

# Immatures of *Wyeomyia (Tryamyia) aporonoma* (Diptera: Culicidae) Collected in Artificial Breeding in the South Brazil

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**Abstract.** Reported is a date of immature forms of *Wyeomyia (Triamyia) aporonoma* Dyar & Knab in artificial container, associated with *Aedes (Stegomyia) albopictus* (Skuse) is provided. The record was made during entomological survey at the municipality of Matinhos, littoral of the state of Paraná, Brazil.

**Keywords:** Culicinae; Entomological Surveillance; Mosquitoes; Sabethini; Vector Ecology.

## Imaturos de *Wyeomyia (Tryamyia) aporonoma* (Diptera: Culicidae) Coletados em Criadouro Artificial no Sul do Brasil

**Resumo.** Relata-se o encontro de formas imaturas de *Wyeomyia (Triamyia) aporonoma* Dyar & Knab em recipiente artificial, associado ao *Aedes (Stegomyia) albopictus* (Skuse), durante inquérito entomológico no município Matinhos, litoral do estado do Paraná, Brasil.

**Palavras-chaves:** Culicinae; Ecologia de Vetores; Mosquitos; Sabethini; Vigilância Entomológica.

Mosquitoes belonging to the genus *Wyeomyia* (Diptera: Culicidae) are widespread in the American Continent. They occur in different biomes of the Nearctic and Neotropical regions. They find, in the forest environment, appropriate conditions for reproduction, shelter, food and places where their immatures can develop.

In the forest, *Wyeomyia* females oviposit in aquatic microecosystems known as phytotelmata, which result from the accumulation of water in certain structures of terrestrial plants. Bromeliads, Araceae, bracts, bamboo internodes, tree holes, fruit peels and fallen leaves, form the natural phytotelmata that house the immature forms of *Wyeomyia* (CONSOLI & LOURENÇO-DE-OLIVEIRA 1994; FORATTINI 2002).

It is not known exactly where in anthropic environments *Wyeomyia* females oviposit. According to FORATTINI *et al.* (1990), anthropic areas adjacent to the originally favored sites may harbor niches that can be occupied by sylvatic mosquitoes. SILVA *et al.* (2004), for instance, found immature forms of *Wyeomyia* spp. on the bromeliads of an area impacted by mining in the municipality of Paranaguá, Brazil, demonstrating that these mosquitoes are able to colonize breeding sites in anthropic environments.

It is rare to find *Wyeomyia* spp. in artificial containers in the American continent, but there have been a few reports. In Costa Rica, *Wyeomyia (Triamyia) aporonoma* Dyar & Knab immatures were found in a sink with church holy water (KUMM *et al.* 1940). In French Guyana, immatures of *Wyeomyia argenteostris* (Bonne-Wepster & Bonne) were collected from small tanks (FLOCH & ABONNENC 1947). In Panama, *Wyeomyia (Wyeomyia) arthrostigma* (Lutz) immatures were found colonizing abandoned cans (ARNETT 1949) and in Tobago the species was collected from artificial containers (CHADEE *et al.* 1984; CHADDE 1990). In Brazil

were collected eggs *Wy. (Tra.) aporonoma* in ovitraps traps installed in four different Paraíba Valley's microregions, state of São Paulo (SANTOS-NETO & MARQUES 1996).

*Wyeomyia (Triamyia) aporonoma* is widely distributed in 18 countries of the Neotropical region, from Mexico to Argentina, including Brazil (Walter Reed Biosystematics Unit. Available at: <http://www.wrbu.org/>). In the state of Paraná *Wy. (Tra.) aporonoma* has been recorded from Cambará, Londrina, Paranaguá and Foz do Iguassu (LANE & CERQUEIRA 1942; GUIMARÃES *et al.* 2003).

In Forests *Wy. (Tra.) aporonoma* are diurnal, and occur near the ground, where they feed on the blood of wild animals and occasionally human blood (GALINDO *et al.* 1955; TRAPIDO *et al.* 1955; AITKEN 1956; FORATTINI *et al.* 1968; ROBERTS *et al.* 1981; GUIMARÃES *et al.* 1985). At least some species of *Wyeomyia* seem to prefer natural containers in shady places in the forest ground, such as Araceae and Bromeliaceae. This may influence the choice of oviposition sites that are protected from the sun in the urban environment.

However, little is known about the diversity patterns of mosquitoes in urban areas and their epidemiological implications. The epidemiological relevance of *Wyeomyia* lies in the maintenance of wild arboviruses. In Trinidad, the virus Kairi (*Orthobunyavirus*) was obtained from *Wy. (Tra.) aporonoma* and *Wyeomyia* spp. (ANDERSON *et al.* 1960). However, at the Yucatán Peninsula, in Mexico, there is evidence that this virus circulates among domestic animals and humans (FARFAN-ALE *et al.* 2009; BLITVICH *et al.* 2012).

The virus Kairi also occurs in tropical and subtropical regions of South America, where it is potentially infectious to humans and animals, both domestic and wild. In Brazil, the virus has been

found in natural hosts such as monkeys and Aedini mosquitoes (WOODAL 1967; CAUSEY *et al.* 1961). In Argentina, it was detected in horses and humans (CALISHER *et al.* 1988; TAURO *et al.* 2009).

This is the first report of *Wyeomyia* colonizing artificial breeding sites in the South Brazil. On 07.29.2015, during entomological survey of the municipality of Matinhos, littoral of the state of Paraná, 66 immature mosquitoes were collected from water accumulated in two tires, using a fine white-mesh net (10 cm in diameter and 15 cm in length) with short cable. Of these, 16 were *Wy. (Tra.) aporonoma* larvae and the other 50 (46 larvae and four pupae) were *Aedes (Stegomyia) albopictus* (Skuse). The tires were in the shade, in the backyard of an educational center at an urban area (25°49,87'S; 48°32,97'W (DDM) - approximate elevation 7 meters above sea level and 450 meters far from the forest), and were being used to decorate a fern, popularly known as samambaia (Figure 1).

The identification of *Wy. (Tra.) aporonoma* was based on morphological characters of the immatures following LANE & CERQUEIRA (1942) and LANE (1953), with some variations: head - seta # 7 double or triple; abdomen - four dorsal setae on siphon (three simple and one preapical double or triple). Inclusion of *Wy. aporonoma* subgenus *Triamyia* was based on MOTTA *et al.* (2007). The immature forms of *Ae. (Stg.) albopictus* were

identified based on the key by FORATTINI (2002). The mosquito name abbreviations follow REINERT (2009).

Voucher material is deposited at the entomological collection Padre Jesus Santiago Moure (Diptera), "Universidade Federal do Paraná", Curitiba, Paraná, Brazil (DZUP), accession numbers DZUP 249.277 to 249.279, [*Wy. (Tra.) aporonoma*], and DZUP 249.280 to 249.282, [*Ae. (Stg.) albopictus*].

The fact that immature forms of *Wy. (Tra.) aporonoma* were found together with *Ae. (Stg.) albopictus*, a synanthropic species, suggests that the former can be able to occupy the same types of artificial recipients abandoned in anthropic environments. In Florida, *Wyeomyia (Wyeomyia) vanduzeei* Dyar & Knab immatures was found in Bromeliaceae with *Aedes (Stegomyia) aegypti* (Linnaeus) or *Culex (Culex) quinquefasciatus* Say (HRIBAR *et al.* 2004).

On a last note, the record of immatures of *Wy. (Tra.) aporonoma* in artificial containers brings up some questions: is this an accidental finding? Do females of *Wy. (Tra.) aporonoma* find new shelters and food sources in the urban areas of Parana's littoral? These questions may possibly open up new perspectives in the study of the adaptive potential of the species in the anthropic environment.



Figure 1. Collection site of immature forms *Wyeomyia (Triamyia) aporonoma* e *Aedes (Stegomyia) albopictus*, Matinhos city, state of Paraná, Brazil (Silva, A.M.).

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### REFERENCES

- Aitken, T.H.G., 1956. Entomological aspects of the Trinidad virus research program. Proceedings of the Tenth International Congress of Entomology, 3: 573-580.
- Anderson, C.R., T.H.G. Aitken, J.P. Speace & W.C. Downs, 1960. Kairi virus, in new virus from Trinidad forest mosquitoes. American Journal of Tropical Medicine and Hygiene, 9: 70-72.
- Arnett, R.H., 1949. Notes on the distribution, habits, and habitats of some Panama culicines (Diptera: Culicidae). Journal of the New York Entomological Society, 57: 233-251.
- Blitvich, B.J., R. Saiyasombat, L.G. Talavera-Aguilar, J.E. Garcia-Rejon, J.A. Farfan-Ale, C. Machain-Williams & M.A. Loroño-Pino, 2012. Orthobunyavirus Antibodies in Humans, Yucatan Peninsula, Mexico. Emerging Infectious Diseases, 18: 1629-1632. DOI: <http://dx.doi.org/10.3201/eid1810.120492>.
- Calisher, C.H., J.G. Oro, R.D. Lord, M.S. Sabbatini & N. Karabatsos, 1988. Kairi virus identified from a febrile horse in Argentina. American Journal of Tropical Medicine and Hygiene, 39: 519-521.
- Causey, O.R., C.E. Causey, O.M. Maroja & D.G. Macedo, 1961. The isolation of arthropod-borne viruses including members of two hitherto undescribed serological groups, in the Amazon Region of Brazil. American Journal of Tropical Medicine and Hygiene, 10: 227-249.
- Chadee, D.D., 1990. *Aedes aegypti* surveillance in Tobago, West Indies (1983-88). Journal of the American Mosquito Control Association, 6: 148-150.



- Chadee, D.D., N.K. Connell, A. Le Maitre & S.B. Ferreira, 1984. Surveillance for *Aedes aegypti* in Tobago, West Indies (1980-1982). *Mosquito News*, 44: 490-492.
- Consoli, R.A.G.R. & R. Lourenço-de-Oliveira, 1994. Principais mosquitos de importância sanitária no Brasil. Rio de Janeiro, Fundação Oswaldo Cruz, 228 p.
- Farfan-Ale, J.A., M.A. Lorono-Pino, J.E. Garcia-Rejon, E. Hovav, A.M. Powers, M. Lin, K.S. Dorman, K.B. Platt, L.C. Bartholomay, V. Soto, B.J. Beaty, R.S. Lanciotti & B.J. Blitvich, 2009. Detection of RNA from a novel West Nile-like virus and high prevalence of an insect-specific flavivirus in mosquitoes in the Yucatan Peninsula of Mexico. *American Journal of Tropical Medicine and Hygiene*, 80: 85-95.
- Floch, H. & E. Abonnenc, 1947. Distribution des moustiques du genre *Culex* en Guyane Française. *Archives de l'Institut Pasteur de la Guyane Française*, 146: 9.
- Forattini, O.P., 2002. *Culicidologia médica, Identificação, Biologia, Epidemiologia*, vol. II. São Paulo, Editora da Universidade de São Paulo, 864 p.
- Forattini, O.P., A.C. Gomes, J.D. Santos, I. Kakitani & D. Marucci, 1990. Freqüência ao ambiente humano e dispersão de mosquitos Culicidae em área adjacente à Mata Atlântica primitiva da planície. *Revista de Saúde Pública*, 24: 101-107. DOI: <http://dx.doi.org/10.1590/S0034-89101990000200004>.
- Forattini, O.P., O.S. Lopes & E.X. Rabello, 1968. Investigações sobre o comportamento de formas adultas de mosquitos Silvestres no Estado de São Paulo, Brasil. *Revista de Saúde Pública*, 2: 111-173. DOI: <http://dx.doi.org/10.1590/S0034-89101968000200002>.
- Galindo, P., S.J. Carpenter & H.A. Trapido, 1955. Contribution to the Ecology and Biology of Tree Hole Breeding Mosquitoes of Panama. *Annals of the Entomological Society of America*, 48: 158-164. DOI: <http://dx.doi.org/10.1093/aesa/48.3.158>.
- Guimarães, A.É., M. Arlé & R.N.M. Machado, 1985. Mosquitos no Parque Nacional da Serra dos Órgãos, estado do Rio de Janeiro, Brasil. II. Distribuição vertical. *Memórias do Instituto Oswaldo Cruz*, 80: 171-185. DOI: <http://dx.doi.org/10.1590/S0074-02761985000200008>.
- Guimaraes, A.É., C.M. Lopes, R.P. Mello & J. Alencar, 2003. *Ecologia de mosquitos (Diptera, Culicidae) em áreas do Parque Nacional do Iguazu, Brasil: 1 - Distribuição por hábitat*. *Cadernos de Saúde Pública*, 19: 1107-1116. DOI: <http://dx.doi.org/10.1590/S0102-311X2003000400032>.
- Hribar, L.J., J.J. Vlach, D.J. Demay, S.S. James, J.S. Fahey & E.M. Fussell, 2004. Mosquito larvae (Culicidae) and other Diptera associated with containers, storm drains, and sewage treatment plants in the Florida Keys, Monroe County, Florida. *Florida Entomologist*, 87: 199-203. DOI: [http://dx.doi.org/10.1653/0015-4040\(2004\)087\[0199:mlcaod\]2.0.co;2](http://dx.doi.org/10.1653/0015-4040(2004)087[0199:mlcaod]2.0.co;2).
- Kumm, H., W. Komp & H. Ruiz, 1940. The mosquitoes of Costa Rica. *American Journal of Tropical Medicine and Hygiene*, 20: 385-422.
- Lane, J., 1953. *Neotropical Culicidae*, vol. II. São Paulo, Universidade de São Paulo, 1.112 p.
- Lane, J. & N.L. Cerqueira, 1942. Os Sabetíneos da América (Diptera, Culicidae). *Arquivos de Zoologia do Estado de São Paulo*, III: 473-849.
- Motta, M.A., R. Lourenço-de-Oliveira & M.A.M. Sallum, 2007. Phylogeny of genus *Wyeomyia* (Diptera: Culicidae) inferred from morphological and allozyme data. *The Canadian Entomologist*, 139: 1-37. DOI: <http://dx.doi.org/10.4039/n06-088>.
- Reinert, J.F., 2009. List of abbreviations for currently valid generic-level taxa in family Culicidae (Diptera). *European Mosquito Bulletin*, 27: 68-76.
- Roberts, D.R., A.L. Hoch, N.E. Peterson & F.P. Pinheiro, 1981. Programa multidisciplinario de vigilancia de las enfermedades infecciosas en zonas colindantes con la carretera transamazonica en Brazil. IV. Estudio entomológico. *Boletín de la Oficina Sanitaria Panamericana*, 91: 379-400.
- Santos-Neto, L.G. & C.C.A. Marques, 1996. Sobre ovos de mosquitos (Diptera, Culicidae) que colonizam recipientes artificiais. *Revista Brasileira de Entomologia*, 40: 17-20. DOI: <http://dx.doi.org/10.1590/S0073-47212004000100011>.
- Silva, A.M., V. Nunes & J. Lopes, 2004. Culicídeos associados a entrenós de bambu e bromélias, com ênfase em *Aedes (Stegomyia) albopictus* (Diptera, Culicidae) na Mata Atlântica, Paraná, Brasil. *Iheringia. Série Zoologia*, 94: 63-66.
- Tauro, L.B., F.L. Almeida & M.S. Contigiani, 2009. First detection of human infection by Cache Valley and Kairi viruses (Orthobunyavirus) in Argentina. *Transactions of the Royal Society Tropical Medicine and Hygiene*, 103: 197-199. DOI: <http://dx.doi.org/10.1016/j.trstmh.2008.09.004>.
- Trapido, H., P. Galindo & S.J. Carpenter, 1955. A survey of forest mosquitoes in relation to sylvan yellow fever in Panama isthmian area. *American Journal of Tropical Medicine and Hygiene*, 4: 525-542.
- Woodall, J.P., 1967. Vírus research in Amazônia. *Atas Simpósio Sobre Biota Amazônica*, 6: 31-63.

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