



## ***Zorotypus novobritannicus* n. sp., the first species of the order Zoraptera (Zorotypidae) from the Australasian Ecozone**

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### **Abstract**

*Zorotypus novobritannicus* n. sp. (Polyneoptera: Zoraptera: Zorotypidae) is described from the Australasian ecozone from males and females of both apterous and dealated morphs. The description includes detailed accounts of head and thorax of the eyeless apterous morphs, head of the dealated winged morph with both eyes and ocelli, and the male and female abdomen and terminalia. *Zorotypus novobritannicus* n. sp. has unique, palmate setae on the lateral and ventral sides of the cerci of both sexes and dealated winged morphs are found at much higher densities than have been reported for any other species of Zoraptera.

**Key words:** biogeography, New Britain, taxonomy, Zoraptera, Zorotypidae

### **Introduction**

Since the discovery of the insect order Zoraptera early in the 20th century (Silvestri, 1913), 35 extant and nine fossil species have been described (Grimaldi & Engel 2005, Rafael & Engel 2006, Rafael *et al.* 2008). Extant zorapteran species are all small insects 3 mm or less in size and are largely similar to each other in form and habitat (Grimaldi & Engel 2005). Originally thought to be entirely wingless (thus this ordinal misnomer, “zor” = pure “aptera” = wingless; Silvestri, 1913), it is now known that adult males and females can be found as either apterous morphs or winged morphs with well-developed, although somewhat simple, wings (Caudell 1920, Rafael & Engel 2006). The apterous morphs are somewhat gregarious and can be found at fairly high densities, usually associated with decaying wood. Winged individuals are less commonly collected, although dealated individuals can often be found at low densities in the same decaying logs as apterous individuals (Choe, 1992). Although this phenomenon is not completely understood, it appears that the alate morphs are an adaptation for dispersal from habitat made unsuitable by seasonal changes, overcrowding, and(or) the exhaustion of local resources, and that development of this morph is triggered by a combination of environmental cues (Caudell 1920, Choe 1992, Engel 2001).

Although Zoraptera has been posited as sister group to Paraneoptera (Beutel & Weide 2005, Hennig 1981, Kristensen 1975) and Holometabola (Rasnitsyn 1998) and many studies have placed them among the polyneopterous insect orders (Boudreaux 1979, Engel 2003, Rafael *et al.* 2008, Terry & Whiting 2005, Wheeler *et al.* 2001), their precise phylogenetic placement remains uncertain. Zoraptera can be common and abundant, but are rarely recognized (Engel 2007, Rafael & Engel 2006), even by experienced researchers. Their somewhat cryptic lifestyle and lack of recognition by researchers has relegated Zoraptera to being one of the least understood of all the insect orders. Extant species have a distinctly pantropical distribution with species from all terrestrial ecozones containing tropical habitat (Olson *et al.* 2001, Pielou 1979), except the Australasian.

Herein we describe the 36th extant species of the order Zoraptera and the first from the Australasian ecozone. This new species is similar to other Zorotypidae in overall form and size but has remarkably complex setation on the lateral and ventral sides of the cerci and material collected to date contains an unexpectedly high percentage of dealated individuals (49.3% of adults).