Journal of the American Mosquito Control Association, 38(4):280–282, 2022

SCIENTIFIC NOTE

AEDEOMYIA (*AEDEOMYIA*) *SQUAMIPENNIS*—NEW GENUS AND SPECIES COUNTY RECORD FOR MONROE COUNTY, FLORIDA, USA

MICHAEL BOEHMLER

Florida Keys Mosquito Control District, 100701 Overseas Highway, Key Largo, FL 33037

ABSTRACT. *Aedeomyia* (*Aedeomyia*) *squamipennis* is a tropical mosquito that has only recently been observed in the USA. Its natural range of Central and South America has been expanded to several Caribbean islands and mainland Florida in recent years and has now been found in the Florida Keys. Despite its association with the Gamboa virus and avian malaria, concern for establishment and vectorial capacity is diminished in the Florida Keys due to *Ad. squamipennis*'s lack of preferred larval habitat.

KEY WORDS *Aedeomyia* (*Aedeomyia*) *squamipennis*, county record, Florida Keys, genus record, species record

A single female specimen of *Aedeomyia squamipennis* (Lynch Arribalzaga) was collected and identified in Monroe County, FL, during routine weekly adult surveillance on October 14, 2021. Florida Keys Mosquito Control District's (FKMCD) weekly surveillance utilizes a solid carbon dioxide/dry ice (CO_2)–baited Centers for Disease Control and Prevention (CDC) miniature light trap (Model 512; John W. Hock, Gainesville, FL) set for an approximately 24-h period. The collection site located on Cross Key has been monitored using CO_2-baited CDC light traps for 18 years. This is the first observation of *Ad. squamipennis* at this location (Fig. 1) and in the Florida Keys.

One of 7 species in its genus, *Ad. squamipennis* is the only species of this genus found in the Americas (Dyar 1928). Six of the 7 species, including *Ad. squamipennis*, belong to the subgenus *Aedeomyia*, and only *Ae. furfurea* (Enderlein) belongs to the subgenus *Lepiothauma*. *Aedeomyia squamipennis* is a tropical species whose natural range extends from Mexico to Argentina (Heinemann and Belkin 1977, 1979). In recent years, *Ad. squamipennis* has been found outside its Central–South American range, including mainland Florida (Burkett-Cadena and Blosser 2017), Cuba (Peraza Cuesta et al. 2015), and Hispaniola (Dominican Republic) (Pena and Chadee 2004). Since it is a new species to the USA, no identification guides were readily accessible at FKMCD, so an identification guide from Australia was used to identify the genus (GWADOH 2021). Positive identification of *Ad. squamipennis* can be made with identification keys by Belkin et al. (1970) and Clark-Gil and Darsie (1983), but these were not used during initial observation. Further investigation and opportune timing of a visit to the Florida Medical Entomological Laboratory in Vero Beach, FL, provided species confirmation of the specimen (Burkett-Cadena and Blosser 2017; Burkett-Cadena, personal communication). Succinctly described by Burkett-Cadena and Blosser (2017), *Ad. squamipennis* is a medium-sized species and adult females are identified by short, thick antennal flagellomeres; wings covered in a striking pattern of broad white, yellow, and brown scales; absence of prespiracular and postspiracular setae; and an apical tuft of scales on the mid- and hind femora (Fig. 2A, 2B). Descriptions of both the males and larval forms of this species are also provided by Burkett-Cadena and Blosser (2017) but are not discussed in this text.

The collection site on Cross Key (25.188579°N, 80.390503°W), colloquially called "Lois Ryan Road" by FKMCD staff, is a private road surrounded by tidal red (*Rhizophora mangle* L.) and black mangrove (*Avicennia germinans* L.) swamps. Associated catch included *Aedes taeniorhynchus* (Wiedemann), *Ae. triseriatus* (Say), *Anopheles atropos* Dyar and Knab, *Culex nigripalpus* Theobald, and *Cx. bahamensis* Dyar and Knab. Characterized by tidal saltwater and brackish water pockets, this swamp produces large populations of *Ae. taeniorhynchus* during the summer months and *An. atropos* during the fall and winter, and is most heavily populated during the wet summer months (Hribar 2002, 2021).

Aedeomyia squamipennis is typically associated with aquatic plants, particularly *Pistia stratiotes* (L.), *Azolla* sp., *Salvania* sp., *Utricularia* sp., and *Eichhornia crassipes* (Mart.) Solms (Tyson 1970), but most likely associated with *Pistia* spp., especially in southern Florida (Peterson and Linley 1995, Burkett-Cadena and Blosser 2017). These aquatic plants are not found in close proximity to the trap site and are also generally considered to be associated with freshwater, a habitat not provided by mangrove swamps or the Florida Keys topography. Additionally, *Ad. squamipennis* larvae have yet to be reported in tidal floodwater or brackish water. For these

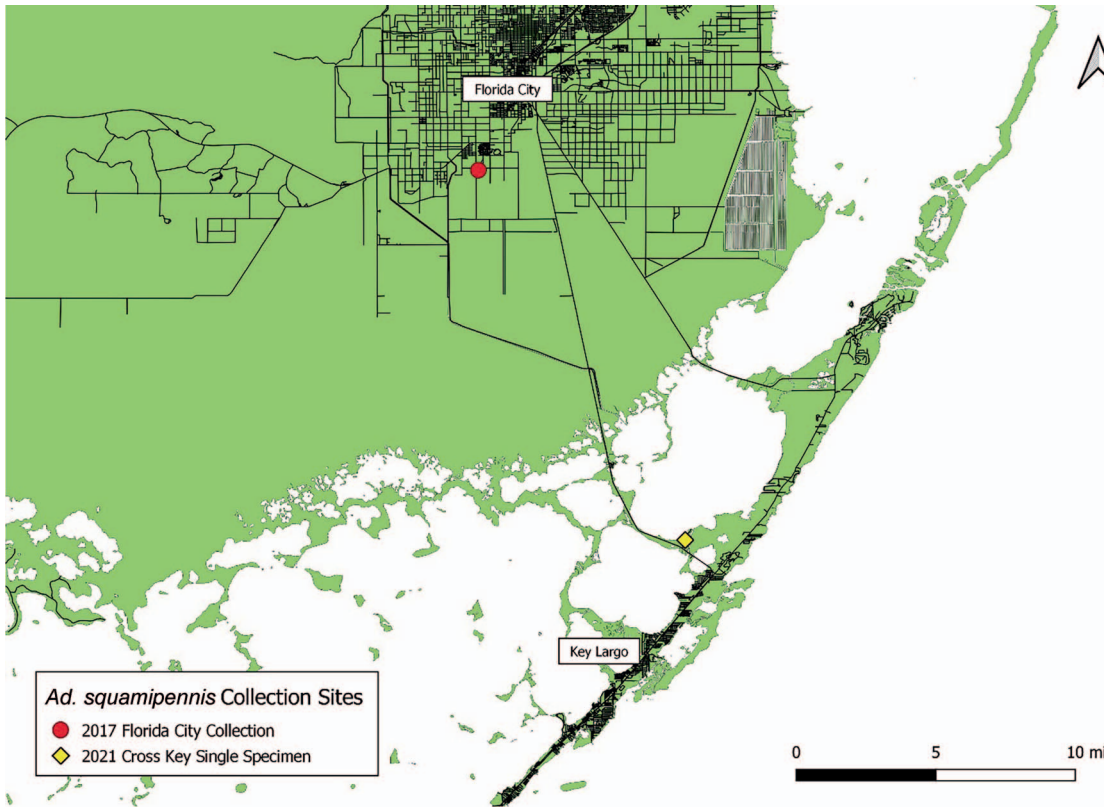

Fig. 1. Location of Burkett-Cadena and Blosser (2017) *Aedeomyia squamipennis* collection site in relation to the Florida Keys Mosquito Control District weekly surveillance site where 1 specimen of *Ad. squamipennis* was identified in October 2021.

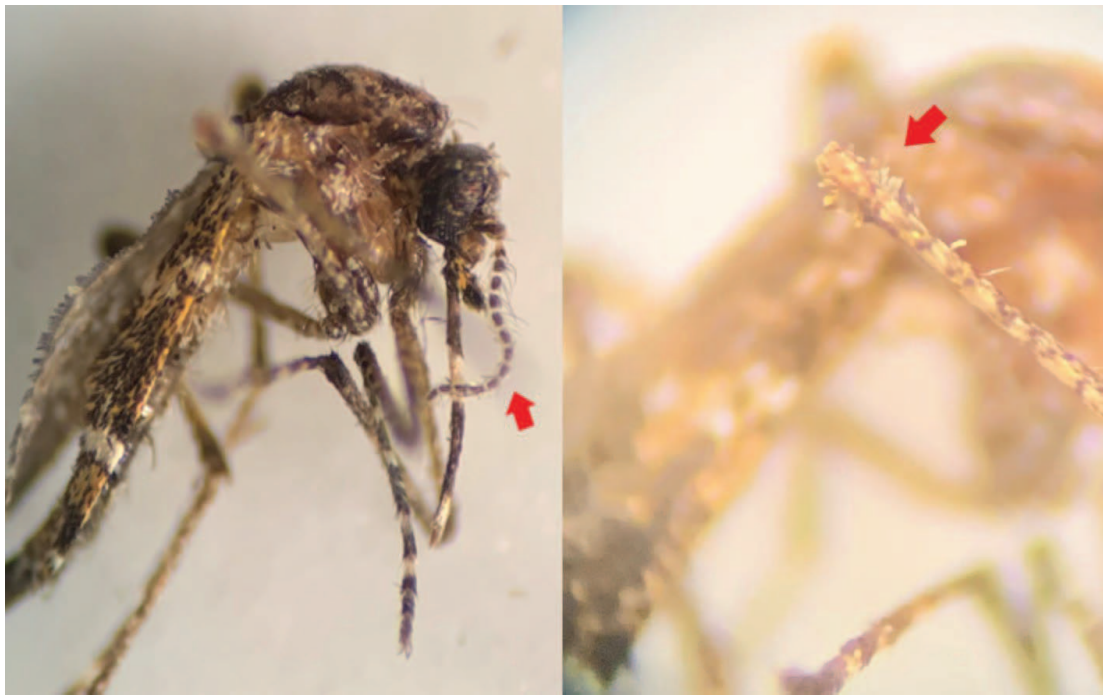

Fig. 2. *Aedeomyia squamipennis* showing identifying characteristics. (A) Full body picture and arrow showing unique flagellomeres. (B) Arrow showing erect scales at the apical end of the hind femora.

reasons, it is unlikely that this species will become established in the Florida Keys.

Wind speed and direction in the week leading up to this novel collection varied between 12.1 and 21.6 mph, with wind gusts up to 60 mph and wind direction ranging from 57° to 146° (ENE–SE) (Visual Crossing 2022). This highly variable wind speed and direction indicate that wind-driven migration may have brought *Ad. squamipennis* from the Everglades National Park in mainland Florida approximately 6 mi north of the trap site, where associated freshwater aquatic plants are more abundant. Although wind-driven migration is a possible explanation for this collection, so too is population expansion. The collection site is located 16.6 mi southeast of the initial collection made in 2017, suggesting that *Ad. squamipennis* has migrated from its initial discovery locality and is expanding its range in South Florida. This species may have already established in mainland Monroe County, but FKMCD does not monitor mosquito populations outside the populated archipelago.

This novel species' presence in Florida carries with it a potential for introduction of arboviruses to the state. Studies have shown it to be a prominent carrier of Gamboa virus (GAMV) (Calisher et al. 1981, Mitchell et al. 1985), and vertical transmission of GAMV by *Ad. squamipennis* has been seen in the field (Dutary et al. 1989). Field-collected specimens have also been shown to carry avian malaria (*Plasmodium* spp.) (Gager et al. 2008) and Venezuelan equine encephalitis virus (Mitchell et al. 1985). This species has the potential to become an important vector of these pathogens in mainland Florida, but it is unlikely that it will become an important vector in the Florida Keys.

REFERENCES CITED

Belkin JN, Heinemann SJ, Page WA. 1970. *The Culicidae of Jamaica*. Kingston, Jamaica: Institute of Jamaica.

Burkett-Cadena ND, Blosser EM. 2017. *Aedeomyia squamipennis* (Diptera: Culicidae) in Florida, USA, a new state and country record. *J Med Entomol* 54:788–792.

Calisher CH, Lazuick JS, Justines G, Francy DB, Monath TP, Gutierrez E, Sabattini MS, Bowen GS, Jakob WL. 1981. Viruses isolated from *Aedeomyia squamipennis* mosquitoes collected in Panama, Ecuador, and Argentina: establishment of the Gamboa serogroup. *Am J Trop Med Hyg* 30:219–223.

Clark-Gil S, Darsie RF. 1983. The mosquitoes of Guatemala. *Mosq Syst* 15:151–294.

Dutary BE, Peterson JL, Pralta PH, Tesh RB. 1989. Transovarial transmission of Gamboa virus in a tropical mosquito, *Aedeomyia squamipennis*. *Am J Trop Med Hyg* 40:108–113.

Dyar HG. 1928. *The mosquitoes of the Americas*. Washington, DC: Carnegie Institution of Washington.

Gager AB, Loaiza JR, Dearborn DC, Bermingham E. 2008. Do mosquitoes filter the access of *Plasmodium* cytochrome b lineages to an avian host? *Mol Ecol* 17:2552–2561.

GWADOH [Government of Western Australia Department of Health]. 2021. *Adult female mosquito identification key: Kimberley Region* [Internet]. Perth, Australia: Government of Western Australia Department of Health [accessed October 14, 2021]. Available from: https://ww2.health.wa.gov.au/Articles/J_M/Mosquito-identification-adult?msclkid=2a03e975abb911eca67fd4e675d7615c.

Heinemann SJ, Belkin JN. 1977. Collection records of the project Mosquitoes of Middle America. 8. Central America: Belize (BH), Guatemala (GUA), El Salvador (SAL), Honduras (HON), Nicaragua (NI, NIC). *Mosq Syst* 9:403–454.

Heinemann SJ, Belkin JN. 1979. Collection records of the project "Mosquitoes of Middle America." 13. South America: Brazil (BRA, BRAP, BRB), Ecuador (ECU), Peru (PER), Chile (CH). *Mosq Syst* 11:61–118.

Hribar LJ. 2002. Mosquito (Diptera: Culicidae) collections in the Florida Keys, Monroe County, Florida, USA. *Stud Dipterol* 9:679–691.

Hribar LJ. 2021. Dataset for mosquitoes (Diptera: Culicidae) from Cross Key, Monroe County, Florida, USA. *Res Ideas Outcomes* 7:e73768.

Mitchell CJ, Monath TP, Sabattini MS, Cropp CB, Daffner JF, Calisher CH, Jakob WL, Christensen HA. 1985. Arbovirus investigations in Argentina, 1977–1980. II. Arthropod collections and virus isolations from Argentine mosquitoes. *Am J Trop Med Hyg* 34:945–955.

Pena CJ, Chadee DD. 2004. *Mansonia dyari, Mansonia flaveola* and *Aedeomyia squamipennis* in the Dominican Republic, three new country records. *J Am Mosq Control Assoc* 20:449–450.

Peraza Cuesta I, Pérez Castillo I, Mendizábal Alcalá ME, Valdés Miró V, Leyva Silva M, Marquetti Fernández MDC. 2015. Riqueza y distribución de especies de culicídos en la provincia La Habana, Cuba. *Rev Cubana Med Trop* 67:270–278.

Peterson JL, Linley JR. 1995. Description of the egg of *Aedeomyia squamipennis* (Diptera: Culicidae). *J Med Entomol* 32:888–894.

Tyson WH. 1970. Contributions to the mosquito fauna of Southeast Asia. VII. Genus *Aedeomyia* Theobald in Southeast Asia. *Contrib Am Entomol Inst* [Internet] 6(2):1–28 [accessed January 19, 2022]. Research Contract No. DA-49-193-MS-2672. Available from: ADA510786.pdf (dtic.mil).

Visual Crossing. 2022. *Weather Data Services—Weather Query Builder* [Internet]. Reston, VA: Visual Crossing [accessed January 20, 2022]. Available from: https://www.visualcrossing.com/weather/weather-data-services.