

New records of biting midges (Diptera: Ceratopogonidae) from Guam Island, USA

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ABSTRACT: The ceratopogonid fauna of Guam has attracted minimal interest since the 1959 survey of the insects of Micronesia. We report on new distribution records for three species previously unknown from the island of Guam: *Culicoides peliliouensis* Tokunaga, *Dasyhelea carolinensis* Tokunaga, and *Dasyhelea dupliforceps* Tokunaga.

Guam is a tropical Pacific Island located between 13°12'–13°42' N, 144°36'–145°00' E in the southwestern portion of the Mariana Archipelago (Figure 1). It is mountainous with an area of 549 km². The northern half of the island consists of porous limestone and lacks free flowing water, but the southern half is volcanic with ponds and free flowing rivers and streams (Mylroie *et al.* 2001). The ceratopogonid fauna of Guam was described as part of a large survey of the insects of Micronesia (Tokunaga and Murachi 1959). The majority of the insects in that survey were opportunistically collected by US Navy personnel. There have been no major studies of the ceratopogonid fauna since the monograph by Tokunaga and Murachi (1959). Ceratopogonid transmitted diseases of humans and domestic animals are unreported on Guam; however, ceratopogonids are occasional biting pests of humans on beaches.

Collection data for all adult Ceratopogonidae are Guam: Santa Rita, US Navy Base main gate area, CDC traps baited with dry ice, 9–11 March 2010, Coll: W.K. Reeves. Traps were operated approximately 2 hours before dusk and retrieved the following morning. Insects were killed with dry ice or by freezing, sorted with a dissecting microscope, and adults were preserved in ethanol for further study. Biting midges were cleared in lactic acid and slide mounted in Canada balsam thinned with clove oil. Voucher specimens were deposited in the Clemson University Collection of Arthropods and the synoptic collection of DAS.

We report 3 new records for three species of Ceratopogonidae from Guam; *Culicoides peliliouensis* Tokunaga, *Dasyhelea carolinensis* Tokunaga, and *Dasyhelea dupliforceps* Tokunaga. In addition to these new records, four other ceratopogonid species previously known from Guam were also collected: *Atrichopogon jacobsoni* de Meijere, *Forcipomyia (Forcipomyia) fascicauda* Tokunaga, *F. (Microhelea) esakiana* Tokunaga, and *Culicoides guttifer* de Meijere.

Culicoides peliliouensis

Culicoides peliliouensis Tokunaga, *in* Tokunaga and Esaki, 1936: 55 (Belau).

Twelve female *C. peliliouensis* were captured in CDC light traps. *Culicoides peliliouensis* is a serious pest in the Federated States of Micronesia (Tokunaga and Murachi, 1959). Biting midges are a pest of humans on Guam's recreational beaches and *C. peliliouensis* is the probable species. Our collections of *C. peliliouensis* are new records for Guam, but this species was already reported to range from the Philippines to Palau and the Federated States of Micronesia (Tokunaga and Murachi 1959; Delfinado 1961).

Dasyhelea carolinensis

Dasyhelea carolinensis Tokunaga, 1941: 112 (Micronesia).

A single male was taken in a CDC light trap. This species was not previously reported from Guam, however it was reported from nearby Rota (Tokunaga and Murachi 1959). Rota is visible from Guam on clear days and insects can blow or fly between islands.

Dasyhelea dupliforceps

Dasyhelea dupliforceps Tokunaga, *in* Tokunaga and Murachi, 1959: 264 (Kiribati).

We collected a single female, which represents a significant range extension for this species. *Dasyhelea dupliforceps* was described from a series collected on Tarawa Island in the Republic of Kiribati (Tokunaga and Murachi 1959).

The biting midges of Guam are still poorly documented. Our limited collections indicate that several species were either missed in previous surveys or are recent introductions. More extensive surveys using multiple trapping methods will likely yield more species undocumented on Guam.



FIGURE 1. Map showing location of Guam, USA and the collection site as a red circle.

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