

# Ethnobotany. Lecture 37

Alexey Shipunov

Minot State University

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# Outline

## 1 Technical plants

## 2 Ornamental plants



# Outline

- 1 Technical plants
- 2 Ornamental plants

# Invasive weed: leafy spurge, *Euphorbia esula*, Euphorbiaceae, East Europe



# Fiber plants

- Normally, bast (phloem) is used for fibers
- Most important stem fibers are flax (*Linum usitatissimum*), jute (*Corchorus* spp., Malvaceae, South Asia) and hemp (*Cannabis sativa*); fruit fibers are cotton, coir (outer part of coconut, *Cocos nucifera*) and kapok (*Ceiba pentandra*, Malvaceae, Central America); leaf fibers are abaka (*Musa textilis*, Musaceae, Philippines), sisal (*Agave sisalana*, Asparagaceae, Mexico), snake plant (*Sansevieria* spp., Asparagaceae, Africa) and New Zealand flax (*Phormium tenax*, Xnanthorrhoeaceae)
- Native Americans used “Indian hemp” (*Apocynum cannabinum*) stems

# Kapok



# Indian “hemp”



# Cotton, *Gossypium* spp., Malvaceae, West Asia

- Several species which were domesticated independently in Old and New Worlds, now the most cultivated species is American *Gossypium hirsutum*
- Requires high temperatures, humidity and (for best result) manual harvesting
- Biggest producers are China, India and U.S.



# Vegetable lamb of Tartary



# Cotton



# Dye plants

- Most of these cultures are declined after invention of artificial dyes in 1920s
- Examples are: “bloodwood” *Haematoxylum campechianum* (Leguminosae, Central America, red haematoxylin); achiote *Bixa orellana* (Bixaceae, South America, yellow annatto), true indigo *Indigofera tinctoria* (Leguminosae, blue indigotin), safflower

# Achiote fruits



# True indigo



# Cochineal, *Dactylopius coccus*/Homoptera + *Opuntia* spp./Cactaceae, North America

- Almost unique combinational culture of scale insect and opuntia (similar to kermes/oak and mulberry/silkworm): cultivated ecosystem
- For several centuries, have been Mexican most valued export
- Insect produces carminic acid

# Cochineal



# Latex plants

- Latex is a stable dispersion (emulsion) of polymer (mostly terpenes) microparticles
- Occur in many plants, but frequently used only several species, e.g., guayule *Parthenium argentatum* (Compositae, Mexico), Panama rubber tree *Castilla elastica* (Moraceae, Central America), little elastic and bio-inert Gutta-percha *Palaquium* spp. (Sapotaceae, South Asia), chewing gum tree *Manilkara chicle* (Sapotaceae, Central America)



# Rubber tree, *Hevea brasiliensis*, Euphorbiaceae

- Large tropical tree originated in Amazonian but cultivated mainly in Southeastern Asia
- Natural rubber is extremely elastic but fragile at low temperatures
- In 1839, Charles Goodyear invented vulcanization (hyper-polymerization with sulfur)

# Para rubber tree



# Incense plants (ceremonial odors)

- Used in many religions, most often in Eastern Christian churches, Hindu and Buddhism
- Multiple plants with essential oils, plus some specific species like myrrh *Commiphora myrrha* (Burseraceae, West Asia), styrax *Stryrax benzoin* (Styracaceae, West Asia) and sandalwood *Santalum* spp. (Santalaceae, Old World tropics)

# Incense stick in Buddhist temple



# Sandalwood cultivation



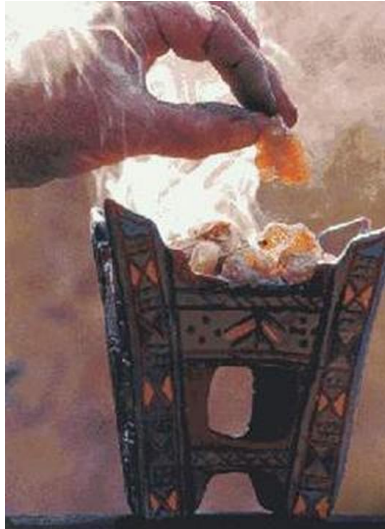
# Frankincense, *Boswellia sacra*, Burseraceae, Africa

- Aromatic resin from *Boswellia* trees
- Burning of frankincense came from ancient Egypt to Hebrew church and then to Christian churches
- Contains a complicated set of terpenes which have also medicinal effects

# Frankincense tree



# Frankincense in church





# Indoor plants

- Should be adapted for dry and relatively dark conditions
- We already covered cacti and other succulents in February excursion

# Some groups of indoor plants

- Orchidaceae: tropical orchids; *Phalaenopsis* is one of the most frequently cultivated
- Bromeliaceae: South American bromeliads; *Cryptanthus*, *Neoregelia* and *Guzmania* are frequently cultivated
- *Begonia* from Begoniaceae, all tropics, is extremely shade-tolerant (and also ferns)
- Many ornamentals (indoor or outdoor) are variegated plants: induced variegation or naturally pigmented leaves

# Begonia



# *Neoregelia*, naturally variegated



# Rubber ficus (*Ficus elastica*, Moraceae, Old World tropics), variegated mutant



# Bonsai

- Specific way of cultivation resulted in dwarf plants
- Variety of temperate tree species used, cultivation is in-house but outdoor (in patio)
- Specific techniques are: leaf trimming, stem pruning and wiring, use stony substrate and small pots

# Bonsai pine



# Cut plants

- Cultivated throughout the year in greenhouses and/or open grounds, then cut
- Forcing of flowering is needed for most cases (hormones, temperature, day length, selection)



# Most frequent cut plants

- Rose: *Rosa* spp., Rosaceae, China
- Carnation: *Dianthus caryophyllus*, Caryophyllaceae, Mediterranean
- Lily: *Lilium* spp., North Hemisphere
- Chrysanthemum: *Chrysanthemum* × *koreanum*, Compositae, East Asia
- Gerbera hybrids: *Gerbera*, Compositae, South Africa

# Carnation



# Gerbera



# Outdoor annuals and perennials

- Plants from diverse families
- Annuals should (like petunia, *Petunia hybrida*, Solanaceae, South America) be fast-growing
- Biennials like pansy (*Viola x wittrockiana*, Violaceae, Europe) produce vegetative part in the first year
- Perennials normally have underground rhizomes (like peony, *Paeonia* spp., Paeoniaceae, East Asia) or bulbs (like daffonlids, *Narcissus* spp., Mediterranean), often wintering indoor (like geraniums, *Pelargonium* spp., Geraniaceae, South Africa)
- Traditionally, flowering shrubs like roses, lilacs (*Syringa* spp., Oleaceae) are also referred here

# Petunia



# Pansy



# Peony



# Bulb plants

- Liliaceae: lily *Lilium*, tulip *Tulipa*, fritillary *Fritillaria*
- Amaryllidaceae: daffodil *Narcissus*, snowdrop *Galanthus*
- Asparagaceae: grape hyacinth *Muscari*, hyacinth *Hyacinthus*, squill *Scilla*, common bluebell *Hyacinthoides*



# Common bluebell



# Landscape woody plants

- Trees, shrubs, rarely vines
- Evergreen and deciduous

# Conifers

- Pinaceae: *Picea* (especially blue spruce, *Picea pungens*, North America), *Pinus*, *Larix*
- Cupressaceae: *Cupressus*, *Juniperus*

# Blue (Colorado) spruce



# Special groups

- Plants for alpine (rocky) gardens like stonecrops, *Sedum* spp., Crassulaceae
- Aquatic ornamentals: ponds (like waterlily, *Nymphaea* spp.) and fishtanks (like *Pistia*, *Elodea* etc.)
- Lawn plants: *Lolium perenne*, ryegrass and species of bluegrass (*Poa*) and bentgrass (*Agrostis*)

# Water lily



# Really short anonymous voluntary survey

- 1 What do you **like** most in advanced cell course?
- 2 What do you **dislike** most in advanced cell course?
- 3 **Which lab** do you remember most of all?
- 4 Please grade (1—bad, 5—excellent):
  - 1 Lectures
  - 2 Labs
  - 4 Exams

# Summary

- Main groups of technical plants: forage, wood, fiber, dye, latex, incense
- Main groups of ornamental plants: indoor, cut, outdoor annuals and perennials, landscape woody



# For Further Reading



A. Shipunov.

*Ethnobotany* [Electronic resource]. 2011—onwards.

Mode of access:

[http://ashipunov.info/shipunov/school/biol\\_310](http://ashipunov.info/shipunov/school/biol_310)