

Taxonomy, Phylogeny and Zoogeography of the Subfamily Ceratomerinae of Australia (Diptera: Empidoidea)

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ABSTRACT. Nineteen endemic Australian species of the Gondwanan genus *Ceratomerus* Philippi are revised, including four described and 15 new species: *C. albistylus* Hardy, *C. athertonius* n.sp., *C. attenuatus* n.sp., *C. barringtonensis* n.sp., *C. bickeli* n.sp., *C. bulbosus* n.sp., *C. campbelli* (Paramonov), *C. falcatus* n.sp., *C. globosus* n.sp., *C. hibernatus* n.sp., *C. inflexus* Hardy, *C. lobatus* n.sp., *C. maculatus* n.sp., *C. malleolus* n.sp., *C. macalpinei* n.sp., *C. ordinatus* Hardy, *C. oreas* n.sp., *C. orientalis* n.sp., and *C. victoriae* n.sp. This is primarily an aquatic genus, restricted to cascading rocky rainforest streams of eastern Australia from the Tablelands near Cairns to Tasmania. Adults prey on flying aquatic insects and are collected on emergent rocks and riparian vegetation.

The Australian ceratomerine fauna comprises three species groups, with the *C. campbelli* group apparently most closely related to the *C. paradoxus* group of Chile. The *C. ordinatus* group appears closely related to species from New Zealand and Ecuador (high elevations). A key to all Australian species is included and zoogeography discussed.

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The aquatic Diptera of Australia are relatively poorly known, with the exception of economically important groups such as Tabanidae, Simuliidae and Culicidae. In the Empidoidea, two subfamilies dominate cascading streams in eastern Australia. Firstly, the Clinocerinae, include at least three genera (*Proagomyia* Collin, *Asymphyloptera* Collin and *Clinocera* Meigen). *Clinocera* includes seven species (Sinclair, 2000b), while there are some 6–8 spp. of *Asymphyloptera* and possibly as many *Proagomyia* (Sinclair, unpubl. data).

The second subfamily is the Ceratomerinae, which is particularly common on emergent rocks in mountainous streams of eastern Australia. Besides these taxa, other empidoids collected on emergent rocks include *Hilara* Meigen (but more often swarming and skimming pools), *Apalocnemis* Philippi, *Hydropeza* Sinclair (1999), and

several undescribed genera (e.g., “Genus No.3” Sinclair & Cumming, 2000). A number of dolichopodid species are also known to frequent river rocks as discussed by Bickel (1994). However, it is the Ceratomerinae that most often dominate this niche in Australia.

The Ceratomerinae are confined to wet forests of the former Gondwanan continents of Australia, New Zealand and South America. Despite its classic Trans-Antarctic distribution, these flies have received sparse attention from zoogeographers, because of the lack of knowledge at both the species and genus level and absence of published data on phylogenetic relationships within this subfamily.

Adults of Ceratomerinae are characterized by long, narrow wings and very elongate antennae, which strongly project forward as they run about. In Australia, the Ceratomerinae are represented by the single genus *Ceratomerus* Philippi, 1865,