



Adult morphology of *Paramorganiella adventurosa* Tonnoir (Diptera: Mycetophilidae: Sciophilinae), including a description of the unique maxillary palpi

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Abstract

The adult morphology of male *Paramorganiella adventurosa* Tonnoir is redescribed on the basis of new material from Tasmania. Details of the male genitalia are described and figured for the first time. The female is described for the first time. Special attention is paid to the clypeus and maxillary palpus, both sexually dimorphic, of which the anatomy is extensively illustrated and discussed with respect to possible function and in the context of palpal modifications found in other Mycetophilidae. Anatomy suggests the palpi of males function as a mechanical tool rather than a probing organ, which is unique among Mycetophilidae and Diptera. Various functional hypotheses are discussed in the context of sexual selection.

Key words: Mycetophilidae, *Paramorganiella adventurosa*, anatomy, maxillary palpus, sexual dimorphism, sexual selection, female description, Australia

Introduction

Mycetophilidae, the fungus gnats, are one of the most species-rich dipteran families in Australia, though they have been little studied, receiving no taxonomic expertise for decades (cf. Austin *et al.* 2004). Tonnoir's (1929) generic synopsis is still the most comprehensive review of Australian Mycetophilidae taxonomy, though it is of limited use on the Australian mainland as most of the specimens studied came from Tasmania. Tonnoir (1929) named numerous new taxa, including the monotypic genus *Paramorganiella*. The type species, *Paramorganiella adventurosa* Tonnoir, 1929, was described from a single male with strikingly aberrant maxillary palpi (Tonnoir 1929: text fig. 5). Tonnoir, who regarded these palpi as prehensile organs, was aware of the singularity of this modification among the Mycetophilidae, and even among the Diptera. Even so, his observation sunk largely into oblivion with both dipterists and morphologists, having only exceptionally been referred to in subsequent publications (cf. Sjøli *et al.* 2000). No additional records of *P. adventurosa* have been published since Tonnoir's days, but upon completion of this manuscript, Chris Borkent (McGill University) informed us of *Paramorganiella* specimens of both sexes that he had seen from New South Wales and Victoria, which appear to be conspecific with *P. adventurosa*.

The senior author recently found *P. adventurosa* in Malaise samples from Tasmania. This new material allows us to redescribe and illustrate the anatomy of males, especially of their clypeus, palpi and terminalia. We also give the first description of the female which has quite ordinary palpi, thereby confirming Tonnoir's (1929) suspicion of sexual dimorphism. The sexually dimorphic palpi of *Paramorganiella* are discussed with respect to functional aspects and in the context of palpal modifications found in other mycetophilids.