

SCIENTIFIC NOTE

IMMATURES OF *ANOPHELES QUADRIMACULATUS* S.S. COLLECTED FROM ATYPICAL HABITATS

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ABSTRACT. Two unusual habitats for the immatures of *Anopheles quadrimaculatus* s.s. are described: a highly polluted sewage retention pond and an artificial container.

KEY WORDS *Anopheles quadrimaculatus* s.s., immature habitats

Anopheles quadrimaculatus (Say) sensu stricto (s.s.) has been collected as immatures from a variety of freshwater habitats, typically among vegetation along the margins of permanent or semipermanent sites such as ponds, lakes, streams, canals, and roadside ditches and they have been taken in association with other members of the *Quadrimaculatus* Complex (i.e., *Anopheles diluvialis* Reinert, *An. inundatus* Reinert, and *An. smaragdinus* Reinert) (Reinert et al. 1997).

Immatures of *Anopheles quadrimaculatus* s.s. were collected from the following 2 atypical habitats at Gainesville, Alachua County, FL. Adults were reared from some of the larvae from each of the 2 collection sites. Identifications were based on adults, their associated pupal and 4th-stage larval exuviae, and 4th-stage larvae.

Specimens from the 1st site were collected at the margins of a sewage retention pond that received liquid and solid effluent from a swine farm. This habitat contained highly polluted, odoriferous water with sparse amounts of duckweed, numerous floating elderberry leaves, and green filamentous algae along the margin, which was partially shaded by large, blooming, elderberry plants. Analysis of the water quality taken on October 21, 1996, was temperature = 20.5°C; pH = 8.2; dissolved solids = 1,141; and conductivity = 1,725 µmhos. Immatures of *An. quadrimaculatus* s.s. were collected from this site on 5 dates in 1996: October 4, three 4th- and one 3rd-stage larvae; October 17, one 4th- and four 2nd-stage larvae; October 21, three 2nd-stage larvae and 1 pupa; October 28, three 3rd- and one 2nd-stage larvae; and November 4, one 2nd-stage larva. Numerous specimens (>150/1-pint dipper) of *Culex nigripalpus* Theobald, which included egg rafts, larvae (1st- through 4th-stage), and pupae, were collected (October 4, 17, and 21, but noticeably fewer on November 4) from this habitat in association with specimens of *An. quadrimaculatus* s.s. Also, immatures of *Culex quinquefasciatus* Say (October 21, two 4th-stage larvae; October 28 and November 4, approximately 500 4th-stage larvae

per day) and a few immatures of *Uranotaenia lowii* Theobald (October 17, six 3rd- and two 2nd-stage larvae; October 21, eleven 3rd- and two 2nd-stage larvae, and 1 pupa; and November 4, two 4th- and three 3rd-stage larvae) were taken in association with the above 2 species. Larval *An. quadrimaculatus* sensu lato (s.l.) have been reported a few times from polluted water sites. For example, Fletcher (1946) recorded larvae collected from a pool polluted by the effluent from a broken sewer in Georgia, Johnson (1959) found larvae breeding in heavily polluted septic tank effluents in Louisiana, Shroyer and Siverly (1971) collected larvae from waste lagoons in Indiana, and Carlson (1982) and Carlson et al. (1986) reported low numbers of larvae in wastewater evaporation-percolation ponds in Florida.

The 2nd habitat was a plastic 5-gal bucket containing approximately 3 gal of rainwater, with several floating pine leaves and many submerged pine and oak leaves, located in an area partially shaded by trees and near a building. Fifty-five 2nd- to 4th-stage larvae were collected on November 3, 1995, from this bucket, all of which were *An. quadrimaculatus* s.s. The following references pertain to *An. quadrimaculatus* s.l. collected from artificial containers. Mulrennan and Beck (1955) found larvae in rain barrels and watering troughs in Florida, Johnson (1959) collected larvae from artificial containers in Louisiana, Eads et al. (1961) reported finding immatures in fire barrels in Texas, and Wilmot et al. (1992) reported collections from artificial containers in Michigan. With the discovery that *An. quadrimaculatus* is a complex of 5 sibling species, designated *An. quadrimaculatus* (A), *An. smaragdinus* (B), *An. diluvialis* (C₁), *An. inundatus* (C₂), and *An. maverlis* Reinert (D) (Kaiser et al. 1988a, 1988b; Lanzaro et al. 1988; Narang et al. 1989, 1990; Reinert et al. 1997), it cannot be determined which species of the complex were involved in the above-mentioned literature records of *An. quadrimaculatus* s.l.

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