



New species of Hawaiian picture wing *Drosophila* (Diptera: Drosophilidae), with a key to species

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Abstract

The picture wing species group of Hawaiian *Drosophila* is the only one to be relatively well known taxonomically, but species continue to be discovered. Here seven new species are described: *Drosophila kikiko* **new species**, *Drosophila kinoole* **new species**, *Drosophila moli* **new species**, *Drosophila nukea* **new species**, *Drosophila opuhe* **new species**, *Drosophila pihulu* **new species**, and *Drosophila pilipa* **new species**. In addition, the male of *Drosophila oreas* Hardy is described for the first time, and *Drosophila virgulata* Hardy & Kaneshiro is reduced to a **new junior synonym** of *Drosophila lanaiensis* Grimshaw, and the status of the latter and *Drosophila ciliaticrus* Hardy is clarified. A complete key to all the picture wing species is provided.

Key words: Hawaii, Idiomyia, *Drosophila* taxonomy, endangered species

Introduction

The Hawaiian picture wing *Drosophila*, numbering over 100 species, are unusual among the endemic insect fauna of the Hawaiian Islands for being both relatively charismatic and recognizable, and biologically well-studied. This is largely due to a concerted effort by a number of prominent researchers in the 1970's, including a series of taxonomic papers by D. Elmo Hardy and Kenneth Kaneshiro (1965–1978) which ended with 105 described species. Many other researchers contributed to the broader Hawaiian *Drosophila* Project, providing information on all aspects of their genetics, evolution, and behavior (e.g., Carson, 1992; Clayton, 1966; Heed, 1968; Kambysellis & Heed, 1971; Montgomery, 1975; Spieth, 1980). Despite continued interest in the group, only four species have been described since then, and it is notable that of these only one (*D. mulli*; Perreira & Kaneshiro, 1990) was first collected after 1978. In contrast, other groups of Hawaiian *Drosophila* continue to have significant numbers of species discovered (Hardy & Kaneshiro, 1979; Hardy, *et al.*, 2001; Magnacca & O'Grady, 2008b; 2009; O'Grady, *et al.*, 2003), and a large backlog of undescribed taxa exists in collections. The lack of additional species discoveries in the *picture wing* group may also be related to the general decline that has taken place in abundance since that time, particularly after the introduction of the western yellowjacket, *Vespa pensylvanica* (Carson, 1986). Twelve species are currently listed as endangered or threatened (U.S. Fish and Wildlife Service, 2006), and many more are at high risk of extinction.

This paper describes seven new species, three of which are newly-discovered from the island of Kaua'i. The other four have existed for some time in collections, but were never formally described, no doubt in part due to their rarity and similarity to named species. Only one species of the latter group has been collected since 1973, and two are known from single individuals. Three previously-described species, *D. ciliaticrus*, *D. lanaiensis*, and *D. oreas*, are redescribed; all are of conservation significance.

At least three additional species are known but remain undescribed. One female, listed as “species near *peniculipedis*” in Montgomery (1975), was reared from *Touchardia* bark on Hawai'i. This specimen cannot be located, and no additional specimens have been found despite rearing from *Touchardia* at other locations. Two females identical to *D. liophallus* were collected from Hawai'i island (Pu'u La'ala'au, Kohala Mts., 4000', 3–4.viii.1966,