The Use of Male Terminalia in the Higher Classification of Coleoptera

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The classificatory value of characters of the aedoeagus and of the segmentum abdominale-9 of δ Coleoptera is reviewed, with a brief account of the main literature on the subject and particular reference to recent papers by S. M. Yablokoff-Khnzorian. It is concluded that, though the aedoeagus provides some of the best characters for discrimination of closely related species in many groups of the ordo, its value in classification at familia-group and higher levels is limited and comparable with that of many other characters such as venation and folding of postala, structure of met-endosternitum, cavitas procoxalis, larval spiracula, larval maxillae, types of ommatidial structure, etc, and that attempts to construct classifications of the ordo based mainly on δ terminalia structures have produced clearly unnatural results.

In Coleoptera, as in other Insecta, the δ copulatory apparatus commonly provides good characters for separating closely related species; it may also take distinctive forms in groups at much higher classificatory levels — as may the 9th (genital) abdominal segment [S.a.-9], and the corresponding female organs. The use of δ (and to a much lesser extent, η), terminalia in the classification of Coleoptera is largely a development of the 20th century; one recent author has gone so far as to say, of the male terminalia “sans elle aucune classification sérieuse des coléoptères n’est ‘possible’” [Yablokoff-Khnzorian 1980: 251] — thus dismissing from consideration the works of the great 19th century coleopterists, Erichson, Lacordaire, Thomson, Leconte et alii.

One of the earliest, and most extreme, applications of δ external genitalia in the classification of Coleoptera was that of Verhoeoff [1895], who on this basis alone proposed an independent subordo for Coccinellidae, having previously [1893] drawn attention to some apparently important differences in δ terminalia in other groups of Coleoptera. His work probably prompted the much more extensive study of δ terminalia by Sharp & Muir [1912], who set a bad example by offering a new classification of the ordo based only on their interpretation of this evidence — an early example of what Hennig [1950] was later to criticise as “Merkmalsphylogenie”. A later work of Verhoeoff [1917], largely ignored by subsequent writers, provided some additional data and criticisms of the conclusions of Sharp & Muir and others. Wilson [1930] reviewed the aedoeagus in a range of Cucujoid familialia, and Jeannel & Paulian [1944], reviewing the abdominal structures of Coleoptera, concentrated attention on the aedoeagus, proposing a new classification of the ordo, slightly modified by them in the “Traité de Zoologie” [1949].

1 1st, 2nd, . . . 9th abdominal segment = segmentum abdominale -1, -2, . . . -9; in further text: S.a.-1, S.a.-2, . . . S.a.-9.