



What determines
biogeographical
ranges? Historical
wanderings and
ecological constraints in
the danthonioid grasses

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What's this paper about?!

- The point of the research behind this paper was to figure out and better understand what limits the distribution range of the danthonioid grasses.

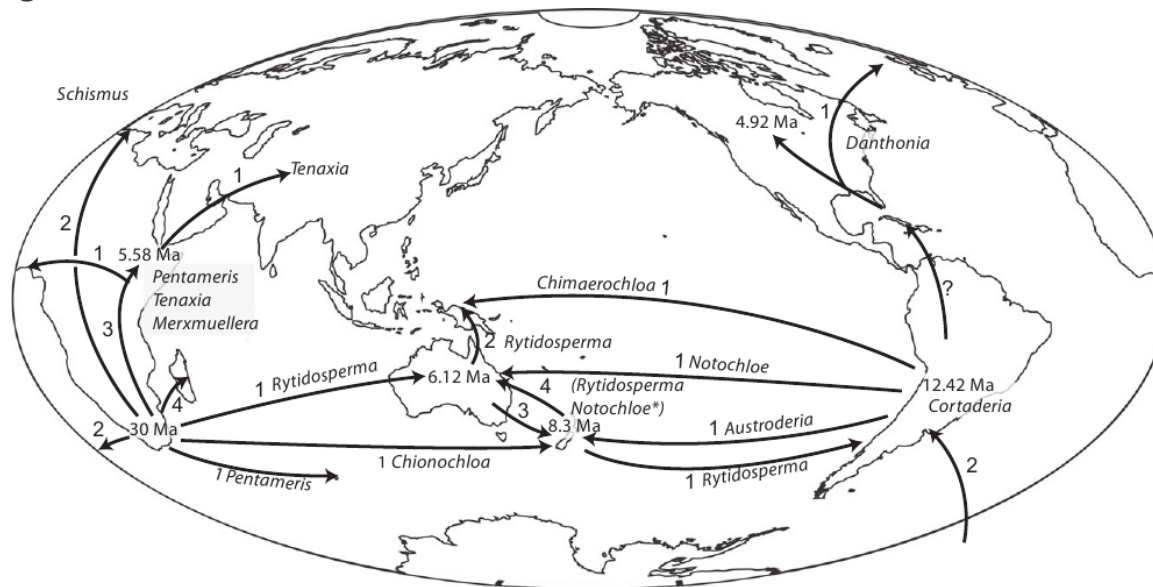


Main Points Covered

- Historical Biogeography of Danthonioideae
- Lag Time
- Dispersal Routes
- Ecological control of distribution ranges

Historical Biogeography of Danthonioideae

- This map shows the estimated dispersal routes of the subfamily Danthonioideae.
- The arrows and lines account for the minimum number of events that make up the current distributions and names of the descendant genera.
- Danthonioideae grasses are believed to have first originated from Southern Africa during the cool seasons of Oligocene when Antarctica was first glaciated.
- Dispersal to the Northern Hemisphere occurred only during the Pliocene era although many Northern Hemisphere areas that could potentially have these grasses do not.



Lag Time

- A “lag time” is the waiting time between when the species you’re observing arrives in an area and the first dispersal (to leave a trace) from that area.
- These lag times can often be many years.
- The danthonioid grasses are assumed to have spread to almost all their potential habitats throughout the world between 21 and 38 million years ago.

Dispersal Routes

- In doing the research necessary to find the routes of dispersal these grasses took, researchers found that these grasses preferred to mostly travel directly to regions around them and the shortest distance possible.
- This would explain why there are little to no big populations of these grasses, even in the Northern Hemisphere where the climate is perfect for them.

Ecological Control of Distribution Ranges

- The danthonioid grasses typically occupy warm-temperate habitats.
- Researchers found that there were none of this species living in tropical and equatorial climates and very rarely did they find any of the species in cold-temperature climates...however, it was not due to lack of opportunity.
- Many of the regions that these grasses are found in are very close to colder/tropical regions, however, although the grasses have been known to disperse to the other climates, they never take root and live.

Conclusion

- Looking at all the facts, researchers came up with a “big picture” for this species. They determined that danthonioid grasses have colonized all suitable areas in the Southern Hemisphere but not in the Northern Hemisphere. The first danthonioid grasses were believed to have originated from South Africa, which is also where the biggest majority and selection of the species reside, even today. And finally, the big question of “what limits the distribution range of the danthonioid grasses” was answered simply by figuring out that some parts of the globe have ecologically suitable climates and areas these grasses prefer while others do not. Although it is highly possible for dispersals over oceans to take place, it happens a lot more infrequently than the researchers had presumed it would thus limiting the danthonioid grass distribution.

References

- http://ashipunov.info/shipunov/school/biol_330/presentations/linder2013_what_determines_biogeogr_ranges.pdf