strongly contrasting than in *A. alpina*. Underside background coloration orange.

31. *Acerbia seitzi* (A. Bang-Haas, 1910)

(Pl. 6, Fig. 2)

Arctia seitzi A. Bang-Haas, 1910: 30, pl. 3, fig. 17, TL: Tianchan centr: "Narynsk" [= Naryn, Kirghizia].

[= *strandii* Niepelt, 1911; *niepeltiana* Strand, 1919]

[*seitzi* – in honour of German entomologist A. Seitz]

Bang-Haas, O., 1927: 70, pl. 9, fig. 4, *Hyphoraia seitzi khumbeli*
Dubatolov, 1996b: 49, *Acerbia seitzi*

Subspecies:

A. s. khumbeli O. Bang-Haas, 1927.

Description. Male: alar expanse 45 mm. Fw yellow with an indistinct black-and-gray pattern in the form of diffused transverse bands and darkened veins. Hw orange with black submarginal maculae and a crescent median spot. Underside orange with a black discal spot on fw. Pattern of underside of hw same as from above.

Variability. A series of ten specimens from Pass Kumbel near Alma-Ata (ssp. *khumbeli* O. Bang-Haas) shows no considerable variability. From the typical form they differ by a lustreless yellow colour of the maculae on the fws. The hws are lustreless red in colour.

The single male specimen available from the Ugamskiy Mts (Uzbekistan, Ugamskiy Mt. Range, Sairam-Su River, 17.VII.1986, T. Tillaev leg.) represents a sharply deviating melanistic form similar to a number of melanists in other species. We describe it below as a new form.

f. *tillaevi* forma nova (Pl. 6, Fig. 3).

Male: alar expanse 44 mm, length of fw 21 mm. Upper side of fw gray-brown with yellow pollination generating vague belts. Hw black. Underside of fw orange-yellow with three black maculae at costal edge and two more placed closer to anal angle of fw. Hw black with a bright yellow fringe. Body from above black except for a fascicle of yellow hairs at apex of abdomen.

Named in honour of amateur entomologist T. Tillaev, Tashkent, Uzbekistan.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Zailiiskiy Alatau (near Alma-Ata, Kazakhstan), Kungey Alatau, Naryn (central Tian-Shan), western Chatkal Mts, Ugamskiy Mts Range, Aksu-Dzhebagly Nature Reserve (West Tian-Shan).

Beyond the former Soviet Union. China (Xinjinag: Tian-Shan).

Biology. Mainly inhabiting talus and adjacent alpine grassy lawns at 2800-3200 m a.s.l. Flight in the afternoon in July. Caterpillars black, coated with black or dark gray hairs, in the daytime hiding under stones. Feeding on herbaceous plants (in captivity they ate *Taraxacum*).

Caterpillars hibernating at the last instar. After overwintering, they pupate without additional feeding.

Similar species. *A. alpina* has dark gray fws with clear-cut white maculae. Most parts of the hw and the wing underside are obscure. Both these species never occur together.

Acerbia kolpakofskii (Alpheraky, 1882)

Callimorpha kolpakofskii Alpheraky, 1882: 26, pl. 1, fig. 31, TL: River Kungess, Tian-Shan. "In der Nähe des Flussus Kungey (Kounguesse)".

[kolpakofskii – after Mr. Kolpakofski]

Seitz, 1910: 95, *Hyphoraia kolpakofskii*

Bang-Haas, O., 1927: 70, *Hyphoraia kolpakofskii*

Note. This moth is known to us based on brief descriptions only. Seitz (1910) puts it between *Hyphoraia seitzi* and *Hyphoraia aulica*. O. Bang-Haas (1927), by assigning this species to *Hyphoraia*, also considers it as close to or even a synonym of *H. seitzi*.

Description (after Seitz, 1910). Antennae of male two-combed. Fw coated with sparse scales, with white spots scattered all over the wing. Hw ochre yellow. Base reddish with small black maculae at edge and three larger ones at anal angle, before apex and at inner edge. Thorax and abdomen black-brown.

Superficially, the moth thus resembles *A. seitzi* or *A. alpina*.

Variability. Apparently, only a single, holotype specimen is known. As noted by O. Bang-Haas (1927), *A. seitzi* is probably a synonym of this species.

Distribution. The moth has been described from China, yet rather close to the border to Kazakhstan (Kungess River at the confluence with Tekes River forming the Ili River).

Biology. The holotype was found on the stem of a dry tree on 9.06.1879 at about 1300 m a.s.l.

Similar species. *A. seitzi* has reddish pink hws.

20. Genus *Platarctia* Packard, 1864

Platarctia Packard, 1864: 109, TS: *Arctia parthenos* Harris, 1850.

Moths of medium size. Wing pattern of Type I. Fw violet brown with a pattern of yellow maculae. Eyes large, hemispherical, not situated on a bare suborbital sclerite. Male genitalia: valva with one apical process only.

One species within the former Soviet Union, two species in North America.

32. *Platarctia atropurpurea* (O. Bang-Haas, 1927)

(Pl. 6, Fig. 6)

Hyphoraia ornata atropurpurea O. Bang-Haas, 1927: 117, TL: environs of Ulan-Bator (Urga), Mongolia; "Umgebung der Stadt Urga" (südlich Kiachta)".

[= *ornata* Staudinger, 1896]

[atropurpurea – black-purple (Lat.)]

Seitz, 1910: 101, pl. 18, row f, *Hyphoraia ornata*

Draudt, 1931: 83, pl. 7, row d, *Hyphoraia ornata pallida*

Bang-Haas, O., 1927: 117, *Hyphoraia ornata atropurpurea*

Dubatolov, 1996b: 49, *Platarctia atropurpurea*

Dubatolov, 1996b: 70, fig. 2g, *Platarctia atropurpurea sotavaltai*

Subspecies:

P. a. pallida Draudt, 1931

P. a. sotavaltai Dubatolov, 1996.

Description. Alar expanse 40 mm. Fw violet-brown with yellow maculae, hind edge of fw dark. Basal field above this edge yellow with dark points. Along costal edge, four yellow maculae (spot closest to base of fw partly merged with basal field; spot at apex like an oblique short line). Along external edge, a series of spots (three fore spots smaller). Two spots closer to hind edge of fw. Hw yellow with a darkened external edge and a median spot. Submarginal series of spots and inner edge also darkened. Underside pattern similar.

Variability. Coloration and size of spots variable.

The following subspecies are known:

ssp. *pallida*. Chita: hws whitish with weak gray pollination;

ssp. *sotavaltai*. E. Yakutia, 180 km NE of Khandyga.

According to the original description, alar expanse of female 33-38 mm, of male 32 mm. Fw grayish brown with a typical pattern. "The main character of the new subspecies is the size of the yellow antemedian and postmedian spots in the space 1 (between veins 2A and Cu2) on the fw. These spots are small, either of equal size or the antemedian spot being smaller than the postmedian one. *P. atropurpurea atropurpurea* has a large antemedian spot in the space 1, elongated between the veins, and usually this spot is twice as long as the postmedian one. In addition, the hw in the new subspecies has separate rose spots, being brighter in the females."

The form (ssp.?) from Chukotka (P. I. Beda leg.) differs by the orange background colour of the hw (Fig. 31). The moths from central Yakutia show a tint intermediate between the yellow Altai and the orange Chukcha specimens. V. A. Ganson (in litt.) noted this difference.

Distribution. Pattern East Asian.

Within the former Soviet Union. West Siberia (Yenisey River, isolated records), Altai, East Sayan, Chita Region, southern and eastern Yakutia, Magadan Region, Chukotka.

Beyond the former Soviet Union. Mongolia, China.

Biology. Flight in June in alpine and partly in the upper forest belt (in the Altai from 1700 up to 2100 m a.s.l.). Flying in daytime and to light.

Similar species. No similar species seem to inhabit our countries.



1



2

Fig. 31. *Platarctia atropurpurea* (O. B.-H.), Russia, Altai Mts, Kuraiskiy Mt. Range, 2000 m, 15.VI.1998, V. S. Murzin leg. (1), Russia, Chukotka, Bilibino, VI.1985. P.I. Beda leg. (2) (photo V. S. Murzin).

21. Genus *Oroncus* Seitz, 1910

Oroncus Seitz, 1910: 82, TS: *Phragmatobia urania* Püngeler, 1904.

Bang-Haas, O., 1927: 60, *Oroncus*

Adults of this genus differ by the dark colour of the fw with a bright white or yellow stria along the costal edge. Hw yellow or red. Females often rest open on stones. Males promptly sweep along steep taluses high in the mountains at about 4000 m a.s.l.; flight during the day. High-montane.

O. Bang-Haas (1927) referred all forms of this genus encountered over the territories in question to one species, *O. tancrei* Staudinger. However, the noticeable differences in the patterns of separate forms allow to assume a specific status of some of these forms. Highly provisionally, four species considered by O. Bang-Haas as subspecies can be delimited. In addition, this genus also contains *O. secreta* Draudt, 1931, from northern Gansu (Nord-Kansu), China (Draudt, 1931), *O. bieti* (Oberthür, 1883), from Ta-chin-lu (Kanding), southeastern China, and *O. elisabethae* Kotszsch, 1938, also from China. To review or revise *Oroncus*, more material must be considered.

Key to species of *Oroncus* (Fig. 32):

1. Hws pink. 2
- Hws yellow. 3
2. A white stria extending from the end of a white band at costal edge to hind angle of fw. Apex of fw without a white short line. *O. alaica*
- A white band beginning near apex of fw and running parallel to external edge with a small flexure in upper part. *O. fasciata*
3. Apex of fw on underside black with white points. *O. urania*
- Apex of fw on underside with three black short lines over a light background. *O. tancrei*



Fig. 32. *Oroncus* species. (1) *O. tancrei* (Stgr.), ♀, (2) *O. tancrei* ab. *neptunus* O. B.-H., ♀ type, (3) *O. fasciata* O. B.-H., ♀ type, (4) *O. fasciata* ab. *pura* O. B.-H., ♂ type, (5) *O. alaica* O. B.-H., ♂ type, (6) *O. alaica* O. B.-H., ♀ type (after O. Bang-Haas, 1927).

The modest quality of the illustration is only due to the relatively poor quality of an old original picture.

33. *Oroncus tancrei* (Staudinger, 1887)

(Pl. 6, Fig. 10; Fig. 32: 1)

Arctia tancrei Staudinger, 1887: 81, TL: Tian-Shan, "Issyk-Kul, Sulucka".

As there seems to be no place like "Sulucka" in the Tian-Shan, O. Bang-Haas assumed that be a misspelt "Souka Pass" situated on the road Przhevalsk–Aksu, also a watershed of the Issyk-Kul and Naryn catchment areas.

[tancrei – in honour of entomologist Tankre]

Bang-Haas, O., 1927: 60, *Oroncus tancrei*

Description. Alar expanse 35-40 mm. Fw black, costal edge white almost up to apex, latter with a white short line. A white indistinct stria running from the end of a white costal band to anal angle of fw (Fig. 32). Hw red or pink, yellowish toward fore edge, with a black crescent spot on discal vein and with prolate spots along peripheral edges.

Variability. Based on limited material, generally insignificant.

Distribution. Pattern Central Asian.

Within the former Soviet Union. West Pamirs (Dzhilandy), Central Tian-Shan, Dzhungarskyi Alatau Mts (?).

Beyond the former Soviet Union. Xinjiang: mountains north of Korla and near Aksu (Püngeler, 1904) (= *urania* Püngeler according to Dubatolov, 1996b).

Biology. Flight at great heights (4000 m a.s.l. and above) on large stony taluses. Females usually resting openly on stones; males can be seen volant in the daytime. Eggs rather large, ball-shaped, white. Last instar caterpillars black with black warts and thick fascicles of black hairs. Fed on dandelion (*Taraxacum*) during lab rearing. Caterpillars hibernating, pupating without additional nutrition in spring with an approaching warm weather.

Similar species. *O. urania* differs by the yellow hw and the pattern on the fw, i.e. the transverse belt running not from the end of the costal, white, short line, but from the apical spot.

Note. According to O. Bang-Haas (1927), *O. tancrei* is so close to *Arctia flavia* (Fuessly) that both species are to be referred to a separate genus, or to assign *A. flavia* to *Oroncus*. However, this point of view seems insufficiently well-grounded, as the male genitalia of *Arctia* and *Oroncus* are too different.

34. *Oroncus urania* (Püngeler, 1904)

(Pl. 6, Figs 8-9; Fig. 32: 2)

Phragmatobia urania Püngeler, 1904: 121, TL: "Berge nordlich von Korla", Tianchan centr.

[urania – Uranus, one of the supreme gods in ancient Greek mythology, personified heavens (Gr.)]

Bang-Haas, O., 1927: 61, *Oroncus tancrei urania* ab. *neptunus*

Bang-Haas, O., 1927: 61, *Oroncus tancrei urania* ab. *fulminans*

Bang-Haas, O., 1927: 61, *Oroncus tancrei urania* ab. *fumosa*

Description. Superficially close to *O. fasciata* O. Bang-Haas, 1927, perhaps both forms actually represent one and the same species.

Variability. O. Bang-Haas (1927) described a series of forms he referred to *urania*:

f. *neptunus* (Fig. 32: 2) has a continuous oblique belt running from the end of a white costal edge to the external angle, and connected to the apical belt;

f. *fulminans* with a red hw;

f. *fumosa* has a smoky brown hw.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Central Tian-Shan ["high in the mountains north of Aksu, Hahn-Tengry" (O. Bang-Haas, 1927)], Inylchek Mt. Range.

Beyond the former Soviet Union. China, Aksu (Kokshaal Tau Mt. Range).

Biology. Flight in July above stony taluses at about 4000 m a.s.l. Flight rectilinear and rash. Female resting openly on stones. Moths from the crest of Inylchek Mt. Range, about 4000 m a.s.l., flying in July in the daytime.

Similar species. *O. tancrei* has a yellow hw. On fws, the marginal belt is sinuous and generally runs parallel to the external edge.

35. *Oroncus fasciata* O. Bang-Haas, 1927

(Fig. 32: 3-4)

Oroncus tancrei fasciata O. Bang-Haas, 1927: 61, pl. 8, fig. 17 (♀), TL: “Tianchan sept.: Dsharkent” [Kazakhstan, Dzharkent]. (Probably the high-mountainous parts of Dzhungaria, in lowlands this moth does not seem to occur).

[*fasciata* – decorated with belts (Lat.)].

Description. Alar expanse of 37-40 mm. Fw black with a white band along costal edge. A white band running along external edge and curved outside in fore half of fw. Hw yellow with a crescent median spot and two prolate submarginal spots.

Variability. Modest.

ab. *pura* O. Bang-Haas, 1927: 61 – hws without dark spots (Fig. 32: 4). Dzharkent (Yarkand).

Distribution. Pattern Central Asian.

Within the former Soviet Union. Dzhungarskiy Alatau Mts., northeastern Tian-Shan.

Beyond the former Soviet Union. Unknown.

Biology. Flight in July at high elevations (4000 m a.s.l.).

Similar species. *O. tancrei* has a white stroke at fw apex.

36. *Oroncus alaica* O. Bang-Haas, 1927

(Pl. 6, Figs 11-12; Fig. 32: 5, 6; genitalia in Pl. 26, Fig. 1)

Oroncus tancrei alaica O. Bang-Haas, 1927: 61, pl. 8, figs. 19-20, TL: Alaiskiy Mt. Range.



Fig. 33. Kirghizia, Alai Mts, Dugoba-Shigou Canyon, 3500 m, place of occurrence of *Palaearctia gratiosa* (Gr.-Gr.), *P. ferghana* (Stgr.), *Oroncus alaica* O. B.-H., *Arctia rueckbeili* (Pngl.) and some others (photo by V. S. Murzin).

[alaica – from the Alaiskiy Mt. Range (Lat.)]

Description. Male: alar expanse 38-42 mm. Fw with small residual subapical belt or latter completely missing, with black spots at costal edge inside a white band. An oblique belt often interrupted in the middle running from the end of costal band to anal angle. Hw pink with usual black spots. Abdomen black with a yellow band on lateral sides and from below.

Female larger (up to 50 mm), with a white collar.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Alaiskiy (sources of Dugoba River) and Zaalayskiy Mt. ranges (Aram-Kungëy), West Pamirs (Dzhilandy).

Beyond the former Soviet Union. Unknown.

Biology. Flight in July at about 4000 m a.s.l. Last instar caterpillar black, coated with long rich hairs on black warts, last instar hibernating. Lab cultures fed on leaves of dandelion (*Taraxacum*).

Similar species. Both *O. fasciata* and *O. tancrei* show a sinuous transverse belt running parallel to the external edge.

Genus *Orontobia* de Freina, 1997

Orontobia de Freina, 1997: 50, TS: *Orontobia dalailama* de Freina, 1997.

Within this genus which is clearly Chinese-Tibetan and Central Asian in origin, the following taxa are accepted: *Orontobia coelestina* (Püngeler, 1904), *O. dalailama dalailama* de Freina, 1997, *O. dalailama kansuensis* de Freina, 1997, *O. taglangla* de Freina, 1997 and *O. mooseri* de Freina, 1997. Almost all of these species or subspecies have recently been described from China, except for *O. coelestina* (Püngeler, 1904) (Fig. 20) which was earlier referred to the genus *Phragmatobia*. According to de Freina (1997), *coelestina* is known from Altyn-Dagh Pass in Kazakhstan. Thus, had this been correct, the genus would appear relevant to the scope of the present paper. However, the locality name Altyn-Dagh, meaning “a gold mountain”, is very common in Central Asia and can even prove to actually concern the Altyn-Dagh Mt. Range lying in China. Nevertheless, for the sake of completeness, this genus is treated here as well.

By its features (Pl. 24, Fig. 8), *Orontobia* seems to lie between *Phragmatobia* Stephens, 1828 and *Oroncus* Seitz, 1910. The proboscis is present, but it is less strongly developed than in *Phragmatobia*. The antennae are virtually filiform, only weakly dentate, ciliae on the palps extremely long, considerably longer than in *Oroncus* and *Phragmatobia*. The head is convex but rather small; the apex of the wings (Fig. 34) is strongly rounded. The venation of the fw is

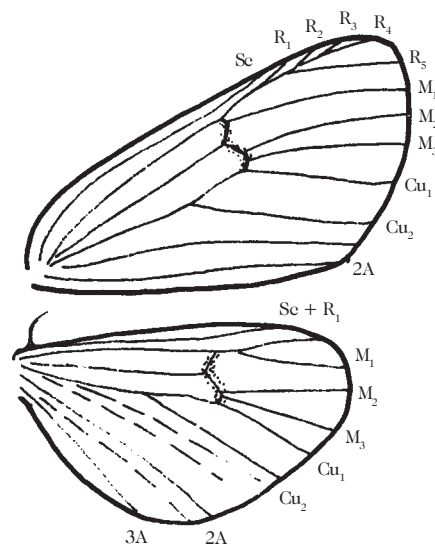


Fig. 34. Wing venation in *Orontobia* species (male) (after de Freina, 1997).



Fig. 35. *Orontobia coelestina* (Pngl.), ♂ (after Seitz, 1910).

characterised by very short radial veins positioned on a common pedicel. The moth is unique in the venation of the hw: Sc + R1 not merging anywhere with R.

The male genitalia resemble those of representatives of *Oroncus*. The appearance of some species also reminds of *Oroncus* due to the light band along the costal edge.

The moths fly high in the mountains above taluses in the daytime.

Genus *Preparctia* Hampson, 1901

Preparctia Hampson, 1901: 219, TS: *Chelonia mirifica* Oberthür, 1892.

Seitz, 1910: 97, *Preparctia*

Strand, 1919: 121, *Preparctia*

Kishida, 1995: 41, pl. 107, fig. 12, *Preparctia cupido*

Kishida, 1998: 32, pl. 132, fig. 1-3, *Preparctia hamingtoni*

Fang, 2000: 318, *Preparctia*

Species of this genus (Pl. 24, Figs 10-11) are known from China (Tibet, Sichuan, Gansu) and northwestern India (Kumaon). At the moment, six species are recognised: *P. romanovi* (Grum-Grshimailo, 1891) (Amdo, NE. Tibet), *P. allardi* (Oberthür, 1911) (Tibet), *P. mirifica* (Oberthür, 1892) (Sichuan), *P. buddenbrocki* Kotsch, 1929 (Gansu) (= *Preparctia biedermanni* O. Bang-Haas, 1932/33), *P. hamingtoni* Hampson, 1901 (Kumaon), and *P. cupido* Kishida, 1995 (Nepal).

Wing pattern of Type I. *P. romanovi* and *P. allardi* are characterised by the yellow hws (orange in basal part) and the subterminal yellowish belt on the fw, the belt sharply curved inside in the middle and reaching a postmedian belt. *P. mirifica* and *P. buddenbrocki* also show a strongly angulate subterminal belt on the fw, but the hws are crimson or dark red instead of yellow (Kishida, 1995).

Over the territory of the former Soviet Union, no species of this genus are known to occur.

22. Genus *Arctia* Schrank, 1801

Arctia Schrank, 1802: 152, TS: *Phalaena caja* Linnaeus, 1758.

= *Eyprepia* Oechsenheimer, 1810: 299, TS: *Phalaena caja* Linnaeus, 1758

= *Eyprepia* Hübner, 1819: 181 (misspelling)

= *Zoote* Hübner, 1820: 181, TS: *Phalaena caja* Linnaeus, 1758

= *Chelonia* Godart, 1822: 299, TS: *Phalaena caja* Linnaeus, 1758

= *Callarctia* Packard, 1864: 114, TS: *Phalaena caja* Linnaeus, 1758

Moths of medium size, coloration variegated; fw prolate; eyes large and spherical; palps short, with a reduced last segment. Wing pattern of Type I. An accessory cell on fw, this feature variable. Fw with 12 veins; proboscis weakly developed, almost invisible in males but visible in females. Antennae of male double-combed, in female dentate. Middle tibiae with one pair, hind tibiae with two pairs, of spurs (calariae). Male genitalia with uncus tapering at apex, without lamellae.

There seem to be five species occurring in our fauna. Dubatolov in Abdrashitova et al. (1996) has recorded *Arctia ladakensis* O. Bang-Haas, 1927 in Kirghizia. This species is known from the basin of Aksu River, China, which in the lower flow represents Sarydzhas River, Kirghizia, Tian-Shan. Possibly, the species can indeed be present in our territory similarly to *Parnassius loxias*.

Dubatolov, 1990e has described the genus *Atlantarctia* Dubatolov, 1990e, as close to *Arctia*. No representatives of this genus have hitherto been encountered in the former Soviet Union.

Key to our species of *Arctia*:

- | | |
|---|------------------------|
| 1. Band <i>Ls</i> (see Fig. 9) in middle part of fw missing. | 2 |
| –. Band <i>Ls</i> present. | 4 |
| 2. The white lines on fw solid. | 3 |
| –. The white lines on fw broken into separate spots. | <i>A. rueckbeili</i> |
| 3. Hws red. | <i>A. intercalaris</i> |
| –. Hws yellow. | <i>A. flavia</i> |
| 4. Eyes orbicular (Fig. 37: 1). | <i>A. caja</i> |
| –. Eyes oval (Fig. 37: 2). | <i>A. olschwangi</i> |



Fig. 36. *Arctia caja* (L.) in nature. (1) *A. c. sajana* O. B.-H., ♂. Russia, Altai Mts, 10 km E of Aktash, 50°19'N, 87°45'E, 2000 m a.s.l., 19.VII.2000. (2) *A. c. pamiroalaica* Stshetkin, ♂. Kirghizia, Terskei Ala-Too Mts, Teploklyuchenka, 18.VI.1993, ex l., moth emerged 28.VII.1993 (photo by O. G. Gorbunov).

Fig. 37. Heads of *Arctia caja* (L.) (1) and *A. olschwangi* Dub. (2).

37. *Arctia intercalaris* (Eversmann, 1843)

(Pl. 7, Figs 1-3)

Euprepia intercalaris Eversmann, 1843: 544, pl. 10, figs 1a, b, TL: Dzhungarskiy Alatau (Kazakhstan).

[intercalaris – intercalary (Lat.)]

Bang-Haas, O., 1927: 72, pl. 9, figs 7-9, *Arctia intercalaris alpherakyi*

Seitz, 1910: 98, pl. 18 row a, *Arctia intercalaris*

Dubatolov, 1996b: 51, *Arctia intercalaris*

Subspecies.

A. i. boettcheri O. Bang-Haas, 1927

A. i. alpherakyi Staudinger, 1886: 258 (= *Arctia intercalaris badakhshana* Wiltshire, 1961).

Description. Alar expanse of male 45-47 mm, of female 50 mm. Fw black with a white pattern. External part of fw with an X-shaped white pattern. Three white, gradually reduced belts running from costal edge of fw, the belt running closer to wing base not reaching the hind edge of fw; basal band reaching the base of wing and containing black points. Hw red with three black submarginal spots. On underside, basal part of fw pink and partly replacing a black background in the middle of fw. Underside with two black spots at a yellowish white costal edge of hw. Abdomen red with black transverse short lines on dorsal and lateral sides of each segment. Legs yellowish.

Variability. Individual variability insignificant. In showing a median white belt, the f. *ilithya* Böttcher, 1905, described from Naryn, Central Tian-Shan, becomes similar to the ssp. *thibetica* Felder, 1874, from the northwestern Himalaya;

f. *pulchrrior* Seitz, 1910 with extended white spots;

f. *aurantiaca* Seitz, 1910 with yellow hw, and some other varieties;

ssp. *intercalaris* is distributed in Dzhungskiy Alatau Mts, in the Tian-Shan (including Central Tian-Shan) and the West Altai;

ssp. *boettcheri* O. Bang-Haas, 1927, described from Terskey Alatau, yet with inappreciable differences from the typical form, the moth being a little larger, with an extended white pattern;

ssp. *alpherakyi* Staudinger, 1886 inhabits the W. Pamirs and Pamirs-Alai and differs from the typical form by the unusually small size (30 mm), yet the differences in pattern are insignificant. The form from the Shugnanskiy Mt. Range (Sangou-Dara River), volant at 3300-3500 m a.s.l., probably belongs to this subspecies. It is small (alar expanse 30-32 mm), the white stria in the apical part of the fw is reduced.

Beyond the territories considered, several other subspecies/forms have been known. Among them are the following:

ssp. *thibetica* Felder, 1874, a highly original form noticeably different from the others; Tibet. Ladak;

ssp. *suttadra* Moore, 1879b, Himalaya;

f. (?) *elisabethana* Bender & Naumann, 1980;

f. (?) *cajula* Staudinger, 1886;

f. (ssp.) *aurantiaca* Seitz, 1910.

The latter form deserves special mention. It differs by the yellow hws and illustrates the common trend in replacing the red colour by yellow. Similar forms can be found all over the geographical range of this species.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Dzhungarskiy Alatau Mts, Zailiiskii Alatau (Talgar River, Lake Issyk); West and Central Tian-Shan (Maidantal River, Naryn) and Pamirs-Alai (Dugoba River), Hissarskiy Mt. Range, Turkestanskiy Mt. Range (Kum-Bel Pass, Zaaminskiy Nature Reserve), West Pamirs (Shugnanskiy, Shakhdarinskiy, Darwazskiy Mt. ranges).

Beyond the former Soviet Union. The mountains of Afghanistan and Northwest Pakistan; the Himalaya (Kashmir).

Biology. Flight in July-August in the afternoon. Differs by fast zigzag flight. Occurring on open mountain slopes at 2000 to 3000 m a.s.l. Caterpillars reddish brown with fascicles of hairs on black warts, found on raspberry (*Rubus*).

Similar species. In our fauna, no particularly similar species seem to exist.

Arctia ladakensis (O. Bang-Haas, 1927)

Oroncus ladakensis O. Bang-Haas, 1927: 116, TL: Ladak: Sham, Chalsi.

[ladakensis – from Ladak (Lat.)]

Draudt, 1931: 79, pl. 6 row k, *Micrarctia ladakensis*

Dubatolov, 1996c: 242, *Arctia ladakensis*

Abdrashitova et al., 1996: 242, *Arctia ladakensis*

Description. Alar expanse of male 33 mm, of female 34 mm. Fw deep black with four yellowish white transverse striae. First basal belt reaching the inner edge; second belt running from the centre of costal edge only up to the middle of wing; third transverse belt running from costal edge to anal angle; fourth belt, close to apex, only weakly traced. In female, these belts considerably thinner because of an expanded black background. Hw of male reddish yellow, in female red, with two prolate black spots at edge of wing, just like in *O. tancrei*. Hw of female with a black median spot. A clear, transverse stria located in front part of hw between base and median spot. Head, thorax and abdomen black, latter with a long red stria. Antennae of female simple, not dentate. Holotype in ZMKU.

Variability. No data.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Perhaps Kokshaal-Tau Mt. Range.

Beyond the former Soviet Union. The moth is known from Ladak and the Aksu River Valley (probably Kokshaal-Tau Mt. Range), China: Xinjiang (Dubatolov, 1996b).

Biology. Flight at very high elevations (h ~ 5000 m a.s.l.) in June-July.

Similar species. In our fauna, no particularly close species seem to exist.

Note. O. Bang-Haas (1927) wrote: "Owing to the prolate shape of the wing and a resemblance of the spots on the hws, I would like to provisionally allocate this interesting, small species in the genus *Oroncus*. As the antenna of the male is absent, a more precise diagnosis is impossible at the present".

Draudt (1931) placed this species in *Micrarctia*, whereas Dubatolov (1996b) in *Arctia*.

38. *Arctia caja* (Linnaeus, 1758)

(Pl. 7, Figs 4-9; Pl. 8, Figs 1-8; Pl. 9, Figs 1-4; Figs 36-39; genitalia in Fig. 5)

Phalaena caja Linnaeus, 1758: 500, TL: Sweden.

[= *lusitanica* Spuler, 1910; *rebeli* Vnukovsky, 1929]

[*caja* – flame, burning (Gr.)]

[Garden Tiger, Great Tiger, Woolly Bear (larva) – (Engl.)]

[Brauner Bär, Gemeiner Bär, Nesselspinner Bärvoegel – (Germ.)]

[Ecaille Martre, Ecaille Hérissonne – (Fr.)]

Staudinger, 1892: 278, *Arctia caja*

Spuler, 1910: 148, pl. 74, fig. 12, *Arctia caja*

Seitz, 1913: 98, pl. 19, row b, *Arctia caja*

Dubatolov, 1996b: 50, *Arctia caja*

Fang, 2000: 334, *Arctia caja*

Subspecies:

A. c. tshimgana Sheljuzhko, 1935b: 31

A. c. pamiroalaica Stshetkin, 1982: 39

A. c. confluens Rebel, 1910: 430

A. c. kamtschadalis Draudt, 1933: 87, f. 7f

A. c. sajana O. Bang-Haas, 1927: 72, pl. 9, f. 6, ♂

A. c. phaeosoma (Butler, 1877): 395 [= *Euprepia auripennis* Butler, 1881; *immaculata* Matsumura, 1927; *tschiliensis* Draudt, 1931]

A. c. wislotti Staudinger, 1879: 333

A. c. ossetica Dubatolov, 1996b: 37, 71

A. c. orientalis Moore, 1878: 230.

Description. One of the largest tiger moths in our fauna. Alar expanse from 50 up to 75 mm. Fw brown with a white pattern in the form of intersecting bands and spots. Hw red-orange with dark blue, shining spots encircled black. Head and thorax brown, sometimes with a reddish collar, abdomen orange with black, transverse, short lines on upper side of each segment. White pattern of female more strongly developed.

Variability. Distinguished by very high-degree geographical and individual variability. A number of forms (aberrations) and geographical races (subspecies) have been described from different regions. In many cases, the coloration of the hw can vary from red to yellow. In other cases, the white pattern on the fws or the dark spots on the hws appear reduced or missing. Because of the strong variability, the species is an interesting object of genetic research.

The following forms can be denoted among others:

ab. *phantasma* Niepelt, 1905 – fw uniform cream white, hw red but black spots replaced by yellow; described from England (Fig. 38: 2);

ab. *bolga* Theiri-Miegen, 1910 – fw uniform brown, hw uniform black or brown; forms transitional to the usual specimens also existing;

ab. *immaculata* Matsumura, 1927 – described from Korea, but occurring in other places as well, devoid of a black spot in the central cell of the hw;

ab. *rubrodorsalis* Schultz, 1908 – black spots on abdomen absent.

Among the stable geographical forms, the following can be mentioned:

ssp. *caja* – the typical form widespread over the European part of Russia, the Crimea, the northern Caucasus, northern Kazakhstan and southwestern Siberia (Fig. 38: 1);

ssp. *tshingana* (Pl. 7, Figs 6, 7) – a form with an extensive white pattern widespread in the Tian-Shan and in the south of Fergana Valley;

ssp. *pamiroalaica* (Pl. 7, Figs 8, 9) – differing by yellow hws and a yellow abdomen; Peter-1 Mt. Range (TL: Darai-Nazarak), Hissarskiy, Karateginskiy, Khozratishokh Mt. ranges, western part of Shugnanskiy Mt. Range (Khorog);

ssp. *confluens* – distinguishable by a weakened white pattern of fw; hw red with extensive, black, partly merged maculae; distribution in the south of Karelia, Lake Ladoga, probably in other boreal areas;

ssp. *kamtschadalis* (Pl. 8, Fig. 6) – very narrow white stripes on fw; hw red; distributed in Kamchatka and Sakhalin (possibly this form is phenotypical, associated with a cold climate); specimens with a similar coloration sometimes occur in Siberia (Zeya region, Altai Mts), in the Urals and near Moscow; superficially, this form is close to the following;

ssp. *sajana* (Pl. 8, Fig. 1) – “Sajan mont: Tunkinsk Weißgebirge”, 2000 m a.s.l.; the moth is darkened, the hws are distinguished by small rounded spots;



Fig. 38. Variability of *Arctia caja* (L.): normal form (1) and ab. *phantasma* Niep. (2).

ssp. *phaeosoma* (Pl. 8, Figs 2-5) – this large moth differing by strong variability of coloration and pattern intensity; coloration of hw of female varying from bright red to pale orange and yellow; occurring in Amurland, the Primorye as well as in the adjacent parts of China and Korea;

ssp. *wiskotti* (Pl. 9, Figs 1-4) – this rather large subspecies (male 55-60 mm, female about 80 mm in alar expanse) with an extensive white pattern and with pale yellow hws occurs in Armenia;

ssp. *ossetica* Dubatolov, 1996b – “Ossetia, Buron, 1250 m”. “The wing expanse is 60-64 mm in males, 75 mm in females. This subspecies is transitional between the European *A. caja caja* and the Transcaucasian *A. caja wiskotti*. The colour of the fw and the shape of spots are the same as in the above subspecies, but the coloration of the hw is peculiar, being bright yellowish orange in the new subspecies, bright red in *A. caja caja*, and pale yellow in *A. caja wiskotti*”;

ssp. *orientalis* – a variety with but minor colour differences from the nominate form, Kashmir.

In addition, a number of subspecies have been described from North America:

A. c. americana (Harris, 1841);

A. c. utahensis (Edwards, 1886);

A. c. transmontana (Neumoegeen & Dyar, 1893);

A. c. parva Rothschild, 1910, and some others.

Distribution. Pattern Holarctic.

Within the former Soviet Union. Baltic countries; Belarus; Ukraine, Crimea; Moldova; European part of Russia up to Arkhangelsk, Syktyvkar and Ukhta, Komi Republic in the north; Caucasus; Transcaucasia; South Kazakhstan (Zailiiskiy Alatau); mountains of the West Tian-Shan; South Siberia (up to Khanty-Mansiisk, Altai, Tomsk Region and Angara River in the north); central Yakutia and Magadan Region (Upper Kolyma region); Kamchatka; Amur River Basin (Zeya, Pashkovo, Raddevka); Primorye; Sakhalin; Southern Kuril Islands (from Iturup to Kunashir).

Beyond the former Soviet Union. Western Europe (except for the Polar regions, the southern part of Iberian Peninsula, and Greece); Asia Minor; Iran; mountains of Afghanistan and Pakistan; Mongolia; China (Xinjiang, Henan, Hebei; Dunbei); Korea; Japan (Hokkaido, Honshu); North America (Canada; USA, including Alaska).

Biology. Flight from the end of June till August. Everywhere usual. Moths flying after sunset, often arrive on light.

According to some observations, when the moth feels itself as being in danger, fetid transparent drops nettle in odour are excreted from the fore part of the thorax. Special experiments have shown this excretion to be repellent to many predators which thus avoid attacking *A. caja*. This behaviour also corresponds nicely with the expressed aposematic coloration of the moths.



Fig. 39. Larva and cocoon of *Aretia caja* (L.) (after Hofmann, 1890).

In the mountains, the species reaches up to 2500 m a.s.l. (West Tian-Shan, Pamirs-Alai, Altai). Last instar caterpillars, in England termed as “shaggy bears”, are coated with long thick hairs, the thorax is brown-black, the lateral sides red (Fig. 39). A penultimate instar larva has silvery hairs. Larvae feed on various herbaceous as well as some shrubby and woody plants: *Allium schoenoprasum*, *Betula* spp., *Alnus incana*, *Salix* spp., *Populus tremula*, *Rheum rhaponticum*, *Sedum telephium*, *Ribes* spp., *Fragaria ananassa*, *Rubus idaeus*, *Filipendula ulmaria*, *Spiraea salicifolia*, *Malus domestica*, *Sorbus aucuparia*, *Crataegus coccinea*, *Prunus padus*, *P. domestica*, *P. nana*, *Geum rivale*, *Trifolium* spp., *Vaccinium myrtillus*, *V. uliginosum*, *Calystegia sepium*, *Stachys sylvatica*, *Lamium album*, *Plantago* spp., *Achillea millefolium*, *Taraxacum* spp. Caterpillar hibernating.

Similar species. *A. caja* is easily identifiable in spite of the strong variability. *A. olschwanzi* Dubatolov differs in the smaller size, the pink tint of the fw white pattern, the small oval eyes and certain details of genitalic conformation.

39. *Arctia flavia* (Fuessly, 1779)

(Pl. 9, Figs 5-8; Fig. 40; genitalia in Pl. 26, Fig. 2)

Bombyx flavia Fuessly, 1779: 70, pl. 1, fig. 11, TL: High Alps (Switzerland and Tyrol) “Hochalpen der Schweiz und Tirol”.

[flavia – yellowish (Lat.)]

[Gelber Bär – (Germ.)]

[Ecaile Jaune – (Fr.)]

Erschoff, 1874: 32, pl. 2, fig. 28, *Arctia flavia*

Christoph, 1887b: 55, pl. 3, fig. 2, *Arctia flavia*

Graeser, 1892: 212, *Arctia flavia campestris*

Heyne, 1899: 98, *Arctia flavia uralensis*

Hampson, 1901: 272, *Arctia flavia*

Oberthür, 1906: 40, *Arctia flavia*



Fig. 40. *Arctia flavia* (Fuessly), ♂. Russia, Altai Mts, 10 km E of Aktash, 50°19'N, 87°45'E, 2000 m a.s.l., 13.VII.2000 (photo by O. G. Gorbunov).

- Seitz, 1910: 99, pl. 18, row b, *Arctia flavia*
 Bang-Haas, O., 1927: 74, pl. 9, fig. 11, *Arctia flavia baicalensis*
 Bang-Haas, O., 1927: 75, pl. 9, fig. 12, *Arctia flavia lederi*
 Bang-Haas, O., 1927: 75, pl. 9, fig. 13, *Arctia flavia jeholensis*
 Draudt, 1931: 87, *Arctia flavia*
 Fang, 1982: 212, fig. 1573, *Phragmatobia flavia*
 Fang, 2000: 335, pl. 15, fig. 1, *Arctia flavia*

Subspecies:

- A. f. uralensis* Heyne, 1899
A. f. sibirica Heyne, 1899
A. f. baicalensis O. Bang-Haas, 1927
A. f. lederi O. Bang-Haas, 1927
A. f. jeholensis O. Bang-Haas, 1927
A. f. campestris Graeser, 1892.

Description. Alar expanse about 55 mm. Fw black with white or yellowish striae. One of the transverse belts located closer to base of wing connected with the base by a pale stria. External part of fw with a pale X-shaped pattern. Apex of fw with a light bracket. Head and thorax black. Abdomen on underside and caudally black, lateral sides pink, upper side with dark spots. Hw pale yellow with a black bracket on transverse vein and with two maculae closer to wing edge. Antennae of male weakly pinnate. Female a little larger with a more strongly developed black pattern on hw. Fringe white.

Variability. Pale pattern of fw sometimes weakened. In some cases, fw completely black (Pl. 9, Fig. 8).

The following forms/aberrations are noteworthy:

- ab. *albimaculata* Lorez, 1904 – centre of fw with a large white spot;
 ab. *nox* Romberg, 1913 – fw and hw black;
 ab. *immaculata* Lorez, 1904 – spots on hw weakened;
 ab. *continua* Schultz, 1905 – a black belt along edge of hw;
 ab. *signata* Spuler, 1910 – 4-5 small, additional, boundary spots on hw.

Based on the literature, the following taxa seem stable geographically, but their actual status remains unclear:
 ssp. *uralensis* – described from the foothills of Middle and South Urals, this moth shows very slender white striae on the fw while the hw differs by a saturated yellow colour;

ssp. *sibirica* – differing by narrow white belts on fw and almost merged spots of submarginal belt on hw, “Tarbagatai” (Tarbagatay Mt. Range, Kazakhstan);

ssp. *baicalensis* (Pl. 9, Fig. 8) – with a poor residual white pattern in the form of thin interrupted striae; fw almost purely black; black pattern of hw extensive; Irkutsk, Transbaikalia;

ssp. *lederi* (Pl. 9, Figs 5-6) – small slender moths with a dark but not black coloration of fw and an extensive white pattern; hw pale yellow with small black maculae, often so at anal edge only; Altai, northern Mongolia, Tuva, Sayan;

ssp. *jeholensis* – differing by large size (typical specimen: female 55 mm), fw with a broadened white pattern, hw pattern, on the contrary, attenuated; median spot point-shaped, submarginal spots narrow; abdomen yellow instead of red; Cisamuria (“Khing’an mount. Or.: Prov Tehili, Lin-si-hien, Chi-fong-shien”);

ssp. *campestris* – alar expanse 53-58 mm, median spot on fw reaching the inner edge; hw pale brown-yellow, often absolutely devoid of black spots, abdomen brown-yellow; Blagoveshchensk, Amurskaya Region, Russian Far East.

Distribution. Pattern East Palaearctic.

Within the former Soviet Union. North Ukraine, including Carpathians; European Russia east of Tver, up to Syktyvkar, Komi Republic (Sedykh, 1974), in the north, Saratov Region and Orenburg in the south; North Kazakhstan; West and South Siberia (up to 60°N: Kurgan, Omsk, Tomsk, Khanty-Mansiisk and Podkamennaya Tunguska River); considerable parts of Yakutia (up to the Upper Kolyma region in the north); Magadan Region (Upper Kolyma); Amur Basin (Zeya, Pashkovo, Khabarovsk); Primorye.

Beyond the former Soviet Union. Mountains of Western Europe (Alps, Balkans); Mongolia; China [Xinjiang, Nei Mongolia, Liaonin (Fang, 2000), Manchuria, Hebei]. O. Bang-Haas (1927) recorded this species in North Germany, yet in a later work (Koch, 1984) there is no confirmation of this report for the same region.

Biology. Flight from early July up to the end of August. According to some published observations, the moth, when in danger, can exude transparent oily droplets which smell like nettles. The moth ejects the fluid from the front part of the thorax in two jets to a distance of 20 cm.

In the Alps, flying at 1600 m a.s.l. Over our territories, flight is also observed in lowlands but in the mountains (Altai: environs Aktash, Ukok Table-land) reaching 2800 m a.s.l. Often occurring in steppe or forested steppe landscapes. Females lay pale yellow eggs on herbaceous plants, but sometimes on bushes as well. Egg development about two weeks. Caterpillars light gray, coated with fascicles of short gray hair, omnivorous, sometimes (e.g., West Siberia) harmful to agricultural plants. In Yakutia and Transbaikalia, hibernating twice. In spring, larvae start eating in the end of April, pupating in June. Pupa lasting 2-3 weeks.

Similar species. There seem to be no similar species in our countries.

40. *Arctia rueckbeili* (Püngeler, 1901)

(Pl. 10, Fig. 1)

Hyphoraia rueckbeili Püngeler, 1901: 190, pl. 3, fig. 11a, TL: "Aksu in Central Asia".
[Probably, the inferior flow of Sary Dzhas River (Kokshaal Tau Mts, in China)].

[rueckbeili – in honour of German entomologist Rückbeil]

Seitz, 1910: 100, *Arctia rueckbeili*

Draudt, 1931: 87, Pl. 7 row f, *Arctia rueckbeili*

Dubatolov, 1987b: 87, *Arctia rueckbeili*

Description. Alar expanse 55-60 mm. Fw pale brown with separate yellowish spots. Hw yellow with pale brown spots all over; a brown bracket on discal vein. Coloration of underside same. Head dark brown. Thorax clothed with hairs of same colour as wing. Collar pink with white. Abdomen on underside and from above dark, upper side with transverse dark bands on each segment, on lateral sides pinkish or yellowish.

Variability. Rather often the coloration of the fw is ashy brown, just as illustrated in Draudt (1931).

Distribution. Pattern Central Asian.

Within the former Soviet Union. Turkestanskiy, Alaïskiy and Zaalayskiy Mt. ranges, Kaingdy-Katta Gorge in Central Tian-Shan.

Beyond the former Soviet Union. According to Seitz (1910), the species also occurs in "desert south of Aksu (Central Asia)" (China).

Biology. Flight in July in the mountains at 2500-3500 m a.s.l. In the Alaïskiy and Turkestanskiy Mt. ranges, rather common in juniper woodlands (Fig. 41).

Similar species. In our fauna, similar species seem to be absent.

41. *Arctia olschwangi* Dubatolov, 1990

(Fig. 42)

Arctia olschwangi Dubatolov, 1990c: 89, TL: southern Yamal.

[olschwangi – in honour of Russian entomologist V. N. Olschwang]

Description. Alar expanse about 42 mm. Fw pale brown with pink-white belts. Superficially very similar to *A. caja*, but differing in details of pattern. Spots on hw dull black, subbasal spots narrow. Pattern of fw with strong pink tint. Eyes small, oval, hairless, twice as long as wide. Antennae of male two-combed, of female bipectinate.

Variability. Only several specimens are known.

Distribution. Pattern Polar Siberian.

Within the former Soviet Union. The Polar Urals, southern Yamal, lower flow of Lena River (extreme north).



Fig. 41. *Arctia rueckbeili* (Pngl.), ♂ resting on stone. Uzbekistan, Turkestanskiy Mt. Range, Kum-Bel Pass, 3500 m, 10.VII.1979 (photo by V. S. Murzin).



Fig. 42. *Arctia olschwangi* Dub. ♂. Russia, southern Yamal, Khadyga River, 16.VII.1982, leg. Olschwang (after Dubatolov, 1990c).

Beyond the former Soviet Union. Unknown.

Biology. Flight from mid-July to the beginning of August in the tundra.

Similar species. *A. caja*, differs by a larger size, by the eyes orbicular in shape, and by certain details of genitalic conformation.

23. Genus *Epicallia* Hübner, 1820

Epicallia Hübner, 1820: 182, TS: *Phalaena villica* Linnaeus, 1758.

Fw with one additional cell. Antennae of male bipectinate. Body stout. Middle calariae of hind tibiae shorter than diameter of tibiae.

Male genitalia. Sacculus with a finger. Peniculus short, no more than 4-5 times longer than broad, oblate toward apex.

42. *Epicallia villica* (Linnaeus, 1758)

(Pl. 10, Figs 2-5; Figs. 43, 44)

Phalaena villica Linnaeus, 1758: 501, TL: Europe.

[= *vidua* Poda, 1761; *konevkaii* Freyer, 1831; *domiduca* Meigen, 1832; *secular* Zeller, 1847; *nigrella* Fettig, 1889; *arabum* Oberthür, 1910; *britannica* Oberthür, 1911; *nicaeensis* Oberthür, 1911; *corsica* Oberthür, 1911; *syriaca* Oberthür, 1911; *wambachi* von der Goltz, 1932; *floresi* Agenjo, 1942]

[*villica* – villager (Lat.)]

[Cream-spot Tiger – (Germ.)]

[Schwarzer Bär – (Germ.)]

[Ecaille fermière – (Fr.)]

Romanov, 1884: 87, pl. 4, fig. 9, *Arctia villica confluens*

Dubatolov, 1996b: 52, *Epicallia villica*

Subspecies:

E. v. angelica (Boisduval, 1829): 31

E. v. fulminans (Staudinger, 1871): 59

E. v. confluens (Romanov, 1884)

E. v. marchandi (de Freina, 1983): 73.



43



44

Fig. 43. *Epicallia villica* (L.), ♂ on tree trunk. Russia, Moscow Region, October District, Derevlevo, 10.VII.1967 (photo by A. Grazhdankin).

Fig. 44. *Epicallia villica* (L.), ♂. Kazakhstan, Aktyubinsk Region, 26 km W of Novoalekseevka, 50°10'N, 55°18'E, 225 m, 6.VI.1998 (photo by O. G. Gorbunov).

Description. Alar expanse of male 50-55 mm, female larger. Fw black with eight pale rounded spots of various size (largest basal spot often drop-shaped; lesser spot at external edge). Hw ochre yellow with black spots and a transverse band near external edge. Thorax black with two light spots; abdomen reddish with a series of black maculae. Proboscis abortive.

Variability. Individual variability notably profound, displayed in reduction or fusion of light maculae on fw, in variation both in number and size of black maculae on hw.

The following subspecies are known:

ssp. *confluens* (Pl. 10, Fig. 2) – a taxon with merged largest light spots on fw. Romanov (1884) provided a colour illustration and described this moth as a subspecies based on material from Lenkoran, Astrabad and other parts of Iran;

Another form with an expanded light pattern occurs in Nakhichevan (Pl. 10, Fig. 4). Apparently, this moth can be considered as transitional to the typical form.

A number of subspecies are known from beyond the territories concerned, e.g.

ssp. *angelica* and ssp. *fulminans*, from Syria, with red hws similar to those of *Parasemia plantaginis caucasica* Ménétrière from the Caucasus, and ssp. *marchandi* (de Freina, 1983).

Distribution. Pattern West Palaearctic.

Within the former Soviet Union. South of Baltic countries (Lithuania and Latvia); Belarus; Ukraine, Crimea; Moldova; European Russia up to St.-Petersburg and Vyatka in the north; Caucasus; Transcaucasia (Nakhichevan, Armenia, Lenkoran); West Siberia (Kurgan, Shadrinsk).

Beyond the former Soviet Union. Central and Southern Europe, southern England; northwestern Africa; Asia Minor; Near East; Turkey, northwestern and northern Iran up to Shahkuh Mts in the east.

Biology. Inhabiting lowlands and hillands in the south of the Palaearctic and in northern Europe, except for the polar belt. Flight at night, flying to light, in the daytime hiding in grass or bushes. Sometimes moths can be seen on walls of houses and fences. Caterpillar black with gray-brown fascicles of hairs. Head and legs reddish brown.

Larvae feeding on various herbaceous plants: *Plantago*, *Lamium*, *Achillea*, *Taraxacum*, *Urtica*, *Centaurea*, *Fragaria* etc. Hibernating as caterpillars, pupating in spring. Moths flying in the late spring and in the beginning of summer, at the Black Sea coast of the Caucasus from the end of April, near Moscow from early June. Population densities of moths subject to considerable variation from one year to another. In Central Europe, the moths are distributed sporadically, in some regions, e.g. northern Germany, rare.

In the mountains (Transcaucasia: Nakhichevan, Armenia), moths occur at 1500-2000 m a.s.l.

Similar species. There seem to be no particularly similar species in our fauna.

24. Genus *Eucharia* Hübner, 1820

Hübner, 1820: 181, TS: *Phalaena hebe* Linnaeus, 1767.

= *Ammobiota* Wallengren, 1885, TS: *Phalaena hebe* Linnaeus, 1767.

Moth of medium size with a stout body and brightly coloured wings. Fw with white and black transverse striae. In external part of fw, pattern H- or R-like. Antennae of male and female pectinate; in female, crests short.

Key to species of *Eucharia*:

- | | |
|--|---------------------------|
| 1. Thorax black, collar wide and brightly red, yellow or white. | 2 |
| –. Collar very thin or absent. | <i>E. festiva</i> |
| 2. Collar without black points. | <i>E. interrogationis</i> |
| –. Collar with two black points. | <i>E. culoti</i> |

43. *Eucharia festiva* (Hüfnagel, 1766)

(Pl. 10, Figs 7-8; Pl. 11, Figs 1-9; Figs. 45-46; genitalia in Fig. 47 and Pl. 26, Fig. 3)

Bombyx festiva Hüfnagel, 1766: 416, TL: Germany, Berlin.

[= *hebe* Linnaeus, 1767; *monacha* Geoffroy, 1785]

[festiva – festal (Lat.)]

[Garbenspinner Hebe – (Germ.)]

[Ecaille Héb  – (Fr.)]

Staudinger, 1895: 395, *Arctia hebe sartha*

Spuler, 1910: 137, pl. 73, fig. 10, *Arctia hebe*

Seitz, 1910: 100, pl. 18, row d, *Arctia hebe*

Wagner, 1913: 4, *Arctia hebe iliensis*

Bang-Haas, O., 1927: 75, pl. 9 figs 14-15, *Arctia (Eucharia) festiva nivea*

Bang-Haas, O., 1927: 76, pl. 9 fig. 20, *Arctia (Eucharia) festiva philippsi*

Bang-Haas, O., 1927: 76, pl. 9 figs 21-22, *Arctia (Eucharia) festiva interposita*

Dubatolov, 1996b: 52, *Eucharia festiva*

de Freina, 1997: 58, figs 22-25, *Arctia festiva arafati*

Fang, 2000: 332, pl. 6, fig. 1, *Eucharia festiva*

Subspecies:

E. f. sartha (Staudinger, 1895)

E. f. iliensis (Wagner, 1913)

E. f. interposita (O. Bang-Haas, 1927)

E. f. philippsi (O. Bang-Haas, 1927).

Description. Male alar expanse 50 mm, female 46 mm. Background coloration of fw black, pattern consisting of white transverse bands. Two bands closest to base of wing, reaching the hind edge, the third narrower and short. External edge of wing black. White pattern on external part of fw H-shaped. Hw purple red with two black submarginal



Fig. 45. *Eucharia festiva* (Hfng.), ♂. Kazakhstan, Aktyubinsk Region, 10 km SSW of Novomikhailovka, 50°26'N, 56°04'E, 320 m, 27.V.1998 (photo by O. G. Gorbunov).

Fig. 46. *Eucharia festiva* (Hfng.), ♀. Ukraine, Crimea, Belogorsk, 2.V.1996 (photo by O. G. Gorbunov).

prolate spots and a narrower black stria closer to base of wing. A black spot often present in place of transverse vein. Head and thorax black. Collar red, narrow. Abdomen red on lateral and on upper sides, but with black striae on upper side, tip of abdomen black. Antennae twice pectinate.

Female a little smaller with brighter red hws. Pattern on wing like in male. Last segments of abdomen black. Antennae weakly pectinate.

Variability. One of the most intriguing and enigmatic tiger moths in our fauna. Individual variability is pronounced, apparent in a shortened or reduced white pattern, in brachypterous females, in size variation, in the existence of relatives of unknown rank.

A number of subspecies are known, the following from our territory.

Ssp. (?), from the Rostov-on-Don Region (Efremo-Stepanovka, 200 km north of Rostov-on-Don), distinguishable by the very thin black bands on the male fw and, like in the female, by the bright red colour of the hw. Female with black fw with two transverse white bands. The third white band is absent, and the central field on the fw is black (11 ♂ and 4 ♀). These moths are probably close to European forms.

Ssp. *philippsi* O. Bang-Haas. This subspecies was described from “Gouv. Syr Darja: reg. Perowsk, Baiga-Kum”.

A highly interesting subspecies. Alar expanse 40 mm. Background coloration of male fw pale pink. Five wide black belts almost fused, first four divided only by weak white lines. Both submarginal black spots divided by a thin white line, this occurring but extremely seldom in *festiva*. Hw pink with short transverse belts at costal edge, with a small basal spot and an interrupted submarginal belt. Collar thin, red. Thorax and abdomen black.

Ssp. *sartha* Staudinger: Syr-Darya, Auli-Ata (Baigakum), Kzyl-Orda. The holotype (male) from the Tarbagatay Mts was illustrated by O. Bang-Haas (1927). Alar expanse of male 47 mm.

Fw with three black belts, these being much wider than in the other subspecies. Though distance between these belts small, none of them in touch with one another.

Female smaller (alar expanse 43-45 mm), with short-cut wings and a bordered pale collar. The female figured in Seitz (1910) shows a dominating white colour of the fw and rather narrow black striae. Hw red with a basal black band reaching the hind edge of wing. Black spots on hw with a narrow light bordering. This subspecies forms an interesting transition to *E. interrogationis* Ménétrières, 1863.

Ssp. *interposita* O. Bang-Haas: “Alai mont.”.

This subspecies differs first of all by the small size (alar expanse 35 mm). Male: fw with a very wide black field (central white band absent), hw pale pink with a narrow boundary belt. Collar, thorax and abdomen completely black.

Female not capable of flight, brachypterous, wings considerably shorter as compared to body size. Fw completely black, hw with a black external belt and a transverse band. Collar red and thin, thorax and a part of abdomen black, fore half of abdomen red. Though no material from the Alai Mts has been available to us, a female corresponding to the description has been found on Mt. Chimgan in the western part of Chatkalskiy Mt. Range (Pl. 11, Fig. 2). Alai, Margelan, Chatkal.

Ssp. (?). A larger form is known from Zuvand, Talysh Mts, southern Azerbaijan: alar expanse of female up to 48 mm. A considerable proportion of females show black fws and black belts instead of spots on hws. Black females sometimes display white spots on the fws. Coloration of male fws black with usual narrow white strips (Pl. 11, Figs 4, 9).

Ssp. (?). A similarly larger form is observed in the environs of Chimkent, Kazakhstan (Kara-Tau Mts): alar expanse 45 mm. Fw black, in many cases with white maculae near external border closer to base (Pl. 11, Fig. 3). This form is

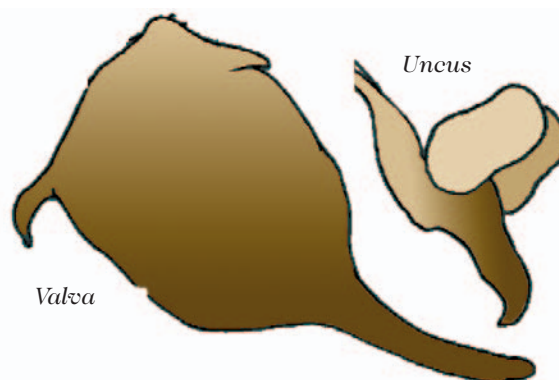


Fig. 47. Male genitalia of *Eucharhia festiva* (Hfng.), valve and uncus.

similar to some specimens from Zuvand. Superficially it also resembles the ssp. *interposita*, but the size is noticeably larger. Hw brightly red with large black maculae, but not belts as in the ssp. *interposita*. It is possible that this variety actually belongs to the next subspecies.

Further to the east, the following form is known to occur:

Ssp. *iliensis* Wagner. This subspecies was described from “Ili-Gebiet, Alexandergebirge”, i.e. Semirechye (Ili River) and Kirghizskiy Mt. Range. Alar expanse 40-46 mm. This form has narrow white bands on the fw and a not always missing third band. Hw strongly spotty. When defining the given subspecies, O. Bang-Haas (1927) mentioned the existence of black females in the Kirghizskiy Mt. Range (Pl. 11, Figs 6-7).

From Asia Minor, the ssp. *nivea* O. Bang-Haas, 1927 and the ssp. *arafati* de Freina, 1997 (Anti-Liban Mt. Range) are known. The former variety differs from the European specimens by snow-white tint of the fw and by an extensive light pattern.

Thus, females with black hws occur from Lenkoran, Caucasus to Chimkent, W. Chatkal (Chimgan) and Alai, Central Asia. Over the remaining parts of the distribution area, females tend to show the usual fw pattern.

Distribution. Pattern Mediterranean and Euro-Siberian.

Within the former Soviet Union. Belarus; Ukraine; Moldova; European Russia (south of Oka River, Kazan, Middle Urals), West Siberia (Kurgan, Omsk, Novosibirsk, western Altai, Tuva); South Transbaikalia (data from the early 1900's); Caucasus; Transcaucasia (Azerbaijan, Armenia, Georgia); Kazakhstan (Ili River steppes, Zailiiskiy Alatau Mts, foothills of the Kirghizskiy and Talasskiy Mt. ranges); Uzbekistan (Tashkent, Ugam, Chatkal, Chimgan, Syr-Darya, Fergana, Shakhimardan).

Beyond the former Soviet Union. Central and Southern Europe (except for the southern part of Spain and western France), Sicily; Iraq, Asia Minor, Anti-Liban Mt. Range; Mongolia; China (Xinjiang). There are some data suggesting that in Europe the distribution area of this species is shrinking.

Biology. Moths appear in the middle to end of spring, usually in May. Males flying to light. As females are too heavily loaded with eggs, they do not fly and can often be seen creeping on the ground in the daytime.

Eggs hemispherical, in the beginning pale yellow but silvery gray later. Usually about 200-300 eggs per batch. Caterpillars from the Caucasus rather light smoky gray, coated with bunches of hairs of the same colour on dorsal side but reddish on lateral sides. According to Lampert (1913), in Germany the caterpillar is black with long gray-black hairs on the dorsal side but rusty red hairs on both lateral sides, the warts are dark gray, the head is black. Last instar caterpillar up to 60 mm long. Larvae feeding on *Achillea*, *Thymus*, *Euphorbia*, *Plantago*, *Taraxacum*, *Cynoglossum*, *Artemisia*, *Rumex*, *Cirsium*, *Alissum*, *Chenopodium*. Caterpillar hibernating. Pupation in April in a loose gray cocoon with admixture of hairs. Pupa black-brown.

Inhabitant of various places like wood, steppe or forested steppe, but more common in rather dry places, including dry mountain slopes, in Armenia up to 2000 m a.s.l. According to some observations, in Western Europe this species becomes increasingly rare. In the Caucasus and Kazakhstan, this species is one of the most usual spring moths. Thus, *E. festiva* probably belongs to a group of basically Asian species which, in the western part of the geographical range, i.e. at the distribution periphery, appear increasingly sporadic.

Similar species. *E. interrogationis*, differs by the wide white belts on the fw and the wide bright red collar.

44. *Eucharia interrogationis* (Ménétriès, 1863)

(Pl. 10, Fig. 6)

Chelonia hebe interrogationis Ménétriès, 1863: 147, pl. 15, fig. 1, TL: Kolyvan in Altai Region.

[= *collaris* Grum-Grshimailo, 1899]

[*interrogationis* – *interrogative* (Lat.)]

Grum-Grshimailo, 1899: 462, *Arctia hebe collaris*

Seitz, 1910: 100, pl. 18, row d, *Arctia hebe interrogationis*

Bang-Haas, O., 1927: 76, *Arctia festiva interrogationis*

Bang-Haas, O., 1927: 76, pl. 9, fig. 28, *Arctia festiva interrogationis* ab. *collaris* [sic!]

Dubatolov, 1996b: 52, *Eucharia festiva collaris*

de Freina, 1997: 58, *Arctia interrogationis*

Description. Male: alar expanse about 50 mm. Basic colour of fw white. Several black transverse bands intersecting fw. Base of fw black with further three narrow, black, transverse bands. Fourth band broken into two in the middle. Apex and part of external edge of fw black. Fringe in places adjoining to a black stria also black, remaining parts white. Hw pink, with black spots elongated transversely, edged yellow. Hw with a thin, black, transverse line in fore half of wing. Head, antennae and thorax black, collar widely red. Abdomen red, except for black last segments.

Female with narrow and short fws. Background colour of fw white. Pattern consisting of four thin, transverse, black stripes. Base of fw white. Hw red, brighter than in male. Middle part of hw with a black stripe. Hw with two submarginal elongated spots and one spot in the middle of costal edge. Collar very wide, yellow or white, thorax black with two large white spots on prothorax. Abdomen red with black transverse rings, end of abdomen (the last two segments) black. Antennae dentate. Female not flying.

Variability. Black transverse bands of fw sometimes very narrow, striolate-like.

Ssp. *collaris* (Grum-Grshimailo) – “In montibus In-shan in itinera Peking et Dolon-noor”. The specimen from Transbaikalia/Dahuria illustrated by O. Bang-Haas (1927) (pl. 9, fig. 28) shows bright red hws like in the female, and a red (except for the last segments) abdomen. According to O. Bang-Haas, this species occurs also in SE. Siberia and probably at Shanghai, China. However, the moths taken from Mongolia and at Menza River, Transbaikalia, Russia appear to look very different from O. Bang-Haas’ material.

Distribution. Pattern Mongolian-Chinese.

Within the former Soviet Union. Southeastern Siberia (River Menza), Altai (?)

Beyond the former Soviet Union. Mongolia (Central Aimak, East Aimak, Urtyn) and adjacent parts of China.

Biology. Flight from the end of May to mid-June. Female brachypterous, with short wings, not capable of flight.

Similar species. *E. festiva*, differs by a developed black pattern. The red collar is either very weakly expressed or absent, the fringe is completely black. *E. culoti*, has both head and collar light yellow, the latter with two black points.

Note. The fw pattern of this species tends to intensify its white colour while the females of *E. festiva* tend to lose their white coloration.

There are disagreements concerning the systematic position of *Eucharia interrogationis*. Below we quote Dubatolov (1996a: 52), who considers *E. interrogationis* as a subspecies of *E. festiva*:

“The type locality of *Chelonia interrogationis* Men. is Kolyvan in Altaiskii Krai (the West Altai). I have seen the type specimen in the collection of Zoological Institute (St.- Petersburg) as well as other specimens from this region. All of them are similar to *E. festiva festiva* (Hfn.) but differ from Transbaikalian, Tuvian, Mongolian and North Chinese specimens that I consider as *E. festiva collaris* (Grum-Grshimailo).“

However, the type locality of *E. festiva collaris* is the In-Shan Mountains lying between Beijing and Dolon-noor (~150-200 km north of Beijing), i.e. very far way from Kolyvan. In appearance, the moths referred to here also differ considerably from *E. festiva*. The most noticeable distinction is, the wide white collar and two white spots on the prothorax in the female. Instead, *E. festiva* either shows a very thin red collar or it is absent. The upper side of the male abdomen of the moth treated here as *E. interrogationis* is red, except for the last segments, while the female shows a red abdomen with black rings.

This taxon is considered as a separate species by de Freina (1997).

If one accepts *E. interrogationis* as a species *bonae fide*, the ssp. *collaris* Grum-Grshimailo, 1899 is rather to be regarded as a subspecies of *E. interrogationis*, not of *E. festiva*. O. Bang-Haas (1927) considered *E. collaris* as an aberration, but this is certainly incorrect. It is even possible that *E. collaris* represents a species of its own while *E. interrogationis* is a synonym of *E. festiva*. In general, the situation concerning the status of *E. interrogationis* remains rather confused.

45. *Eucharia culoti* (Oberthür, 1912)

Chelonia culoti Oberthür, 1912: 322, pl. 116, fig. 1028, TL: Ost Sibirien (?).

[*culoti* – in honour of Swiss entomologist Culot]

Strand, 1919: 340, *Arctia culoti*

Draudt, 1931: 88, *Arctia culoti*

Bang-Haas, O., 1927: 77, *Arctia festiva* ab. *culoti*

Dubatolov, 1996b: 53, *Eucharia festiva collaris*

Description. According to Draudt (1931), alar expanse 46 mm. Head and collar light ochre yellow, collar with two black points. Thorax black, in front with yellow short lines. Base of abdomen red, further light brown with black spots on lateral sides.

Distribution. Pattern East Siberian.

Within the former Soviet Union. East Siberia (?).

Beyond the former Soviet Union. Unknown.

Biology. Flight in the taiga in July.

Note. This species remains unknown to us. Perhaps it is just a form/subspecies of the previous species. According to O. Bang-Haas (1927), proposal of this taxon was unjustified. In contrast, Draudt (1931) considered *E. culoti* as a “bona species” (“sehr gedrungene gebaute Art”). Dubatolov (1996b) regards this form as a synonym of *E. festiva*.

A solution to the problem will only be possible after new material is taken and compared with type specimen(s).

According to Draudt (1931), *A. culoti* represents a small species with a wing coloration similar to *E. interrogationis*.

Similar species. *E. festiva* has no yellow collar; *E. interrogationis* has a collar without black spots.

25. Genus *Pericallia* Hübner, 1820

(Genitalia in Pl. 26, Fig. 4)

Pericallia Hübner, 1820: 182, TS: *Phalaena matronula* Linnaeus, 1758.

= *Pleretes* Lederer, 1853a: 77, TS: *Phalaena matronula* Linnaeus, 1758;

= *Pleredes* Hofmann, 1887: 41 (misspelling)

Palps clothed with highly decumbent hairs, proboscis developed, antennae in both sexes setose. Male genitalia: uncus with a protuberance.

The genus contains about 50 species living in the Palaearctic and Ethiopian regions. Superficially, they are largely dissimilar to the single species occurring in our countries.

Strand, 1919: 258; *Pericallia*

Fang, 1985: 70; *Pericallia*

Kôda, 1987: 209; *Pericallia*

46. *Pericallia matronula* (Linnaeus, 1758)

(Pl. 12, Figs 1-2)

Phalaena matronula Linnaeus, 1758: 509, TL: Germany.

[= *idriensis* Scopoli, 1772; *matrona* Hübner, 1803]

[*matronula* – small matron (Lat.)]

[Waldgrund-Buschbär, Augsburger Bär – (Germ.)]

[Ecaille Brune – (Fr.)]

Schultz, 1905: 125, *Pericallia matronula centralasiae*

Spuler, 1910: 140, *Pleretes matronula agassizi*

Seitz, 1910: 96, pl. 17, rows f, g, *Pericallia matronula*

Sheljuzhko, 1926: 56, *Pericallia matronula amurensis*

Draudt, 1931: 84, pl. 7, row e, *Pericallia matronula sachalinensis*

Dubatolov, 1996b: 53, *Pericallia matronula*

Subspecies:

P. m. centralasiae Schultz, 1905

P. m. amurensis Sheljuzhko, 1926

P. m. sachalinensis Draudt, 1931.

Description. Alar expanse 72-80 mm, female a little larger. Fw dark brown, with three large yellow maculae at costal edge, with one at base and one at external edge, sometimes with 2-3 additional spotlets. Hw yellow with a black region of discal vein. Two rows of irregularly shaped black spots closer to base of wing and to its external edge.

Variability. Distinguished by strong individual variability. In this connection, a number of forms have been described, e.g.,

f. *serena* Schultz, 1905 – with a series of submarginal spots on hw;

f. *luteotincta* Schultz, 1905 – with orange, not yellow, spots on fw;

f. *agassizi* Spuler, 1906 – with a transverse light band traversing fw;

f. *marmorata* Schultz, 1905 – with enlarged yellow maculae;

f. *obliterata* Sheljuzhko, 1926 – with yellow fws, irregularly and vaguely pollinated brown; hw orange yellow almost without spots.

There are also some geographical forms:

ssp. *amurensis* Sheljuzhko, 1926 – “Nikolaevsk-on-Amur”;

ssp. *sachalinensis* Draudt, 1931 – Sakhalin, very common;

ssp. *centralasiae* Schultz, 1905 – Central Asia.

However, in our opinion these forms show but weak external differences from the nominotypical subspecies.

Distribution. Pattern Euro-Siberian.

Within the former Soviet Union. Baltic countries; Belarus; Carpathian Mts, northern and central Ukraine, Moldova; central Russia (up to Leningrad Region in the north, scattered populations in the west of Moscow Region), Upper Volga and lower Kama River regions (Samara, Saratov); patchily in North Kazakhstan; Siberia, i.e. southwestern Siberia (south of 55°N: Tobolsk; Tomsk), the upper and middle flows of Angara River, Irkutsk, Altai, southern Transbaikalia, Cisamuria (Zeya, Svobodnyi); and Primorye, South Sakhalin, Kunashir Island.

Beyond the former Soviet Union. Europe: eastern France, southern England, southern and central Germany, Alps, Eastern Europe: Poland, Hungary and Romania; northern Mongolia; Korea, Japan (Hokkaido), China: Dunbei, Hebei, Northern Nei Mongolia, Heilongjiang, Jilin, Liaoning, Shanxi, Ningxia (Fang, 2000).

Biology. Flight in June-July, occurring patchily. Flight usually after sunset, males flying to light, but sometimes males appearing also in the daytime. Eggs pale yellow. Young caterpillar light brown with brownish hairs, last instar caterpillar dark brown with reddish brown hairs. Larvae feeding on numerous plants, including leafed bushes and trees: *Lonicera*, *Hieracium*, *Vaccinium*, *Fraxinus*, *Prunus*, *Corylus*, *Quercus* etc. In boreal latitudes, e.g. England and Germany, hibernation twice. Pupating in a whitish gray cocoon on the ground.

In Western Europe, moths occur in hills and mountains, over the plains of Belarus and central Russia in woodlands, in Siberia mostly inhabiting steppe and forested steppe landscapes, only partly penetrating the taiga, in the Far East in various places ranging from river valleys to mountains.

In Western Europe, the species is infrequent, sporadic. In Siberia and the Far East, it is very common.

Similar species. There seem to be no similar species in our fauna.

Subfamily Micrarctiinae

Genus *Micrarctia* Seitz, 1910

Micrarctia Seitz, 1910: 83, TS: *Nyctemera trigona* Leech, 1899.

Dubatolov, 1987a: 30, *Micrarctia*

A recent revision of this genus carried out by Dubatolov (1987a) has changed the earlier approaches to its classification. The genus has been split into five genera, mainly on the basis of male genitalic conformation. *Micrarctia* is only to be reserved for *M. trigona* (Leech), known from the environs of Kanding (Ta-Tchin-Lu, 30° N, 102° E), China. The males of *M. trigona* (Pl. 15, Fig. 12; Pl. 24, Figs 4-5) can often be encountered in early August in the afternoon in pine woodlands, on forest glades and in the alpine belt at 3000-4500 m a.s.l. Females are short-winged, not capable of

flight (S. V. Murzin, personal communication). In addition to the typical form, the f. *nigra* (Leech, 1899) with a reduced light pattern of the fw and a completely dark hw is known to exist (Pl. 24, Fig. 6).

When splitting the erstwhile *Micrarctia*, Dubatolov (1987a) has erected a new genus, *Ocnogynodes*, to accommodate another Chinese species, *Arctia y-albula* Oberthür, 1866 (Pl. 24, Fig. 3). This type-species was described virtually from the same place as *M. trigona* (25 km to east of Kanding). Based on the structure of the genitalia, this genus is close to *Ocnogyna* but differs by winged females. “Palpi moderately long (hardly longer than head pubescence) with dense hairs, eyes large, oval, strongly convex, beset with short ciliae. Antennae of male two-combed, of female serrate. Female with well-developed wings. Fore tibiae short, twice shorter than femur, with a long epiphysis, middle tibiae with one pair, hind tibiae with two pairs, of thin calariae” (Dubatolov, 1987a). As *Arctia y-albula* Oberthür is also the type-species of *Lithosarctia* Daniel, 1954, *Ocnogynodes* is an objective junior synonym of *Lithosarctia*.

Yet another new genus in Dubatolov’s opinion belonging to the tribe Arctiini has been erected: *Sinoarctia* Dubatolov, 1987a, with the type-species *S. kasnakovi* Dubatolov, 1987a, from eastern Tibet. In further detail, this genus has been considered above (p. 51).

Still before Dubatolov’s revision, *Micrarctia* was partly treated by Ferguson (1984), who isolated a new genus, *Paelearctia* Ferguson, 1984, considered below. According to Dubatolov (1987a), *Paelearctia* is to be merged with, and sunk under, *Tancrea* Püngeler, 1898. However, later Dubatolov (1990) considered both these genera as separate.

Finally, Dubatolov (1990) has established the new genus *Sibirarctia* for two species of *Paelearctia*, *P. kindermanni* (Staudinger, 1867) (the type-species) and *P. buraetica* (O. Bang-Haas, 1927). *Tancrea*, *Paelearctia* and *Sibirarctia* species occur in the former Soviet Union.

26. Genus *Divarctia* Dubatolov, 1990

Divarctia Dubatolov, 1990a: 84, TS: *Ocnogyna diva* Staudinger, 1887.

Antennae of male two-combed with long crests. Eye without hairs, large, strongly convex. Fore tibiae with a large epiphysis, with two spines at apex (in difference to species of *Paelearctia* and *Arctia*). Middle and hind tibiae with spines



Fig. 48. Kirghizia, W. Tian-Shan, Chatkal Mts, a place very rich in tiger moth species from the genera *Carcinopyga*, *Paelearctia*, *Chelis*, *Arctia*, *Tyria* and *Rhyparia* (photo V. S. Murzin).

at apex, middle tibia with one pair, hind with two pairs, of calariae (only one in *Ocnogyna*). Different from *Cymbalophora* by certain details of genitalic structure. Female with short wings.

Divarctia seems to be the closest to *Palaearctia* (cf. Dubatolov, 1990a).

47. *Divarctia diva* (Staudinger, 1887)

(Pl. 12, Figs 3-4)

Ocnogyna diva Staudinger, 1887a: 84, TL: W. Tian-Shan.

[= *haberhaueri* Alpheraky, 1888]

[diva – divine (Lat.)]

Stshetkin, 1972: 106, *Ocnogyna diva*

Description. Alar expanse of male 43-45 mm. Fw white with dark brown spots arranged in a few series. Basal series consisting of two spots: one like a wide short line at costal edge, the other in the form of an oblique short line at inner edge of fw. The following, subbasal series consisting of two similarly situated spots, but costal spot angulate while inner spot rounded. 3rd and 4th series including three spots each, those in fourth series largest. Finally, external edge infusate from apex of fw down to cubital vein. Hw white with two dark spots at external edge. Underside of fw white with pale spots, no spots along hind edge of fw. Antennae of male two-combed with long crests. Female with a short wrinkled fw. Antennae serrate.

Variability. Development of black pattern slightly varied.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Mountains of Central Asia: mountains around Fergana Valley, West Tian-Shan (Chatkalskiy, Pskemskiy, Ugamskiy and Karzhantau Mts); Turkestanskiy, Zerafshanskiy and Hissar Mts; Peter-1 Mt. Range, Khozratishokh Mts.

Beyond the former Soviet Union. Unknown.

Biology. Moths appear in autumn, in September, in the foothills on slopes overgrown by bushes at 1300-1800 m a.s.l. Males often flying to light, females incapable of flight. Larvae feeding on various herbaceous plants: *Plantago*, *Achillea*, *Taraxacum*, *Rumex*, *Sakvia*, *Astragalus*, *Galium*, *Ulex*, *Artemisia*, *Lactuca*, Umbelliferae. Caterpillars hibernating at instar 3.

Similar species. *Cymbalophora rivularis* (Ménétrières, 1832) smaller, with angular black spots, antennae of male simple.

27. Genus *Tancrea* Püngeler, 1898

Tancrea Püngeler, 1898: 57, TS: *Tancrea pardalina* Püngeler, 1898.

Tympanic organ absent. A single species in the genus.

48. *Tancrea pardalina* Püngeler, 1898

(Fig. 49)

Tancrea pardalina Püngeler, 1898: 57, TL: Ili River.

[pardalina – small panther (Lat.)]

Dubatolov, 1991a: 67, *Tancrea pardalina*

Description. Small moths with variegated coloration. Alar expanse about 30 mm. Male ochre yellow with brown spots of irregular shape scattered over fw. Hw pattern consisting of roundish submarginal spots, a crescent spot on transverse vein, and two rays running from base of fw to external edge. Female ochre yellow with short wings.



Fig. 49. *Tancrea pardalina* Püngeler (after Seitz, 1910).

Variability. Probably insignificant.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Dzhungarskiy Alatau region (Ili River), Kugart Pass (Fergana Mt. Range), Karakum Desert.

Beyond the former Soviet Union. China (Xining).

No detailed distribution is known. Apparently, this species also occurs in other parts of the Dzhungarskiy Alatau region and eastern Tian-Shan (Dubatolov, 1991a).

Biology. Flight in July. Spread in eremic areas and in “tugai” (= riverside) thickets. Flight resembling that of *Orgyia dubia* Tauscher, 1806 (Lymantriidae).

Similar species. *Orgyia dubia*, with yellow hws with a continuous dark edge.

28. Genus *Holoarctia* Ferguson, 1984

Holoarctia Ferguson, 1984: 452, TS: *Grammia cervini* (Fallou, 1864).

=*Orodemnias* Wallengren, 1885, TS: *Bombyx quenseli* Paykull

The genus is established based on structure of the genitalia and some other features, being close to *Palearctia*. It differs by the colour pattern in the fws having five white transverse bands instead of four in *Palearctia*. O. Bang-Haas (1927) assigned this group of species to the genus *Orodemnias* Wallengren, 1885.

Key to species of *Holoarctia*:

- | | |
|---|----------------------|
| 1. Hws uniform dark. | <i>H. cervini</i> |
| –. Hws yellow or white. | 2 |
| 2. Hws yellow with several dark submarginal spots. | <i>H. marinae</i> |
| –. Hws white with several dark submarginal spots. | <i>H. puengeleri</i> |

49. *Holoarctia cervini* (Fallou, 1864)

(Pl. 12, Figs 7-8)

Nemeophila cervini Fallou, 1864: 23, pl. 1, fig. 2, TL: Matterhorn, Switzerland.

[= *hnatecki* Frey, 1872; *rougemonti* O. Bang-Haas, 1927; *scriniensis* Berthet, 1948; *stettei* Rober, 1930; *teriolensis* Burmann, 1975; *splendida* Gerber, 1979]

[*cervini* – reindeer (Matterhorn, Mons cervinus, Cervine mountain) – the mountain in Switzerland, whence this moth has been described (Lat.)]

[Matterhornbär – (Germ.)]

[Ecaille Zebrée – (Fr.)]

McDunnough, 1921: 167, *Holoarctia cervini sordida*

Torstenius, 1971: 173, figs 1-2, *Orodemnias cervini fridolini*

Dubatolov, 1990c: 152, *Holoarctia cervini perunovi*

Dubatolov, 1996b: 54, *Holoarctia cervini*, *Holoarctia cervini puengeleri*

Subspecies:

H. c. sordida McDunnough, 1921

H. c. fridolini (Torstenius, 1971)

H. c. perunovi Dubatolov, 1990c.

Description. Alar expanse about 30 mm. Fw light, yellowish with diffused dark gray spots, sometimes a dark background dominating. Veins coated with yellow blossom dust. Hw dark gray with yellow pollination at edge of wing and with a yellow fringe. Abdomen black with yellow transverse lines. Patagia and tegula with a yellow border.

Variability. The f. *hnatecki* Frey, 1872, from Tyrol, differs from the nominate form by the uniform colour of the wings, the strongly reduced black pattern of the fws and the completely yellow hws.

The following subspecies are known:

ssp. *perunovi* Dubatolov, from the Altai and Mongolia, differing by the rounded fw without light pollination on the veins; hw uniform black;

ssp. *fridolini* (Torstenius), inhabiting the polar regions ranging from Scandinavia to Chukotka and Alaska; sometimes the ssp. *fridolini* is considered as a “good” species;

ssp. *sordida* McDunnough – Alberta, Canada.

Distribution. Pattern boreo-alpine.

Within the former Soviet Union. Kola Peninsula, Urals, southern Siberia (Altai and Sayan Mts, Khamar-Daban Mt. Range), Verkhoyanskiy Mt. Range, Kamchatka, Chukotka.

Beyond the former Soviet Union. Europe (Alps, polar parts of Scandinavia), Asia [North Korea (Kôda, 1988: as “*Hyperborea czechanowskii*”); Mongolia]; North America (Alaska; Canada: Alberta (ssp. *sordida* McDunnough).

H. cervini is a circumpolar species. Its presence in the Alps as well in the mountains in southern Siberia obviously reflects its relict character at the southern periphery of the distribution area.

Biology. The species inhabits elevated, alpine parts. Flight in the daytime in July-August. Caterpillar black with fascicles of black hairs and an interrupted light stria on each lateral side. Head black. In the Alps, caterpillars feeding on various herbaceous plants like *Primula farinosa*, *Saxifraga*, *Silene* etc. In the daytime, often resting on stones or bare ground.

The biology of our subspecies is unknown.

Similar species *H. marinae* Dubatolov, has a fuzzy light pattern.

50. *Holoarctia marinae* Dubatolov, 1985

(Pl. 12, Figs 5-6; Fig. 50; genitalia in Pl. 26, Fig. 5)

Holoarctia marinae Dubatolov, 1985d: 57, TL: Altai (Aktash).

[*marinae* – after a feminine name, Marina]

Dubatolov, 1985b:152, figs 2v, 3b, *Holoarctia marinae*

Dubatolov, 1985d: 57, *Holoarctia marinae*

Description. Alar expanse of male 30 mm, of female 36 mm. Fw ashy gray with a yellowish diffused pattern like transverse dentate stripes (two submarginal stripes most appreciable). Hw dull gray with diffuse dark spots (spots larger in female). Body black, legs of male with yellow maculae.

Variability. Reflected by certain reduction of yellow pattern (a series of 10 specimens).

Distribution. Pattern South Siberian.



Fig. 50. *Holoarctia marinae* Dub., ♀. Russia, Altai Mts, 10 km E of Aktash, 50°19'N, 87°45'E, 2800 m a.s.l., 18.VII.2000 (photo by O. G. Gorbunov).

Within the former Soviet Union. Altais (Terektinskiy and Kuraiskiy Mt. ranges).

Beyond the former Soviet Union. Unknown.

Biology. Flight at 2600-2800 m a.s.l. on steep taluses covered with scarce vegetation. Red-haired caterpillars in the afternoon hiding under stones, pupating there. Pupa in a thin cocoon, prolate, coated with bluish pollination. Pupation in June, moths appearing in the middle of July. Caterpillar hibernating.

Similar species. *H. cervini* (Fallou), has a more strongly developed and clear light pattern.

51. *Holoarctia puengeleri* (O. Bang-Haas, 1927)

(Pl. 12, Figs 10-11)

Orodemnias puengeleri O. Bang-Haas, 1927: 60, pl. 8, fig. 14, TL: Sayan (Sayan mount.: Obo Sarym and Munko Sardyk).

[puengeleri – in honour of entomologist Rudolf Püngeler (Lat.)].

Description (based on female). Alar expanse 41 mm. Fw gray-black with thin whitish pollination on veins and with five transverse stripes. Two most clear external stripes sometimes bridged in the middle of fw, forming an X-shaped pattern. Two following stripes, both also beginning at costal edge, promptly coming to end, with only a basal, thin, white strip reaching the hind edge. This strip forming a sharp angle in the middle of fw. Hw dirty white with small, fuzzy, dark maculae. Body dark, abdomen with yellow rings.

Distribution. Pattern circumpolar.

Within the former Soviet Union. Arctic part of Europe and Asia, Urals, Altais, Sayan, Chukotka.

Beyond the former Soviet Union. Polar Europe and Alaska.

Biology. In the mountains, flight in the afternoon from July to early August at 2000-2500 m a.s.l. on taluses. Caterpillar hibernating, pupating under stones.

Similar species. *H. cervini* (Fallou), has a clearer network of light strips. Hw dark.

Note. Dubatolov (1996b: 54) considers this species as a subspecies of *H. cervini*. However, Draudt (1931: 77) regarded *Orodemnias puengeleri* as a separate species (“A highly interesting discovery from the Sayan Mountains”). Draudt was probably right. The external differences of this form from the typical *H. cervini* are very considerable.

29. Genus *Palearctia* Ferguson, 1984

Palearctia Ferguson, 1984: 454, TS: *Arctia glaphyra mannii* Alpheraky, 1882.

Dubatolov, 1996ba: 9, *Palearctia*

Small moths inhabiting high mountains, as a rule. Wing pattern of Type I. Fw dark with a white pattern, hw varied in coloration: red, yellow, black. Antennae bipectinate. Eye small, proboscis short or missing. Tympanic organ absent (in difference from *Tancrea*).

The status of many forms in this genus is unclear. For example, many consubgenera appear to occur in Central Asia, including Tian-Shan and Pamiro-Alai. Thus, both *Micrarctia glaphyra schottlanderi* (Strand, 1912) and *M. glaphyra selmonsi* (Böttcher, 1905) seem to have been described from the same place ("Narynsk" or "Naryn") in the Central Tian-Shan (cf. O. Bang-Haas, 1927).

Dubatolov has introduced the following subgenera:

The subgenus *Centrarctia* Dubatolov, 1990d, monobasic, with the type-species *Arctia mongolica* Alpheraky, 1888, and the nominotypical subgenus with all remaining species.

Key to species of *Palearctia*:

1. Hw gray or white. 2
- . Hw of different colour. 5
2. Hw gray with indistinct white gleam. Pattern of upper side of fw consisting of longitudinally elongated spots with light veins. Altai. *P. mira*
- . Hw white with dark spots. 3
3. Upper side of fw with three separate spots on common basal band running along hind edge. *P. golbecki*
- . Two separate spots (median missing or barely marked) along hind edge of fw. 4
4. Discoidal cell on underside of fw with two rounded spots, one in the centre of cell, the other on discal vein. *P. rupicola*
- . Discoidal cell on underside of fw with a dark strip running from base of wing to the middle of cell. *P. sarycola*
5. Hw red or orange. 6
- . Hw yellow. 12
6. Pattern on fw consisting of sharp white or yellow stripes. 7
- . Pattern on fw diffuse. *P. wagneri*
7. Light stripes on fw ochre yellow. *P. dublitzkyi*
- . Pattern on fw consisting of white stripes. 8
8. External edge of hw bordered with a thin black line from costal edge on. Spots of submarginal series large. Discoidal spot present. *P. glaphyra*
- . External edge of hw red. From apex along external edge a thin submarginal strip or an arcuate spot and sometimes small points. Discoidal spot absent. 9
9. Thorax white with three black striae. *P. mongolica*
- . Thorax uniform black. 10
10. Spot at apex of hw removed from edge, apex of hw light. A thin dark strip can be present at edge of hw. 11
- . Apex of hw infuscate; spot at apex merged with a dark edge of wing. Black short rays running from base. *P. ferghana*
11. Base of fw light, without infuscation, marginal spots small or absent. *P. erschoffi*
- . Base of fw with dark short strips or spots. Submarginal spots large (about 2 mm). 12
12. Discal spot on hw missing. Costal edge infuscate. No black short rays running from base of hw. *P. gratiosa*
- . Discoidal spot on hw present. Black short rays running from base of wing. *P. gracilis*

52. *Palaearctia (Palaearctia) mira* Dubatolov & Tshistjakov, 1989

(Pl. 12, Fig. 9)

Palaearctia mira Dubatolov & Tshistjakov, 1989: 141, figs 1-2, TL: Kurayskiy Mt. Range (Altai, environs of Aktash, Fig. 51).

[mira – wonderful (Lat.)]

Description. Male: alar expanse 27-29 mm. Fw black with white striolae on all veins. Cubital vein with a wider stria from base of wing until transverse vein. White, narrower stria instead on an undeveloped vein A1. A white dot located at cell centre. External part of fw with a white, transverse, sinuous band. Hw dark gray with whitish thin striae at edge of wing and on transverse vein.

Female with a yellowish gray hw with weakly expressed diffusive spots.

Distribution. Pattern South Siberian.

Within the former Soviet Union. Altai (Kurayskiy Mt. Range).

Beyond the former Soviet Union. Unknown.

Biology. Flight in the daytime in July on rocky slopes at 2500-2700 m a.s.l. Caterpillar pupating on grassy slopes under stones in a loose cocoon. Pupa pollinated bluish.

Similar species. In our fauna, no similar species seem to occur.

53. *Palaearctia (Palaearctia) glaphyra* (Eversmann, 1843)

(Pl. 13, Figs 1-6; Fig. 52)

Euprepia glaphyra Eversmann, 1843: 544, pl. 10, fig. 4, TL: Lake Zaisan (cf. Dubatolov, 1996b).

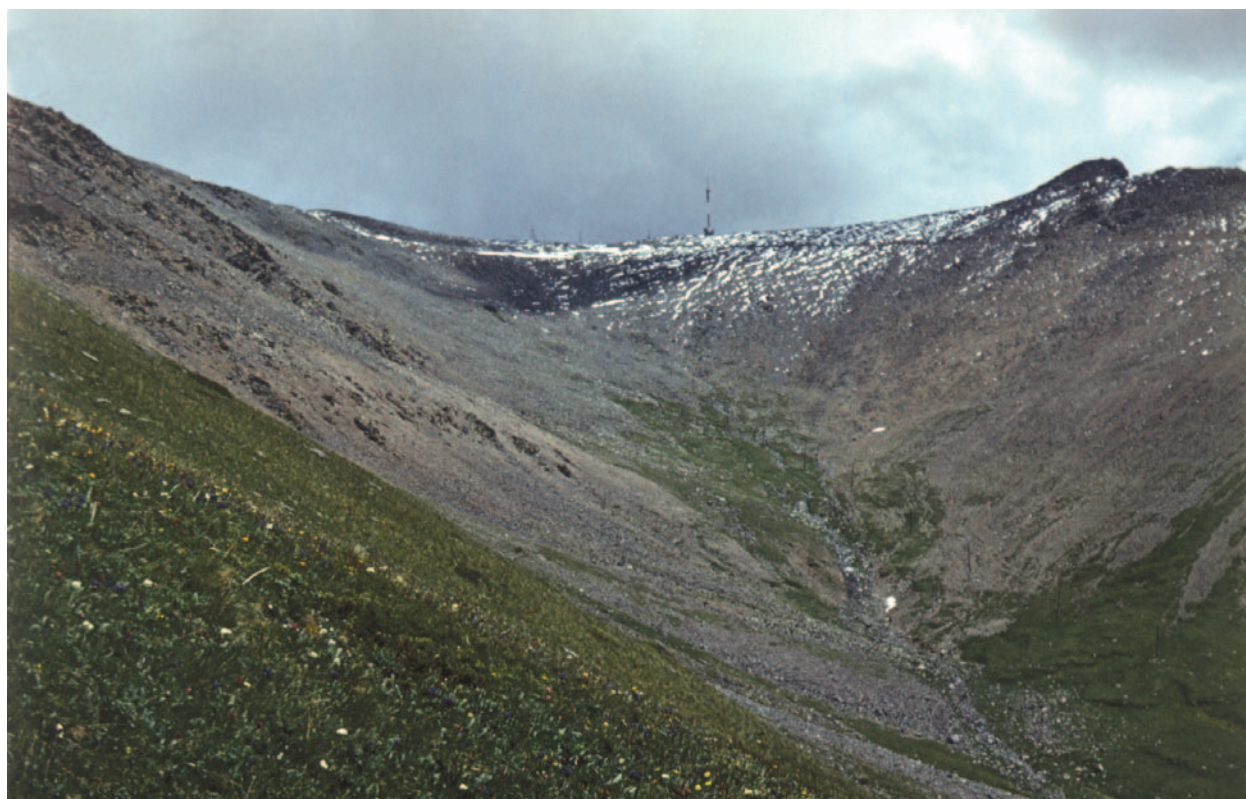


Fig. 51. Russia, Altai Mts, Kuraiskiy Mt. Range, head of Aktash Valley, the talus at right, at 2700-3000 m a.s.l., supporting *Dodia sasonovi* Dub.(TL), *Acerbia alpina* (Q.) and *Holoarctia cervini perunovi* Dub., at left both *H. marinae* Dub.(TL) and *Palaearctia mira* Dub. & Tschist.(TL) (photo by V. S. Murzin).

[= *mannii* Alpheraky, 1882; *naryna* O. Bang-Haas, 1927]

[*glaphyra* – a feminine name]

Staudinger, 1881: 402, *Arctia glaphyra manni*

Böttcher, 1905: 63, pl. 53, figs 4-12, *Micrarctia glaphyra gratiosata* (= *gratiosa* Seitz, non *gratiosa* Groum-Grshimailo)

Böttcher, 1905: 61, *Micrarctia glaphyra* f. *puengeleri*

Seitz, 1910: 83, pl. 16, row i, *Micrarctia glaphyra*

Bang-Haas, O., 1927: 62, Pl. 13, Fig. 2, *Micrarctia glaphyra* ab. *flava*

Bang-Haas, O., 1927: 62, pl. 8, fig. 23, *Micrarctia glaphyra* ab. *illustrata*

Bang-Haas, O., 1927: 62, *Micrarctia glaphyra* ab. *nigroradiata*

Bang-Haas, O., 1927: 63, pl. 8, fig. 28, *Micrarctia glaphyra naryna*

Bang-Haas, O., 1927: 63, pl. 8, figs 26-27, *Micrarctia glaphyra aksuensis*

Ferguson, 1984: 454, *Palearctia glaphyra*

Dubatolov, 1996b: 55, *Palearctia glaphyra glaphyra*, *P. glaphyra aksuensis*

Fang, 2000: 342, pl. 6, fig. 6, *Palearctia glaphyra*

Subspecies:

ssp. *manni* Staudinger, 1881: 402

ssp. *aksuensis* O. Bang-Haas, 1927: 55 (= *naryna* O. Bang-Haas, 1927: 63) (Fig. 52).

Description. Male alar expanse 30 mm, female a little smaller. Fw dark, almost black, with thin white striae (Pl. 13, Fig. 1). Hw red with black submarginal spots and a black, crescent-shaped, discal spot. Sometimes external edge of wing with a thin black stria. Black pattern on fw of female being strongly reduced, background colour of wing white. Black pattern like angular spots or short striae.

Variability. Individual variation becomes clear when different forms are considered:



Fig. 52. Mating pair of *Palearctia glaphyra aksuensis* (O. B.-H.), Kazakhstan, River Orta-Kokpak, 3000 m a.s.l., 18.VII.1993 (photo by V. S. Murzin).

- f. *flava* – yellow hws (Pl. 13, Fig. 2);
 f. *illustrata* – white hws with a black pattern;
 ab. *gratiosata* Böttcher, 1905 – both discal spot and boundary stria on hw lost;
 f. *puengeleri* – black hws (Pl. 13, Fig. 3).

There are many other forms or aberrations: ab. *rosearea* Seitz, 1910 (Staudinger, in litt.) has a pink, not white pattern on the fw; ab. *obscurata* Böttcher, 1905 with darkened fws; ab. *amabilis* Böttcher with a whitish median belt on the fw, and so on.

A number of subspecies are known, among which the following seem noteworthy:

ssp. *glaphyra* – mountains of eastern Kazakhstan (environs of Zaisan, Dzhungarskiy Alatau, Tyshkan-Tau Mts) and adjacent regions of China;

ssp. *manni* – East Tian-Shan (Kungess, China);

ssp. *aksuensis* – environs of Khan-Tengry Peak, Central Tian-Shan (Pl. 13, Figs 1, 2, 4) (“mountains north of Aksu”) and Yuldus, China; distributed in the Zailiiskiy Alatau, the eastern part of Terskey Alatau Mts, the southern part of Central Tian-Shan (Kaingdy-Katta Mt. Range, Inylchek, Kokshaal-Tau Mts), China (Xinjiang).

Available material from the northern slopes of Kaingdy-Katta Mts (at about 2700 m a.s.l. – ssp. *aksuensis*) and from near Orta-Kokpak River, in the source area of Tekes River, Terskey Alatau Mts, fails to show noticeable differences from specimens from the environs of Alma-Ata. As at Alma-Ata, Zailiiskiy Alatau Mts, the species *P. dublitzkyi* (O. Bang-Haas, 1927) is known to occur, this taxon cannot be a subspecies of *glaphyra* because of sympatry. We believe that the Zailiiskiy Alatau Mts support *P. glaphyra aksuensis* and *P. dublitzkyi*, the latter a bona species;

ssp. *naryna* – Naryn, Central Tian-Shan; this moth shows bright red hws, yet in the limits of the usual variation range of *P. glaphyra*. Dubatolov (1996a) regards this form as a synonym of *P. glaphyra aksuensis*. We think that he is right;

ssp. *manni* Staudinger (= *mannii* Alpheraky) – Eastern Tian-Shan, upper reaches of Kungess River, Arshan, China. This subspecies does not seem to occur in our territory;

ssp. *altotibetana* de Freina, 1997 – environs of Mt. Everest, China, 5200 m a.s.l. Being a considerably deviating form, this is probably a bona fide species.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Dzhungarskiy Alatau (and the mountains south of Lake Zaisan), Khan-Tengry Mt., Kaingdy-Katta Mt. Range, upper reaches of Inylchek River, Kuilu Mt. Range, Orta-Kokpak River (a tributary to Tekes River, Terskey Alatau), Zailiiskiy Alatau; Central Tian-Shan, up to Naryn and Dolon Pass in the west.

Beyond the former Soviet Union. Northwestern China (Xinjiang: source area of Kungess River, Kulja), Kuruktag Mts [Tibet (environs of Everest)?].

Biology. Flight in July to early August at elevations above 2500 m a.s.l. in noon time, females poorly active. Eggs of green colour laid in groups. Caterpillars feeding on various herbaceous plants (in lab conditions well reared on dandelions). Caterpillars of instars 3-4 hibernating. Last instar caterpillars almost black, coated with fascicles of black hairs on black warts. In the daytime, caterpillars hiding under stones. Pupation there at the end of June in a very loose cocoon consisting of a small number of threads. Pupa pollinated bluish, at the caudal end with remains of a larval skin.

Similar species. *P. ferghana* and *P. gratiosa*, with a dark apical part of the hw; black spots are moved to the edge.

54. *Palaearctia (Palaearctia) dublitzkyi* (O. Bang-Haas, 1927)

(Pl. 13, Figs 7-8)

Micrarctia glaphyra dublitzkyi O. Bang-Haas, 1927: 63, pl. 8, figs 29-30, TL: “Berg Khoum Bel beim Alma Ata” [= Mt. Kumbel, 3000 m a.s.l., Zailiiskiy Alatau, env. Alma-Ata].

[*dublitzkyi* – after Russian entomologist Dublitzky]

Dubatolov, 1996b: 15, *Palaearctia glaphyra dublitzkyi*

Description. Male alar expanse 33 mm, female a little smaller. Superficially very similar to *P. glaphyra*. Light pattern on fw considerably expanded. Colour of pattern not white but golden yellow or light ochre. Hw pink with large black spots. External edge often with a thin black stria (Pl. 13, Fig. 7). Female background colour of fw white with a weakly expressed black pattern. Black longitudinal strokes along external edge of fw (Pl. 13, fig. 8).

Variability. Within the distribution area known to us, no meaningful variability is observed, individual variation being reduced to loss of a discal spot on the hw. Available material (19 specimens) seems to reveal no other differences. There is an aberration (ab. *victori* Dublitzky, 1925) with a reduced black pattern, fws only with two black spots on vein R2 and one on Cu2, hws without spots on veins A2 and A3.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Our material derives only from the environs of Alma-Ata, Zailiiskiy Alatau (Talgar, Medeo, Kum-Bel). Dubatolov (1996a) records many other places: “Zailiiskiy Alatau; Kungey Ala-Tau in Kazakhstan and Kirghizstan”.

Beyond the former Soviet Union. Unknown.

Biology. Adults flying in early August at about 3000 m a.s.l. Caterpillar superficially typical of the genus, in the daytime hiding under stones on taluses; pupation there in a loose cocoon.

Similar species. *P. glaphyra* has a white pattern over a dark background. The female shows no black longitudinal strokes at the fw external edge.

Note. Contrary to Dubatolov (1996), Draudt (1931) and O. Bang-Haas (1927) who consider this taxon as a subspecies of *P. glaphyra*, we regard *P. dublitzkyi* as a “good” species, because it co-occurs together with *P. glaphyra* (*aksuensis*?), and the moth flies a little later, in August instead of July as known for *P. glaphyra*.

55. *Palaearctia (Palaearctia) gratiosa* (Groum-Grshimailo, 1890)

(Pl. 13, Figs 9-10)

Arctia glaphyra var. *gratiosa* Groum-Grshimailo, 1890: 533, pl. 19, fig. 5, TL: “Artcha-Bash” (northern slope of Alaiskiy Mt. Range), 9500 ft.

[*gratiosa* – pleasant, lovely (Lat.)]



Fig. 53. Uzbekistan, Turkestanskiy Mt. Range, Kum-Bel Pass, 3200 m), habitat of *Palaearctia ferghana* (Stgr.), *Palaearctia gratiosa* (Gr.-Gr.) and *Arctia rueckbeili* (Pngl.) (photo by V. S. Murzin).

Hampson, 1894b: 18, fig. 5, *Ocnogyna postflavida*
 Hampson, 1901: 238, 132, *Ocnogyna postflavida*
 Bang-Haas, O., 1927: 63, pl. 8, fig. 32, *Micrarctia glaphyra gratiosa*
 Bang-Haas, O., 1927: 62, pl. 8, fig. 31, *Micrarctia glaphyra* ab. *nigromarginis*
 Reich, 1933: 312, *Micrarctia gratiosa lochmatteri*
 Ferguson, 1985: 222, figs 44, 101-102, *Palaearctia kashmirica*
 Dubatolov, 1996b: 24, figs 4f, 9a, 9c, *Palaearctia gratiosa caroli*
 Dubatolov, 1996b: 24, figs 4g, 8h, *Palaearctia gratiosa sergei*
 Dubatolov, 1996b: 25, *Palaearctia gratiosa postflavida*, *Palaearctia gratiosa flavala*

Subspecies:

P. g. sergei Dubatolov, 1996b
P. g. caroli Dubatolov, 1996b
P. g. flavala Dubatolov, 1996b.

Description. Alar expanse 26-30 mm. Fw dark gray with darker, almost black, angular maculae. White pattern rather thin, including an X-shaped pattern in external part of fw and a white longitudinal stria above vein A. This stria connected by a white short strip with inner edge (pattern of Type I). Hind edge of fw darkened, centre of costal edge sometimes with a white spot reaching the middle part of cell. Hw yellow with dark costal edge and apex. Besides, 2-3 partly merged black spots near edge of hw. Spot on discal vein missing.

Variability. Apparent in the degree of development of the white pattern and main colour, latter varying from white to yellowish, pinkish or grayish. The hws may be of a different colour: sometimes orange, yellow or grayish white instead of the normally red. The discoidal spot may be well-developed or absent. Veins are often covered with black scales at the wing base.

Several subspecies are known:

ssp. *gratiosa* (Groum-Grshimailo) – eastern Zaalayskiy Mt. Range, Central and West Pamirs;



Fig. 54. Tajikistan, central Pamirs, Fortambek Glacier at 4000 m, habitat of *Palaearctia gratiosa* (Gr.-Gr.) and an *Oroncus* species (photo V. S. Murzin).

ssp. *caroli* Dubatolov, 1996b – Chatkalskiy and Kirghizskiy Mt. ranges; hw reddish at base and the centre of wing but yellowish at external and costal edges; yellowish to red ratio can vary; discoidal spot sometimes absent;

ssp. *sergei* Dubatolov, 1996b – southern slopes of Terskey Alatau Mts; differing from the nominotypical form by the large size (fw 15 mm in length, alar expanse 31.5 mm); hw orange, with large contrasting discoidal and submarginal spots; veins dark; spots of fw contrasting, V-shaped spot being well-developed (Dubatolov, 1996b);

ssp. *flavala* Dubatolov, 1996b – Zeravshanskiy, Turkestanskiy and Hissarskiy Mts; fw as in the ssp. *gratiosa* but hws always yellow.

Several subspecies have been described from beyond the former Soviet Union:

ssp. *postflavida* (Hampson, 1894b) – Kashmir, Skoro-la, 15,000 f, Sichuan, China;

ssp. *lochmatteri* (Reich, 1933) – “Third side valley of Shyok Valley, 4800 m”.

Distribution. Pattern Central Asian.

Within the former Soviet Union. West Tian-Shan (Chatkalskiy and Kirghizskiy Mt. ranges), Terskey Alatau; Pamirs-Alai (Alaiskiy, Transalaiskiy, Turkestanskiy, Hissarskiy and Zeravshanskiy Mt. ranges); Pamirs (Peter-1 and northern Academy of Science Mt. ranges).

Beyond the former Soviet Union. Afghanistan (Karakorum); India (Kashmir); western China.

Biology. Flight (males) in July in the second half of the day on grassy mountain slopes at more than 3000 m a.s.l. Near Fortambek Glacier, Peter-1 Mt. Range, Pamirs (Fig. 54), pupae were found under a stone at 4050 m a.s.l., 11.VII.1987.

Similar species. *P. glaphyra*, costal and external edge of hw light; spot on median vein of hw present; hw usually red.



Fig. 55. Kirghizia, W. Tian-Shan, Chatkal Mts, near Lake Sary-Chelek, above the edges of mountains at 3000 m supporting both *Palearctia gracilis* Dub. (TL) and *P. golbecki* Dub. (photo by V. S. Murzin).

56. *Palearctia (Palearctia) gracilis* Dubatolov, 1996

(Pl. 12, Figs 11-13)

Palearctia gracilis Dubatolov, 1996a: 31, fig.10g-h, TL: "Lake Sary-Chelek" (Chatkalskiy Mt. Range).

[*gracilis* – *gracile*, orderly, thin (Lat.)]

Description (based on three paratypes). Superficially very similar to *P. erschoffi* (Alpheraky, 1882) and some others congeners. Alar expanse 23-25 mm. Fw black with a white pattern consisting of four wide transverse bands and a narrow longitudinal band passing closer and parallel to inner edge. Two external bands merged or nearly so in medial part of wing, forming an X-shaped pattern (pattern of Type I). Fringe white. Hw from brick red to yellow with three black spots along, and some distance off, external edge, latter with a thin black strip, a black spot on discal vein. A black strip running along inner edge of wing from its base to middle. Underside of wings yellow with a spotty pattern.

Variability. The colour of the hws varies from red to yellow.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Chatkalskiy Mt. Range (Fig. 55).

Beyond the former Soviet Union. Unknown.

Biology. Flight at 2-3 m above the ground over herb-clad mountain slopes and crests of mountain ridges at about 3000 m a.s.l. in the beginning of August.

Similar species. *P. erschoffi*, has only a narrow black bracket near the apex of the hw. Median spot missing. Hws bright red.



Fig. 56. Kirghizia, Central Tian-Shan, Kaingdy-Katta Mt. Range, type locality of *Palearctia wagneri* (Pngl) (photo by V. S. Murzin).

57. *Palaearctia (Palaearctia) golbecki* Dubatolov, 1996

(Pl. 13, Fig. 15)

Palaearctia golbecki Dubatolov, 1996a: 19, fig. 10a-b, TL: "Loc. Tshai-Sandyk, Jug. Alexandrinum, Prov. Syr-Darja".

[*golbecki* – in honour of the first collector, A. Golbeck]

Description (based mainly on a paratype). Male. Alar expanse 22-24 mm. Head covered with dark brown hairs, antennae bipectinate, with combs of equal length and several times as wide as diameter of antennal stem. Body relatively short, stout, covered with thick brownish black hairs. Patagia, tegula, two longitudinal bands on thorax covered with gray hairs. Lateral sides, caudal end and underside of abdomen also gray. Fore tibia short (~1.5 mm), with a large epiphysis. A single pair of calariae on middle tibia and two pairs of calariae on hind tibia slightly shorter than tibia's diameter. Wings with sharp apices. Disposition of spots on fw as in *P. glaphyra*. Hw white, with dark veins, discoidal spot and wide marginal stria. General view of underside similar but strongly lightened. Underside dirty white with a black spotted pattern. Separate black spots at edge of hw. Hw with a diffuse brown spot also at costal part of base.

General structure of male genitalia as in *P. glaphyra* but aedaeagus dorsally without spikes in distal part, vesica structure also different.

We have not seen a female. Dubatolov (1996a) has given the following description:

"The length of the fw (of the female) is 9.5 mm, the alar expanse is 21 mm. The head is covered with brownish gray decumbent hairs. The palpi are stretched forward. The antennae are biserrate. The body is thick, cylindrical, 11.5 mm in length, clothed with dense brownish black hairs. The margins of the tegula, patagia, two longitudinal bands on the thorax and the underside of the abdomen, as well as the uniformly coloured legs, are coated with brownish gray scales. The calariae are short, not longer than half of the tibia's diameter. The wings are very narrow, with contrasting black strokes, one in the middle of the cell, the other behind the base of vein Cu2, a discoidal spot, a transverse spot between the base of veins Cu1 and Cu2, a spot between veins M1 and M2, another one in the distal part of vein Cu2, and three spots along and in front of vein A1. The marginal part of the wing is slightly darkened. The hw is almost entirely dark brown with a clear lightened space between veins M and Cu1 and a weakly lightened space behind vein Cu2. The pattern of the wing underside is similar, but strongly lightened".

Variability. Only several specimens are known.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Kirghizskiy, Mt. Range (Tshai-Sandyk, Tyuz-Ashu Pass, 3400 m).

Beyond the former Soviet Union. Unknown.

Biology. Flight in the end of June and in July on grassy slopes at 3000-3500 m a.s.l.

Similar species. *P. glaphyra*, has only a thin black strip at the hw edge and a small black spot not merged with the boundary strip, or the hw is uniformly black.

58. *Palaearctia (Palaearctia) rupicola* (Groum-Grshimaïlo, 1890)

(Pl. 14, Fig. 5)

Micrarctia rupicola Groum-Grshimaïlo, 1890: 535, pl. 19, fig. 6, TL: Zaalayskiy Mt. Range, headwaters of Aram River ("Transalai: Oberlauf des Flusses Aram"). Holotype in ZISP.

[*rupicola* – rock-dweller (Lat.)]

Staudinger, 1892a: 251, pl. 3, fig. 6, *Arctia glauca*

Ferguson, 1985: 222, figs 44, 101, 102, *Palaearctia kashmirica*

Subspecies:

P. r. kashmirica Ferguson, 1985.

Description. Superficially, close to *P. gratiosa* (Groum-Grshimaïlo, 1890). A part of the original description is quoted below:

“*Arctia rupicola* Gr.-Gr. Alis anticis nigro fuscis, in parte externa multo palidioribus, fuscescente strigatis; posticis fusciscentibus, in venis basin versus fusco-atomatis et pariter pallidioribus; macula discocelulari tribusque macula submarginalibus permañnis et fere confluentibus – fuscis.

(♀–*ignotus*; ♂ = 12 mm.” (Lat.)

“Fw from above almost black, except the part of fw near external edge. Pattern chequered. Spots disposed approximately as in *glaphyra* Ev. Hw gray-white but with frail pink tint. External edge and veins darker, discoidal spot very large. This spot virtually merging with a wide black-brown spot occupying entire apex of wing.

Abdomen short; thorax coated with brown-black hairs in two longitudinal clear bands and with collar of same colours. Fore part of abdomen almost black, subsequent coated with yellowish scales. *P. rupicola* mainly comes close to *glaphyra*, but it shows rather essential differences with all known forms of this species. However, the nearest is our var. *gratiosa*. The large marginal spots, the lack of a fourth spot in the delta pattern, the completely different coloration and the brightly expressed discal spot allow us to distinguish *rupicola* from all known forms of *gratiosa* Groum-Grshmailo” (Groum-Grshmailo, 1890: 535).

Provisionally, the full specific status of this form is retained before accumulation of new material. In the Aram Canyon, different forms from the *rupicola*–*gratiosa* group indeed co-occur.

Variability. Modest.

Ssp. *kashmirica* Ferguson, 1985, described from Baltistan, Kashmir, India. This moth is very close to the nominotypical form but differs by the diffuse pattern on the fw.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Zaalayskiy Mt. Range, Pamirs.

Beyond the former Soviet Union. India (Kashmir)

Biology. “*P. rupicola* was found under a stone in the Aram Canyon, Transalai Mountains, at an elevation of approximately 10,000 ft. Locality: steep slopes and rocky talus, beginning of July” (Groum-Grshmailo, 1890: 535). Flight in the daytime at more than 3000 m a.s.l. in mid-July to early August. Restricted to overgrown taluses and rocks.

Note. Dubatolov (1987a) regards *P. rupicola* as a synonym of *P. gratiosa*, yet no arguments to support this opinion have been provided. As Groum-Grshmailo (1890) described and clearly distinguished both forms in the same paper, we follow his opinion. A picture of the holotype is given in Dubatolov (1987a) while a little sketchy pattern in Groum-Grshmailo (1890).

Similar species. *P. gratiosa* (Groum-Grshmailo, 1890).

59. *Palearctia (Palearctia) wagneri* (Püngeler, 1918)

(Pl. 13, Fig. 14)

Arctia wagneri Püngeler, 1918: 46, TL: Sary Djas. Tian-Shan.

[*wagneri* – after German entomologist Wagner]

Dubatolov, 1996b: 18, *Palearctia wagneri*

Description. Alar expanse 36 mm. Fw almost black with diffuse white spots as remains of the usual pattern of the *glaphyra* group. Hw pink or yellow without median spot, but with small rounded spots at edge. A diffuse dark stria running from base of hw parallel to inner edge. Head and body black.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Tian-Shan (“Sarydzhaz”), Kaingdy-Katta Mt. Range (Fig. 57).

Beyond the former Soviet Union. Unknown.

Biology. Flight in the daytime above clayey slopes at 2500-2800 m a.s.l. in July.

Similar species. Absent.

60. *Palearctia (Palearctia) erschoffi* (Alpheraky, 1882)

(Pl. 14, Figs 1-2; Figs 58, 59; genitalia in Pl. 26, Fig. 6)

Arctia erschoffi Alpheraky, 1882: 29, pl. 1, fig. 33, TL: “Yulduz” [= Julduz, Xinjiang, China].



Fig. 57. *Paelearctia erschoffi arcana* Pljustsch & Dolin, ♂. Kirghizia, Sary-Kamysh Mts., 41°55'N, 74°03'E, 2200 m, 28.VII.1993, ex l., moth emerged on 3.VIII.1993 (photo by O. G. Gorbunov).

Fig. 58. *Paelearctia erschoffi arcana* Pljustsch & Dolin, ♂+♀ in copula. Kirghizia, Sary-Kamysh Mts, 41°55'N, 74°03'E, 2200 m, 28.VII.1993, ex l., moths emerged on 3.VIII.1993 (photo by O. G. Gorbunov).

[erschoffi – in honour of Russian entomologist N. Ershov = Erschoff]

Staudinger, 1887: 82, *Arctia erschoffi issyka*

Böttcher, 1905: 62, figs 18-21, *Arctia erschoffi selmonsi*

Seitz, 1910: 84, pl. 16, row k, *Micrarctia kindermanni erschoffi*

Bang-Haas, O., 1927: 66, pl. 8, fig. 44, ♂, fig. 45, ♀, *Micrarctia kindermanni issyka*

Bang-Haas, O., 1927: 67, pl. 8, fig. 47, *Micrarctia kindermanni korlana*

Ferguson, 1985: 219, figs 41, 105, 106, *Paelearctia erschoffi*

Dubatolov, 1987: 33, *Tancrea erschoffi*

Dubatolov, 1996b: 26, *Paelearctia erschoffii erschoffi*

Fang, 2000: 343, pl. 6, fig. 8, *Paelearctia erschoffi*

Pljustsch & Dolin, 2000: 436, figs 7-8, *Paelearctia erschoffi sarydzhasica*

Pljustsch & Dolin, 2000: 436, fig. 9, *Paelearctia erschoffi arcana*

Pljustsch & Dolin, 2000: 436, figs 10-12, *Paelearctia erschoffi miranda*

Subspecies:

P. e. issyka (Staudinger, 1887)

P. e. selmonsi (Böttcher, 1905)

P. e. sarydzhasica Pljustsch & Dolin, 2000

P. e. arcana Pljustsch & Dolin, 2000

P. e. miranda Pljustsch & Dolin, 2000.

Description (based on material from Kaingdy-Katta Mt. Range). Alar expanse of male 26-28 mm. Fw black with a white pattern. An arcuate thin stria running from base of wing to tornal angle of external edge. Two external transverse striae bridged in the middle of wing and forming an X-shaped pattern. A third, wider stria starting in the middle of costal edge of fw and reaching to sometimes intersecting the white arcuate longitudinal stria, but usually not reaching the inner edge of wing. A rather thin, basal, transverse stria reaching the inner edge, interrupted at white longitudinal stria. Fringe of external edge white. Hw red with a black arc along external edge. Arc beginning at costal edge, reaching up to 1/4 external edge, at 1.5 mm off latter. Apex of hw red. Black points lying 1.5 mm off external edge often present in latter's

medial part. Costal edge of hw and fringe yellow. Underside of fw yellowish with a reduced black pattern but with a clear, black, oval spot in the middle of medial cell. Hw underside red orange in colour. Black pattern same as from above. A black dot in the middle of costal edge. From above, head, thorax and abdomen black, underside of abdomen yellowish.

Variability. Individual variability is displayed in the width of a white pattern and in size variation of black spots on the hw. Sometimes spots on the hw are absent and the wings become uniform orange-red or red. Sometimes the third transverse band on the fw is broken into separate spots.

The following subspecies are known:

ssp. *erschoffi* – Yuldus, Kulja, Lake Issyk-Kul; spots on hw large, coloration of hw orange red;

ssp. *issyka* – “probably from the mountains east of Tashkent” (O. Bang-Haas, 1927: 66); as the picture of a type shows (O. Bang-Haas, 1927), this form is distinguished by the ochre yellow background of the fw and the larger spots on the hw (= *erschoffi erschoffi* sensu Dubatolov, 1996a: 28);

ssp. *selmonsi* – Inner Tian-Shan (Naryn); pattern of the fw yellowish instead of white, hw red, black spots reduced;

ssp. *sarydzhastica* – Central Tian-Shan, northern slope of Kaingdy-Katta Mts; background colour of fw pale yellow, coloration of dark pattern chestnut brown. Based on material from Kaingdy-Katta Mts, only a small part of the population seems to be coloured like typical *sarydzhastica* while the majority appear to represent typical *erschoffi*. This alone suggests their synonymy;

ssp. *arcana* – Tian-Shan, point of junction of Talasskiy and Kyrghizskiy Mt. ranges, west of Tyuz-Ashu Pass. Background colour of fw lemon yellow; light pattern on fw very extensive;

ssp. *miranda* – West Tian-Shan, Talasskiy Mt. Range, Kara-Bura Pass; background colour of fw orange yellow; dark pattern of fw black; hw red.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Environs of Lake Zaisan, Tian-Shan (Chatkalskiy Mt. Range, Zailiiskiy Alatau, eastern Terskey Alatau (tract Orta-Kokpak), Kaingdy-Katta Mt. Range, Naryn), Pamirs-Alai (Alaiskiy Mt. Range).

Beyond the former Soviet Union. China: Yulduz (Xinjiang)

Biology. Flight in the end of July or August, later than *P. glaphyra*, at 2600-3000 m a.s.l. (Kaingdy-Katta Mt. Range and eastern Terskey Alatau Mts). According to our observations, males flying in the second half of sunny days and in twilight. According to O. Bang-Haas (1927), males fly between 11 a.m. and 2 p.m. Females fly reluctantly, small green eggs laid in batches not fastened to a substrate. Freshly hatched caterpillars almost do not eat, hibernation at instar 1. Food plants: various herbs, including *Astragalus*, in captivity dandelion (*Taraxacum*). In the daytime, larvae hiding under stones, mostly on slopes of southern exposition. Living on dry herb-clad slopes, distribution patchy. In many places, a mass species.

Similar species. *P. mongolica*, has submarginal spots on the hw; the longitudinal stria on the fw is wide.

61. *Palearctia (Palearctia) ferghana* (Staudinger, 1887)

(Pl. 14, Fig. 4)

Arctia erschoffi ferghana Staudinger, 1887: 82, TL: “Margelan, Alai mont.” [= Alaiskiy Mts].

[ferghana – after Fergana = Ferghana, Central Asia]

Groum-Grshimailo, 1890: 533, *Arctia erschoffi ferghana*
 Seitz, 1910: 84, pl. 16, row k, *Micrarctia kindermanni ferghana*
 Strand, 1912: 2, *Arctia schottlaenderi*
 Bang-Haas, O., 1927: 67, *Micrarctia kindermanni ferghana*
 Daniel, 1961: 155, pl. 11, fig. 8, *Micrarctia mustangbhoti*
 Daniel, 1966: 161, pl. 3, figs 4-16, *Micrarctia variabilis*
 Dubatolov, 1996b: 28, *Palearctia ferghana*
 Dubatolov, 1996b: 30, *Palearctia ferghana sussamyra*
 Dubatolov, 1996b: 30, *Palearctia ferghana turkestanica*

Subspecies:

P.f. ferghana (Staudinger, 1887)

P.f. schottlaenderi (Strand, 1912)

P.f. mustangbhote (Daniel, 1961)

P.f. variabilis (Daniel, 1966)

P.f. sussamyra Dubatolov, 1996b

P.f. turkestana Dubatolov, 1996b.

Description. Superficially, resembling *P. glaphyra* but differing in an infuscate apex of hw and by details of fw pattern. On fw, dark medial bands not interrupted, otherwise hind angle of fore spot on first median band (M1) sharp (Dubatolov, 1996b).

Variability. This concerns the size of black spots on the hw and the width of white bands on the fw. Differences appear appreciable only based on a number of specimens.

The following subspecies are accepted:

ssp. *ferghana* – Alaiskiy Mt. Range (“Margelan, Alai mont.”);

ssp. *turkestana* – Shakhristan Pass, Kum-Bel Pass (Turkestanskiy Mts); background colour white; spots so enlarged that merging into transverse bands; basal part of anal vein on hw pollinated by black scales;

ssp. *variabilis* – Afghanistan, Hindu Kush, Anjuman Pass; fw pattern highly variable, hw with a wide black margin or fully black;

ssp. *sussamyra* – Kirghizia, Susamyr Mts, Ala-Bel Pass, 3300 m a.s.l.; main colour purely white, transverse striae merged, hw above vein R yellow, discoidal spot on hw large;

ssp. *schottlaenderi* – “Thianschengebirge”;

ssp. *mustangbhote* – Nepal, Mustangbhot, Tange-Khola, 5000 m.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Pamirs-Alai (Alaiskiy and Turkestanskiy Mt. ranges), West Tian-Shan: Sussamyr Valley (Fig. 59).



Fig. 59. Kirghizia, W. Tian-Shan, Susamyr Valley, habitat of *Chelis thianshana* Dub., *Palearctia ferghana sussamyra* Dub. and some others (photo by V. S. Murzin).

Beyond the former Soviet Union. Afghanistan (Anjuman Pass), Himalaya.

Biology. Moths appearing in the beginning of August, in warm years in mid-July, on dry places and at edges of taluses at 2600-3200 m a.s.l. Caterpillars spending the daytime under stones, where they pupate in loose cocoons. Pupa brown, pollinated bluish.

Similar species. All species of the *erschoffi-mongolica* group (see the key).

62. *Palaearctia (Centrarctia) mongolica* (Alpheraky, 1888)

(Pl. 14, Fig. 3; genitalia in Pl. 26, Fig. 7)

Arctia mongolica Alpheraky, 1888: 67, TL: "Djoungor, dans la province Ordos".

[= *serarum* Grum-Grshimailo, 1899; *serum* Grum-Grshimailo, 1902]

[*mongolica* – in honour of a prince of the Mongolian nomads in Chinese Djoungor (Dzhungar) – (Lat.)]

Alpheraky, 1892: 13, pl. I, fig. 6, *Arctia mongolica*

Seitz, 1910: 84, pl. 16, row k, *Micrarctia kindermanni mongolica*

Dubatolov, 1990d: 157, *Centrarctia mongolica*

Dubatolov, 1996a: 10, *Centrarctia mongolica*

Note. Dubatolov (1990f) has erected the subgenus *Centrarctia* as based on the differences in male genitalic structure of *Palaearctia mongolica* and other congeners. In our opinion, however, the differences are too small to separate *P. mongolica* into a genus-group category. Still Dubatolov's (1990f) classification is retained for the sake of completeness.

The species was described upon material taken during G. Potanin's expedition in 1883-1884, nowadays included in the Red Data Book of the Russian Federation (Danilov-Danilian, 2001).

Description. Male: alar expanse 31-34 mm. Main colour of wing black, with a network of white striae. White pattern on fw with pink tint, consisting of a white X-shaped pattern in external part of fw and two transverse striae running from costal edge up to a white longitudinal stria, sometimes reaching the hind edge. The white longitudinal stria arising at base of fw and running to external edge along vein A1. Hw pink red, with large submarginal spots and a prolate spot, latter running from costal edge to discoidal vein.

Variability. Width of white striae on fw, and size and shape of spots on hw varied.

Distribution. Pattern Chinese-Mongolian.

Within the former Soviet Union. Tuva (Ubsu Nor).

Beyond the former Soviet Union. Mongolia (Gobi, Altai etc.), China (Ordos Plateau, Nei Mongolia).

Biology. Flight in July in dry places. In the mountains reaching 3300 m a.s.l. Larvae feeding on *Artemisia* spp. and other herbaceous plants.

Similar species. *P. erschoffi*, has no submarginal spots on the hw, and only a narrow stria at the apex. The longitudinal stria on the fw is narrow.

63. *Palaearctia (Palaearctia) sarycola* de Freina, 1997

(Pl. 14, Fig. 6; Fig. 61)

Palaearctia sarycola de Freina, 1997: 55 (*Palaearctia*, misspelling), TL: China, Sarykolskiy Mt. Range, 30 km east of Mustagata.

[*sarycola* – dweller of Sarykolskiy Mt. Range, East Pamirs (Lat.)]

Description. Male. Pattern of fw usual in the *glaphyra*-group. Fw prolate, narrow, yellow brownish (ochre). Spots brown-black, very clear, doubled subapical spot black, strongly expressed. External edge of fw yellowish. Hw creamy white, sharply contrasting to fw; veins darkened, discal spot point-like; a wide costal band interrupted on vein Cu1 up to edge of wing. Antennae pectinate. Head and thorax covered with long yellow ochre hairs. Patagia very bright, yellowish. Abdomen black with ochre yellow segments, tegula acyanotic brown, bordered ochre yellow.



Fig. 60. *Palearctia (Palearctia) sarycola* de Freina, ♂. Tajikistan, E. Pamirs, Sarykol Mt. Range, Lake Dunkeldyk, 2.VIII.1996 (photo by A. Sotchivko).

Variability. Only two specimens available.

Distribution. Pattern Central Asian.

Within the former Soviet Union. East Pamirs (Sarykolskiy Mt. Range, Fig. 61) and Beik Pass.

Beyond the former Soviet Union. West China (eastern slopes of Sarykolskiy Mts).

Biology. Flight at 4100-4700 m a.s.l. in the end of July. Caterpillar hibernating.

Similar species. Slightly resembling *P. golbecki*.

30. Genus *Sibirarctia* Dubatolov, 1987

Sibirarctia Dubatolov, 1987a: 36, TS: *Arctia kindermanni* Staudinger, 1867.

The genus is distinguished by a number of peculiarities separating it from *Tancrea* and *Palearctia*: eye with ciliae, valve of males with three processes, fore epiphysis well-developed, bulla present etc. Based on genitalic conformation, the species of *Sibirarctia* are close to *Chelis* Rambür.

“Palpi very short. Head beset with hairs, antennae of male and female two-combed but crests of female shorter. Eye with rather sparse ciliae. Fore tibiae twice as short as femora, with a long epiphysis, middle tibiae with one pair, hind with two pairs, of short calariae.

Genitalia of males: uncus narrow, slightly curved, valve almost rhomboidal with three processes at external edge, juxta almost exactly hexangular, with spikes at edges. Aedaeagus curved, with spikes at apex” (Dubatolov, 1987a: 39).

Key to species of *Sibirarctia*:

1. On underside, basal part of hw light. *S. buraetica*
 –. On underside, basal part of hw with black spots. *S. kindermanni*



Fig. 61. Tajikistan, E. Pamirs, Sarykolskiy Mts, Lake Dunkeldyk, 4050 m, and Pamir Plateau, habitat of *Oroncus* and *Palearctia* spp. (photo by A. Sotchivko).

64. *Sibirarctia kindermanni* (Staudinger, 1867)

(Pl. 14, Fig. 7; Fig. 64; genitalia in Pl. 26, Fig. 8)

Arctia kindermanni Staudinger, 1867: 102, TL: (?) Ural [“probably the Orenburg Gouvernement” (O. Bang-Haas, 1927)].

[= *kindermanni roseni* O. Bang-Haas, 1927; *kindermanni ussuriensis* O. Bang-Haas, 1927]

[*kindermanni* – named in honour of German entomologist E. Kindermann (Lat.)]

Staudinger, 1887b: 192-193, pl. 11, fig. 4, *Arctia pretiosa*

Staudinger, 1897: 326, pl. 9, fig. 23, *Arctia kindermanni pomona*

Rothschild, 1910: 83, *Ocnogyna pretiosa albovittata*

Spuler, 1910: 138, pl. 76, fig. 12, *Arctia kindermanni*

Seitz, 1910: 78, pl. 14, row e, *Micrarctia kindermanni pretiosa*

Bang-Haas, O., 1927: 65, pl. 8, fig. 40, *Micrarctia kindermanni*

Fang, 2000: 340, pl. 6, fig. 5, *Sibirarctia kindermanni*

Subspecies:

S. k. kindermanni (Staudinger, 1867)

S. k. pretiosa (Staudinger, 1887)

S. k. pomona (Staudinger, 1897) [= *roseni* (O. Bang-Haas, 1927)]

S. k. chinensis (Grum-Grshimailo, 1899)

S. k. albovittata (Rothschild, 1910).

Description (based on a specimen from Primorye (Pl. 14, Fig. 7; ssp. *pretiosa* (Staudinger, 1887)). Alar expanse 30 mm. Fw of male black with a white pattern consisting of two transverse striae, neither reaching the inner edge, and



Fig. 62. Russia, Kuznetskiy Alatau Mts, Siberian dark fir taiga supporting *Sibirarctia kindermanni* (Stgr.), *S. buraetica* (O. B.-H.), *Arctia flavia* (Fuessly), *A. caja* (L.), *A. culoti* (Ob.), *Spiris bipunctata* (Stgr.), *Dodia* sp. etc. (photo by V. S. Murzin).

an X-shaped pattern in external part of wing. A thin longitudinal stria (Ls, Fig. 9) passing from base of wing till third light stria. Hw yellow, with a black basal field and a wide black border. A crescent spot on discoidal vein. Colour of wing and pattern on underside same as from above. Head, thorax and abdomen from above black. Underside collar, forehead (epicranium) and thoracic segments yellow.

Variability. Considerable.

Within the territory of the former Soviet Union, the following subspecies are known:

ssp. *kindermanni* – southern Urals up to Yenisey River; a very wide light pattern on fw, basal part of hw considerably darkened (Fig. 63);

ssp. *pretiosa* – Middle Amurland (Raddevka), Primorye (Ussuriysk, Sikhote-Alin); China (Heilongjiang); according to Seitz (1913), female smaller, with a more strongly developed light pattern, boundary belt on hw divided into separate spots.

Illustrations of this subspecies in Seitz (1910) and O. Bang-Haas (1927) (type!) are completely different. Specimens from Amur (Raddevka) (Pl. 14, Fig. 7) appear to be much closer to Seitz's than to the type as depicted by O. Bang-Haas;

ssp. *pomona* – southern slopes of Yablonovyi Mt. Range, southern Transbaikalia (locus typicus), southern coast of Lake Baikal; Transbaikalia; Upper Amurland; Mongolia. Hw yellow, white pattern on fw significantly narrower than in the nominotypical form, but more strongly developed than in the ssp. *pretiosa*. Black boundary belt divided into two separate wide spots (as in the typical form). Basal part of hw with a small darkening (O. Bang-Haas, 1927, type!).

From China, the following forms have been described:

ssp.(?) *chinensis* (Grum-Grshimaïlo, 1899: 462) (*Ocnogyna latreillei chinensis*) – Khingan Mts, China;

ssp.(?) *albovittata* (Rothschild, 1910: 83) (*Ocnogyna pretiosa albovittata*) – Qinhai.

The status of these two subspecies is questioned.

Distribution. Pattern Siberian-Chinese.

Within the former Soviet Union. Southern Urals; south half of West Siberia (Omsk, Novosibirsk, Krasnoyarsk); Altai; southern coast of Lake Baikal, Transbaikalia; Middle Amurland; Primorye.



Fig. 63. *Sibirarctia kindermanni kindermanni* Stgr., ♂. Ural Mts (after Spuler, 1906).

Beyond the former Soviet Union. Northern and central Mongolia; China: Khingan, Qinhai, Xinjiang, Liaonin, Shaanxi, Nei Mongolia, Heilongjiang (Dubatolov, 1996b), Liaonin.

Biology. Flight in July, in various habitats like leafed and coniferous forests, on slopes of hills and in the mountains.

Similar species. *S. buraetica*: fw with a reticulate pattern consisting of thin striae.

65. *Sibirarctia buraetica* (O. Bang-Haas, 1927)

(Pl. 14, Figs 8-9)

Micrarctia buraetica O. Bang-Haas, 1927: 64, pl. 8, figs 35-36, TL: Tannuola Mt. Range (Shavir, Tuva Republic).

[= *Micrarctia buraetica ekwesi* O. Bang-Haas, 1927]

[*buraetica* – after the Buryat people, Siberia (Lat.)]

Bang-Haas, O., 1927: 64, pl. 8, fig. 37, *Micrarctia buraetica validus*
Dubatolov, 1996b: 58, 71, fig. 2], *Sibirarctia buraetica chajataensis*

Subspecies:

S. b. validus (recte: *valida*) O. Bang-Haas, 1927

S. b. chajataensis Dubatolov, 1996b.

Description (based on specimens from Yakutia). Alar expanse 27 mm. Fw almost black, with a thin white pattern consisting of longitudinal (on veins) and transverse striae. Fringe of fw white. Hw yellow with several black spots at edge and with a large discal spot. Fringe yellow. Abdomen yellow with black transverse striae. Thorax black with yellow longitudinal striae.

Variability. Several geographically stable forms have been described:

ssp. *buraetica* – Tuva, Transbaikalia, central Yakutia, Altai, East Sayan; northern Mongolia;

ssp. *valida* – southwestern Transbaikalia (Kyakhta District in Buryatia) (Dubatolov, 1996b);

ssp. *chajataensis* – mountains of eastern Yakutia (Suntar-Khayata Mt. Range, Oimyakon).

We only have material from Mongolia and Yakutia. These are shown on Pl. 14, Figs 8-9.

Distribution. Pattern South and East Siberian.

Within the former Soviet Union. Southeastern part of Altai; Tuva; East Sayan Mts; Baikal; Transbaikalia; central and eastern Yakutia.

Beyond the former Soviet Union. Northern and central Mongolia.

Biology. Flight in the end of June to July in the taiga, in low woody mountains.

Similar species. *S. kindermanni*, differs by the black fw with a smaller number of light striae.

31. Genus *Chelis* Rambür, 1866

Chelis Rambür, 1866: 256, TS: *Phalaena maculosa* Gerning, 1780.

= *Cletis* Kirby, 1892: 263

Seitz, 1910: 43, *Cletis*

de Freina, 1984: 209, *Chelis*

Toulgoët, 1985: 69, *Chelis*

Dubatolov, 1988: 80, *Chelis*

Fw usually light with angular black spots, hw pink with median and boundary maculae. Eyes large, coated with rather sparse and very small hairs. Antennae of male and female combed, in female crests short. Proboscis abortive. Fore tibiae with a large epiphysis, middle tibiae with one pair of calariae, hind with two.

Species of this genus are distributed in Europe and northern Asia. Revisions were carried out by de Freina & Witt (1984) and Dubatolov (1988).

There is certain ambiguity as regards the species composition of this genus. The use of structural features of the adult only seems to fail to reveal specific or subspecific independence of the various forms. More detailed information on sympatry or allopatry, the biology, pre-imaginal stages is necessary. In general, we follow Dubatolov (1988), with the following species accepted: *Ch. maculosa* (Gerning, 1780) (ssp. *maculosa* and ssp. *mannerheimi* (Duponchel, 1836)), *Ch. reticulata* (Christoph, 1887) (ssp. *reticulata* and ssp. *transcaucasica* Dubatolov, 1988), *Ch. ferghana* Dubatolov, 1988, *Ch. tianshana* Dubatolov, 1988, *Ch. dahurica* (Boisduval, 1832) and *Ch. caecilia* (Kindermann, 1853).

Superficially, several congeners are very similar and their exact identification requires preparation of the male genital apparatus. A key to species based on genitalic conformation is given by Dubatolov (1988). We rather stick to external characters.

Key to species or subspecies of *Chelis* (Fig. 64):

1. Black spots at external edge of fw either absent or there is one small spot near apex. *Ch. maculosa maculosa*
- . External edge of fw with two or more black spots. 2
2. On hw, light colours (red, pink or yellowish) dominating. A black pattern covering less than half of wing. 3

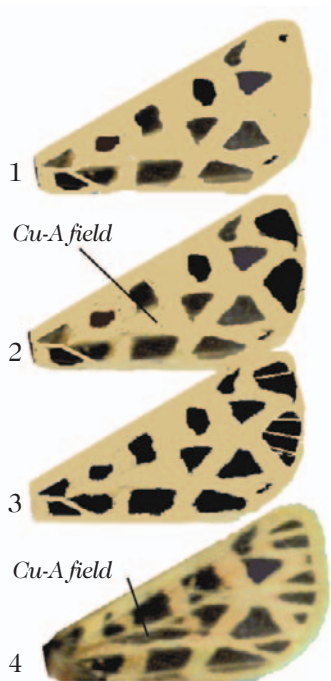


Fig. 64. Diversity of patterns in *Chelis*. (1) *Ch. maculosa* (Gern.). Black spots at external edge of fw missing; (2) *Ch. maculosa mannerheimi* (Dup.). Black marginal spots present; (3) *Ch. reticulata* (Chr.). Black marginal spots cut by thin lines; (4) *Ch. dahurica* (Bsd.). Black marginal spots cut by thick lines (photo by V. S. Murzin).

- . On hw, black dominating. *Ch. caecilia*
3. External edge of fw with two separate, triangular, black maculae not divided by light pollination on veins.
 *Ch. maculosa mannerheimi*
- . Black maculae at external edge of fw intersected along veins by very thin light lines. 4
4. Triangular spots on veins M2 and Cu1 at external edge of fw divided by *very thin* light veins. Fw creamy.
 *Ch. reticulata*
- . Marginal spots intersected along veins by *wide* light striae. 5
5. A narrow black spot prolate in longitudinal direction in the middle of wing below cubital vein and vein Cu2.
 6
- . Middle of wing without such a spot. *Ch. ferghana*
6. A black triangular spot ranging from base of cell to its middle. *Ch. dahurica*
- . Black spot in central cell divided into two separate spots. *Ch. tianshana*

66. *Chelis maculosa* (Gerning, 1780)

(Pl. 14, Figs 10-12)

Phalaena maculosa Gerning, 1780: 862, pl. 2, figs 1–3, TL: Vienna, Austria.

[= *honesta* Freyer, 1843; *monacensis* Osthelder, 1933, *stertzi* Schulz, 1902, *marsicana* Dannehl, 1929, *centralhispanica* Daniel, 1935; *boursini* Daniel, 1935, *arlanzona* Agenjo, 1937, *nordiberica* Agenjo, 1937]

[*maculosa* – spotty (Lat.)]

[Felsheiden-Fleckenbär, Schwarzgefleckter Bär – (Germ.)]

[Ecaille Tachetée – (Fr.)]

Duponchel, 1836: 49, pl. 4, fig. 2, *Chelonia mannerheimi*

Staudinger, 1894: 256, *Arctia maculosa arragonensis*



Fig. 65. *Chelis maculosa mannerheimi* (Dup.), ♂. Kazakhstan, Aktyubinsk Region, 26 km W of Novoalekseevka, 50°10'N, 55°18'E, 225 m, 6.VI.1998 (photo by O. G. Gorbunov).

Seitz, 1910: 78, *Cletis maculosa*

Dubatolov, 1988: 80, *Chelis maculosa*

Fang, 2000: 344, pl. 6, fig. 9, *Chelis maculosa mannerheimer* [sic!] (misspelling)

Subspecies:

Ch. m. mannerheimi (Duponchel, 1836) (Fig. 65) [= *Ch. m. sliwnoensis* (Rebel, 1903)]

Ch. m. honesta (Freyer, 1843)

Ch. m. latina Turati, 1909.

Description (based on specimens from Austria). Alar expanse of male 28-31 mm, of female 24-26 mm. Fw, including costal edge, fulvous gray with neat, black, triangular spots. No boundary series of spots expressed. Hw from above dirty pink with three large, rounded, submarginal spots; small spots on discoidal vein and at base closer to inner edge. Pattern brighter and more contrasting in female than in male. Costal vein on fw darkened. Antenna with short teeth. Underside dark pink.

Variability. Noticeably varying in size of spots and coloration.

The following geographically isolated taxa are well discernible:

ssp. *maculosa* – Middle and southern Europe: Crimea, southern European Russia, lower flow region of Kama River, southern Urals, southwestern Siberia, Western Europe;

ssp. *mannerheimi* – eastern part of the distribution range of the species: Don River region, Lower Volga region, southwestern Siberia, northern Kazakhstan, northwestern China; described from “the Kyrgyz steppes” as an independent species; a little larger than the typical form, fw often lighter, creamy with well-marked submarginal series of spots;

ssp. *sliwnoensis* – Bosnia, very similar to the ssp. *mannerheimi*;

ssp. *honesta* – Romania;

ssp. *latina* – Sicily, Italy.

The two latter forms, as well as *sultana* Schwingenschuss, 1937 and *schwingenschussi* Daniel, 1961, have been referred by Toulgoet (1985) to the ssp. *mannerheimi*;

ab. *flava* Spuler, 1910 – a form of infrasubspecies rank with yellow, not red, hws.

Distribution. Pattern Euro-Siberian.

Within the former Soviet Union. European part of Russia: Don and Volga rivers, in the north up to lower Kama River region, southern Urals, Orenburg, Millerovo, Ryazan, Orel; West Siberia (Kurgan, Omsk, Karasuk); Ukraine; Crimea.

Beyond the former Soviet Union. Europe: Spain, France, southern Germany, Austria, Hungary, southern Poland, Czech Republic, Slovakia, Bulgaria (Buresch & Tuleschkow, 1943), Macedonia, Greece, European Turkey; (?) China (Xinjiang).

Biology. Associated with limestone (Koch, 1984). Flight from mid-June to the end of July.

Larva black with a reddish dorsal strip and oblique strokes on lateral sides. Warts black with fascicles of dark gray hairs on dorsal side and with red hairs on lateral sides. Head black. Caterpillars living on *Galium*, *Achillea* and other herbs from August till June, hibernating. Pupation in a loose cocoon on the ground or under stones.

Note. Toulgoet's (1985) treatment of this species seems to be imperfect. In particular, the attribution of several oriental forms like *dahurica*, *caecilia*, *reticulata* and some others to the ssp. *mannerheimi* seems incorrect.

Similar species. *Ch. dahurica* (Boisduval), *Ch. tianshana* Dubatolov, *Ch. ferghana* Dubatolov (see key).

67. *Chelis reticulata* (Christoph, 1887)

(Pl. 14, Figs 13-14)

Arctia maculosa reticulata Christoph, 1887a: 163, TL: Nukhur, W. Kopetdagh.

[reticulum – web (Lat.)]

Daniel, 1933: 103, *Chelis maculosa schwingenschussi*

Schwingenschuss, 1937: 59, *Chelis maculosa sultana*

Dubatolov, 1988: 92, fig. 2d, *Chelis reticulata transcaucasica*

Subspecies:

C. r. schwingenschussi Daniel, 1933

C. r. sultana Schwingenschuss, 1938

C. r. transcaucasica Dubatolov, 1988.

Description. Alar expanse 31-35 mm. Fw creamy or creamy gray with a black pattern of spots. Marginal series of spots including two rather large spots triangular or oval in form, one at apex and the second in the middle of external edge. Last spot cut by thin light strips on veins. Hw yellowish, often with pink spots at base and in the centre of wing. Submarginal series of rounded spots on hw quite well-developed while series M2 usually not expressed. Spot on transverse vein narrow, as a rule. Antenna double-combed, in male with long crests, in female with shorter ones but still these 2 times longer than their segment thick.

Variability. Individual variability is marked in colour variation and the degree of development of hw pattern, i.e. belt M2 sometimes visible, median spot on hw enlarged, pink tint on hw reduced.

The following subspecies are known:

ssp. *schwingenschussi* – Asia Minor;

ssp. *sultana* – with bright pink hws, described from the Anthurus Mt. Range, Turkey;

ssp. *transcaucasica* – differing by a well-developed stria M2 while boundary spots on fw weakly divided on veins (Dubatolov, 1988). However, as the rich topotypic material available to us, from Aragats Mt., Armenia, proves to contain numerous specimens identical to the nominotypical form, this subspecies is questionable.

Distribution. Pattern Anatolian-Caucasian.

Within the former Soviet Union. Caucasus, Transcaucasia, W. Turkmenistan (Kopetdagh, Greater Balkhan);

Beyond the former Soviet Union. Northern Iran, Turkey.

Biology. Flight in the end of June and in July at 1400-2000 m a.s.l. Often flying to light.

Similar species. *Ch. maculosa mannerheimi*, smaller, light veins not dividing the marginal spots. Both *Ch. maculosa mannerheimi* and *Ch. reticulata* occur sympatrically in the northern Caucasus.

68. *Chelis caecilia* (Kindermann, 1853)

(Fig. 66)

Arctia maculosa caecilia Kindermann, 1853, in Lederer: 364, TL: Altai.

[= *insularia* Kozhantchikov, 1924]

[*caecilia* – a female name (Lat.)]

Lederer, 1855a: 97-121, *Arctia maculosa caecilia*

Seitz, 1910: 78, pl. 14, row g; pl. 16, row a, *Cletis maculosa caecilia*

Spuler, 1910: 137, *Arctia mannerheimi caecilia*

Koshantschikov, 1924: 69, *Cletis maculosa insularia*

Dubatolov, 1988: 80, *Chelis insularia*

Dubatolov, 1994: 16, *Chelis caecilia*

Dubatolov, 1996b: 56, *Chelis caecilia*

Description. Alar expanse 34 mm. Fw yellow-gray with black spots. Marginal pattern of fw consisting of two large triangular spots not divided by light veins. As remaining black spots large, general coloration of wing dark. Hw coloration from red to gray with black boundary and submarginal maculae merged due to radial bands, latter running from base of wing to external edge. Median spot well-developed. Abdomen with a black dorsal stria, thorax yellow with three longitudinal striae, collar yellow.

Variability is displayed in width of the light pattern on the fw and in size of the dark spots on the hw. It also concerns hw coloration.

Distribution. Pattern South Siberian.

Within the former Soviet Union. Altai Mts; Khakassia; Kuznetskiy Alatau Mts (Fig. 62), western Buryatia; northeastern Kazakhstan.



Fig. 66. *Chelis caecilia* (Kind.), ♂. Russia, Altai Mts, Kuraiskiy Mt. Range, Aktash, 1600 m, 5.VI.1999. V. Murzin leg., Coll. V. Murzin (photo by V. S. Murzin).



Fig. 67. *Chelis dahurica* (Bsd.), ♂. Russia, Altai Mts, 10 km E of Aktash, 50°19'N, 87°45'E, 2500 m, 10.VII.2000 (photo by O. G. Gorbunov).

Beyond the former Soviet Union. Mongolia.

Biology. Flight in June at 1200-2000 m a.s.l. In the Altai, the species occurs on felling grounds, in sparse taiga stands and also on taluses with thin vegetation.

Note. Spuler (1910) erroneously considered *Ch. caecilia* as *Arctia mannerheimi* var. *caecilia* and recorded this variety in Bulgaria and Armenia. Seitz (1910) considered *Ch. caecilia* as a small form of *Ch. maculosa* distributed from Asia Minor to the Altai, with transitional forms already found in Eastern Europe. One of such "transitional" forms showing the black spots on the fws so greatly enlarged that they often merge at the edge is *slivnoënsis* Rebel, described from Bosnia. Draudt (1931) omitted *Ch. caecilia* altogether. The same concerns Dubatolov's (1988) revision of *Chelis* and his faunistic list of the mountains of southern Siberia (Dubatolov, 1990). In contrast, later (Dubatolov, 1994, 1996), *Ch. caecilia* has been resurrected to full species known from "East Kazakhstan", Buryatia, Khakassia and Mongolia.

Similar species. *Ch. dahurica*, differs by bright hws with a smaller number of black spots.

69. *Chelis dahurica* (Boisduval, 1832)

(Pl. 14, Fig. 15; Pl. 15, Figs 1–3; Figs 68, 69; genitalia in Pl. 26, Fig. 9)

Chelonia dahurica Boisduval, 1832: 126, pl. 60, fig. 1, TL: Altai (?) (Dubatolov, 1988), Turkestan (Fang, 2000).

[= *gruneri* Staudinger, 1867; *maculosa sojota* Tschetwerikov, 1904].

[dahurica – from Dahuria, a historical and geographical region covering the basins of Shilka, Argun, Zeya, Bureya and some other rivers in Transbaikalia) (Lat.)]

Tschetwerikov, 1904: 77-79, *Cletis maculosa sojota*

Seitz, 1910: 78, pl. 14 row f, *Cletis maculosa dahurica*

Dubatolov, 1988: 94, *Chelis dahurica*

Dubatolov, 1996: 59, *Chelis dahurica*

Fang, 2000: 345, pl. 6, fig. 10, *Chelis dahurica*

Description. Alar expanse 35-37 mm. Fw from creamy to dark gray. Black spots prolate in longitudinal direction, this providing an arrow-like appearance. In particular, such a spot filling the central cell. All veins clearly brightened. Besides, often there is a transverse stria in discoidal cell, Ls stria above anal vein, and a white X-shaped pattern in external half of wing. Hw of male pink, of female brighter. Spots of subbasal row often merged with each other into a transverse belt adjacent to median spot. Spots of submarginal row rounded, rather large, sometimes merged. Fw of female narrower, abdomen large and thick.

Variability. The following infrasubspecies are known:

f. *sojota* Tschetwerikov, 1904. Described as a subspecies of *Ch. maculosa*, from Irbek River, Siberia. This form distributed “south of Sayan Mountains, Minusinsk” (Tschetwerikov, 1904) is very similar to *Ch. dahurica* but shows much darker chestnut coloured fws. As a similar kind of moth occurs in the Altai among the usual *Ch. dahurica*, we probably face an infrasubspecific form;

f. *gruneri* (Staudinger, 1867). Described as a distinct species from Ust-Kamenogorsk, southwestern Altai. Alar expanse 37 mm. Fw very light, creamy in colour, with small black maculae disposed along cells of fw in the form of



Fig. 68. *Chelis dahurica* (Bsd.), ♀. Russia, Altai Mts., Ukok Table-land, 49°15'N, 88°05'E, 2800 m, 6.VIII.1990 (photo by V. S. Murzin).



Fig. 69. *Ch. dahurica* f. *kenigsbergi*, forma nova. Russia, Altai Mts., Kuraiskiy Mt. Range, near Chagan-Uzun, 2000 m, 10.VII.1997, V. Murzin leg., Coll. V. Murzin (photo by V. S. Murzin).

narrow longitudinal striae; hw pink with black spots bordered yellow; body light, thorax with a black triangular spot in the middle and with black patagia, abdomen with a black dorsal series of points;

f. *kenigsbergi* forma nova, Kuraysky Mts (Chagan-Uzun) at 2000 m a.s.l., 10.VII.1997 (Fig. 69). 1 specimen, ♂.

Alar expanse 32 mm. Fw light brown with several rather small black maculae. Series of cuneiform spots along external edge of fw. A black stria running from base of fw along costal vein (such a stria missing in *Ch. d. dahurica*). Black spots on fw edged pale. Hw red with black boundary spots (like in *Ch. d. dahurica*). A light vein traversing a small discal spot.

Distribution. Pattern South Siberian.

Within the former Soviet Union. South Urals; Siberia: Kurgan and Omsk regions; Novosibirsk, Karasuk, Barnaul; mountains of South Siberia: Altai, Khakassia, Tuva, Sayan Mts; Irkutsk, Transbaikalia, Kazakhstan: Saur, Tarbagatay Mts.

Beyond the former Soviet Union. Northern and central Mongolia; China: Xinjiang.

Biology. More common in the mountains up to 2000 m a.s.l., yet also found over plains in the forested steppe from the Altai and Novosibirsk region to Shadrinsk, Kurgan Region. Flight in July.

Similar species. *Ch. maculosa mannerheimi*, dark triangular spot at fw apex not traversed by light veins, median spot on hw small. *Ch. caecilia*, strongly developed black spots on hw merged due to radial striae.

70. *Chelis ferghana* Dubatolov, 1988

(Pl. 15, Fig. 4; genitalia in Pl. 26, Fig. 10: 1)

Chelis ferghana Dubatolov, 1988: 92, figs 1n, 2e, TL: Padsha-Ata River (Chatkalskiy Mt. Range, north of Namangan).

Description. Alar expanse 33-36 mm. Fw straw with numerous black maculae. Marginal series of spots consisting of separate cuneiform maculae divided by light veins.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Chatkalskiy and Talasskiy Mt. ranges, Toktogul.

Beyond the former Soviet Union. Unknown.

Biology. Flight in the end of June in light deciduous and mixed woods at about 1500 m a.s.l.

Similar species. *Ch. maculosa mannerheimi*, *Ch. dahurica*, differ reliably by male genitalic structure only. *Ch. caecilia*, hw with a predominantly dark pattern.

71. *Chelis tianshana* Dubatolov, 1988

(Genitalia in Pl. 26, Fig. 10: 2)

Chelis tianshana Dubatolov, 1988: 93, figs 1k, 2g, TL: Uzun-Gyr (Kyrghizskiy Mt. Range).

[tianshana – after Tian-Shan Mts (Lat.)]

Description (based on paratypes). Alar expanse 36-38 mm. Fw light with large black spots. Several cuneiform spots at external edge of fw, these traversed by light veins. Remaining black pattern expressed completely, but general coloration of wings light due to spots edged by wide light fields. Discoidal spot rectangular but broken into three parts by discoidal vein. Hw pinkish red. Submarginal belt consisting of large maculae. Discoidal spot well-developed. Median belt (M2) running from costal edge to vein A3. Underside pink with a dark pattern concurring with upper side pattern.

Variability. Development of a black pattern is varied.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Central and East Tian-Shan (Kirghizskiy Mts, Susamyr Valley, Terskey Alatau, Zailiiskiy and Dzhungarskiy Alatau, Naryn), Tarbagatay Mt. Range.

Beyond the former Soviet Union. China (Xinjiang: East Tian-Shan).

Biology. Flight in July on open places with bushes, on mountain slopes overgrown with taluses.

Similar species. *Ch. ferghana*, lighter with developed light striae, like *Ch. dahurica* differs by genitalic conformation.

32. Genus *Grammia* Rambür, 1866

Grammia Rambür, 1866: 261, TS: *Bombyx quenseli* Paykull, 1793.

= *Orodemnias* Wallengren, 1885: 315, TS: *Bombyx quenseli* Paykull, 1793

= *Callarectia* auct., non Packard, 1864

= *Holarctia* Smith, 1938: 6, TS: *Arctia turbans* Christoph, 1892

Antennae of male bipectinate, of female simple, slightly dentate. Proboscis short, rolled into a spiral. Palps thin, coated with long hairs. Hind tibiae with two pairs, middle with one pair, of calariae. Fore tibiae 2 times shorter than femur.

Male genitalia: tegumen shorter than uncus, juxta ventrally nearly crescent in form, aedaeagus short and thick.

In North America, more than 20 congeners are known.

Key to our species or subspecies of *Grammia*:

- | | |
|----------------------------------|----------------------------|
| 1. Hw yellow. | 2 |
| –. Hw red. | <i>G. philippiana olga</i> |
| 2. Basal part of hw yellow. | <i>G. turbans</i> |
| –. Basal part of hw dark. | <i>G. quenseli</i> |

72. *Grammia quenseli* (Paykull, 1793)

(Pl. 15, Figs 7-8; genitalia in Pl. 26, Fig. 11)

Bombyx quenseli Paykull, 1793: 99, pl. 2, fig. 2, TL: Sweden.

[= *strigosa* Fabricius, 1794; *quenseli* v. *falloui* Jourdheuil, 1866; *gelida* Schöyen, 1880, (preoccupied by Moschler, 1848); *quenseli* var. *norvegica* Strand, 1919 (replacement name for *gelida* Schöyen, 1880); *daisetsuzana* Matsumura, 1927: 110, 113]

[*quenseli* – in honour of Swedish entomologist Conrad Quensel]

[Ecaille Radiante – (Fr.)]

Ménétriès, 1859b: 500, *Chelonia quenseli liturata*

Spuler, 1910: 139, pl. 73, fig. 27, *Arctia quenseli*

Seitz, 1910, 82, pl. 16, row g, *Orodemnias quenseli*

Esaki et al., 1971: 209, pl. 121, fig. 2561, *Orodemnias quenseli daisetsuzana*

Subspecies:

G. q. liturata (Ménétriès, 1859) [= *G. q. daisetsuzana* (Matsumura, 1927)].

Description. Alar expanse 35-37 mm. Fw black with contrastingly yellow veins. Yellow pollination on vein Cu2 especially expanded. A yellow transverse stria or point at apex of cell. A zigzag transverse stria along external edge of wing. Hw of male uniform dark gray. Hw of female with a yellow field forming a marginal stria with irregular edges. Thorax black with yellowish striae and patagia, latter surrounded by yellow. Abdomen yellow with a black stria from above and with spots on each lateral side.

Variability. Width of yellow striae on veins varied.

Several subspecies are known:

ssp. *quenseli* – distributed in the polar parts of Europe and Asia;

ssp. *liturata* – southern and East Siberia: Altais, Tuva, Sayan, Transbaikalia, Middle Amurland, Zeya River; Russian Far East: Yakutia, Magadan and northern Khabarovsk regions, Kamchatka; northern Mongolia, northern Japan.

Distribution. Pattern circumpolar. Widely but locally spread in Europe, Asia and America.

Within the former Soviet Union. Khibines, Polar Urals, Altais, Tuva, East Sayan, Transbaikalia, Yakutia, Magadan Region, Kamchatka, Wrangel Island; Saur Mts, southeastern Kazakhstan.

Beyond the former Soviet Union. Europe (Alps, Carpathians, polar regions of Scandinavia); northern Mongolia; Hokkaido Island, Japan; Xinjiang, Hebei, Heilongjiang, China; polar regions and mountains of North America.

Biology. Flight in June-July, in the south in the mountains on rather humid slopes, in near-polar regions in the tundra. Caterpillar black; a light stria consisting of points and strips running along body. Blackish fibrous warts on segments 4 to 12. Reddish spiracles on each lateral side of body. Hairs on fore segments short, on hind segments elongated, reddish brown.

Larvae occurring since July until spring, hibernating, living on various herbaceous plants: *Lathyrus*, *Geum*, *Plantago*, *Taraxacum*, *Gentiana*. In the daytime larvae hiding under stones. Pupa brown with bluish pollination, in a loose cocoon under stones, perhaps sometimes hibernating.

Similar species. *G. philippiana olga*, differs by red hws with a black pattern; *G. turbans* (Christoph), has yellow hws with black spots.

73. *Grammia philippiana* Ferguson, 1985

(Fig. 70)

Grammia philippiana Ferguson, 1985: 229, figs. 53-54, TL: Alaska.

Grammia philippiana ssp. *olga* Dubatolov, 1990a: 79, TL: Wrangel Island.

[*olga* – in honour of Olga Khruleva, the collector]

Description. Male (based on paratype). Alar expanse 35 mm. Fw black with contrastingly white veins. White pollination on vein Cu2 especially wide. Light transverse stria or point at apex of cell absent. A zigzag, pale, transverse stria passing along external edge of wing. Hw of male uniformly dark gray with a pink undulate fascia close to external edge. Underside pattern the same. Eyes small, oval, strongly convex, without ciliae. Antennae short, about half as long as costal edge, bipectinate, black. Tibiae from above white, their underside black. Hind tibiae gradually enlarged toward apex. Thorax and abdomen black.



Fig. 70. *Grammia philippiana* ssp. *olga* Dubatolov. ♂ paratype (left). Wrangel Island, between Roger and Somnitelnaya bays, 21.VII.1960, leg. A. Velijanin. ♀ (right). Wrangel Island, lower reaches of Gusinaya River, 14.VII.1984, leg. O. Khruleva (ZMUM).

Female. Alar expanse 34-35 mm. Pattern like in male but more contrasting while pollination on veins yellowish. Thorax yellowish with a central black line. Patagia edged yellow. Hw red with black radial striae running from base of wing, with irregular edges. Abdomen yellow with a black stria from above and with spots on each lateral side.

Distribution. Pattern Polar American.

Within the former Soviet Union. Wrangel Island.

Beyond the former Soviet Union. Polar regions of North America, Alaska.

Biology. Flight from mid-July to early August.

Similar species. *G. quenseli*, has the hw yellow or black, not red; light longitudinal stria at the apex of central cell of fw absent; costal process of valve longer, narrow at base, not narrowed toward apex.

74. *Grammia turbans* (Christoph, 1892)

(Pl. 15, Figs 10-11)

Arctia turbans Christoph, 1892: 460, TL: Tunga-Alpen, SW of Irkutsk.

[turba – disorder, confusion (Lat.)]

Seitz, 1910: 88, pl. 16, row g, *Orodennias turbans*

Dubatolov, 1996b: 60, *Grammia turbans*

Description. Alar expanse 35-37 mm. Fw black with contrastingly yellow veins. Yellow pollination on vein Cu₂ especially expanded. Apex of discoidal cell with a yellow longitudinal stria. A zigzag transverse stria along external edge. Hw of male yellow with a black boundary band, with four black submarginal spots and a large discal spot. Pattern of underside almost the same as from above, but submarginal spots on hw divided by yellow veins. Legs black with yellow tibiae. Forehead (epicranium) yellow. Thorax black with patagia edged yellow. Abdomen from upper side black; on lateral sides with yellow striae. Underside with segments edged yellow. Female with a dark basal part of hw.

Distribution. Siberian–West Nearctic.

Within the former Soviet Union. Khakassia, East Sayan, southern Baikal region, Transbaikalia, Middle Amurland, central Yakutia.

Beyond the former Soviet Union. Mongolia, Alaska, NW. Canada (Alberta, Saskatchewan, Manitoba).

Biology. Flight from the end of July and in August in various habitats like taiga, burned forests, grassy mountain slopes and forest glades. Caterpillar hibernating. In Transbaikalia, a mass species in the second half of summer (Dubatolov, 1985b).

Note. Smith (1938) referred this species to the subgenus *Holarctia* with the type species *Arctia turbans* Christoph.

Similar species. *G. quenseli*, hw almost completely infusate.

33. Genus *Hyperborea* Grum-Grshimaïlo, 1899

Hyperborea Grum-Grshimaïlo, 1899: 464, TS: *Hyperborea czekanowskii* Grum-Grshimaïlo, 1899.

Slender moths with a small head, short palpi and simple antennae. Fw widely triangular, hw rounded. A single species involved.

75. *Hyperborea czekanowskii* Grum-Grshimaïlo, 1899

(Pl. 15, Figs 13-14)

Hyperborea czekanowskii Grum-Grshimaïlo, 1899: 464, TL: Tunguska River valley.

[czekanowskii – in honour of A. L. Czekanowski (1832-1876), a famous explorer of eastern Siberia]

Seitz, 1910: 103, pl.18, row h, *Hyperborea czekanowskii*

Strand, 1919: 107, *Hyperborea czekanowskii*



Fig. 71. Russia, N. Siberia, Taimyr Peninsula supporting *Pararctia lemniscata* (Stich.), *Hyperborea csekanowiskii* (Gr.-Gr.), *Dodia albertae eudiopta* Tshist., *Pararctia tundrana* Tshist. and *Acerbia alpina* (Q.) (photo by A. Grazhdankin).

Description. Alar expanse of male 32-34 mm, of female about 25-27 mm. Male wing wide, length ratio of costal edge to external edge about 1.5. Fw dark gray, semi-transparent, with diffuse white pollination on veins and with a dentate stria along edge of fw. Hw white, with vague dark spots at edge and with 2-3 submarginal maculae. Female with narrow and short fws.

Variability insignificant.

Distribution. Pattern circumpolar.

Within the former Soviet Union. Polar and boreal regions north of 65°N, from the lower flow of Tunguska River to Chukotka and Wrangel Island as well as northern Kamchatka. This species has also been recorded in the Kodar Mt. Range, southern Transbaikalia (Kostjuk & Golovushkin, 1994).

Beyond the former Soviet Union. Alaska.

Biology. Flight in the tundra in July.

Similar species. No similar species seem to occur in our fauna.

34. Genus *Diacrisia* Hübner, 1819

Diacrisia Hübner, 1819: 169, TS: *Phalaena russula* Linnaeus, 1758.

= *Euthemonia* Stephens, 1828: 55 (key), 68, TS: *Phalaena russula* Linnaeus, 1758

= *Elpis* Dyar, 1893 (preoccupied by *Elpis* Mulsant, 1850 (Coleoptera)), TS: *Antarctia rubra* Neumögen, 1884

Dubatolov, 1985a, b, *Diacrisia*

A genus very close to *Parasemia* Hübner, 1820, but differing by lack of an accessory cell on fw. Veins R2-R5 on a common pedicel. Antennae of male double saw-toothed, of female simple with erect scales and hairs. Wing pattern of Type II A, fw monochromous, with a separated spot. Male genitalia: juxta nearly rectangular, with a membranous area in its median portion in ventral view, spinules absent.

Most species of this large genus are tropical.

Gaede (1930) and some other authors proposed to use the name *Spilosoma* Stephens, 1827 for Palaearctic moths as well. Indeed, superficially some African *Diacrisia* like *D. subhutea* (Bartel, 1903), *D. scortilla* (Wallengren, 1876) and

many others can easily be seen as strongly resembling species of *Spilosoma*, but we choose the usage of *Diacrisia* not only because its being an older name but also because both these genera differ considerably in male genital structure.

In our fauna, the genus is represented by two species.

76. *Diacrisia sannio* (Linnaeus, 1758)

(Pl. 16, Figs 1-6; Fig. 72; genitalia in Fig. 73 and Pl. 26, Fig. 12)

Phalaena sannio Linnaeus, 1758: 506, TL: Europe.

[= *russula* Linnaeus, 1758; *vulpinaria* Linnaeus, 1758; *sannio caucasiana* Strand, 1919; *Diacrisia sannio uniformis* A. Bang-Haas, 1907; *D. sannio syrdarja* Strand, 1919]

[*sannio* – clown (Lat.)]

[Clouded Buff, Clouded Ermine – (Engl.)]

[Rotrandbär – (Germ.)]

[Bordure Ensanglantée – (Fr.)]

Erschoff, 1874: 32, *Nemeophila russula*

Staudinger, 1887: 78, *Nemeophyla russula mortua*

Staudinger, 1892b: 347, *Nemeophila russula pallida*

Schaposchnikoff, 1904: 253, *Diacrisia sannio caucasica*

Bang-Haas, A., 1907: 76, pl. 3, *Diacrisia sannio uniformis*

Spuler, 1910: 141, pl. 74, figs 16a-b, *Diacrisia sannio*

Seitz, 1910: 94, pl. 14, row k, *Diacrisia sannio*

Strand, 1919: 416, *Diacrisia sannio caucasiana*

Sedykh, 1974: 149, *Diacrisia sannio*



Fig. 72. *Diacrisia sannio* (L.), ♂. Kirghizia, Lake Issyk-Kul, 1600 m a.s.l., 16.VII.1980, leg. V. Murzin (photo by O. G. Gorbunov).

Subspecies:

D. s. mortua Staudinger, 1887 (including f. *uniformis*)

D. s. pallida Staudinger, 1892b

D. s. caucasica Schaposchnikoff, 1904.

Description (based on material from near Moscow, Russia). Male: alar expanse 38-40 mm. Fw yellow with hind edge and fringe pink. A dark spot on discal vein in the middle of fw. Hw pale yellowish with a gray-brown submarginal band (3.5 mm in width), a yellow edge and a pink fringe. Discal vein with a gray-brown spot. Head and thorax yellow. Antennae double-pectinate. Underside of hw yellow with a diffuse middle spot. Underside of fw dark gray with a yellow edge and a dark spot in the middle.

Female a little slenderer (34-36 mm), with a narrower fw. Upper side orange ochre with infuscation on transverse vein, hw with a dark pattern, i.e. a black spot on discal vein, a darkened fw base, a black submarginal band at inner edge connected to basal part. External edge of fw yellow. Underside of wing ochre yellow with discal and 1-2 submarginal maculae black. Two black rays running from basis of fw, base of hw infuscate.

Variability appreciable.

In Central Asia, in eremic parts like Syr-Darya and Ili rivers in particular, the form *uniformis* A. Bang-Haas (= *syrdarja* Strand) is known to occur; uniform yellow without dark pattern of fw and hw, underside likewise almost without dark pattern except for traces of a median spot; this form is common but does not seem to dominate (Pl. 16, Fig. 3);

ssp. pallida – a reduced black pattern (width of black belt on hw diminished); individual variations of this form occur in Europe, but more often in the central parts of Asia like the Altai, Dahuria and Tarbagatay Mts;

ssp. mortua – encountered in the Alai Valley, in the south of Fergana Valley and at Lake Issyk-Kul and, according to Seitz (1913), differing by a completely lacking pink coloration of fw hind edge. Hw yellow in coloration but black pattern persisting. Among the material available to us from the Lake Issyk-Kul region, there are samples with the inner edge either pink or yellow while the black pattern of the hw is clearer than in the central Russian, typical form.

Males from Mongolia are characterised by an even more strongly developed black edge of the hw and by a darkened underside of the fw;

ssp. caucasica [= *caucasiana* Strand] – Caucasus, Transcaucasia, a little deviating form with a more strongly developed dark pattern slightly surpassing the normal range of individual variation.

In general, only *mortua* (including f. *uniformis*) and *pallida* might indeed prove to deserve a subspecific rank.

Distribution. Pattern North Palaearctic.

Within the former Soviet Union. Baltic countries; Belarus; Ukraine; Crimea; Moldova; European Russia (except for such boreal parts as Karelia, central part of Komi Republic, Arkhangelsk); Caucasus; Transcaucasia (Armenia, Nakhichevan); central and southern Siberia (Ob River and Tomsk regions), Transbaikalia, central Yakutia.

Beyond the former Soviet Union. Western China, Mongolia.

Biology. Flight in June-July on forest glades and humid grassy lawns. In the daytime, easy to fly up from herbs. Caterpillar dark brown with reddish pubescence, a pale red, spotty, dorsal stria and white spiracles. From August to May,

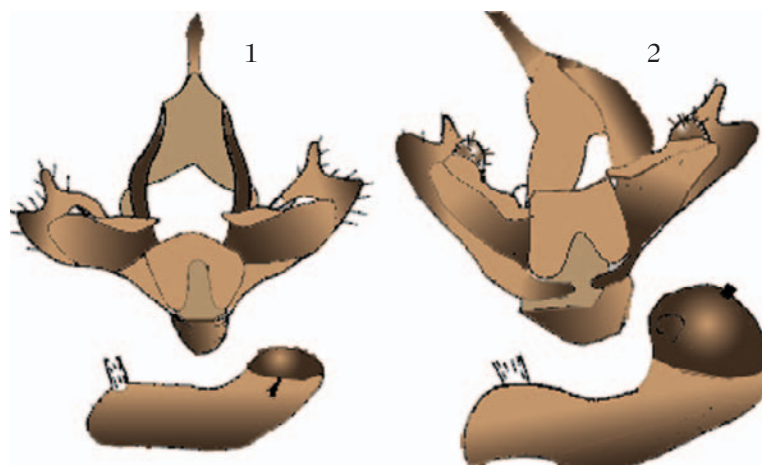


Fig. 73. Male genitalia of *D. sannio* (L.) (1) and *D. irene* Btl. (2) (after Dubatolov, 1985a).

larvae feeding on *Taraxacum*, *Plantago*, *Trifolium*, *Euphorbia*, *Urtica*, *Galium*, *Alnus incana*, *Salix*, *Polygonum* spp., *Chamaenerion angustifolium*, *Calluna vulgaris*, *Vaccinium uliginosum*, *V. oxycoccos*, *Cirsium arvense*, *Hieracium umbellatum*, hibernating. Pupation in loose cocoons on the ground or under stones. Pupa red-brown, glossy.

Similar species. *D. irene*, has a pink colour on the hw, a dark background coloration of the fw underside, and conspicuous male genitalia (Fig. 73).

77. *Diacrisia irene* Butler, 1881

(Pl. 16, Figs 7-9; genitalia in Fig. 73)

Diacrisia irene Butler, 1881: 6, TL: Japan.

[= *sannio rishiriensis* Matsumura, 1930a; *sannio rubrocentralis* Bryk, 1948]

[irene – a feminine name]

Staudinger, 1892c: 277, *Diacrisia russula amuri*

Spuler, 1910: 132, *Diacrisia sannio* v. *amuri*

Seitz, 1910: 94, pl. 14, row k, *Diacrisia sannio irene*

Esaki et al., 1971: 210, fig. 2568, *Diacrisia sannio irene*

Dubatolov, 1985a: 70, *Diacrisia irene*

Dubatolov, 1985a: 70, *Diacrisia irene amuri*

Subspecies:

D. i. amuri Staudinger, 1892.

Description. Alar expanse 38-40 mm. Main colour of fw and hw ochre yellow. Hind edge of fw pink. Spots on fw also with pink colour. Submarginal stria on hw consisting of clear dark gray maculae. Discal spot angular, fringe pink. Underside of fw also yellow with gray subcostal belt and stria from base of fw along median cell to dark spot on discal vein.

Variability modest.

The ssp. *amuri* was originally referred to *D. sannio*, but Dubatolov (1985a) has shown that, as *amuri* differs considerably from *sannio* by genitalic conformation, it must be regarded as a separate species. Based on the external resemblance of the Japanese *D. irene* and the Russian Far Eastern *amuri*, however, even without study of pertinent material of *irene* but only using the pictures as presented by Inoue (1982), Dubatolov (1985a) has referred to *amuri* as a subspecies of *D. irene*. We have studied an example from Hokkaido and can confirm Dubatolov's opinion.

Distribution. Pattern East Asian.

Within the former Soviet Union. The Far East, Middle Amurland; according to Dubatolov (1985a), Upper Cisamuria, Primorye, Sakhalin and southern Kuril Islands.

Beyond the former Soviet Union. Northeastern China, Japan and Korea.

Biology. Flight in the end of June and in July.

Similar species. *D. sannio*, differs mainly by lack of a pink colour on the hw, by the dark background coloration of fw underside, and by male genitalic structure (Fig. 73).

35. Genus *Rhyparioides* Butler, 1877

Rhyparioides Butler, 1877: 395, TS: *Rhyparioides nebulosa* Butler, 1877.

Fw with residual dark spots or spotty striae. In other respects, this genus is similar to *Diacrisia* Hübner, 1819.

Male genitalia: juxta nearly rectangular with short denticles laterally in its apical $\frac{1}{4}$ - $\frac{1}{3}$. Aedaeagus with small spinules in apical portion (Fang, 2000).

Three species in our countries. From China, *Rhyparioides subvarius* (Walker, 1855) is known [= *Diacrisia subvaria* Walker, 1855].

Key to species of *Rhyparioides*:

1. Antennae of male bipectinate. 2
 –. Antennae of male biserrate. 3
 2. Fw median veins of male with dark red or brown pollination. Fw veins of female with scarlet tint.
 *R. metelkana*
 –. Fw with veins devoid of red tint. *R. amurensis*
 3. Abdomen crimson, fw without dark discoidal marking. *R. nebulosa*
 –. Abdomen orange, fw with a dark discoidal marking over a yellow background. *R. subcarius* (China)

78. *Rhyparioides metelkana* (Lederer, 1861)

(Pl. 15, Figs 10-12)

Nemeophila metelkana Lederer, 1861: 162. pl. 3, fig. 12, TL: Hungary (“Also-Dabas near Felsu-Dabas”).

[= *flavida* Bremer, 1861; *occidentalis* Daniel, 1939, *simanensis* Miyake, 1909, *okinaŵana* Matsumura, 1927, *sounkeana* Matsumura, 1927, *kianŵsui* Daniel, 1943]

[metelkana – after Fr. Metelka, a German inventor engineer]

Bremer, 1861: 477, *Chelonia flavida*

Hampson, 1901: 299, *Diacrisia metelkana*

Spuler, 1910: 132, pl. 74, fig. 14, *Diacrisia metelkana*

Seitz, 1910: 94, pl. 14, row i, *Rhyparioides metelkana*

Esaki et al., 1971: 210, pl. 121, fig. 2565, *Rhyparioides metelkana*

Dubatolov, 1985c: 86, *Rhyparioides metelkana*

Fang, 2000: 326, pl. 14, fig. 16, *Rhyparioides metelkana*

Subspecies:

Rh. m. flavida Bremer, 1861.

Description. Alar expanse 40-42 mm. Fw of male lemon yellow, of female dark, yellow brownish. Male fw with several black points, an infuscate spot around discal vein and a dark vague stria along cubital vein. In addition, female with a series of reddish maculae. Hw of male rosy red with a black median spot and a series of submarginal spots. Female hw brighter.

Variability modest.

Ssp. *flavida* – Primorye, Russia, Japan and Korea; coloration of fw less bright; dark pattern of fw weakened.

Distribution. Pattern amphi-Palaeartic.

Within the former Soviet Union. Southern Ukraine; Rostov-on-Don Region, European part of Russia; Middle Amurland and Primorye, Far East.

Beyond the former Soviet Union. Central Europe (northern France, some regions of Germany), part of Eastern Europe (Hungary, Poland, southern Slovakia, delta of Danube River) and Far East (Korea, China [Zhejiang (Daniel, 1955)], Japan).

Biology. Preferring open places in woodland, meadows on river and stream banks. Flight from mid-June to mid-August. Last instar caterpillar pale yellow with two wide, dark, longitudinal striae divided by a narrow white line. Yellowish dorsal warts on striae with gray-yellow, here and there reddish, hairs. Thoracic as well as 2-3 last segments with admixture of black hairs. Underside black-gray, false legs red-brown, thoracic legs and head black. Caterpillars often living in cane, *Phragmites* sp. (above and under the water, upon which they can move fast), on other water plants (*Iris*, water lily, *Nymphaea alba*, where they eat away round foramina in the middle of the plant), on *Taraxacum*, *Euphorbia*, *Caltha*, *Polygonum persicaria* (Fang, 2000). Larvae hibernating and can be found from spring to mid-June. Pupation in a yellowish cocoon on stems or leaves of plants. Pupa black-brown with reddish edges of segments (Spuler, 1910).

Similar species. *Diacrisia sannio* and *D. irene*, differ by lack of a longitudinal stria on the fw; hw yellow, along inner edge of wing with rectangular spots sometimes fused into a belt; in female, basal part of hw dark.

79. *Rhyparioides amurensis* (Bremer, 1861)

(Pl. 17, Figs 1-2; genitalia in Pl. 26, Fig. 13)

Chelonia rubescens amurensis Bremer, 1861: 477, TL: Amur.

[*amurensis* – from Amur River (Lat.)]

Hampson, 1901: 298, *Diacrisia amurensis*

Seitz, 1910: 94, pl. 14, row i, *Rhyparioides amurensis*

Esaki et al., 1971: 210, pl. 121, figs 2566-2567, *Rhyparioides amurensis*

Fang, 2000: 326, pl. 14, fig. 16, *Rhyparioides amurensis*

Description. Alar expanse 42-44 mm. Fw of male bright yellow with a small number of black points (1-3 points in the middle of wing costal edge, sometimes on transverse vein and near hind edge), hw pink with black spots (one spot on median vein, 1-2 closer to base, and several spots forming submarginal series). All body yellow with series of black points on upper side and on each side of abdomen. Chaotically scattered brownish spots over a yellow surface of fw in female. Remaining pattern like in male.

Variability considerable.

F. obliterated Kardakoff, 1928 – distinguished by a slightly reduced black pattern.

Subspecies are known from Japan and China:

ssp. *meridei* Daniel, 1943 – China;

ssp. *nipponensis* Kishida & Inomata, 1981 – Japan.

Distribution. Pattern Eastern Asian.

Within the former Soviet Union. Middle Amurland, Primorye, southern Kuril Islands.

Beyond the former Soviet Union. China: Kiukiang, Hubei, Sichuan, Heilongjiang, Henan, Zhejiang, Jiangsu, Dunbei, Hebei, Shaanxi, Fujian, Jiangxi, Hunan, Guangxi, Shanxi, Yunnan, Jilin, Liaonin, Nei Mongolia, Shandong (Dubatolov, personal communication; Fang, 2000); Korea; Japan.



Fig. 74. Russia, Primorye, environs of. Ussuriysk, forest glade with tiger lily in deciduous wood, a place supporting numerous and various tiger moth species like *Arctia caja phaeosoma* (Btl.), *A. flavia* (Fuessly), *Pericalia matronula* (L.), *S. kindermanni pretiosa* (Stgr.), *Diacrisia irene* Btl., *Rhyparioides nebulosa* Btl., *R. amurensis* (Br.), *R. metelkana* (Led.), *Rhyparia purpurata* (L.), *Amurrhyparia leopardinula* (Stgr.), *Chionarctia nivea* (Mén.), *Spilosoma lubricipedum* (L.) and others (photo V. S. Murzin).

Biology. Flight in July on forest glades in the belt of deciduous forest. Flying to light. Larva dwelling on *Ulmus*, *Genista* sp. (Fang, 2000).

Similar species. *Rh. nebulosa*, external edge of fw with a series of black points or strips.

80. *Rhyparioides nebulosa* Butler, 1877

(Pl. 17, Figs 4-5)

Rhyparioides nebulosa Butler, 1877: 396, TL: Yokohama, Japan.

[= *simplicior* Butler, 1881]

[*nebulosa* – foggy, unclear (Lat.)]

Hampson, 1901: 314, 317, *Diacrisia nebulosa*

Seitz, 1910: 94, pl. 14, row i, *Rhyparioides nebulosa*

Esaki, 1971: 210, pl. 121, fig. 2564, *Rhyparioides nebulosa*

Fang, 2000: 325, pl. 14, fig. 15, *Rhyparioides nebulosa*

Description. Alar expanse 50 mm. Fw yellow. Male sometimes with black spots at costal edge. Hind half of fw except external edge dark, brownish. Body orange yellow with black points on upper side and on lateral sides of abdomen. Fw of female with brownish spots over its orange yellow background. Black points at external edge of fw in both sexes.

Variability insignificant.

Distribution. Pattern Eastern Asian.

Within the former Soviet Union. Southern Primorye, Kunashir Island.

Beyond the former Soviet Union. Japan (Hokkaido, Honshu), Korea, northern China (Dunbei, Nei Mongol, Heilongjiang, Jilin, Liaonin).

Biology. Flight in July on forest glades. Larvae living on *Taraxacum mongolicum* (Fang, 2000).

Similar species. *Rh. amurensis*, fw of male monochromous, yellow, with small black spots. External edge of fw without black points.

36. Genus *Rhyparia* Hübner, 1820

(Genitalia in Pl. 26, Fig. 14)

Rhyparia Hübner, 1820: 183, TS: *Phalaena purpurea* Linnaeus, 1758.

Dubatolov, 1985a: 66, *Rhyparia*

Moth of medium size. Fw yellow with dark spots. Accessory cell on fw missing. Antennae of male pectinate, of female bristly. Palps long, directed down and forward. Proboscis developed.

Male genitalia: juxta semi-oval with numerous minute denticles in distal half, valva with a semicircular process bearing numerous denticles, aedaeagus strongly curved.

81. *Rhyparia purpurata* (Linnaeus, 1758)

(Pl. 17, Figs 3, 6, 7; Fig. 75; genitalia in Pl. 26, Fig. 14)

Phalaena purpurea Linnaeus, 1758: 505, TL: "Roes. Inf." (Russia).

[= *obscura* Rehberg, 1880; *rhypariella* Strand, 1919]

[*purpurata* – purple-dressed (Lat.)]

[Purpurbär – (Germ.)]

[Ecaille Pourprée – (Fr.)]

Alpheraky, 1867: 14, *Arctia purpurata caucasica*
 Krulikovsky, 1909: 172, *Rhyparia purpurata barteli*
 Spuler, 1910: 131, *Rhyparia purpurata uralensis*
 Seitz, 1910: 93, pl. 14, row h, *Rhyparia purpurata*
 Warnecke, 1918: 81, *Rhyparia purpurata gerda*
 Fang, 2000: 323, pl. 14, fig. 14, *Rhyparia purpurata*

Subspecies:

Rh. p. caucasica (Alpheraky, 1867)

Rh. p. barteli Krulikovsky, 1909

Rh. p. uralensis Spuler, 1910

Rh. p. gerda Warnecke, 1918.

Description. Alar expanse 40-43 mm. Fw bright yellow with numerous dark, sometimes weakly expressed, brownish spots. Hw red with contrasting black spots: two spots or striae close to base of wing, one in the centre of discal vein, and four spots forming submarginal series. Head, thorax and abdomen yellow. Latter with series of black points on dorsal side. Male antennae pinnate, female ones simple.

Variability. Individual variability appreciable (Fig. 75). Specimens with reduced dark spots on fw occurring everywhere (f. *berostripnesis* Fuchs, 1897 and f. *immaculata* Fuchs, 1897). The ab. *flava* Staudinger, 1861 with orange hws occurs seldom. In f. *flavescens* Spuler, 1910 and f. *transiens* Spuler, 1910, red tint replaced to some extent by yellow.

The extremely aberrant form *paradoxa* Phillips, 1922 (Draudt, 1931, pl. 7, row c) is noteworthy (Fig. 75), in which the fw is brown with the gap of a yellow field in the basal part. The base of the hw is orange with a black external border taking up more than half of the wing.

The following subspecies can be accepted:

ssp. *caucasica* – dark spots on fw almost completely lost; a similar form occurring in the Zailiiskiy Alatau Mts east of Alma-Ata; the apparently close *uralensis*, which we only consider as a form or aberration of *purpurata*, shows diminished dark spots at the fw costal edge only;

ssp. *barteli* – southern Urals; diminished and attenuated spots on upper side of fw; probably this form can be joined with *uralensis*; Dubatolov (1996b) refers to *barteli* as a synonym of the nominotypical form;

ssp. *gerda* – small or partly vanishing black-gray spots in inner and middle parts of fw; in contrast, boundary spots wider and partly merged, especially in female; hw in female, boundary spots large; black spots on abdomen small or disappearing; Cisamuria, Primorye; East Mongolia, NE. China, Korea, Japan.

Distribution. Pattern Palaearctic.

Within the former Soviet Union. European Russia and all northern Asia except for the extreme North; Caucasus and Transcaucasia, southern Siberia, Cisamuria (*Zeya*) and Primorye.

Beyond the former Soviet Union. All Europe except for the extreme West; Asia Minor; Mongolia, northern China, Korea, Japan.

Biology. Inhabitant of various open biotopes, slopes of mountains supporting bushes up to 2000 m a.s.l., forest glades (except tundra and taiga). Males flying in the daytime about noon, females more active at night. Flight from early



Fig. 75. Individual variability of *Rhyparia purpurata* (L.) (after Spuler, 1906).

June to mid-July. Eggs small, yellowish. Coloration of last instar caterpillar black with a dorsal white stria. Warts light with small black points. Hairs on thorax of male red, on lateral sides yellow. In female, yellowish hairs prevailing. White transverse striae over gray ventral side. Last instar caterpillar up to 50 mm long. Larvae living from July until May on *Salix repens*, *S. phylicifolia*, *Sorbus aucuparia*, *Trifolium repens*, *Vaccinium myrtillus*, *Plantago major*, *Galium verum*, *Achillea millefolium*, *Artemisia campestris*, *Hieracium umbellatum* etc. Caterpillar hibernating.

Similar species. Similar species seem to be absent.

37. Genus *Amurrhyparia* Dubatolov, 1985

(Genitalia in Pl. 27, Fig. 1)

Amurrhyparia Dubatolov, 1985a: 66, TS: *Diacrisia leopardinula* Strand, 1919.

Differs by male genitalic structure, in particular by the uncus of a complex form, the presence of apical processes on the valve, and a strongly sclerotised aedaeagus with fingers in the apical part (Fig. 3).

“Palps direct, coated with long thick hairs. Head, thorax and abdomen also clothed with long, thick, erect hairs. Hairs on head a little longer. Body thick. Legs of medium length, femur beset with long erect, tibiae and tarsi with decumbent, hairs. Fore tibiae with an epiphysis, middle with one, and hind with 2 pairs of short calariae subequal in length to diameter of tibia” (after Dubatolov, 1985a: 66).

82. *Amurrhyparia leopardinula* (Strand, 1919)

(Pl. 17, Fig. 8; genitalia in Fig. 3 and Pl. 27, Fig. 1)

Diacrisia leopardinula Strand, 1919: 185 (replacement name for *Chelonia leopardina* Ménétrières, 1859a, non *Euprepia leopardina* Kollar, 1844), TL: Amur.

[leopardinula – small leopard (Lat.)]

Bang-Haas, O., 1936: 348, *Diacrisia leopardina mandschurica*

Fang, 2000: 324, pl. 5, fig. 35, *Amurrhyparia leopardinula*

Description. Alar expanse 35-37 mm. Fw of male cream yellow, of female brownish. Fw with a black stria along cubital vein up to the middle of wing, and with 1-2 black spots in external part of wing. Hw cream pink, in female more intensively coloured, with a darkened base but a medially light cell, and with several submarginal spots. Head, thorax and abdomen of same colour as wings, abdomen darkened from above.

Variability. Reduced to the degree of development of the black pattern.

Distribution. Pattern Eastern Asian.

Within the former Soviet Union. Transbaikalia, Cisamuria, southern Primorye.

Beyond the former Soviet Union. China (Shansi, Gansu, Chinhai, Tibet).

Biology. Flight on glades and at forest edges, over meadows in river flood-lands in June-July. Caterpillar polyphagous, reported on beans (Fabaceae) (Dubatolov, 1990d). This species is rather infrequent in collections.

Similar species. Easily identifiable by the black longitudinal stria running from the base of the fw. Other species have no such strip.

Genus *Gonerda* Moore, 1879

(Pl. 6, Fig. 7)

Gonerda Moore, 1879a: 395, TS: *Gonerda perornata* Moore, 1879a.

Dubatolov (1996b) mentions a specimen of *G. perornata* Moore in the ZISP collection with a label reading “Przhevalsk”. He considers this record as an error. Indeed, N. M. Przewalsky could have captured this specimen during one of his travels to the Himalaya while the label might show an incomplete name of the collector. Unfortunately, the

year when the moth was taken was not referred to. The town of Przhevalsk received the name only in 1889, after the death of the traveller in 1888. Recently, it has been renamed as Karakol.

Earlier, only two species of *Gonerda* were registered from the Palaearctic, i.e. Tibet, the Himalaya and Kashmir: *G. bretaudiau* Oberthür, 1896 and *G. perornata* Moore, 1879. Recently, Kishida (1995) has described five new species from the high mountains of Nepal. Moths show a highly original pattern consisting of concentric bands and rings over a bright yellow and red background. Females are short-winged. In the territory of the former Soviet Union, no species of this basically Himalayan genus have reliably been recorded.

Subfamily Spilosomatinae

38. Genus *Ocnogyna* Lederer, 1853

Ocnogyna Lederer, 1853a: 78, TS: *Chelonia zoraida* de Graslin, 1836.

- = *Trichosoma* Rambür, 1832: 272 (non *Trichosoma* Rudolphi, 1819 (Nematoda)), TS: *Phalaena parasita* Hübner, 1790
- = *Pachylischia* Rambür, 1866: 240, TS: *Trichosoma boeticum* Rambür, 1866
- = *Nototrachus* Rambür, 1866: 245, TS: *Nototrachus pierreti* Rambür, 1866
- = *Somatrichia* Kirby, 1892: 274, TS: *Phalaena parasita* Hübner, 1790

Small moths of modest coloration. Wing pattern of Type I. Flight at night. Proboscis not developed; wings of female short or absent. Head strongly hairy. About three dozen species in Europe, North Africa, Asia Minor and China, among them the following:

O. corsica (Rambür, 1832) (Corsica, Sardinia); *O. pierreti* (Rambür, 1841) (Algeria); *O. baetica* (Rambür, 1836) (Spain and North Africa); *O. zoraida* (de Graslin, 1837) (Spain); *O. hemigena* (de Graslin, 1850) (Pyrenees); *O. cypriaca* O. Bang-Haas, 1934 (Cyprus); *O. leprieuri* Oberthür, 1878 (Algeria); *O. pudens* (H. Lucas, 1853) (Morocco and southern Spain); *O. latreillei* (Goddart, 1822) (Spain); *O. banghaasi* Staudinger, 1895 (Iraq); *O. mutabilis* Turati, 1924 (North Africa); *O. nogelli* Lederer, 1865 (Asia Minor); *O. houlberti* Oberthür, 1911 (Ta-tsien-lu = Kanding, China); *O. oberthueri* Rothschild, 1910 (Kuku-Nor); *O. joiceyi* Talbot, 1928 (Morocco); *O. anatolica* Witt, 1980 (Turkey); *O. afganicola* Ebert, 1973 (Afghanistan), etc. The latter species has been recorded at 2500-3000 m a.s.l., its female remains in a cocoon where copulation, egg-laying and the emergence of young caterpillars take place.

Note. Fang (2000) omits the genus *Ocnogyna* in the fauna of China.

Key to (potentially) our species of *Ocnogyna*:

- 1. External part of fw pale brown without dark spots. *O. parasita*
- . External part of fw with large dark spots. *O. armena*, *O. loewii*

As the external differences between *O. loewii* (Zeller, 1846) and *O. armena* Staudinger, 1871 are so insignificant, only a study of the structure of the male genitalia is necessary to distinguish both species. In *O. loewii*, the uncus is gradually tapering toward apex which is not wider than 0.1 mm; in *O. armena*, the uncus forms short and wide processes at apex which is 0.2 mm wide or wider, its tip being blunt.

In our countries, only *O. armena* seems to occur.

83. *Ocnogyna parasita* (Hübner, 1790)

(Pl. 17, Figs 9, 10)

Phalaena parasita Hübner, 1790: 42, pl. 2, fig. 1, TL: Hungary?

[parasita – parasite (Lat.)]

Lederer, 1865: 62, pl. 3, figs 3-6, *Ocnogyna parasita nogelli*

Staudinger, 1878: 335, *Ocnogyna parasita intermedia*
 Seitz, 1910: 76, pl. 14, row e, *Ocnogyna parasita*
 Bang-Haas, A., 1912: 108, pl. 6, fig. 3, *Ocnogyna rothschildi*
 Spuler, 1913: 134, pl. 73, fig. 3a-b, *Trichosoma parasita*
 Draudt, 1931: 73, pl. 6, row e, *Ocnogyna rothschildi*
 Witt, 1980: 170, *Ocnogyna parasita lianea*, *O. parasita arenosa*
 Dubatolov, 1996b: 63, *Ocnogyna parasita*

Subspecies:

O. p. nogelli Lederer, 1865
O. p. intermedia Staudinger, 1878
O. p. rothschildi A. Bang-Haas, 1912.

Description. Alar expanse of male 30-34 mm. Fw brown-gray with black, longitudinal, short striae and spots. External part of wing gray, without black pattern. Small black spots sometimes only at apex. Wings of female narrow and short.

Variability considerable:

ssp. *parasita* – Hungary, Romania, Yugoslavia and the Pontus, Turkey;
 ssp. *intermedia* (Pl. 17, Fig. 9, ♂; Fig. 10, ♀) – black spots on fw diminished; a form transitional to the ssp. *nogelli*, from Asia Minor, in which black spots are totally missing;
 ssp. *rothschildi* – described from Samara, Volga region as a separate species, this variety might prove to represent the northeasternmost subspecies/form of *O. parasita*, which could have reached the Middle Volga region (Samara, Saratov, Kamyshin) and possibly also the Ural River. Superficially, this moth is indeed very similar to *O. parasita* as depicted by Draudt (1931, ♂). In *rothschildi*, separate black maculae are sometimes edged white. Males fly over the flood-plains of Volga River on sunny days in early April (see Draudt, 1931). The length of the fw in females is 4-5 mm. Females do not fly.

Distribution. Pattern Euro-Mediterranean.

Within the former Soviet Union. Moldova, Crimea, Black Sea coast of the Caucasus (Avadkharo), Transcaucasia, Middle Volga region, Uralsk (Zhuravlev, 1909).

Beyond the former Soviet Union. Central and South Europe, Alps, Asia Minor.

Biology. Basically a mountain species, in France, Switzerland and the Caucasus occurring at 1300-2400 m a.s.l. Moth flight in one generation in February-April, appearing at once after snow melting. Caterpillar yellowish or brown, coated with yellow-brown hairs, with three light dorsal striae with dark points in interspaces, spiracles white. Head reddish with four dark points. Larva living in May-June on herbs, including grasses, *Gentiana lutea*, *Plantago*, *Urtica*, *Scabiosa*. Pupa red-brown in a grayish cocoon, hibernating, sometimes twice.

Similar species. There seem to be no similar species in our fauna.

Ocnogyna loewii (Zeller, 1846)

Trichosoma loewii Zeller, 1846: 9, TL: Asia Minor ["Istenas (Asia min.)"].

[= *clathrata* Lederer, 1845; *andresi* Draudt, 1931, *herrichi* Staudinger, 1879]

Lederer, 1855b: 202, pl. 2, fig. 7, *Trichosoma clathrata*

Description. Alar expanse 30-34 mm (male). Fw gray-brown with a white pattern of crossed bands. Hw white with dark spots. Head and thorax coated with thick hairs. Female wingless, similar to a woodlouse.

Variability. Individual variability insignificant.

Distribution. Pattern East Mediterranean.

Within the former Soviet Union. Probably absent.

Beyond the former Soviet Union. Asia Minor, Syria, Egypt, Rhodes Island.

Biology. Males flying in early spring. Larva living on *Achillea*, *Chrysanthemum*, *Cirsium*, *Onopordum*, *Trifolium* and some other herbs.

Similar species. *O. armena*, lighter, with a developed light pattern on the fw; a dark stria running from the costal edge of the hw to its centre; submarginal spots small.

84. *Ocnogyna armena* Staudinger, 1871

(Pl. 17, Figs 11-13)

Ocnogyna loewii armena Staudinger, 1871: 59, TL: Armenia.

Christoph, 1884: 109, pl. 7, fig. 1a-b, *Ocnogyna loewii pallidior*

Stshetkin, 1975: 134-138, *Ocnogyna loewii pallidior*

Tilavov, 1978: 62, *Ocnogyna loewii pallidior*

Dubatolov, 1996b: 63, 71, figs 1d, 2i, *Ocnogyna armena daghestana*

Subspecies:

O. a. pallidior Christoph, 1884

O. a. daghestana Dubatolov, 1996.

Description. Alar expanse 30 mm. Fw dark brown with a pattern of gray striae. A rather wide stria parallel to hind edge of wing. Hw gray-brown with dark submarginal spots and a spot near discal vein.

Variability. Individual variability insignificant.

Several subspecies have been described from the territories considered:

ssp. *daghestana* – eastern Caucasus (Daghestan); spots on fw pale brown with darker borders, not uniformly dark brown as in *O. armena armena* (Pl. 17, Fig. 11) and other subspecies; hw with a spot at ternal angle; subterminal spots on hw forming a wide band extended from costa to vein M₂; discoidal spot large;

ssp. *pallidior* – eremic parts of Central Asia (foothills of Kopetdagh, Repetek, Badkhyz (Fig. 76) etc.; northern Iran, Afghanistan) (Pl. 17, Figs 12-13); external spots divided by thin lines.



Fig. 76. Turkmenistan, environs of Kushka, Badkhyz Nature Reserve, Kzyl-Jar Ravine, habitat of *Utetheisa pulchella* (L) and *Ocnogyna armena pallidior* Chr. (photo V. S. Murzin).

Distribution. Pattern Central Asian.

Within the former Soviet Union. Daghestan; eastern Transcaucasia (Armenia; Azerbaijan); Turkmenistan (Kopetdagh, Greater Balkhan Mts, Badhkyz Nature Reserve, Repetek Nature Reserve, Mary, Chardzhou); southern Uzbekistan; southwestern Tajikistan.

Beyond the former Soviet Union. Iraq, Iran, North Afghanistan.

Biology. In Central Asia, occurring in eremic, semidesert and steppe landscapes; in Armenia in steppe, foothill and montane conditions up to 2000 m a.s.l. Males flying in the second half of night; arriving on light (Yerevan, slopes of Aragats Mt.) in the end of October and in November.

In southern Turkmenistan (Repetek, Badhkyz), males start flying in December. Females wingless, similar to woodlice, gray in colour, laying ~200 small, greenish, spherical eggs. Caterpillars appearing in early spring and feeding on numerous herbs like *Achillea*, *Chrysanthemum*, *Cirsium*, *Onopordum*, *Trifolium* etc. Early instars gregarious, exterminating grass on considerable areas and leaving cobweb coating over barren terrain. Last instar caterpillars living solitary. Larvae almost black in the beginning, later instars coated with dark brown hairs on dorsal side, with red hairs on lateral sides. Pupation deep under ground in the end of April to early May. Summer diapause as pupa. A mass species.

Similar species. *O. loewii*, differs by genitalic conformation. According to Dubatolov (1996b), the male genitalic structure (including *O. a. pallidior*) differs well from that of *O. loewii* from Asia Minor (Taurus Mts) and the Near East. The uncus of *O. loewii* tapers gradually towards the tip which is not wider than 0.1 mm; in *O. armena*, the uncus forming short and wide processes on top, the latter is blunt, 0.2 mm wide or wider.

39. Genus *Tajigyna* Dubatolov, 1990

Tajigyna Dubatolov, 1990a: 82, TS: *Tajigyna gansoni* Dubatolov, 1990a.

Head and palpi beset with long erect hairs. Body gracile. Proboscis reduced, shorter than palpi. Eyes small, oval, without hairs. Antennae bipectinate, with long crests (more than 1 mm). Fore tibiae without spines at apex, equal in length to femur, carrying an epiphysis. Medial and hind tibiae with one pair of long thin calariae. On fw, vein R2 diverging from stem R(3+5).

By its genitalic conformation, this genus is close to *Ocnogyna*.

85. *Tajigyna gansoni* Dubatolov, 1990

(Fig. 77)

Tajigyna gansoni Dubatolov, 1990a: 83, figs 1b, 2g, TL: Peter Great Mt. Range (Komsomolabad). Holotype in IB SD RAS.

[*gansoni* – after V. A. Ganson, an amateur entomologist from Moscow]



Fig. 77. *Tajigyna gansoni* Dub., ♂, Tajikistan, Komsomolabad, 4.V.1988, S. Lyapunov leg., Coll. V. Ganson (photo by V. S. Murzin).

Description. Length of fw of male 13.5 mm. Fw brown; costal edge before central cell with three small white spots, their costal edge with yellow scales; fourth spot disposed closer to apex of discal vein, prolate, irregular in shape. A weak yellowish spot near apex of fw. A large, hexangular, white spot between veins Cu1+2 and A2. Several white scales at base of vein M3 and in the middle of Cu1. Hw bright yellow with a brown basal field. External edge of hw with two brown spots; one more spot in a submarginal series closer to fore edge. Body coated with long black hairs and separate red scales.

Variability insignificant.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Peter-I Mt. Range [Komsomolabad District, Tajikistan].

Beyond the former Soviet Union. Unknown.

Biology. Flight in the beginning of May on mountain slopes supporting high-montane steppe vegetation.

Similar species. No similar moths seem to be present in our fauna.

40. Genus *Watsonarctia* de Freina & Witt, 1984

Watsonarctia de Freina & Witt, 1984: 324, TS: *Arctia deserta* Bartel, 1902.

= *Eurachia* Dubatolov, 1985: 147, TS: *Arctia deserta* Bartel, 1902

= *Eucastana* Leraut, 1985: 43, TS: *Arctia deserta* Bartel, 1902

Antennae of male bipectinate, less than half as long as costal edge of fw, in female even shorter, simple.

86. *Watsonarctia deserta* (Bartel, 1902)

(Pl. 17, Figs 14-15)

Arctia casta deserta Bartel, 1902: 226, TL: Sarepta, Volga region.

[= *casta* Esper, 1784, *callesi* Gymez Bustillo, 1979, *esper* Koçak, 1980]

[*deserta* – eremic, lonely (Lat.)]

[Labkrautbär – (Germ.)]

[Ecaille Saumon – (Fr.)]

Esper, 1784: 177, pl. 33, fig. 2, *Bombyx casta*

Seitz, 1910: 80, pl. 16, row c, *Eucharia casta*

Koshantschikov, 1924: 68, *Eucharia casta sibirica*

Bang-Haas, O., 1927: 59, pl. 8, fig. 9, *Eucharia casta centralasiae*

Bang-Haas, O., 1927: 59, pl. 8, fig. 10, *Eucharia casta centralasiae* ab. *triangularis*

Draudt, 1931: 75, *Eucharia casta*

de Freina, 1983: 105, *Eucharia deserta karduchena*

Dubatolov, 1996b: 64, *Watsonarctia deserta*

Fang, 2000: 333, pl. 6, fig. 2, *Eucharia casta*

Subspecies:

W. d. sibirica Koshantschikov, 1924

W. d. centralasiae O. Bang-Haas, 1927

W. d. karduchena de Freina, 1983.

Description (based on specimens from Armenia). Alar expanse of male about 30 mm. Fw light with pink tint and brown spots. On fw, basal field brown, middle of fw with two spots. One triangular spot at fore edge, another at inner. External edge pale brown, as well as fringe. On hw, dark pattern consisting of spots near edge. Body brown.

Female smaller, alar expanse 26 mm. Pattern of fw same as in male but background lighter, almost white, and pattern brighter. Hw purple red with brown submarginal spots.

Variability. Individual variability reduced to variation in dark pattern. Sometimes dark median spots on fw fused both between themselves and with basal field.

Ab. *triangularis* – East Tian-Shan (“Yuldus”, China); hw median belt more angulate, triangular in shape.

The following geographically stable forms have been described:

ssp. *centralasiae* – “Thianchan or., Juldus”, Ili, Issyk-Kul; Jarkand, Zaisan; hw median belt expressed only as a stroke at costal edge;

ssp. *sibirica* – South Siberia (Minusinsk), Altai; in our opinion, superficially this form fails to differ from the nominotypical subspecies;

ssp. *karduchena* – Transcaucasia and eastern Turkey.

Distribution. Pattern Euro-Siberian.

Within the former Soviet Union. European part of Russia: Penza, Ulyanovsk, Samara, Kazan, Ufa, Belaya River; Caucasus; Transcaucasia; northern and central Ukraine; northern Kazakhstan (Astana); South Siberia: Barnaul, Altai (Shebalino, Aktash, Ongudai), Khakassia, Minusinsk, Tomsk, Irkutsk.

Beyond the former Soviet Union. Europe: SW. Germany, northern France, northern Iberian Peninsula, but absent from the Alps, the west part of former Yugoslavia, and Greece; Asia Minor; Mongolia; China (Xinjiang).

Biology. Flight in May. Inhabiting dry stony slopes and pastures, in rocky gorges; in the Altai occurring on subalpine meadows and on herb-clad slopes up to 2000 m a.s.l. Caterpillars living on various herbaceous plants like *Galium*, *Asperula*, *Achillea* etc. since May until August. Larvae blackish with a yellow dorsal stria on each segment broken by prolate, quadrangular, velvety black spots. One more light line extended on lateral sides of body. Warts blackish, hairs black-gray. Head black-brown. Pupation in a loose ovoid cocoon made of ground and hairs. Pupa hibernating.

Similar species. There seem to be no similar species in our fauna.

41. Genus *Chionarctia* Kôda, 1988

(Genitalia in Pl. 27, Fig. 2)

Chionarctia Kôda, 1988: 54, TS: *Dionychopus niveus* Ménétriès, 1859.

= *Gigantospilosoma* Dubatolov, 1990c: 95, TS: *Dionychopus niveus* Ménétriès, 1859

Wing pattern of Type II A.

87. *Chionarctia nivea* (Ménétriès, 1859)

(Pl. 17, Fig. 16)

Dionychopus niveus Ménétriès, 1859a: 218, TL: unknown [Amur (?)].

[nivea – snowy (Lat.)]

Seitz, 1910: 85, pl. 15, row h, *Spilosoma niveum*

Dubatolov, 1996b: 64, *Chionarctia nivea*

Fang, 2000: 414, pl. 17, fig. 1, *Chionarctia nivea*

Description. Alar expanse 60-65 mm. Wings and body white with one small black point in the middle of fw and a thin black bracket on discal vein of hw. Abdomen on upper side and on each lateral side with five series of black points. Lateral sides with a series of red spots. In addition, tibiae of all legs red on outer side.

Variability. Occasionally with additional, small, black points.

Distribution. Pattern East Asian.

Within the former Soviet Union. Middle Amurland; Primorye; southern Sakhalin; Kuril Islands (Kunashir).

Beyond the former Soviet Union. China (Dunbei, Hebei, Nei Mongolia, Shaanxi, Zhejiang, Fujiang, Hubei, Hunan, Guangxi, Sichuan); Korea (Simpkho); Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Biology. Flight in July on forest glades and at forest edges. Caterpillars hibernating at early instars. Last instar caterpillar up to 65 mm long, dirty gray with light lateral spots and long yellow-gray fascicles of hairs. Food plants: *Triticum sativum*, *Panicum* sp., *Plantago major* (Fang, 2000).

Similar species. There seem to be no similar species in our fauna.

42. Genus *Alphaea* Walker, 1855

Alphaea Walker, 1855: 683, TS: *Alphaea fulvohirta* Walker, 1855.

Congeners mainly occur from Kashmir to western China and northern India. Only *A. melanostigma* (Erschoff, 1872) reaching the territories concerned in the present paper. The type species occurs in India and China.

Pattern of fw consisting of a white background and alternating black patches. Male genitalia: tegumen with small postero-subventral projections.

88. *Alphaea melanostigma* (Erschoff, 1872)

(Pl. 18, Figs 1-3)

Spilosoma melanostigma Erschoff, 1872: 316, TL: Warsaminar (headstream of Zeravshan River).

[= *karakorumica* Daniel, 1961]

[*melanostigma* - marked by black (Lat.)]

Erschoff, 1874: 33, pl. 2, fig. 30, *Spilosoma melanostigma*

Groum-Grshimailo, 1890: 539, *Spilosoma melanostigma*

Seitz, 1910: 85, *Spilarctia melanostigma*

Dubatolov, 1996b: 64, *Alphaea melanostigma*

Description. Alar expanse 45-50 mm. Head, thorax and wings pale yellow. Fw with numerous black points and striae, hw with black spots on discal vein and several spots along external edge. Abdomen from above yellow, underside lighter, with a series of black points.

Variability. Expressed in different degrees of manifestation of the black pattern (Pl. 18, Fig. 3).

Distribution. Pattern Central Asian and North Indian.

Within the former Soviet Union. Pamirs-Alai: Zeravshan, Alai and Transalai Mt. ranges; Pamirs: Hissar and Rushan Mt. ranges, Khorog.

Beyond the former Soviet Union. Afghanistan; Pakistan; North India (Himalaya, to Sikkim and Assam in the south); China (Qinghai).

Biology. Flight at 1500-2500 m a.s.l. in gorges and on slopes of mountains supporting sparse woodlands. At lower altitudes, appearing in May, at higher elevations in July. Willingly flying on light. Females laying eggs in groups. Eggs small, ball-shaped, yellowish. Caterpillar of instar 1 light, yellow-gray, last instar almost black, coated with long silky hairs, highly mobile. Feeding on various herbs, including dandelion (*Taraxacum*), plantain (*Plantago*), *Astragalus* etc. Pupa hibernating.

Similar species. There seem to be no similar species in our fauna.

43. Genus *Andala* Walker, 1855

Andala Walker, 1855: 774, TS: *Andala unifascia* Walker, 1855.

Antennae of male bipectinate. Forehead (epicranium) coated with long pale hairs. Palpi short, directed forward, hairs on them short. Proboscis missing. Eyes large, bare. On hw, Sc + R1 merging with R up to the middle of cell. Abdomen with spots from above and on each lateral side.

Except for two species occurring in our territories, the Chinese *A. wiltshirei* (Toulgoet, 1962) and *A. unifascia* Walker, 1855 belong to this genus.

Key to our species of *Andala*:

1. Abdomen from above yellow *A. guttata*
 –. Abdomen from above pink. *A. transversa*

89. *Andala guttata* (Erschoff, 1874)

(Pl. 18, Figs 14-15)

Arctia guttata Erschoff, 1874: 32, pl. 2, fig. 28, TL: Urgüt (headstream of Zerafshan River).

[gutta - dot (Lat.)]

Groum-Grshimailo, 1890: 536, *Arctia guttata*

Seitz, 1913: 84, *Spilarctia guttata*

Description. Alar expanse 29 mm. "From above, fw slightly yellowish white, with several spots ashy gray in colour, in particular at fore and inner edges, and with fringe of variable colour, whitish and grayish; main colour of hw a little lighter than of fw, with two ashy gray small spots at anal angle. Underside of fw lighter than from above; pattern translucent from upper side. Thorax yellowish white with three dotted spots. Abdomen from above yellow with a series of blackish maculae, underside monochromous white" (Erschoff, 1874).

Distribution. Pattern Central Asian.

Within the former Soviet Union. West Tian-Shan (Mt. Chimgan), Pamirs-Alai (Alaiskiy and Hissarskiy Mt. ranges).

Beyond the former Soviet Union. Eastern Afghanistan

Biology. Flight in July at 2000-2800 m a.s.l.

Similar species. *A. transversa*, main colour of fw gray, hw the same, fringe monochromous, abdomen pink red.

90. *Andala transversa* (Moore, 1879)

(Pl. 18, Figs 6-7)

Cycnia transversa Moore, 1879a: 398, TL: Hindu Kush (?)

[= *puella* Staudinger, 1887; *vartiana* Daniel, 1965]

[transversa – transverse (Lat.)]

Description. Alar expanse of male 30-34 mm. Wing ashy gray with dark spots. Head and thorax same in colour. From 4 to 6 dark cuneiform spots (spike of wedge directed toward centre of wing) along costal edge of fw, the same number of spots at hind edge and 1-2 irregularly shaped spots in the middle of wing. External edge also with black points. Hw with small vague spots. Abdomen pink from above and gray on underside. Series of black points along dorsal side and on each lateral side. Female a little larger with pink tint.

Variability. Expressed to a greater or lesser extent in the development of a dark pattern.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Pamirs-Alai (Alaiskiy and Zaalayskiy Mt. ranges), Pamirs (Peter-I, Zeravshanskiy and Hissarskiy Mt. ranges).

Beyond the former Soviet Union. East Afghanistan, NW. Pakistan. .

Biology. Flight in July at night at 1700-2500 m a.s.l. within the belt of leafed and juniper woodlands. Often arriving on light.

Similar species. In *A. guttata*, the main colour of the fw is pale, whitish; the fringe is chequered, the abdomen from above is yellowish.

44. Genus *Hyphantria* Harris, 1841

(Genitalia in Pl. 27, Fig. 3)

Hyphantria Harris, 1841: 255, TS: *Phalaena textor* Harris, 1828.

= *Hypantria* Clemens, 1861 (misspelling)

Strand, 1919: 248, *Hyphantria*

Fang, 2000: 450, *Hyphantria*

Wing pattern of Type II A. Fws monochromous with separate spots or points.

A North American genus. In our fauna, only one representative is known to occur.

91. *Hyphantria cunea* (Drury, 1773)

(Pl. 18, Figs 8-9; genitalia in Pl. 27, Fig. 3)

Phalaena cunea Drury, 1773: 36, pl. 18, fig. 4, TL: Canada.

[= *liturata* (Goeze, 1781); *punctatissima* (Smith, 1797); *budea* (Hübner, 1823), *textor* (Harris, 1828); *mutans* Walker, 1856; *punctata* Fitch, 1857; *pallida* Packard, 1864; *candida* Walker, 1865; *suffusa* Strecker, 1900; *brunnea* Strecker, 1900]

[*cuneus* – wedge (Lat.)]

[Fall webworm moth, spotless fall web-worm – (Engl.)]

[Weisser bärenspinner, Webebär, Weberspinner – (Germ.)]

[Ecaille fileuse (larva) – (Fr.)]

[American white moth – (Rus.)]

Fang, 1981: 340, *Hyphantria cunea*

Dubatolov, 1996b: 65, *Hyphantria cunea*

Fang, 2000: 350, *Hyphantria cunea*

Description. Alar expanse 22-36 mm. Fw and hw white, sometimes fw with black points, orange markings on body and legs. Head strongly pubescent, abdomen with a white pappus.

Variability. Becomes apparent generally in a greater or poorer development of black spots on the fw. Specimens with numerous points on the fw have been referred to as f. *punctatissima* Abott & Smith, 1797 (Pl. 18, Fig. 9).

Distribution. Pattern North American, introduced to Europe and East Asia.

Within the former Soviet Union. Found for the first time in 1952. At present the species has been recorded in Transcarpathia, Moldova and in the south of Ukraine, in the Crimea and the Primorye, Russian Far East. The advance of the American white moth continues northward and eastward with a rate of up to two dozen kilometres per year. Based on suitable climatic conditions, in the future the geographical range of this species can prove to reach the Leningrad, Vologda and Perm regions as well as the Urals in the northeast.

Beyond the former Soviet Union. North America (USA, Canada); Japan; China.

Biology. This species is a dangerous pest of many fruit and other arboreal cultures as well as herbs. Altogether, more than 240 species are currently known as its food plants. Flight in June (first generation), July and August (second generation). Egg laying on the underside of leaves, 400-500 eggs per batch, altogether 1000-1500 eggs, density about 400 eggs per sq. cm. The egg is spherical, 0.5-0.55 mm in size, with a flat base, yellowish virescent in colour. Egg batches coated with white fluff (Churaev, 1962). Larvae gregarious, forming large silk webs on tree branches. Younger larval instars feeding on the epidermis of both sides of the leaf, leaving veins untouched. Older larvae consume the entire leaf, leaving intact only the petiole. Caterpillar from above velvety brown with black warts; on each lateral side with a yellow band with orange warts. Last instar caterpillars up to 35 mm long, living in cobweb nests, sometimes weaving entire tree crowns.

In America, two different forms of larva are known to exist. In the northern part of the range, larvae show a black head capsule, a yellowish or greenish body with a dark stria at the foot of each lateral side, and black and orange warts

with long whitish hairs located along the stria's borders. More southerly, larvae demonstrate an orange or reddish head, a yellowish-tan body with orange or reddish warts and brownish hairs. Most probably, our countries have gained in the northern form only. In 40-50 days, the larva pupates in a light cocoon. In our conditions, two generations per year are formed. Hibernation as pupa, frost resistance up to -25° C.

In Central Europe and the former Soviet Union, more than 100 insect species have been registered that prey on the pupae and/or caterpillars of the American white moth (Sharov & Izhevskiy, 1987: 290-298). In the former Soviet Union, the entomophages include *Larvivora (Tachina) larvarum* L., *Tachina fallax* Meig., *Compsilura concinnata* Meig., *Ceromasia nigripes* Flln., *Apantelles phutellai* Kurg. and many others (Churaev, 1962: 69-70).

Similar species. Superficially, the moth resembles *Spilosoma lubricipedum* (Pl. 19, Fig. 4) or *S. urticae* (Pl. 18, Fig. 11) but both latter species show a yellow abdomen with black spots.

45. Genus *Diaphora* Stephens, 1827

(Genitalia in Pl. 27, Fig. 4)

Diaphora Stephens, 1827: 244, TS: *Phalaena mendica* Clerck, 1759.

= *Cyenia* auct., non Hübner, 1818

Wing pattern of Type II C, fws uniform, without pattern. Wings slightly translucent. Male wings white or brown, female white. Head and body densely coated with hairs. Eyes completely hidden in hairs. Pollination thin.

A single species.

92. *Diaphora mendica* (Clerck, 1759)

(Pl. 18, Figs 10-13)

Phalaena mendica Clerck, 1759: 1, pl. 3, fig. 5, TL: "Kalkgebirge" (Europe).

[= *punctata* (Geoffroy, 1785); *rustica* (Hübner, 1790); *inversa* Caradja, 1898; *binaghii* Turati, 1910; *mendicana* Strand, 1919; *venosa* Adkin, 1922; *sabulosa* Derenne, 1929; *malatiana* Bytinski-Saltz, 1936; *radiata* Cockayne, 1949; *circumpunctata* Cockayne, 1949; *stripata* Cockayne, 1951; *pallida* Lempke, 1961]

[*mendica* – mendicant (Lat.)]

[Muslin Moth – (Engl.)]

[Graubär – (Germ.)]

[Ecaille Mendiante – (Fr.)]

Fixsen, 1887: 335, *Diaphora mendica*

Staudinger, 1892c: 289, *Diaphora mendica*

Seitz, 1910: 91, pl. 17, row b, *Diaphora mendica*

Esaki, 1971: 213, fig. 2579, *Diaphora mendica*

Description. Alar expanse 31-33 mm. Male light brown with two black points in cubital cell (one on fork of cubital and discal veins, the other closer to base). Thorax of the same colour, pubescent. Abdomen darker. Female white, wings slightly transparent, same as in male with black spots and often with an additional point at costal edge.

Variability. Individual variability expressed in additional black points on fw and hw.

The following colour forms are known:

f. *rustica* – male as white as female. In Armenia (Mt. Aragats), all ca. 25 males collected by us showed such a coloration. On the Black Sea coast of the Caucasus, the white form of the males appears to prevail, with brown specimens being rare. In contrast, in central Russia brown males dominate.

A number of experiments on the hybridization of the moths of various coloration and also representing some closely related species are known to have been carried out. Standfuss (1896) interbred f. *rustica* males with females "from a normal population" (i.e. containing brown males). As a result, yellowish males (f. *standfussi* Caradja, 1894)

were obtained. By subsequently interbreeding males of *f. rustica* and females of *f. standfussi*, Caradja got females with spots resembling a completely different species. Unfortunately, as no further experimentation in this field seems to have ever been completed, no generalization of results at the genetic level can be drawn.

Distribution. Pattern Euro-Siberian.

Within the former Soviet Union. Baltic countries; Belarus; Ukraine, Crimea; Moldova; European part of Russia (from Karelia and southern part of Komi Republic to Taganrog, Rostov-on-Don Region and Caucasus); Transecaucasia (Mt. Aragats and Lake Sevan in Armenia; Nakhichevan); South Siberia {from Kurgan, Tobolsk, Tomsk, the middle flow region of Angara River, Irkutsk to Kazakhstan, Altai and the southern coast of Lake Baikal}.

Beyond the former Soviet Union. Europe: southern Scandinavia and southern England (absent from the Iberian Peninsula and Greece); northern Turkey; Syria; Lebanon.

Biology. Flight from the end of April (early spring) until June. Males flying on light. Females in the daytime taking short flights on forest glades, at edges of woods, and on overgrown slopes of ravines. In the mountains, reaching 2000 m a.s.l.

Egg spherical, yellowish white. Young caterpillar pale, coated with long yellow ochre hairs. Last instar caterpillar from above greenish brown with one thin, aborted, light stria. Lateral sides virescent or yellowish. Fascicles of hairs on warts reddish or brown-gray. Head and thoracic legs dark red.

Caterpillars feeding on various plants: *Urtica dioica*, *Rumex crispus*, *Chenopodium* spp., *Atriplex* spp., *Trifolium* spp., *Lythrum salicaria*, *Chamaenerion angustifolium*, *Impatiens noli-tangere*, *Stachys sylvatica*, *Lamium* spp., *Galeopsis* spp., *Plantago major*, *Betula* spp., *Salix* spp. Larva pupating in spring in a gray creamy cocoon on the ground. Pupa shining, brown.

Similar species. *Hyphantria cunea*, fw purely white without black points; alar expanse 1.5 times less, fw narrower. The spotted form of *H. cunea* differs by the considerably developed spotted pattern. *Eudiaphora turensis* reminds of the brown male form of *Diaphora mendica*, but differs easily by the developed dark pattern and the yellow spotted abdomen.

46. Genus *Eudiaphora* Dubatolov, 1990

(Genitalia in Pl. 27, Fig. 5)

Eudiaphora Dubatolov, 1990c: 93, TS: *Spilosoma turensis* Erschoff, 1874.

Fang, 2000: 354, fig. 248 (genitalia).

“Fw brown-gray, with black discal spots and two belts of spots, one subbasal, the other postdiscal. Sometimes (rarely) with submarginal spots at apex of fw and with basal spots. Hw with a discal spot. Head small, coated with rich erect hairs; palpi pubescent, a little longer than head. Eye large, semispherical, bare. Antennae of male bipectinate with long crests, of female two-dentate. Proboscis reduced. Body rather narrow, beset with long hairs like legs are. Fore tibiae with a long epiphysis, middle tibiae with one pair, hind with two pairs, of thin calariae” (Dubatolov, 1990e).

Dubatolov isolated this genus from *Diaphora* based on genitalic conformation. Valves in *Diaphora* are short, wide, with a sharp process in the inner part. In *Eudiaphora*, there is no such a sharp protuberance, the male genitalia show a broad triangular uncus, the valva is straight, not furcated at apex.

93. *Eudiaphora turensis* (Erschoff, 1874)

(Pl. 18, Figs 14-19)

Spilosoma turensis Erschoff, 1874: 33, pl. 2, fig. 29, TL: Kyzyl-Kum Desert (“inter Ulus et Djam”).

[= *turensis maracandica* Seitz, 1910; *afghanistanensis* Daniel, 1966]

[*turensis* – Turan (Lat.)]

Seitz, 1910: 92, pl. 17, row d, *Diaphora turensis maracandica*



Fig. 78. Kazakhstan, Ili River, banks supporting *Eucharia festiva iliensis* (Wagner), *Tancrea pardalina* Pngl., *Watsonarctia deserta centralasiarum* (O. B.-H.), *Eudiaphora turensis* (Er.), *Diacrisia sannio* (L.) and some others (photo V. S. Murzin).

Daniel, 1966: 163, pl. 3, fig. 1, *Diaphora afghanistanensis*

Dubatolov, 1996b: 65, *Eudiaphora turensis*

Description. Alar expanse 37-39 mm. Moth gray-brown with black points on fw. First point located at base of fw, followed by a series of points forming a curved stria. One or several small points on transverse vein, finally followed by an arcuate stria running from costal edge to inner one parallel to a convex external edge. Both position and expression of the stria strongly variable. A crescent spot on discal vein of hw. Head and body dark brown, coated with silky hairs. Abdomen on lateral sides yellow, with dark points.

Variability considerable.

E. maracandica – Seitz (1910), crediting Staudinger as author of this form, quoted it from Turkestan, "...much larger, a black transverse stria unclear, often also a little lighter ...". Such a too general description coupled with "Turkestan", much of Central Asia, allows for no identify of this form to be attempted prior to a restudy of type material.

As the abundant material available to us shows, the variation range of this species is quite profound, being expressed in reduction or loss of a black pattern as well as varied coloration. The geographical range of this species occupies extensive territories of Central Asia and Kazakhstan. In the east, in the foothills of Dzhungarskiy Alatau Mts, darker specimens appear to prevail. In the West Pamirs and the Hissarskiy Mt. Range, lighter moths with a black pattern are dominant. However, there are samples with a completely missing pattern or only with a single median spot on the hw. Specimens from Chimgan Mts, Chatkalskiy Mt. Range are darker, the pattern is poorly expressed, and the moth is a little smaller (alar expanse 33-35 mm).

The following form from the environs of Bakanas, inferior flow of Ili River, Kazakhstan is noteworthy:

f. *yuldashevi* forma nova – coloration of wing, head and thorax very light cream or sandy yellowish upon conservation of a usual pattern (3 males) (Pl. 18, Fig. 18). This moth was collected by S. Murzin in early August as opposed to the usual *E. turensis*, whose flight period is in the spring. The systematic status of this form is unclear. Probably the moths belong to the second generation that appears infrequently.

This new form is named in honour of friend A. A. Yuldashev, from Tashkent, who helped in our work.

From Afghanistan, *Diaphora afghanistanensis* Daniel has been described, which differs a little from *E. turensis* both superficially and by genitalic structure. In appearance, *D. afghanistanensis* seems to be similar to *E. turensis*

from the Hissarskiy Mt. Range and, though Dubatolov (1996b) considers it as a synonym of *E. turensis*, its status is not clear to us.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Foothills of Kopetdagh and Kuhitang-tau Mt. ranges, Samarkand, Chardzhou, Nuratau, Syr-Darya River; Ferghanskiy Mt. Range and Ferghana Valley; western Chatkal (Chimgan, Brich-Mulla, Parkent, Khumsan), Karzhantau, Alaiskiy, Turkestanskiy, Hissarskiy and Zeravshanskiy Mts; Kazakhstan (Sugety-Tau Mt. Range, Ili River: Bakanas; Zailiiskiy Alatau, Chimkent, Ketmen Mts); West Pamirs (Khorog).

Beyond the former Soviet Union. Afghanistan; NW. China (Xinjiang).

Biology. Occurring in semideserts or sufficiently dry places, basically on plains and at foothills, but sometimes in the mountains up to 2000 m a.s.l. Over plains, flight in spring, at end of April or in May, in the mountains up to mid-July. Very common.

Similar species. *Diaphora mendica*, brown males differ by the almost uniform brown abdomen.

47. Genus *Spilosoma* Curtis, 1825

(Genitalia in Pl. 27, Fig. 6)

Spilosoma Curtis, 1825: pl. 92, TS: *Bombyx menthastris* Denis & Schiffermüller, 1775 [= *Phalaena lubricipeda* Linnaeus, 1758].

= *Spilosoma* Stephens, 1827: 1, 242, TS: *Phalaena lubricipeda* Linnaeus, 1758

= *Ardices* Walker, 1855: 709, TS: *Arcides fulvohirta* Walker, 1855

= *Rhaëgonis* Walker, 1862: 270, TS: *Rhaëgonis bicolor* Walker, 1862

= *Spilarctia* Butler, 1875 (part): 3, TS: *Phalaena lutea* Hüfnagel, 1766

= *Elpis* Dyar, 1893: 36, TS: *Antarctia rubra* Neumögen, 1884 (preocc. *Elpis* Mulsant, 1850, Coleoptera)

Moth of medium size. Wing pattern of Type II A. Fws monochromous with separate spots or points. Wings white, with 12 veins, sometimes with black points. Abdomen thick, yellow, red or white, with series of spots on dorsal and lateral sides. Palps short, invisible among fascicles of hairs covering entire forehead (epicranium). Proboscis abortive. Antennae of male pectinate, of female filiform.

Except for the species considered below, the following Palearctic congeners are known: *S. rostañoi* (Oberthür, 1911) (W. China); *S. caeria* (recte: -um) (Püngeler, 1906) (Kukunor, China); *S. erythrozona* (Kollar, 1844) (Kashmir); *S. rybakowi* Alpheraky, 1897 (from W. China to Korea); *S. fujiensis* (recte: -se) Fang, 1981 (Fujian, China); *S. extrema* (recte: -um) Daniel, 1943 (Yunnan); *S. likiangensis* (recte: -se) Daniel, 1943 (Yunnan); *S. mienshanicum* Daniel, 1943 (Shanxi); *S. ningyuenfui* Daniel, 1943 (Sichuan, China); *S. daïtoensis* (recte: -se) (Matsumura, 1930) (Taiwan). Several species are also known from North America. The total number of species in this genus amounts to more than 30.

Key to our species of *Spilosoma*:

1. Abdomen from above yellow. 3
- . Abdomen from above red. 2
2. Fw with black spots. *S. punctarium*
- . Fw white. *S. album*
3. Antennae of male uniform black, long, only slightly shorter than cell length. *S. streltsovi*
- . Antennae of male noticeably shorter than length of cell (not more than 2/3 its length). 4
4. Combs of antenna white. Fw with few black points. Point on discal vein of hw more often missing. *S. urticae*
- . Combs of antenna black. 5
5. Fw with numerous black points scattered without any order over surface of fw. *S. lubricipedum*
- . Some of the points located in transverse series. *S. mandli*

94. *Spilosoma lubricipedum* (Linnaeus, 1758)

(Pl. 19, Figs 4-9; genitalia in Fig. 80 and Pl. 27, Fig. 6)

Phalaena lubricipeda Linnaeus, 1758: 505, TL: Sweden.

[= *menthastris* ([Denis & Schiffermüller], 1775); *lepus* (Retzius, 1783); *mendicum* (Rossi, 1790), *ermineum* (Marsham, 1791); *walkeri* Curtis, 1825, *menthastris chishimanum* Matsumura, 1929; *masuense* Matsumura, 1930; *menthastris elegans* Bryk, 1948; *sotiriadis* Koutsaftikis, 1973]

[lubricus – slippery, pedestrian (Lat.)]

[White ermine – (Engl.)]

[Weiße tigermotte – (Germ.)]

[Écaille Tigrée – (Fr.)]

Erschoff, 1874: 34, *Spilosoma menthastris*

Spuler, 1910: 129, pl. 80, fig. 2, *Spilosoma menthastris*

Seitz, 1910: 87, pl. 15, row f, *Spilosoma menthastris*

Dubatolov, 1996b: 66, *Spilosoma lubricipedum*

Description. Alar expanse 35-40 mm. Wings white with numerous black points. Abdomen orange with black dorsal spots. Hw white, only occasionally with a dark discoidal dot and 2-3 submarginal dots. Combs of antenna dark from above.

Variability. Everywhere common, providing ample possibilities for studying variation. Most of the variations reduced to the number of points on fws, e.g. fw with three or several points only, hw spotless, and so on. The following aberrations and forms are noteworthy:

ab. *transitoria* Oberthür, 1912 – fw obscurely brownish;

ab. *unipuncta* Strand, 1929 – with one point on fw;

ab. *apicistrigata* Kardakoff, 1928 – only a short apical stria on fw, remaining black points disappearing;

ab. *flavotergata* Kardakoff, 1928 – without black spots on abdomen.

The latter two forms have been described from Narva Island near Vladivostok.

f. *ochrea* Seitz, 1910 – fw of sandy colour;

f. *brunnea* Oberthür, 1896 – fw brownish;

f. *luxerii* Goddard, 1822 – fw on upper side pink red, underside with brownish bloom;

Distribution. Pattern Palearctic.

Within the former Soviet Union. Nearly all European part (rare in the Crimea, in the north up to Karelia and Arkhangelsk), Siberia (south of 58° N), Transbaikalia, Amurland, Far East (Primorye); Caucasus and western Transcaucasia; Kazakhstan; Central Asia.

Beyond the former Soviet Union. All Europe; NW. China, Korea, Japan.

Biology. Flight from the end of May until July on forest grassy lawns, in parks and gardens. Caterpillar dark brown with brown fascicles of hairs on warts and with a reddish dorsal stria. Spiracles white. Larvae living from the end of July until next spring on various herbs or bushes like *Urtica dioica*, *Polygonum calcatum*, *Rumex* spp., *Pisum sativum*, *Trifolium* spp., *T. repens*, *Geranium sanguineum*, *Vaccinium uliginosum*, *Plantago* spp, *Taraxacum* spp., *Lactuca sativa*, *Salix phylicifolia*, *Rubus idaeus* etc. Caterpillar hibernating.

Similar species. *S. urticae*, number of black points on fw significantly less, stem of antenna from above substantially white. According to Mikkola (1975), in the male the crests of the antennae are differentiated, with low crests 2 times longer than stem diameter, at apex of antenna not longer than stem thickness. *S. punctarium*, has a red abdomen.

95. *Spilosoma punctarium* (Stoll, 1782)

(Pl. 19, Figs 1-3)

Bombyx punctaria Stoll in Cramer, 1782: 5, 233, pl. 398, TL: Japan.

[= *punctigera* Motschulsky, 1861; *roseiventer* Snellen, 1863; *dornesii* Oberthür, 1879; *doerrisi* Oberthür, 1881; *punctarium miserata* Bryk, 1942]

[*punctarium* – pointed (Lat.)]

Seitz, 1910: 87, pl. 15, row g, *Spilosoma punctarium*

Fang, 2000: 418, pl. 17, fig. 4, *Spilosoma punctarium*

Description. Alar expanse 38 mm. Fw white with black points. Hw with several round small spots on discal vein and in a submarginal series. Body white except for a red upper side of abdomen. Abdomen with five series of black points, one row each on upper side, at border of red and white on lateral side, and lower subventrally over white part. Thorax and first segments of abdomen coated with white pubescence. Tip of abdomen white. Antennae black.

Variability. Number of points on fw considerably varied. In some specimens with a large number of points, they form a diagonal stria from fw apex to inner edge like in some species of *Spilarctia* Butler.

Distribution. Pattern East Asian.

Within the former Soviet Union. Middle Amurland (Pashkovo, Raddevka, Blagoveshchensk, Khabarovsk), Primorye (Ussuriysk, Sikhote-Alin, Barabash, Khasan), southern Kuril Islands.

Beyond the former Soviet Union. Central and eastern China; Korea; Japan.

Biology. Flight from the end of May to mid-July. Caterpillars living on various herbs. Pupa hibernating.

Similar species. *S. urticae* and *S. lubricipedum*, abdomen yellow.

96. *Spilosoma urticae* (Esper, 1789)

(Pl. 19, Figs 11-12; Pl. 20, Figs 1-3; Fig. 79; genitalia in Fig. 80)

Phalaena urticae Esper, 1789: 3, 20, pl. 83, fig. 2, TL: Europe (?).

[= *Phalaena papyratia* Marsham, 1791]

[urtica – nettle (Lat.)]

[Water Ermine – (Engl.)]

[Nesselbär – (Germ.)]

[Ecaille de l'ortie – (Fr.)]



Fig. 79. *Spilosoma urticae* (Esp.), ♂. Russia, Tula Region, Tatinki, 53°40'N, 38°45'E, 13.VI.1998 (photo by O. G. Gorbunov).

Butler, 1879b: 5, pl. 42, fig. 5, *Spilosoma urticae sangaiica* Walker, 1865

Spuler, 1910: 129, pl. 80, fig. 3, *Spilosoma urticae*

Seitz, 1910: 88, pl. 15, row g, *Spilosoma urticae*

Fang, 2000: 422, pl. 17, fig. 10, *Spilosoma urticae*

Description. Alar expanse 35-40 mm. Wings white with few black points. Hw without spots. Abdomen orange with black dorsal spots. Combs of antenna white (except for apex).

Variability. Some specimens showing either an enlarged number of black points or devoid of them.

Distribution. Pattern Palaearctic.

Within the former Soviet Union. Southern Baltia (Lithuania); Belarus; Ukraine, Crimea; Moldova; European part of Russia (Bryansk, Orel, Tula, Moscow, Kazan, Penza, Saratov), South Siberia (south of the line Kurgan, Novosibirsk, Tomsk and middle flow of Angara River), Transbaikalia, Middle Amurland (Zeya, Blagoveshchensk), southern Primorye; Caucasus; Transcaucasia; Kazakhstan (Ili River, Zailiiskiy Alatau); Central Asia (Bishkek, Osh, Ferghana, West Tian-Shan).

Beyond the former Soviet Union. Western Europe (from southern England and southern Scandinavia to northern Italy and northern Balkans); northern Iran (Chelus); China (Xinjiang, Sichuan, Jiangsu).

Biology. Flight in June to early July. Seitz (1910) specified a second generation flying in August. Moths preferring steppe and steppoid places, glades in dry forests. Eggs yellowish, cone-shaped. Caterpillar blackish with a black head and dark brown hairs. Spiracles white. Larva living on various herbs like *Mentha*, *Plantago*, *Rumex*, *Lamium album*, *Polygonum*, *Urtica*, *Senecio*, *Galium*, *Menyanthes* etc. Pupa hibernating.

Similar species. *S. lubricipedum*, number of black points on fw significantly higher, crests of antenna black. Male crests of antennae 2 times longer than stem diameter at apex, and 3 times so than at base of antenna. Wings wider than in *S. urticae*.

97. *Spilosoma mandli* Schawerda, 1922

(Pl. 19, Fig. 10)

Spilosoma mandli Schawerda, 1922: 11, TL: Nikolsk-Ussuriyskiy (Ussuriysk).

[= *sangaiica* Walker, 1865]

Draudt, 1931: 81, pl. 7, row b, *Spilosoma mandli*

Dubatolov, 1996b: 66, *Spilosoma urticae mandli*

Description (after Draudt, 1931). Male similar to female of *lubricipedum* (= *menthastri*). Antennae entirely white, crests much shorter than in *lubricipedum*, but longer than in *urticae*. Fw narrower, in basal field with four black

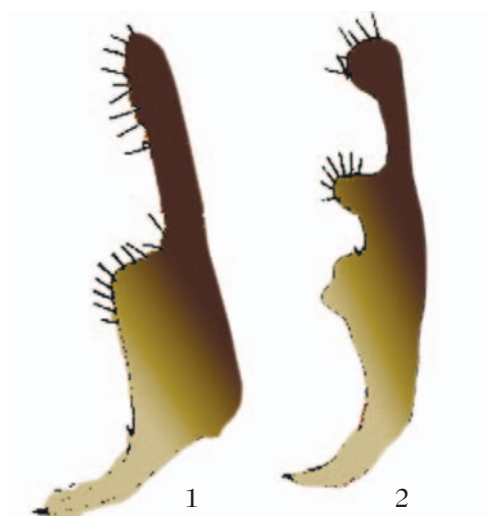


Fig. 80. Male genitalia of *Spilosoma lubricipedum* (L.) (1) and *S. urticae* (Esp.) (2).

strokes, not points. Middle series of black spots forming an acute angle directed outside. Further a point-like dashed series forming an almost straight row. At apex, three short strokes, middle of external edge with three smaller strokes. Fringe white. Hw white, often in the middle with a black stroke. Abdomen ochre yellow, with two series of black maculae.

“From Nikolsk-Ussuriyskiy, but seemingly ubiquitous as found also in Hungary (Igló), ignored only because of its resemblance to similar species” (Draudt, 1931: 81). However, we believe that Hungary is actually populated by one of the variations of *S. lubricipedum* or *S. urticae*.

Distribution. Pattern East Asian.

Within the former Soviet Union. Nikolsk-Ussuriyskiy, lower flow region of Amur River; Primorye.

Beyond the former Soviet Union. Unknown.

Note. Dubatolov (1996b) considers *S. mandli* as an East Asian subspecies of *S. urticae*. However, based on available material, Primorye also supports populations indistinguishable from the European *S. urticae*. *S. mandli* being uncommon, its rank of an independent species is indeed to be questioned.

Similar species. *S. lubricipedum*, *S. urticae* (see key).

98. *Spilosoma streltsovi* Dubatolov, 1996

Spilosoma streltsovi Dubatolov, 1996b: 76, TL: Amurskaya Region, near Blagoveshchensk.

[streltsovi – in honour of A. N. Streltsov, an entomologist from Blagoveshchensk]

Description. Alar expanse of male 37-38 mm, of female up to 43 mm. Antennae of male uniformly black, long, only slightly shorter than cell. Fore femur yellow, middle and hind femora white. Tibiae white, on upper side with a contrastingly black stroke, tarsi black. Abdominal segments yellow with a series of black spots on dorsal and both lateral sides each. Sternites whitish. Traces of two series of black spots visible only in female. Male fw opaque, in female semi-transparent, white with small black maculae. Fw with a basal and a subbasal spot at costal edge; one more, if noticeable, and still another behind medial vein. Two or three anteromedial spots at costa; sometimes one or more spots added in the middle of first vein. Female with an anteromedial spot more proximally of vein Cu2. Discoidal vein with two black points. Subterminal series in most cases variable but always with a longitudinal strip between veins M1 and M2. Terminal spots missing. Hw with a black spot at fore angle of cell and usually three subterminal spots, occasionally an additional spot near vein 1b.

According to the original description by Dubatolov (1996b), “There are additional distinctive characters: *S. streltsovi* has longer and black antennae, evenly black tarsi and black dorsal striae on the hind tibiae, and it lacks terminal spots on the wings. On the contrary, *S. lubricipedum* has shorter antennae, no more than 2/3 of cell length, coated with black and white scales, white tarsi, sometimes with an incomplete black dorsal stripe; the black terminal dots on the fws are often visible in the Far Eastern specimens. By these characters, as well as the valve shape, *S. streltsovi* sp. n. resembles most the Chinese *S. mienshanica* Daniel, 1943, but differs by a smaller size, a white thorax and a yellow abdomen. *S. mienshanica* Daniel is larger, wing expanse being 41-44 mm in males and 48-49 mm in females, the thorax is cream-white, the abdomen is red. Unfortunately, F. Daniel showed only a male valve, so it is impossible to compare the entire genitalia of both species.”

Distribution. Pattern East Asian.

Within the former Soviet Union. Amurland, Primorye.

Beyond the former Soviet Union. Unknown.

Biology. Flight since spring prior to the beginning of summer in forested regions.

Similar species. *S. lubricipedum*, has shorter antennae which are not more than 2/3 as long as the central cell, a different pattern of the fw, with black spots in cell 5, between veins M3 and M2, always placed only along veins, and a slightly different genitalic structure.

Spilosoma album Bremer & Grey, 1853

(Pl. 24, Fig. 7)

Spilosoma album Bremer & Grey, 1853: 61, TL: NE. China.

[= *rubidus* Leech, 1890; *leucoptera* Alpheraky, 1897]

[album – white (Lat.)]

Description. Differs by snow-white fw and hw (with 2-3 dark spots on hw). Abdomen with a bright red upper side and a white underside. Rows of black points on each lateral side.

Distribution. Pattern Manchurian.

Within the former Soviet Union. This species has not been recorded in Russia. However, since *S. album* occurs in Korea and China quite close to the eastern borders of Russia, one may expect its presence in the southern Primorye as well.

Beyond the former Soviet Union. Northeastern China; Korea.

48. Genus *Spilarctia* Butler, 1875

Spilarctia Butler, 1875: 39, TS: *Phalaena lutea* Hüfnagel, 1766.

Antennae of males pinnate, of females simple. Radial veins R2–R4 of fw running from apex of cell on common pedicel. Fw usually with black points, more rarely with transverse bands, e.g. in the Japanese *S. bifasciata* Butler, 1881 (Pl. 20, Fig. 12). Abdomen with five series of black spots. Male genitalia: valva usually narrow, weakly curved, with one or several processes at ventral edge. Uncus rostral.

Key to our species of *Spilarctia*:

1. Abdomen from above yellow. Antennae of male two-combed. Colour of fw and hw yellowish, not bright. *S. lutea*
–. Abdomen from above red or orange. 2
2. Antennae of male bipectinate. 3
–. Antennae of male serrate. Fw white or only slightly with yellowish tint. *S. subcarnea*
3. A black stria 5-6 mm long running from base of fw along costal edge. On underside of fw, inner border of fw darkened or black. *S. seriatopunctata*
–. On underside of fw, inner edge not infuscate. *S. obliquisonata*

99. *Spilarctia lutea* (Hüfnagel, 1766)

(Pl. 20, Figs 4–11)

Phalaena lutea Hüfnagel, 1766: 182, pl. 381, fig. F, TL: Europe.

[= *radiatus* (Haworth, 1812); *rhodosoma* Turati, 1907; *corpusrufum* Hoffmeyer, 1960; *reisseri* Koutsaftikis, 1973]

[lutea – yellow (Lat.)]

[Buff Ermine – (Engl.)]

[Gelbe Tigermotte – (Germ.)]

[Ecaille Pied de Lièvre – (Fr.)]

Kirby, 1892: 228, *Diacrisia lutea*

Hampson, 1901: 258, 278, *Diacrisia lutea*

Hampson, 1920: 375, *Diacrisia lutea*

Kôda, 1988: 67, figs 102, 107, 118, *Spilarctia lutea*

Fang, 2000: 447, fig. 32 (genitalia), pl. XVIII, fig. 9, *Spilarctia lutea*

Description. Alar expanse 33-36 mm. Wings of male yellowish, of female paler. Upper side of fw with small black spots at costal edge and with a series of small points passing from apex of wing to the middle of inner edge. Two points at hind edge of fw most expressed. Hw with a black point on discoidal vein and sometimes with an additional point near hind angle. Underside with points on discoidal vein of fw and hw, and with an oblique stria in the centre of wing running from apex of fw to the middle of inner edge. Upper side of abdomen dark yellow with black points. Underside lighter. Lateral side with black points.

Variability considerable.

The following forms are known:

f. *zatima* (Stoll, 1781) (Pl. 20, Fig. 7) – originally described from Helgoland Island, Germany; a very dark form with a brown background of wings, yellowish pollination on veins and in the centre of fw;

f. *frisica* Müller, 1926 – dark fw combined with a light body;

f. *deschangei* Depuset, 1886 – almost uniform, with brown wings and thin clarified veins;

f. *totinigra* Seitz, 1910 – melanist;

f. *unicolor* Homberg, 1907 – also almost uniform pale without spots;

ab. *hipperti* Lamber, 1906 (male) – quite pale like females;

ab. *paupera* (Hoffman, 1911) – females without spots on hw.

There are numerous other infrasubspecific categories within this species. Among these one East Asian deserves special mention.

f. *japonica* (Rothschild, 1910) – based on about 30 specimens from the Primorye available to us, this form, though described originally as a subspecies, fails to show significant differences from the European typical form.

Distribution. Pattern Palaearctic.

Within the former Soviet Union. Baltia; Belarus; Ukraine, Crimea; Moldova; European Russia from southern Karelia and Kotlas in the north to West Caucasus (Maikop) in the south; Transeaucasia (western Georgia); South Siberia

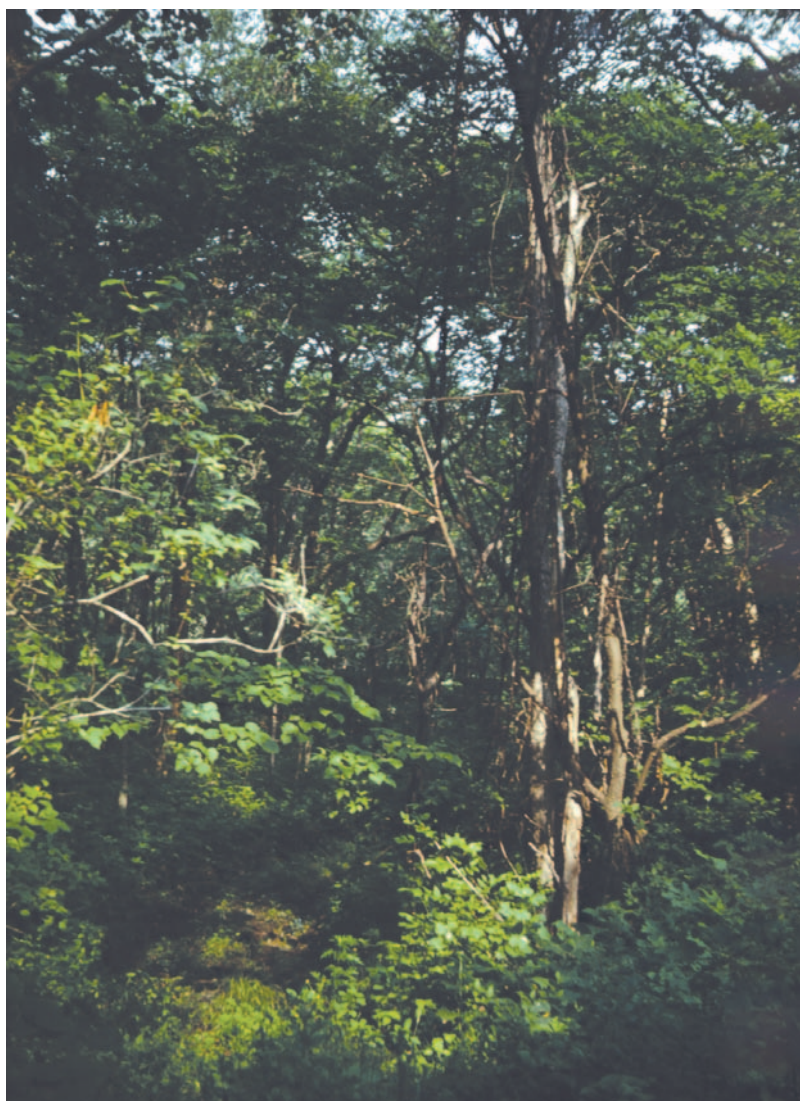


Fig. 81. Russia, Primorye, Far Eastern “taiga” forest supporting *Spilarctia subcarnea* (Walker), *S. seriatopunctata* (Motsch.), *Lemyra jankowskii* (Ob.), *Phragmatobia amurensis* Seitz, *Epatomis luctifera* (Den. & Schiff.) and some other tiger moths (photo V. S. Murzin).

from Kurgan, Tobolsk, Tomsk, Krasnoyarsk, and Irkutsk to northern Kazakhstan and Altai; Middle Amurland; Primorye; Sakhalin; southern Kuril Islands (Urup, Kunashir); perhaps absent from Transbaikalia.

Beyond the former Soviet Union. Europe from southern Scandinavia in the north to Spain in the south; northern part of Asia Minor; China (Dunbei, Hebei, Shaanxi); Korea; main Japanese Islands (Hokkaido, Honshu, Shikoku, Kyushu).

Biology. Flight in May-June. Caterpillar pale brown, coated with long hairs. White striae on lateral sides, a less strongly expressed light stria on upper side. Head yellow-brown. Caterpillar highly mobile. Feeding on different plants since July until autumn: *Urtica dioica*, *Galium*, *Taraxacum*, *Alnus incana*, *Quercus robur*, *Rheum rhaponticum*, *Ribes uva-crispa*, *Rubus idaeus*, *Plantago major* etc. Pupation on the ground in a silk cocoon, with admixture of hairs. Pupa hibernating.

Similar species. *S. seriatopunctata*, the fw has a black stria at the costal edge at base on the upper side and a black inner edge on the underside. *S. obliquizonata*, has an expressed transverse belt on the fw.

100. *Spilarctia seriatopunctata* (Motschulsky, 1861)

(Pl. 21, Figs 6-11; genitalia in Pl. 27, Fig. 8)

Spilosoma seriatopunctata (sic!) Motschulsky, 1861: 31, TL: Primorye.

[= *striato-punctata* Oberthür, 1879; *ione* Butler, 1875]

[seriatopunctata – points serially distributed (Lat.)]

Swinhoë, 1892: 183, *Spilarctia seriatopunctata*

Hampson, 1901: 285, *Spilarctia seriatopunctata*

Seitz, 1913: 85, pl. 15, row c, *Spilarctia seriatopunctata*

Daniel, 1943: 702, *Spilarctia seriatopunctata*

Fang, 1982: 216, fig. 1599, *Spilarctia seriatopunctata*

Fang, 2000: 435, pl. 17, fig. 20, *Spilarctia seriatopunctata*

Description (based on material from Primorye). Alar expanse of male about 40 mm, of female larger, up to 48 mm. Main component of wing colour yellow. Fw with a black stria 4 mm in length running from base of wing along costal edge. A chain of black points from apex to hind edge of fw, near hind edge these a little larger, in the middle of wing absent. This chain reaching the hind edge at 2/3 fw length from base. A dark stria on underside of fw beneath this chain of spots translucent from above. Upper side of hw with or without several black points. Underside of fw with a black spot on discal vein, an oblique black stria extended from apex of wing to its hind edge, and a wide dark band along hind edge. Central part of wing pink. Hw with a black point on discal vein. Abdomen from above red, underside white, with a series of black points at border between red and white. Thorax yellow, fore legs partly pink.

Variability modest:

ab. *flexomaculosa* Kardakoff, 1928 – Narva Island, environs of Vladivostok, Primorye; three black points near base of fw under a longitudinal stria, one more black spot at the end of cell, hw with a clear spot.

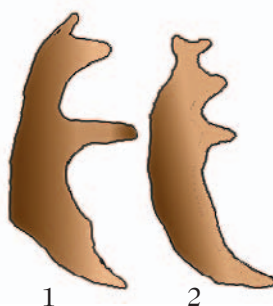


Fig. 82. Valvae of *Spilarctia casigneta* (Kollar) (1) and *S. seriatopunctata* (Motsch.) (2).

Distribution. Pattern Far Eastern.

Within the former Soviet Union. Middle Amurland, Primorye, southern Sakhalin, Southern Kuril Islands (from Urup to Kunashir).

Beyond the former Soviet Union. Korea (Singpo); Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima, Yaku, Amami, Okinawa); China (Heilongjiang, Jilin, Fujiang, Sichuan).

Biology. Flight in July in woodlands.

Note. This species has often (e.g. Seitz, 1910; Konovalova & Volkova, 1970) been treated as a subspecies of *S. casigneta* (Kollar, 1844), the latter taxon originally described from Kashmir (Pl. 21, Fig. 12) (= *striatopunctata* Oberthür, 1879; *sanguinalis* Moore, 1879b; *saggitifera* Moore, 1879). However, the male genitalia show considerable differences (Fig. 82; Pl. 27, Fig. 7). Therefore, *S. seriatopunctata* (Motschulsky) is to be considered as a separate species.

Similar species. *S. lutea*, has a yellow abdomen; the fw is without black costal stria.

101. *Spilarctia obliquizonata* (Miyaki, 1910)

(Pl. 21, Fig. 3)

Diacrisia obliquizonata Miyaki, 1910: 208, TL: Japan.

[obliquizonata – obliquely zonate (Lat.)]

Esaki et al., 1971: 213, pl. 122, fig. 2587, *Spilarctia obliquizonata*

Fang, 1982: 216, fig. 1599, *Spilarctia obliquizonata*

Fang, 2000: 435, pl. 17, fig. 20, *Spilarctia obliquizonata*

Description. Alar expanse reaching 42 mm. Main colour of wing, head and thorax creamy white. Costal edge of fw with two black striae, a gradually expanding black band divided by light veins running from apex of wing to the middle of hind edge. Hw with a black spot on discal vein and several submarginal spots. Abdomen pink with a series of black points laterally.

Variability. No data available.

Distribution. Pattern East Asian.

Within the former Soviet Union. Southern Kuril Islands (Kunashir), southern Sakhalin.

Beyond the former Soviet Union. Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Biology. Flight in July in woodlands.

Similar species. *S. lutea*, has a yellow abdomen, the black pattern is weakly expressed.

102. *Spilarctia subcarnea* (Walker, 1855)

(Pl. 21, Figs 1-2)

Spilosoma subcarnea (sic!) Walker, 1855: 675, TL: Shanghai, China.

[= *leucothorax* (Felder, 1862); *bifrons* (Walker, 1855); *erubescens* Moore, 1877; *tsingtauana* Rothschild, 1910; *charbini* Daniel, 1943]

[subcarnea – nearly solid (Lat.)]

Butler, 1877: 6, pl. 42, fig. 8, *Spilarctia subcarnea*

Hampson, 1901: 314, *Diacrisia subcarnea*

Seitz, 1910: 86, pl. 15, row d, *Spilarctia subcarnea*

Daniel, 1943b: 694, *Spilarctia subcarnea*

Daniel, 1943b: 696, pl. 19, figs 7-8, *Spilarctia subcarnea charbini*

Fang, 1982: 218, fig. 1613, *Spilarctia subcarnea*

Fang, 2000: 426, pl. 17, fig. 11, *Spilarctia subcarnea*

Dubatolov, 1996b: 68, *Spilarctia subcarnea* f. *lidia*

Description. Alar expanse about 40 mm. Fw white with slight yellowish tint; hw white. Fw with an arcuate series of black spots running from the middle of hind edge to external edge, the spots not reaching the latter. Spots at costal edge and on discoidal vein, sometimes also a series of spots near base. Hw with a weakly expressed dot on discal vein. Underside of wings white with black points on discal veins and with traces of an arcuate series on fw. Thorax and first abdominal segments white. Abdomen from above carmine red, underside white. A series of black spots on dorsal side and at border between red and white on each lateral side. In addition, a series of black points passing over white field on each lateral side. Antennae of male serrate.

Variability rather pronounced:

f. *bifrons* (Walker, 1855) – Japan; hw pink, fw without black pattern;

f. *lidia* – southern Primorye (Kaimanovka); abdomen yellow;

ssp. *charbini* – NE. China; abdomen yellow. Kurentsov (1966) has recorded *charbini* in Kamchatka but Dubatolov (1996b) doubts the occurrence of this form in our country.

Distribution. Pattern East and Southeast Asian.

Within the former Soviet Union. Primorye (Kaimanovka, Khasan).

Beyond the former Soviet Union. China (Hongkong, Hubei, Sichuan, Beijing, Shanghai, Taiwan, Heilongjiang, Guangdong, Yunnan, Shaanxi (Hauzhenzi) etc.); Japan; Korea (Singpo) and other parts of Asia down to the Malay Archipelago and the Philippines.

Biology. Flight in August over glades of mixed and deciduous woodlands.

Similar species. *S. lutea*, has a yellow abdomen; the antennae of *S. obliquisonata* are bipectinate.

49. Genus *Lemyra* Walker, 1856

Lemyra Walker, 1856: 1690, TS: *Lemyra extensa* Walker, 1856.

= *Thanatarctia* Butler, 1877: 395, TS: *Thanatarctia infernalis* Butler, 1877

Thomas, 1990: 1, *Lemyra*

Fang, 2000: 526, *Lemyra*

Antennae bipectinate. Proboscis not developed. Palpi short, directed downwards. Forehead coated with short hairs. More than 40 species in the Palaearctic.

Note. Thomas (1990) has provided a revision of the genus while Fang (2000) a key to most of the congeners.

103. *Lemyra boghaika* Tshistjakov & Kishida, 1994

(Pl. 21, Fig. 5)

Lemyra boghaika Tshistjakov & Kishida, 1994: 189, figs 1-2, 3-4, TL: southern Primorye.

Dubatolov, 1994: 17, *Lemyra inaequalis* Butler, 1879

Dubatolov, 1996b: 68, *Lemyra inaequalis*

Description. Male. Alar expanse 32-35 mm. Fw from above white, with a dark diagonal band consisting of separate spots and running from apex of wing to middle of hind edge. A dark spot on discal vein present. Fw with a black dot at costal edge almost in the middle. Hind half of hw with pinkish tint. A black spot at apex of cell and several black maculae closer to edge of hw. Head and thorax pale creamy, abdomen from above pink.

Female. Alar expanse 40-44 mm. Wings, head and thorax white. Several longitudinal black strips at apex of fw, black spots at apex of cell on fw and hw. In addition, several dark spots located near external edge of hw. Abdomen yellow with black points on upper side, but last segments of abdomen remaining white.

Distribution. Pattern East Asian.

Within the former Soviet Union. Lower Amurland, Primorye.

Beyond the former Soviet Union. Korea; NE. China; Japan.

Biology. Flight in July-August on glades in mixed and deciduous woodlands, including forested slopes.

Similar species. *Spilarctia seriatopunctata*, on the average larger, female creamy yellow. Male has a black point near the base of the fw; along the costal vein there is a black strip running from the base. *S. obliquizonata*, larger (alar expanse 43-50 mm); the diagonal band on the fw is wide; the costal vein of the fw with a prolate black spot near the apex of cell; a black stria at the base. *S. subcarnea*, the abdomen is red with black points.

Note. Dubatolov (1994, 1996b) misidentified the Russian records as belonging to *Lemyra inaequalis* (Butler, 1879). At present these are correctly referred to *L. boghaika*.

104. *Lemyra jankowskii* (Oberthür, 1881)

(Pl. 22, Figs 1-2; genitalia in Pl. 27, Fig. 9)

Spilosoma jankowskii Oberthür, 1881: 31, pl. 8, fig. 3, TL: Askold Island (Primorye).

[= *jankowskii korearctia* Bryk, 1948]

[*jankowskii* – in honour M. I. Jankowski, a landowner in the Far East of Russia who assisted many explorers]

Leech, 1899: 152, *Spilosoma jankowskii* var. *soror*

Seitz, 1910: 86, pl. 15, row c, *Spilarctia jankowskii*

Dubatolov, 1996b: 68, *Lemyra jankowskii*

Fang, 2000: 400, pl. 16, fig. 18, *Lemyra jankowskii*

Subspecies:

L. j. soror (Leech, 1899) [= *vialis* Oberthür, 1911].

Description. Alar expanse 35-40 mm. Fw and thorax yellow. A black point on discal vein. A gray stria divided into spots by yellow veins running from apex of wing to the middle of hind edge. Initial part of the stria near the apex consisting of small spots. Hw white with black points on discal vein and near anal angle. Underside of fw white with a yellowish apex, hw white. Pattern of underside same as on upper side. Abdomen from above red, underside yellowish with black spots at border between yellow and red parts. Antennae of male black, pectinate. Last segments of abdomen of female larger, white.

Variability noticeable:

ssp. *soror* (Leech, 1899) – China (Beijing, Sichuan, Tibet, Yunnan, Shaanxi); coloration of fw darker; spotty stria curved toward fore edge of wing, an additional gray spot near inner edge.

Distribution. Pattern Southeast Asian.

Within the former Soviet Union. Middle Amurland, Primorye.

Beyond the former Soviet Union. China; India (Sikkim, Assam).

Biology. Flight in mixed coniferous-deciduous forests in July-August, common. Last instar caterpillar black. Hairy integument consisting of a mixture of black and white hairs, seemingly gray. On lateral sides, each segment with up to three separate brown spots. Head brown, body with brown spots (Seitz, 1910).

Similar species. *L. boghaika*, has white wings, the crests of the antenna are short. *Spilarctia subcarnea*, has a black, contrasting, diagonal stria, the abdomen from above is with black points.

50. Genus *Phragmatobia* Stephens, 1828

Phragmatobia Stephens, 1828: 55, TS: *Phalaena fuliginosa* Linnaeus, 1758.

All species of the same type. Fw uniformly brown or light brown, hw red with a dark edge or with separate dark spots. Male genitalia: uncus rather slender and nearly straight, costa narrow and long.

Several dozen species of this genus are currently known. The geographical range of *Phragmatobia* covers nearly all of the Palearctic. In the fauna of former Soviet Union, three species have been registered.

Key to species of *Phragmatobia*:

1. A red spot on discal vein of fw. *Ph. placida*
 –. No red spot but only one or two black points on discal vein of fw. 2
 2. Antennae of male simple. *Ph. fuliginosa*
 –. Antennae of male pectinate. *Ph. amurensis*

105. *Phragmatobia fuliginosa* (Linnaeus, 1758)

(Pl. 22, Figs 4–7, 10; Pl. 23, Figs 2, 3, 9, 10; genitalia in Pl. 27, Fig. 10)

Phalaena fuliginosa Linnaeus, 1758: 509, TL: W. Germany (“West Gothia”).

[= *fervida* Staudinger, 1871; *meridionalis* Tutt, 1904; *lurida* Rothschild, 1910; *totirubra* Vorbrodt, 1914; *furcula* Bryk, 1923; *atropa* Bryk, 1923; *clara* Sibille, 1927; *kruegeri* Rangnow, 1935; *kolari* Diószeghy, 1935; *obscura* Obratsov, 1936; *ochracea* Zlotowzycki, 1948; *inhoffi* Stoecklin, 1959; *monticola* Daniel, 1970; *naxari* Ebert, 1973]

[fuligo – soot (Lat.)]

[Rostbar, Zimtbär – (Germ.)]

[Ruby tiger – (Engl.)]

[Ecaile Cramoisie, Ecaile Fuligineuse – (Fr.)]

Staudinger, 1871: 59, *Spilosoma fuliginosa borealis*, *S. fuliginosa fervida*

Alpheraky, 1889: 84, *Spilosoma fuliginosa pulverulenta*

Spuler, 1910: 130, pl. 73, fig. 26, *Phragmatobia fuliginosa*

Seitz, 1910: 79, pl. 16, row b, *Phragmatobia fuliginosa*

Daniel, 1970: 9, *Phragmatobia fuliginosa taurica*

Lenek, 1966: 105, *Phragmatobia fuliginosa paghmani*

Fang, 2000: 353, pl. 15, fig. 6, *Phragmatobia fuliginosa*

Subspecies:

Ph. f. borealis (Staudinger, 1871)

Ph. f. fervida (Staudinger, 1871)

Ph. f. pulverulenta (Alpheraky, 1889) (= *pallida* Rothschild, 1910; *thibetia* Strand, 1919)

Ph. f. paghmani Lenek, 1966

Ph. f. taurica Daniel, 1970.

Description. Alar expanse 25–32 mm. Fw dark brown with a black point, either with two spots or with a stria on discal vein. Hw red with purple tint and two points on discal vein. A series of dark spots often merged into a boundary belt at edge of hw. Prothorax coated with velvety brown hairs; upper side and underside of abdomen dark, lateral sides red, tip of abdomen often reddish. Antennae of male simple.

Male genitalia: uncus regularly tapered toward apex, subtriangular; two processes opposite each other at apex of valve at its upper and inner edges; saccus rounded from above.

Variability. The following subspecies are known from our territory:

ssp. *fuliginosa* – southern half of Europe, central and southern Russia, southern Urals, southern Siberia;

ssp. *borealis* – boreal; hw almost completely dark, only inner edge still with a red background; in central Russia, for example near Moscow, specimens with completely dark hws or separate spots at the edge of the wings, as well as intermediate forms, are known to occur;

ssp. *fervida* – southern Europe, Turkey, Transcaucasia; larger, with reddish, often clarified fws; hw bright red with small black spots at edge of wing; Groum-Grshimailo (1890) mentioned the presence of this form in the Pamirs, Central Asia;

ssp. *taurica* – Caucasus (except for the northeastern part), Transcaucasia (except for Armenia); eastern Turkey, northern Iran; fw lighter;

ssp. *pulverulenta* – differs by the larger size (30–37 mm), upper side of fw often light, yellow-brown, especially in eremic parts, in the mountains darker; two black points, sometimes vague or missing, at the end of median cell; hw red or pink with separate, small, black spots in submarginal region and two black points on transverse vein; abdomen red



Fig. 83. Russia, birch wood near Moscow City, glades supporting numerous tiger moth species like *Callimorpha dominula* (L.), *Diaphora mendica* (Cl.), *Tyria jacobaeae* (L.) *Parasemia plantaginis* (L.), *Diacrisia sannio* (L.), *Phragmatobia fuliginosa* (L.), *Spilosoma lubricipeda* (L.), *S. urticae* (Esp.) and some others (photo V. S. Murzin).

with a series of black points of each lateral side; described based on material taken by N. M. Przewalsky in the region of Lake Lob-Nor in Tibet, China, southern Mongolia and probably also in the south of Central Asia; in any case, similar specimens occur in different parts of Central Asia;

ssp. *pagmani* (Pl. 22, Fig. 10; Pl. 23, Figs 2 & 3) – southwestern Transcaucasia, Central Asia, southern Kazakhstan, Afghanistan; fw lighter than in the typical form, hw red with small dark spots; possibly this form is just a junior synonym of *pulverulenta*.

Some other subspecies have been described from the western and southern Palearctic as well as North America but they do not seem to occur in the territory of the former Soviet Union.

Distribution. Pattern Holarctic.

Within the former Soviet Union. Baltia; Belarus; Ukraine, Crimea; Moldova; entire European part of Russia, Siberia, Caucasus; Transcaucasia, Central Asia, southern Kazakhstan.

Beyond the former Soviet Union. Europe, E. Turkey, Iraq (Shaqlava), northern Iran, Afghanistan, southern Mongolia, China (Xinjiang, Qinghai, Nei Mongolia) and North America.

Biology. In the south of the range, flight in two generations from early spring until autumn, in Tajikistan and Turkmenistan up to four (Stshetkin, 1960) from the end of March to the end of September; in more boreal parts (ssp. *borealis*) in one generation (May-June). Flying at night. Caterpillar gray-brown with reddish brown hairs and a black head. In the afternoon usually hiding under stones. Food plants: various grasses and bushes like *Salix repens*, *S. starkeana*, *S. phylicifolia*, *Polygonum* spp., *Rumex* spp., *Myosotis* spp., *Potentilla erecta*, *Rubus idaeus*, *Trifolium* spp., *Chamaenerion angustifolium*, *Calluna vulgaris*, *Vaccinium myrtillus*, *V. uliginosum*, *Andromeda polifolia*, *Plantago* spp., *Taraxacum vulgare*, *Linum* sp., *Carelia* spp., *Spalanzania* sp. Caterpillar hibernating, in Central Asia sometimes pupa hibernating. Pupa black in a gray-brown cocoon made of silk with hairs. Pupation in crevices of tree bark, among leaves etc.

Similar species. *Ph. amurensis*, male antennae are pectinate, genitalia different, distributed in Cisamuria and Primorye. *Ph. placida*, has a small red spot between two black points on the discal vein of the fw, distributed only in Transcaucasia and Central Asia.

106. *Phragmatobia amurensis* Seitz, 1910

(Pl. 23, Figs 4-8)

Phragmatobia amurensis Seitz, 1910: 79, pl. 16, row b, TL: Amur.

[= *chosensis* Bryk, 1948]

Rothschild, 1910: 116, *Phragmatobia amurensis japonica*

Esaki et al., 1971: 209, pl. 121, fig. 1560, *Phragmatobia fuliginosa japonica*

Dubatolov, 1996b: 69, *Phragmatobia amurensis japonica*

Subspecies:

Ph. a. japonica Rothschild, 1910.

Description. Superficially not differing from *Ph. fuliginosa*. Alar expanse 25-32 mm. Fw brown with a black point on discal vein. Hw red with purple tint and two points on discal vein. A series of dark spots at edge of wing. Prothorax coated with velvety brown hairs, abdomen from above and on underside dark, lateral sides red. Tip of abdomen often reddish. Antennae of males pectinate. Uncus rostral, sharply narrowed toward apex. Processes at apex of valve merged and forming a plate on inner side of valve. Saccus pointed from above.

Variability noticeable:

ssp. *japonica* – Amurland, southern Sakhalin, southern Kuril Islands and Japan; differing by brown fws with gray pollination and by a wide submarginal belt on hw.

Distribution. Pattern East Asian.

Within the former Soviet Union. Primorye and Amurland, southern Sakhalin, southern Kuril Islands.

Beyond the former Soviet Union. Korea; Japan; China.

Biology. Flight in various habitats from June until August.

Similar species. *Ph. fuliginosa*, differs by genitalic conformation; the antennae of the male are simple. *Ph. placida*, has a red spot on the discal vein of the fw, not occurring in the Far East of Asia.

107. *Phragmatobia placida* (Frivaldzsky, 1835)

(Pl. 22, Figs 3, 8, 9, 11-12; Pl. 23, Fig.1)

Euprepia placida Frivaldzsky, 1835: 271, pl. 7, fig. 5, TL: Southeastern Europe (?).

[*placida* – quiet (Lat.)]

Erschoff, 1874: 33, *Arctia placida*

Spuler, 1910: 130, pl. 73, fig. 26, *Phragmatobia placida*

Seitz, 1910: 79, pl. 16, row b, *Phragmatobia placida*

Description. Alar expanse 37-39 mm. Fw brown with two points on discal vein, a red dot often but not always lying between them. Furthermore, a pink red field at base of fw below cubital vein. Hw semi-transparent, pink with few small black spots at edge and with black points at end of discal cell. Fringe of fw brown, of hw pink. Abdomen from above red with a brown dorsal band. All femora red.

Variability. Specimens from Central Asia (Alaiskiy Mt. Range) show lighter fws. Red markings on the fw are weakly expressed. In some specimens, the fws from above have two black points instead of red and black (Erschoff, 1874). The fore edge of the hw is infuscate.

Distribution. Pattern Anatolian-Iranian.

Within the former Soviet Union. Ukraine (Kostjuk & Pljustsh, 1987), Armenia and Central Asia.

Beyond the former Soviet Union. From ex-Yugoslavia to Turkey.

Biology. In Armenia, flight from the end of June up to early August. Caterpillar a little larger than in *Ph. fuliginosa*, dark, from red-brown to almost black; fascicles of hairs on dark warts of the same colours. Head deep brown or black. Larvae feeding on *Plantago*, *Taraxacum* etc. Most of caterpillars hibernating, moth emergence in the beginning of summer.

Similar species. *Ph. fuliginosa* and *Ph. amurensis*, no red point on discal vein of fw; the latter species does not occur together with *Ph. placida*.

51. Genus *Epatolmis* Butler, 1877

(Genitalia in Pl. 27, Fig. 11)

Epatolmis Butler, 1877: 348, TS: *Atolmis japonica* Walker, 1865.

= *Arctinia* Eichwald 1830: 195, TS: *Phalaena caesarea* Goeze, 1781

Close to *Spilosoma*. Head and thorax coated with thick hairs. Palpi short, strongly pilar. Proboscis very short. Hw with a yellow patch at anal angle.

A monotypical genus.

108. *Epatolmis luctifera* (Denis & Schiffermüller, 1775)

(Pl. 23, Figs 11-12)

Bombyx luctifera Denis & Schiffermüller, 1775: 54, TL: Europe (?).

[= *Phalaena caesarea* Goeze, 1781; *luctifera* Esper, 1784; *japonica* Walker 1865; *moerens* Butler, 1885]

[*luctifera* – carrying grief (?) (Lat.)]

[*caesarea* – royal (Lat.), black and yellow being Habsburg's colours]

[Trauerspinner, Kaiserbär – (Germ.)]

[Le Deuil – (Fr.)]

Spuler, 1910: 131, pl. 73, fig. 2, *Arctinia caesarea*

Seitz, 1910: 91, pl. 17, row b, *Arctinia caesarea*

Fang, 2000: 352, pl. 15, fig. 5, *Epatolmis caesarea*

Description. Alar expanse 31-34 mm. Fw brownish black, hw of same colour but with a yellow macula near anal angle. Underside with the same pattern. Head, thorax and inner part of abdomen as well as legs black. Abdomen yellow with black points on lateral sides and dorsally. Antennae of male pinnate. Proboscis abortive. Female smaller in size, coloration more saturated.

Variability. Individual variability insignificant:

f. (ab.) *moerens* – yellow macula at anal angle of hw absent, sometimes yellow tint covering all inner edge of hw.

Distribution. Pattern Palaearctic.

Within the former Soviet Union. Baltia; Belarus; Ukraine; Moldova; European part of Russia (from the line Luga, Leningrad Region – Kazan in the north, and Taġanroġ, Rostov-on-Don – Millerovo – Middle Volġa region in the south), Transcaucasia (Borzhomi in Georgia and Gyanja (Kirovabad) in western Azerbaijan); South Siberia (Tobolsk, Barnaul, Khakassia, Minusinsk); southern coast of Lake Baikal; Transbaikalia; middle flow region of Amur River (Blagoveshchensk, Pashkovo); southern Primorye (Sikhote-Alin Mts).

Beyond the former Soviet Union. Central and South Europe (southern France, southern Germany, Austria, Czech Republic, Slovakia, northern Italy and northeastern Balkans); Asia Minor; northern China; Japan.

Biology. Flight in May-June, in the south in two generations. Caterpillar black-brown with a reddish dorsal strip and fascicles of black-brown hairs on black warts. In July-August, feeding on *Rubus*, *Plantago*, *Veronica*,

Galium, *Euphorbia*, *Stellaria*, *Hieracium*, *Atriplex*, *Cynoglossum*. Pupa red-brown, shining; hibernating in a dark gray cocoon.

Similar species. There seem to be no similar species.

Conclusions

At present, in the territory of the former Soviet Union, no fewer than and 108 species from 51 genera of Arctidae in the narrow sense are known to occur. However, further numerical changes are possible as a result of new discoveries and revisions. Three new forms of unknown but likely infraspecific status are described in this book, and some further nomenclatural remarks are given.

Most of our tiger moths prove to be polyphages, with *Plantago*, *Taraxacum* and *Vaccinium* spp. being the most preferred food plants for the caterpillars (Fig. 85).

The fauna appears to be quite diverse both due to the great territory and habitat diversity concerned and the group's incipient euryoeky. Species populate the southern mountains and the coasts of boreal seas, the highest mountain peaks, steppe, desert, dry and wet subtropical habitats, relict forests along the Caspian Sea and the woodlands of the Russian Far East.

The greatest proportion of the fauna accounts for Central Asian species (about 30%). Further ca. 12% are contributed by East Asian taxa. Rather well-represented appear to be Siberian species partly penetrating into Europe, Mongolia, North America and other adjacent countries (about 20%). These elements are followed by species widely distributed all over the northern Palaearctic (~10%). A noticeable contribution is provided by Mediterranean elements (4 species). There are also representatives of the Iranian, northern American, Chinese-Mongolian and other faunas.

The greatest number of endemic tiger moths occur in Central Asia and the Altai. Among these elements, the Central Asian *Dixearctia diva*, *Palaearctia ferghana*, *P. erschoffi*, *P. dublitzkyi*, *P. gratiosa*, *P. gracilis*, *P. golbecki*, *P. rupicola*, *Oroncus alaica*, *Acerbia seitszi*, *Chelis ferghana*, *Ch. tianshana*, *Tajigyna gansoni*, the Altaian *Chelis caecilia*,



Fig. 84. The tops of mountains deprived of forest in Siberia ("goltsy"), usually covered by high-montane tundra vegetation. Here sometimes there are species from the Far North, as for example *Hyperborea czechanowskii* Gr.-Gr., *Dodia kononenkoi* Tschist.& Laf., or widespread species like *Borearctia menetriesi* Ev.

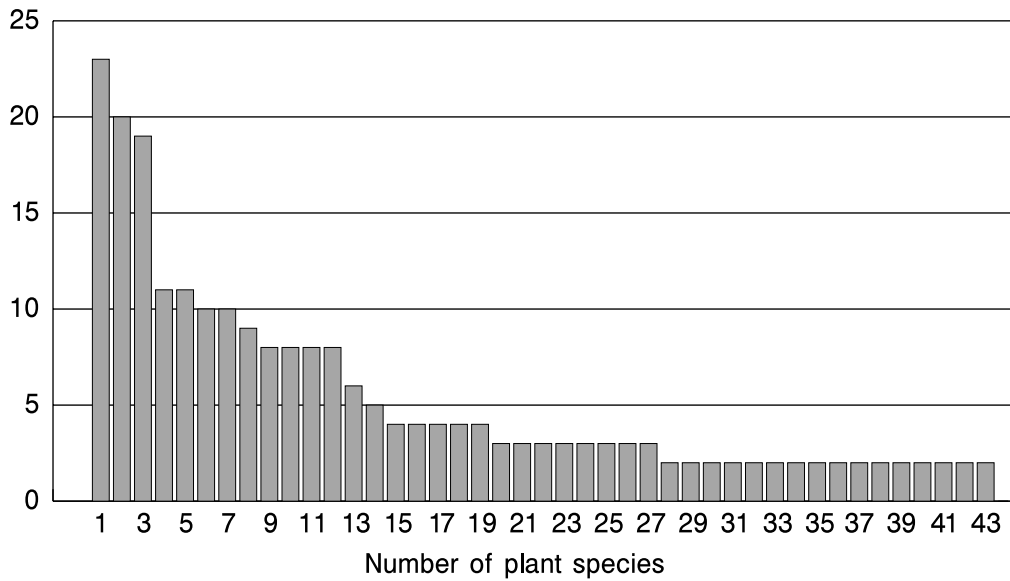


Fig. 85. Distribution of main food plants between tiger moth species (see Add. IV-7).

Palearctia mira, *Holarctia marinae*, *Dodia sazonovi* as well as the extremely boreal *Hyperborea czekanowskii*, *Arctia olschwanzi*, *Pararctia tundrana* and some others are noteworthy. Not surprisingly, the species from the Russian Far East appear to be especially closely related to the faunas of China and Korea, as a rule. Rather mysterious remains the distribution of *Borearctia menetriesi*, a form quite rare in existing collections. This tiger moth species ranges from Finland in the west to China and Sakhalin in the east, occupying various habitats like forest glades, taiga stands, “goltsy”, taluses, etc. but everywhere uncommon.

As most of our endemic species have only been described over the past few decades, new exciting discoveries are to be expected in the field of tiger moth systematics, distribution, ecology and biology.

Acknowledgements

The author wishes to thank all colleagues who helped him in this work: A. Avalov, V. V. Dubatolov, V. A. Ganson, A. V. Sviridov, V. V. Sinyaev. Special gratitude goes to O. G. Gorbunov for a critical review of the manuscript and to S. I. Golovatch for the help in editing the manuscript. *Pensoft Publishers* is cordially thanked for publication.

IV. Addenda

IV-1. Alphabetical List of Genera

1	<i>Acerbia</i> Sotavalta, 1963	27	<i>Holoarctia</i> Ferguson, 1984
2	<i>Aglaomorpha</i> Kôda, 1987	28	<i>Hyperborea</i> Grum-Grshimailo, 1900
3	<i>Alphaea</i> Walker, 1855	29	<i>Hyphantria</i> Harris, 1841
4	<i>Amurrhyparia</i> Dubatolov, 1985	30	<i>Hyphoraia</i> Hübner, 1820
5	<i>Andala</i> Walker, 1855	31	<i>Lacydes</i> Walker, 1855
6	<i>Arctia</i> Schrank, 1802	32	<i>Lemyra</i> Walker, 1856
7	<i>Axiopoena</i> Ménétriès, 1842	33	<i>Ocnogyna</i> Lederer, 1853
8	<i>Borearctia</i> Dubatolov, 1984	34	<i>Oroncus</i> Seitz, 1910
9	<i>Callimorpha</i> Latreille, 1809	35	<i>Palearctia</i> Ferguson, 1984
10	<i>Carcinopyga</i> Felder, 1874	36	<i>Pararctia</i> Sotavalta, 1965
11	<i>Chelis</i> Rambür, 1866	37	<i>Parasemia</i> Hübner, 1820
12	<i>Chionarctia</i> Kôda, 1988	38	<i>Pericalia</i> Hübner, 1820
13	<i>Coscinia</i> Hübner, [1819]	39	<i>Phragmatobia</i> Stephens, 1828
14	<i>Cymbalophora</i> Rambür, 1866	40	<i>Platarctia</i> Packard, 1864
15	<i>Diacrisia</i> Hübner, [1819]	41	<i>Preparctia</i> Hampson, 1901
16	<i>Diaphora</i> Stephens, 1827	42	<i>Rhyparia</i> Hübner, 1820
17	<i>Divarctia</i> Dubatolov, 1990	43	<i>Rhyparioides</i> Butler, 1877
18	<i>Dodia</i> Dyar, 1901 (=Hyalocoa)	44	<i>Sibirarctia</i> Dubatolov, 1987
19	<i>Epatolmis</i> Butler, 1877	45	<i>Spilarctia</i> Butler, 1875
20	<i>Epicalia</i> Hübner, 1820	46	<i>Spilosoma</i> Curtis, 1825
21	<i>Epimydia</i> Staudinger, 1892	47	<i>Spiris</i> Hübner, 1819
22	<i>Eucallimorpha</i> Dubatolov, 1990	48	<i>Tajigyna</i> Dubatolov, 1990
23	<i>Eucharia</i> Hübner, 1820	49	<i>Tamcrea</i> Püngeler, 1898
24	<i>Eudiaphora</i> Dubatolov, 1990	50	<i>Tyria</i> Hübner, 1819
25	<i>Euplagia</i> Hübner, 1820	51	<i>Utetheisa</i> Hübner, 1819
26	<i>Grammia</i> Rambür, 1866	52	<i>Watsonarctia</i> de Freina & Witt, 1984

IV-2. Checklist of the Tiger Moths of the Former Soviet Union

The genera and species recorded in the former Soviet Union are numbered

Subfamily Callimorphinae

1. Genus *Callimorpha* Latreille, 1809
 1. *Callimorpha dominula* (Linnaeus, 1758)
 2. *Callimorpha philippsi* Bartel, 1906
2. Genus *Euplagia* Hübner, 1820
 3. *Euplagia quadripunctaria* (Poda, 1761)
 4. *Euplaga splendidior* (Tams, 1922)
3. Genus *Eucallimorpha* Dubatolov, 1990
 5. *Eucallimorpha principalis* (Kollar, 1844)
5. Genus *Cymbalophora* Rambür, 1866
 6. *Cymbalophora rivularis* (Ménétriès, 1832)
6. Genus *Carcinopyga* Felder, 1874

7. *Carcinopyga lichenigera* Felder, 1874
 8. *Carcinopyga proserpina* (Staudinger, 1887)
 9. *Carcinopyga gurkoi* Kautt & Soldatis, 1997
7. Genus *Axiopoena* Ménétriès, 1842
 10. *Axiopoena maura* (Eichwald, 1830)
 11. *Axiopoena karelini* Ménétriès, 1863
8. Genus *Tyria* Hübner, 1819
 12. *Tyria jacobaeae* (Linnaeus, 1758)
9. Genus *Dodia* Dyar, 1901
 13. *Dodia diaphana* (Eversmann, 1848)
 14. *Dodia albertae* Dyar, 1901
 15. *Dodia kononenkoi* Tschistjakov & Lafontaine, 1984
 16. *Dodia sazonomi* Dubatolov, 1990
10. Genus *Epimydia* Staudinger, 1892
 17. *Epimydia dialampra* Staudinger, 1892
11. Genus *Lacydes* Walker, 1855
 18. *Lacydes spectabilis* (Tauscher, 1806)
12. Genus *Spiris* Hübner, 1819
 19. *Spiris striata* (Linnaeus, 1758)
 20. *Spiris bipunctata* (Staudinger, 1892)
13. Genus *Coscinia* Hübner, 1819
 21. *Coscinia cribraria* (Linnaeus, 1758)
14. Genus *Utetheisa* Hübner, 1819
 22. *Utetheisa pulchella* (Linnaeus, 1758)
- Subfamily Arctiinae
15. Genus *Stauropolia* Skalski, 1988
 23. †*Stauropolia nekruutenkoi* Skalski, 1988
16. Genus *Parasemia* Hübner, 1820
 24. *Parasemia plantaginis* (Linnaeus, 1758)
17. Genus *Hyphoraia* Hübner, 1820
 25. *Hyphoraia aulica* (Linnaeus, 1758)
18. Genus *Pararctia* Sotavalta, 1965
 26. *Pararctia lapponica* (Thunberg, 1791)
 27. *Pararctia lemniscata* (Stichel., 1911)
 28. *Pararctia tundrana* Tshistjakov, 1990
20. Genus *Borearctia* Dubatolov, 1984
 29. *Borearctia menetriesi* (Eversmann, 1846)
21. Genus *Acerbia* Sotavalta, 1963
 30. *Acerbia alpina* (Quensel, 1802)
 31. *Acerbia seitzii* (A. Bang-Haas, 1910)
22. Genus *Platarctia* Packard, 1864
 32. *Platarctia atropurpurea* (O. Bang-Haas, 1927)
23. Genus *Oroncus* Seitz, 1910
 33. *Oroncus tanerei* (Staudinger, 1887)
 34. *Oroncus urania* (Püngeler, 1904)
 35. *Oroncus fasciata* O. Bang-Haas, 1927
 36. *Oroncus alaica* O. Bang-Haas, 1927
26. Genus *Arctia* Schrank, 1801
 37. *Arctia intercalaris* (Eversmann, 1843)
 38. *Arctia ladakensis* (O. Bang-Haas, 1927)
 39. *Arctia caja* (Linnaeus, 1758)
 40. *Arctia flavia* (Fuessly, 1779)
 41. *Arctia rueckbeili* (Püngeler, 1901)
 42. *Arctia olschwangi* Dubatolov, 1990

27. Genus *Epicallia* Hübner, 1820
43. *Epicallia villica* (Linnaeus, 1758)
28. Genus *Eucharia* Hübner, 1820
44. *Eucharia festiva* (Hufnagel, 1766)
45. *Eucharia interrogationis* (Ménétrières, 1863)
46. *Eucharia culoti* (Oberthür, 1912)
29. Genus *Pericallia* Hübner, 1820
47. *Pericallia matronula* (Linnaeus, 1758)
- Subfamily Micrarctiinae
31. Genus *Divarctia* Dubatolov, 1990
48. *Divarctia diva* (Staudinger, 1887)
32. Genus *Tancrea* Püngeler, 1898
49. *Tancrea pardalina* Püngeler, 1898
33. Genus *Holoarctia* Ferguson, 1984
50. *Holoarctia cervini* (Fallou, 1864)
51. *Holoarctia marinae* Dubatolov, 1985
52. *Holoarctia puengeleri* (O. Bang-Haas, 1927)
34. Genus *Palaearctia* Ferguson, 1984
53. *Palaearctia* (Palaearctia) *mira* Dubatolov & Tshistjakov, 1989
54. *Palaearctia* (Palaearctia) *glaphyra* (Eversmann, 1843)
55. *Palaearctia* (Palaearctia) *dublitzkyi* (O. Bang-Haas, 1927)
56. *Palaearctia* (Palaearctia) *gratiosa* (Groum-Grshimailo, 1890)
57. *Palaearctia* (Palaearctia) *gracilis* Dubatolov, 1996
58. *Palaearctia* (Palaearctia) *golbecki* Dubatolov, 1996
59. *Palaearctia* (Palaearctia) *rupicola* Groum-Grshimailo, 1890
60. *Palaearctia* (Palaearctia) *erschoffi* (Alpheraky, 1882)
61. *Palaearctia* (Palaearctia) *ferghana* (Staudinger, 1887)
62. *Palaearctia* (Centrarctia) *mongolica* (Alpheraky, 1888)
63. *Palaearctia* (Palaearctia) *sarycola* de Freina, 1997
35. Genus *Sibirarctia* Dubatolov, 1987
64. *Sibirarctia kindermanni* (Staudinger, 1867)
65. *Sibirarctia buraetica* (O. Bang-Haas, 1927)
36. Genus *Chelis* Rambür, 1866
66. *Chelis maculosa* (Gerning, 1780)
67. *Chelis reticulata* (Christoph, 1887)
68. *Chelis caecilia* (Kindermann, 1853)
69. *Chelis dahurica* (Boisduval, 1832)
70. *Chelis ferghana* Dubatolov, 1988
71. *Chelis tianshana* Dubatolov, 1988
37. Genus *Grammia* Rambür, 1866
72. *Grammia quenseli* (Paykull, 1793)
73. *Grammia philippiana* Ferguson, 1985
74. *Grammia turbans* (Christoph, 1892)
38. Genus *Hyperborea* Groum-Grshimailo, 1899
75. *Hyperborea ezekanowskii* Groum-Grshimailo, 1899
39. Genus *Diacrisia* Hübner, 1819
76. *Diacrisia sannio* (Linnaeus, 1758)
77. *Diacrisia irene* Butler, 1881
40. Genus *Rhyparioides* Butler, 1877
78. *Rhyparioides metelkanus* (Lederer, 1861)
79. *Rhyparioides amurensis* (Bremer, 1861)
80. *Rhyparioides nebulosa* Butler, 1877
41. Genus *Rhyparia* Hübner, 1820
81. *Rhyparia purpurata* (Linnaeus, 1758)

42. Genus *Amurrhyparia* Dubatolov, 1985
82. *Amurrhyparia leopardinula* (Strand, 1919)
- Subfamily Spilosominae
44. Genus *Ocnogyna* Lederer, 1853
83. *Ocnogyna parasita* (Hübner, 1790)
84. *Ocnogyna armena* Staudinger, 1871
45. Genus *Tajigyna* Dubatolov, 1990
85. *Tajigyna gansoni* Dubatolov, 1990
46. Genus *Watsonarctia* de Freina & Witt, 1984
86. *Watsonarctia deserta* (Bartel, 1902)
47. Genus *Chionarctia* Kôda, 1988
87. *Chionarctia niveum* (Ménétrières, 1859)
48. Genus *Alphaea* Walker, 1855
88. *Alphaea melanostigma* (Erschoff, 1872)
49. Genus *Andala* Walker, 1855
89. *Andala guttata* (Erschoff, 1874)
90. *Andala transversa* (Moore, 1879)
50. Genus *Hyphantria* Harris, 1841
91. *Hyphantria cunea* (Drury, 1773)
51. Genus *Diaphora* Stephens, 1827
92. *Diaphora mendica* (Clerck, 1759)
52. Genus *Eudiaphora* Dubatolov, 1990
93. *Eudiaphora turensis* (Erschoff, 1874)
53. Genus *Spilosoma* Curtis, 1825
94. *Spilosoma lubricipedum* (Linnaeus, 1758)
95. *Spilosoma punctarium* (Stoll, 1782)
96. *Spilosoma urticae* (Esper, 1789)
97. *Spilosoma mandli* Schawerda, 1922
98. *Spilosoma streltsovi* Dubatolov, 1994
54. Genus *Spilaretia* (Butler, 1875)
99. *Spilaretia lutea* (Hübner, 1766)
100. *Spilaretia seriatopunctata* (Motschulsky, 1861)
101. *Spilaretia obliquizonata* (Miyaki, 1910)
102. *Spilaretia subcarnea* (Walker, 1855)
55. Genus *Lemyra* Walker, 1856
103. *Lemyra boghaika* Tshistjakov & Kishida, 1994
104. *Lemyra jankowskii* (Oberthür, 1881)
56. Genus *Phragmatobia* Stephens, 1828
105. *Phragmatobia fuliginosa* (Linnaeus, 1758)
106. *Phragmatobia amurensis* Seitz, 1910
107. *Phragmatobia placida* (Friedländer, 1835)
58. Genus *Epatolmis* Butler, 1877
108. *Epatolmis luctifera* (Denis & Schiffermüller, 1775)

IV-3. Geographical Dictionary (Within the Former Soviet Union)

Geographical names

Abkhazia

Description and geographical position

A republic of Georgia, on the E. coast of the Black Sea: ~43°N, 40-42°E. Subtropical and mountains.

Ai-Dere

A village in the W. Kopet-Dagh Mts, Turkmenistan. Dry subtropical (pomegranate, walnut, fig trees etc., many endemic plants).

Aksu-Dzhebagly Nature Reserve

A nature reserve at the turn of Ugamskiy and Talasskiy Mt. ranges, W. Tian-Shan: 42°20'N, 70°36'E.

Aktash, Altais	A small town in Kurai Mts, 1700 m a.s.l.: 50°20'N, 87°53'E.
Alai Valley	A broad valley (8-22 km) situated between the Alai and Zaalaiskiy Mt. ranges at 3000 m a.s.l., Kzyl-Su River. Steppe. In Kirghizia between Chinese and Tajikistan borders.
Alai, Alai Mt. Range (Kichik Alai)	The mountain ranges bordering on Fergana Valley in the N. of Pamirs-Alai Mts, up to 6100 m a.s.l. Semidesert, feather-grass steppe, juniper woodlands, alpine meadows, elevations over 3000 m a.s.l.: ~39-41°N, 71-75°E.
Alai-Pamirs (Pamirs-Alai, Pamiro-Alai)	Highlands north of the Pamirs, including Alai, Transalai, Turkestanskiy, Hissarskiy, and Zeravshan Mt. ranges.
Aldan River	A confluent of Lena River in E. Siberia. Coniferous forests (taiga). The point of junction at ~63°28'N, 129°21'E.
Alexandrovskiy Mt. Range	See Kirghiz Alatau Mts
Alma-Ata (Almaty)	The former capital of Kazakhstan at the foothills of Zailiiskiy Alatau Mts, average elevation ca. 1000 m a.s.l., 43°16'N, 76°57'E.
Altai (Altays)	Highlands in S. Siberia from 50°N until Mongolian border in the S. Numerous mountain ridges, plateaus, glaciers. Mountain ridges from 500 to 5000 m a.s.l. Lower parts taiga-clad, higher altitudes supporting alpine meadows, rocks, taluses, snow/glaciers.
Amu-Darya River	A river in Central Asia. The source is in the Pamirs (~37°N, 68°20'E), delta at ~44°N, 59°01'E. Deserts, semideserts, "tugai" woodlands (riverside thickets).
Amur, Amur Basin, Amurland	A river in E. Siberia. The basin is ca. 2,000,000 sq. km. The flow of the river lying from 48° up to 50°N, 120-140°E. Coniferous and mixed forests.
Angara River	A right tributary to Yenisey River, discharging in Lake Baikal, extent ca. 1800 km. The basin is ca. 500000 sq. km in area. Source: 51°51'N, 104°59'E, delta: 58°11'N, 93°E. Coniferous forests (pine, fir, larch, etc.).
Aralsk	A town on the coast of Lake Aral (Aral Sea). Sandy desert.
Arkhangelsk, Arkhangelsk Region	Both a city and a region in the north of European Russia: 64°30'N, 40°40'E, taiga.
Armenia	A country in Transcaucasia. The capital is Yerevan: 40°08'N, 44°31'E. Formerly SSR Armenia.
Artybash	A settlement at the source of Biya River (Lake Teletskoe) (51°48'N, 87°15'E).
Astrakhan	A city in the delta of Volga River: 46°22'N, 48°E.
Avadkharo (Auadkhara)	A highland (1900-2400 m a.s.l.) place on the southern slope of the Caucasus Major, Abkhazia. Fir and mixed forests, alpine meadows near Lake Ritsa.
Azerbaijan	A country in Transcaucasia. The capital is Baku: 40°24'N, 49°51'E. Formerly SSR Azerbaijan.
Azov Sea	A sea in the south of European Russia. 46±1.7°N, 35-38°E. Banks steppe-clad.
Badhkyz	A nature reserve with a savanna-like landscape (steppe with <i>Pistacia</i> trees) in SE. Turkmenistan on the Turkmenistan-Afghan border, 36°N, 62°E.
Baikal	The largest lake in Siberia: 51°29'-55°46'N, over 600 km in extent. The lake is edged by mountain ranges supporting taiga woodlands.
Baikal area, Baikal region	Surroundings of Lake Baikal with shores and mountain ranges (Khamar-Daban, Barguzin, with elevations up to 3000 m a.s.l.). Rich mountain forests, mainly taiga.
Baikit	A settlement on Podkamennaya Tunguska River (~62°N, 97°E).
Balkhan Major	See Great Balkhan Mts
Balkhash	A lake, partly salt, in NE. Kazakhstan. Deserts, semideserts (Semirechye region).
Baltic countries, Baltia	Lithuania, Latvia and Estonia, i.e. republics of the former Soviet Union on the E. coast of Baltic Sea (54-59°N, west of 28°E).

Barnaul	A city in S. Siberia: 53°24'N, 84°E. Taiga, steppe.
Barnaul region (Altai Region)	An extensive territory in S. Siberia from the northern borders of Kazakhstan and the northern slopes of Altai Mts up to 54°N. Steppes, pine forests, mountain forests, taiga.
Bashkiria (Bashkortostan)	A republic in the east of European Russia, including the southern part of Ural Mts and Belaya River Basin. The capital is Ufa: 54°42'N, 56°E.
Belaya River	A river in the SW. Urals, a confluent of Kama River.
Belarus (Byelorussia)	A republic in the former Soviet Union. The capital is Minsk: 53°54'N, 27°32'E. Formerly SSR Byelarus. A region supporting mixed forests, alluvial ridges with pine woodlands and moors.
Bering Island	The largest among the Commander Islands, off Kamchatka: 55°06'N, 166°30'E.
Beryozov	A small town on Sosva River, in the lower flow of Ob River. North taiga. 64°N, 65°E.
Bilibino	A settlement on Smaller Anuy River (~68°30'N 167°E) north of Anuyskiy Mt. Range. Light coniferous (larch) taiga; mountain tundra in the mountains.
Bishkek (formerly Frunze)	The capital of Kirghizia (Kyrgyzstan): 42°54'N, 74°36'E.
Blagoveshchensk	The capital of Amurskaya Region of the Russian Far East, middle flow of Amur River: 50°21'N, 127°30'E.
Bolshoi Balkhan	See Great Balkhan Mts
Borzhomi	A small town in Georgia, Transcaucasia: 41°50'N, 43°23'E. Rich fir and hardwood forests.
Brieh-Mulla (Burchmulla)	A village on the bank of Chatkal River (~41°25'N, 70°50'E).
Bryansk	A city in central Russia: 53°14'N, 34°21'E. Large pine forests.
Carpathians	A mountain country in the center of Europe. Within the former Soviet Union, in the W. Ukraine only, average elevations ca. 1000 m a.s.l., maximum 2600 m a.s.l. Mt. Hoverla (2058 m): 48°15'N, 24°30'E. Rich fir, beech, maple etc. forests.
Caspian Sea	A vast sea lake at the E. border between Europe and Asia. The coasts support a variety of environments ranging from deserts/semideserts to Tertiary humid Hyrcan woods in the SW. and S. parts.
Caucasus	A vast montane land in the south of European Russia (38°25'-47°15'N, 36°37'-50°22'E), lying between the Black and Caspian seas. The highest peak is Elbrus (> 6500 m a.s.l.). Vegetation very rich (6500 species of flowering plants alone). Beech, oak, softwood forests, alpine meadows, rocks, glaciers.
Central Asia	See Middle Asia
Central Tian-Shan	The part of Tian-Shan Mts between Lake Issyk Kul and Kokshaaltau Mt. Range in the south, and between 74°E and 80°E.
Chany Lake	A lake in Novosibirsk Region, W. Siberia: ~77°N, 54°E.
Chardzhou	A city in Kara Kum Desert on the bank of Amu-Darya River: 39°03'N, 63°34'E.
Chatkal Mts (Chatkalskiy Mt. Range)	A range of ~600 km in extent in the W. Tian-Shan (~41-42°N, 70-72°E), Kirghizia and Uzbekistan, elevations up to more than 4000 m a.s.l. Vegetation from lowland juniper or walnut-apple-pear forests to highland fir stands and alpine meadows.
Chimgan Mt.	A peak in the western part of Chatkal Mts (h~4000 m a.s.l.). The type locality for many species of butterflies and moths.
Chita	A city in Transbaikalia: 52°N, 113°28'E.
Chu Valley	The valley of Chu River in the Tian-Shan. The source is in Terskey Alatau: 41°57'N, 76°37'E, the delta in Saumak-Kol Lake in Bet-Pak-Dala Desert (~45°N, 70°E). In summer, the river dries up to disappears in the sands. Deserts, semideserts, steppe (in the south).

Chukotka (Chukot Peninsula)	A vast area in the extreme NE. of Asia. Mainly tundra-clad low hills/mountains with groves of larch, poplar, willow, birch etc. along rivers.
Chulym River	A river in central Siberia (Tomsk Region), a confluent of Ob River: 57°17'N, 83°48'E.
Cisamuria	Same as Amurland.
Crimea (Krym)	A peninsula on the N. coast of Black Sea, Ukraine. The central part is steppe-clad, the south part subtropical. The capital city is Simferopol: 44°56'N, 34°06'E.
Daghestan	A republic in the NE. part of the Caucasus Major. The capital city is Makhachkala on the W. coast of Caspian Sea.
Dahuria	(See Transbaikalia).
Darvaz Mts	One of the mountain regions of the Western Pamirs (~38°45'N). In the east, adjacent to the Academy of Sciences Mt. Range. The extent is about 200 km, height up to 5500 m a.s.l. Vegetation: steppe, bushland, in the upper belt alpine meadows, rocks, taluses and glaciers.
Darvazskiy Mt. Range	A mountain range in the W. Pamirs at ca. 38°N and between ~70.5°E and 72°E. Elevations up to 6000 m a.s.l.
Derbent	A town on the W. coast of Caspian Sea in Daghestan: 42°N, 48°17'E.
Djungarskiy Alatau Mts (Dzhungarskiy Alatau Mts, Jongar Mts)	A mountain land between Ili River and Lake Ala Kol, mainly within Kazakhstan. Elevations up to 4400 m a.s.l. Lowlands supporting semideserts to steppe, midmontane belts fir and birch woodlands, the upper belts are alpine meadows, rocks, taluses (45°N, 79-82°E).
Dolon Pass	A pass on the road between Rybatchye and Naryn in central Tian-Shan, Kirghizia (h = 3300 m a.s.l.): 41°49'N, 75°46'E.
Don	A river in the S. of European Russia, flowing into the Azov Sea. The biggest city is near the delta: Rostov-on-Don (46°32'N, 39°44'E).
Dzhanybek	A settlement in a semidesert region of Kazakhstan lying between Volga and Ural rivers.
Estonia	A Baltic republic, the capital is Tallinn. Formerly SSR Estonia.
European Russia	The area lying between the borders of Russia with the Baltic countries, Belarus and the Ukraine in the W. and SW., with Transcaucasia and the Caspian Sea in the S., and the Urals in the E.
Evenkia	A national region in E. Siberia, lying on the Middle-Siberian Table-land (60-70°N, 90-105°E). Average elevations about 600 m a.s.l. Forests (taiga).
Far East	Russia's Far East encompasses the territories lying E. of the Chita Region, i.e. E. of Siberia.
Fergana Valley (Ferghana)	A vast intermontane depression bordering on the Chatkalskiy and Kuraminskiy Mt. ranges in the N., and on the Alaitskiy and Turkestanskiy Mt. ranges in the S. The valley is ca. 300 km long (40°15'-41°15'N, 70-72°30'E). Heavily used for agriculture, with some central areas being deserts, partly salty. The slopes of the mountains are largely woody (walnut, apple, apricot, juniper, etc.).
Ferganskiy Mt. Range	One of the mountain ridges in central-southern Tian-Shan (from Naryn River to Alaitskiy Mt. Range (N. point: 40°32'N, 74°49'E, S. point: 41°29'N, 73°25'E). Elevations up to 5000 m a.s.l. The W. slopes are mostly woody, the E. steppe-clad.
Georgía	A country in W. Transcaucasia. The capital is Tbilisi (formerly Tiflis): 41°43'N, 44°49'E. Formerly SSR Georgía.
Gezgyadyk Mts	The W. part of Badkhyz Nature Reserve cut by deep ravines, Turkmenistan: 35°47'N, 61°35'E.
Great Balkhan Mts (Bolshoi Balkhan, Balkhan Major)	An inselberg mountain system north of W. Kopet-Dagh Mts in W. Turkmenistan. Elevations up to 1880 m a.s.l. (39°38'N, 54°36'E). Rocks, deep canyons with barren vegetation (fig trees, juniper etc.)
Ganja (Gyandzha, Kirovabad)	A city in W. Azerbaijan: 40°39'N, 46°21'E.

Gydan	A mountain range in E. Siberia (Kolyma Mt. Ridge), situated between Yama River in the south up to Bolshoy Anuy River in the north. (~ 1000 km), at ca. 64°N, 162°E in the central parts.
Hissar Mts (Hissarskiy Mt. Range)	A mountain ridge in the Pamirs-Alai, extent ca. 450 km, in latitudinal direction ~39°N, 67-70°E, elevations over 5000 m a.s.l.
Ichinskaya Sopka Mt.	Volcanic mountains in central Kamchatka. (3621 m a.s.l.): 55°41'N, 157°43'E.
Igarka	A city in Polar Siberia: 67°35'N, 86°35'E.
Ili River	A river starting at the junction of Tekes and Kungess rivers in China and flows into Lake Balkhash (~45°N, 75°E) in Kazakhstan. Semidesert, desert, "tugai" riverside thickets.
Irkutsk, Irkutsk Region	A large city and a region in the Lake Baikal area: 52°16'N, 104°20'E. Taiga.
Issyk Lake	A small lake on the northern slopes of Zailiiskiy Alatau Mts, Kazakhstan. (1780 m a.s.l.). Coniferous forest.
Issyk-Kul Lake	The largest lake in central Tian-Shan (1600 m a.s.l.), enclosed by mountains, in the north by Kungey Alatau, in the south by Terskey Alatau: 42°09'-42°41'N, 76°15'-78°20'E. Forests on the N. side of the lake, steppe and semideserts on the S. side.
Kaluga	A city in central Russia: 54°32'N, 36°19'E.
Kama River	The largest tributary of Volga River, delta at 55°10'N, 49°19'E.
Kamchatka	A vast mountainous peninsula with numerous volcanoes in the extreme NE. part of Asia, from north to south ca. 1200 km (51-62°N). The N. parts supporting mossy tundra, the central taiga-clad and with birch woodlands, elevated parts with alder and pine elfin woodlands and alpine meadows.
Kanin Peninsula	A peninsula in N. European Russia (67-68.5°N, 44-46°E). Tundra (partly bushy), moors, lakes.
Kara-Kala	A settlement in the W. Kopet-Dagh Mts. Semidesert, oases at foothills.
Kara-Kum Desert	The largest desert in the territory of the former Soviet Union, lying in Turkmenistan. Numerous ephemeroïds, <i>Haloxylon</i> , etc. The centre of the desert is at ca. ~ 40°N, 60°E.
Karasuk	A small town in the Novosibirsk Region, SW. Siberia: 52°53'N, 77°E. Steppe.
Karelia	A republic in NW. Russia, in the W. it borders on Finland, in the N. on the Kola Peninsula, in the S. on the Leningrad Region. The capital is Petrozavodsk: 61°46'N, 34°20'E.
Karzhantau Mts	Mountains in NW. Tian Shan, ~ 42°N, 70°E, up to 2880 m a.s.l. Slopes are covered with couch-grass steppes, in deep valleys with forest, highlands with alpine meadows.
Kashkadaryinskaya Region	A region in S. Uzbekistan in the Kashka-Darya River Basin and in the W. spurs of the Pamirs-Alai. Desert, dry steppes. The capital is Karshi: 38°52'N, 65°47'E.
Kazakhstan	A huge republic in Central Asian, bordering on Russia in the N., mostly supporting steppe and forested steppe habitats, clayey and sandy deserts in the central parts; in the S. and SE., it includes the N. periphery of Tian-Shan as well as Dzhungarsky Alatau, Saur, Tarbagatay, and Altai mountains. The capital is Astana: 51°15'N, 71°26'E. Formerly SSR Kazakhstan.
Ket River	A river in W. Siberia, a tributary of Ob River. Length 1356 km: ~58°21'N, 82°30'E. Taiga and birch forests around.
Ketmen Mt. Range	An inselberg mountain system off N. Tian-Shan in SE. Kazakhstan (~ 43°20'N, 79-81°45'E), elevations up to 3500 m a.s.l. Slopes in the lower parts of the mountains are covered with steppe vegetation, valleys and highlands up to 3000 m a.s.l. with birch and spruce/fir forests.

Khabarovsk	A major city at the junction site of Amur and Ussuri rivers: 48°30'N, 135°15'E. Deciduous woods.
Khakassia	A republic in the W. part of Minusinskaya and Chulym-Yenisey depressions and on slopes of the Kuznetskiy Alatau and West Sayan Mts. Steppes dominating, in the E. and NE., covered with forested steppe vegetation, mountains taiga and tundra-clad. The capital is Abakan: 54°43'N, 91°28'E.
Khamar-Daban Mts	A mountain ridge on the S. and SE. coasts of Lake Baikal. Length ~ 300 km, elevations up to 2300 m a.s.l. (Sokhor Mt.: 51°17'N, 105°12'E). Slopes taiga-clad, lower places covered with forested steppe.
Khanty-Mansiisk	The capital of the Khanty-Mansiiskiy National Region, located on Irtysh River. The area largely supports taiga woodlands with birch, in the north both tundra and moors. Khanty-Mansiisk: 69°02'E, 60°58'N.
Kharkov	A large city in the E. Ukraine (~50°N, ~36°E). Agricultural landscapes, steppe, deciduous woodlands.
Khozratishokh Mt. Range	A SW. extension of Darvaz Mt. Ridge, elevations 2800-4100 m a.s.l., 38°15'N, 70°11'E
Kherson	A city in the S. Ukraine: 46°39'N, 32°38'E. Steppes.
Khibiny Mts	A mountain ridge in the Kola Peninsula, elevations up to 1200 m a.s.l. Woodlands in lower parts, mountain tundra at higher altitudes. Kirovsk: 67°37'N, 33°43'E.
Khorog	A capital town in the W. Pamirs: 37°26'N, 71°44'E, elevation ca. 2000 m a.s.l.
Khumsan	A town near Charvak Water Reservoir at the junction site of Pskem and Chatkal rivers: 41°42'N, 69°54'E.
Kirghiz Alatau Mts (Kirghizskiy Alatau, Kyrghizskiy Mt. Range, formerly Alexandrovskiy Mt. Range)	One of the north mountain ridges of W. Tian-Shan (42.5°N, 72-76°E), extent 375 km, elevations up to 4875 m. The following pattern of vertical belts from down to up: deserts, steppes, deciduous and juniper woodland, alpine meadows.
Kirghizia (Kyrgyzstan)	A republic in the Tian-Shan Mts, Central Asia. The capital is Bishkek. Formerly SSR Kirghizia.
Kirov (Vyatka)	A large, capital city situated on the bank of Vyatka River: 58°36'N, 49°30'E.
Koksu	A tributary to Karatal River in Dzhungarskiy Alatau Mts, E. Kazakhstan; delta at 44°21'N, 78°55'E. (NB: There are many rivers with the same name in Central Asia, meaning "a green river").
Kola Peninsula	A peninsula in the extreme NW. of Russia, up to 70°N. The capital city is Murmansk. In the N., covered with tundra or forested tundra, in the S., taiga-clad.
Kolyma River	A river in NE. Siberia, discharging into the East Siberian Sea: ~ 69°20'N, 161°E. In the inferior flow region supporting tundra and forested tundra, in the S., taiga-clad.
Kolyvan	A small city at the N. foothills of Altai Mts: 51°20'N, 82°35'E.
Komi Republic	A vast republic in N. European Russia, lying between ca. 60-68°N. and 47-62°E. In the N., covered with bushy tundra turning first into forested tundra and then taiga towards the S.
Komsomolabad	A settlement on Vakhsh River: 38°40'N, 70°E, near the W. extremity of Peter-I Mt. Range, Tajikistan.
Kopet-Dagh Mts (Kopetdagh Mts)	A mountain system lying in the S. of Turkmenistan along the border with Iran. Extent ca. 600 km, elevations up to 3000 m a.s.l. In the lower parts covered with deserts and semideserts, higher with steppe vegetation. In some valleys, rich woodlands (figs, maple, etc.), dry subtropics.
Koryakia	A national region in the N. of Kamchatka and adjacent continental parts. The capital is Palana: 59°N, 160°E. Pine-birch forests, tundra, moors, low mountains.

Kosh-Agach	A settlement in the S. Altai on Chuya River, Russia: ~50°N, ~88.5°E. Steppe.
Kotlas	A town on North Dvina River, Russia: 61°17'N, 46°31'E.
Krasnodar	A city in the N. Caucasus on Kuban River, Russia: 45°N, 39°E. Steppe.
Krasnovodsk	A port on the E. coast of the Caspian Sea, Turkmenistan: 40°N, 53°E. Deserts.
Krasnoyarsk	A large city in Central Siberia: 56°N, 92°54'E. Environs are taiga-clad.
Kugart Pass	A pass in the Ferganskiy Mt. Range: 41°14'N, 73°46'E), on the road Dzhahalabad–Kazarman.
Kuhitang Mt. Range (Kuhitang-tau Mts)	Small mountain ridge of meridional direction: ~37.5-38°N, 66.5°E. Semideserts, steppes, occasionally juniper woodlands.
Kulunda Steppe	A steppe area in the S. of West Siberian lowlands between 51 and 54°N, and between 75 and 84°E in the Barnaul region. Steppe, pineries, birch groves ("kolki").
Kum-Bell Pass	Turkestanskiy Mts, elevations up to 3200 m a.s.l. Juniper woodlands, spiny-cushion (<i>Astragalus</i>) and sainfoin (<i>Espartetus</i>)
Kungey Alatau Mt. Range	A mountain ridge on the N. coast of Lake Issyk-Kul, extended in latitudinal direction for ca. 280 km: ~42°45'N. Elevations up to 4700 m a.s.l. Fir/spruce woodlands, alpine meadows, taluses.
Kurayskiy Mt. Range	One of the mountain ridges in the E. Altai: 88-89°E, 55°N (central part), extent ~100 km, elevations up to 3500 m a.s.l. Taluses and alpine meadows at >2700 m a.s.l., lower with pine and larch taiga, and steppe vegetation.
Kurgan	A city in W. Siberia: 55°33'N, 65°20'E. Steppe, forested steppe, pine forests, birch groves («kolki»).
Kuril Islands (Kuriles)	A stretch of volcanic islands between Kamchatka and Hokkaido. The N. extremity: 50°56'N, 156°30'E; the S. extremity: 43°26'N, 145°24'E. Vegetation rich, about 1000 plant species, bamboo thickets, deciduous woodlands, open grasslands, etc.
Kushka	A small town in S. Turkmenistan: 35°11'N, 62°28'E.
Kuznetskiy Alatau	A mountain ridge N. of the Altai: ~55°N, 88°E. Extent ~300 km, elevations up to ~2000 m a.s.l. On slopes covered with fir, spruce and pine taiga, at foothills with birch and larch. Above a tree belt, montane tundra.
Latvia	A Baltic republic on the E. coast of Baltic Sea. The capital is Riga: ~57°N, 24°E. Formerly SSR Latvia.
Lena River, delta	The mouth region of a great Siberian river, representing a vast area of 30000 sq. km and 130 km in extent with a set of sleeves. The delta island is covered with peat bogs and tundra: 73°N, 125°E.
Lisichansk	A town on Severskiy Donets River, Ukraine: 48°51'N, 38°25'E.
Lithuania	A republic on the E. coast of Baltic Sea. The capital is Vilnius: ~54°45'N, 25°18'E. Formerly SSR Lithuania.
Lower Volga region	The flow of Volga River lower than the mouth of Kama River: ~55°N, 49°E. Deciduous woodlands, forested steppe, steppe.
Luga	A settlement in the Leningrad Region: 58°44'N, 29°51'E. Forests, moors.
Magadan region	A vast region in the Far East of Russia on the W. coast of the Sea of Okhotsk. The capital is Magadan: 59°40'N, 151°E. The N. parts largely supporting a tundra, the S. a taiga type vegetation.
Maidantal River	A river in the W. Tian-Shan; fusion of the Maidantal and Oigainig rivers (42°N, 70°40'E) gives rise to Pskem River.
Bolshye Kóty	A village in the central part of the W. bank of Lake Baikal, Siberia.
Merw (Mary)	A town in Turkmenistan in the S. Kara Kum Desert: ~38°26'N, 62°E.
Mesen	A small town near the delta of Mesen River: 65°51'N, ~44°E.
Middle Amurland	A region of Amur River flow from Blagoveshchensk down to Khabarovsk (~1000 km).

Middle Asia (Central Asia)	A vast region including the deserts Kara-Kum and Kyzyl-Kum, the mountain systems Kopet-Dagh, Pamirs, Tian-Shan, Pamirs-Alai, Khozratishokh, and a number of other mountains largely within the former Soviet Union, partly also in Afghanistan and Iran.
Middle Ural	The part of the Ural Mts from 59°08'N down to 55°55'N.
Middle Volga region	The flow of Volga River between the mouth of Oka River (Nizhniy Novgorod) down to Samara. Forests and forested steppe.
Millerovo	A town in S. Russia: ~48°52'N, 40°20'E.
Minusinsk	A town in S. Siberia: 53°43'N, 91°42'E.
Moldova (Moldavia)	A republic in the SW. of the former Soviet Union, lying between the Ukraine and Romania. The capital is Chisinau (formerly Kishinev): 47°N, 28°47'E. Formerly SSR Moldavia.
Moscow	The capital of Russia: 55°28'N, 37°19'E. Deciduous, pine and other forests, deciduous towards the S. of the Moscow Region.
Murmansk	A city in N. Russia (Kola Peninsula): 69°59'N, 33°E. Tundra.
Nakhichevan Republic (Nakhichevan)	An autonomous republic in Azerbaijan, bordering Armenia in the N., and both Iran and Turkey in the S. The capital is Nakhichevan: 39°12'N, 45°24'E.
Naryn	A small town in the Inner Tian-Shan, elevations ca. 2000 m a.s.l.: 41°23'N, 76°E.
Nerchinsk	A small city in the Chita Region, Siberia: 52°05'N, 117°E. Common birch groves, mountain steppe.
Nikolaev	A city in the S. Ukraine: 46°56'N, 32°E. Steppe, natural vegetation preserved only in ravines.
Nizhniy Novgorod (Gorkiy)	A city at the site of fusion of Volga and Oka rivers: 56°20'N, 44°E. Forests.
Nizhniaya Tunguska River	A river in Siberia, tributary to Yenisey River, flowing across the Middle Siberian Table-land. Dela: ~66°N, 88°E.
North Kazakhstan	Steppe and forest-steppe parts of Kazakhstan N. of 51°N.
Northeast Kazakhstan	The part of Kazakhstan lying NE. of Tarbagatay Mts ("Songoria", Saur Mts, Lake Zaisan, W. Altai).
Northwest Caucasus	The part of the Caucasus Major lying W. of ~41°E.
Novoalexandrovka	A settlement in the Kherson Region of Ukraine. Steppe.
Novosibirsk	The largest city in W. Siberia, on Ob River: 55°N, 82°55'E.
Nuratau	Mountains lying N. of Samarkand: ~40°35'N, 66°50'E.
Oktyabrskoe (Oktyabrskiy) (Khanty-Mansiisk Region)	A settlement in the lower flow region of Ob River, NW. Siberia: ~62,5°N, 66°E. Taiga.
Odessa	A city in the SW. Ukraine, a port on the Black Sea: 46°26'N, 30°44'E. Steppe.
Oimyakon region	A plateau in Yakutia in the upper reaches of Indigirka River. Peaks reaching 1500 m a.s.l., canyons down to 700 m a.s.l. Lower parts taiga-clad, higher supporting a mountain tundra. The town of Oimyakon: 69°22'N, 141°E.
Olenek River	A river in Yakutia, originating in the Middle Siberian Table-land and discharging in the Laptev Sea. The town of Olenek: 68°45'N, 112°E.
Omolon River	A river in E. Siberia, tributary to Kolyma River. Delta: 68°42'N, 159°E. Tundra.
Omsk	A city in W. Siberia: ~55°N, 73°20'E.
Onon River	A river in S. Transbaikalia, one of the sources of Shilka River. Delta: 51°44'N, 115°09'E. Originating in Mongolia.
Ordubad	A small town in the Nakhichevan Republic, Azerbaijan: ~38°55'N, 46°E.
Orel	A city in central European Russia: ~53°N, 36°15'E.
Orenburg	A city in the S. Urals: 51°13'N, 55°E. Steppe.
Osh	A city in at the foot of Alaisky Mt. Range, elevation ca. 1000 m a.s.l.: 40°32'N, 72°49'E. Akbura River. Mountain steppe, rocks, deep canyon.

Pamirs	A high-montane land in SE. Central Asia, delimited in the N. by the Zaalayskiy Mt. Range (~39.5°N), in the E by the Kashgarskiy Mt. Range, in the S. by the Hindu Kush, in the W. by the Pyanj River Valley. Some of the Pamirs lie also in the adjacent parts of China and Afghanistan. The E. Pamirs represent a high-montane plateau of 4000 m elevation, the W. Pamirs are cut by deep gorges and canyons. Large glaciers, rocks and taluses. The E. Pamirs are a high-montane desert, a snow cover only at elevations more than 6000 m a.s.l. In the W. Pamirs, the vegetation is richer, including woodlands.
Pamirs-Alai (Pamiro-Alai)	A conditional region comprising the Alaiskiy, Turkestanskiy, Zeravshanskiy, Hissarskiy Mt. ranges and their W. spurs.
Parkent	A town ~70 km E. of Tashkent, Uzbekistan. Steppe, bushes, rocks.
Pashkovo	A settlement in the middle flow region of Amur River.
Penza	A city on Volga River: 53°12'N, 45°E.
Peter-the-Great Mts (Peter-1 Mt. Range)	A mountain ridge on the Central Pamirs, ca. 200 km in latitudinal direction: (39°N, 70°20'-72°E), restricted in the S. by the Surkhob River Valley. Elevations up to 7000 m a.s.l.
Petrovskiy Zavod (Petrovsk Zabaikalskiy since 1926)	A city in the Chita Region, Transbaikalia: 51°17'N, 108°51'E.
Podkamennaya Tunguska River (Middle Tunguska, Katanga)	A river in E. Siberia, tributary to Yenisey River. Delta: 61°32'N, 90°E.
Pogranichnyi (Grodekovo))	A settlement in the S. Primorye: 44°25'N, 131°48'E.
Pokrovka	A settlement in upper reaches of Amur River: 53°25'N, 121°35'E.
Polar Siberia	Siberia's region supporting tundra and forest-tundra landscapes, N. of 67-70°N.
Polar Urals	The parts of the Urals N. of Khulga River: 65°37'N. Elevations up to 1500 m a.s.l. Tundra.
Polar Yakutia	The tundra belt of Yakutia, roughly N. of 69°N.
Polyarnyi Ural	A mountain range in the N. Urals. The central part is situated at the Polar Circle: ~64°E.
Poronay River	A river in the central part of Sakhalin Island, with moors in the valley, and larch forests in the mountains.
Primorye (Maritime Region)	The part of the Russian Far East lying S. of 48°N, very rich floristically and faunistically, with numerous Tertiary relicts.
Pskem	A river in the W. Tian-Shan between the Pskemskiy and Ugamskiy Mt. ranges, tributary to Chatkal River, delta: 41°37'N, 70°05'E. The valley supports poplar, birch, juniper etc. wood- to bushlands.
Pskem Mts	A S. spur of Talasskiy Mt. Range, extent ~160 km, elevations over 4000 m: 42°N, 71°E.
Ryazan	A city in central Russia, 190 km SE. Of Moscow. Mixed forests.
Rostov-on-Don	A large city in the lower flow of Don River: 47°15'N, 39°45'E. Steppe.
Rushanskiy Mt. Range	A mountain range in the W. Pamirs N. of Khorog: ~37°30'N, 72°E. The highest peak is 6080 m a.s.l.
Sakhalin	A large island in the Far East of Russia, extent ca. 1000 km from N. to S.: ~142-143°E.
Samara	A large city on Volga River: 53°13'N, 50°09'E. Forested steppe and steppe.
Samarkand	An ancient city in Central Asia: 39°38'N, 66°59'E. Semidesert.
Saratov	A city on Volga River: 51°29'N, 46°E. Steppe.
Sarydzhas River (Saryjaz)	A river in the Central Tian-Shan. In China, the river is named Aksu. Sources in the glaciers of Khan-Tengry Peak: 42°10'N, 79°40'E.
Saur Mts	A minor mountain range at the border between Kazakhstan and China SE. of Lake Zaisan: 47°03'N, 85°25'E. The highest elevation ~3800 m a.s.l.
Sayan Mts	A vast mountainous land in S. Siberia, the highest peaks ~3500 m a.s.l. The Western Sayan lying between 89 and 96°E, the Eastern Sayan up to

	ridge Khamar Daban in Transbaikalia (~103°E). A forest, lowlands and remote area by forest-steppe and steppe coat the mountains. At heights more than 2000 m a.s.l. the alpine pratums.
Sayano-Shushenskii Nature Reserve	A large nature reserve in Sayan Mts, Siberia.
Semipalatinsk	A city in NE. Kazakhstan: 50°26'N, 80°17'E.
Shadrinsk	A town in W. Siberia: 56°09'N, 62°28'E. Forested steppe.
Shakhdaryn'skiy Mt. Range	A mountain range in the W. Pamirs, lying between Shakhdara and Pyanj rivers: ~37°N, 72°E.
Shantarskiye Islands	An archipelago in the Sea of Okhotsk. Major Shantar Is.: 55°N, 137°43'E.
Shugnanskiy Mt. Range	A mountain range in the W. Pamirs: ~37°25'N, 72°E.
Siberia	The parts of Russia lying between the Ural Mts and the Russian Far East, i.e. W. of the Amurskaya (Blagoveshchensk) Region.
Sikhote-Alin Mts	A mountainous land in the extreme SE. of Russia's Far East, lying mainly along the coasts of the Sea of Japan, extent ca. 1200 km, width up to 300 km. Elevations up to ca. 2000 m a.s.l. Climate monsoon. Mixed coniferous-deciduous and deciduous woodlands. The Sikhote-Alin Biosphere Nature Reserve: 45°16'N, 136°08'E.
Simbirsk	(See Ulyanovsk).
Sochi	A resort place in Russia, on the Black Sea coast, NW. Caucasus: 43°40'N, 39°50'E. Largely subtropical.
Sokhondo Nature Reserve	The SE. part of Chita Region, Transbaikalia: 49°44'N, 111°06'E. Elevations up to 2500 m a.s.l. Slopes taiga-clad, higher altitudes tundra-clad.
Sormovo	A suburb of Nizhniy Novgorod.
South Baltic countries	Lithuania and Latvia, both the southern countries of the three Baltic republics of the former Soviet Union.
South Crimea	The Black Sea coast of the Crimea lying S. of the mountain ridge. Mediterranean biota.
South Primorye	The parts of the Primorye lying S. of 44°N.
South Siberia	The parts of Siberia lying S. of the line Kurgan–Omsk–Novosibirsk, plain areas predominantly steppe and forested steppe in character, mountainous areas (Altai, Sayan, Tuva) largely taiga-clad.
South Transbaikalia	The regions of Dahuria lying S. of the line Ulan-Ude – Chita.
South Turkmenistan	The regions of Turkmenistan including the Kopet-Dagh Mts and the areas adjacent to the borders with Iran and Afghanistan.
South Urals	The part of the Ural Mts lying between 51 and 57°N, i.e. between the upper reaches of Ufa River and the River Ural, the town of Orsk.
Southwest Siberia	Steppe and forested steppe belts of Siberia S. of the line Kurgan–Novosibirsk.
Southern Karelia	The parts of Karelia lying S of 63°N. Pine and fir woodlands dominating.
Southern Kuril Islands	Kunashir, Iturup, Urup, Brouton, Black Brothers islands, all S. of Bussol Strait.
Southern Sakhalin	Parts of Sakhalin Island S. of 51°20'N.
St.-Petersburg	A large city in NW. Russia: 59°55'N, 30°20'E. (former Leningrad)
Stanovoy Mt. Range	A mountain system ranging between the middle flow of Olekma River up to the source of Maya River, where it extends into the Dzhugdzhur (Jugjur) Mt. Range. Extent ~700 km in latitudinal direction: ca. 56°N, 120-132°E. Larch and spruce taiga forests, moors.
Stavropol	A city in the N. Caucasus, Russia: 45°01'N, 42°E.
“Stolby” Nature Reserve	A nature reserve near Krasnoyarsk: ~55°46'N, 93°46'E.
Suntar	A settlement on Vilyui River, E. Siberia: 62°11'N, 117°41'E.
Susamyr Valley	The valley of Susamyr River: ~42°11'N, 74°E. Steppe, bushlands.
Susamyr Mts	A plateau/ridge in the W. Tian-Shan about 100 km in extent, elevations up to 4000 m a.s.l. Grassy and others steppe vegetation types: ~42°05'N, 73.5°E.

Svanetia	A region on the S. slopes of the Central Caucasus Major, Georgia.
Syktyvkar	The capital of Komi Republic: 61°51'N, 50°46'E.
Syr-Darya River	A river in Central Asia, discharging into the Aral Sea (46°N, 62°E), originating from the junction of Naryn and Kara-Darya rivers in the upper part of Fergana Valley. Deserts, "tugai" riverside thickets.
Taganrog	A town in S. Russia on the E. coast of Azov Sea: 47°13'N, 38°50'E.
Taimyr Peninsula	A vast peninsula N. of the Polar Circle in Siberia: 85-115°E. Polar deserts, tundra, forested tundra.
Tajikistan	One of the most high-montane republics of the former Soviet Union, largely lying in the Pamirs. The capital is Dushanbe: 38.5°N, 68°45'E. Diverse environments, dense varied vegetation. Formerly SSR Tajikistan.
Talasskiy Alatau Mts	A mountain range in the W. Tian-Shan: 42°15'N, 71-74°E. Average altitudes ca. 4000 m a.s.l., foothills covered with steppe vegetation with xerophilous bushes (dogrose, <i>Berberis</i> etc.), higher with alpine meadows.
Talgar River	A river in Trans-Ili Mts, habitats ranging from glaciers to steppe.
Tannuola, Tannu Ola	A mountain ridge in the S. of Tuva Republic, extent ca. 300 km, elevations up to 3000 m a.s.l. N. slopes covered with fir/pine taiga, S. slopes – steppe. At 2300 m a.s.l. and higher covered with taluses/montane tundra.
Tarbagatay Mt. Range	A minor mountain range in E. Kazakhstan: ~47°N, 81-85°E. Semideserts, steppe, relict birch and poplar groves, subalpine meadows.
Tashkent	The capital of Uzbekistan: 41°18'N, 69°19'E.
Teberda	A resort place in the N. Caucasus, Russia: 43°25'N, 41°44'E. Elevations averaging 1300 m a.s.l.
Teletskoe Lake	A vast lake in the Altai: ~87°40'E, 51°50'N. Mostly birch forests and/or taiga-clad slopes with pine and fir, with numerous glades, at 2200 m a.s.l. and higher covered with taluses, subalpine and alpine meadows.
Terskey Alatau	A vast ridge in the Central Tian-Shan, extending along the S. coast of Lake Issyk-Kul for ~380 km, elevations up to 5000 m a.s.l.: 42°N, 78°E.
Tian-Shan (Tien-Shan)	A huge mountain system in Central Asia, lying between 40-45°N and 67-95°E. Many of the N. slopes border on Ili River, the SW. border lies N. of Fergana Valley. Both Central and W. Tian-Shan lie within the former Soviet Union, the E. parts in China.
Tobolsk	A city in Siberia, on Irtysh River: 58°10'N, 68°16'E.
Tokko	A river in E. Siberia, tributary to Chara River. Sources on the N. slopes of Udokanskiy Mt. Range. The town of Tokko: 60°N, 120°E.
Toktogul	A settlement on the road Osh–Bishkek, Kirghizia: 41°53'N, 72°50'E.
Tomsk	A city in Siberia: 56°15'N, 85°E.
Torey	A settlement in S. Transbaikalia: 50°33'N, 104°49'E.
Trans-Alai (Transalai Mts, Zaalayskiy Mts)	One of the N. mountain ridges of the Pamirs. Elevations up to 7000 m a.s.l., delimited in the N. by the Alai Valley, basically latitudinal in direction: 39°20'N, 71.5-75°E.
Transbaikalia (Dahuria)	A region in E. Siberia lying E. of Lake Baikal.
Transcarpathia	A region of the W. Ukraine lying SW. of the Carpathians.
Trans-Ili Alatau, Trans Ili Mts.	See Zailiiskiy Alatau
Tsav	A settlement in SE. Armenia: ~39°N, 46.5°E.
Tseyskiy Gorge	In the N. Caucasus: ~42°48'N, 43°54'E.
Turkestaniskiy Mt. Range	The N. range in the Pamirs-Alai, extending in latitudinal direction from 67 to 71°E at a latitude of 39°30'N.
Turkmenistan	A republic in SW. Central Asia. The capital is Ashkhabad: ~38°N, 58°20'E. Formerly SSR Turkmenia.
Tuva Republic	A republic in S. Siberia. The capital is Kyzyl: 51°43'N, 94°12'E.
Tver (Kalinin)	A city on Volga River: 56°51'N, 35°55'E. Largely taiga woodlands.
Tyumen	A city in W. Siberia: 57°10'N, 65°32'E. Taiga to birch woodlands.

Ubsu-nur Lake	A closed lake on the border of Tuva Republic, Russia and Mongolia, elevation 760 m: 50°30'N, 93°E. Deserts.
Udokan Mt. Range	A ridge in Transbaikalia, extent ~300 km, elevations up to 2500 m a.s.l. Larch woods up to 1200 m a.s.l., higher elevations supporting tundra vegetation: 56°20'N, 117-119°E.
Ufa	A city on Belaya River, in the S. Urals: 54°49'N, 55°52'E. Forests.
Ukhta	A town in Komi Republic: 63°30'N, 53°55'E. Taiga.
Ukok	A plateau at 3000 m a.s.l. in the S. of Russia's Altai's bordering on Mongolia. High-montane tundra.
Ukraine	A vast country in the S. of Eastern Europe down to the Black Sea. The capital is Kiev: ~50°15'N, 30°E. Formerly SSR Ukraine.
Ulan-Ude	A city in Transbaikalia: 51°49'N, 107°34'E. The capital of Buryatia (Buryat Republic).
Ulyanovsk	A city on Volga River: 54°17'N, 48°21'E.
Upper Kolyma region	The river originates from the junction of two sources, Kula and Ayar-Yuryakh (62°19'N, 147°44'E) in the Tas-Kystabyt Mts within the mountain taiga belt.
Upper Volga region	The Volga River flow from the source down to the mouth of Oka River at Nizhniy Novgorod: 56°20'N, 44°E.
Uralsk	A town in the upper reaches of Ural River.
Urup	One of the S. Kuril islands.
Ust-Tsilma	A settlement on Pechora River: 65°30'N, 52°E.
Uzbekistan	A large republic in Central Asia. The capital is Tashkent: 41°17'N, 69°17'E. Formerly SSR Uzbekistan.
Vakhsh	A river in the Pamirs, tributary of Pyanj River. Delta: 37°20'N, 68°19'E.
Vasilsursk	A town ca. 120 km E. of Nizhniy Novgorod on Volga River: ~56°N, 46°E.
Verkhoyanskiy Mt. Range	A mountain system in Yakutia, lying E of Lena River and consisting of several mountain ridges up to 200 km wide. Elevations up to 2000 m a.s.l., higher places supporting tundra, N. slopes forested tundra, S. slopes taiga vegetation. Verkhoyansk: ~67°40'N, 133°12'E.
Vilyui	A river in Yakutia, 2435 km long. The town of Vilyuisk: ~64°N, 121°20'E. The upper reaches are swampy, the lower flow with extensive larch taiga woodlands.
Volga River	The largest river in European Russia. The upper reaches are among woods, from the sources on the Valday Hills: ~57°13'N, 32.5°E, down to Nizhniy Novgorod. The middle flow down to the mouth of Kama River is likewise largely among woodlands. The lower flow runs among steppe and semidesert landscapes.
Volgodonsk	A town on the bank of Tsimlyanskoe Water Reservoir: 47°32'N, 42°E. Steppe.
Vologda	A city in central European Russia: 59°13'N, 40°E. Woodlands.
Vyatka	See Kirov
West Georgia	The part of Georgia W. of 43°E.
West Pamirs	See Pamirs.
West Sayan Mts	See Sayan.
West Siberia	The part of Siberia lying between the Ural Mts and Yenisey River.
Wrangel Island	An island in the Arctic Ocean: ~71°N, 180°EW. Lowlands and mountains (ca. 1000 m a.s.l.), tundra-clad.
Yablonovyi Mt. Range	A mountain ridge in Transbaikalia, extent ca. 1000 km, elevations up to 1800 m a.s.l. Serving as a watershed between the Pacific and Arctic oceans: 52.5°N, 114°E. Larch and fir-pine taiga.
Yakutia (Yakut-Sakha Republic), Yakutsk	A very large republic (ca. 2000 km from N. to S. and from E. to W.) in the N. and NE. of Asia, bordering on the Arctic Ocean. The area is largely taken up by mountains and table-lands, mostly taiga-clad but the N.

	parts covered with tundra and forested tundra, rarely steppe. The capital is Yakutsk, situated on Lena River: ~62°N, 129°E.
Yamal Peninsula (Yamal)	A peninsula in the N. of W. Siberia, ~700x200 km. The capital is Salekhard: 67°N, 68°E. Tundra, forested tundra, peat bogs.
Yana River	A river in E. Siberia originating in the Verkhoyanskiy Mt. Range and discharging into the Laptev Sea. Length ca. 900 km. The capital is Verkhoyansk, on Yana River: ~67°40'N, 133°12'E.
Yenisey River	A river on the border between W. and E. Siberia, one of the largest rivers in Russia and the entire world, originating in Tuva Republic. The largest city on the Yenisey is Krasnoyarsk: 56°N, 93°E.
Zaaminskiy Nature Reserve	A nature reserve on the N. slope of Turkestanskiy Mt. Range: ca. 39.5°N, 68°20'E.
Zailiiskiy (Trans-Ili) Alatau Mts	A N. mountain range in the W. Tian-Shan, extent in latitudinal direction ca. 300 km: ~43°N, 76-79°E. Grasslands and bushlands ("prilavki") with a belt of fruit trees at foothills and medium elevations, between 1700 and 3000 m a.s.l. fir/spruce woodlands, above them alpine meadows.
Zaisan Lake	A lake in E. Kazakhstan at 380 m a.s.l.: ~48°N, 84°E. The coasts are covered with semidesert vegetation.
Zaporozhye Region	A region in the S. Ukraine. The capital is Zaporozhye: 47°49'N, 35°15'E. Steppe, mostly under agricultural usage, islets of natural vegetation remaining on slopes of ravines and at margins of woodlands growing in flood-plains of rivers.
Zeravshanskiy Mt. Range	A mountain range in the Pamirs-Alai: 39°15'N, 66.5-71°E. Elevations up to 5500 m a.s.l. Glaciers, rocks, taluses, mountain steppe, below agricultural fields.
Zeravshan River (Matcha)	A river in Central Asia, extent more than 700 km, starting at 2800 m a.s.l. in the Koksuy mountain knot: 39°25'N, 70°27'E.

IV-4. Tiger Moth Species Erroneously Included in Our Red Data Books

(a) Red Data Book of the USSR, 1984. "Lesnaya Promyshlennost" Publ. House, Ed. A. M. Borodin, 458 p. Moscow. (In Russian) (see Borodin, 1984a, 1984b).

1. *Callimorpha quadripunctaria* (Pöda, 1761): 290.
2. *Utetheisa pulchella* (Linnaeus, 1758): 291.
3. *Axiopoenia maura* (Eichwald, 1830): 292.
4. *Callimorpha dominula* (Linnaeus, 1958): 293.

(b) Red Data Book of the Russian Federation, 2001. "Astrel" Publ. House, Ed. V. I. Danilov-Danilian, 864 p., Moscow. (In Russian).

1. *Palearctia (Centrarctia) mongolica* (Alpheraky, 1888)

IV-5. Index of Intraspecific, Species- and Genus-Group Names of Tiger Moths

Boldface script refers to the genus- and species-group names considered as accepted/valid; regular script refers to presumed subspecies; italicised script refers to junior synonyms and/or presumed infraspecific categories.

A	aegrotum , <i>Utetheisa</i> , 40
abraxoides , <i>Utetheisa</i> , 40	affinis , <i>Empyreuma</i> , 12
Acerbia , 5, 7, 12, 42, 52, 84, 111, 149	afganicola , <i>Ocnogyna</i> , 120
<i>Acimba</i> , 35	<i>afghanistanensis</i> , <i>turensis</i> , 130, 131

- agassizi*, matronula, 76, 77
Aglaomorpha, 5, 6, 21, 149
aksuensis, glaphyra, 85, 86
alaica, Oroncus, 56, 58, 147, 150
albertae, Dodia, 29-32, 34, 35, 111, 150
albida, striata, 37
albimaculata, flavia, 67
albipuncta, Eucallimorpha, 20
albociliata, pulchella, 40
albosignata, pulchella, 40
albovittata, kindermanni, 98, 99
album, Spilosoma, 132, 136, 137
allardi, Preparetia, 60
Alphaea, 5, 9, 126, 149
alpherakyi, intercalaris, 62
alpicola, plantaginis, 43
alpina, Acerbia 52, 53, 54, 84, 111, 150
altaica, plantaginis, 44
altotibetana, glaphyra, 86
amabilis, glaphyra, 86
amabilis, pulchella, 40
americana, caja, 65
Ammobiota, Eucharia, 71
amurensis, Rhyarioides, 116, 117, 151
amurensis, matronula, 76, 77
amurensis, Phragmatobia, 138, 143, 145, 146, 152
amuri, irene, 114
Amurrhyparia, 4, 5, 119, 149
anatolica, Ocnogyna, 120
Andala, 5, 7, 126, 127, 149
andresi, loewii, 121
anellata, spectabilis, 36
angelica, villica, 70, 71
anglica, cribraria, 39
Antarctica, 132
antennata, Utetheisa, 40
apicistrigata, lubricipedum, 133
arabum, villica, 70
arafati, festiva, 72, 74
araitensis, plantaginis, 44, 46
arcana, erschoffi, 93, 94
Arctia, 5-7, 10, 12, 25, 36, 57, 60, 61, 65-70, 72, 75, 78, 83, 87, 96, 108, 110, 116, 118, 124, 127, 145, 148, 149
aretica, diaphana, 31
Arctinia, Epatolmis, 146
arcuata, pulchella, 40
Ardices, 132
Areas, 5
arenosa, parasita, 121
Argyna, 6
arizana, Eucallimorpha, 20
arlanzona, maculosa, 102
arragonensis, maculosa, 102
armena, Ocnogyna, 120, 122, 152
Atasca, 40
aterrima, striata, 37
Atlantaretia, 61
Atolmis, 146
atra, albertae, 31, 32
atropa, fuliginosa, 143
atropurpurea, Plataretia, 54, 55, 150
aulica, Hyphoraia, 46, 47, 48, 54, 150
aurantiaca, intercalaris, 62
auripennis, phaeosoma, 64
avia, lapponica, 49
Axiopoena, 1, 5, 8, 13, 26, 27, 149

B
badakhshana, alpherakyi, 62
baetica, Ocnogyna, 120
baicalensis, flavia, 67
balcanica, dominula, 15
banghaasi, Ocnogyna, 120
barteli, purpurata, 118
bella, Utetheisa, 40
berostripnesis, purpurata, 118
bicolor, pulchella, 41
bicolor, 46
bieti, Oroncus, 56
bifrons, subcarnea, 140, 141
bimacula, dominula, 16
binaghi, mendica, 129
bipunctata, Spirid, 38, 150
bithynica, dominula, 15
boettcheri, intercalaris, 62
boghaika, Lemyra, 141, 142, 152
Bombyx, 26, 39, 108, 124, 132, 133, 146
borealis, fuliginosa, 143
Borearctia, 5, 7, 51, 147, 148, 149
boursini, maculosa, 102
bretauiaui, Gonerda, 120
britannica, villica, 70
brunnea, lubricipedum, 132, 133
brunnea, cunea, 128
brunneocephala, pulchella, 40
brunneomarginata, pulchella, 40
buddenbrocki, Preparetia, 60
budea, cunea, 128
buraetica, Sibiraretia, 78, 97, 99, 100, 151

C
caecilia, Chelis, 101, 102, 104, 105, 107, 147, 151
caeria, Spilosoma, 132
caesarea, luctifera, 138, 146
caespitis, plantaginis, 45
caja, Arctia, 5, 12, 60, 61, 64, 99, 150
cajula, intercalaris, 62
Callarctia, Grammia, 83

Callarctia, Aretia, 60
callesi, deserta, 124
Callimorpha, 1, 5, 6, 10, 12, 15, 17, 144, 149
Callopis, Spiris, 37
campestris, flavia, 66, 67
Canarctia, 7
canigulensis, cribraria, 39
candida, cribraria, 39
candida, cunea, 128
Carcinopyga, 5, 6, 12, 22, 23, 78, 149
caroli, gratiosa, 88, 89
carpathica, plantaginis, 43
casigneta, Spilarctia, 139, 140
caspica, plantaginis, 43
casta, deserta, 124
caucasiana, sannio, 112, 113
caucasica, plantaginis, 44, 71
caucasica, purpurata, 118
caucasica, sannio, 112, 113
centralasiae, matronula, 76
centralasiae, deserta, 124, 125, 131
centralhispanica, maculosa, 102
Centrartia, 83, 96
cervini, Holoarctia, 80, 82, 151
chajataensis, buraetica, 100
charbini, subcarnea, 140, 141
Chelis, 5, 8, 10, 78, 97, 101, 104-107, 147, 149
Chelmia, Lacydes, 36
Chelonia, Cymbalophora, 22, 60, 74, 75, 106, 108
chinensis, kindermannii, 98, 99
Chionarctia, 5, 9, 125, 149
Chionophila, Parasemia, 43
chishimanum, lubricipedum, 133
chosensis, coreana, 21
chosensis, amurensis, 145
chrysocephala, striata, 37
chrysocephala, cribraria, 39
cichorii, petrosa, 45
circumpunctata, mendica, 129
clara, fuliginosa, 143
clathrata, loewii, 121
Cletis, Chelis, 101, 103
coelestina, Orontobia, 59, 60
collaris, interrogationis, 71, 74, 75
colon, cribraria, 39
commerelli, striata, 37
completa, pulchella, 40
confluens, caja, 63, 64
confluens, villica, 70, 71
confluens, plantaginis, 45
confluens, jacobaeae, 28, 29
confluens, pulchella, 40
connexa, rivularis, 22
continua, flavia, 67

coreana, histrio, 21
corpusrufum, lutea, 137
corsica, villica, 70
corsica, Ocnogyna, 120
Coscinia, 5, 6, 9, 37, 38, 149
Cretonotos, 7
cribrellum, cribraria, 39
cribrum, cribraria, 38
cribraria, Coscinia, 9, 39, 150
Ctenia, Spiris, 37
culoti, Eucharia, 71, 75, 76, 151
cunea, Hyphantria, 1, 3, 8, 10, 127, 128, 152
cupido, Preparctia, 60
Cycnia, 12, 127, 129
Cymbalophora, 5, 6, 22, 79, 149
ezekanowskii, Hyperborea, 81, 110, 111, 148, 151

D

daghestana, Ocnogyna, 122
dahurica, Chelis, 101, 102, 103, 105, 106, 108, 151
daisetsuzama, quenseli, 108
daitoensis, 132
dalailama, Orontobia, 59
dannehli, rivularis, 22
Deiopeia, Utetheisa, 40
dejeani, Hyphoraia, 47
dehmulata, pulchella, 40
depuncta, pulchella, 40
deschangei, lutea, 138
deserta, Watsonarctia, 124, 127, 152
designata, pulchella, 40
Diacrisia, 5, 9, 12, 111, 112, 117, 119, 137, 149
dialampra, Epimydia, 32, 35, 150
diaphana, Dodia, 29, 30, 32, 34, 150
Diaphora, 5, 9, 129, 149
diplosema, lemniscata, 50
diva, Divarctia, 22, 78, 79, 147, 151
Divarctia, 5, 7, 10, 78, 79, 147, 149
Dodia, 5, 8, 9, 12, 29, 111, 147, 148, 149
doerrisi, punctarium, 133
domiduca, villica, 70
domina, dominula, 15
dominula, Callimorpha, 1, 12, 15, 16, 17, 18, 144, 149, 164
dominula, dominula, 15
donna, dominula, 16, 17
dornesii, punctarium, 133
dublitzkyi, Palearctia, 83, 86, 147, 151
duplohmulata, pulchella, 40

E

elegans, lubricipedum, 132
elisabethae, Oroncus, 56
elisabethana, intercalaris, 62
Elpis, Diacrisia, 111, 132

ekvesi, buraetica, 100
Empyreuma, 12, 14
Emydia, Spiris, 37, 39
Epatolmis, 5, 8, 146, 149
Epicalia, 5, 70, 149
Epimydia, 5, 8, 12, 35, 149
equitalis, Eucallimorpha, 20, 21
ermineum, lubricipedum, 132
erschoffi, Palearctia, 12, 83, 90, 92-96, 147, 151
erubescens, subcarnea, 140
erythema, lemniscata, 50
erythrozona, Spilosoma, 132
esperis, deserta, 124
Euarctia, Carcinopyga, 22
Eucallimorpha, 5, 6, 10, 20, 149
Eucastana, Watsonarctia, 124
Eucharia, 5, 7, 12, 71-74, 124, 149
Euchelia, Tyria, 28
Eudiaphora, 5, 8, 9, 130, 149
eudiopta, albertae, 31, 32, 111
Eulepia, Spiris, 37
Euplagia, 1, 5, 6, 12, 18, 126, 149
Euprepia, Spiris, 37
Eupsychoma, Parasemia, 43
Eurachia, Watsonarctia, 124
Euthemonia, Diacrisia 111
Exitelica, Utetheisa, 40
extensa, Lemyra, 141
extrema, Spilosoma, 132
extrema, striata, 37
Eyprepia, 22, 36, 37, 60

F

falloui, quenseli, 108
fasciata, Oroncus, 56-59, 150
fedtschenkoi, principalis, 10, 20
ferghana, Palearctia, 58, 83, 86, 94, 95, 147, 151
ferghana, Chelis, 102, 107, 108, 147, 151
fervida, fuliginosa, 143
festiva, Eucharia, 71-76, 151
festiva, Pararctia, 49, 50
flava, glaphyra, 86
flava, maculosa, 103
flava, maura, 26
flava, pulchella, 41
flava, purpurata, 118
flavala, gratiosa, 88, 89
flavescens, purpurata, 118
flavescens, jacobaeae, 29
flavia, Aretia, 57, 61, 66, 99, 116, 150
flavida, metelkana, 115, 116
flavotergata, lubricipedum, 132
floccosa, plantaginis, 44
floresis, villica, 70

fluviatilis, maura, 26
formosana, histrio, 21
forsteri, Sinoarctia, 51
fridolini, cervini, 81
frisias, lutea, 138
fujianense, Spilosoma, 132
fulgida, quadripunctaria, 18, 19
fuliginosa, Phragmatobia, 5, 142, 143, 144, 145, 146, 152
fulminans, villica, 70
fulminans, urania, 57
fulvescens, jacobaeae, 29
fulvohirta, Alphaea, 126, 132
fumidaria, cribraria, 39
fumosa, urania, 57
funerea, bipunctata, 37, 38
furcula, fuliginosa, 143

G

gansoni, Tajigyna, 123, 147, 152
geddesi plantaginis, 45
gelida, quenseli, 108
geometrica, petrosa, 43
geometrica, plantaginis, 43
gerda, purpurata, 118
gibsoni, lapponica, 49
Gigantospilosoma, 125
glaphyra, Palearctia, 12, 83, 84, 85, 86, 89, 91, 94, 151
glauca, rupicola, 91
golbecki, Palearctia, 83, 89, 91, 97, 147, 151
Gonerda, 5, 12, 119,
gracilis, Palearctia, 83, 89, 90, 147, 151
Grammia, 5, 7, 80, 108, 149
grammica, Spiris, 37
gratiosa, Palearctia, 58, 83, 86, 91, 92, 147, 151
gratiosata, glaphyra, 85, 86
grisescens, jacobaeae, 29
gruneri, dahurica, 106
gurkoi, Carcinopyga, 23-26, 150
guttata, Andala, 3, 98, 152

H

haberhaueri, diva, 79
hamata, aulica, 46, 47
hamelensis, dominula, 16
hanningtoni, Preparctia, 60
hebe, festiva, 71, 72
hemigena, Ocnogyna, 120
hera, quadripunctaria, 18
herrichi, loewii, 121
hesselbarthi, plantaginis, 44
Hipocrita, Tyria, 28
hipperti, lutea, 138
histrio, Aglaomorpha, 6, 21
hmatecki, cervini, 80, 81

Holarctia, Grammia, 110
Holoarctia, 5, 8, 81, 82, 148, 149
honesta, maculosa, 103
hospita, plantaginis, 43
hospitali, striata, 37
houlberti, Ocnogyna, 120
Hyalocoa, Dodia, 29-31
hyperborea, lapponica, 49
Hyperborea, 5, 10, 110, 147, 149
Hypercompa, Aglaomorpha 21
Hyphantria, 1, 5, 7, 10, 128, 130, 149
Hyphoraia, 5, 7, 46, 53, 54, 68, 149

I

idriensis, matronula, 76
iliensis, festiva, 72, 74, 131
ilithya, intercalaris, 62
illustrata, glaphyra, 86
imhoffi, fuliginosa, 143
immaculata, purpurata, 118
immaculata, aulica, 46, 47
immaculata, flavia, 67
immaculata, phaeosoma, 64
inaequalis, Lemyra, 141
incompleta, striata, 37
infernalis, Lemyra, 141
inquinata, cribraria, 39
insubrica, dominula, 15
insularia, caecilia, 104
insularum, plantaginis, 43
intercalaris, Arctia, 25, 61, 62, 150
intercissa, spectabilis, 36
intermedia, parasita, 121
interposita, festiva, 25, 72, 73
interrogationis, Eucharis, 71, 73-76, 151
inversa, mendica, 129
ione, seriatopunctata, 139
irene, Diacrisia, 113-115, 151
isabella, Pyrrharetia, 12
italica, dominula, 15
issyka, erschoffi, 93, 94

J

jacobaeae, Tyria, 6, 28, 29, 144, 150
jankowskii, Lemyra, 138, 142, 152
japonica, amurensis, 145
japonica, luctifera, 146
japonica, lutea, 138
japonica, plantaginis, 43, 45
jeholensis, flavia, 67
jezoensis, plantaginis, 44
johanseni, alpina, 52, 53
joiceyi, Ocnogyna, 120

K

kamtschadalis, caja, 63 64
kamtschadalus, plantaginis, 44
kansuensis, dalailama, 59
karakorumica, melanostigma, 126
karduchena, deserta, 124, 125
karelini, Axiopoenia, 26, 27, 28, 150
kashmirica, rupicola, 88, 91, 92
kasnakovi, Sinoarctia, 78
kenigsbergi, dahurica, 107
khumbeli, seitzii, 53
kiangsui, metelkana, 115
kindermanni, Sibirarctia, 78, 93, 94, 97-100, 151
kolari, fuliginosa, 143
kolpakofskii, Acerbia, 54
konewkaii, villica, 70
kononenkoi, Dodia, 30, 33, 147, 150
korearctia, jankowskii, 142
korlana, erschoffi, 93
kozshantshikovi, atra, 31, 32
kruegeri, fuliginosa, 143
kunashirica, plantaginis, 44
kurdistanica, dominula, 15

L

Lacydes, 5, 35, 149
ladakensis, Arctia, 61-63, 150
ladakensis, principalis, 20
lapponica, Pararctia, 48-50, 150
latefasciata, quadripunctaria, 18, 19
latina, maculosa, 103
latreillei, Ocnogyna, 120
lederi, flavia, 67
lemniscata, Pararctia, 48, 50, 111, 150
Lemyra, 5, 7, 141, 149
lenzeni, Eucallimorpha, 20
leopardinula, Amurhhyparia, 4, 116, 119, 152
lepida, pulchella, 40
leprieuri, Ocnogyna, 120
lepus, lubricipedum, 132
leucomelas, cribraria, 39
leucomera, plantaginis, 43
leucoptera, album, 136
leucospilota, Utetheisa, 40
leucothorax, subcarnea, 140
lichenigera, Carcinopyga, 22-24, 26, 150
lidia, subcarnea, 140, 141
likiangensis, Spilosoma, 132
lindti, proserpina, 23, 25
Lithosarctia, 79
litrata, quenseli, 108, 109
litrata, cunea, 128
lochmatteri, gratiosa, 88, 89
loewii, Ocnogyna, 120-123

- lotrix*, pulchella, 40
lubricipedum, Spilosoma, 12, 116, 129, 134-136, 144, 152
luctifera, Epatolmis, 146, 152
luctifera, luctifera, 146
lurida, fuliginosa, 143
lusitanica, caja, 63
lusitanica, dominula, 15
lutea, Spilarctia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lutescens, quadripunctaria, 18, 19
luxerii, lubricipedum, 132, 133
- M**
- macromera, plantaginis, 43
maculosa, Chelis, 101-107, 151
majolica, dominula, 15
malatiana, mendica, 129
mandli, Spilosoma, 132, 135, 136, 152
mandschurica, leopardinula, 119
 mannerheimi, maculosa, 101-104, 107
 manni, glaphyra, 85
mannii, glaphyra, 85
maracandica, turensis, 130, 131
 marchandi, villica, 70, 71
marinae, Holarctia, 80-82, 84, 148, 151
marmorata, matronula, 77
marsicana, maculosa, 102,
masuensis, lubricipedum, 132
matrona, matronula, 76
 matronalis, plantaginis, 43
matronula, Pericallia, 76, 116, 151
maura, Axiopoea, 1, 13, 26-28, 150, 164
Maurica, 7
melanissima, plantaginis, 45
 melanomera, plantaginis, 45
melanostigma, Alphaea, 5, 126, 152
melas, plantaginis, 44
mendica, Diaphora, 129, 131, 144, 152
mendicana, mendica, 129
menetriesi, Borearctia, 51, 52, 147, 148, 150
menthastri, lubricipeda, 132, 133
 meridei, amurensis, 116
meridionalis, fuliginosa, 143
metelkana, Rhyparioides, 115, 116, 151
Micrarctia, 8, 63, 77, 78, 88, 91, 96
mienshanicum, Spilosoma, 132, 136
mira, Palearctia, 83, 84, 148, 151
miranda, ersehoffi, 93, 94
mirifica, Preparctia, 60
miserata, punctarium, 133
modesta, petrosa, 45
moerens, luctifera, 146
monacensis, maculosa, 102
monacha, festiva, 71
mongolica, Centrарctia, 83, 94, 96, 151, 164
monticola, fuliginosa, 143
montana, aulica, 46
mooseri, Orontobia, 59
 mortua, sannio, 113
mussoti, Sinoarctia, 51
 mustangbhoti, ferghana, 94, 95
mutabilis, Ocnogyna, 120
mutans, cunea, 128
- N**
- naryna, glaphyra, 85
naewari, fuliginosa, 143
nebulosa, Rhyparioides, 114-117, 127, 151
nekrutenkoi, Stauropolia, 14, 42, 150
Nemeophila, Parasemia, 43, 112
Neocallimorpha, Aglamorpha, 21
nephos, Eucallimorpha, 20
neptunus, urania, 56, 57
nevadensis, cribraria, 39
nicaeensis, villica, 70
niepeltiana, seitzii, 53
nigra, trigona, 77
nigra, dominula, 16
nigra, striata, 37
nigrana, jacobaeae, 29
nigrella, villica, 70
nigrina, bipunctata, 38
nigrociliata, striata, 37
nigrolineata, pulchella, 40
nigromaculata, pulchella, 40
nigromarginis, gratiosa, 88
nigroradiata, glaphyra, 85
nikitini, cribraria, 39
ningyuenfui, Spilosoma, 132
 nipponensis, amurensis, 116
nivea, festiva, 72, 74
nivea, Chionarctia, 116, 125, 152
Noctua, 35
nogelli, Ocnogyna, 120, 121
nordiberica, maculosa, 102
norvegica, quenseli, 108
Nototrachus, Ocnogyna, 120
nox, flavia, 67
 nuytenae, lichenigera, 23
Nyctemera, 77
nyctemerata, Eucallimorpha, 20
 nycticans, plantaginis, 44, 45
- O**
- oberthueri**, Ocnogyna, 120
obliquizonata, Spilarctia, 137, 139, 152
obliterata, amurensis, 116

- obliterata*, matronula, 77
obscura, fuliginosa, 143
obscura, purpurata, 117
obscurata, glaphyra, 86
occidentalis, metelkana, 115
ochracea, fuliginosa, 143
ochrea, lubricipedum, 133
ochreomaculata, pulchella, 40
ochricolor, Eucallimorpha, 20
ochromaculata, dominula, 16
Ocnogyna, 5, 8, 10, 79, 88, 98, 99, 120, 121, 149
Ocnogynodes, 78
okinawana, metelkana, 115
okinawensis, Utetheisa, 40
olga, philippiana, 109, 110
olschwangi, Arctia, 61, 68, 69, 148, 150
orientalis, caja, 64, 65
ornata, atropurpurea, 54, 55
ornatrix, Utetheisa, 40
Orodemnias, Holoarctia, 80, 82, 108
Oroncus, 5, 7, 9, 12, 56, 59, 62, 63, 88, 98, 149
Orontobia, 5, 9, 12, 59
ossetica, caja, 64, 65
- P**
- Pachylischia*, Ocnogyna, 120
paghmani, fuliginosa, 143, 144
Palaearctia, 5, 8, 10, 12, 77, 78, 80, 83, 84, 87, 88, 90, 95-97, 147, 149
palladia, striata, 37
pallens, jacobaeae, 29
pallida, atropurpurea, 55
pallida, sannio, 113, 114
pallida, mendica, 130
pallida, cunea, 128
pallida, fuliginosa, 143
pallidior, armena, 122, 123
Palparctia, Lacydes, 35
pamiroalaica, caja, 61, 63, 64
Panaxia, 15
papyratia, urticae, 134
papuana, pulchella, 40
paradoxa, purpurata, 118
paramushira, araitensis, 44
Pararectia, 5, 7, 9, 10, 12, 48, 51, 111, 149
Parasemia, 5, 6, 10, 12, 43, 45, 144, 149
plataginis, quadripunctaria, 18
parasita, Ocnogyna, 120, 121, 152
pardalina, Tanerea, 79, 80, 131, 151
parthenos, Platarectia, 54
parva, caja, 64, 65
passanauriensis, plantaginis, 44
paucimacula, dominula, 16
paupera, lutea, 138
pectinata, Utetheisa, 40
pellex, Utetheisa, 40
Pericallia, 5, 8, 76, 149
perornata, Gonerda, 119
persica, dominula, 17
persona, dominula, 16, 17
perunovi, cervini, 81, 84
perversa, rivularis, 22
petrosa, plantaginis, 45
pfeifferi, striata, 37
phaeosoma, caja, 64, 65, 116
Phalaena, 15, 28, 60, 63, 70, 71, 76, 101, 102, 111, 112, 120, 128, 129, 132, 137, 142, 146
phantasma, caja, 64
philippiana, Grammia, 108, 109, 151
philippsi, Callimorpha, 15, 17, 149
philippsi, festiva, 72, 73
Phragmatobia, 3, 5, 8, 12, 56, 59, 67, 142-145, 149
pierreti, Ocnogyna, 120
Pitasila, 40
placida, Phragmatobia, 143, 145, 146, 152
plagiata, Aglaomorpha, 21
plantaginis, Parasemia, 12, 18, 43, 144, 150
Platarectia, 5, 7, 54, 149
Pleretes, Pericallia, 76
pomona, kindermanni 96, 98, 99
pompalis, dominula, 15
posteripunctata, rivularis, 22
postflavida, gratiosa, 88
Preparectia, 5, 60, 149
pretiosa, kindermanni 96, 98, 99
principalis, Eucallimorpha, 20, 52, 149
processionea, striata, 37
proserpina, Carcinopyga, 22, 23, 24, 26, 150
pudens, Ocnogyna, 120
pudica, Cymbalophora, 22
puella, transversa, 127
puengeleri, glaphyra, 85, 86
puengeleri, Holoarctia, 49, 80, 82, 151
pugione, Empyreuma, 14
pulchella, Utetheisa, 1, 40, 41, 122, 150, 164
pulchelloides, Utetheisa, 40
pulchra, pulchella, 40
pulchrior, intercalaris, 62
pulverulenta, fuliginosa, 143, 144
punctarium, Spilosoma, 132-134, 152
punctata, cunea, 128
punctata, mendica, 129
punctatissima, cunea, 128
punctigera, cribraria, 39
punctigera, *punctarium*, 133
punctissima, cunea, 128
purpurata, Rhyparia, 116, 117, 151
purpurea, 117

pura, fasciata, 56, 58

Q

quenseli, Grammia, 80, 108, 151

quadripunctaria, Euplagia, 1, 18-20, 149, 164

R

radiata, mendica, 129

radiata, dominula, 16

radiata, aulica, 46, 47

radiatus, lutea, 137

rebeli, caja, 63

regalis, principalis, 20, 21

reisseri, lutea, 137

reticulata, Chelis, 101-104, 151

Rhagonis, Spilosoma, 132

rhodanica, dominula, 15

rhodoscensis, quadripunctaria, 18

rhodosoma, lutea, 137

Rhyparia, 5, 9, 12, 78, 117, 149

rhypariella, purpurata, 117

Rhyparioides, 5, 9, 12, 114-117, 149

rippertii, cribraria, 39

rishiriensis, irene, 114

rishiriensis, aulica, 46

rivularis, Cymbalophora, 22, 79, 149

romanovi, Preparetia, 60

romanovi, dominula, 16, 17

rondoui, cribraria, 39

rosea, lapponica, 48

rosea, festiva, 60

rosearea, glaphyra, 86

roseiventer, punctarium, 133

roseni, kindermannii, 97

rossica, dominula, 15, 16

rostaĝnoi, Spilosoma, 132

rothschildi, parasita, 121

rougemonti, cervini, 80

rubidus, album, 136

rubra, Diacrisia, 111

rubrior, pulchella, 40

rubrocentralis, irene, 114

rubrodorsalis, caja, 64

rubrogrisea, pulchella, 40

rueckbeili, Aretia, 58, 61, 68, 69, 87, 150

rufomarginata, pulchella, 40

rupicola, Palearctia, 83, 91, 92, 147, 151

russula, Diacrisia, 111

rustica, mendica, 129, 130

rybakowi, Spilosoma, 132

S

sabulosa, mendica, 129

sachalinensis, matronula, 76, 77

sachalinensis, plantaginis, 44, 45

saggitifera, seriatopunctata 140

sajana, caja, 61, 63, 64

sangaica, urticae, 135

sanguinalis, casigneta, 140

sannio, Diacrisia, 12, 112-115, 131, 144, 151

sartha, festiva, 72, 73

sarycola, Palearctia, 83, 95-97, 151

sarydzhasica, erschoffi, 93, 94

sazonovi, Dodia, 30, 34, 84, 148, 150

schottlaenderi, glaphyra, 83, 94, 95

schwingenschussi, maculosa, 103

scriniensis, cervini, 80

scudderi, plantaginis, 45

secretata, Oroncus, 56

secular, villica, 70

seitzi, Acerbia, 53, 54, 147, 150

selmonsi, erschoffi, 83, 93

sekwynii, petrosa, 45

senecionis, jacobaeae, 28

separata, pulchella, 40

serarum, mongolica, 96

serena, matronula, 77

sergei, gratiosa, 88, 89

seriatopunctata, Spilarectia, 137, 138, 139, 152

serum, mongolica, 96

sheljuzhkoi, spectabilis, 36

Sibirarectia, 5, 7, 97-100, 149

sibirica, alpina, 52, 53

sibirica, cribraria, 39

sibirica, deserta, 124, 125

sibirica, flavia, 67

sieversi, Sinoarectia, 51

sifanica, plantaginis, 44, 45

signata, flavia, 67

sikhotensis, kononenkoi, 33, 34

simanensis, metelkana, 115

similis, Callimorpha, 20

simplicior, nebuosa, 117

Sinoarectia, 5, 51, 78

Sinowatsonia, 5

slivnoensis, maculosa, 103, 105

slovenica, striata, 37

sojota, dahurica, 106, 107

Somatrichia, Oenogyna, 120

sordida, cervini, 81

soror, jankowskii, 142,

sotavaltai, atropurpurea, 55

sotiriadis, lubricipedum, 133

sounkeana, metelkana, 115

spectabilis, Lacydes, 35, 36, 150

Spilarectia, 5, 9, 12, 132, 134, 137-140, 149

Spilosoma, 5, 7, 9, 12, 111, 132, 133, 136, 144, 149

Spilosoma, Spilosoma, 132

- Spiris**, 5, 6, 12, 37, 39, 149
splendida, cervini, 80
splendidior, Euplagia, 19, 20, 149
standfussi, mendica, 129
Stauropolia, 14, 42, 43
stertzi, maculosa, 102
stettei, cervini, 80
stoetzneri, plantaginis, 44
strandi, seitzii, 53
streltsovi, Spilosoma, 132, 136, 152
striata, Spiris, 37, 38, 150
striatopunctata, casigneta, 139, 140
strigosa, quenseli, 108
stripata, mendica, 129
subalpina, plantaginis, 43
subcarnea, Spilarctia, 137, 138, 142, 152
sublutea, Diacrisia, 111
subnebulosa, Pararctia, 48, 50
subvarius, Rhyparioides, 114
suffusa, cunea, 128
sultana, maculosa, 103, 104
sussamyra, ferghana, 94, 95
suttadra, intercalaris, 62
swanetica, dominula, 15
syrdarja, sannio, 112, 113
syriaca, villica, 70
- T**
taglangla, Orontobia, 59
Tajigyna, 5, 123, 147, 149
Tancrea, 5, 8, 78, 79, 97, 149
tancrei, Oroneus, 12, 56, 57, 58, 59, 62, 63, 150
taurica, fuliginosa 143
teberdina, dominula, 15
tenera, Cyenia, 12
teriolensis, cervini, 80
testudinaria, Hyphoraia, 47
testudinarioides, aulica, 46, 47
textor, cunea, 128
Thanatarctia, Lemyra, 141
thibetia, pulverulenta, 143
thibetica, intercalaris, 62
Thimida, 13
thomanni, plantaginis, 43
thulea, alpina, 52
thytea, pulchella, 40
tianshana, Chelis, 95, 102, 103, 107, 147, 151
tillaevi, seitzii, 53
tkatchukovi, splendidior, 19
totinigra, lutea, 138
totirubra, fuliginosa, 143
totonigra, jacobaeae, 29
transbaikalensis, kononenkoi, 33
transcaucasica, maura, 27
transcaucasica, reticulata, 103, 104
transiens, purpurata, 118
transitoria, lubricipedum, 133
transmontana, caja, 65
transversa, Andala, 127, 152
triangularis, deserta, 124, 125
Trichosoma 120
trigona, Micrarctia, 77
trybomi, plantaginis, 44
tschiliensis, phaeosoma, 64
tshimgana, caja, 25, 63, 64
tsingtauana, subcarnea, 140
tundrana, Pararctia, 48, 49, 50, 111, 148, 150
turbans, Grammia, 108, 110, 151
turensis, Eudiaphora, 130, 131, 152
turkestana, ferghana, 94, 95
Tympanophora, Cymbalophora, 22
Tyria, 5, 6, 28, 78, 144, 149
thyter, pulchella, 41
- U**
unicolor, lutea, 138
unifascia, Andala, 126
uniformis, sannio, 112, 113
unipuncta, lubricipedum, 133
unipunctata, pulchella, 40
uralensis, flavia, 66, 67
uralensis, plantaginis, 44
uralensis, purpurata, 118
urania, Oroneus, 56, 57, 150
urticae, Spilosoma, 129, 132-136, 144, 152
ussuriensis, kindermanni, 98
utahensis, caja, 65
Utetheisa, 1, 5, 6, 12, 40, 149
- V**
valida, buraetica, 100
variabilis, ferghana, 94, 95
variana, transversa, 127
venosa, mendica, 129
vernetensis, cribraria, 39
verticalis, Dodia, 30
vialis, soror, 142
victori, dublitzkyi, 87
vidua, villica, 70
villica, Epicallia, 70, 151
Volgarctia, Laeydes, 35
vulpinaria, sannio, 112
- W**
wagneri, Palearctia, 83, 90, 92
walkeri, lubricipedum, 132
wambachi, villica, 70
Watsonarctia, 5, 8, 124, 149

wiltshirei, Andala, 98, 127
wiskotti, caja, 64, 65

X

xanthoptera, striata, 37
Xenorma, 13

Y

y-albula, Micrarctia, 78

yarrowii, Pararectia, 48
yuldashevi, turensis, 131

Z

zatima, lutea, 138
Zoote, Arctia, 60
zoraida, *Ocnogyma*, 120

IV-6. Index of the Main Food Plants of Tiger Moth Caterpillars

(numbers of pages have varied; concern to old variant, let you not take into consideration)

<i>Achillea</i>	48, 66, 71, 74, 79, 103, 119, 123	<i>Galeopsis</i>	130
<i>Achillea millefolium</i>	66	<i>Galium</i>	22, 79, 118, 114, 119, 125, 135, 139, 146
<i>Agrostis stolonifera</i>	38	<i>Galium verum</i>	119
<i>Alissum</i>	74	<i>Genista</i>	117
<i>Allium schoenoprasum</i>	66	<i>Gentiana</i>	94, 121
<i>Alnus incana</i>	66, 114, 139	<i>Geranium sanguineum</i>	133
<i>Andromeda polifolia</i>	144	<i>Geum</i>	94
<i>Artemisia</i>	24, 27, 38, 74, 79, 96, 119	<i>Geum rivale</i>	66
<i>Artemisia campestris</i>	119	<i>Hieracium</i>	38, 48, 77, 114, 146
<i>Asperula</i>	125	<i>Hieracium umbellatum</i>	114, 119
<i>Asperula cynanchica</i>	22	<i>Impatiens noli-tangere</i>	130
<i>Astragalus</i>	79, 94, 126, 158	<i>Lactuc</i>	79
<i>Atriplex</i>	130, 146	<i>Lactuca sativa</i>	133
<i>Betula</i>	46, 56, 66, 130	<i>Lamium</i>	19, , 66, 71, 130, 135
<i>Betula nana</i>	49, 56	<i>Lamium album</i>	66, 135
<i>Calamagrostis</i>	48	<i>Lamium lanceolata</i>	38
<i>Calluna vulgaris</i>	38, 38, 114, 144	<i>Lathyrus</i>	94
<i>Caltha</i>	115	<i>Linum</i>	144
<i>Calystegia sepium</i>	66	<i>Lonicera</i>	17, 19, 77
<i>Carelia</i>	144	<i>Lythrum salicaria</i>	130
<i>Centaurea</i>	28, 71	<i>Malus domestica</i>	66
<i>Chamaenerion angustifolium</i>	114, 130, 144	<i>Melandrium</i>	46
<i>Chenopodium</i>	74, 130	<i>Mentha</i>	135
<i>Chrysanthemum</i>	123	<i>Menyanthes</i>	135
<i>Cirsium</i>	74, 114, 123	<i>Myosotis</i>	17, 144
Compositae	123	<i>Nigrum</i>	139
<i>Corals</i>	89	<i>Onopordum</i>	123
<i>Corylus</i>	19	<i>Panicum</i>	126
<i>Crataegus coccinea</i>	66	<i>Petasites</i>	29
<i>Cynoglossum</i>	17, 48, 74, 146	<i>Phragmites</i>	115
<i>Deschampsia</i>	48	<i>Phalaris arundinacea</i>	38
<i>Elymus arenarius</i>	38	<i>Pisum sativum</i>	133
<i>Elytrigia repens</i>	38	<i>Plantago</i>	38, 41, 46, 48, 52, 60, 66, 71, 74, 79, 94, 114, 119, 121, 126, 126, 130, 133, 135, 139, 144, 146, 146
<i>Epilobium</i>	19	<i>Polygonum</i>	52, 60, 114, 115, 133, 135, 144
<i>Euphorbia</i>	24, 48, 74, 114, 115, 146	<i>Polygonum persicaria</i>	115
<i>Festuca</i>	38, 38	<i>Populus</i>	17, 66
<i>Festuca ovina</i>	38	<i>Populus tremula</i>	66
<i>Fragaria</i>	17, 66, 71		
<i>Fraxinus</i>	17, 77		

<i>Potentilla</i>	48	<i>Saxifraga</i>	81
<i>Potentilla erecta</i>	144	<i>Scabiosa</i>	121
<i>Primula farinosa</i>	81	<i>Sedum telephium</i>	66
<i>Prunus</i>	17, 66, 77	<i>Senecio</i>	29, 135
<i>Prunus domestica</i>	66	<i>Silene</i>	46, 81
<i>Prunus nana</i>	66	<i>Sorbus aucuparia</i>	66, 119
<i>Prunus padus</i>	89	<i>Spalanzania</i>	144
<i>Quercus robur</i>	77, 139	<i>Spiraea salicifolia</i>	66
<i>Ribes uvacrispa</i>	66	<i>Stachys sylvatica</i>	66, 130
<i>Ranunculus</i>	17	<i>Stellaria</i>	146
<i>Rheum rhaponticum</i>	66	<i>Taraxacum</i>	35, 36, 48, 52, 53, 54, 57, 59, 66, 71, 74, 79, 94, 114, 115, 126, 133, 139, 144, 146
<i>Rheum rhaponticum</i>	139	<i>Taraxacum mongolicum</i>	117
<i>Ribes</i>	66	<i>Thymus</i>	74
<i>Ribes uvacrispa</i>	139	<i>Trifolium</i>	66, 114, 119, 123, 130, 133, 144
<i>Rosacea</i>	66	<i>Trifolium . repens</i>	133
<i>Rubus</i>	17, 19, 62, 66, 133, 139, 144, 146	<i>Triticum sativum</i>	126
<i>Rubus chamaemorus</i>	49	<i>Tussilago</i>	29
<i>Rubus idaeus</i>	66, 133, 139, 144	<i>Ulex</i>	79
<i>Rumex</i>	46, 74, 79, 130, 133, 135, 144	<i>Ulmus</i>	17, 117
<i>Rumex crispus</i>	146	<i>Umbeliferae</i>	24, 79
<i>Sarothamnus</i>	144	<i>Urtica</i>	17, 71, 114, 121, 135
<i>Salix</i>	17, 61, 66, 114, 119, 130, 144	<i>Urtica dioeca</i>	130, 133, 139
<i>Salix herbacea</i>	53	<i>Vaccinium</i>	49, 53, 56, 61, 66, 77, 114, 119, 133, 144
<i>Salix phylicifolia</i>	133	<i>Vaccinium myrtillus</i>	46, 66, 119, 144
<i>Salix repens</i>	119	<i>Vaccinium uliginosum</i>	44, 56, 114, 133
<i>Salix starkeana</i>	144	<i>Veronica</i>	146
<i>Saxia</i>	38, 79		
<i>Saxia pratensis</i>	38		

IV-7. Arctiid Species As Distributed Between Food Plants

¹	Number of species of Arctiidae feeding on a given plant	Name of plant	
1.	23	Plantago	
2.	20	Taraxacum	63, 68, 75, 81, 84, 91, 125, 130, 133, 135, 148, 158, 164, 172, 174
3.	19	Vaccinium	44, 52, 56, 61, 75, 89, 130, 137, 158, 172
4.	11	Achillea	
5.	11	Lamium	14, 17, 75, 81, 153, 160
6.	11	Salix	14, 61, 75, 130, 137, 153, 172
7.	10	Galium	22, 91, 118, 130, 137, 146, 160, 164, 175
8.	10	Rubus	14, 17, 56, 75, 158, 164, 172, 175
9.	9	Artemisia	
10.	8	Polygonum	52, 60, 130, 133, 158, 160, 172
11.	8	Rumex	52, 84, 91, 153, 158, 160, 172
12.	8	Trifolium	75, 130, 137, 142, 143, 153, 158, 172
13.	8	Urtica	14, 81, 130, 141, 160
14.	6.	Euphorbia	24, 54, 84, 130, 133, 175
15.	5	Hieracium	40, 54, 130, 175
16.	4	Betula	4
17.	4	Calluna vulgaris	4
18.	4	Cirsium	4
19.	4	Cynoglossum	4
20.	4	Prunus	14, 75
21.	3	Geum	75, 125
22.	3	Fragaria	14, 75, 81
23.	3	Astragalus	3
24.	3	Chamaenerion angustifolium	3
25.	3	Chenopodium	3
26.	3	Populus	14, 75
27.	3	Ribes uvacrispa	75
28.	3	Salvia	40, 91
29.	2	Asperula	1
30.	2	Gentiana	125, 141
31.	2	Fraxinus	14, 89
32.	2	Lactuc	91
33.	2	Festuca	40, 43
34.	2	Atriplex	2
35.	2	Centaurea	2
36.	2	Chrysanthemum	2
37.	2	Compositae	2
38.	2	Cotton	2
39.	2	Alnus incana	
40.	2	Lonicera	14, 17
41.	2	Myosotis	14, 172
42.	2	Onopordum	142, 143
43.	2	Potentilla	54
44.	2	Rheum rhaponticum	75
45.	2	Senecio	30, 160
46.	2	Silene	52, 94
47.	2	Sorbus aucuparia	75, 137
48.	2	Ulmus	14, 134

49.	2	Umbeliperae	91
50.	1	Geranium sanguineum	158
51.	1	Galeopsis	153
52.	1	Impatiens nolitangere	153
53.	1	Genista	134
54.	1	Festuca ovina	40
55.	1	Calamagrostis	1
56.	1	Caltha	1
57.	1	Calystegia sepium	1
58.	1	Carelia	1
59.	1	Corals	1
60.	1	Corylus	1
61.	1	Crataegus coccinea	1
62.	1	Deschampsia	1
63.	1	Agrostis stolonifera	
64.	1	Alissum	
65.	1	Allium schoenoprasum	
66.	1	Andromeda polifolia	
67.	1	Elymus arenarius	1
68.	1	Elytrigia repens	1
69.	1	Epilobium	1
70.	1	Lathyrus	125
71.	1	Leguminosae	138
72.	1	Linum	172
73.	1	Loonier	89
74.	1	Lythrum salicaria	153
75.	1	Malus domestica	75
76.	1	Melandrium	52
77.	1	Mentha	160
78.	1	Menyanthes	160
79.	1	Nigrum	164
80.	1	Panicum	147
81.	1	Petasites	30
82.	1	Phalaris arundinacea	43
83.	1	Pisum sativum	158
84.	1	Primula farinosa	94
85.	1	Quercus robur	164
86.	1	Ranunculus	14
87.	1	Rosacea	75
88.	1	Sarothamnus	172
89.	1	Saxifraga	94
90.	1	Scabiosa	141
91.	1	Sedum telephium	75
92.	1	Spalanzania	172
93.	1	Spiraea salicifolia	75
94.	1	Stachys sylvatica	75, 153
95.	1	Stellaria	175
96.	1	Thymus	84
97.	1	Triticum sativum	147
98.	1	Tussilago	30
99.	1	Ulex	91
100.	1	Veronica	175

IV-8. References

1. General literature

- Seitz A., 1910. 4. Familie Arctiidae, Bärenspinner. In: Seitz A. (Ed.), *Die Gross-Schmetterlinge der Erde. Die palaearktischen Spinner und Schwärmer* 2: 43-108, pl. 11-18, 56. Alfred Kerner, Stuttgart, 1910-1913.
- Draudt M., 1931. 4. Family: Arctiidae. In: Seitz A. 1933. *Die Gross-Schmetterlinge der Erde. The Palaearctic Bombyces and Sphingines. Div. I. Fauna Palaearctica, Suppl. 2*: 61-94, pl. 5-7. Alfred Kerner, Stuttgart.
- Dubatolov V., 1996. A list of the Arctiinae of the territory of the former USSR (Lepidoptera, Arctiidae). *Neue Entom. Nachr.* 37: 39-89.
- Staudinger O. & Rebel H., 1901. Catalog der Lepidopteren des Palaearctischen Faunengebietes. XXXI. Arctiidae: 364-379.
- Freina J. de & Witt T., 1987. Die Bombyces und Sphingines der Westpalaearktis 1: 333-380. München.
- Watson A., Fletcher D.S. & Nye I.W.B., 1980. *The generic names of moths of the world*. London: British Mus. Nat. Hist. 2. 228 p.

2. Special literature

- Abdrashitova N., Aspök K., Aspök U. et al., 1996. [Superclass Hexapoda: Lepidoptera]. In: Shukurov E.Y. (Ed.), *Cadastre of the gene pool of Kyrgyzstan* 3: 406 p. [Arctiidae: 242-244, compiler: V. Dubatolov] [in Russian].
- Alberti B., 1973. Zweite Mitteilung über einige bemerkenswerte Lepidopteren-Formen aus dem Grossen Kaukasus und Transkaukasien (Lepidoptera). *Atalanta* 4: 380-393.
- Alpheraky S.S., 1867. [Lepidoptera of the North Caucasus]. *Trudy Russ. entom. obshchestva* 10: 1-53 [in Russian].
- Alpheraky S., 1876. [Lepidoptera of the Taganrog District]. *Trudy Russ. entom. obshchestva* 18: 150-226 [in Russian].
- Alpheraky S., 1882. Lépidoptères du district de Kouldja et des montagnes environnantes. *Horae Soc. Entom. Ross.* 17: 15-103, pl. 1-3.
- Alpheraky S., 1888. Neue Lepidopteren. *Stett. ent. Ztg.* 49: 66-69.
- Alphéraky S., 1889. Lépidoptères rapportés du Thibet par le Général N. M. Przewalsky de son voyage de 1884-1885. In: Romanoff N. M. (Ed.), *Mémoires sur les Lépidoptères* 5: 59-89, pl. 4. St.-Pétersbourg.
- Alpheraky S., 1892. Lépidoptères rapportés de la Chine et de la Mongolie par G. N. Potanine. In: Romanoff N. M. (Ed.), *Mémoires sur les Lépidoptères* 6: 1-81, pls. I-III. St.-Pétersbourg.
- Alpheraky S., 1897. Lépidoptères de l'Amour et de la Corée. In: Romanoff N. M. (Ed.), *Mémoires sur les Lépidoptères* 9: 151-184, pls. 10-13. St.-Pétersbourg.
- Bang-Haas A., 1907. Neue oder wenig bekannte palaearktische Macrolepidopteren. *Dtsch. Ent. Zeitschr. Iris* 20: 69-88. pl. 3.
- Bang-Haas A., 1910. Neue oder wenig bekannte palaearktische Macrolepidopteren. *Dtsch. Ent. Zeitschr. Iris* 24: 27-51. pl. 3.
- Bang-Haas A., 1912. Neue oder wenig bekannte palaearktische Macrolepidopteren. *Dtsch. Ent. Zeitschr. Iris* 26: 103-110, 139-162, 221-230, pl. 5-6.
- Bang-Haas O., 1927. *Horae Macrolepidopterologicae Regionis Palaearcticae* 1: 128 p., 11 pls. Dresden.
- Bang-Haas O., 1932-1933. Neubeschreibungen und Berichtigungen der palaearktische Macrolepidopterenfauna. *Dtsch. Ent. Zeitschr.* 46: 261-263.
- Bang-Haas O., 1934. Neubeschreibungen und Berichtigungen der palaearktische Macrolepidopterenfauna. *Ent. Zeitschr. & Int. Ent. Zeitschr.* 48: 7-8, 16, 48, 56, 71-72, 108-110, 128, 135.
- Bang-Haas O., 1936. Neubeschreibungen und Berichtigungen der palaearktische Macrolepidoptera. *XXV. Ent. Zeit. & Int. Ent. Zeitschr.* 50 (30): 345-348.
- Bang-Haas O., 1938. Neubeschreibungen und Berichtigungen der palaearktische Macrolepidoptera. *XXXVI. Ent. Zeitschr.* 52 (22): 177-180.
- Bang-Haas O., 1939. Neubeschreibungen und Berichtigungen der Palaarktischen Macrolepidopterenfauna. *XXXVIII. Dtsch. Ent. Zeitschr.* 53: 49-60.
- Bartel M., 1902. Lepidopteren des südlichen Urals. *Dtsch. Ent. Zeitschr. Iris* 15: 183-230.
- Bartel M., 1903. Zwei neue paläarktische Lepidopteren. *Dtsch. Ent. Zeitschr. Iris* 16: 215-220.
- Bartel M., 1906. *Callimorpha philippi*, eine neue Art aus Zentral-Asien. *Soc. Entom. Zürich* 21 (6): 41-42.
- Billberg G.J., 1820. *Enumeratio Insectorum in Museum Billberg.* 138 p. Holmiae.
- Blest A.D., 1964. Protective display and production of ultrasonic signals in some New World Arctiidae and Ctenuchiidae moths. *Zoologica* 49: 161-181. Stuttgart.
- Blest A.D., Collet T.S. & Pye J.D., 1963. The generation of ultrasonic signals by a New World arctiid moth. *Proc. R. Soc. London* 158B: 196-207.
- Boisduval J.B. A., 1829. *Europaeorum Lepidopterorum index methodicus.* 103 p. Mequignon-Marvis, Paris-Bruxelles.
- Boisduval J.B. A., 1832-1834. *Icones historiques de Lépidoptères d'Europe nouveaux ou peu connus* 2: 192 p., 84 pls. Paris.

- Borkhausen M.B., 1790. Naturgeschichte der europäischen Schmetterlinge nach systematische Ordnung **3**: 476 p. (**3**, 1790; **4**, 1792). Frankfurt.
- Borodin A.M. (Ed.), 1984a. [Red Data Book of the USSR] **1**: 391 p. Lesnaya promyshlennost, Moscow [in Russian]
- Borodin A.M. (Ed.), 1984b. [Red Data Book of the USSR] **2**: Special part V. The arthropods, Lepidoptera: 278-348. Lesnaya promyshlennost, Moscow [in Russian].
- Böttcher E., 1905. Neue und wenig bekannte Arctiiden aus Turkestan. *Ent. Zeitschr.* **19**: 53-55, 61-63.
- Bremer O., 1861. Neue Lepidopteren aus Ost-Sibirien und dem Amur-Lande gessammelt. *Bull. Acad. Imp. Sci. St. Pétersb.* **3**: 461-495.
- Bremer O. & Grey W., 1853. Diagnoses de Lépidoptères nouveaux trouvés par Mss. Tatarinoff et Gaschkewitsch aux environs de Peking. In: Motschulsky V. (Ed.), *Etud. Ent.*: 58-67.
- Bremer O. & Grey W., 1853. Beiträge zur Schmetterlinge Nord-Chinas. 76 p. St. Petersburg.
- 3Ck F., 1937. Arctiidae: subfam. Callimorphinae, Nyctemerinae. In: Junk W. (Ed.), *Lepidopterorum Catalogus* **82**. 105 p. Gravenhage.
- Bryk F., 1942. Zur Kenntnis der Großschmetterlinge der Kurilen. *Dtsch. Ent. Zeit. Iris* **56**: 3-90, pls. 1, 2.
- Bryk F., 1948. Zur Kenntnis der Großschmetterlinge von Korea. *Ark. Zool.* **41A** (1): 1-125, 7 pls.
- Butler A.G., 1875. Revision of the genus *Spilosoma* and the allied groups of the family Arctiidae. *Cistula Ent.* **2**: 21-44. London.
- Butler A.G., 1877. Descriptions of new species of Heterocera from Japan. *Ann. Mag. Nat. Hist.* **20** (4): 393-404, 473-483.
- Butler A.G., 1879a. Descriptions of new Species of Lepidoptera from Japan. *Ann. Mag. Nat. Hist.* **4** (5): 349-374, 437-457.
- Butler A.G., 1879b. Illustrations of typical specimens of Lepidoptera Heterocera in the collection of the British Museum **3**: XXIII+82 p., pls. XLI-LIX. London
- Butler A.G., 1881. Descriptions of new genera and species of heterocerous Lepidoptera from Japan. *Trans. Entomol. Soc. London* **1881**: 1-23; 171-200, 401-426, 597-600.
- Butler A.G., 1885. Descriptions of moths new to Japan, collected by Mes. Lewis and Pryer. *Cistula Ent.* **3**: 113-139. London
- Buresch Iv. & Tuleschkow Kr., 1943. %>@87>=B0;=>B> @07?@>AB@0=5=85=0?5?5@C48B5 (Lepidoptera) 2J J;30@80.V [Horizontal distribution of Lepidoptera in Bulgária. V]. '725AB80=0 F0@A:8B5 ?@8@>4>=0CG=8 8=AB8BCB8 2J!>D80 1943: 93-110 [in Bulgarian].
- Caradja A., 1893. Beitrag zur Kenntnis der Grossschmetterlinge des "Départament de la Haute Garonne". *Dtsch. Ent. Zeitschr. Iris* **6**: 161-240.
- Caradja A., 1894. Ein Hybridationsversuch. *Soc. Entom. Zürich* **7**: 55 p.
- Cerf F. le, 1913. Contribution à la faune lépidoptérologique de la Perse. *Ann. Hist. Nat. Delegation en Perse* **2**, entom., fasc. 2, 12+85 p., pl. 1-2.
- erný K., 1986. *Carcinopyga lindti* spec. nov. (Lepidoptera, Arctiidae) aus Tian Schan. *Neue Ent. Nachr.* **19** (1/2): 31-36.
- Christoph H., 1877. Sammelergebnisse aus Nordpersien, Krasnowodsk in Turkmenien und dem Daghestan. *Horae Soc. Entom. Ross.* **12**: 181-299, pl. 5-8.
- Christoph H., 1884. Lepidoptera aus dem Achal-Tekke-Gebiete. 1. Theil. In: Romanoff N. M (Ed.), *Mémoires sur les Lépidoptères* **1**: 93-138, pl. 6-8. St.-Pétersbourg.
- Christoph H., 1885. Lepidoptera aus dem Achal-Tekke-Gebite. In: Romanoff N. M (Ed.), *Mémoires sur les Lépidoptères* **2**: 119-171, pl. VI-VIII & XV. St.-Pétersbourg.
- Christoph H., 1887a. Diagnosen neuer Lepidopteren aus Tekke. *Stett. ent. Ztg.* **48**: 162-167.
- Christoph H., 1887b. Lepidoptera aus dem Achal-Tekke-Gebiete. In: Romanoff N. M (Ed.), *Mémoires sur les Lépidoptères* **3**: 50-125, pl. III-V. St.-Pétersbourg.
- Christoph H., 1889. Lepidoptera aus dem Achal-Tekke-Gebiete. 4. Theil. In: Romanoff N. M (Ed.), *Mémoires sur les Lépidoptères* **5**: 1-58, pl. I-III. St.-Pétersbourg.
- Christoph H., 1892. *Arctia turbans*, eine neue sibirische Art. *Horae Soc. Entom. Ross.* **26**: 460-461.
- Christoph H., 1893. Lepidoptera nova faunae Palaearcticae. *Dtsch. Ent. Zeitschr. Iris* **6**: 86-96.
- Churaev I.A., 1962. [American white moth]. 2nd ed., 103 p. Selkhozizdat, Moscow [in Russian].
- Clerck Ch., 1759. Iconographia Insectorum rariorum nominibus erorum, locisque ... Syst. Nat. allegatis. 21 p., 55 pl. Holmiae.
- Coro F., Connor W.E. & Sanderford, M.V., 1992. Auditory receptors response to intraspecific acoustic signals in *Empyreuma affinis* (= *pugione*) (Lepidoptera, Arctiidae). *Proc. ASA 124th Meeting*, **3**: 214-219. New Orleans.
- Cramer P., 1776-1782. In: Cramer P & Stoll C., *Papilions exotiques des trois parties du monde, l'Asie, l'Afrique et l'Amérique*. [ibid. (1776) **1**: 1-132; ibid. (1777) **2**: 133-156; ibid. (1779-1780), **3**: 1-128; 129-176; ibid. (1780), **4**: 1-90; (1781), 91-164; ibid. (1782) **5**: 193-252, pl. 289-400.
- Curtis J., 1823-1839. British Entomology, being illustrations and descriptions of the genera of insects found in Great Britain and Ireland **1-16**. 770 pl. London [1: 225 p.; 1823. **2**: 56; 1827. **4**: 169; 1835. **12**: 61].
- Cyrrilli D., 1787. Entomologiae Neapolitanae specimen primum. 270 p. Napoli (1787-1792).
- Dalman J.W., 1823. *Analecta Entomologica*. 97 p. Holmiae.
- Daniel F., 1932. Lepidopteren-Fauna aus Marash in türkisch Nordsyrien. *Mitt Münch. Ent. Ges.* **22**: 52-87.
- Daniel F., 1933. Lepidopteren aus dem nördlichen Libanon. *Dtsch. Ent. Zeitschr. Iris* **47**: 60-109.

- Daniel F., 1939. Gedanken zu einigen Arctiiden-Formen (Lepidoptera). *Mitt. Münch. Ent. Ges.* **29**: 354-368.
- Daniel F., 1943a. Beiträge zur Kenntnis der Arctiidae Ostasiens unter besonderer Berücksichtigung der Ausbeuten H. Häne's aus diesem Gebiet (Lep.Het.). I. Teil: Callimorphinae und Nyctemerinae. *Mitt. Münch. Ent. Ges.* **33**: 247-269, pl. 13.
- Daniel F., 1943b. Beiträge zur Kenntnis der Arctiidae Ostasiens unter besonderer Berücksichtigung der Ausbeuten H. Häne's aus diesem Gebiet (Lep., Het.). II. Teil: Hypsinae, Micrarctiinae, Spilosominae, Arctiinae. *Mitt. Münch. Ent. Ges.* **33** (2/3): 673-759, pl. 14-22.
- Daniel F., 1951-1954. Beiträge zur Kenntnis der Arctiidae Ostasiens unter besonderer Berücksichtigung der Ausbeuten von Dr. h. c. H. Häne aus diesem Gebiet (Lep.-Het.). *Bonn. zool. Beitr.* 1951, **2** (3-4): 291-327; 1952, **3** (1-4): 75-90, pl. II, 305-324; 1954, **4** (1-2): 89-138.
- Daniel F., 1953. Neue Heterocera-Arten und Formen. *Mitt. Münch. Ent. Ges.* **43**: 252-261.
- Daniel F., 1955. Beiträge zur Kenntnis der Arctiidae Ostasiens unter besonderer Berücksichtigung der Ausbeuten von Dr. h. c. H. Höne aus diesem Gebiet. IV. Teil: Nachträge. *Bonn. zool. Beitr.* **6** (1-2): 132-145.
- Daniel F., 1961. Zygaenidae – Cossidae. Lepidoptera der Deutschen Nepal-Expedition 1955. In: Lobbichler F., Forster W., Daniel F. et al. (Eds), *Verh. Zool. Staatssaml. München* **6** (4): 101-187, pl. 4-33.
- Daniel F., 1965. Österreichische entomologische Iran-Afghanistan-Expeditionen. Beiträge zur Lepidopterenfauna, Teil 4. Weitere Beiträge zur Bombyces- und Sphinges-Fauna. *Z. Wien. Ent. Ges.* **50**: 121-145.
- Daniel F., 1966. Zwei neue Arctiidae aus Afghanistan (Lep.). *Mitt. Münch. Ent. Ges.* **56** (7): 161-164, pl. 3.
- Daniel F., 1970. Rassenanalytische Untersuchungen bei *Phragmatobia fuliginosa* L. und *Phragmatobia amurensis* Seitz (Lep. Arctiidae). *Zeitschr. der Arbeitsgemeinschaft Österr. Entomologen* **22**: 2-17.
- Daniel F., 1971. Österreichische Expeditionen nach Persien und Afghanistan. Teil 16. (Beitrag zur Bombyces- und Sphinges-Fauna). *Ann. Naturhist. Mus. Wien* **75B**: 651-660.
- Danilov-Danilian V.I. (Ed.), 2001. The Red Data Book of the Russian Federation, "Astrel", Moscow [in Russian].
- Daritsheva M A., 1972. [Fauna and ecology of the highest Lepidoptera of southern Turkmenia (Lepidoptera, Rhopalocera and Heterocera)]. In: *Nasekomye Yuzhnoi Turkmenii* [Insects of South Turkmenia]: 47-74. Ylym, Ashkhabad [in Russian].
- Denis J.N.C.M. & Schiffermüller I., 1775. Ankündigung eines systematischen Werkes von den Schmetterlinge der Wienergegend. 323 p. 3 pl. Wien: Bernardi.
- Draudt M., 1931. 4. Family: Arctiidae. In: Seitz A. (Ed.), Die Gross-Schmetterlinge der Erde. The Palaearctic Bombyces and Sphinges. Div. I. *Fauna Palaearctica, Suppl.* **2**: 61-94, pl. 5-7 (1931-1933). Alfred Kerner, Stuttgart.
- Drury D., 1773. Illustrated natural history of exotic insects **2**, index: 11, 28, 36, pl. 6, 18.
- Dubatolov V.V., 1984. [*Borearctia* gen. n., a new genus for the tiger moth *Callimorpha menetriesi* (Ev.) (Lepidoptera, Arctiidae)]. *Entom. Obozr.* **63** (2): 336-339 [in Russian].
- Dubatolov V.V., 1985a. [On the systematics of the tiger moth (Lepidoptera, Arctiidae) genus group *Diacrisia* Hb. – *Rhyparia* Hb.]. In: *Sistematika i biologiya chlenistonogikh i gelmintov* [Systematics and biology of arthropods and helminths]: 66-71. Nauka, Novosibirsk [in Russian].
- Dubatolov V.V., 1985b. [Arctiinae (Lepidoptera, Arctiidae) of the South Siberian mountains. Part 1]. In: *Chlenistonogie Sibiri i Dalnego Vostoka* [Arthropods of Siberia and the Far East]: 134-159. Nauka, Novosibirsk [in Russian].
- Dubatolov V.V., 1985c. [*Rhyparioides metelkana* (Lederer, 1861) in Siberia]. *Vestnik zoologii* **5**: 86. Kiev [in Russian].
- Dubatolov V.V., 1985d. Notes on the *Holoarctia cervini* complex (Lepidoptera, Arctiidae). 1. *Holoarctia marinae* sp. n. from Altai. *Ann. Ent. Fenn.* **51** (2): 57-58, pl. 51.
- Dubatolov V.V., 1987a. [On the systematics of the genus *Micrarctia* Seitz, s. lat. (Lepidoptera, Arctiidae)]. In: *Nasekomye, klestshi i gelminty* [Insects, mites and helminths]: 30-47. Nauka, Novosibirsk [in Russian].
- Dubatolov V.V., 1987b. [*Arctia rueckbeili* Püngeler (Lepidoptera, Arctiidae) in the fauna of the USSR]. *Vestnik zoologii* **3**: 87. Kiev [in Russian].
- Dubatolov V.V., 1988. [A review of species of the genus *Chelis* Rbr. (Lepidoptera, Arctiidae)]. In: *Taksonomiya zhivotnykh Sibiri* [Animal taxonomy of Siberia]: 80-98. Nauka, Novosibirsk [in Russian].
- Dubatolov V.V., 1989. [A revision of the genus *Axiopoena* (Lepidoptera, Arctiidae)]. *Vestnik zoologii* **1**: 8-13. Kiev [in Russian].
- Dubatolov V.V., 1990a. [New taxa of Arctiinae (Lepidoptera, Arctiidae) of the Palearctic]. In: *Redkie gelminty, kleshchi i nasekomye* [Rare helminths, mites and insects]: 79-86. Nauka, Novosibirsk [in Russian].
- Dubatolov V.V., 1990b. [A tiger moth species, *Carcinopyga lichenigera* C. et R. Felder, 1874 (Lepidoptera, Arctiidae), new to the USSR fauna)]. *Vestnik zoologii* **2**: 87. Kiev [in Russian].
- Dubatolov V.V., 1990c. [New taxa of Arctiinae from the Palearctic. Note 2]. In: *Taksonomiya nasekomykh i gelmintov* [Taxonomy of insects and helminths]: 89-101. Nauka, Novosibirsk [in Russian].
- Dubatolov V.V., 1990d. [Arctiinae (Lepidoptera, Arctiidae) of the South Siberian mountains. Part 2]. In: *Chlenistonogie i gelminty* [Arthropods and helminths]: 139-169. Nauka, Novosibirsk [in Russian].
- Dubatolov V.V., 1990e. [A new genus of the family Arctiidae (Lepidoptera)]. In: *Novosti faunistiki i sistematiki* [News in faunistics and systematics]: 89-90. Naukova dumka, Kiev [in Russian].

- Dubatolov V.V., 1991a. [The *Pardalina* tiger moth, *Tancrea pardalina* Püngl. (Lepidoptera, Arctiidae:Arctiinae), a species new to the Turkmenistan fauna]. *Izvestiya AN Turkm. SSR, seriya biol. nauk* **5**: 67-69. Ashkhabad [in Russian].
- Dubatolov V.V., 1994. Tiger-moths (Lepidoptera, Arctiidae: Arctiinae) of the former USSR: the distribution throughout countries and regions. *Actias* **1** (1-2): 11-17. Moscow.
- Dubatolov V.V., 1996a. A review of the genus *Palaearctia*. *Neue Entom. Nachr.* **37**: 9-37.
- Dubatolov V.V., 1996b. A list of the Arctiinae of the territory of the former USSR (Lepidoptera, Arctiidae). *Neue Entom. Nachr.* **37**: 39-89, pl. 2.
- Dubatolov V.V., 1996c. [Fam. Arctiidae – Tiger and Footmen Moths]: 242-244. In: Shukurov E. (Ed.), *Cadastre of the gene pool of Kyrgyzstan*: III, Superclass Hexapoda. 406 p. [in Russian].
- Dubatolov V.V. & Tshistjakov J. A., 1989. [A new species of the genus *Palaearctia* (Lepidoptera, Arctiidae), an interesting example of convergent similarity in tiger moths]. *Zool. Zhurnal* **68** (11): 141-143, pl. 68 [in Russian].
- Duponchel Ph., 1836. Supplément à l'histoire naturelle des Lépidoptères d'Europe **3**: 651 p., 50 pls. Paris.
- Dyar H.G., 1899. Notes on Alaskan Arctiidae. *Entom. News* **10**: 130-131.
- Dyar H.G., 1901. Diagnosis of a new Arctian. *J. N.Y. Ent. Soc.* **9**: 85-86.
- Ebert G., 1973. Afghänishe Bombyces und Sphingees. 6. Arctiidae. Ergebnisse der 2. Deutschen Afghanistan-Expedition (1966) der Landessammlungen für Naturkunde in Karlsruhe. *Reichenbachia* **14** (8): 47-74.
- Efetov K.A. & Budashkin Y.I., 1987. [Tiger moths (Lepidoptera, Arctiidae) of the Crimea]. *Vestnik zoologii* **4**: 77-78. Kiev [in Russian].
- Efetov K.A. & Budashkin Y.I., 1990. [Lepidoptera of the Crimea]. 112 p. Tavria, Simferopol [in Russian].
- Eichwald E., 1830. Zoologia specialis quam expositis animalibus tum vivis, tum fossilibus postissimum Rossiae in Universum, et Poloniae in specie, in usum lectionum publicarum in Universitate Caesarea Vिल्nensi. Pars altera. 323 p. Vilnae.
- Erschoff N., 1872. Diagnoses de quelques espèces nouvelles de Lépidoptères appartenant à la faune de la Russie asiatique. *Horae Soc. Entom. Ross.* **8**: 315-318.
- Erschoff N., 1874. [Lepidoptera]. In: Fedtschenko A.P. (Ed.), *Travel to Turkestan* **2** (5): 32-35 (Arctiidae), No. 3, 4+6+128 p., 4 pl. [in Russian].
- Esaki T., Mutumura A., Inoue H., Ogata M., Okagaki H. & Kuroko H., 1971. Icones Heterocerorum Japonicorum **22**: 304 p., 136 pl.
- Esper E.J., 1784. Die europäischen Schmetterlinge in Abbildungen nach der Natur, etc. **3**: 177 pl. 33. Erlangen.
- Esper E.J., 1789. Die europäischen Schmetterlinge in Abbildungen nach der Natur, etc. **3**: 20, pl. 83. Erlangen.
- Eversmann E., 1843. Quaedam lepidopterorum species novae in montibus Uralensibus et Altaicus habitantes nunc descriptae et depictae. *Bull. Soc. Imp. Natural. Moscou* **16** (3): 535-553.
- Eversmann E., 1846. Lepidoptera quaedam nova in Rossia observata. *Bull. Soc. Imp. Natural. Moscou* **19** (3): 83-89.
- Eversmann E., 1847. Lepidoptera quaedam nova Rossiae et Sibiriae indigena descripsit et delineavit. *Bull. Soc. Imp. Natural. Moscou* **20** (3): 66-83, 6 pls.
- Eversmann E., 1848. Beschreibung einiger neuen Falter Russlands. *Bull. Soc. Imp. Natural. Moscou* **21** (3): 205-232.
- Fabricius J., 1793. Entomologia systematica emendata et aucta **2**: 320 p. Hafniae.
- Fabricius J., 1794. Entomologia systematica emendata et aucta. **3** (2): IV+487+349 p. Hafniae.
- Fallou M.J., 1864. Description d'un nouveau Lépidoptère Hétéroèce du genre *Nemophila* Stph. *Ann. Soc. Ent. France* **4** (4): 23-26.
- Fang Chenglai, 1981. Distinctions between the fall webworm and *Spilosoma* spp. *Acta entom. Sinica* **24** (3): 340-341 [in Chinese].
- Fang Chenglai, 1982. Arctiidae. In: Iconographia Heterocerorum Sinicorum **2**: 190-277, pl. 39-75. Beijing [in Chinese].
- Fang Chenglai, 1985. Economic Insects. *Fauna of China* **33**: 175-177 [in Chinese].
- Fang Chenglai, 2000. Lepidoptera, Arctiidae. *Fauna Sinica, Insecta* **19**: 589 p., 20 pl. Science Press, Beijing [in Chinese].
- Felder C., 1874-1875. In: Felder R. & Roggenhofer A.F. (Eds), Reise der österreichischen Fregatte Novara um die Erde (Zool.) **2** (2): 1874, pl. 75-107, 108-120; 1875, pl. 121-140, Erklärung 1-10, Inhaltverzeichnis 1-20. Wien.
- Ferguson D.C., 1984. Two new generic names for groups of Holarctic and Palaearctic Arctiini (Lepidoptera, Arctiidae). *Proc. Ent. Soc. Wash.* **86** (2): 452-459.
- Ferguson D.C., 1985. Contribution toward reclassification of the world genera of the tribe Arctiini. *Entomography* **3**: 181-275.
- Fixsen C., 1887. Lepidoptera aus Korea. In: Romanoff N.M. (Ed.), *Mémoires sur les Lépidoptères* **3**: 233-356, 3 pl. St-Petersbourg.
- Fourcroy A.F., 1785. Entomologia parisiensis **2**: 262 (see Geoffroy 1785).
- Freina J.J. de, 1982. *Carcinopyga lichenigera nuytenae* ssp. n. (Lepidoptera, Arctiidae). *Entomofauna* **3**: 1-20.
- Freina J.J. de, 1983. 4. Beitrag zur systematischen Erfassung der Bombyces- und Sphingees-Fauna Kleinasiens. Neue Kenntnisse über Artenspektrum, Systematik und Nomenklatur sowie Beschreibungen neuer Taxa (Lepidoptera). *Mitt. Münch. Ent. Ges.* **72**: 57-127.
- Freina J. de, 1997. Nouvelles Arctiides de la faune paléarctique asiatique (Lepidoptera, Arctiidae, Arctiinae). *Linneana Belg.* **16** (1): 49-60.
- Freina J.J. de & Witt T.J., 1984. Taxonomische Veränderungen bei den Bombyces und Sphingees Europas und Nordwestafrikas. Zwei neue Arctiidae-Gattungen für den westpaläarktischen Faunenbereich: *Watsonarctia* gen. n. und *Maurica* gen. n. (Lepidoptera, Arctiidae). *Entomofauna* **5** (28): 323-334.
- Freina J. de & Witt T., 1987. Die Bombyces und Sphingees der Westpaläearktis **1**: 333-380. München.

- Frey H., 1872. Die Lepidopteren der Schweiz. *Mitt. Schweiz. Ent. Ges.* **3**: 478-496.
- Freyer C., 1831. Neue Beiträge zur Schmetterlingskunde **1**: 6, 79, 134, 178, pl. 33, fig. 1-2. Augsburg.
- Freyer C., 1834. Neue Beiträge zur Schmetterlingskunde **2**: pl.2 fig. 56c. Augsburg.
- Freyer C., 1842. Neue Beiträge zur Schmetterlingskunde **4**: 167 p., 96 pl. Augsburg.
- Freyer C., 1843. Neue Beiträge zur Schmetterlingskunde **5**: 37, pl. 405. Augsburg.
- Fuessly J.C., 1778-1779. Magazin für die Liebhaber der Entomologie **2**: 70, pl. 1. Zürich & Winterthur [2 vol.].
- Fullard J.H., 1994. Jamming bat echolocation: the dogbane tiger moth *Cycnia tenera*. *J. Exp. Biol.* **194**: 285-298.
- Fullard J.H. & Dawson J., 1995. The neuroethology of sound production in tiger moths (Lepidoptera, Arctiidae). Location of the tymbal central pattern generator in *Cycnia tenera* Hübner. *J. Comp. Physiol.* **176A**: 541-549.
- Fullard J.H., Simmons J.A. & Saillant P.A., 1997. Talking to bats: what do arctiids say? *J. Comp. Physiol.* **181A** (5): 477-483.
- Fullard J.H., Dawson J.W., Otero L.D. & Surlykke A., 1997. Bat-deafness in day-flying moths (Lepidoptera, Notodontidae, Dioprinae). *J. Comp. Physiol.* **181A** (5): 484-498.
- Geoffroy E.L., 1785. In: Fourcroy A.F. (Ed.), *Entomologia parisiensis* **2**: 260. (The authorship of the new species belongs to Geoffroy).
- Gerning S.V., 1780. Frankfurter Beiträge zur Wissenschaft **2**: 862, pl. 2, fig. 1-3.
- Godart J.B., 1822. Histoire naturelle de Lépidoptères. *Papillons de France* **4**: 390 p. Paris.
- Godart J.B. & Latreille P.A., 1819-1823. Encyclopédie méthodique d'histoire naturelle **9** & Suppl.: 828 p., Paris.
- Graeser L., 1888. Beiträge zur Kenntnis der Lepidopteren-Fauna des Amurlandes. *Berl. Ent. Zeitschr.* **32**: 33-153, 309-414.
- Graeser L., 1892. Beiträge zur Kenntnis der Lepidopteren-Fauna des Amurlandes. *Berl. Ent. Zeitschr.* **37**: 209-234.
- Groum-Grshimailo Gr., 1890. Le Pamir et la faune lépidoptérologique. In: Romanoff N. M. (Ed.), *Mémoires sur les Lépidoptères* **4**: 576 p., 21 pl. St.-Petersbourg.
- Groum-Grshimailo, Gr., 1891. Lepidoptera nova in Asia centrali novissime lecta et descripta a Gr. Grum-Grshimailo. *Horae Soc. ent. Ross.* **25**: 445-465.
- Grum-Grshimailo, Gr., 1899. Lepidoptera nova ve parum cognita regionis palaearticae. I. *Ezhegod. Zool. Mus. Imp. Akad. Nauk [Annu. Mus. Zool. Acad. Imp. Sci.]* **4**: 455-472 [in Russian].
- Grum-Grshimailo, Gr., 1902. Lepidoptera nova vel parum cognita regionis palaearticae. II. *Ezhegod. Zool. Mus. Imp. Akad. Nauk* **7**: 191-204 [in Russian].
- Hampson G.F., 1894a. Heterocera of the Nilgiri District. Illustrations of typical specimens of Lepidoptera Heterocera of the British Museum **8**: I-IV, 1-144, pl. 139-156.
- Hampson G.F., 1894b. The fauna of British India, Ceylon and Burma. Moths **1**: XXII+609 p. London.
- Hampson G.F., 1901. Catalogue of the Lepidoptera Phalaenae in the collection of the British Museum (Natural History) **3**: XII+609 Pp., pls. 36-54. London.
- Hampson G.F., 1907. Moths [Papilionidae, Pieridae, Lycaenidae (part)]. The fauna of British India, including Ceylon and Burma **5** (2): i-viii, 1-480, 10 col. pl., 28 text-figs. London.
- Hampson G.F., 1920. Catalogue of the Lepidoptera Phalaenae in the British Museum. Supplement 2. Catalogue of the Lithosiidae (Arctianae) and Phalaenoididae in the collection of the British Museum. Trustees Brit. Mus. (Nat. Hist.): XXIII+619 p., 112 figs., pl. 42-71. London.
- Harris T.W., 1841. Report on the insects of Massachusetts injurious to vegetation: 255. New York
- Herrich-Schäffer G.A.W., 1843-1856. Systematische Bearbeitung der Schmetterlinge von Europa als Text, Revision und Supplement zu Hübner **1-6**. Regensburg.
- Heyne A., 1899. Neue und wenig bekannte melanistische Formen europäischer Grossschmetterlinge. *Soc. Ent. Zürich* **14**: 97-98, 105-106.
- Hofmann E., 1890. Die Raupen der Grossschmetwrlinge Europas. Hofmann O. (Ed.), Stuttgart. XXXVIII p. + 60 pls.
- Holland W., 1903. The moth book. 479 p., 48 pls, 263 figs. Page & Co., New York.
- Hori H., 1926. *Callimorpha Menetriesi* Ev. from Saghalien. *Kontyu* **1**: 86-87.
- Hübner J., 1790. Beiträge zur Geschichte der Schmetterlinge **1, 2**. (1786-1790). Augsburg.
- Hübner J., 1803. Geschichte der europäischen Schmetterlinge. [1793-1842]. Augsburg.
- Hübner J., 1804. Sammlung der europäischen Schmetterlinge **2**: 230-247 (1797-1838. 8 vol.). Augsburg..
- Hübner J., 1819. Verzeichnis der bekannter Schmetterlinge (1816-1826). 431 p. Augsburg.
- Hübner J., 1820. Verzeichnis der bekannter Schmetterlinge:164-183 Augsburg.
- Hübner J., 1824. Zuträge zur Sammlung der exotischen Schmetterlinge **1-3** (1818-1824). Augsburg.
- Inoue H., 1976a. Some new and unrecorded moths belonging to the Bombyces and Sphingees from Japan (Lepidoptera). *Bull. Fac. Domest. Sci. Otsuna Wom. Univ.* **12**: 153-196.
- Inoue H., 1976b. Further notes on the two species of the genus *Utetheisa* (Arctiidae) collected in Japan. *Yugato* **65**: 99-103.
- Inoue H., 1982. 68. Arctiidae. In: *Moths of Japan* **1**: 638-659; **2**: 74-79, 136-137, 334-342, pl. 154-162, 346-348.
- Inoue H. & Kobayashi H., 1956. A systematic study of the Japanese Arctiidae (1). *Tinea* **3**: 136-140, pl. 17, figs 1-12.

- Jarzewbowski E.A., 1980. Fossil insects from the Bembridge marls, Paleogene of the Isle of Wight, Southern England. *Bull. Brit. Mus. Nat. Hist., Geol. Ser.* **33** (4): 237-293.
- Jordan K., 1939. On the constancy and variability of the differences between the Old World species of *Utetheisa* (Lep., Arctiidae). *Novit. Zool.* **41**: 251-291.
- Kardakoff N., 1928. Zur Kenntnis der Lepidopteren des Ussuri-Gebietes. *Entom. Mitt.* **17** (8): 414-425.
- Kautt P. & Saldaitis A., 1997. Beschreibung einer neuen Art der Gattung *Carcinopyga* Felder, 1874 (Lepidoptera: Arctiidae) und Anmerkungen zur Verbreitung und Bionomie der drei Arten der Gruppe. *Nachr. entomol. Ver. Apollo, N.F.* **18** (2/3): 129-140.
- Kernbach., 1967. Über die bisher im Pliozän von Willershausen gefundenen Schmetterlings- und Raupenreste. *Ber. naturhist. Ges. Hannover* **111**: 103-108.
- Kindermann A., 1853. In: Lederer J. (Ed.), Lepidopterologisches aus Sibirien. *Verh. Zool.-Bot. Ges. Wien* **3**: 390 p.
- Kirby W.F., 1892. Sphingés and Bombyces. A synonymic catalogue of Lepidoptera Heterocera (moths) **1**: 951 p. London.
- Kishida Y., 1992. Arctiidae. In: Moths of Nepal. Part 1. *Tinea* **13** (Suppl. 2): 72-75, pl. 17, 18.
- Kishida Y., 1995. Arctiidae. In: Moths of Nepal. Part 4. *Tinea* **14** (Suppl. 2): 39-43, pl. 107.
- Kishida Y., 1998. Arctiidae. In: Moths of Nepal. Part 5. *Tinea* **15** (Suppl. 1): 32-35, pl. 132.
- Koch M., 1984. Schmetterlinge (Wir bestimmen Schmetterlinge): 212-221, pl. II-2; II-3. Neumann, Leipzig.
- Kôda N., 1987-1988. A generic classification of the subfamily Arctiinae of the Palaearctic and Oriental regions based on the male and female genitalia (Lepidoptera, Arctiidae). Part I. *Tyô to Ga*, 1987, **38** (3): 153-237, figs 21-24; Part II. *Tyô to Ga*, 1988, **39** (1): 1-79, figs 57-119.
- Kolenati F., 1846. Lepidoptera. V. Insecta Caucasi. In: *Meletemata entomologica*: 80-112, pl. 18. Petropoli.
- Kollar V. & Redtenbacher L., 1844. Aufzählung und Beschreibung der von Freiherrn Carl v. Hügel auf seiner Reise durch Kaschmir und das Himalayagebirge gesammelten Insecten. In: Hügel C. (Ed.), *Kaschmir und das Reich der Siek* **4** (2): 393-564, 582-585, pls 1-28.
- Konovalova Z A. & Volkova V.F., 1970. [The tiger moths (Lepidoptera, Arctiidae) in the northeastern part of the Primorye Region]. In: *Entomologicheskije issledovaniya na Dalnem Vostoke* [Entomological studies in the Far East]: 179-183. DVO AN SSSR, Vladivostok [in Russian].
- Kostjuk I.Yu. & Golovushkin M.I., 1994: [A contribution to the knowledge of the Macroheterocera (Lepidoptera) of eastern Transbaikalia]. In: *Cheshuekrylye Zabaikalya* [Lepidoptera of Transbaikalia]: 51-57. Kiev [in Russian].
- Kostjuk I.Yu. & Pljustsh I.G., 1987. [A tiger moth species new to the fauna of the USSR European part - *Phragmatobia placida* Friv. (Lepidoptera, Arctiidae)]. *Vestnik zoologii* **6**: 58. Kiev.
- Koshantschikov [Kozhantschikov] W., 1923-1925. [Materials to the fauna of Lepidoptera of the Minusinsk District (Siberia, Eniseiskaya Gouv.)]. *Ann. Martjanov. Staatsmus.* **1** (1): 2-50; **2** (1): 66-75; **3** (1): 66-83. Minussinsk [in Russian].
- Kozlov M.V. 1988. [Lepidopteran palaeontology and the problems of phylogeny of the order Papilionida]. In: Ponomarenko A.G. (Ed.), *Melovoi biotsenoticheskii krizis i evolyutsiya nasekomykh* [Cretaceous biocenotic crisis and the evolution of insects]. Moscow, Nauka: 16-69 [in Russian].
- Krasilnikova G A., 1977. [Lepidoptera]. In: *Fauna i ekologiya geksapod Turkmenistana* [Fauna and ecology of hexapods of Turkmenistan]: 71-90. Ylym, Ashkhabad [in Russian].
- Krulikovsky L., 1904. Notice sur la chasse des Lépidoptères durant 1903 dans le district d'Ourjoun, gouv. de Viatka. *Russk. Entom. Obozr.* **4** (1): 27-31.
- Krulikovsky L., 1909. [Lepidoptera of the Vyatka Gouvernements]. *Materialy k poznaniyu fauny i flory Rossiyskoi Imperii, Otdel zoologicheskii* [Materials to the knowledge of the fauna and flora of the Russian Empire, Zool. Dept.] **9**: 48-250 [in Russian].
- Kurentsov A.I., 1966. [On zoogeographical peculiarities of the fauna of the Kamchatka Region]. In: *Entomofauna lesov Kurilskikh ostrovov, Kamchatskoi i Magadanskoi oblastei* [Entomofauna of forests of Kuril islands, Kamchatka and Magadan Regions]: 63-76. Nauka, Moscow & Leningrad [in Russian].
- Kuznetsov V.I., 1960. [Materials to the fauna and biology of Lepidoptera of the western Kopetdagh]. In: *Fauna i ekologiya nasekomykh Turkmeniskoi SSR* [Insect fauna and ecology of SSR Turkmenia]. *Trudy Zool. Inst. AN SSSR* **27**: 11-93. Moscow & Leningrad [in Russian].
- Kuznetsov V.I. & Stekolnikov A A., 2001. [New approaches to the system of Lepidoptera of the world fauna (based on abdominal functional morphology)]. *Trudy Zool. Inst. AN SSSR* **282**. 464 p. [in Russian].
- Laboulbène A., 1865. Liste des travaux d'entomologie publiés de 1811 à 1864 par M. Léon Dufour. *Ann. Soc. Ent. France* **4** (4): 216-252.
- Lampert., 1913. [Atlas of the moths and caterpillars of Europe and partly of the Russian Asian possessions]. 486 p. +93 pl. St.-Petersburg [in Russian].
- Lafontaine J.D. & Tshistjakov J A., 1984. A review of the genus *Dodia* Dyar (Lepidoptera, Arctiidae) with description of a new species from Eastern Siberia and Northern Canada. *Canad. Ent.* **116**: 1549-1556.
- Latreille P.A., 1809. Genera Crustaceorum et Insectorum secundum ordinem naturalem in familias disposita, iconibus exemplisque plurimus explicata **4**: 399 p. 24 pl. (Index alph. generum: 389-399). Paris.
- Lederer J., 1853a. Versuch die europäischen Lepidopteren in möglichst natürliche Reihenfolge zu stellen, etc. *Verh. Zool.-Bot. Ges. Wien* **2** (1852): 14-54, 65-126.

- Lederer J., 1853b. Lepidopterologisches aus Sibirien. *Verh. Zool.-Bot. Ges. Wien* **3**: 351-386, pl. 1-7.
- Lederer J., 1855a. Weiterer Beitrag zur einer Schmetterlingsfauna des Altaigebirges in Sibirien. *Verh. Zool.-Bot. Ges. Wien* **5**: 97-121.
- Lederer J., 1855b. Beitrag zur einer Schmetterlingsfauna von Cypern, Beirut und einem Theil Kleinasiens. *Verh. Zool.-Bot. Ges. Wien* **5**: 177-234, pl. 3.
- Lederer J., 1861. *Nemeophila metelkana* n. sp. *Wiener Entom. Monatschr.* **5** (5): 162-163, pl. 3.
- Leech, J.H., 1881. On the collection of Lepidoptera from Kukiang. *Trans. Ent. Soc. London* **1881**: 99-148, pl. 9.
- Leech J.H., [1889] 1888. On the Lepidoptera of Japan and Corea. Part II. Heterocera. Sect. 1. *Proc. Zool. Soc. London* **1888**: 550-655, pl. 30-32.
- Leech J.H., 1899. Lepidoptera Heterocera from northern China, Japan, and Corea. Part II. *Trans. Ent. Soc. London* **1899**: 99-215.
- Lenek O., 1966. Österreichische Iran-Afghanistan-Expeditionen. Beiträge zur Lepidopteren-Fauna, Theil 7. *Phragmatobia fuliginosa* L., ssp. *nova paghmani*. *Zeitschr. Wien. Entom. Ges.* **51** (8): 105-106.
- Leraut P., 1980. Liste systématique et synonymique des Lépidoptères de France, Belgique et Corse, Arctiidae. *Suppl. Alexanor*: 153-155. Paris.
- Leraut P., 1985. *Eucastana* nomen. nov. pour *Eucharia* au sens des auteurs (Lep. Arctiidae). *Linneana Belg.* **10**: 43.
- Linnaeus C., 1758. [Lepidoptera]. In: *Systema Naturae*, etc. Ed. 10: 458-542. Holmiae.
- Linnaeus C., 1761. [Lepidoptera]. In: *Fauna Suecica*, etc., Ed. 2: 267-371. Holmiae.
- Linnaeus C., 1767. [Lepidoptera]. In: *Systema Naturae*, etc. Ed. 12: 744-900. Holmiae.
- Mann J., 1862. Verzeichniss der im Jahre 1851 bei Brussa in Kleinasien gesammelten Schmetterlinge. *Wiener Ent. Monatschr.* **6**: 356-371, 373-409.
- Matsumura S., 1911. Erster Beitrag zur Insektenfauna von Sakhalin. *J. Coll. Agric. Hokkaido Imp. Univ.* **4**: 42-60.
- Matsumura S., 1927. New species and subspecies of moths from the Japanese Empire. *J. Coll. Agric. Hokkaido Imp. Univ.* **19**: 1-91.
- Matsumura S., 1929. New moths from Kuriles. *Insecta Matsumurana* **3** (4): 165-168.
- Matsumura S., 1930a. New species and forms of Arctiidae from Japan. *Insecta Matsumurana* **5** (1-2): 31-40 pl. 1.
- Matsumura S., 1930b. A catalogue of the Arctiidae of the Japanese Empire. *Insecta Matsumurana* **5**: 58-94, pl. 1.
- McDunnough J., 1921. Note on the generic position of two Canadian arctiids with descriptions of new species (Lepid.). *Can. Entomol.* **53**: 167-168.
- Meigen J.W., 1832. Systematische Beschreibung der europäischen Schmetterlinge **2**: 4+212 p, 38 pls. Aachen & Leipzig.
- Ménétrières E., 1832. Catalogue raisonné des objets de zoologie recueillis dans un voyage au Caucase et jusqu'aux frontières de la Perse entrepris par ordre de S. M. l'Empereur. 271 p. St.-Petersbourg.
- Ménétrières E., 1842. Sur un nouveau genre de lépidoptère nocturne de la Russie. *Bull. phys.-mat. Acad. Imp. Sci. St.-Petersb.* **9** (195): 40-43.
- Ménétrières E., 1859a. Lépidoptères de la Sibérie orientale et en particulier des rives de l'Amour. *Bull. Acad. Imp. Sci.* **17**: 212-221. St. Pétersbourg.
- Ménétrières E., 1859b. Sur quelques Lépidoptères du gouvernement de Jakoutsk. *Bull. Acad. Imp. Sci.* **17**: 494-500. St.-Petersbourg.
- Ménétrières E., 1863. Descriptions de nouvelles espèces de Lépidoptères de la collection de l'Académie Imperiale des Sciences. 3ème et dernière partie. Pars 3, Lep. Heterocera. In: Ménétrières E. (Ed.), *Enumeratio corporum animalium Musei Imp. Acad. Sci. etc. Petropolitane*: 145-161, pl. 15-18. St.-Petersbourg.
- Miyake T., 1909. A revision of the Arctiidae of Japan. *Bull. Coll. Agric. Univ. Tokyo* **8**: 153-174.
- Mikkola K., 1975. *Spilosoma urticae* määritäminen. *Fin. Lepid. Soc.* **1**: 5-9.
- Moore F., 1860. In: Horsfield, Th. & Moore F., 1860. A catalogue of the lepidopterous insects in the Museum of the Hon. East-India Company **2**: 279-440 + 6 p. index, pl. 13-23, 7a-13a. London.
- Moore F., 1872. Description of new Indian Lepidoptera. *Proc. Zool. Soc. Lond.* **1872** (2): 601 p., 56 pl.
- Moore F., 1877. New species of heterocerous Lepidoptera of the tribe Bombyceae, collected by Mr. W. B. Pryer, chiefly in the district of Shanghai. *Ann. Mag. Nat. Hist.* (4) **20**: 83-94.
- Moore F., 1878. Descriptions of new species of Lepidoptera collected by the late Dr. F. Stoliczka during the Indian government mission to Yarkand in 1873. *Ann. Mag. Nat. Hist.* **1** (5): 227-237.
- Moore F., 1879a. Description of new genera and species of Asiatic Lepidoptera Heterocera. *Proc. Zool. Soc. Lond.* **1879**: 387-417, pl. 32.
- Moore F., 1879b. Lepidoptera. In: Scientific results of the second Yarkand mission based upon the collections and notes etc.: 1-18, pl. 1. Calcutta.
- Motschulsky V., 1861. Insectes du Japon. *Etudes Ent.* **9**: 4-39.
- Müller O., 1774. *Natursystemae* **5**: 662, pl. 22, f. 2
- Nägel W.P. & Isaacson D.L., 1974. *Tyria jacobaeae* and Tansy ragwort in Western Oregon. *J. Econ. Ent.* **67** (4): 494-496.
- Neumoegen & Dyar H.G., 1893. A revision of the Lepidopterous family Arctiidae. *Entom. News* **4**: 214
- Niepelt W., 1911. Neue paläarktische Macrolepidopteren. *Int. Ent. Ztg.* **5** (58): 274-275.
- Oberthür Ch., 1876-1896. Etudes d'Entomologie. Descriptions d'insectes Lépidoptères nouveaux ou peu connus **1** (1876), **3** (1878), **7** (1883), **11** (1887), **16** (1892), **20** (1896). Rennes.
- Oberthür Ch., 1879. Diagnoses d'espèces nouvelles de Lépidoptères de l'île Askold. 16 p., Rennes. Paris.
- Oberthür Ch., 1881. Faune des Lépidoptères de l'île Askold. Première partie. *Etud. Ent.* **5**: IX-X, 11-88, pl. 1-9.
- Oberthür Ch., 1910. Notes pour servir à établir la faune française et algérienne des Lépidoptères. *Etud. Lépid. Comp.* **4**: 691 p.
- Oberthür Ch., 1911. [No title]. *Etud. Lépid. Comp.* **5** (1): 134-141.

- Oberthür Ch., 1912. [No title]. *Etud. Lépid. Comp.* 6: 322-323, pl. 116, fig. 1028.
- Obraztsov N.S., 1936. Zur Lepidopterenfauna des südlichen Transdneprgebietes. *Festschrift für Dr. Embrik Strand* 2: 229-242. Riga.
- Ochsenheimer F., 1810. Die Schmetterlinge von Europa, Nachtfalter 3 (VIII): 360 p. Leipzig.
- Packard A.S., 1864. Synopsis of the Bombycidae of the United States. *Proc. Ent. Soc. Philad.* 3: 97-130.
- Paykull G., 1793. Beskrivelse over 5 arter nye natsommerfulge. *Skrift. Naturh. Selsk. Kjøbenhavn* 2: 97-102, pl. 2.
- Pinhey E.C.G., 1979. Moths of Southern Africa. 273 p., 63 pls. Balkema, Rotterdam.
- Pljušč I.G. & Dolin W.G., 2000. Über die Verbreitung und Veränderlichkeit *Palaeartica erschoffi* (Alpheraky, 1882) (Lepidoptera, Arctiidae). *Lambillionea* 3C: 433-437.
- Pljušč I.G. & Kostjuk I.Y., 1988. [*Acymba spectabilis* Tausch. (Lepidoptera, Arctiidae), a tiger moth new to the fauna of Ukraine]. *Vestnik zoologii* 4: 86. Kiev [in Russian].
- Poda N., 1761. Insecta musei Graecensis, quae in ordines, genera et species juxta Systema Naturae Caroli Linnaei digessit Nicolaus Poda, e Societate Jesu, Philosophiae Doctor et Matheseos Professor, Graecii, Widmanstadii, 18+127 p., 2 pls.
- Püngeler R., 1898. Diagnosen neuer Lepidopteren aus Centralasien. *Soc. Entom. Zürich* 13: 57-58.
- Püngeler R., 1899. Neue Macrolepidopteren aus Central-Asien. *Dtsch. Ent. Zeitschr. Iris* 12: 95-106.
- Püngeler R., 1901. Neue Macrolepidopteren aus Central-Asien. *Dtsch. Ent. Zeitschr. Iris* 14: 171-191, pl. 1-3.
- Püngeler R., 1904. Neue Macrolepidopteren aus Centralasien. *Soc. Entom. Zürich* 19: 121-122, 129-131.
- Püngeler R., 1906. Neue paläarktische Macrolepidopteren. *Dtsch. Ent. Zeitschr. Iris* 19: 78-98.
- Püngeler R., 1918. 6. *Arctia wagneri* Püng. nov. spec. *Zeitschr. Österr. Ent. Ver.* 3: 46. Wien.
- Quensel C., 1802. Lepidoptera. In: Acerbi J. (Ed.), *Travels through Sweden, Finland and Lapland, to the North Cape 1798 & 1799* 2: 253. London.
- Rambür P., 1866. Catalogue systématique des Lépidoptères de l'Andalousie. I-IX+412 p., pl.1-22. Paris.
- Rebel ", 1898. Fossile Lepidopteren aus Miocänformation von Gabbro. *S.-B. Österr. k. Akad. Wiss* 107: 731-745, pl. 1. Wien.
- Rebel H., 1910. *Arctia caja confluens*. In: Berge, F. (Ed.), *Schmetterlingsbuch nach dem gegenwärtigen Stande der Lepidopterologie*, 9. Aufl., 1-24 (Schluss) [1909-10]: vi+509 p., pl. 53. Schweizerbart, Stuttgart.
- Reich P., 1933. Eine neue Arctiide (Micrartiniinae) der holländische Karakorum-Expedition 1929-1930. *Int. Ent. Ztg.* 27: 307-315.
- Reich P., 1935. *Callimorpha dominula* L. (Lepidopt. Callimorphinae). *Ent. Rundschau* 53 (1): 8-10.
- Rjabov "...", 1958. [Lepidoptera]. In: Pavlovsky E.N. (Ed), *Zhivotnyi mir SSSR* [The animal world of the USSR] 5: 351-374. N USSR, "oscow & Leningrad [in Russian].
- Romanoff N.M., 1884. Les Lépidoptères de la Transcaucasie. Première partie. In: Romanoff N.M. (Ed.) *Mémoires sur les Lépidoptères* 1: 1-92, pl. IV. St.-Pétersbourg.
- Rothschild W., 1910. Catalogue of the Arctiinae in the Tring Museum, with notes and descriptions of new species. *Novitat. Zool.* 17: 1 85, 113-188.
- Rothschild, W., 1914. Arctiidae, subfamilie Arctiinae. In: Seitz A. [Ed.] *Die Gross-Schmetterlinge der Erde.* 10: 236-263. Alfred Kernen, Stuttgart.
- Sbordoni V. & Forestiero S., 1985. *Butterflies of the world.* 312 p. Mondatori, Milano.
- Schawerda K., 1906. Ueber die Formen der *Parasemia plantaginis* L. *Jahresb. Wien. Ent. Ver.* 17: 61-81; *Verh. Zool-Bot. Ges. Wien* 56: 230-231, 239-241.
- Schawerda K., 1922. Ussuriensia. *Wien. Zeitschr. des Österr. Entomologen-Vereines* 7: 10-11. Wien.
- Schawerda C., 1929a. Meine vierte Lepidopterenausbeute aus dem Hochgebirge Korsikas. *Wien. Zeitschr. des Österr. Entomologen-Vereines* 14 (3, 6). Wien.
- Schawerda !., 1929b. Neue und interessante Formen aus meiner Sammlung. *Zeitschr. des Österr. Entomol.-Vereines* 14 (11, 12). Wien.
- Schrank F., 1802. *Fauna Boica* 2 (2). 412 p. Igelstadt.
- Schultz O., 1905. Ueber die Variabilität von *Pericallia matronula* L. *Entom. Zeitschr.* 18 (31): 125-126.
- Schultz O., 1908. Über die neue Variabilität von *Arctiidae*. *Entom. Zeitschr.* 22: 183.
- Schwingenschuss L., 1937. Weitere Neuheiten aus Nord-Persien. *Wien. Zeitschr. des Österr. Entomologen-Vereines* 22 (6): 57-61.
- Scopoli J A., 1763. *Entomologia Carniolica exhibens insecta Carnioliae indigena et distributa in ordines, genera, species, varietates methodo Linnaeana.* 418 p. Vindobonae.
- Scopoli J A., 1772. Schmetterlinge. In: *Annus historico-naturalis* 5. 128 p. Lipsae.
- Sedykh K.R., 1974. [Animal world of ASSR Komi. Invertebrata]. 191 p. Syktyvkar [in Russian].
- Schaposchnikoff C.G., 1904. [Notes sur les Macrolépidoptères de la partie centrale du Caucasic septentrional-occidental]. *Annu. Mus. Zool. Acad. Imp. Sci. St.-Petersb.* 9: 189-259 [in Russian].
- Seitz A., 1910. 4. Familie Arctiidae, Bärenspinner. In: Seitz A. (Ed.). *Die Gross-Schmetterlinge der Erde. Die Palaearctischen Spinner und Schwärmer* 2: 43-108, pl. 11-18, 56. Alfred Kerner, Stuttgart, 1910-1913.
- Sharov A A. & Izhevskiy, S.S., 1987. The complex of parasites of the fall webworm *Hyphantria cunea* Drury (Lepidoptera, Arctiidae) in the South of the European part of the USSR. *Entomol. Obozr.*, 66, (2): 290-298 (in Russian).

- Sheljuzhko L., 1918. Diagnoses lepidopterorum novorum Sibiriae. *Neue Beitr. syst. Insektenkunde* 1: 104.
- Sheljuzhko L., 1922. Lépidoptères nouveaux ou peu connus de la Sibérie. *Ann. Soc. Ent. France* 91: 281-290, pl. 5, fig. 5.
- Sheljuzhko L., 1926. Neue palaearectische Heteroceren. *Dtsch. Ent. Zeitschr. Iris* 40: 56-65.
- Sheljuzhko L., 1929. Zur Kenntnis der *Melanorgia hahmede*-Gruppe. *Ent. Anz.* 9: 13-15, 25-29, 45-50, 118-119, 120-122, 33 figs.
- Sheljuzhko L., 1934. Eine neue *Callimorpha dominula*-Rasse aus dem Kaukasus. *Ent. Zeitschr.* 48: 73-75. Frankfurt a. M.
- Sheljuzhko L., 1935a. Eine neue Rasse von *Callimorpha quadripunctaria* Poda aus Transkaukasien. *Zeitschr. Österr. Ent. Ver.* 20: 21-22, 36, 67. Wien.
- Sheljuzhko L., 1935b. Einige neue und wenig bekannte Lepidopteren aus dem Westlichen Tian-Schan. *Mitt. Münch. Ent. Ges.* 25: 27-38, pl. 3.
- Skalski, A.W., 1988. [*Staupropolia nekrutenkoi* gen. et sp. n. (Lepidoptera, Arctiidae) - a new fossil tiger-moth from the Miocene of Caucasus]. *Vestnik zoologii* 4: 21-25. Kiev [in Russian].
- Smith J.E., 1797. In: Smith J.E. and Abbott J. Nat. Hist. Rarer lepid. Insects Georgia. 2, 104 pl.
- Smith M.J., 1938. Revision of the genus *Apantesis* 6: iv + 183 p., 14 pl. Univ. Illinois. Urbana.
- Sokolov G.N., 1936. Die Evolution der Zeichnung der Arctiidae. *Zool. Jahrb., Anat.* 61: 139-194.
- Sotavalta O., 1963. The generic position of *Hyphoraia alpina* Quens. (Lep. Arctiidae). *Suom. hyont. Aikak. [Ann. Ent. Fenn.]* 29: 257-267.
- Sotavalta O., 1964. Studies on the variation of the wing venation of certain tiger moths (Lep., Arctiidae, Subfam. Arctiinae). *Ann. Acad. Sci. Fenn., Ser. Biol.* 4A: 1-42.
- Sotavalta O., 1965. A revision of the genus *Hyphoraia* Hübner (Lepidoptera, Arctiidae). *Suom. hyont. Aikak. [Ann. Ent. Fenn.]* 31 (3): 159-197.
- Sovinsky V., 1905. [Trois nouvelles formes de Lépidoptères du Caucase]. *Russk. Entom. Obozr.* 5 (3-4): 108-110 [in Russian].
- Spuler A., 1906. Die Raupen der Schmetterlinge Europas. 38 p. + 50 pls. Stuttgart.
- Spuler A., 1910. XXIII. Fam. Arctiidae Sph. In: Spuler A. (Ed.), *Die Schmetterlinge Europas* 2: 128-152, pl. 73, 74. Stuttgart.
- Standfuss M., 1896. Handbuch der paläarktischen Gross-Schmetterlinge. 370 p. Jena.
- Standfuss M., 1899. Gesamtbild der bis Ende 1898 an Lepidopteren vorgenommenen Temperatur- und Hybridisations-Experimente. *Insectenbörse* 16: 14.
- Staudinger O. 1861. [Macrolepidoptera]. In: Staudinger, O. & Wocke, M. (Eds), Catalog der Lepidopteren Europas und der angrenzenden Länder. XVI+192 p. Dresden.
- Staudinger O., 1867. Einige neue Lepidopteren (aus der Sammlung des verstorbenen O. Gruner). *Stett. ent. Ztg.* 28: 100-110.
- Staudinger O., 1871. Macrolepidoptera. In: Staudinger O. & Wocke M. (Eds), Catalog der Lepidopteren des europäischen Faunengebiets. Ed. 2. 38+426 p. Dresden.
- Staudinger O., 1879. Lepidopteren-Fauna Kleinasiens. *Horae Soc. Entom. Ross.* 14: 176-482.
- Staudinger O., 1886. Description of a new Bombyx allied to *Arctia caja*. *Ent. Month. Mag.* 22: 258.
- Staudinger O., 1887a. Centralasiatische Lepidopteren. *Stett. ent. Ztg.* 48: 49-102.
- Staudinger O., 1887b. Neue Arten und Varietäten von Lepidopteren aus dem Amur-Gebiete. In: Romanoff N.M. (Ed.), *Mémoires sur les Lépidoptères* 3: 126-232. St.-Petersbourg.
- Staudinger O., 1892a. Neue Arten und Varietäten von Lepidopteren des paläarktischen Faunengebietes. *Dtsch. Ent. Zeitschr. Iris* 4: 224-339, pl. 3.
- Staudinger O., 1892b. Lepidopteren des Kentei-Gebirges. *Dtsch. Ent. Zeitschr. Iris* 5: 300-393.
- Staudinger O., 1892c. Die Macrolepidopteren des Amurgebietes. I. Theil. Rhopalocera, Sphingés, Bombyces, Noctuae. In: Romanoff N.M. (Ed.), *Mémoires sur les Lépidoptères* 6: 83-658, pl. 4-14. St.-Petersbourg.
- Staudinger O., 1894. Neue Lepidopteren-Arten und Varietäten aus dem paläarktischen Faunengebiet. *Dtsch. Ent. Zeitschr. Iris* 7: 241-296.
- Staudinger O., 1896. Drei neue palaearectische Heteroceren. *Dtsch. Ent. Zeitschr. Iris* 9: 188-192, pl. 4.
- Staudinger O., 1897. Lepidopteren des Apfelgebirges. *Dtsch. Ent. Zeitschr. Iris* 10: 320-344, pl. 9.
- Staudinger O. & Rebel H., 1901. Catalog der Lepidopteren des Palearctischen Faunengebietes. 3. Auflage. 368 p. Berlin.
- Stephens J.F., 1828. Illustration of British Entomology; or a synopsis of indigenous insects etc. 4, 41 pls., 1827-1835. Haustellata, London.
- Stichel H., 1911. Zweiter Beitrag zur nordischen Schmetterlingsfauna und anknüpfende Bemerkungen. *Berl. Ent. Zeitschr.* 61: 33-104, pl. 3.
- Stoll C., 1776-1782. In Cramer P & Stoll C., *Papillons exotiques des trois parties du monde, l'Asie, l'Afrique et l'Amérique*. [ibid. (1776) 1: 1-132; ibid. (1777) 2: 133-156; ibid. (1779-1780), 3: 1-128; 129-176; ibid. (1780), 4: 1-90; (1781), 91-164; ibid. (1782) 5: 193-252, pl. 289-400.
- Strand E., 1912. Ein neuen Bär von Tianschan. *Int. Ent. Ztg.* 6: 2.
- Strand E., 1919. Arctiidae: Subfam. Arctiinae. In: Wäagner H. (Ed.), *Lepidopterorum Catalogus* 22: 416 p. W. Junk, Berlin.
- Stshetkin Y.L., 1960. [Macrolepidoptera of the Vakhsh Valley (Tajikistan). Part I. Lepidoptera. Rhopalocera et Heterocera]. 103 p. Stalinabad [in Russian].
- Stshetkin Y.L., 1972. [*Ocnogyna diva*, a little-known endemic of Central Asia]. In: *Voprosy zoologii Tadzhikistana* [Questions of Tajikistan's zoology]: 106-120. Donish, Dushanbe [in Russian].
- Stshetkin Y.L., 1975. [Pasturable tiger moth (*Ocnogyna loewii pallidior* Chr.) in Middle Asia (Lepidoptera: Arctiidae)]. In: *Entomologiya Tadzhikistana* [Entomology of Tajikistan]: 134-138. Donish, Dushanbe [in Russian].

- Stshetkin Y.L., 1982. [A new subspecies, *Arctia caja pamiroalaica* Stshetkin, ssp. n., from Middle Asia (Lepidoptera: Arctiidae)]. *Izvestiya Akad. Nauk Tadzh. SSR (biol. nauki)* **1**: 39-43 [in Russian].
- Stshetkin Y.L., 1984. *Utetheisa pulchella* (Linnaeus, 1758). In: Borodin F.V. (Ed.), *Red Data Book of the USSR* **1**: 391 p. Lesnaya promyshlennost, Moscow [in Russian].
- Sviridov A.V., 1972. [To the lepidoptero-fauna of the Badkhyz]. *Izvestiya Akad. Nauk. Turkmen. SSR, ser. biol.* **1**: 46-52 [in Russian].
- Swinhoe L.C., 1885. List of Lepidoptera collected in Southern Afghanistan. *Trans. Entom. Soc. Lond.* **3**: 337-355.
- Swinhoe L.C., 1892. Catalogue of Eastern and Australian Lepidoptera Heterocera in the collection of the Oxford Museum **1** (Sphingés and Bombyces): 324 p. Oxford.
- Tams W., 1922. A new *Callimorpha* from north-west Persia and Armenia. *Entomologist* **55**: 196-197.
- Tams W., 1939. Changes in the generic names of some British moths. *Entomologist* **72**: 66-74; Further notes on the generic names of British moths. *ibid.*: 133-141.
- Tauscher A.M., 1806. Lepidopterorum Rossiae indigenorum observationes sex. *Mém. Soc. Natural. Moscou* **1**: 207-212, pl. 1.
- Tauscher A.M., 1811. Lepidopterorum novorum Rossiae indigenorum, observationes sex. *Mém. Soc. Natural. Moscou* **1**: 174-179, pl. 13, fig. 6.
- Theiri-Miegen P., 1889. Aberrations nouvelles de Lépidoptères français. *Naturaliste* (2) **3**: 143, 181, 197.
- Thomas W., 1989. Bemerkungen zur Gattung *Carcinopyga* (Lep., Arctiidae) und zu *Carcinopyga lichenigera* Felder (Beiträge zur Arctiiden-Systematik 4). *Atalanta* **19** (1-4): 139-147.
- Thomas W., 1990. Die Gattung *Lemyra* (Lepidoptera, Arctiidae). *Nachr. entomol. Ver. Apollo, Suppl.* **9**: 1-83.
- Thunberg C.P., 1791. Dissertatio. Entomologica sistens Insecta Suecica **2**: 40, fig. 7.
- Tilavov T., 1978. [On the biology of a pasturable tiger moth (*Oenogyna loewii pallidior*) in the conditions of the Kashkadarya Region]. *Uzbek. Biol. J.* **3**: 61-62 [in Russian].
- Torstenius S., 1971. *Orodemnius cervini* Fallou ssp. *fridolini* n. ssp. (Lepidoptera, Arctiidae). *Entom. Tidskr.* **92** (3-4): 173-177.
- Toulgoët H., 1985. Mises au point sur la variation infraspécifique et la répartition de *Chelis maculosa* Gerning (Lépidoptères Arctiidae Arctiinae). *Alexamor* **14** (2): 69-80.
- Tschetwerikov S.S., 1904. Lepidoptera palearctica nova. *Russk. Entom. Obozr.* **4** (2-3): 77-79 [in Russian].
- Tschetwerikoff S.S., 1984. [Lepidoptera]. In: Zolotarev G.S. (Ed.), S.S. Tschetwerikov. Fauna and Biology of Lepidoptera: 101 p. Nauka, Novosibirsk.
- Tshistjakov YA., 1988 [Tiger moths of the genus *Dodia* Dyar, 1901 (Lepidoptera, Arctiidae) of the USSR fauna]. *Entom. Obozr.* **67** (3): 632-643 [in Russian].
- Tshistjakov YA., 1990. [*Pararctia tundrana* sp.n. - a vicariant of *P. subnebulosa* (Dyar, 1899) (Lepidoptera, Arctiidae) in the subarctic sector of Asia]. In: *Novosti sistematiki nasekomykh Dalnego Vostoka* [News in insect systematics of the Far East]: 97-99. DVO AN USSR, Vladivostok [in Russian].
- Tshistjakov YA., 1992. [Fam. Arctiidae]. In: Insects of the Khingan Nature Reserve. Part 2: 149-154. Dalnauka, Vladivostok [in Russian].
- Tshistjakov YA., 2000. An annotated checklist of larger moths (Lepidoptera: Heterocera, except Geometridae and Noctuidae) of the Kamchatka Peninsula, with notes on their zoogeography. *Nat. Hist. Res., Special Issue* **7**: 253-266.
- Tshistjakov YA. & Kishida Y., 1994. A new species of the genus *Lemyra* Walker, 1856 (Lepidoptera, Arctiidae) from the Russian Far East and Korea. *Tyo to Ga* **45** (3): 189-192.
- Tshistjakov YA. & Lafontaine J.D., 1984. A review of the genus *Dodia* Dyar (Lepidoptera: Arctiidae) with description of a new species from Eastern Siberia and Northern Canada. *Canad. Entom.* **116**: 1549-1556.
- Turati C.E., 1909. Nuove forme di lepidotteri e note critiche. *Natura Siciliana* **21**: 133 p., 7 pl. Palermo.
- Vnukovsky W., 1929. 3. Einige Nomenklatur-Notizen über die palaearktischen Lepidopteren. *Zool. Anz.* **83** (9/10): 221-224.
- Wagner H., 1913. Beitrag zur Lepidopterafauna des Iligebietes sowie Sary-Dschas, Centralasien. *Ent. Mitt.* **2**: 22-30; 50-62; 88-95; 112-126; 153-288. 2 pls.
- Walker F., 1855. List of the specimens of lepidopterous insects in the collection of the British Museum **3**: 583-775 (1854-1866, 1-35, with descriptions). London.
- Walker F., 1865. List of the specimens of lepidopterous insects in the collection of the British Museum **31** (suppl.): 321 p. London.
- Wiltshire E. P., 1957. The Lepidoptera of Iraq. 162 p., pls. 1 - XVII. Nicholas Kaye Lim., London.
- Woodward ", 1879. On the occurrence of *Branchipus* (or *Chirocephalus*) in a fossil state, associated with *Eosphaeroma* and with numerous insect remains, in the Eocene freshwater (Bembridge) limestone of Gurnet Bay, Isle of Wight. *Q. J. Geol. Soc. Lond.* **35**: 342-350.
- Zaguljaev A.K., Kuznetsov V.I., Stekolnikov A. A., Kukhareva I.L. & Falkovich M.I., 1981. [Lepidoptera]. In: Medvedev, G.S. (Ed.), *Keys to the insects of the USSR European part* **4** (2): 787 p. Nauka, Leningrad [in Russian].
- Zeller P.C., 1846. Beschreibung der *Trichosoma loewii* n. sp. Nebst Bemerkungen bei Carrenno's "Insecte, dont l'ordre est incertain". *Entom. Ztg.* **7**: 5-11.
- Zhuravlev S.M., 1909-1910. [Materials to the fauna of Lepidoptera in the neighbourhood of Uralsk and other places of the Ural Mountain Range]. *Horae Soc. Entom. Ross.* **39**: 415-463 [in Russian].

3. References to some regional faunas of Arctiidae

- General.** Dubatolov, V.V., 1994. Tiger-moths (Lepidoptera, Arctiidae: Arctiinae) of the former USSR: the distribution throughout countries and regions. *Actias* **1** (1-2): 11-17. Moscow.
- Altai.** Suvortsev M., 1894. [Material to studying the entomological fauna of the Altai and Semipalatinsk regions. II. *Notes of the West Siber. Div. of the Imp. Russ. Geogr. Soc.* **17** (3): 1-14 [in Russian].
- Lederer J., 1855. Weiterer Beitrag zur einer Schmetterlingsfauna des Altaigebirges in Sibirien. *Verh. Zool.-Bot. Ges. Wien* **5**: 97-121.
- Armenia.** Mirzozian S.A. & Arutiunian K.M., 1980. Tiger moths of Armenia (Lep. Arctiidae). *Trudy Inst. Zastsh. Rast.* **4**: 96-104. Erevan [in Russian].
- Baltia.** Sulcs A. & Viidalepp J., 1967. Verbreitung der Grossschmetterlinge (Macrolepidoptera) im Balticum. II. Spinnerartige und Schwärmer. *Dtsch. Entom. Zeit., NF* **14** (5): 395-431.
- Bashkiria.** Grosser N., 1983. Zur Lepidopteren-Fauna (Macrolepidoptera) Baschkiriens. *Wiss. Z. Univ. Halle* **32** (1): 11-21.
- Belarus.** Merzheevskaya O.I., Litvinova A.N. & Molchanova R.V., 1976. [Lepidoptera of Belarus (a catalogue)]. 132 p. Nauka i tekhnika, Minsk [in Russian].
- Caucasus.** Alpheraky S.S., 1867: [Lepidoptera of the North Caucasus] -Russ. entomol obshchestva **10**:1-53 [in Russian]
- Crimea.** Budashkin Y.N., 1987. [Lepidoptera (Report 3)]. In: Lepidoptera of the Karadag Nature Reserve: 32-62. Inst. Animal Evol. Morphol. Ecol., Moscow [in Russian].
- Efetov K.A. & Budashkin Y.I., 1990. [Lepidoptera of the Crimea]. 112 p. Tavria, Simferopol [in Russian].
- Dahuria.** Kostjuk I.Yu., Budashkin Yu.I. & Golovushkin M.I., 1994. [Lepidoptera of the "Daurisky" Nature Reserve]. Kiev, 36 p. [in Russian].
- East Siberia.** Dubatolov V.V. & Ammosov Y.N., 1991. [Tiger moths (Lepidoptera, Arctiidae: Arctiinae) from the northeastern USSR]. In: Entomological researches in the northeastern USSR. **2**: 48-65. DVO AN SSSR, Vladivostok [in Russian].
- Estonia.** Remm H. & Viidalepp J., 1986. Catalogus Macrolepidopterorum Estoniae. *Abiks Loodusevaatlajale*. **84**. 34 p. Tartu (in Estonian).
- Kamchatka, Kuril Islands and Sakhalin.** Konovalova Z.A., 1968. [To the fauna of Heterocera of the Kuril Islands]. In: [*Insect fauna and ecology of the Far East*]: 28-41. Vladivostok [in Russian].
- Dubatolov V.V., 1991b. Moths from Southern Sakhalin and Kunashir, collected in 1989. Part 1. Macroheterocera, excluding Geometridae and Noctuidae. *Japan Heterocerists J.* **161**: 182-187.
- Sedykh K.R., 1979. [Lepidoptera (Macrolepidoptera) of Kamchatka and the neighbouring regions]. *Entom. Obozr.* **58** (2): 288-298 [in Russian].
- Viidalepp J. & Remm H., 1982. [New material of Macrolepidoptera from Sakhalin]. In: [*Useful or pest insects of Siberia*]: 137-151. Nauka, Novosibirsk [in Russian].
- Sedykh K.R., 1979. [Lepidoptera (Macrolepidoptera) of Kamchatka and the neighbouring regions]. *Entom. Obozr.* **58** (2): 288-298 [in Russian].
- Kirov Region.** Tcherushina A.N. & Shernin A.I., 1974. [Chapter 13. Order Lepidoptera] In: *Animal world of the Kirov Region* **2**: 351-477. Kirov [in Russian].
- Kuril Islands.** Konovalova Z.A., 1968. [To the fauna of Heterocera of the Kuril Islands]. In: *Fauna i ekologiya nasekomykh Dalnego Vostoka* [Insect fauna and ecology of the Far East]: 28-41. Vladivostok [in Russian].
- Kirghizia.** Abdrashitova N., Aspök K., Aspök U. et al., 1996. [Superclass Hexapoda: Lepidoptera]. In: Shukurov E.Y. (Ed.), *Cadastre of the gene pool of Kyrgyzstan* **3**: 406 p. [Arctiidae: 242-244, compiler: V. Dubatolov] [in Russian].
- Middle Urals.** Krulikovskiy L., 1909. [Lepidoptera of the Vyatka Gouvernements. Materials to the knowledge of the fauna and flora of the Russian Empire. *Zool. Dept.*] **9**: 48-250. Vyatka [in Russian].
- Middle Volga Region.** Eversmann E., 1844. Arctiidae. In: *Fauna Volgo-Uralensis*: 110-197. Casani.
- Tschetwerikov S.S., 1993. [Lepidoptera of the Gorkii Region]. 128 p. Nizhnii Novgorod State University Press, Nizhnii Novgorod [in Russian].
- Kumakov A.P. & Korshunov Y.P., 1979. [Lepidoptera of the Saratov Region]. 240 p. Saratov [in Russian].
- Sachkov S.A., 1992. [The tiger-moth fauna (Lepidoptera: Arctiidae, Arctiinae) of the "Samarskaya Luka" and neighbouring territories of the Samara Region]. In: *Samarskaya Luka. Bulletin* **3**: 136-144 [in Russian].
- Shlykov O.V., 1988. [A list of Macrolepidoptera of the Penza Region]. *Entom. Obozr.* **68** (1): 48-61 [in Russian].
- Primorye and Amurland.** Konovalova Z.A. & Volkova V.F., 1970. [The tiger moths (Lepidoptera, Arctiidae) of the northeastern part of Primorye Region]. In: *Entomologicheskie issledovaniya na Dalnem Vostoke* [Entomological studies in the Far East]: 179-183. DVO AN SSSR, Vladivostok [in Russian].
- Moltrecht A.K., 1929. Ueber die geographische Verbreitung der Macrolepidopteren des Ussuri- und Amur-Gebietes. *Proc. Vladivostok Dept State Russian Geogr. Soc.* **3** (XX): 5-70.
- Tshistjakov Y.A., 1992. [Fam. Arctiidae]. In: *Insects of the Khingan Nature Reserve*. Part 2: 149-154. Dalnauka, Vladivostok [in Russian].
- Vasiurin V.D. & Tshistjakov Y.D., 1979. [Materials to the fauna of Macrolepidoptera of the upper mountain belt of southern Sikhote Alin]. In: [*Biological studies in the Far East*]: 95-105. DVO AN SSSR, Vladivostok [in Russian].
- Siberia.** Lavrov D., 1927. [Materials to studying the entomofauna of the Omsk Region]. *Trans. Siber. Inst. Agric. Forestry* **8** (3): 51-100. Omsk [in Russian].
- Southern Russia.** Alpheraky S., 1876. [Lepidoptera of the Taganrog District]. *Trudy Russ. entom. obshchestva* **18**: 150-226 [in Russian].

- Southern Urals.** Kuznetsov V.I. & Martynova E.F., 1954. [A list of Lepidoptera of the middle part region of Ural River]. *Trans. Zool. Inst. AN USSR* **16**: 321-350 [in Russian].
- Tadjikistan.** Stshetkin Y.L., 1960. [Macrolepidoptera of the Vakhsh Valley (Tajikistan). Part I. Lepidoptera. Rhopalocera et Heterocera]. 103 p. Stalinabad [in Russian].
- Turkmenistan.** Kuznetsov V.I., 1960. [Materials to the fauna and biology of Lepidoptera of the western Kopetdagh]. In: *Fauna i ekologiya nasekomykh Turkmenskoi SSR* [Insect fauna and ecology of SSR Turkmenia]. *Trans. Zool. Inst. AN USSR*. **27**: 11-93. Moscow & Leningrad [in Russian].
- Daricheva M A., 1972. [Fauna and ecology of the highest Lepidoptera of southern Turkmenia (Lepidoptera, Rhopalocera and Heterocera) In: *Nasekomye Yuzhnoi Turkmenii* [Insects of South Turkmenia]: 47-74. Ylym, Ashkhabad [in Russian].
- Daricheva M A. & Dubatolov V.V., 1989. [Fauna and ecology of the tiger moth family (Lepidoptera, Arctiidae) of Turkmenistan]. *Izvestiya AN Turkm. SSR, seriya biol. nauk*. **2**: 39-44. Ylym, Ashkhabad [in Russian].
- Tuva.** Viidalepp J., 1979. [On the fauna of Lepidoptera of ASSR Tuva. II. Sphingés and Bombyces]. *Acta et commun. Univ. Tartu* **483**: 17-39 [in Russian].
- Ukraine.** Sheljuzhko L., 1941. [Materials to the lepidopteran fauna of the Kiev Region. Bombyces and Sphingés I]. *Trudy. Zool. Mus. Kyiv. Derzh. Univ* **1**: 1-101 [in Ukrainian].
- Urals.** Kuznetsov V.I. & Martynova E.F., 1954. [A list of Lepidoptera of the middle part region of Ural River]. *Trans. Zool. Inst. AN USSR*. **16**: 321-350 [in Russian].
- Low Volga Region.** Lvovsky A.L., 1971. [Materials to the fauna of Macrolepidoptera of the Astrakhan Region]. *Entom. Obozr.* **50** (4): 800-810 [in Russian].
- West Siberia.** Sitnikov P.S., 1992. [Toward creating a cadastre of regional rare insects of the Tyumen Region]. *Yearbook of Tyumen regional museum*: 200-228. Tyumen [in Russian].
- Dubatolov V.V. & Zolotarev G.S., 1990. [On the fauna of tiger moths (Lepidoptera: Nolidae, Arctiidae) of the West Siberian Plain]. In: *Arthropoda and helminths*: 122-139. Nauka, Novosibirsk [in Russian].

V. Colour plates

-
1. *Callimorpha dominula rossica* Kol. Prov. Samarensis, distr. Stavropol "Lesnoe", 10.VI.1916 (old style), G. Paschin, ♂. (Coll. V. Murzin)
 2. *Callimorpha dominula* L. Ukraine, Donetsk Region, Severskiy Donets River, Brusino, 24.VI.1935 (e.l.), Smirnov, ♀. (Coll. V. Murzin)
 3. *Callimorpha dominula* ssp. (?) ♀. Armenia, S. slope of Mt. Aragats, Inaklu, 2000 m, 10.VI.1987 (e.l.), V. Murzin leg. (Coll. V. Murzin)
 4. *Callimorpha dominula* ssp. *teberdina* Shelj. ♂, Russia, N. Caucasus, Teberda, Shumka River, 17.VI.1915, G. Pashin leg. (Coll. V. Murzin).
 5. *Callimorpha dominula* ssp. *teberdina* Shelj. ♀. Russia, N. Caucasus, Teberda, Mukhu River, 3.VII.1916, G. Pashin leg.
 6. *Euplagia quadripunctaria* (Poda), ♂. Turkmenistan, W. Kopetdagh, Ai-Dere Valley, 20.VI.1985, S. Murzin leg. (Coll. V. Murzin)
 7. *Euplagia quadripunctaria* (Poda), ♀. Azerbaijan, Lenkoran, Veri, 20.VI.1971, V. Murzin leg. (Coll. V. Murzin)
-

Plate 1. *Callimorpha* – *Euplagia*



-
1. *Euplagia splendidior* Tams, ♂. Armenia, S. slope of Mt. Aragats, Inaklu, 2000 m, 23.VII.1936, A. Tsvetaev leg. (Coll. V. Murzin)
 2. *Eucallimorpha equitalis* Daniel, ♂. Nepal, env. Kathmandu, Naġarjun Forest, 5.V.1996, V. Murzin leg. (Coll. V. Murzin)
 3. *Eucallimorpha principalis* (Kollar), ♂ N. Nepal, Mt. Annapurna, 28°34'N, 83° 50'E, 4200 m, 6.VII.1995, E. Afonin & V. Sinyaev leg. (Coll. V. Murzin)
 4. *Eucallimorpha principalis* (Kollar), ♀. N. Nepal, Mt. Annapurna, 28°34'N, 83°50'E, 4200 m, 7.VII.1995, E. Afonin & V. Sinyaev leg. (Coll. V. Murzin)
 5. *Eucallimorpha principalis fedtschenkoi* (Gr.-Gr.), ♂. Tajikistan, W. Pamirs, Shakh Dara River, Barvaz 2800 m, 20.VII.1987, (Coll. V. Murzin)
 6. *Eucallimorpha principalis fedtschenkoi* (Gr.-Gr.), ♂. Tajikistan, W. Pamirs, Khorog, Botanical Garden, 19.VI.1956, A. Zhelokhovtsev leg. (Coll. V. Murzin).
-

Plate 2. *Euplagia* – *Eucallimorpha*



-
1. *Aglaomorpha histrio* (Walker), ♂. N. Korea, Pyongyang, 10.VIII.1990. S. Murzin leg. (Coll. V. Murzin)
 2. *Carcinopyga proserpina* Stgr., ♂. Tajikistan, Pamirs, Hissar Mts., Kondara, 1.X.1965. A. Tsvetaev leg. (Coll. V. Murzin)
 3. *Carcinopyga proserpina* Stgr., ♀. Tajikistan, Pamirs, Vanchskiy Mt. Range, Lyangar, 3300 m, 19.VII.1973, A. A. Tsvetaev leg. (Coll. V. Murzin)
 4. *Carcinopyga proserpina* ssp. *lindti* Černy, ♂. Uzbekistan, Ugam River, Khumsan, 1300 m, 20.IX.1980, A. Yuldashev leg. (Coll. V. Murzin)
 5. *Carcinopyga proserpina* ssp. *lindti* Černy, ♀. Uzbekistan, Karzhantau Mt. Range, Aktash, 22.IX.1965, A. A. Tsvetaev (Coll. V. Murzin)
 6. *Tyria jacobaeae* (L.). ♂. Russia, Rostov-on-Don Region, Ust-Donetsk Distr., 12.VI.1976, A. Grazhdankin leg. (Coll. V. Murzin)
 7. *Cymbalophora rivularis* (Mén.). ♂. Russia, Daghestan, Kopchugai, 10.IX.1937, M. Rjabov (Coll. V. Murzin)
 8. *Tyria jacobaeae* (L.). ♀. Russia, Moscow Region, Egoryevsk Distr., Nikitkino, 13.V.1930 (e.l.), A. Tsvetaev leg. (Coll. V. Murzin).
-

Plate 3. *Aglaomorpha* – *Tyria*



1. *Axiopoenia maura* Eich. ♀. Turkmenistan, W. Kopetdagh, Ai-Dere, 2.VII.1985, S. Murzin leg. (Coll. V. Murzin)
 2. *Axiopoenia karelini* Mén. ♀. Armenia, Aragats, Erevan, 21.VII.1962, V. Murzin leg. (Coll. V. Murzin)
 3. *Dodia diaphana* (Ev.). Russia, Altai, Ukok Plateau, Argamzha River, 2900 m, 10.VII.1991, V. Murzin leg. (Coll. V. Murzin)
 4. *Dodia sazonoovi* Dub. ♂. Russia, Altai, Kurayskiy Mt. Range, Aktash, 2600 m, 16.VII.1990, V. Murzin leg. (Coll. V. Murzin)
 5. *Epimydia dialampra* Stgr. ♂. Mongolia, Darhat Depression, 3.VI.1967, V. Solyanikov leg. (Coll. V. Murzin)
 6. *Dodia sazonoovi* Dub. ♀. Russia, Altai, Kurayskiy Mt. Range, Aktash, 2600 m, 16.VII.1990, V. Murzin leg. (Coll. V. Murzin)
 7. *Lacydes spectabilis spectabilis* (Tauscher). ♂. Ukraine, Kharkov Region, 13.IX.1987 (Coll. V. Murzin)
 8. *Lacydes spectabilis* ssp. ? ♂. Kirghizia, Lake Issyk-Kul, Bokonbaevskoe, 8.VIII.1989, V. Murzin leg. (Coll. V. Murzin)
 9. *Lacydes spectabilis spectabilis* (Tauscher). ♀. Ukraine, Kharkov Region, 13.IX.1987 (Coll. V. Murzin)
 10. *Lacydes spectabilis* ssp. *anellata* (Christoph). ♂. Turkmenistan, W. Kopetdagh, Ai-Dere, 25.IX.1978, V. Murzin leg. (Coll. V. Murzin)
 11. *Spiris striata* (L.) ♂. Russia, Central Caucasus, Teberda, Djemagat River, 2.VII.1916, G. Pashin (Coll. V. Murzin)
 12. *Spiris striata* (L.) ♂. Russia, Altai, near Biysk, 2.VIII.1931, P. Valdayev (Coll. V. Murzin)
 13. *Spiris striata* f. *melanoptera* (Brahm), ♂. Russia, Moscow Region, Egoryevsk Distr., Nikitino, 3.VII.1921, A. A. Tsvetaev leg. (Coll. V. Murzin)
 14. *Spiris bipunctata* (Stgr.) ♂. Mongolia, Lake Dood-Nur, 15.VIII.1966, V. Solyanikov (Coll. V. Murzin)
 15. *Spiris bipunctata* (Stgr.) ♂. Mongolia, Lake Dood-Nur, 22.VII.1966, V. Solyanikov (Coll. V. Murzin)
 16. *Coscinia cribraria* (L.) ♂. Russia, S. Urals, Miass, Ilmenskiy Nature Reserve, 3.VIII.1946, V. Stepanov leg. (Coll. V. Murzin)
 17. *Coscinia cribraria* (L.) ♂. Prov. Samarensis, distr. Stavropol, "Lesnoe", 4.VII.1915 (old style), G. Pashin leg. (Coll. V. Murzin)
 18. *Spiris bipunctata* f. *funerea* (Ev.). ♂. Russia, Altai, near Biysk, 27.VII.1931, P. Valdayev leg. (Coll. V. Murzin).
-

Plate 4. *Axiopoena* – *Coscinia*



1. *Utetheisa pulchella* (L.). ♂. Turkmenistan, Ashkhabad, 28.IX.1956, V. Potopolskiy leg. (Coll. V. Murzin)
 2. *Parasemia plantaginis plantaginis* (L.). ♂. Bulgaria, Sofia, Mt. Vitosha, VII.1972, S. Murzin leg. (Coll. V. Murzin)
 3. *Parasemia plantaginis plantaginis* (L.), f. *hospita* (Den. & Schiff.). ♂. Russia, Moscow City, Losinyi Ostrov Park, 22.VII.1973, S. Murzin leg. (Coll. V. Murzin)
 4. *Parasemia plantaginis plantaginis* (L.). ♀. Russia, Moscow Region, Zvenigorod, 23.VII.1973, S. Murzin leg. (Coll. V. Murzin)
 5. *Parasemia plantaginis sifanica* (Gr.-Gr.), f. *hospita* (Den. & Schiff.). ♂. Russia, Altai, Shebalino, e.o., 21.VII.1987, V. Murzin leg. (Coll. V. Murzin)
 6. *Parasemia plantaginis sifanica* (Gr.-Gr.). ♀. Russia, Altai, Shebalino, e.o., 21.VII.1987, V. Murzin leg. (Coll. V. Murzin)
 7. *Parasemia plantaginis sifanica* (Gr.-Gr.). ♂. Russia, Altai, Chemal, 11.VII.1990, V. Murzin leg. (Coll. V. Murzin)
 8. *Parasemia plantaginis sifanica* (Gr.-Gr.). ♀. Russia, Altai, Shebalino, e.o., 21.VII.1987, V. Murzin leg. (Coll. V. Murzin)
 9. *Parasemia plantaginis sifanica* (Gr.-Gr.), f. *nycticans* (Mén.). ♂. Russia, Altai, Kurayskiy Mt. Range, Aktash, 1800 m, 10.VII.1990, V. Murzin leg. (Coll. V. Murzin)
 10. *Parasemia plantaginis sachalinensis* Mats. ♂. Russia, Kamchatka, near Petropavlovsk, VII.1965 (Coll. V. Murzin)
 11. *Parasemia plantaginis araitensis* Mats. (?). ♂. Russia, Kamchatka, VII.1949, S. Nikolaev leg. (Coll. V. Murzin)
 12. *Parasemia plantaginis sachalinensis* Mats. ♀. Russia, Sakhalin, Aniva Distr., Novo-Aleksandrovsk, 28.VII.1971, Kostiuk leg. (Coll. V. Murzin)
 13. *Parasemia plantaginis caucasica* (Mén.). ♂. Armenia, Tsakhkadzor (Darachichag), 24.VI.1925 (Coll. V. Murzin)
 14. *Hyphoraia aulica* (L.). ♂. Russia, Amur River, Pashkovo, 9.VI.1977, S. Murzin leg. (Coll. V. Murzin)
 15. *Hyphoraia aulica* (L.). ♀. Russia, Primorye, Lazovskiy Nature Reserve, Sokolchi, 6.VII.1980, S. Murzin leg. (Coll. V. Murzin)
 16. *Pararctia lemniscata* Stichel. ♂. Russia, Yakutia, Indigirka River, 5.VII.1977, A. Grazhdankin leg. (*P. lemniscata* Stichel., V. Dubatolov det.) (Coll. V. Murzin)
 17. *Pararctia tundrana* Tshist. ♂. Russia, E. Chukotka, Chaplino, Goryachie Klyuchi, 22.VII.1963, A. Tsvetaev leg. (Coll. V. Murzin)
 18. *Pararctia lemniscata* Stichel. ♂. Russia, Altai, Ukok Plateau, Kalguty, 3000 m, 10.VII.1991, L. Nikolaevskiy leg. (Coll. V. Murzin).
-

Plate 5. *Utetheisa* – *Pararctia*



1. *Borearctia menetriesi* (Ev.), Russia, Amurland, Djevatulak Distr., Moġat, bank of Moġat River, mixed forest, 25.VI.1975, leg. E. Boġdanova (*Panaxia menetriesi* Ev., A. A. Sviridov det.) (Coll. ZMUM)
 2. *Acerbia seitszi* (A. B.-H.). ♂. Kazakhstan, Zailiiskiy Alatau Mts, near Alma-Ata, Malaya Almatinka River, Pass Kumbel, 3000 m, 20.VI.1992, S. Murzin leg. (Coll. V. Murzin)
 3. *Acerbia seitszi* (A. B.-H.), *tillaevi* forma nova. ♂. Uzbekistan, Uġamskiy Mt. Range, Sairam-Su River, 3000 m, 17.VII.1985, T. Tillaev leg. (Coll. V. Murzin)
 4. *Acerbia alpina* (Quen.). ♀. Mongolia, Horidullin-Sardig-Nuru Mt. Range, 26.VII.1966, V. P. Solyanikov leg. (Coll. V. Murzin)
 5. *Acerbia alpina* (Quen.). ♂. Russia, Altai, Ukok Plateau, Kalguty Mine, 15.VII.1991, V. Murzin leg. (Coll. V. Murzin)
 6. *Platarctia atropurpurea* (O. B.-H.). ♂. Russia, Altai, Kurayskiy Mt. Range, Aktash, 2500 m, 2.VII.1991, V. Murzin leg. (Coll. V. Murzin)
 7. *Gonerda* sp. Nepal, Khumbu Himal (Mt. Everest region), Siangbotche, 4000 m, 10.V.1996, leg. S. Murzin (Coll. V. Murzin)
 8. *Oroncus urania* (Png.). ♀. Aksu, Chinese Turkestan, 18.V.1926. Ex Coll. Filippov (Coll. ZMUM)
 9. *Oroncus urania* (Png.). ♀. Kirghizia, Tian-Shan, Inylchek-Tau Mt. Range, Sary-Dzhaz, 15.VII.1984, V. A. Ganson leg. (Coll. V. Ganson)
 10. *Oroncus tancrei* (Stgr.) (?). ♀. Tajikistan, SE. Pamirs, Sarykolskiy Mt. Range, Lake Dunkeldyk, 30.VII.1994, V. Murzin leg. (Coll. V. S. Murzin)
 11. *Oroncus alaica* O. B.-H. ♂. Tajikistan, Pamirs, Shuġnanskiy Mt. Range, Dzhilandy, 4200 m, 30.VII.1987, S. Sazonov leg. (Coll. V. Murzin)
 12. *Oroncus alaica* O. B.-H. ♀. Tajikistan, Pamirs-Alai, Alaiskiy Mt. Range, Duġoba River, Aktash, 4000 m, 27.VII.1992, V. Murzin leg. (Coll. V. Murzin).
-

Plate 6. *Borearctia* – *Platarctia*



-
1. *Arctia intercalaris* (Ev.). ♂. Uzbekistan, Ugamskiy Mt. Range, 5.VII.1992, S. Murzin leg. (Coll. V. S. Murzin)
 2. *Arctia intercalaris* (Ev.). ♀. Kirghizia, Naryn Mts, Kyzyl Bel, 3000 m, 10.VII.1980, V. Murzin leg. (Coll. V. S. Murzin)
 3. *Arctia intercalaris alpherakyi* Stgr., ♂. Tajikistan, Pamirs, Shugnanskiy Mt. Range, Sangou-Dara, 3200 m, 25.VII.1971, V. Murzin leg. (Coll. V. S. Murzin)
 4. *Arctia caja* (L.). ♂. Russia, Moscow, 35 road-km of Kaluzhskoe Highway, 4.VII.1966, V. Murzin leg. (Coll. V. S. Murzin)
 5. *Arctia caja* (L.). ♀. Ukraine, Crimea, Simeiz, 1000 m, 17.08.88, V. Sinyaev leg. (Coll. V. Sinyaev)
 6. *Arctia caja tshimgana* Shelj. ♂. Uzbekistan, 42°11'N, 70°60'E, Maidantal Mts, Pskem River, 28-31.VII.1994, S. Murzin leg. (Coll. V. S. Murzin)
 7. *Arctia caja tshimgana* Shelj. ♀. Uzbekistan 42°11'N, 70°60'E, Maidantal Mts, Pskem River, 28-31.VII.1994, S. Murzin leg. (Coll. V. S. Murzin)
 8. *Arctia caja* (L.), spp. ?. ♂. Uzbekistan, Alai Mts, Dugoba River, 2500 m, 15.VII.1992, V. Murzin leg. (Coll. V. S. Murzin)
 9. *Arctia caja tshimgana* Shelj. ♂. Kirghizia, Chatkalsky Mt. Range, Sary-Chelek Nature Reserve, 1400 m, 10.8.1983, V. Murzin leg. (Coll. V. S. Murzin).
-

Plate 7. *Arctia*



-
1. *Arctia caja* (L.), ssp. *sajana* O. B.-H. ♂. Russia, Altai, Kurayskiy Mt. Range, Aktash, 50°20'N, 87°41'E, 11.07.1989, V. Murzin leg. (Coll. V. S. Murzin)
 2. *Arctia caja* (L.), ssp. *phaeosoma* (Btl.) ♀. Russia, Primorye, Lazovskiy Nature Reserve, Sokolchi, 19.VIII.1978, S. Murzin leg. (Coll. V. S. Murzin)
 3. *Arctia caja* (L.), ssp. *phaeosoma* (Btl.) ♂. Russia, Khabarovsk Region, Amur River, Pashkovo, 5.VIII.1977, S. Murzin leg. (Coll. V. S. Murzin)
 4. *Arctia caja* (L.), ssp. *phaeosoma* (Btl.) ♀. Russia, Primorye, Lazovskiy Nature Reserve, Sokolehi, 22.VIII.1978, S. Murzin leg. (Coll. V. S. Murzin)
 5. *Arctia caja* (L.), ssp. *phaeosoma* (Btl.) ♂. Russia, Khabarovsk Region, Amur River, Pashkovo, 5.VIII.1977, S. Murzin leg. (Coll. V. S. Murzin)
 6. *Arctia caja* (L.), ssp. *kamtschadalis* Drdt. ♂. Russia, Sakhalin, Tymovsky Distr., Slavy, VII.1973, S. Murzin leg. (Coll. V. S. Murzin)
 7. *Arctia caja* (L.), ssp. ?. ♂. Russia, Amurland, Zeya River, Zeyskiy Nature Reserve, Smirnovskiy Checkpoint, 53°55'N, 127°22'E, 11.VII.1996, leg. V. Murzin (Coll. V. S. Murzin)
 8. *Arctia caja* (L.), ssp. ?. ♂. Russia, Amurland, Zeya River, Zeyskiy Nature Reserve, Smirnovskiy Checkpoint, 53°55'N, 127°22'E, 11.VII.1996, leg. V. Murzin (Coll. V. S. Murzin).
-

Plate 8. *Arctia*



-
1. *Arctia caja wisikotti* Stgr. ♂. Armenia, Zangezurskiy Mt. Range, David-Bek, 15.VIII 1968, S. & V. Murzin leg. (Coll. V. S. Murzin)
 2. *Arctia caja wisikotti* Stgr. ♀. Armenia, Zangezurskiy Mt. Range, David-Bek, 15.VIII 1968, S. & V. Murzin leg. (Coll. V. S. Murzin)
 3. *Arctia caja pamiroalaica* Stshet. ♂. Tajikistan, Hissar Mts, Takob Valley, 1800 m, 8.VIII.1971, V. Murzin leg. (Coll. V. S. Murzin)
 4. *Arctia caja pamiroalaica* Stshet. ♀. Tajikistan, Hissar Mts, Takob Valley, 1800 m, 8.VIII.1971, V. Murzin leg. (Coll. V. S. Murzin)
 5. *A. flavia* (Fuessly), spp. *lederi* O. B.-H. ♀. Russia, Altai, Kurayskiy Mt. Range, Aktash, 1800 m, 25.VII.2000, V. Murzin leg. (Coll. V. S. Murzin)
 6. *Arctia flavia* (Fuessly), spp. *lederi* O. B.-H. ♂. Russia, Altai, Kurayskiy Mt. Range, Aktash, 1800 m, 5.VII.2000, V. Murzin leg. (Coll. V. S. Murzin)
 7. *Arctia flavia* (Fuessly), ab. ?. Russia, Central Urals, Nizhniy Tagil, 29.V.1932, A. Tsvetaev leg. (Coll. V. S. Murzin)
 8. *Arctia flavia* (Fuessly), spp. *baicalensis* O. B.-H. ♀. Russia, Irkutsk Region, Listvyanka, 5.VIII.1979, V. Murzin leg. (Coll. V. S. Murzin).
-

Plate 9. *Arctia*



-
1. *Arctia rueckbeili* (Png.). Tajikistan, Pamirs-Alai, Alaiskiy Mt. Range, Dugoba River, 3000 m, 15.VII.1985, V. Murzin leg. (Coll. V. S. Murzin)
 2. *Epicallia villica confluens* (Rom.). ♂. Azerbaijan, Lenkoran Distr., Avrora, 8.VI.1980, M. Danilevskiy leg. (Coll. V. Murzin)
 3. *Epicallia villica villica* (L.). ♂. Russia, Moscow, 35 road-km of Kaluzhskoe Highway, Desna River, 25.V.1971, V. Murzin leg. (Coll. V. S. Murzin)
 4. *Epicallia villica confluens* (Rom.). ♂. Azerbaijan, Nakhichevan, Bichenek Pass, 2000 m, 19.VII.1962, V. Murzin leg. (Coll. V. Murzin)
 5. *Epicallia villica* (L.). ♀. Russia, Moscow Region, Saltykovka, 10.VI.1954, V. Murzin leg. (Coll. V. S. Murzin)
 6. *Eucharia interrogationis* (Mén.). ♂. Mongolia, Dood-Nur, 10.VII.1965 (Coll. V. Murzin)
 7. *Eucharia festiva* (Hüfn.). ♂. Ukraine, Donetsk Region, Kramatorsk, 21.V.1938, A. Smirnov leg. (Coll. V. Murzin)
 8. *Eucharia festiva* (Hüfn.). ♀. Armenia, Mt. Aragats, Nor-Amberd, 2000 m, 16.V.1987, V. Murzin leg. (Coll. V. Murzin)
-

Plate 10. *Arctia* – *Eucharia*



1. *Eucharia festiva* (Hüfn.). ♂. E. Kazakhstan, near Panfilov (= Jarkent, = Yarkand), 26.IV.1988. S. Murzin leg. (Coll. V. S. Murzin)
 2. *Eucharia festiva* (Hfng.), ssp. *interposita* (O. B.-H.). ♀. Uzbekistan, Chatkalsky Mt. Range, Chimgan Mts, 2500 m, 4.VII.1977, N. Yuldasheva leg. (Coll. V. S. Murzin)
 3. *Eucharia festiva* (Hfng.), ssp. ?. ♀. Kazakhstan, Kara-Tau Mts, env. Dzhambul, 6.V.1995, S. Murzin leg. (Coll. V. S. Murzin)
 4. *Eucharia festiva* (Hüfn.). ♂. Azerbaijan, Talysh Mts, Zuvand, Gosmalian, 8.V.1971, V. Murzin leg. (Coll. V. S. Murzin)
 5. *Eucharia festiva* (Hüfn.). ♀. Kazakhstan, Kara-Tau Mts, Turlakskiy Pass, 1200 m, 11.V.1935, F. Pravdin leg. (Coll. V. S. Murzin)
 6. *Eucharia festiva* (Hfng.), ssp. *iliensis* (Wagner). ♂. Kazakhstan, Ili River, Kapchagai, 15.IV.1963, V. Murzin leg. (Coll. V. S. Murzin)
 7. *Eucharia festiva* (Hfng.), ssp. *iliensis* (Wagner). ♀. Kazakhstan, Ili River, Kapchagai, 15.IV.1963, V. S. Murzin leg. (Coll. V. S. Murzin)
 8. *Eucharia festiva* (Hfng.). ♂. Armenia, Aragats Mts, Nor-Amberd, 2000 m, 10.V.1972, V. Murzin leg. (Coll. V. S. Murzin)
 9. *Eucharia festiva* (Hüfn.). ♀. Azerbaijan, Talysh Mts, Zuvand, Gosmalian, 8.V.1971, V. Murzin leg. (Coll. V. S. Murzin).
-

Plate 11. *Eucharia*



1. *Pericallia matronula* (L.). ♂. Russia, Sakhalin, near Yuzhno-Sakhalinsk, Mt. Chekhova, 5.08.1990, V. Sinyaev & V. Tuzov leg. (Coll. V. Sinyaev)
 2. *Pericallia matronula* (L.). ♀. Russia, Amurland, Pashkovo, 10.VII.1977, S. Murzin leg. (Coll. V. Murzin)
 3. *Divarctia diva* (Stgr.). ♂. Uzbekistan, W. Tian-Shan, Ugamskiy Mt. Range, Pskem River, Kara-Bulak, 18.09.1980, leg. V. Murzin (Coll. V. Murzin)
 4. *Divarctia diva* (Stgr.). ♀. W. Uzbekistan, Tian-Shan, Ugamskiy Mt. Range, Pskem River, Kara-Bulak, 18.09.1980, leg. V. Murzin (Coll. V. Murzin)
 5. *Holoarctia marinae* Dub. ♂. Russia, Altai, Kurayskiy Mt. Range, env. Aktash, 2900 m, 50°19'N, 88°00'E, 6.VII.1997, V. Murzin leg. (Coll. V. Murzin)
 6. *Holoarctia marinae* Dub. ♀. Russia, Altai, Kurayskiy Mt. Range, env. Aktash, 2900 m, 50°19'N, 88°00'E, 5.VII.1997, V. Murzin leg. (Coll. V. Murzin)
 7. *Holoarctia cervini* (Fallou). ♂. Switzerland, Cr. Gornergiat, 1911, M. Stricker leg. (Coll. ZMUM)
 8. *Holoarctia cervini* (Fallou). ♀. Switzerland, Riffelbery, e.l., 1911 (Coll. V. Murzin)
 9. *Palaearctia mira* Dub. & Tshist. ♂. Russia, Altai, Kurayskiy Mt Range, env. Aktash, 2900 m, 50°19'N, 88°00'E, 1-10.VII.1997, leg V. S. Murzin (Coll. V. Murzin)
 10. *Holoarctia puengeleri* (O. B.-H.). ♂. Russia, E. Chukotka, Chaplino, 29.VII.1963, A. Tsvetaev leg. (Coll. V. Murzin)
 11. *Holoarctia puengeleri* (O. B.-H.). ♀. Russia, Taimyr, Khatanga River, 19.VII.1953, A. Nikolaev leg. (Coll. A. Nikolaev)
 12. *Holoarctia puengeleri* (O. B.-H.). ♂. Russia, Sayan Mts, Mondy, 2.VII.1970, A. Khabarov leg. (Coll. O. Grachev).
-

Plate 12. *Pericallia* – Holarctica



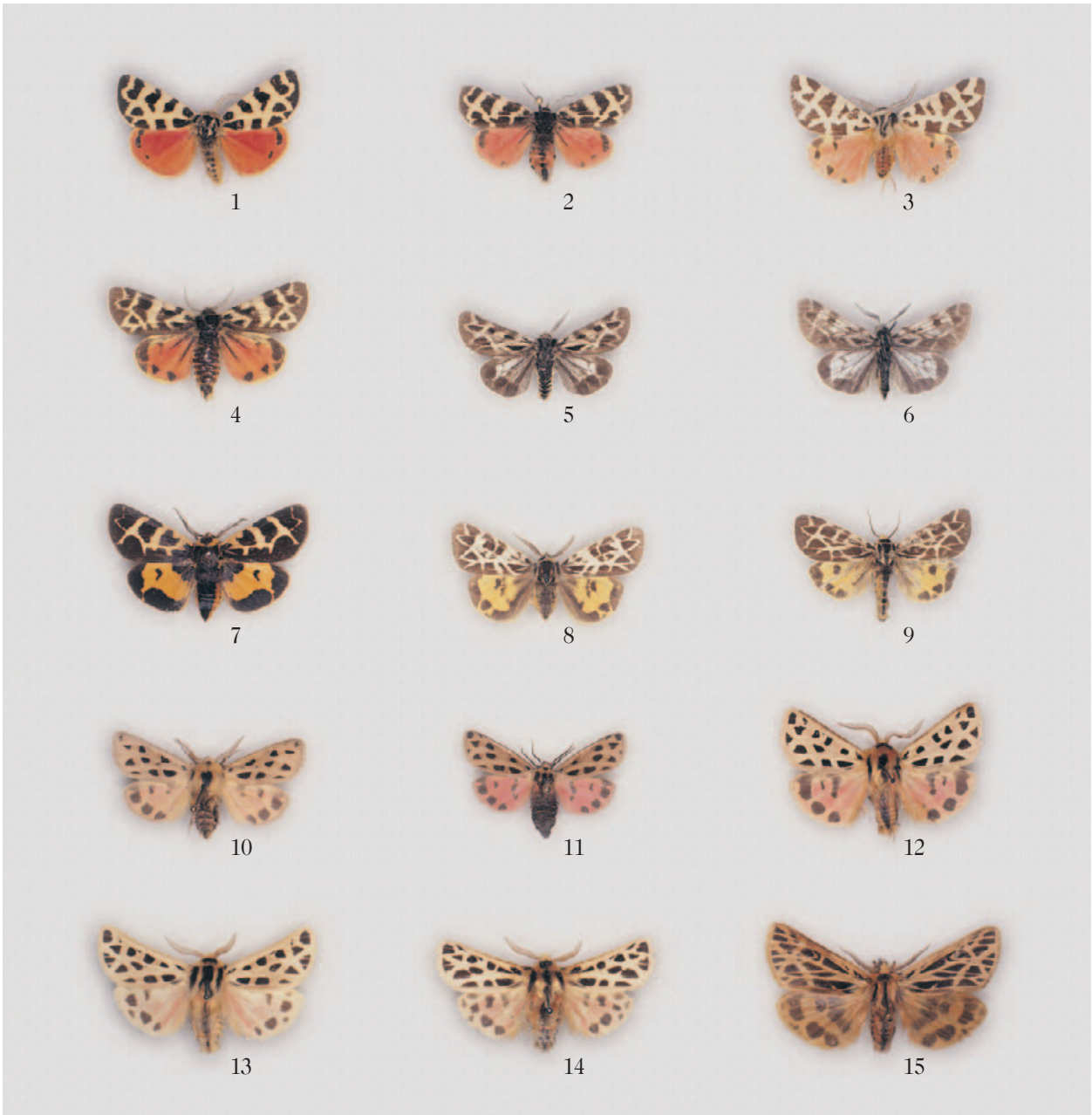
1. *Palaearctia glaphyra aksuensis* O. B.-H. ♂. Kirghizia, Kaingdy-Katta Mt. Range, Tashkaro, 2500-3000 m, 15-19.VII.1993, O. Gorbunov leg. (Coll. V. Murzin)
 2. *Palaearctia glaphyra aksuensis* O. B.-H., f. *flava* O. B.-H. ♂. Kirghizia, Tian-Shan, Terskey-Alatau Mts, Orta Kokpak River, 2400 m, 11.VII.1992, S. Murzin leg. (Coll. V. Murzin)
 3. *Palaearctia glaphyra* (Ev.), f. *puengeleri* Böttcher. ♂. Kazakhstan, Tian-Shan, Zailiiskiy Alatau, near Alma-Ata, Bolshaya Almatinka River, 3300 m, 29.VII.1960, V. Murzin leg. (Coll. V. Murzin)
 4. *Palaearctia glaphyra aksuensis* O. B.-H. ♀. Kazakhstan, Cenral Tian-Shan, Kaindy-Katta Mt. Range, 2800 m, 17.07.1986, V. Murzin leg. (Coll. V. Murzin)
 5. *Palaearctia glaphyra* (Ev.), spp. ?. ♂. Kazakhstan, Tian-Shan Mts, Zailiiskiy Alatau Mt. Range, Bolshaya Almatinka River, 3300 m, 2.08.1992, leg. S. Murzin (Coll. V. Murzin)
 6. *Palaearctia glaphyra* (Ev.), spp. ?. ♀. Kazakhstan, Tian-Shan Mts, Zailiiskiy Alatau Mt. Range, Bolshaya Almatinka River, 3300 m, 12.08.1992, leg. S. Murzin (Coll. V. Murzin)
 7. *Palaearctia dublitzkyi* (O. B.-H.). ♂. Kazakhstan, Alma-Ata, Gorelnik, 3200 m, e.l., 3.VIII.1992, S. Murzin leg. (Coll. V. Murzin)
 8. *Palaearctia dublitzkyi* (O. B.-H.). ♀. Kazakhstan, Alma-Ata, Gorelnik, 3200 m, e.l., 3.VIII.1992, S. Murzin leg. (Coll. V. Murzin)
 9. *Palaearctia gratiosa* (Gr.-Gr.). ♂. Tajikistan, Turkestanskiy Mt. Range, Kum-Bel Pass, 3200 m, 5.07.1973, V. Murzin leg. (Coll. V. S. Murzin)
 10. *Palaearctia gratiosa* (Gr.-Gr.). ♂. Tajikistan, Central Pamirs, Peter-I Mt. Range, Fortambek Glacier, ex p., 17.07.1988, V. Murzin leg. (Coll. V. Murzin)
 11. *Palaearctia gracilis* Dub. ♂ paratype. Kirghizia, Chatkalskiy Mt. Range, Lake Sary-Chelek, 2700 m, 26.VII.1983, V. Murzin leg. (Coll. V. Murzin)
 12. *Palaearctia gracilis* Dub. ♂ paratype. Kirghizia, Chatkalskiy Mt. Range, Lake Sary-Chelek, 2700 m, 26.VII.1983, V. Murzin leg. (Coll. V. Murzin)
 13. *Palaearctia gracilis* Dub. ♂ paratype. Kirghizia, Chatkalsky Mt. Range, 3000 m, 5.VIII.1983, leg. V. Murzin (Coll. V. Murzin)
 14. *Palaearctia wagneri* (Pngr.). ♂. Kirghizia, Kaingdy-Katta Mts, 2500 m, 11.07.1985, V. A. Ganson leg. (Coll. V. Ganson)
 15. *Palaearctia golbecki* Dub. ♂ paratype. Kirghizia, Kirghizskiy Mt. Range, Tyuz-Ashu Pass, 3400 m, 17.07.1977, V. Murzin leg. (Coll. V. Murzin).
-

Plate 13. *Palaearctica*



1. *Palaearctia erschoffi* (Alph.). ♂. Kirghizia, Tian-Shan, Terskey Alatau Mts, Orta-Kokpak River, 2400 m, e.l., 20.VIII.1993, V. Murzin leg. (Coll. V. Murzin)
 2. *Palaearctia erschoffi* (Alph.). ♀. Kirghizia, Alaiskiy Mt. Range, Aktash, 3300 m, 19.VIII.1992, V. Murzin leg. (Coll. V. Murzin)
 3. *Palaearctia mongolica* (Alph.). ♂. Russia, Tuva, Ovyurskiy Distr., Sagly, VII.1971, V. Koroteev leg. (Coll. V. Murzin)
 4. *Palaearctia ferghana* (Stgr.) (paratype of *Palaearctia ferghana susamyra* Dubatolov). ♂. Kirghizia, Susamyr Mts, Pass Ala-Bel, 3300 m, 14.VII.1977, V. Murzin leg. (Coll. V. Murzin)
 5. *Palaearctia rupicola* (Gr.-Gr.). Kirghizia, Aram-Kungey, 3800 m, 25.VII.1972, A. V. Sotchivko leg. (Coll. V. Murzin)
 6. *Palaearctia sarycola* de Freina. ♂. E. Pamirs, Sarykolskiy Mt. Range, Lake Dunkeldyk, 4250 m, 30.VII.1994, V. Murzin leg. (Coll. V. Murzin)
 7. *Sibirarctia kindermanni pretiosa* (Stgr.). ♂. Russia, Far East, Primorye, Lazovskiy Nature Reserve, Sokolchi, 18.VII.1980, S. Murzin leg. (Coll. V. Murzin)
 8. *Sibirarctia buraetica* (O. B.-H.). ♂. Mongolia, Horidullin-Sarj-Nuru Mts, 11.VIII.1966, V. Solyanikov leg. (Coll. V. Murzin)
 9. *Sibirarctia buraetica* (O. B.-H.). ♀. Russia, Yakutia, 227 road-km of Yakutsk – Magadan Highway, 28.VI.1989, V. Ganson leg. (Coll. V. Murzin)
 10. *Chelis maculosa* (Gern.). ♂. Austria, Sollenau, e.l., 6.V.1965 (Coll. V. Murzin)
 11. *Chelis maculosa* (Gern.). ♀. Austria, Sollenau, e.l., 4.VII.1965 (Coll. V. Murzin)
 12. *Chelis maculosa mannerheimi* (Dup.). Russia, Rostov-on-Don Region, Ust-Donetsk, 15.VI.1976, A. Grazhdankin leg. (Coll. V. Murzin)
 13. *Chelis reticulata transcaucasica* Dub. ♂. Armenia, Mt. Aragats, Nor-Amberd, 2000 m, 10.VII.1971, V. Murzin leg. (Coll. V. Murzin)
 14. *Chelis reticulata transcaucasica* Dub. ♂. Armenia, Mt. Aragats, Nor-Amberd, 2000 m, 9.VII.1962, V. Murzin leg. (Coll. V. Murzin)
 15. *Chelis dahurica* (Boisd.), f. *sojota* Tschetw. (Tsvetaev det.). ♂. Russia, Tuva, Tsagan-Shibetu, Mugur-Aksy, 1.VII.1968, Kostiuk leg. (Coll. V. Murzin)
-

Plate 14. *Palaearctica – Chelis*



1. *Chelis dahurica* (Boisd.). ♂. Russia, Altai, Kurayskiy Mt. Range, Aktash, 2500 m, 1-10.VII.1997, leg. V. Murzin (Coll. V. Murzin)
 2. *Chelis dahurica* (Boisd.). ♀. Russia, Altai, Sailugem Mts, Dzhumala River, 2700 m, 14.VII.1990, leg. V. Murzin (Coll. V. Murzin)
 3. *Chelis dahurica* (Boisd.). ♂. Russia, Altai, Kurayskiy Mt. Range, 2000 m, 1-10.VII.1997, V. Murzin leg. (Coll. V. Murzin)
 4. *Chelis ferghana* Dub. ♂. Kirghizia, Toktogul, Chichkan River, 1500 m (380 road-km of Bishkek–Osh Highway), 12.VII.1977 (Coll. V. Murzin)
 5. *Chelis ferghana* Dub. ♂. Tian-Shan, Terskey Alatau Mts, Orta-Kokpak River, 2400 m, 9.VII.1992, leg. V. Murzin (Coll. V. Murzin)
 6. *Chelis tianshana* Dub. ♂. Kirghizia, Toktogul, Chichkan River, 1500 m (380 road-km of Bishkek–Osh Highway), 12.VII.1977 (Coll. V. Murzin)
 7. *Grammia quenseli* (Payk.). Austria, S. Tyrol, Franz Rhihohe, 2400 m, 20.VII.1925 (Coll. ZMUM)
 8. *Grammia quenseli* (Payk.). Mongolia, Lake Dod-Nur, 2.VII.1966, V. Solyanikov leg. (Coll. V. Murzin)
 9. *Grammia quenseli liturata* (Mén.). Russia, N. Buryatia, VII.1917 (Coll. V. Murzin)
 10. *Grammia turbans* (Christoph). ♂. E. Siberia, Vitim Table-land, Baisa, 10.08.1978, V. Dubatolov leg. (Coll. V. Murzin)
 11. *Grammia turbans* (Christoph). ♀. Russia, Altai, Kurayskiy Mt. Range, Aktash, 2500 m, ex p., 1.VIII.1990, V. Murzin leg. (Coll. V. Murzin)
 12. *Micrarctia trigona* (Leech). ♂. China, W. Sichuan, 30 km N. of Kanding, Mogesho, 3300 m, 10.8.1996, S. Murzin leg. (Coll. V. Murzin)
 13. *Hyperborea czechanowskii* Gr.-Gr. ♂. Magadan Region, Bolshoy Annachag Mt. Range, Sibit-Tyellakh, 17.07.1985, P. Beda leg. (Coll. V. Ganson)
 14. *Hyperborea czechanowskii* Gr.-Gr. ♀. Wrangel Island, middle flow of Neizvestnyi Stream, 25.VII.1983, O. Khruleva leg. (Coll. ZMUM).
-

Plate 15. *Chelis* – *Hyperborea*



-
1. *Diacrisia sannio* (L.). ♂. Russia, Moscow, 35 road-km of Kaluzhskoe Highway, Desna River, 5.VI.1971, V. Murzin leg. (Coll. V. Murzin)
 2. *Diacrisia sannio* (L.). ♀. Russia, Moscow Region, Dubna, 24.VI.1968, O. Grachev leg. (Coll. V. Murzin)
 3. *Diacrisia sannio* (L.), f. *uniformis* A. B.-H. ♂. Kazakhstan, Ili River, Bakanas, 1.VIII.1992, S. Murzin leg. (Coll. V. Murzin)
 4. *Diacrisia sannio* (L.). ♂. Kirghizia, Lake Issyk-Kul, 26.VI.1980, V. Murzin leg. (Coll. V. Murzin)
 5. *Diacrisia sannio* (L.). ♀. Altai. Katun River, Chemal, 20.VII.1990, V. Murzin leg. (Coll. V. Murzin)
 6. *Diacrisia sannio* (L.). ♂. Russia, Far East, Yakutsk, 7.VII.1987, V. Nefedov leg. (Coll. V. Murzin)
 7. *Diacrisia irene* Btl. ♂. Russia, Primorye, Ussuriysk, Gorno-Tayozhnaya Research Station, 10.VII.1979, V. Murzin leg. (Coll. V. Murzin)
 8. *Diacrisia irene* Btl. ♀. Russia, Amurland, Khabarovsk Region, Obluchye, 25.VI.1977, S. Murzin leg. (Coll. V. Murzin)
 9. *Diacrisia irene* Btl. ♂. Russia, Amurland, Khabarovsk Region, Obluchye, 25.VI.1977, S. Murzin leg. (Coll. V. Murzin)
 10. *Rhyparioides metelkana metelkana* (Led.). ♂. Russia, Rostov-on-Don Region, Nedvigovka, 15.VII.1996 (Coll. V. Murzin)
 11. *Rhyparioides metelkana* (Led.), f. *flavida* (Bremer). ♂. Russia, Amurland, Dichun, 24.VI.1978, S. Murzin leg. (Coll. V. Murzin)
 12. *Rhyparioides metelkana* (Led.), f. *flavida* (Bremer). ♀. Russia, Primorye, Barabash, 5.VIII.1980, S. Murzin leg. (Coll. V. Murzin)
-

Plate 16. *Diacrisia* – *Rhyparioides*



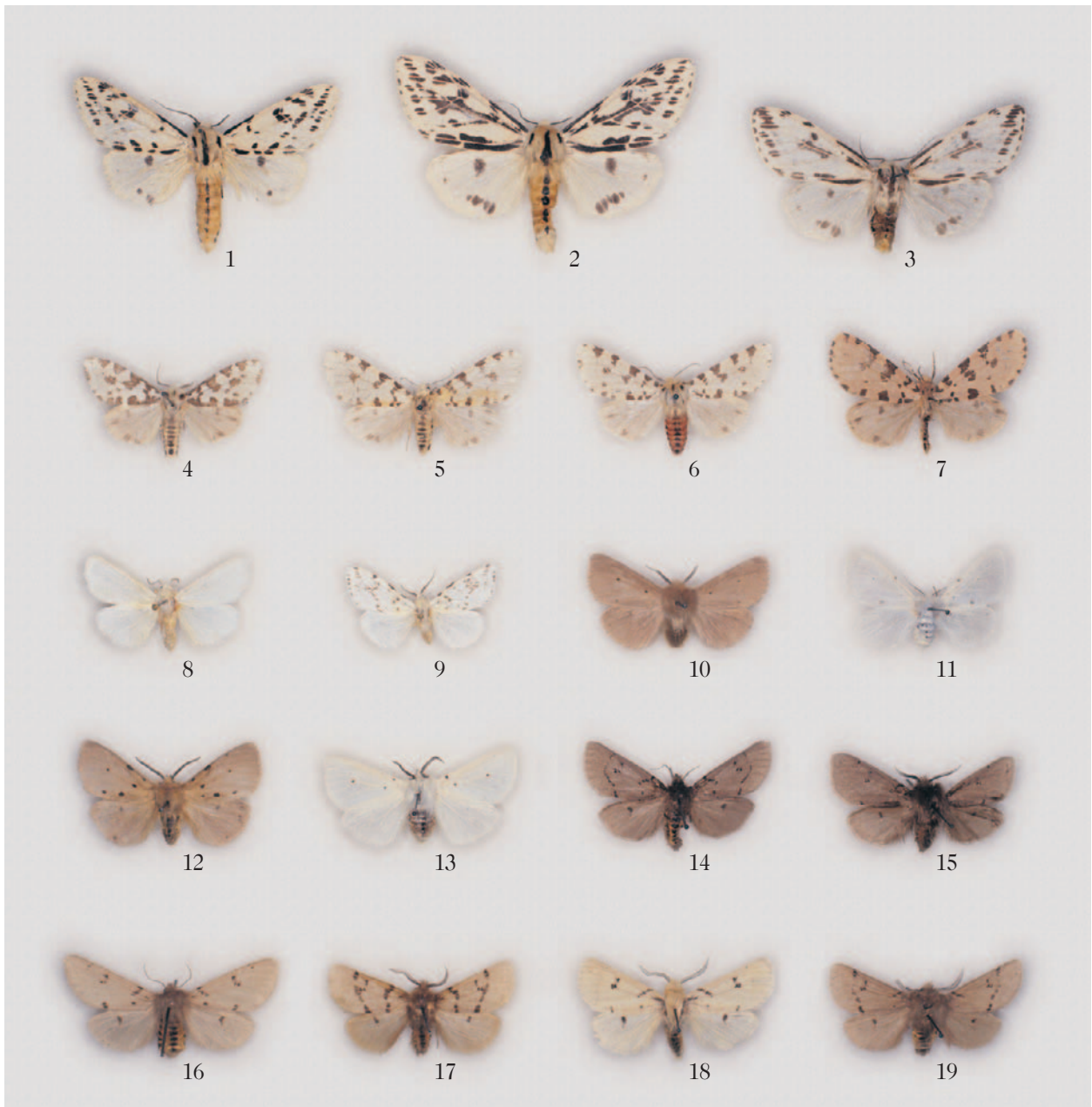
1. *Rhyparioides amurensis* (Bremer). ♂. Russia, Primorye, env. Ussuriysk, Kaymanovka, 13.VII.1979, V. Murzin leg. (Coll. V. Murzin)
 2. *Rhyparioides amurensis* (Bremer), ♀. Russia, Amurland, Pashkovo, 2.VII.1977, S. Murzin leg. (Coll. V. Murzin)
 3. *Rhyparia purpurata* (L.). ♂. Amurland, Zeya River, Zeyskiy Nature Reserve, Checkpoint "52 km", 4-10.VII.1996, V. Murzin leg. (Coll. V. Murzin)
 4. *Rhyparoides nebulosa* Btl. ♂. Russia, Primorye, Sikhote-Alin Mt. Range, Lazovskiy Nature Reserve, 10.07.1978, S. Murzin leg. (Coll. V. Murzin)
 5. *Rhyparioides nebulosa* Btl. ♀. Russia, Primorye, Sikhote-Alin Mt. Range, Lazovskiy Mature Reserve, 10.07.1978, S. Murzin leg. (Coll. V. Murzin)
 6. *Rhyparia purpurata* (L.). ♀. Russia, Amur River, Pashkovo, 2.VII.1977, S. Murzin leg. (Coll. V. Murzin)
 7. *Rhyparia purpurata* (L.). Kirghizia, Tian-Shan, Terskey Alatau Mts, Orto-Kokpak River, 2400 m, 10.VII.1992, S. Murzin leg. (Coll. V. Murzin)
 8. *Amurrhyparia leopardinula* (Mén.). ♂. Russia, Amur River, Pashkovo, 10.VI.1978, S. Murzin leg. (Coll. V. Murzin)
 9. *Ocnogyna parasita* (Hbn.). ♂. Ukraine, Crimea, Sudak, 28.III.1986. K. Yafetov leg. (Coll. V. Murzin)
 10. *Ocnogyna parasita* (Hbn.). ♀. Caucasus, Abkhazia, Audkhara, e.l., 16.III.1969 (Coll. V. Murzin)
 11. *Ocnogyna armena* Stgr. ♂. Armenia, Mt. Aragats, Erevan, 3.XI.1971, V. Murzin leg. (Coll. V. Murzin)
 12. *Ocnogyna armena pallidior* Christoph. ♂. Turkmenistan, Bakhklyz Nature Reserve, Morgunovka near Kushka, 1.XII.1978. A. Cellarius leg. (Coll. V. Murzin)
 13. *Ocnogyna armena pallidior* Christoph. ♀. Turkmenistan, Kushka, e.l., 10.XII.1978, V. Sinyaev leg. (Coll. V. Sinyaev)
 14. *Watsonarctia deserta* (Bartel). ♂. Armenia, Mt. Aragats, 2000 m, 24.07.1962, V. Murzin leg. (Coll. V. Murzin)
 15. *Watsonarctia deserta* (Bartel). ♀. Czech Republic, Bohemia, Praha–Hostivar, 1951 (Coll. V. Murzin)
 16. *Chionarctia nivea* (Mén.). ♀. Russia, Primorje, Ussuriysk, Gorno-Taezhnaya Research Station, 1.XI.1976. (Coll. V. Murzin)
-

Plate 17. *Rhyparioides* – *Chionarctia*



1. *Alphaea melanostigma* (Ersch.). ♂. Uzbekistan, Alaiskiy Mt. Range, Dugoba River, near Yordan, 40°00'N, 71°45'E, 16.V.1995, S. Murzin leg. (Coll. V. Murzin)
 2. *Alphaea melanostigma* (Ersch.). ♀. Uzbekistan, Alaiskiy Mt. Range, Dugoba River, near Yordan, 40°00'N, 71°45'E, 16.V.1995, S. Murzin leg. (Coll. V. Murzin)
 3. *Alphaea melanostigma* (Ersch.), ab. ? ♂. Uzbekistan, Alaiskiy Mt. Range, Dugoba River, near Yordan, 40°00'N, 71°45'E, 10.VII.1995, S. Murzin leg. (Coll. V. Murzin)
 4. *Andala guttata* (Ersch.). ♂. Tajikistan, Pamirs, Hissarskiy Mt. Range, Kondara Canyon, 1100 m, 20.V.1969. V. Murzin leg. (Coll. V. Murzin)
 5. *Andala guttata* (Ersch.). ♀. Tajikistan, Pamirs, Hissarskiy Mt. Range, Kondara Canyon, 1100 m, 18.V.1966, A. Tsvetaev leg. (Coll. V. Murzin)
 6. *Andala transversa* (Moore). ♂. Pamirs, Hissarskiy Mt. Range, Kondara Canyon, 1100 m, 18.V.1966, A. Tsvetaev leg. (Coll. V. Murzin)
 7. *Andala transversa* (Moore). ♀. Uzbekistan, Alaiskiy Mt. Range, Dugoba River, near Yordan, 40°00'N, 71°45'E, 2400 m, 10.VII.1995, S. Murzin leg. (Coll. V. Murzin)
 8. *Hyphantria cunea* (Drury). Ukraine, Crimea, Simferopol, 29.V.1985, K. Efetov leg. (Coll. V. Murzin)
 9. *Hyphantria cunea* (Drury), f. *punctatissima* (Abbott & Smith). Crimea, Simferopol, 29.V.1985, K. Efetov leg. (Coll. V. Murzin)
 10. *Diaphora mendica* (Cl.). ♂. Russia, Moscow, 35 road-km of Kaluzhskoe Highway, 27.04.1970, V. Murzin leg. (Coll. V. Murzin)
 11. *Diaphora mendica* (Cl.). ♀. Russia, Moscow, 35 road-km of Kaluzhskoe Highway, 02.06.1973, V. Murzin leg. (Coll. V. Murzin)
 12. *Diaphora mendica* (Cl.). ♂. Russia, Caucasus, Krasnodar Region, Sochi, Adler, Kudepsta, 1956 (Coll. V. Murzin)
 13. *Diaphora mendica* (Cl.), f. ♂ *rustica* (Hbn.). Azerbaijan, Lenkoran, Avrora, 31.04.1971, V. Murzin leg. (Coll. V. Murzin)
 14. *Eudiaphora turensis* (Ersch.). Kazakhstan, 160 km W of Alma-Ata, 5.05.1995, S. Murzin leg. (Coll. V. Murzin)
 15. *Eudiaphora turensis* (Ersch.). Kazakhstan, Sugety-Tau, 28.IV.1995, S. Murzin leg. (Coll. V. Murzin)
 16. *Eudiaphora turensis* (Ersch.). ♀. Tajikistan, Pamirs, Hissarskiy Mt. Range, Kondara Canyon, 1100 m, 20.V.1969, V. Murzin leg. (Coll. V. Murzin)
 17. *Eudiaphora turensis* (Ersch.). Tajikistan, Pamirs, Khorog, 25.06.1959, Zapryagaev leg. (Coll. V. Murzin)
 18. *Eudiaphora turensis* (Erschoff), *yuldashevi* forma nova. ♂ holotype. Kazakhstan, Ili River, Bakanas, 7.VIII.1992, S. Murzin leg. (Coll. V. Murzin)
 19. *Eudiaphora turensis* (Ersch.). Uzbekistan, W. Chatkalskiy Mt. Range, Chimgan Mts, 2000 m, 28.V.1994, S. Murzin leg. (Coll. V. Murzin)
-

Plate 18. *Alphaea* – *Eudiaphora*



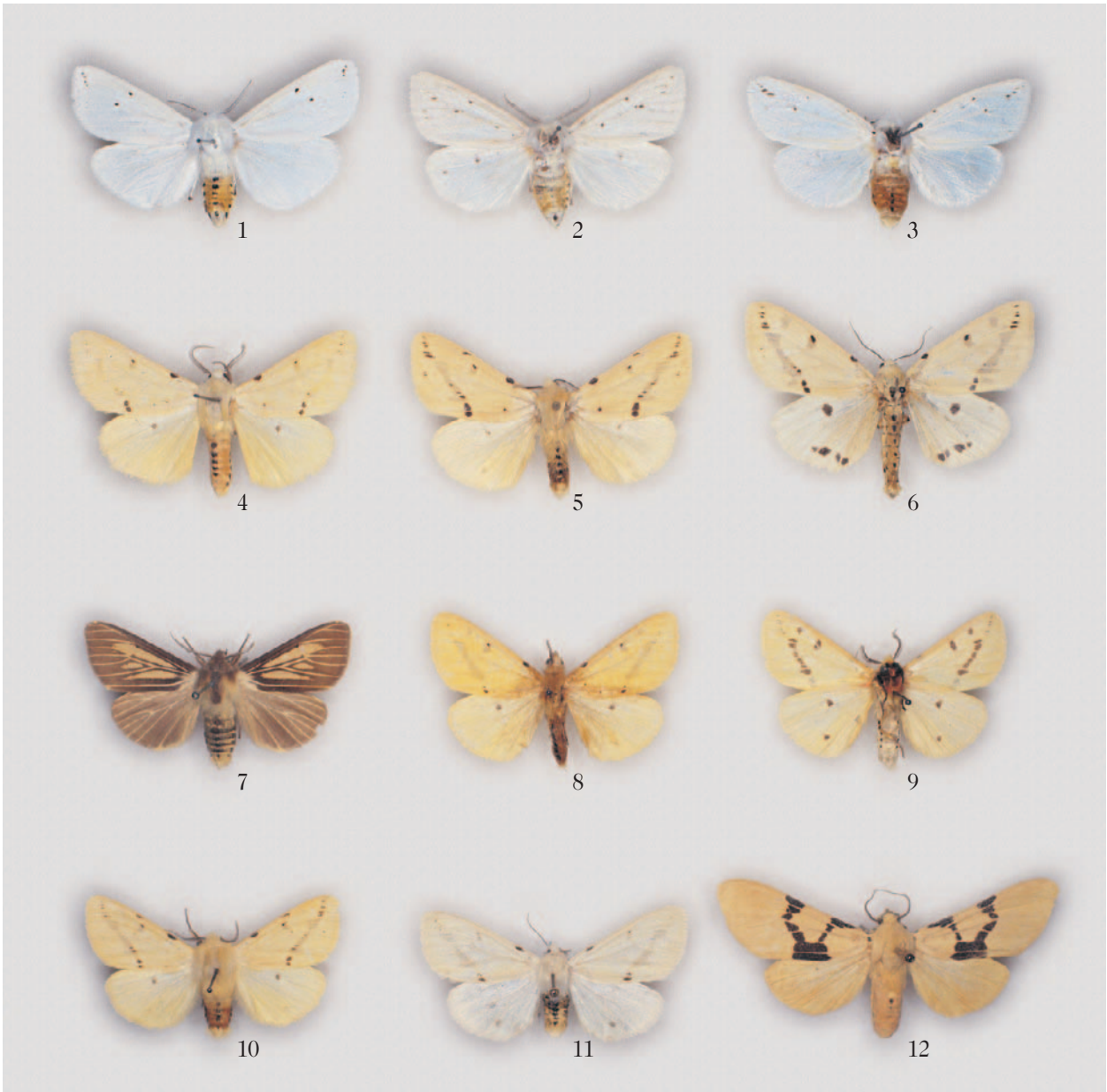
-
1. *Spilosoma punctarium* (Stoll). ♂. Russia, Primorye, Vladivostok, Okeanskaya, 12.VII.1949, V. Murzin leg. (Coll. V. Murzin)
 2. *Spilosoma punctarium* (Stoll). ♀. Russia, Primorye, Vladivostok, Okeanskaya, 12.VII.1949, V. Murzin leg. (Coll. V. Murzin)
 3. *Spilosoma punctarium* (Stoll). ♂ underside. Russia, Primorye, "Kedrovaya Pad" Nature Reserve, 10.VII.1976 (Coll. V. Murzin)
 4. *Spilosoma lubricipedum* (L.). ♂. Russia, Moscow Region, Desna River, 35 km SW. of Moscow City, 10.VII.1962, V. Murzin leg. (Coll. V. Murzin)
 5. *Spilosoma lubricipedum* (L.). ♂. Russia, N.Caucasus, env. Maikop, Mesmai, 19.VIII.1997, S. Murzin leg. (Coll. V. Murzin)
 6. *Spilosoma lubricipedum* (L.). ♂. Russia, Primorye, Sikhote-Alin Mts, Lazovskiy Nature Reserve, Sokolchi, 10.VII.1980, S. Murzin leg. (Coll. V. Murzin)
 7. *Spilosoma lubricipedum* (L.), ab. ?. ♂. Russia, Primorye, Sikhote-Alin Mts, Lazovsky Nature Reserve, Sokolchi, 10.VII.1980, S. Murzin leg. (Coll. V. Murzin)
 8. *Spilosoma lubricipedum* (L.). ♂. Caucasus, Abkhazia, Gagra, 10.VII.1912 (Coll. V. Murzin)
 9. *Spilosoma lubricipedum* (L.). ♂ underside. Russia, Moscow Region, Desna River, 35 km SW. of Moscow City, 12.VII.1963, V. Murzin (Coll. V. Murzin).
 10. *Spilosoma mandli* Schaw. ♂. Russia, Primorye, env. Shmakovka, Ozernoe, 4.VIII.1935, S. Sevastyanov leg. (Coll. ZMUM, det. V. Dubatolov, XI.82: *Spilosoma urticae* ssp. *mandli* Schim.)
 11. *Spilosoma urticae* (Esp.). ♂. Russia, Moscow Region, Desna River, 35 km SW. of Moscow City, 24.VI.1962, V. Murzin leg. (Coll. V. Murzin)
 12. *Spilosoma urticae* (Esp.). ♂. Russia, Moscow City (W. part), 20.VI.1962, V. Murzin leg. (Coll. V. Murzin).
-

Plate 19. *Spilosoma*



1. *Spilosoma urticae* (Esp.). ♂. Kazakhstan, Alma-Ata, 1000 m, 30.VI.1993, V. Murzin leg. (Coll. V. S. Murzin)
 2. *Spilosoma lubricipedium* (L.), ♂. Russia, Primorye, Barabash, 5.VIII.1980, S. Murzin leg. (Coll. V. S. Murzin)
 3. *Spilosoma urticae* (Esp.). ♀. Russia, Amurland, Swan's Lake, 17.VI.1978, leg. S. Murzin (Coll. V. S. Murzin)
 4. *Spilarctia lutea* (Hfng.). ♂. Russia, Amur River, Dichun, 24.VI.1978. leg. S. Murzin (Coll. V. S. Murzin)
 5. *Spilarctia lutea* (Hfng.), f. *japonica* (Rtsch.). ♂. Russia, Primorye, Sikhote-Alin Mts, Terney, 22.VII.1962, M. Volkov leg. (Coll. V. S. Murzin)
 6. *Spilarctia lutea* (Hfng.), f. *japonica* (Rtsch.). ♀. Russia, Primorye, Vladivostok, Okeanskaya, 1956, L. Anufriev leg. (Coll. V. S. Murzin)
 7. *Spilarctia lutea* (Hfng.), f. *zatima* (Stoll). ♂. Germany, Helgoland Island, e.o., Fr. Daniel (Coll. V. S. Murzin)
 8. *Spilarctia lutea* (Hfng.). ♂. Kazakhstan, Alma-Ata, 1.VIII.1956, leg. V. Murzin (Coll. V. S. Murzin)
 9. *Spilarctia lutea* (Hfng.), f. *japonica* (Rtsch.). ♂ underside. Russia, Primorye, Ussuriysk, 10.VII.1979, leg. V. Murzin (Coll. V. S. Murzin)
 10. *Spilarctia lutea* (Hfng.). ♂. Russia, Moscow Region, Desna River, 35 km SW. of Moscow City, 10.VIII.1972, leg. V. Murzin (Coll. V. S. Murzin)
 11. *Spilarctia lutea* (Hfng.). ♀. Russia, Moscow Region, Desna River, 35 km SW. of Moscow City, 10.VIII.1972, leg. V. Murzin (Coll. V. S. Murzin)
 12. *Spilarctia bifasciata* Btl. ♀. Japan, Saitama Pref., Mt. Hotosawa, 16.VI.1970 (Coll. V. S. Murzin).
-

Plate 20. *Spilosoma* – *Spilarctia*



-
1. *Spilarctia subcarnea* (Walker). ♀. Russia, Primorye, env. Ussuriysk, Gorno-Taezhnaya Research Station, 10.VII.1979, V. Murzin leg. (Coll. V. Murzin)
 2. *Spilarctia subcarnea* (Walker). ♀ underside. Russia, Primorye, env. Ussuriysk, Kaymanovka, 15.VII.1966, A. Tsvetaev leg. (Coll. V. Murzin)
 3. *Spilarctia obliquisonata* (Miyaki). ♂. Russia, Kuril Islands, Kunashir Island, 20.VII.1970, A. Shuvalov leg. (A. Lisetskiy det., 1970) (Coll. V. Murzin)
 4. *Lemyra boghaika* Tshist. & Kishida. ♂. Russia, Khabarovsk Region, 15 km N. of Obluchye, 15.VII.1993, V. Sychev leg. (Coll. V. Murzin)
 5. *Lemyra boghaika* Tshist. & Kishida. ♀. Russia, Khabarovsk Region, 15 km N. of Obluchye, 15.VII.1993, V. Sychev leg. (Coll. V. Murzin)
 6. *Spilarctia seriatopunctata* (Motsch.). ♂. Russia, S. Primorye, "Kedrovaya Pad" Nature Reserve, 16.VII.1965, A. Tsvetaev leg. (Coll. V. Murzin)
 7. *Spilarctia seriatopunctata* (Motsch.). ♀. Russia, Primorye, env. Ussuriysk, Gorno-Taezhnaya Research Station, 19.VII.1979, V. Murzin leg. (Coll. V. Murzin)
 8. *Spilarctia seriatopunctata* (Motsch.). ♂. Russia, Primorye, env. Vladivostok, Popova Island, 15.VIII.1980, S. Murzin leg. (Coll. V. Murzin)
 9. *Spilarctia seriatopunctata* (Motsch.). ♂ underside. Russia, Primorye, env. Ussuriysk, Gorno-Taezhnaya Research Station, 19.VII.1979, V. Murzin leg. (Coll. V. Murzin)
 10. *Spilarctia seriatopunctata* (Motsch.). ♀. Russia, Primorye, Vladivostok, Okeanskaya, 1956, L. Anufriev det. (Coll. V. Murzin)
 11. *Spilarctia seriatopunctata* (Motsch.). ♀. Russia, Primorye, env. Ussuriysk, Kaymanovka, 15.VII.1966, A. Tsvetaev leg. (Coll. V. Murzin)
 12. *Spilarctia casigneta* (Koll.). ♂. China, N. Yunnan, Haba Mts, 2400 m. 25.VI.1996, S. Murzin leg. (Coll. V. Murzin).
-

Plate 21. *Spilarctia*



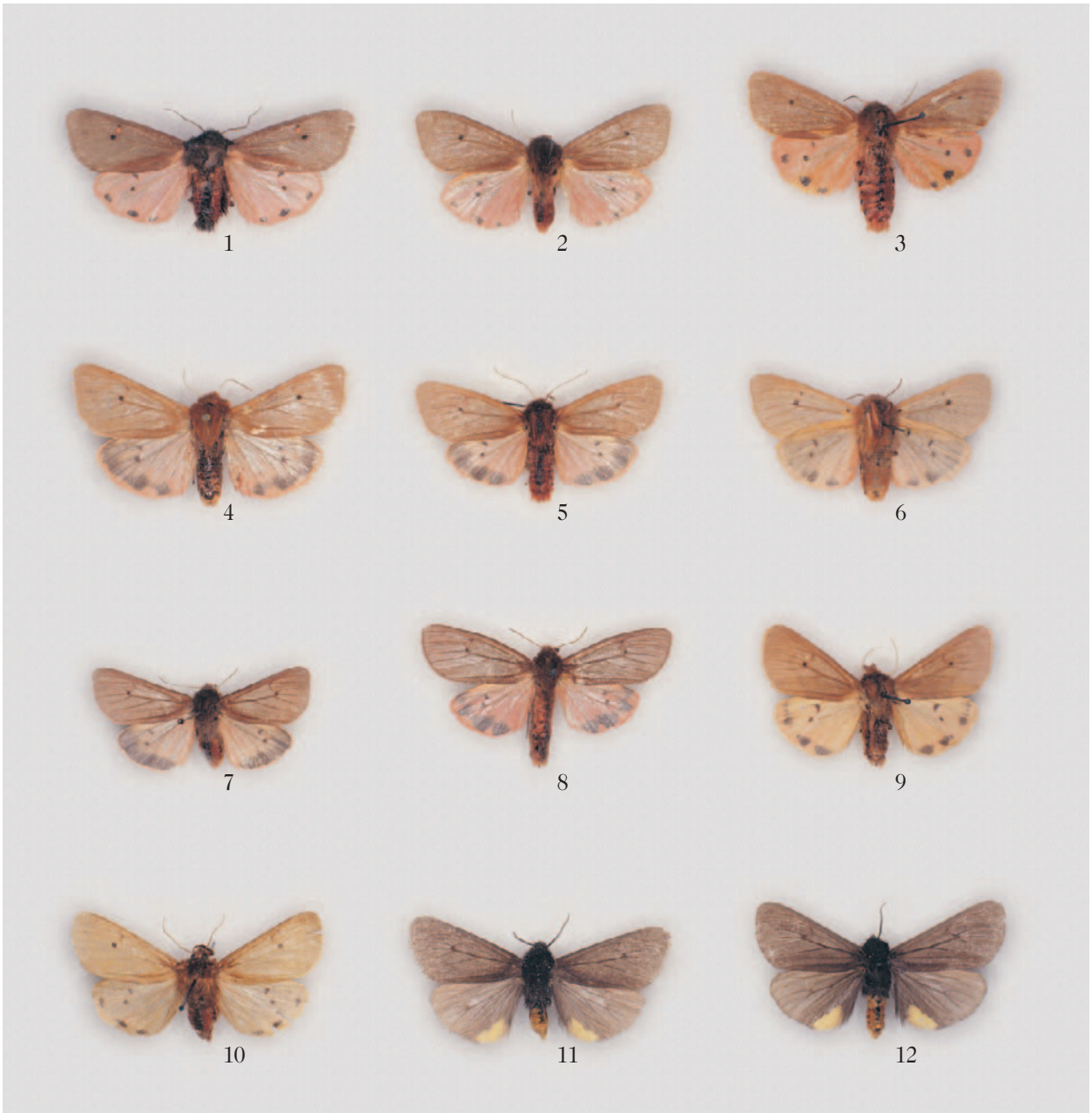
-
1. *Lemyra jankowiskii* (Ob.). ♂. Russia, Amurland, Dichun, 24.VI.1978, S. Murzin leg. (Coll. V. Murzin)
 2. *Lemyra jankowiskii* (Ob.). ♀. Russia, Primorye, Ussuriysk, Kaymanovka, 18.VII.1979, V. Murzin leg. (Coll. V. Murzin)
 3. *Phragmatobia placida* (Friv.). ♂. Kirghizia, Terskey Alatau Mts, 4 km S. of Teploklyuchenka, 2100-2600 m, 14-18.VI.1993, O. Gorbunov leg. (Coll. V. S. Murzin)
 4. *Phragmatobia fuliginosa* (L.). ♂. Russia, Moscow City, VII.1990, V. Sinyaev leg. (Coll. V. Sinyaev)
 5. *Phragmatobia fuliginosa* (L.). ♀. Russia, Moscow City, VII.1990, V. Sinyaev leg. (Coll. V. Sinyaev)
 6. *Phragmatobia fuliginosa borealis* (Stgr.). ♂ underside. Russia, Moscow Region, Dubna, 12.VIII.1960, O. Grachev leg. (Coll. V. Murzin)
 7. *Phragmatobia fuliginosa borealis* (Stgr.). ♂. Russia, Moscow Region, Dubna, 12.VIII.1960, V. Murzin leg. (Coll. V. Murzin)
 8. *Phragmatobia placida* (Friv.). ♀. Uzbekistan, Nuratau Mts, 14.VI.1994, S. Murzin leg. (Coll. V. Murzin)
 9. *Phragmatobia placida* (Friv.). ♀. Uzbekistan, env. Parkent, Nevich, 5.VIII.1998, V. Murzin leg. (Coll. V. Murzin)
 10. *Phragmatobia fuliginosa paghmani* Lenek. ♂. Turkmenistan, W. Kopetdagh, Kara-Kala, 24.IV.1994, S. & V. Murzin leg. (Coll. V. Murzin)
 11. *Phragmatobia placida* (Friv.). ♂. Uzbekistan, Nuratau Mts, 14.VI.1994, S. Murzin leg. (Coll. V. Murzin)
 12. *Phragmatobia placida* (Friv.). ♀. Armenia, Mt. Aragats, 2000 m, 24.VI.1966, V. Murzin leg. (Coll. V. Murzin).
-

Plate 22. *Lemyra* – *Phragmatobia*



1. *Phragmatobia placida* (Friv.). ♂. Armenia, Mt. Aragats, 2000 m, 10.VI.1970, V. Murzin leg. (Coll. V. Murzin)
 2. *Phragmatobia fuliginosa paghmani* Lenek. ♂. Azerbaijan, Lenkoran, Veri, 20.VI.1971, V. Murzin leg. (Coll. V. Murzin)
 3. *Phragmatobia fuliginosa paghmani* Lenek. ♀. Azerbaijan, Lenkoran, Veri, 20.VI.1971, V. Murzin leg. (Coll. V. Murzin)
 4. *Phragmatobia amurensis* Seitz. ♀. Russia, Primorye, Sikhote-Alin Mts, Terney, 11.VII.1962, M. Volkov leg. (Coll. V. Murzin)
 5. *Phragmatobia amurensis* Seitz. ♂. Russia, Primorye, Terney Distr., Tunsha River, 12.VI.1966, A. Grazhdankin leg. (Coll. V. Murzin)
 6. *Phragmatobia amurensis* Seitz. ♂ underside. Russia, Primorye, Sikhote-Alin Mts, Terney, 11.VII.1962, M. Volkov leg. (Coll. V. Murzin)
 7. *Phragmatobia amurensis* Seitz. ♂. Russia, Amur River, Dichun, 24.VI.1978, S. Murzin leg. (Coll. V. Murzin)
 8. *Phragmatobia amurensis* Seitz. ♀. Russia, Amurland, Ekimchan, 13.VI.1975, A. Tsvetaev leg. (Coll. V. Murzin)
 9. *Phragmatobia fuliginosa* (L.). ♂. Russia, Amurland, Obluchye Distr., Pashkovo, 25.VI.1977, S. Murzin leg. (Coll. V. Murzin)
 10. *Phragmatobia fuliginosa paghmani* Lenek. ♂. Kazakhstan, Dzhungarsky Alatau Mts, Bastchi, 14.VIII.1993, S. Murzin leg. (Coll. V. Murzin)
 11. *Epatolmis luctifera* (Denis & Schiff.). ♂. Russia, Primorye, Ussuriysk, Gorno-Taezhnaya Research Station, 27.VII.1979, S. Murzin leg. (Coll. V. Murzin)
 12. *Epatolmis luctifera* (Denis & Schiff.). ♂. Russia, Altai, Kurayskiy Mt. Range, Aktash, 1600 m, 4.VI.1991, V. Murzin leg. (Coll. V. Murzin).
-

Plate 23. *Phragmatobia* – *Epatolmis*



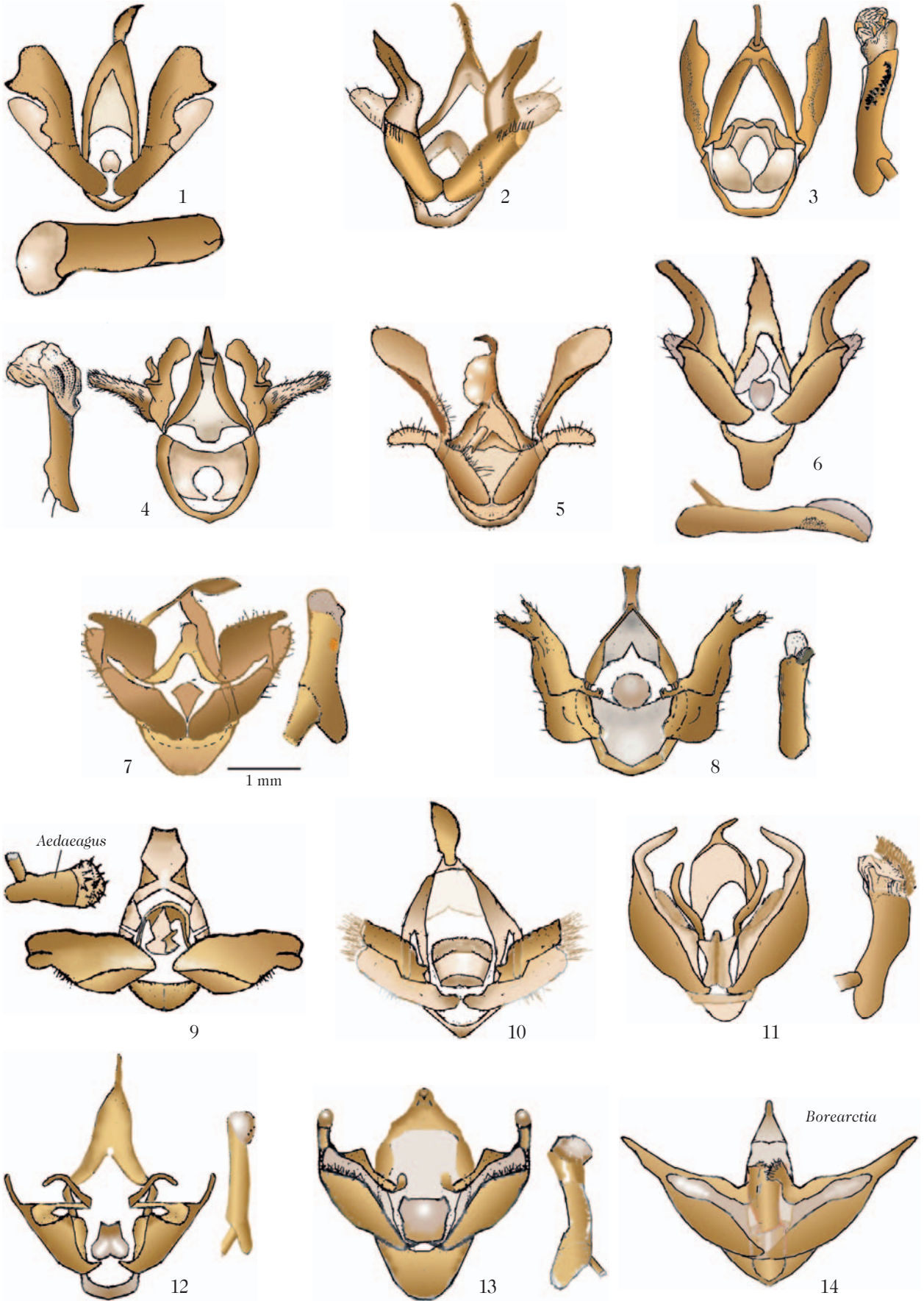
-
1. *Sinoarctia sieversi* (Gr.-Gr.). ♂. China, S. Gansu, env. Langmusi, 4100 m, 17-18.VII.1997, S. Murzin leg. (Coll. V. Murzin)
 2. *Sinoarctia* sp., aff. *sieversi* (Gr.-Gr.). ♀. China, N. Sichuan, Pass Juizhaigou-Songpan, 3600-4000, 2.VII.1997, S. Murzin leg. (Coll. V. Murzin)
 3. *Lithosarctia y-albula* (Ob.). ♂. China, N. Sichuan, env. Nanping, 3500 m, 13.VI.1997, S. Murzin leg. (Coll. V. Murzin)
 4. *Micrarctia trigona* (Leech). ♂. China, W. Sichuan, 30 km N. of Kanding, Mogesho, 3300 m, 10.VIII.1996, S. Murzin leg. (Coll. V. Murzin)
 5. *Micrarctia trigona* (Leech). ♂. China, W. Sichuan, 30 km N. of Kanding, Mogesho, 3300 m, 10.VIII.1996, S. Murzin leg. (Coll. V. Murzin)
 6. *Micrarctia trigona* f. *nigra* (Leech). ♂. China, W. Sichuan, 30 km N. of Kanding, Mogesho, 3300 m, 10.VIII.1996, S. Murzin leg. (Coll. V. Murzin)
 7. *Spilosoma album* Bremer & Grey. ♂. N. Korea, Singpo, 18.VI.1990, S. Murzin leg. (Coll. V. Murzin)
 8. *Orontobia dalailama* de Freina. ♀. China, SW. Sichuan, 40 km E. of Xiancheng, 3.VIII.1996, 4700 m, S. Murzin leg. (Coll. V. Murzin)
 9. *Pyrrharcia isabella* (Smith). ♀. USA, Illinois, env. Chicago, Batavia, e.l., 10.IV.1996, V. Murzin (Coll. V. Murzin)
 10. *Preparctia* sp., ♂. China, N. Sichuan, Pass Juizhaigou-Songpan, 3600-4000 m, 2.VII.1997, S. Murzin leg. (Coll. V. Murzin)
 11. *Preparctia* sp., ♀. China, N. Sichuan, Pass Juizhaigou-Songpan, 3600-4000 m, 2.VII.1997, S. Murzin leg. (Coll. V. Murzin).
-

Plate 24. *Sinoarctia* – *Preparctia*



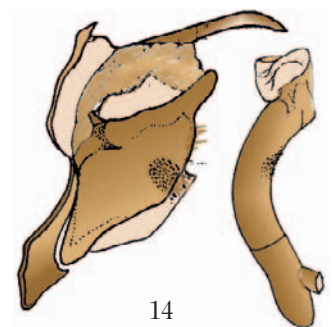
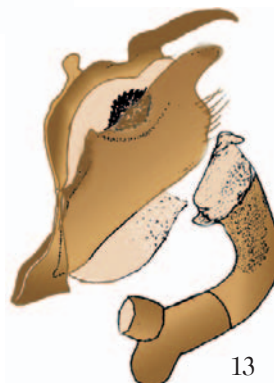
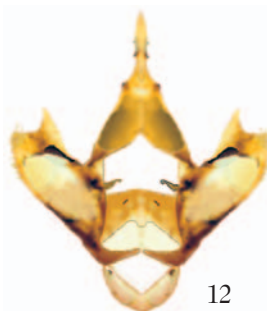
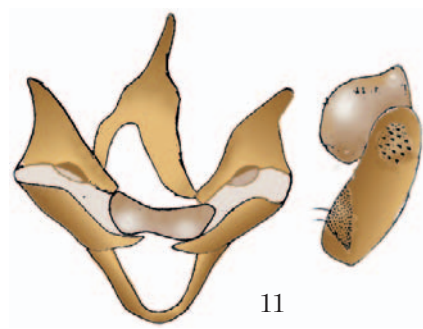
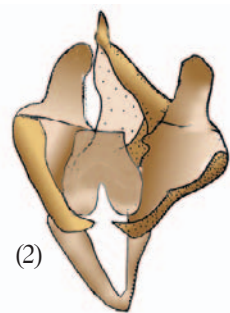
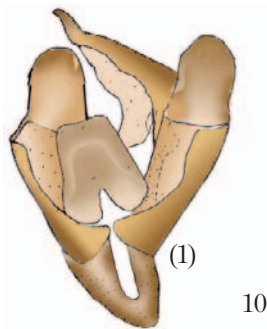
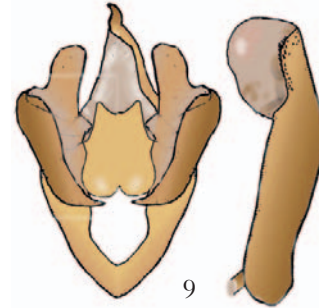
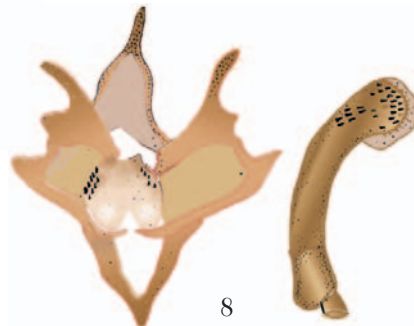
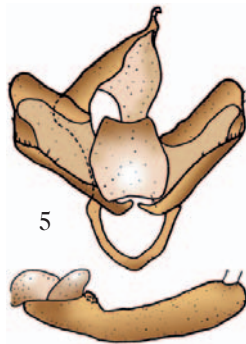
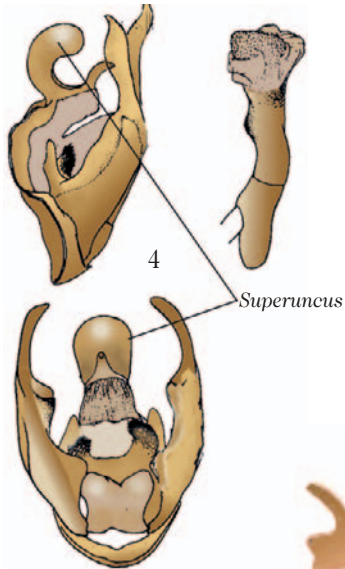
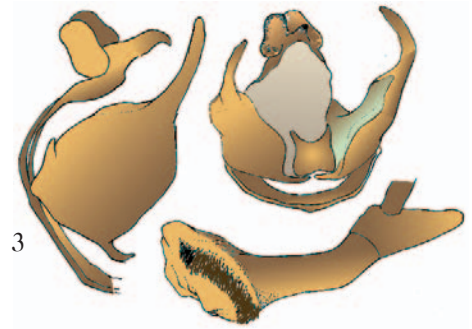
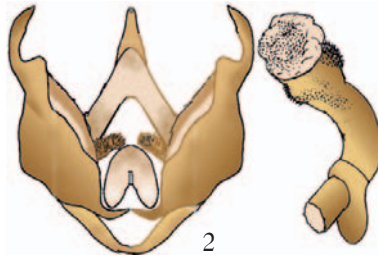
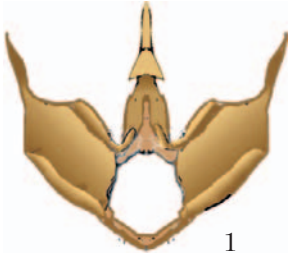
-
1. *Callimorpha dominula* (L.), Central Russia
 2. *Euplagia quadripunctaria* (Poda), Armenia
 3. *Eucallimorpha principalis fedtchenkoi* (Gr.-Gr.), Pamirs
 4. *Aglaomorpha histrio* (Walker), N. Korea
 5. *Carcinopyga proserpina lindti* Černy, Uzbekistan
 6. *Axiopoena karelini* Mén., Armenia
 7. *Tyria jacobaeae* (L.), Abkhazia (after Dubatolov, 1990d)
 8. *Dodia diaphana arctica* Tshstjakov, Magadan Region (after Tshstjakov, 1988)
 9. *Epimydia dialampra* Stgr., Khakassia (after Dubatolov, 1990d)
 10. *Lacydes spectabilis* (Tauscher), Kopetdagh
 11. *Parasemia plantaginis sifanica* Gr.-Gr., Altai
 12. *Hyphoraia aulica* (L.), Central Siberia (after Dubatolov, 1990d)
 13. *Pararctia lapponica* (Thunb.), Central Siberia (after Dubatolov, 1990d)
 14. *Borearctia menetriesi* (Ev.), Transbaikalia (after Dubatolov, 1984)
-

Plate 25. Male genitalia of *Callimorpha* to *Borearctia*



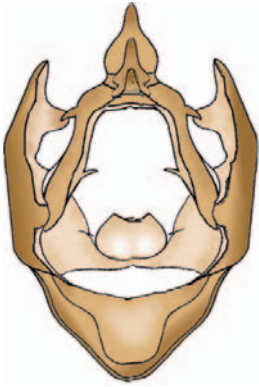
-
1. *Oroncus alaica* O. B.-H., Alaiskiy Mt. Range
 2. *Arctia flavia* (Fuessly), Altais
 3. *Eucharia festiva* (Hfng.), China (after Fang, 2000)
 4. *Pericallia matromula* (L.), Central Siberia (after Dubatolov, 1990d)
 5. *Holoarctia marinae* Dub., Altais (after Dubatolov, 1985b)
 6. *Palaearctia erschoffi* (Alph.), Terskey Alatau (after Dubatolov, 1985b)
 7. *Palaearctia mongolica* (Alph.), Mongolia (after Dubatolov, 1985b)
 8. *Sibirarctia kindermanni* (Stgr.), Khakassia, South Siberia (after Dubatolov, 1985b)
 9. *Chelis dahurica* (Boisd.), Altais (after Dubatolov, 1988)
 10. (1) *Chelis ferghana* Dub., Chatkal Mt. Range; (2) *Chelis tianshana* Dub., Kirghizskiy Mt. Range (after Dubatolov, 1988)
 11. *Grammia quenseli* (Payk.), Buryatia, East Siberia
 12. *Diacrisia sannio* (L.), Moscow City
 13. *Rhyparioides amurensis* (Brem.), Amurland
 14. *Rhyparia purpurata* (L.), Tian-Shan
-

Plate 26. Male genitalia of *Oroncus* to *Chionarctia*

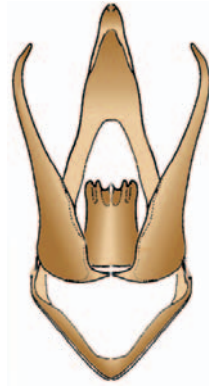


-
1. *Amurrhyparia leopardinula* (Strand), Amurland (after Dubatolov, 1985a)
 2. *Chionarctia nivea* (Mén.), Amurland (after Dubatolov, 1990d)
 3. *Hyphantria cunea* (Drury), Crimea, after Churaev, 1962
 4. *Diaphora mendica* (Clerck). Altai.
 5. *Eudiaphora turensis afghanistanensis* (Daniel), Afghanistan (after Daniel, 1966)
 6. *Spilosoma lubricipedum* (L.), Moscow Region
 7. *Spilarctia casigneta* (Kollar), China (after Fang, 2000)
 8. *Spilarctia seriatopunctata* (Motch.), Primorye
 9. *Lemyra jankowskii* (Obertür), China (after Fang, 2000)
 10. *Phragmatobia fuliginosa* (L.), China (after Fang, 2000)
 11. *Epatolmis luctifera* (Den. & Schif.), China (after Fang, 2000)
-

Plate 27. Male genitalia of *Amurrhyparia* to *Epatolmis*



1



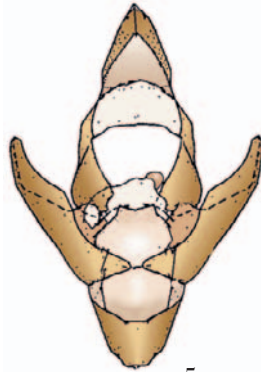
2



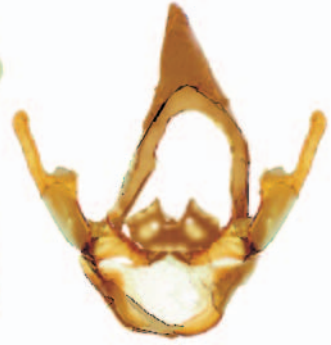
3



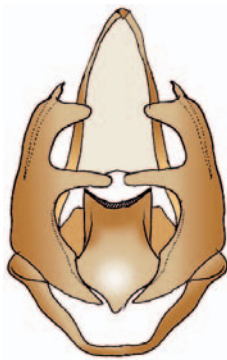
4



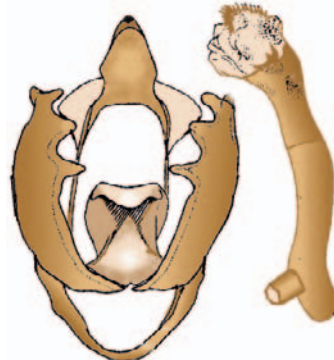
5



6



7



8



9

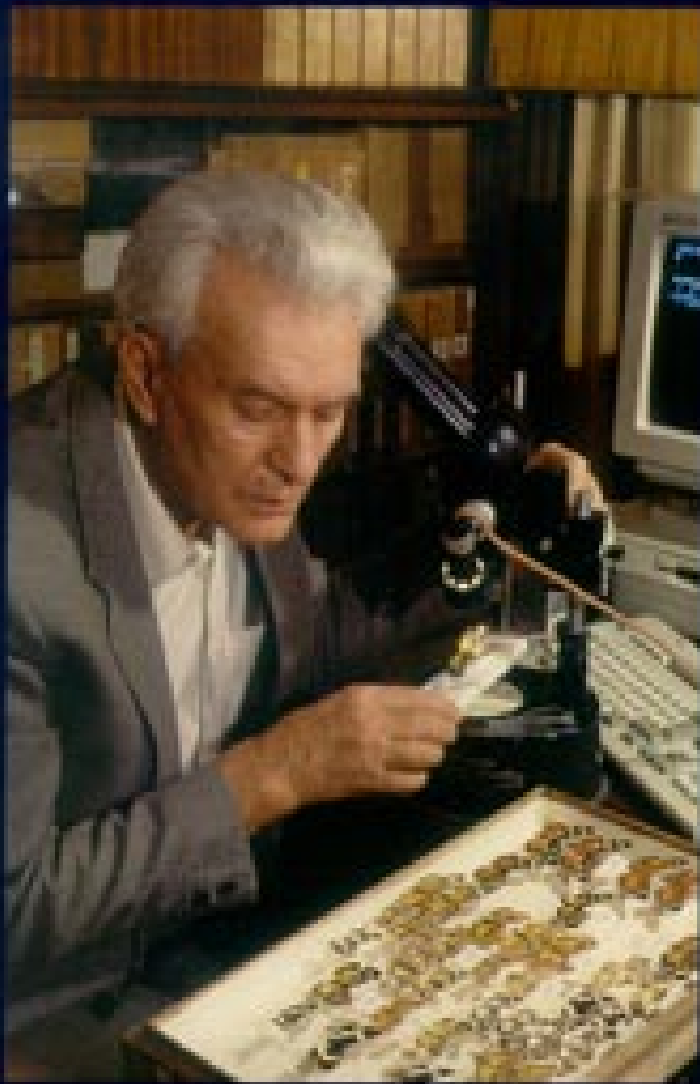


10



11





Professor Vladimir Murzin (born in 1927), a nuclear physicist and Doctor of Physical Sciences, developed an interest in butterflies and moths during his childhood. Today, his collection of Lepidoptera is one of the largest privately owned in Russia. He is a member of the Russian Entomological Society, and is the author of several scientific and popular-science books concerning butterflies and moths and of more than 20 other publications covering ecology and entomology. He has made approximately 50 collecting trips to various parts of the former Soviet Union where he has discovered several new species and subspecies of butterflies and moths.

The present book is a monographic treatment of tiger moths, the Arctiidae, of the former Soviet Union. In covering most of the Palearctic fauna, this publication is unprecedented both in scope and scrupulousness. Numerous colour pictures and several drawings richly illustrate the more than 100 species and subspecies referred to in the book. Identification keys are mainly based on peripheral characters, although in several cases genitalic ones are used. Many full colour photographs show pinned specimens (mainly arranged in 24 plates) and also a variety of live moths and/or their characteristic habitats.

*Above left: Vladimir Sergeyevich Murzin (photo by A. Koshitsky).
 Above right: A female *Clada salicis* (Bd.) resting on a moss on the slope of Salgarem Mountains, Russia - Mongolian border, elevation 2700 m above sea level (photo by V. S. Murzin).*

*Below right: A male *Euplagia quadripunctata* (Pabr.), one of the few tiger moths feeding on flowers. Armenia, Aragats Mountains (photo by V. S. Murzin).*

*On the front cover: A male *Palaemonia arctifl* (Alph.) resting on a rock in the Turkey-Armenia Mountains, Kaghizn, Central Asia (photo by V. S. Murzin).*