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Review of the *spoon tarsus* subgroup of Hawaiian *Drosophila* (Drosophilidae: Diptera), with a description of one new species

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Abstract

The spoon tarsus species subgroup is revised and this clade is placed in the *modified tarsus* group of Hawaiian *Drosophila*. The species boundaries in this group are discussed in light of diagnostic secondary sexual characters of males. *Drosophila septuosa* Hardy is regarded as a junior synonym of *Drosophila percnosoma* Hardy. A new species, *Drosophila kikalaeleele* Lapoint, Magnacca & O'Grady is described. *Drosophila fastigata* Hardy, a species endemic to O'ahu, is added to the species subgroup, bringing the total number of known species to 12. An updated key to species is provided to the spoon tarsus subgroup.

Key words:

Introduction

The Hawaiian Drosophilidae is an impressive example of an adaptive radiation, with an estimated 1,000 species filling diverse ecological niches (Heed 1968; Kambysellis *et al.* 1995; Magnacca, Foote & O'Grady 2008; Montgomery 1975) exhibiting an impressive array of behaviors (Spieth 1966). Males of many species display extreme sexual dimorphism in wing, foreleg, and mouthpart characters. These characters, in combination with the elaborate mating displays, have led many researchers to propose that sexual selection may play a role in the rapid diversification observed in this group (Kaneshiro 1988; Spieth 1966; Carson 1997).

The Hawaiian Drosophilidae are placed in two genera, *Drosophila* and *Scaptomyza*. The Hawaiian *Drosophila* lineage has been divided into a number of species groups and subgroups based on taxonomic (Hardy 1965), chromosomal (Carson & Stalker 1968), ecological (Heed 1968), and phylogenetic (Throckmorton 1966; Thomas & Hunt 1993; Kambysellis *et al.* 1995; Baker and DeSalle 1997; Remsen & DeSalle 1998; Bonacum 2001; Remsen & O'Grady 2002) analyses (Fig. 1). The *haleakalae* species group (sensu Hardy *et al.* 2001) is basal within the Hawaiian *Drosophila* lineage. Throckmorton suggested that the *ciliated tarsus* species group, characterized by having elongate setulae on the foretarsi of males, is also a more basal member of this group, although more recent molecular phylogenetic analyses have contradicted this placement and consider these species to be a subgroup within the *modified tarsus* species group (Bonacum 2001). A large assemblage of species belonging to the *modified mouthpart* and *picture wing* species groups form a poorly supported clade that is sister to two species groups, *antopocerus* and *modified tarsus*. The latter two groups together form what is referred to as the "leaf breeder clade" as the majority of species in this group utilizes decaying leaves as a larval substrate. The *modified tarsus* species group is divided into four subgroups, *split*, *bristle*, *ciliated* and *spoon tarsus*, based on sexually dimorphic characters on male forelegs

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