

New state records of the firefly-mimicking cockroach *Achroblatta luteola* (Blanchard, 1843) (Blattodea: Blaberidae: Panchlorinae) in Mexico

Nuevos registros estatales de la cucaracha mimética de luciérnaga *Achroblatta luteola* (Blanchard, 1843) (Blattodea: Blaberidae: Panchlorinae) en México

Julio C. Estrada-Álvarez^{1,2} , Manuel de Luna^{2,3*} , Reinier Núñez-Bazán^{2,4} 
and Carlo G. Sormani^{2,5} 

¹Museo Universitario de Historia Natural “Dr. Manuel M. Villada” Universidad Autónoma del Estado de México (UAEMex), Toluca, Estado de México, México. ²Entomological Research, Metepec, Estado México, México. ³Facultad de Ciencias Forestales, Universidad Autónoma de Nuevo León, Nuevo León, México. ⁴Centro de Investigación en Biodiversidad y Conservación (CIByC). ⁵Universidad Autónoma del Estado de Morelos (UAEM), Morelos, México. Instituto de Ecología, Xalapa, Veracruz, México. ✉ *scolopendra94@gmail.com

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Abstract. The firefly-mimicking cockroach *Achroblatta luteola* (Blanchard, 1843) (Blattodea: Blaberidae: Panchlorinae) is newly recorded for the Mexican states of Chiapas, Guanajuato, Puebla, Quintana Roo and Tabasco via the examination of specimens deposited in scientific collections and observations in a citizen science platform.

Key words: Citizen science; genitalia; geographic distribution; new records; roaches.

Resumen. La cucaracha mimética de luciérnaga *Achroblatta luteola* (Blanchard, 1843) (Blattodea: Blaberidae: Panchlorinae) es registrada por primera vez para los estados mexicanos de Chiapas, Guanajuato, Quintana Roo, Puebla y Tabasco a través de la examinación de especímenes depositados en colecciones científicas y observaciones en una plataforma de ciencia ciudadana.

Palabras clave: Ciencia ciudadana; cucas; distribución geográfica; genitales; nuevos registros.

Panchlorinae Brunner, 1865 (Blattodea: Blaberoidea: Blaberidae) is a mesodiverse subfamily of cockroaches. In the Americas, this taxon is represented by 50 species which are grouped in five genera: *Panchlora* Burmeister, 1838 with 45 species, *Pelloblatt*a Rehn, 1903 with two species, and the monotypic genera *Achroblatta* Saussure, 1893, *Anchoblatta* Shelford, 1909 and *Biolleya* Saussure, 1897 (Beccaloni 2023). The main character used to distinguish the members of this subfamily from other Blaberidae is the reduction of the phallomeres of the male genitalia; other external characters of diagnostic importance are detailed in the work of Gurney & Roth (1972), which also includes a key to the five genera mentioned.

Achroblatta luteola (Blanchard, 1843) is an easily recognizable firefly-mimicking (Coleoptera: Lampyridae) cockroach (Figs. 1A-B) and the only species of its genus. It is known to range from the Mexican neotropics to South America in Bolivia and Brazil. In Mexico in particular, this species had only been formally recorded in the state of Veracruz (Estrada-Álvarez 2013).

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Specimens of *A. luteola* from five Mexican entomological collections were examined. These are the Laboratorio de Entomología de la Facultad de Ciencias Forestales de la Universidad Autónoma de Nuevo León (UANL-FCF), Nuevo León, México; the Colección Nacional de Insectos del Instituto de Biología de la Universidad Nacional Autónoma de México (UNAM-CNIN), Ciudad de México, México; Colección Entomológica of the Estación de Biología Tropical “Los Tuxtlas” (EBTLT), Veracruz, México; Colección Zoológica de Docencia de la Universidad Nacional Autónoma de México (CZD-UNAM), Ciudad de México, México and the Colección Entomological Research (CER), Estado de México, México; with the exception of the sample from the UANL-FCF, the rest do not have voucher numbers associated with them. Records from the citizen science platform iNaturalist (2023) were consulted and corroborated on the 24th of June 2023; for this, searches for both cockroaches (Blattodea) and fireflies (Lampyridae) were made, this resulted in 12 confirmed observations of *Achroblatta luteola* in Mexico including two from Quintana Roo and one from Tabasco which constitute new state records for the species (Fig. 2).

Achroblatta luteola (Blanchard, 1843)

(Figs. 1A-G, 2)

Distribution. Neotropical, from Mexico to Brazil.

Diagnosis. Panchlorine with a shiny pronotum usually provided with small transverse ridges in the surface (Figs. 1A, D). Body length 18-26 mm. Tegmina and wings extending beyond posterior border of the abdomen (Figs. 1A-B). Femur I without spines; femur II and III with a single genicular spine. Black antennae with yellow segments in the anterior region (Figs. 1A-C). Supra-anal plate with right paraproct thorny (Fig. 1E). Styles of subgenital plate dissimilar (Fig. 1F), the sclerite are slightly sclerotic (Fig. 1G). Additional information in Roth (1971), Gurney & Roth (1972), and McKittrick (1964).

Material examined. *Achroblatta luteola*. **COSTA RICA.** **Alajuela.** 2 females, N slope Volcán de Rincón, 2 km W Dos Ríos, 550 m a.s.l., 22-V-1985, col. J.T. Doyen, P.A. Opler (blacklight) (UNAM-CNIN). **MEXICO.** **Chiapas.** 3 males, 2 females, Agua Azul, 1-V-1978, col. E. Barrera (UNAM-CNIN). 1 female, Agua Azul, I-V-1978 (nocturnal collecting) (UNAM-CNIN). 1 female, Cascadas Agua Azul, Municipality of Tumbalá, 17°15'323"N, 92°06'578"W, 28-III-2011, col. A. Contreras, R. Barba (UNAM-CNIN). 3 males, 2 females, Reserva de Montes Azules, Chajul, Municipality of Ocosingo, 28-IV-1986 to 5-V-1986, col. F. Arias, R. Barba, L. Cervantes (UNAM-CNIN). 1 female, Ruinas de Bonampak, Municipality of Ocosingo, 2-V-1978, col. E. Barrera (UNAM-CNIN). 1 male, road to Tornillo, Municipality of Ocosingo, 16°48'12"N, 90°52'11.8"W, 156 m a.s.l., 12-VII-2004, col. J. Castelo (UNAM-CNIN). 1 male, 3 km west of Laguna Belgica, Municipality of Ocozocoautla, 16°53'47.2"N, 93°27'9.5"W, 956m a.s.l., 5-20-VII-003, col. V.H. Toledo, A.M. Corona (UNAM-CNIN). 1 female, Reserva El Ocote, 2-10-XII-1993, col. G. Ortega, E. Barrera, A. Casasola (UNAM-CNIN). **Guanajuato.** 1 female, Municipality of Acámbaro, XI-1942 (UNAM-CNIN). **Puebla.** 1 male, Est. de Bomb 1, Municipality of San Diego, 16-V-1953 (UNAM-CNIN). **Quintana Roo.** 1 male, km 146 road Chetumal-P. Juárez 17-VI-1984 (light trap) (UNAM-CZD). 1 male, Limones, Municipality of Bacalar, 25-VI-2014, coll. Jorge J. Rodríguez-Rojas (CER). **Tabasco.** 1 male, Cocona, Municipality of Teapa, 18-IX-1960. **Veracruz.** 1 male, 2 females, Estación de Biología Tropical Los Tuxtlas, Municipality of San Andrés Tuxtla; male 170 m a.s.l., 8-VIII-1985, col. A. Ibarra; first female 160 m a.s.l., 24-VII-1985, col. P. Sinaca; second female 7-IX-1988 (EBTLT). 1 male, 2 females, Estación de Biología Tropical Los Tuxtlas, Municipality of San Andrés Tuxtla, 18.585N, -95.0747W, 25-VII-2022, col. Manuel de Luna (attracted to lights) (UANL-FCF-BLATT055). 1 male, 5 females, Estación de Biología Tropical Los Tuxtlas, Municipality of San Andrés Tuxtla; male 19-IV-1989, col. E. Barrera, J. L. Colin; first female 7-VIII-1989,

col. H. Rojas, J. L. Colin; second female 21-X-1988, col. M. A. Pérez, E. Mejorada; third female 7-VI-1990, col. G. Ortega, C. Mayorga; fourth female 14-17-VI-1989, col. J. L. Colin, H. Rojas; fifth female 29-IV-1991, col. C. Mayorga, G. Ortega (UNAM-CNIN). 1 female, Los Tuxtlas, 14-VI-1985, col. L. Cervantes (UNAM-CNIN). 1 female, Las Cabañas, 29-VI-1979, col. E. Mariño P. (UNAM-CNIN). 1 female, Municipality of Sontecomapan, 25-IV-1959 (UNAM-CNIN). 1 female, Ocotal Chico or Santa Martha, Municipality of Sotepan, 23-V-1982, col. H. Pérez (UNAM-CNIN). 1 female, Cerro del Vigía, Municipality of Santiago Tuxtla, 13-IX-1970, col. C. Márquez M. (UNAM-CNIN).

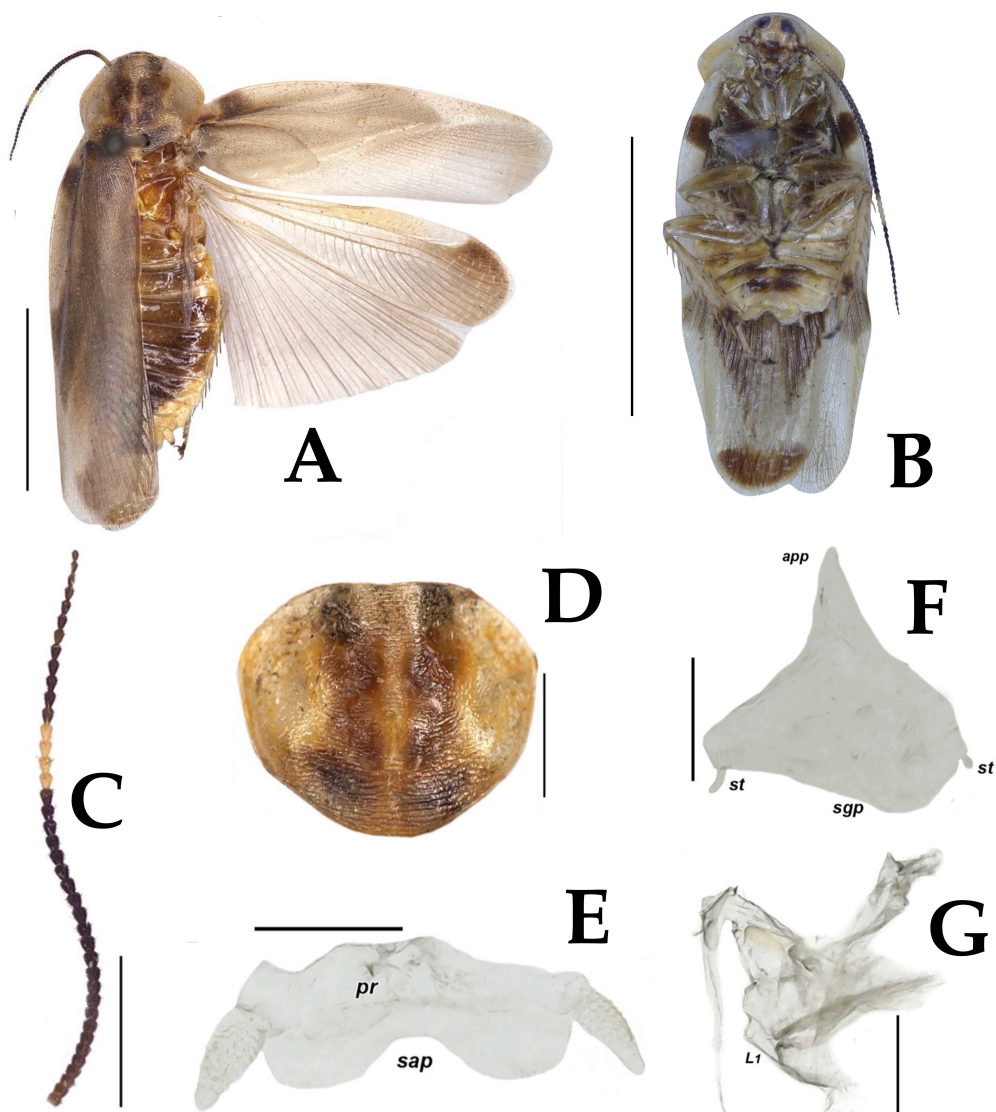


Figure 1. *Achroblatta luteola* from Veracruz, Mexico. **A.** Dorsal view of adult female. **B.** Ventral view of adult male. **C.** Antenna. **D.** Dorsal view of the pronotum. **E.** Supra-anal plate of male (*pr* = paraproctus, *sap* = supranal plate). **F.** Subgenital plate of male (*app* = apodeme, *st* = style, *sgp* = subgenital plate). **G.** Male genitalia (*L1* = left sclerite one). Scale bars A, B=10 mm; C, D=2 mm; E-G=1 mm. / **A.** Vista dorsal de hembra adulta. **B.** Vista ventral de macho adulto. **C.** Antena. **D.** Pronoto en vista dorsal. **E.** Lámina supra-anal masculina (*pr* = paraprocto, *sap* = lámina supra-anal). **F.** Lámina subgenital masculina (*app* = apodema, *st* = estilo, *sgp* = lámina subgenital). **G.** Genitales masculinos (*L1* = esclerito izquierdo uno). Barras de escala A, B=10 mm; C, D=2 mm; E-G=1 mm.

Photographic records (iNaturalist). *Achroblatta luteola*. **MEXICO.** **Chiapas.** Municipality of Ocosingo, 16.7474°N, -91.1233°W, 16-VI-2022, photo by “sabrewing”. Municipality of Motozintla, 15.2727°N, -92.4020°W, 15-IX-2021, photo by “issabell”. **Quintana Roo.** Municipality of Tulum, 20.4664°N, -87.7060°W, 2-VII-2019, photo by “scott_g”. Municipality of Othón P. Blanco, 18.5044°N, -88.5285°W, 3-VII-2019, photo by “cesasrraziel”. Municipality of Ocosingo, 16.9788°N, -91.5830°W, 29-IV-2019, photo by “byron29”. Municipality of Ocosingo, 16.9757°N, -91.5802°W, 29-IV-2019, photo by “wilichankin”. **Tabasco.** Municipality of Macuspana, 19-VII-2022, photo by “jm-30”. **Veracruz.** Municipality of San Andrés Tuxtla, 18.5843°N, -95.0783°W, 25-VII-2018, photo by “jacobgorneau”. Municipality of Amatlán de los Reyes, 18.9224°N, -96.8739°W, 4-XII-2019, photo by “axel-f-m”. Municipality of Naranja, 18.7998°N, -96.9520°W, 18-V-2023, photo by “amira719”. Municipality of Catemaco, 18.4453°N, -95.0629°W, 29-V-2022, photo by “zipactli”. Municipality of Xalapa, 19.4893°N, -96.8904°W, 28-VII-2022, photo by “danymarin”.

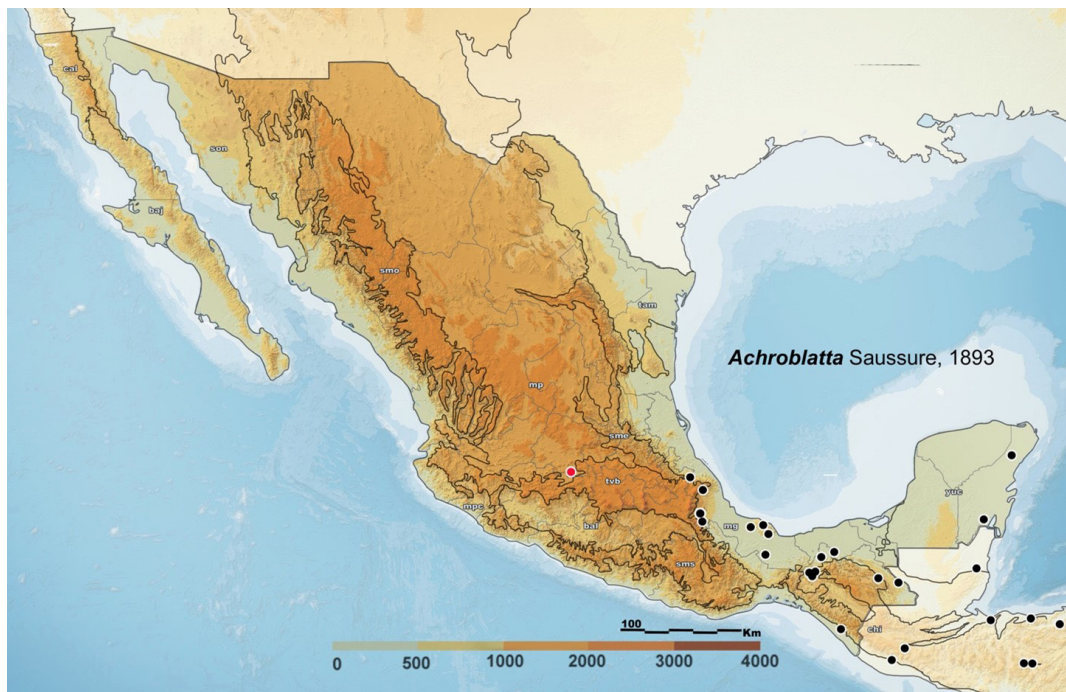


Figure 2. Records of *Achroblatta luteola* for Mexico and neighboring areas. Red dot represents a doubtful record (Guanajuato). / Registros de *Achroblatta luteola* para México y áreas limítrofes. Punto rojo representa un registro dudoso (Guanajuato).

Achroblatta luteola is the only North American Blaberidae which mimics fireflies (Lampyridae), making it very easy to identify, thus, citizen science platforms such as iNaturalist can confidently record this species. It had been reported for Mexico for the state of Veracruz (Estrada-Álvarez 2013) and with the new records presented herein it is now known from the states of Chiapas, Guanajuato, Puebla, Quintana Roo and Tabasco. This species shows positive phototropism. Future endeavors dedicated to the study of this species should focus on its captive husbandry to study its life cycle, making an emphasis on how to distinguish the nymphal stages of this species from those of *Pelloblatta* Rehn, 1903 and *Panchlora* Burmeister, 1838. All records correspond to the Neotropical realm, with the exception of the Guanajuato record, which we consider doubtful (red dot in Fig. 2). The extensive distribution of *A. luteola* warrants comprehensive taxonomic studies to

confirm its taxonomic status. Although it has been documented in the Neotropics, this species inhabits diverse ecosystems, suggesting the potential presence of cryptic lineages, since speciation is not always discernible through external morphology alone (Rivera *et al.* 2018). Furthermore, there is limited understanding of the relationship between the mimicry displayed by this species and its defensive behaviors. It remains unclear whether such mimicry varies across its distribution in relation to the firefly species present.

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