

Short Communication

New record and extended geographical distribution of *Aedes fluviatilis* (Lutz, 1904) in Ceará, northeastern Brazil

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Abstract

Introduction: *Aedes fluviatilis* (Lutz, 1904) is considered a potential vector of yellow fever and dengue viruses and is naturally infected by *Wolbachia*. **Methods:** In March 2018, during a field activity in the municipality of Saboeiro, 163 mosquito larvae were collected in a dammed area of the Jaguaribe River. **Results:** Of the larvae collected, 143 (87.7%) were identified as *Ae. fluviatilis*. **Conclusions:** We report the first documentation of *Ae. fluviatilis* in the municipality of Saboeiro, northeastern Brazil. It is important to conduct additional entomological surveys to characterize the local *Culicidae* fauna. Ignoring the presence and dispersion of this vector could be a public health risk.

Keywords: *Aedes*. Entomology. Arbovirus.

The subfamily Culicinae are mosquitoes of great interest for public health, because they include species that can transmit diseases such as dengue fever, zika, chikungunya, and yellow fever. Additionally, due to the hematophagous habits of females, they are great pests in human populations¹.

Aedes fluviatilis (Lutz, 1904) is a species of culicid mosquito that is widely distributed throughout Central and Latin America and into northern Mexico¹. Several Brazilian states have registered the species' presence in urban and peri-urban areas: Serra dos Órgãos National Park and in the cities of Rio de Janeiro², Ceará³, Paraná⁴, Goiás⁵, Federal District⁶, Rio Grande do Sul⁷, Amazonas⁸, and São Paulo⁹.

The capacity of *Ae. fluviatilis* to transmit yellow fever and dengue virus has been demonstrated experimentally¹⁰. Moreover, it is a vector of *Plasmodium gallinaceum*^{9,10}, a parasite of avian malaria and *Dirofilaria immitis*¹¹, an agent of canine cardiorespiratory diseases, which may also affect humans¹². Associated with its vectorial importance,

Ae. fluviatilis is naturally infected by *Wolbachia*, an endosymbiont capable of blocking the replication of the dengue virus in *Ae. aegypti*, but without any apparent influence on *Ae. fluviatilis*¹⁰.

The typical breeding sites of *Ae. fluviatilis* are accumulations of fresh water, such as in holes in rocks and trees¹³. They prefer aquatic environments with small amounts of visible organic matter that is exposed to sunlight, and shading factors and aquatic vegetation limit their occurrence. However, due to climatic changes and urbanization processes that alter natural environments, this vector has urbanized and recorded anthropophilic behaviour⁹. Another feature worth mentioning is its ability to share breeding grounds with other culicids, especially *Culex quiquefasciatus* and *Ae. aegypti*¹³.

Herein, we report the first record of *Ae. fluviatilis* in the municipality of Saboeiro in the south-central region of the State of Ceará, northeastern Brazil.

In March 2018, during a field activity conducted near a dam on the Jaguaribe River (E: 398.469°; N: 9.277.975°), 1.6 km from the municipality of Saboeiro, Ceará¹⁴ (**Figure 1**), the presence of mosquito larvae in rocky depressions was observed. Because they were morphologically similar to larvae of *Aedes aegypti* but did not present photophobia, they were collected and taken to the Laboratory of Medical Entomology of Cariri in the Municipality of Juazeiro do Norte for further identification.

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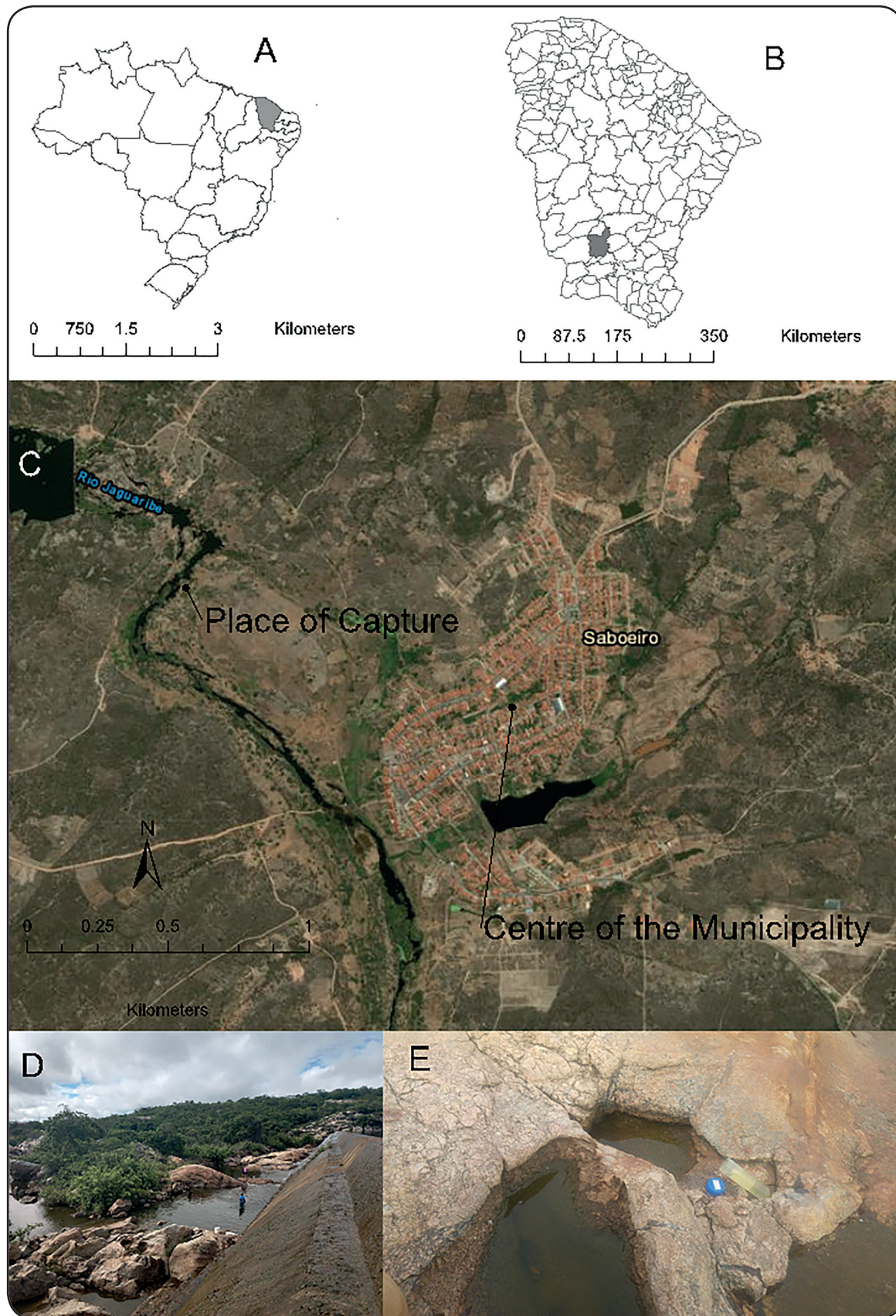


FIGURE 1: A. Brazil; B. Ceará state and the municipality of Saboeiro; C. Place of capture (dam of the Jaguaribe River) and the center of the municipality of Saboeiro. D. Dam of the Jaguaribe River. E. Location where the *Ae. fluviatilis* larvae were collected.
Source: A; B and C: ArcGIS base map; D and E: author.

In the laboratory, 163 larvae were arranged in trays measuring 37×23×6 cm, with 1000 mL of water. The larvae were fed with ornamental fish food (crushed) until metamorphosis was complete. Subsequently, mosquitoes were identified to species, with 20 (12.3%) identified as *Culex quinquefasciatus* and the other 143 (87.7%) as *Ae. fluviatilis*¹⁵.

The area where the larvae were collected, while not located in the urban perimeter, is heavily visited by people, as it is a popular area for fishing and leisurely activities, thus offering optimal conditions for the reproduction and survival of *Culicidae*.

Ignoring the presence and dispersion, 35 years after the first registration of this vector in the capital of Ceará³ could be a risk to public health. As this is the first record of this mosquito in the municipality of Saboeiro, northeastern Brazil, it is important to conduct entomological surveys and characterize the culicid fauna in urban and peri-urban areas, considering its potential as a vector for diseases that circulate in northeastern Brazil. There is recent evidence to suggest that this vector is well-adapted to the urban environment and is able to complete its entire life-cycle within cities, as observed in other regions^{4, 6, 9}.

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Conflict of Interest: The authors declare that there is no conflict of interest.

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