



BUG BIZ

Pest Management and Insect Identification Series



Aedes albopictus, Asian Tiger Mosquito (Diptera: Culcidae)

Bandana Shrestha, Forest Huval, Chris Carlton, Thomas Reagan

Description

The Asian tiger mosquito is an introduced invasive species in North America capable of transmitting multiple viruses to humans, including eastern equine encephalitis (EEE), West Nile virus, dengue, chikungunya and Zika. The common name is due to bold black and white, tiger striped appearance of adult mosquitoes. A bold, white strip down the middle of the thorax is diagnostic and distinguishes the species from the otherwise similar yellow fever mosquito (*Aedes aegypti*). Adult Asian tiger mosquitos measure approximately 1/6 to 1/4 of an inch (4 to 6 mm) in length. Males are 20% smaller than females. Male and female Asian tiger mosquitoes differ in physical characteristics. The male has feathery antennae and modified mouthparts that facilitate nectar feeding. Females possess a long slender feeding tube (proboscis) suited for insertion into the skin and withdrawing blood. The antennae are slender and lack the feathery appearance. Larvae are aquatic, elongate, covered with long hairs and are similar in appearance to those of other mosquito species. They are referred to as wrigglers due to their chaotic movements when disturbed from their usual position just below the water's surface. Eggs are black and are deposited on damp surfaces above the water.

Life Cycle

Asian tiger mosquitos reproduce in receptacles such as flower pots, rain gutters, bird baths, tires, barrels, boats, cans, garden pools and flooded tree holes. Both male and female adult mosquitoes feed on nectar while only the female mosquito requires a blood meal to produce eggs. Larvae may hatch in as little as 24 hours after egg deposition and are filter feeders just below the water surface, with the rear breathing tube (spiracle) typically in contact with the atmosphere. Under optimum conditions, larvae pupate and

Asian tiger mosquito, adult female feeding (Jim Baker, North Carolina State University, Bugwood.org, Creative Commons 3.0).



Asian tiger mosquito, adult female (Susan Ellis, Bugwood.org, Creative Commons 3.0).

transform into tumblers, which also maintain positions at the surface but actively evade disturbances. Adults emerge from the pupal cases (eclosion) at the surface and, after a period of further development, fly away. Females are capable of taking a blood meal within a day and may live for several weeks.

Ecological Significance and Pest Status

Since the species began to be introduced by humans from its native Southeast Asia, it has become one of the most widely distributed mosquito species globally. In tropical regions, Asian tiger mosquitoes are active year-round. In more temperate climates, they overwinter as eggs. Asian tiger mosquito females are highly food motivated biters, primarily feeding during daylight and crepuscular hours. The species utilizes a wide range of hosts, including humans, domestic and wild animals, and birds. The Asian tiger mosquito is capable of transmitting pathogens responsible for various diseases, including Zika, chikungunya, dengue, dog heartworm disease and others. In the New Orleans area, it is a primary vector of dog heartworm. This makes them a significant urban nuisance and disease threat for individuals who work or engage in outdoor activities. The Asian tiger mosquito has displaced the yellow fever mosquitos in many parts of its range, but in some areas, including parts of New Orleans and probably other Louisiana cities, the two species coexist.

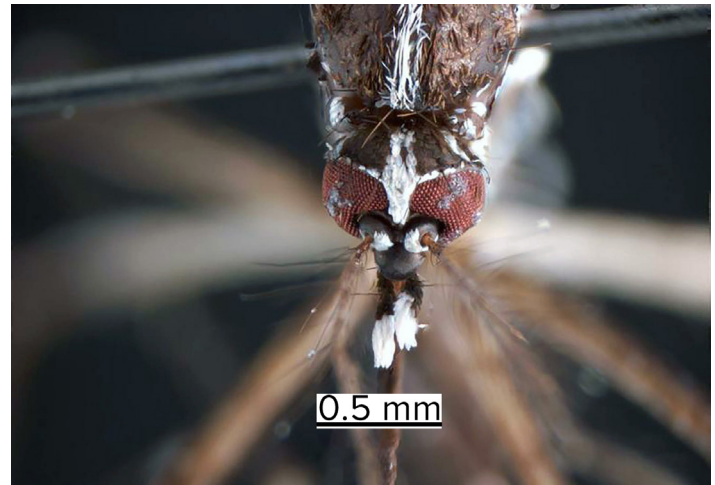
Management

The wide variety of habitats occupied by Asian tiger mosquitoes and their aggressive daytime feeding habits has led to large populations of the species in urban and suburban areas. Management of the species has proven difficult and requires communitywide efforts. Introduction of mosquitofish (*Gambusia affinis*) and predatory mosquitoes (e.g., the elephant mosquito, *Toxorhynchites rutilus*) has shown promise as natural controls, but Asian tiger mosquitoes can survive and reproduce in very small water vessels that may dry frequently, eliminating their predators. Microbial insecticides based on *Bacillus thuringiensis israelensis* (Bti) and methoprene are effective in controlling tiger mosquitoes, but application is labor-intensive due to the large number and often concealed breeding sites.

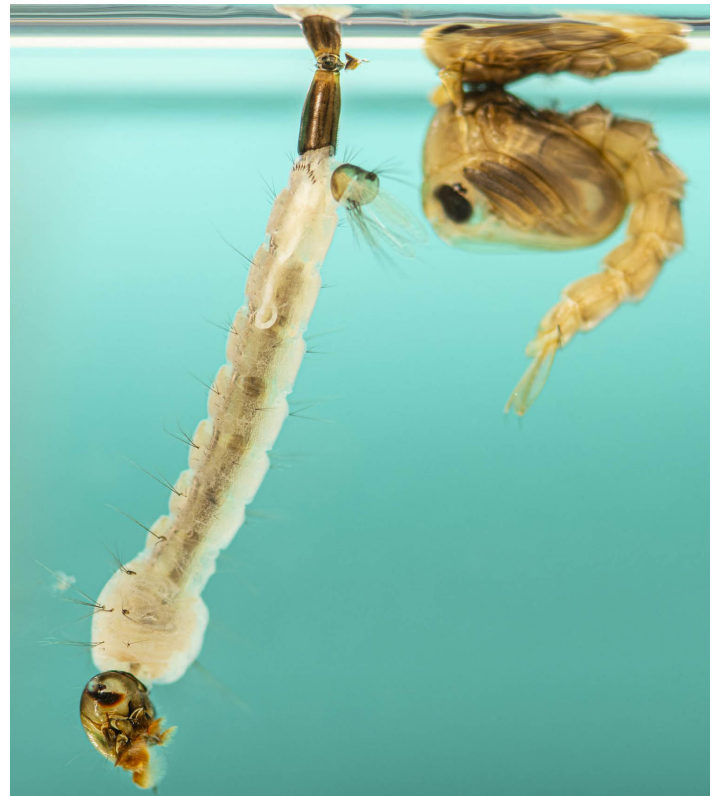
Egg traps are used by mosquito control services to monitor for the presence of the various mosquito species. These traps contain water to attract female mosquitoes to lay their eggs. For species that lay eggs above the water such as tiger mosquitos, a corrugated side facing up is provided as a moist substrate. These traps are filled to a proper level and larvicides are added to prevent unintentional development. They are checked approximately every two weeks.

Community actions to prevent population buildups of Asian tiger mosquito and other species are by far the most effective approaches in urban mosquito management. These involve removal of all sources of standing water from around neighborhoods, including items such as baby pools, flowerpots and birdbaths. In situations where it is not possible to remove breeding sites, such as catch basins or road drains, larvicides should be applied to control the growth of larvae.

Residential spray services or public mosquito control authorities can be enlisted to perform treatments of public and private areas using insecticides, although treatments usually provide only temporary control. One unique approach involves introducing copepod crustaceans, such as *Macrocyclus albidus*, *Mesocyclops leuckarti* and *Mesocyclops longisetus*, that are predators of mosquito larvae in permanent water containers (e.g., drums in gardens) or nutrient rich roadside ditches, where they thrive and feed on mosquito larvae.



Asian tiger mosquito, adult female, detail of head and thorax (Pest and Diseases Image Library, Bugwood.org, Creative Commons 3.0).



Aedes sp. larva, left, and pupa (U.S. Centers for Disease Control, Creative Commons 3.0).

References

- G. Benelli, A.B. Wilke, and J.C. Beier. 2020. *Aedes albopictus* (Asian Tiger Mosquito). Trends in parasitology. 36. 942–943. <https://doi.org/10.1016/j.pt.2020.01.001>.
- H. Seebens, T. M. Blackburn, E. E. Dyer, P. Genovesi, P.E. Humle, J.M. Jeschke... et al. 2017. No saturation in the accumulation of alien species worldwide. Nature Communications, 8. 1-9.
- M.Q Benedict, R. S. Levine, W.A. Hawley, and L. P. Lounibos. 2007. Spread of The Tiger: Global Risk of Invasion by The Mosquito *Aedes albopictus*. Vector-Borne and Zoonotic Diseases. 7.76-85. <http://doi.org/10.1089/vbz.2006.0562>.
- R., Bellini, A. Michaelakis, D. Petrić, F. Schaffner, B. Alten, P. Alten, Bulent, P. Angelini, C. Aranda, N. Becker, M. Carrieri and M.D. Luca. 2020. Practical management plan for invasive mosquito species in Europe: I. Asian tiger mosquito (*Aedes albopictus*). Travel medicine and infectious disease, 35, 101691. <https://doi.org/10.1016/j.tmaid.2020.101691>.
- S. Sherpa. 2021. Why is the tiger mosquito so invasive? Encyclopedia of the environment. 1-10. https://www.encyclopedia-environnement.org/en/life/why-tiger-mosquito-invasive/#_ftnref3.

Contact Us: For advice about arthropod identification or diagnosis, contact the LSU AgCenter Department of Entomology. Reach the department through the Contact Us webpage: <https://bit.ly/36c4awm>.



PUB3901 (online) 1/24

The LSU AgCenter and LSU provide equal opportunities in programs and employment.

Visit our website: www.LSUAgCenter.com