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RECORD OF *ANOPHELES QUADRIMACULATUS* SPECIES C IN LOUISIANA[1,2]

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ABSTRACT. Sibling species C of the *Anopheles quadrimaculatus* species complex was found south of Abbeville (Vermilion Parish), Louisiana, during a state-wide survey in 1993. This constitutes a new state record and currently represents its westernmost distribution.

Darsie and Ward (1981) reported that *Anopheles quadrimaculatus* Say occurs throughout the northeast, southeast, and southwest of the United States. *Anopheles quadrimaculatus* has been considered a single species since its original description in 1824. However, Kaiser et al. (1988), Lanzaro et al. (1988), and Narang and Seawright (1988) recently established that *An. quadrimaculatus* is a species complex after identifying 3 sibling species by cytotaxonomy, hybridization studies, and isozyme analyses. A dichotomous taxonomic key of the sibling species based on isozymes was published by Narang et al. (1989a). The species were tentatively designated as species A, B, and C. Another member of the complex (species D) was identified by Narang et al. (1989b) and added to the electrophoretic key. Additional research by Narang et al. (1990) revealed that species C was divided into 2 geographic isolates, species C_1 and C_2. All of the sibling species and their geographic isolates currently are morphologically indistinguishable.

Members of this species complex display some habitat preference and possess moderate differences in pesticide resistance. Habitat preference is particularly applicable to species A, which generally prefers more open terrain, e.g., agricultural lands. Species C often is found in swamplands and species D in woodlands. However, it is not uncommon to collect multi-species in a given habitat.

Mallet and Fritzius (1993) reported that species A demonstrates high pesticide resistance to malathion in Mississippi and is evolving resistance to pyrethroids. They reported that species B and D in Mississippi were susceptible also to malathion and permethrin.

Extensive and independent surveys were conducted in Mississippi and Louisiana to determine the distribution of the species complex for each state. Entomologists in Mississippi located species A, B, and D but were unable to find species C (Mallet and Fritzius 1993). In the initial stages of identification of mosquitoes from the 1993 Louisiana survey, the authors found species A, B, and D, which substantiated earlier survey results (Seawright et al. 1992). In addition, species C of the complex was found in a cypress swamp south of Abbeville (Vermilion Parish), Louisiana. The authors identified the specimens by starch gel electrophoresis techniques similar to those of Narang and Seawright (1988). The identification was based on the diagnostic electromorphs of hydroxy acid dehydrogenase (Had-3), phosphoglucose isomerase (Pgi-1), and isocitrate dehydrogenase (Idh-1 and Idh-2). This identification later was confirmed by J. A. Seawright and P. E. Kaiser of the USDA–ARS, Medical and Veterinary Entomology Research Laboratory (MAVERL) in Gainesville, Florida. Ribosomal DNA analysis by Kaiser showed the species to be the geographic isolate C_2.

This discovery constitutes a new state record and currently represents the westernmost distribution of species C. Seawright et al. (1992) previously reported that species C was found in only 2 states, Florida and Georgia. According to their records, species C was located as far west as Walton County, Florida. Eighty-one mosquitoes from the Abbeville site have been processed. This group

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consisted of 84% species C_2, 10% species A, and 6% species B.

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