



The *Cycloneura* Marshall group of genera in New Zealand (Diptera: Mycetophilidae: Leiini)

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Abstract

The *Cycloneura* group of genera, as it is here defined, represents a significant component of the Leiini (Diptera: Mycetophilidae) in New Zealand. The group includes little known genera, such as *Cawthronia* Tonnoir & Edwards, *Cycloneura* Marshall, *Paracycloneura* Tonnoir & Edwards, *Paradoxa* Marshall and *Sigmoleia* Tonnoir & Edwards, which are reviewed, as well as two new genera, *Tonnwardsia* **gen. n.** and *Waipapamyia* **gen. n.**, which are described here. The prominent feature of *Cycloneura*-like leiines is the peculiar course of the hind wing veins, CuA2 and A1. Typically, A1 approaches the sinuous course of CuA2, or the two veins even join each other, thereby forming a closed posterior cubital cell. In New Zealand the *Cycloneura* group is more speciose than previously thought. New species described in this paper are: *Paracycloneura inopinata* **sp. n.**, *Sigmoleia peterjohnsi* **sp. n.**, *Sigmoleia separata* **sp. n.**, *Sigmoleia similis* **sp. n.**, *Waipapamyia dentata* **sp. n.**, *Waipapamyia elongata* **sp. n.**, and *Waipapamyia truncata* **sp. n.** The New Zealand members of the *Cycloneura* group do not form a monophyletic group in themselves, but are variously related to extralimital taxa the majority of which is found in the southern Neotropics, South Africa, Australia, and New Caledonia. Possible relationships, with supporting arguments from adult morphology, are discussed.

Key words: taxonomy, morphology, Mycetophilidae, Leiini, new genera, new species, New Zealand

Introduction

According to Sjøli *et al.* (2000), the family Mycetophilidae is subdivided into two subfamilies, Mycetophilinae and Sciophilinae. Sciophilinae is the more diverse subfamily and includes five to six tribes. Leiini, one of the large tribes of Sciophilinae, comprises 25–28 extant genera (Bechev 2000, Blagoderov 2008). Our present understanding of the Leiini goes back to Edwards (1925: 575) who regarded the “genera of the *Leia* group” as the focal point to which further genera were assigned. The key characters of Edwards’ Leiini were derived from wing venation, namely the short R1, being usually little if any longer than ta (r-m of Edwards), and the nearly horizontal inclination of ta. Edwards’ argumentation was solid enough to survive practically unchallenged for almost 80 years to the present. Doubts on the monophyly of the Leiini *sensu* Edwards were expressed repeatedly (e. g., Sjøli 1997, Sjøli *et al.* 2000, Hippa *et al.* 2005), but a phylogenetic hypothesis more conclusive than Edwards’ proposal is hitherto wanting. A phylogenetic analysis embracing all the genera traditionally assigned to the Leiini has never been attempted. Knowledge of rather many of these genera is still fragmentary because relevant descriptive literature lacks sufficient detail and fresh material adequate to restudy their morphology, or even study their molecules, is hardly available. Contributing to these difficulties, many taxa are southern hemisphere in distribution, while most studies of fungus gnats are, as is known, based in the north.

Among the little known southern hemisphere leiines are several genera endemic to New Zealand. Most exhibit wing vein patterns that deviate markedly from the ordinary, notably in that A1 closely approaches or even merges with CuA2, thereby forming a closed posterior cubital cell situated some distance from the wing margin. These *Cycloneura*-like leiines, as they are referred to here, appeared hitherto to be not diverse on the genus and species levels. The present article documents that such an impression results—as is so often the case with mycetophilids outside the Holarctic region—from too little study. No doubt the *New Zealand Fungus Gnats* by Tonnoir and Edwards (1927) is a classic among the literature on Australasian Sciaroidea. Yet our own studies of the last few years reveal, decades after this landmark paper appeared, how much is still to discover among the mycetophilids of the southwest Pacific. Here we describe two new genera and seven new species of the Leiini, and review the poorly known genera *Cawthronia* Tonnoir & Edwards, *Cycloneura* Marshall, *Paracycloneura* Tonnoir & Edwards, *Paradoxa* Marshall, and *Sigmoleia* Tonnoir & Edwards. Most of these taxa have not been subject of any further study since the time of their descriptions. From the viewpoint of adult morphology we discuss the arguments for possible interrelationships of the *Cycloneura*-like genera in New Zealand and elsewhere. Finally, we address the question of a more stringent definition for the Leiini, as its heterogenous nature is quite obvious. It is out of the question that southern hemisphere leiines