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Origins of the Alticinae

(Coleoptera, Chrysomelidae)

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Abstract

The different faunal realms are compared on the basis of their Alticinae genera. Geologic events, such as continental movements, are used to explain and date the origin of Alticinae genera.

The most diverse Alticinae fauna, both in number of species and genera, is found in the Neotropical Realm. In South America there are more than 220 genera (SCHERER, 1962), compared to Africa with somewhat more than 65 genera (SCHERER, 1961). All of the South American genera are endemic, with the exceptions of *Chaetocnema*, *Longitarsus*, and *Terpnochlorus*. Central Africa, Madagascar, and Venezuela each have one species of *Terpnochlorus* (BECHYNÉ, 1967). This genus could be considered as a relic from a unique former southern continent. Likewise *Terpnochlorus* could have a Tertiary distribution, as I will show later for some other Nearctic genera, for *Terpnochlorus* is also known from Mexico (in litt.). We have two wingless, very closely related genera at elevations above 3000 m., *Sjoestedtinia* with one species on Mt. Kilimandjaro and one on Mt. Elgon in eastern Africa, and *Forsterita* with only a few species above 4000 m in Bolivia. It is nearly impossible to separate these genera using morphological characters. Should we consider them as relics from the Mesozoic when South America separated from Afrika (SCHERER, 1973) or as convergence by similar ecological pressure? Those had been the few exceptions with a wider distribution in the South American Alticinae fauna. It should be emphasized that more than 200 genera are endemic to South America. The South American Alticinae fauna is a separate unit without any foreign influence, a situation which we do not find in any other Alticinae fauna of the world; I would expect that even Australia has more immigrants from the north. The Alticinae must have been isolated on this continent for a very long time. We are able to date the past very exactly because about 140 million years ago South America separated from a southern continent and drifted westward. Thus one could say the neotropical Alticinae fauna was born 140 million years ago. Also one could say that it takes at least 140 million years for a generic level taxon to arise. At least 1 million years ago, in postpliocene times, South America was connected with North America but this is a short period when compared to the time it was isolated. It seems that in postpliocene times representatives of the genera *Longitarsus* and *Chaetocnema* invaded from North to South America across the new land bridge. Because the neotropical

species of these two genera are difficult to separate, it could be said that they are comparatively young species. From that time on it was also possible for South American species to invade the Nearctic Realm.

Within the nearctic Alticinae there are about 40% of the genera which are found in the palaearctic and oriental fauna, some of them even in Africa. This is a remnant of the Tertiary when North America began to separate from Eurasia but maintained contact for a long time through the Bering Strait. Climate in Miocene times, for example in Central Europe, was tropical from the Paris Basin to South Africa and from Japan to New Zealand. Besides other tropic plants, palm trees existed in Central Europe and there were deciduous trees across the Bering Strait. From Miocene times onwards the climate declined until at the end of the Tertiary, it was about 10°C and the seasonal fluctuations became more distinct. The nearctic fauna was then isolated from Eurasia for a few million years as compared to the 140 million years of South America. This was not long enough in many cases for the establishment of generic characters in a way that could be considered as distinct from Eurasian taxa. Some of them, such as *Orthaltica*, *Luperaltica*, *Luperomorpha*, and *Blepharida*, would be examples for consideration as subgenera. For example, the oriental and african *Luperomorpha* has its nearest relative *Luperaltica* of North America. *Blepharida* has a distribution from North America to Africa. *Orthaltica* will be discussed in detail during another session of this meeting.

Our palaearctic fauna with about 30 Alticinae genera is comparatively poor, the nearctic fauna with about 45 genera is not much richer when we consider that it is enriched by several genera which invaded from South America. The reason for this deficiency is obvious, that is, these faunas suffered much during the Pleistocene and their climates aren't as favorable as those of warmer areas with less seasonal fluctuations.

The oriental Alticinae fauna, considering only the continental fauna without the many islands, is represented by about 100 genera (SCHERER, 1969). Ten of them (10%), also known in Africa, are remnants from the Tertiary or a Pleistocene distribution when humid areas moved southward. Faunal exchange from Africa to India and vice versa was easily possible across Arabia and Iran which are presently arid zones. Some are of palaearctic origin and probably took the same Pleistocene route just mentioned. The others are old oriental genera and certainly evolved during the long time when India was isolated; that is, because India broke away somewhat earlier from the southern continent than did South America and made its way across the Indian Ocean and collided with Laurasia where it vaulted the Himalayas, which became the border between the palaearctic and oriental fauna. Ten genera are endemic to Sri Lanka and in general, it can be stated that the South Indian Alticinae fauna is rather unique and its faunal elements have an affinity to southern Burma, southern Thailand, and Malaya. In general the oriental Alticinae fauna is an independent unit. In the west and north it is limited by high mountains and in the east by climatic conditions. South China has to be considered as having an oriental Alticinae fauna and some oriental genera are to be found in Japan.

It is superfluous to discuss the Australian Alticinae fauna. This fauna is as independent as in other animals. Some genera are known as immigrants from the north.

As already mentioned the African Alticinae fauna is poor with its somewhat more than 65 genera (SCHERER, 1961) as compared to South America, and is different from the one from Madagascar. Totally, 18 of these African genera are also represented in the oriental and palaearctic region. Of these 18 50% are restricted to the Oriental and Palaearctic Re-

alm. Of the other 9 genera *Podagrica*, *Argopus*, and *Argopistes* are known from the palaearctic, *Psylliodes*, *Phyllotreta*, *Aphthona*, and *Altica* are holarctic, and *Longitarsus* and *Chaetocnema* are distributed worldwide. The last two, *Longitarsus* and *Chaetocnema* are certainly newcomers to South America, as already discussed.

The distribution of Alticinae genera is reflecting geological and ecological events in earth history. This presentation was an attempt to answer the question about the origin of the Alticinae genera.

References

- BECHYNÉ, J. & SPRINGLOVÁ-BECHYNÉ, 1967: Altises néotropicales peu connues ou nouvelles (Col. Chrysomelidae). – Ann. Soc. Ent. France (NS) 3: 1033–1038
- SCHERER, G. 1961: Bestimmungsschlüssel der Alticinen-Genera Afrikas (Col. Phytoph.). – Ent. Arb. Mus. Frey 12 (1): 251–288
- — 1962: Bestimmungsschlüssel der neotropischen Alticinen-Genera (Coleoptera: Chrysomelidae: Alticinae). – Ent. Arb. Mus. Frey 13 (2): 497–607
- — 1969: Die Alticinae des Indischen Subkontinentes (Coleoptera-Chrysomelidae). – Pacif. Ins. Monogr. 22: 1–251
- — 1973: Ecological and Historic-Zoogeographic Influences on Concepts of the Genus as Demonstrated in Certain Chrysomelidae (Coleoptera). – Zoologica Scripta 2: 171–177

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