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A Zoogeographic Problem in Alticinae and its Use for Taxonomic Purposes

(Coleoptera, Chrysomelidae)

By Gerhard Scherer

Zoologische Staatssammlung München

Abstract

The genus *Orthaltica* is used as an example of how knowledge of historic zoogeography and morphological variation suggest that subgeneric distinctions are preferable to splitting the genus. Erection of new genera would eliminate *Orthaltica* as a phylogenetic unit, resulting in a loss of information.

In 1958 when I started to work with the flea beetles, one of my first tasks was to determine African Alticinae. Within material from the frontier area between Cameroun and Nigeria I found some specimens which I determined on the basis of the description as *Livolia sulcicollis* which was described by JACOBY in 1903. *Livolia sulcicollis* was known from southern Africa and years later I found out that my determination was wrong; these specimens belonged to a new species. Later when I was working with the oriental Alticinae I became acquainted with the genus *Micrepitrix* which was proposed by LABOISSIÉRE in 1933 on the basis of a single species *coomani* from Tonkin, presently North Vietnam. Somewhat later I concluded that the oriental genus *Micrepitrix* was nothing more than the African genus *Livolia*. This I published in 1971 but I made the mistake of thinking I could see the organ for jumping in the hind femora of this genus. They don't jump, but I will consider this question later. During my stay in the United States, I collected in South Dakota. Here I found small tiny beetles, known as *Orthaltica* in the nearctic fauna, which are nothing more than *Livolia*; these don't jump either. *Orthaltica* was proposed by CROTCH in 1873 and is therefore the oldest available name. Some other species in the oriental fauna and one from Australia belonging to this genus were described in the genus *Crepidodera* because in former times all species with a pronotal antebasal depression were placed there.

Let us examine all of these species with their large distribution. When we compare the sculpture of the head, we find that the species from South Africa, South Australia, and the four species of North America are somewhat alike (SCHERER, 1971, t. I, 1974, fig. 4). All the other species, those from the oriental region, the one species from the Caroline Islands, and the one from West Africa, are also alike; this last group has four typical punc-

tures across the vertex. If we compare the pronota (SCHERER, 1971, t. III, IV, 1974, fig. 3, 5) we find the same distribution. The South African, South Australian, and North American species have a pronotum with its front angles pointed and not oblique. The pronota of the North American species are somewhat narrower than those from South Australia and South Africa. All the others, the species from the Caroline Is., the oriental and West African species, have the front angles of the pronotum oblique or at least obliquely indicated. If we compare the male genitalia (SCHERER, 1971, fig. 4–19, 1974, fig. 1), the nearctic species form a seperate group in which aedeagus is asymmetric. All the others have a symmetric aedeagus.

Here I divert to explain the position of *Orthaltica* in the phylogenetic system of the subfamily Alticinae. This asymmetrie in the aedeagus of the nearctic *Orthaltica* shows the Galerucinae inheritance. But since phylogeny cannot be seen on a single level or a straight line with two ends, it cannot be placed at the beginning of the Alticinae system with its *Luperus* – like genera. Having the two characters of closed frontal coxal cavities and a pronotal antebasal impression alone does not indicate of a *Luperus*-relationship. Previously (SCHERER, 1959) I mentioned that *Livolia* was related to *Djallonia* Bechyné, and I mentioned as other authors have that *Livolia* leads to the subfamily Galerucinae. Some authors have the opinion that a flea beetle without enlarged hindfemora and without a jumping mechanism is not a flea beetle. LABOISSIÉRE (1933) at least wrote in his publication on *Micrepitrix* that it was the first genus with an antebasal depression on the pronotum in the subfamily Galerucinae. The related African genus *Djallonia* is a very typical Alticinae genus which certainly nobody would place at the beginning or at the end of the Alticinae system. The only difference between *Orthaltica* and *Djallonia* are the very obviously enlarged hind femora in *Djallonia* and nothing else. *Djallonia* even has similar head sculpture which is similar to that of *Orthaltica copalina* from North America (SCHERER, 1971, t. II, fig. 21, 1974, fig. 4b). *Orthaltica* has to have its place in the Alticinae system beside *Djallonia* in the neighborhood of *Derocrepis, Orestia*, and its related genera.

Now to another taxonomic problem. When we look at the distribution of these species, they have a typical Tertiary distribution. In the Tertiary, there was a tropical climate from the Paris Basin to South Africa and from Japan to New Zealand, and there was faunal exchange across the Bering Strait. Thus a distribution from the nearctic to South Australia and South Africa was possible. The declining temperature at the end of the Tertiary closed the Bering Strait and isolated the nearctic *Orthaltica*. An isolation of the most southern species in South Australia and South Africa must have happened. Early characters, for example the sculpture of head and pronotum were preserved. All the other species which are more alike, for example those with four setiferous punctures on the head certainly had a possibility for a distribution from the oriental region to Africa during Pleistocene times. The glacial periods of the Pleistocene caused as Pluvials a narrowing of the Eremial and a break through the presently continous arid belt, for example, the Sahara and Arabia. A distribution from India across Arabia till Africa was possible at this time. The present *Orthaltica* species of West Africa fits exactly in the group of the oriental ones, as does the one species from the Caroline Islands. We could summarize this discussion in a hypothesis stating, that in Tertiary about 30 million years ago, before temperature declined isolating North America, a former *Orthaltica* species had a large distribution – a tertiary distribution – from Africa, South Australia to North America. This species has since responded by speciation to geological and ecological vicariance events. This genus is not re-

presented in the Neotropic Realm, which was isolated much earlier, and is not represented in the Palaearctic, except Japan. This lacking in the Palaearctic cannot be explained, it was never represented there, it can be extincted, it can be the lacking of the foodplant. It is more or less the distribution as the genus *Blepharida* has, which species are feeding on *Rhus*. The nearctic *Orthaltica* species are feeding on *Rhus* too. The oriental and african foodplants we don't know, *Rhus* or at least species of Anacardiaceae are supposed.

Why all these considerations? It would be very easy for a splitter to split this genus into several genera based on certain characters. One could combine these genera into a tribe. The result would be, each genus would have its own name and nothing else than a tribal name would show that they are related. The genus name already gives information about the phylogeny of a species group. The smaller the group, the greater the loss of information. Wouldn't it be much better already on didactic reasons, if we would consider them as one genus and reflect the historic facts in subgeneric groupings. This would provide a system which would indicate the phylogeny of species groups and would promote a better understanding of group relationships.

References

CROTCH, G. R., and CANTAB, M. A. 1873: Materials for the study of the Phytophaga of the United States. – Proc. Acad. Nat. Sci. Philadelphia **1873**: 69

JACOBY, M. 1903: A further contribution to our knowledge of African Phytophagous Coleoptera, Part II. – Trans. Ent. Soc. London **1903**: 15

LABOISSIÈRE, M. V. 1933: Descriptions de trois nouveaux Galerucini du Tonkin. – Bull. Mus. Hist. Nat. Paris **5**: 203–208

SCHERER, G. 1959: Die Alticiden-Ausbeute der Expedition des Museums G. Frey nach Nigeria-Kamerun 1955/56 (Col. Phytoph.). – Ent. Arb. Mus. Frey **10** (1): 247

— — 1969: Die Alticinae des Indischen Subkontinentes (Coleoptera-Chrysomelidae). – Pacif. Ins. Monogr. **22**: 10, 19, 98

— — 1971: Das Genus *Livolia* Jacoby und seine umstrittene Stellung im System. Eine taxonomische-zoogeographische-evolutionistische Studie (Coleoptera-Chrysomelidae-Alticinae). – Ent. Arb. Mus. Frey **22**: 1–37

— — 1973: Ecological and Historic-Zoogeographic Influences on Concepts of the genus as Demonstrated in Certain Chrysomelidae (Coleoptera). – Zool. Scripta **2**: 171–177

— — 1974: Review of North American Species of Orthaltica with new Generic Synonymy (Coleoptera: Chrysomelidae: Alticinae). – The Coleopterists Bulletin **28** (2): 65–72

Anschrift des Verfassers:
Dr. Gerhard Scherer, Zoologische Staatssammlung,
Maria-Ward-Str. 1b, D-8000 München 19

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