



A reclassification of the weevil subfamily Cyclominae (Coleoptera: Curculionidae)

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Abstract

The structure of mainly the ovipositor is used to better define and constitute the tribes of the weevil subfamily Cyclominae, whose composition and classification are highly confused in existing catalogues. Eight tribes are recognised in the subfamily, Cyclomini, Amycterini, Hipporhinini, Rhythirrinini, Listroderini, Notiomimetini, Dichotrachelini and Aterpini, while Diabathrariini, Gonipterini and Viticiini are excluded from it. Based on unique modifications of the ovipositor for laying eggs into the soil, the reconstituted Cyclomini, Amycterini and Hipporhinini can be regarded as monophyletic groups, while Rhythirrinini may still comprise two separate lineages. Largely due to their unmodified ovipositor and a lack of detailed taxonomic studies, Listroderini and Notiomimetini remain undefined although better constituted, while the position of the monotypic Dichotrachelini in Cyclominae is uncertain and the tribe Aterpini remains in need of comprehensive study to determine whether any of its current genera can be retained in the subfamily. As a result, the concept of the subfamily Cyclominae as a monophyletic taxon remains in doubt. Ovipositor structure further indicates a sister-group relationship between Amycterini and Hipporhinini and is also significant in delineating higher taxa in other terricolous weevils, i.e. Brachycerinae and Microcerinae. A checklist of the genera and species of the tribe Cyclomini is provided. Several taxonomic changes are proposed, as detailed in an appendix: 7 new synonymies, 2 synonymies reinstated, 4 tribes resurrected, 4 tribes transferred and 56 genera transferred.

Key words: Amycterini, Aterpini, Brachycerini, Byrsopini, Cyclomini, Diabathrariini, Dichotrachelini, Gonipterini, Hipporhinini, Listroderini, Notiomimetini, Rhythirrinini, Viticiini

Introduction

The subfamily Cyclominae is one of ten recognised in the tentative classification scheme of the weevil family Curculionidae proposed by Oberprieler *et al.* (2007). Although originally established in 1826, it was re-introduced into the literature in a modern sense only by Morrone (1997a, 1997b, 1998), who gathered in it 7–8 tribes that had been grouped by Kuschel (1995) in a larger subfamily Brachycerinae, which included also other groups with generally short rostra and ectophytic, subterranean larvae, among them the adelognathous entimines. Previously, from Lacordaire (1863) to Thompson (1992a), these groups had invariably been treated as separate subfamilies of Curculionidae. Since Alonso-Zarazaga & Lyal (1999) consolidated Morrone's concept of the Cyclominae by enumerating all the genera placed in its groups since Lacordaire (1863), the subfamily in this composition has won general acceptance in the recent literature. However, Morrone's (1998) admission that the monophyly of the Cyclominae critically needs investigation has not been followed up, and it remains a "heterogenous and incompletely defined" (Kojima 2006) "subfamily of convenience" (Oberprieler *et al.* 2007) without any obvious synapomorphies. Also the composition of its various tribes, as listed by Alonso-Zarazaga & Lyal (1999) but largely reflecting only their concepts as in the earlier *Coleopterorum Catalogus* (Schenkling & Marshall 1929, 1931a, 1931b, 1936, 1939), is in most cases highly artificial and untenable.

The flawed classification of the African genera of Cyclominae became evident to me during my study of the entimine tribe Tanyrhynchini (Oberprieler 1988a, 1995), and in 1995 I encapsulated my preliminary investigations into especially the female genitalia of these groups and the resulting classificatory changes in a provisional, annotated conspectus of southern African "brachycerine" genera (*sensu* Kuschel 1995). Unfortunately parts of this conspectus were prematurely and in places incorrectly published by Louw (1998), and the subsequent enumeration of all cyclomine genera in the catalogue of Alonso-Zarazaga & Lyal (1999) further exacerbated the confused classification of the Cyclominae. I have since expanded my study of these weevils to cover the pertinent Australian and other relevant genera and here consolidate these results into revised concepts of the subfamily Cyclominae and its tribes. As such, this study forms a contribution to addressing the currently greatest challenge in weevil classification, namely the delineation of natural subfamilies and tribes in the largest and taxonomically most confused family, the Curculionidae (Oberprieler *et al.* 2007).

In studying the various characters of these weevils, it became readily apparent that the most useful features at suprageneric level are found in the structure of the female genitalia, specifically of the gonocoxites of the ovipositor, which are variously adapted for oviposition into the soil. The gonocoxites in weevils are