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SCIENTIFIC NOTE

NEW RECORDS OF MOSQUITO SPECIES FROM NORTHERN ARGENTINA

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ABSTRACT. Changes in the ecosystems of vector-borne diseases can make the environment more or less favorable for mosquito vectors, animal reservoirs, and disease transmission. We report for the 1st time *Anopheles marajoara* in Argentina. In addition, *An. deaneorum* is reported for the 1st time in northwestern area of the country. *Aedes fulvus*, *Culex eduardoi, Limatus durhamii*, *Mansonia pseudotitillans*, *Psorophora albigenu, Ps. cingulata*, and *Uranotaenia nataliae* are recorded for the 1st time in Tucumán Province. Data on collection localities and comments about medical importance are also presented.

KEY WORDS Distribution, mosquitoes, rainforest areas, urban areas

Changes in climatic conditions are currently having an effect on the spread of vector-borne diseases beyond known geographic and seasonal distributions (Ryan et al. 2019). Climatic variables can alter the environment in which these diseases are transmitted, making it more or less favorable for vectors, animal reservoirs, and disease transmission (Fouque and Reeder 2019). Changes in land use, such as the replacement of wild vegetation with extensive agriculture and urbanization, can also affect mosquito populations. Some mosquito species may be hindered by these changes, while others may thrive (Mattah et al. 2017).

Certain studies of mosquitoes in Tucumán Province were carried out, mainly in areas of the subtropical mountainous rainforest and other natural areas that have undergone anthropogenic modifications (Dantur Juri et al. 2012, 2020, 2022; Apumaita et al. 2023). During the last several decades, it has been observed that the extent of agricultural and urban areas has increased, which could influence environmental conditions for the presence and development of vectors of infectious diseases (Sabattini et al. 1998).

The present note aims to update the list of Culicidae species recorded from different areas of Tucumán Province, including new records of species from the country, its northwest region, and the province, and additional data on the collection localities and medical importance of species.

The research was conducted in 26 different localities situated in 9 administrative divisions (departments) within the province of Tucumán (Fig. 1). San Miguel de Tucumán (the capital), Yerba Buena, Monteros, Chicligasta, Río Chico, Simoca, La Cocha, and Burruyacú are departments located in the piedmont rainforest of the Yungas ecoregion, and the Leales Department is in the semiarid area of the Chaco ecoregion (Mendoza and González 2011).

Adult mosquitoes were collected with the Centers for Disease Control and Prevention light traps baited with carbon dioxide, using mechanical aspirators in natural or disturbed areas. Adults specimens were transported to the laboratory, killed by freezing, and kept separated for subsequent taxonomic identification. Voucher specimens were deposited in the collection of Fundación Miguel Lillo, Tucumán, Argentina. Mosquitoes were identified through direct observation of the morphologic characteristics, using a stereomicroscopic microscope, based on dichotomous keys by Lane (1953), Darsie (1985), and Mureb Sallum et al. (2020). The genus and subgenus abbreviations used in this scientific note are those defined by the Walter Reed Biosystematics Unit (WRBU 2023).

According to the taxonomic identification of the specimens collected, 9 new records are reported, including 2 from *Anopheles* (Meigen) and *Psorophora* (Robineau-Desvoidy), and 1 each from the following genera: *Aedes* (Meigen), *Culex* (L.), *Limatus* (Theobald), *Mansonia* (Blanchard), and *Uranotaenia* (Lynch Arribálzaga).

Anopheles deaneorum (Rosa-Freitas). New records. Argentina • 1 ♀; Tucumán Province, Monteros; 27° 11′35″S, 65°28′60″W; 357 m above sea level (masl); January 24, 2019; Determined by (Det.): E. Villarroel;

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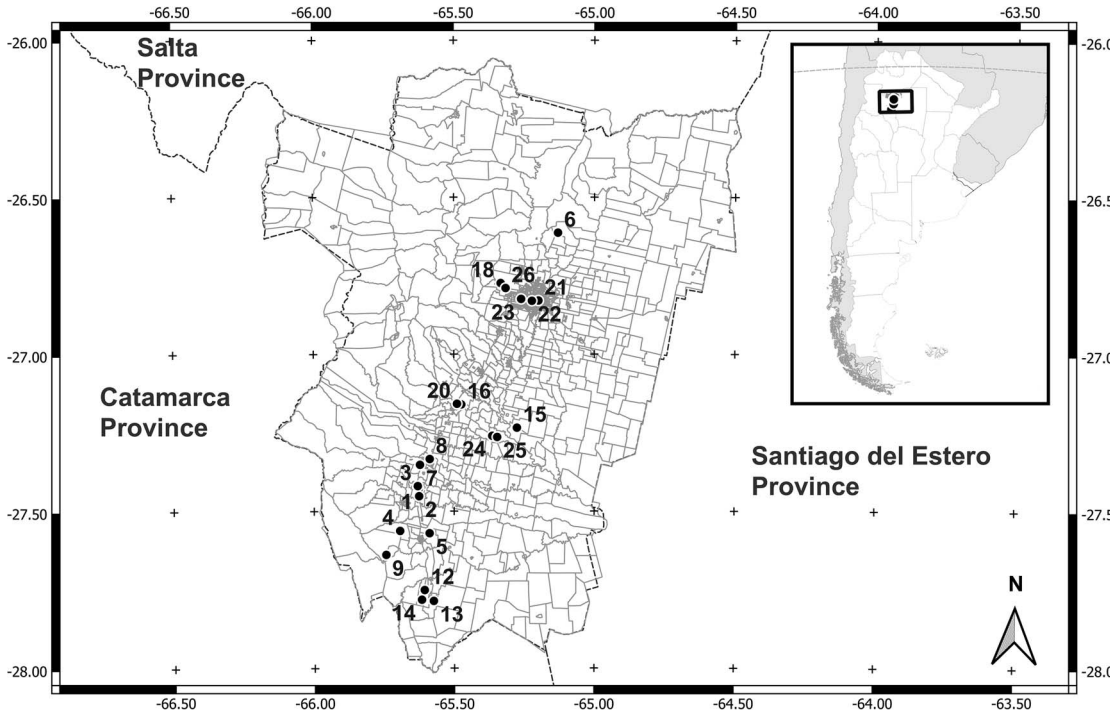

Fig. 1. Study area and localities of mosquito collections from Tucumán Province, Argentina: (1) Aguilares, (2) Aguilares, (3) Aguilares, (4) Alberdi, (5) Alberdi, (6) Burruyacú, El Timbo, (7) Concepción, (8) Concepción, (9) La Cocha, Batiruana, (10) La Cocha, Batiruana, (11) La Cocha, Batiruana, (12) La Cocha, (13) La Cocha, (14) La Cocha, (15) Leales, San Antonio, (16) Monteros, Capitán Cáceres, (17) Monteros, La Florida, (18) Monteros, Sargento Moya, (19) Monteros, (20) Monteros, (21) San Miguel de Tucumán, Aguas Corrientes, (22) San Miguel de Tucumán, Jardín Miguel Lillo, (23) San Miguel de Tucumán, Parque Guillermina, (24) Simoca, (25) Simoca, and (26) Yerba Buena, Horco Molle.

● 2 ♀; Tucumán Province, Monteros; 27°9′29″S, 65° 29′20″W; 354 masl.; January 22, 2019; Det.: E. Villarroel; ● 5 ♀; Tucumán Province, La Cocha; 27° 47′10″S, 65°34′25″W; 462 masl.; May 16, 2019; Det.: E. Villarroel. Current distribution in Argentina. Corrientes, Misiones (Rossi 2015), and Tucumán (this study). First report to the northwestern region.

Anopheles marajoara (Galvão and Damasceno). New records. Argentina ● 1 ♀; Tucumán Province, La Cocha; 27°46′56″S, 65°36′58″W; 467 masl.; May 16, 2019; Det.: E. Villarroel; ● 1 ♀; Tucumán Province, La Cocha; 27°45′5″S, 65°36′22″W; 439 masl.; May 16, 2019; Det.: E. Villarroel. Current distribution in Argentina. First report to Argentina (this study).

Aedes fulvus (Wiedemann). New records. Argentina ● 1 ♀; Tucumán Province, San Miguel de Tucumán, Aguas Corrientes; 26°49′47″S, 65°11′56″W; 437 masl.; November 28, 2019; Det.: M. J. Dantur Juri, G. Flores, E. Villarroel. Current distribution in Argentina. Chaco, Formosa, Misiones, Salta (Rossi 2015), and Tucumán (this study).

Culex eduardoi (Casal and García). New records. Argentina ● 23 ♀ 1 ♂; Tucumán Province, Simoca; 27° 15′38″S, 65°21′49″W; 379 masl. March 22, 2019; Det.: E. Villarroel; ● 2 ♀ 1 ♂; Tucumán Province, Simoca; 27° 15′52″S, 65°20′46″W; 366 masl.; March 22, 2019; Det.: E. Villarroel. ● 2 ♀ 2 ♂; Tucumán Province, Horco Molle; 26°47′23.4″S, 65°18′56.4″W; 628 masl.; January 15, 2023; Det.: G. Molina. Current distribution in Argentina. Buenos Aires, Chaco, Chubut, Corrientes, Formosa, Neuquén, Salta, Santa Cruz (Rossi 2015), and Tucumán (this study).

Limatus durhamii (Theobald). New records. Argentina ● 1 ♀; Tucumán Province, Monteros; 27°11′35″S, 65°28′60″W; 357 masl.; January 24, 2019; Det.: E. Villarroel; ● 1 ♀; Tucumán Province, Monteros; 27° 9′30″S, 65°29′21″W; 359 masl.; January 24, 2019; Det.: E. Villarroel. Current distribution in Argentina. Buenos Aires, Chaco, Corrientes, Formosa, Jujuy, Misiones, Salta (Rossi 2015), and Tucumán (this study).

Mansonia pseudotitillans (Theobald). New records. Argentina. ● 1 ♀; Tucumán Province, Burruyacú, El Timbó; 26°36′48.57″S, 65°7′46.20″W; 798 masl.; January 24, 2023; Det.: G. Molina. Current distribution in Argentina. Buenos Aires, Chaco, Corrientes, Entre Ríos, Formosa, Misiones, Salta, Santa Fé, (Rossi 2015), and Tucumán (this study).

Psorophora albigenu (Peryassú). New records. Argentina ● 2 ♀; Tucumán Province, Aguilares; 27° 25′13″S, 65°37′47″W; 316 masl.; November 22, 2018; Det.: E. Villarroel; ● 1 ♀; Tucumán Province, Leales, San Antonio; 27°14′05.2″S, 65°16′32.4″W;

382 masl.; February 12, 2022. Det.: G. Molina. Current distribution in Argentina. Buenos Aires, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, Misiones, Salta, Santa Fe, Santiago del Estero (Rossi 2015), and Tucumán (this study).

Psorophora cingulata (Fabricius). New records. Argentina • 1 ♀; Tucumán Province, Aguilares; 27°25′13″S, 65°37′47″W; 385 masl.; October 25, 2019; Det.: E. Villarroel; • 8 ♀; Tucumán Province, Monteros; 27°9′30″S, 65°29′21″W; 356 masl.; January 23, 2019; Det.: E. Villarroel. Current distribution in Argentina. Buenos Aires, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, La Pampa, La Rioja, Misiones, Santa Fe (Rossi 2015), and Tucumán (this study).

Uranotaenia nataliae (Lynch Arribálzaga). New records. Argentina • 1 ♀; Tucumán Province, Monteros; 27°9′30″S, 65°29′21″W; 358 masl.; Det.: E. Villarroel. Current distribution in Argentina. Buenos Aires, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, Misiones, Salta (Rossi 2015), and Tucumán (this study).

Knowledge of mosquito fauna, its distribution, and species abundance is necessary, due to the aforementioned pressures (climatic conditions), because both distribution and abundance may vary over time (Fouque and Reeder 2019). The present note updates the distribution of mosquitoes in northern Argentina, including 1 new record for the country, 1 for the northwest region, increasing the total number to 197 species, and 9 species from Tucumán, raising the total number from 72 to 81. *Anopheles marajoara* is reported for the 1st time in Argentina, and its presence in Tucumán is significant because this species can transmit *Plasmodium falciparum* (Welch), *P. vivax* (Grassi and Feletti), and *P. malariae* (Feletti and Grassi) (WRBU 2023). *Anopheles deaneorum* is also reported for the 1st time in northwestern Argentina. This species is considered a potential malaria vector because it has demonstrated susceptibility to *Plasmodium* infection in laboratory tests conducted in Brazil (Klein et al. 1991a, 1991b). Specimens of *Ps. cingulata* were also found for the 1st time in northwestern Argentina. This species is also of public health importance because specimens collected in Chaco, Argentina, were positive for the Venezuelan equine encephalitis virus (Pisano et al. 2010a, 2010b). In addition, this species has been implicated in the transmission of Ilheus virus in Trinidad (Anderson et al. 1956).

The province has experienced a progressive growth of cities and a significant change in land use, which has replaced native vegetation. This has led to the emergence of new larval habitats and, consequently, new disease vectors. In-depth studies are needed to reveal the real implications of the species in virus transmission and to determine and adopt appropriate control measures.

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