

***Ephydra gracilis* Packard, a recent Immigrant Fly in Hawaii**
(Diptera: Ephydriidae)¹

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The first recorded occurrence of *Ephydra gracilis* Packard in the Hawaiian Islands appears to be a specimen found in a light trap at Hickam Field in April 1946. A month later a second specimen was taken in a light trap operated on Sand Island opposite Honolulu. In April a lookout was begun for breeding places while on routine mosquito surveys on Oahu, but the habitat was not discovered until July 23.

The flies were found to be breeding by the millions in salt-water ponds opposite the Moanalua Gardens, the water in these ponds having become increasingly saline as dredging operations had closed the inlet from Keehi Lagoon. These flies skate around on the water surface, congregating in dense masses near the shore, and fly up a few inches when disturbed to alight quickly on the water again a foot or two away. They were seen to enclose themselves in a bubble of air which was captured under their wings, and to crawl by projecting sticks or stones to the bottom a few inches below where their long straight tarsal claws (a generic character) served well to anchor them as they crawled around, presumably ovipositing. This habit previously has been noted for *E. hians* Say in Great Salt Lake, Utah, but not for *gracilis*. The larvae and pupae were found in the dense algal masses in the water and in the upper layers of the algae-covered bottom ooze.

Essig (1926) briefly summarized the knowledge of *gracilis* existing at that time: "*Ephydra gracilis* Packard is 2.3 to 3.5 mm. long, opaque gray, paler beneath and with a slight green tinge above, and bright green legs marked with yellow. The larvae are somewhat transparent white 10.6 mm. long, the anal tube which has a basal and apical pair of forks, is from the base to the terminal fork 4.9 mm. long, each of the prongs of the terminal fork 1.6 mm., and each basal fork 2 mm. in length. They have 8 pairs of long prolegs. The larvae live suspended everywhere in the open water of Great Salt Lake and Salton sea, in salt water in San Francisco and adjacent to the Pacific Ocean at Laguna Beach, California. The fly was

¹ From the U. S. Quarantine Station, Honolulu, T. H.
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introduced from Great Salt Lake into San Francisco Bay by railroad trains after the building of the cut-off at the lake; J. M. Aldrich, *Psyche*, 25: 30, 1918."

Aldrich (1912) had previously given a description of *gracilis*, adult, larva, and puparium, with biological notes, in a review of the biologies of the western U. S. species of the genus *Ephydra*. The related species, *hians*, was often so abundant in western salt lakes that windrows of puparia several feet deep were driven on the beaches by storms; these when collected and prepared by the Indians were often used as food and given the name "Koo-chah-bie."

More recent collections (August 26, 1946) at Iroquois Point near Pearl Harbor on Oahu showed *gracilis* to be quite abundant there in salt marsh pools in which the water had evaporated almost to the saturation point of the contained salt. However, in pools in which salt crystallization had actually occurred *gracilis* larvae were killed, but an undetermined syrphid fly larva (probably *Lathyrrophthalmus aeneus*) and larvae of a psychodid fly apparently were still thriving.

It is believed, in view of the habits of *Ephydra gracilis* and the circumstances surrounding its first discovered occurrence in the Hawaiian Islands, that the introduction of this species can be more definitely attributed to aircraft transport than can any other of the numerous recently discovered insect immigrants. The close proximity of favorable breeding habitats at California seaplane bases, the large numbers of adults produced at times, their habit of swarming into moving vehicles (where they are a pest, as in trains crossing Great Salt Lake), and finally the proximity of receptive habitats near the Oahu seaplane bases, together develop conditions favorable for insect "transplantation."

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REFERENCES

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