

New records of the striped earwig *Labidura riparia* (Pallas, 1773) (Insecta: Dermaptera: Labiduridae) in Mexico

Nuevos registros de la tijereta rayada *Labidura riparia* (Pallas, 1773) (Insecta: Dermaptera: Labiduridae) en México

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Abstract. The striped earwig *Labidura riparia* (Pallas, 1773) is a cosmopolitan species and the sole representative of the family Labiduridae in North America. In Mexico, this species has been previously mentioned for the states of Baja California, Oaxaca, Sonora, Tamaulipas, and Veracruz. In this contribution, it is reported for the first time for the states of Baja California Sur, Colima, Durango, Guerrero, Jalisco, Michoacán, Morelos, Nuevo León, Puebla, Quintana Roo, Sinaloa, and Yucatán, via the examination of vouchered specimens deposited in scientific collections. Additionally, records from the citizen science platform iNaturalist were consulted, confirming the presence of this species in the states of Aguascalientes, Chihuahua, Ciudad de México, Coahuila, Guanajuato, Hidalgo, Nayarit, Querétaro, San Luis Potosí, Tabasco, and Zacatecas. A brief diagnosis is provided for the family, genus, and species.

Key words: Cosmopolitan species; dermapteran; introduced species.

Resumen. La tijereta rayada *Labidura riparia* (Pallas, 1773) es una especie cosmopolita y la única representante de la familia Labiduridae en Norteamérica. En México, esta especie ha sido mencionada previamente para los estados de Baja California, Oaxaca, Sonora, Tamaulipas y Veracruz. En este aporte se reporta por primera vez para los estados de Baja California Sur, Colima, Durango, Guerrero, Jalisco, Michoacán, Morelos, Nuevo León, Puebla, Quintana Roo, Sinaloa y Yucatán, a través de la examinación de especímenes depositados en colecciones científicas y registros presentes en la plataforma de ciencia ciudadana iNaturalist, confirmando además su presencia en los estados de Aguascalientes, Chihuahua, Ciudad de México, Coahuila, Guanajuato, Hidalgo, Nayarit, Querétaro, San Luis Potosí, Tabasco y Zacatecas. Se provee de una breve diagnosis para el reconocimiento de la familia, género y especie.

Palabras clave: Dermáptero; especie cosmopolita; especie introducida.

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The earwigs (Insecta: Dermaptera) are elongated insects which have their cerci modified into sclerotized pincers, these are called forceps and are the most noticeable characteristic of this order of polyneopterans (Triplehorn and Johnson 2004); there are, however, some exceptions: the juveniles of some families (*e.g.*, Diplatyidae, Karschiellidae, and Haplodiplatyidae) have long and filiform cerci (Peng *et al.* 2022); and the two families which are ectosymbiotic of mammals (*e.g.*, Arixeniidae, symbionts of Asian bats; and Hemimeridae, symbionts of African rodents) have short and unsclerotized cerci (Nakata and Maa 1974). The winged species fold their hindwings under the tegmina in a way unique from the rest of the insects (Haas and Kukalova-Peck 2001).

North America is home to seven families of earwigs: Anisolabididae, Chelisochidae, Forficulidae, Haplodiplatyidae, Labiduridae, Pygidicranidae, and Spongiphoridae. Of these, Chelisochidae and Labiduridae are represented by a single introduced species, *Chelisoches morio* (Fabricius, 1775) and *Labidura riparia* (Pallas, 1773) (Figs. 1A-B), respectively; the former has been introduced to Florida and California, USA, while the latter is extremely widespread, being considered cosmopolitan (Brindle 1966; Langston and Powell 1975; Helfer 1987; Choate 2001). The genus *Labidura* Leach, 1815 is comprised by nine species and includes the largest species of earwig, the now extinct St. Helena giant earwig *Labidura herculeana* (Fabricius, 1798) (Miles 2015; Hopkins 2023); *L. riparia* and *Labidura xanthopus* (Stål, 1855) are the only members of this genus that are found in the Americas, although the validity of *L. xanthopus* has been questioned (Brindle 1966, 1971a, 1971b).

In Mexico, *L. riparia* has been reported in the states of Baja California (Langston and Powell 1975), Oaxaca (Burr 1911), Veracruz (Burr 1911; Hebard 1917), Sonora (Langston and Powell 1975) and Tamaulipas (Burr 1914) (Fig. 2). New state records of *L. riparia* are reported via the revision of specimens from the Colección Nacional de Insectos (CNIN) de la Universidad Nacional Autónoma de México (UNAM), and the Laboratorio de Entomología de la Facultad de Ciencias Forestales (FCF) de la Universidad Autónoma de Nuevo León (UANL); the new records correspond to the states of Baja California Sur, Colima, Durango, Guerrero, Jalisco, Michoacán, Morelos, Nuevo León, Puebla, Quintana Roo, Sinaloa and Yucatán (Fig. 2). Additionally, Mexican records from the citizen science platform iNaturalist (2023) were consulted on the 27th of August 2023 and corroborated by checking the unequivocal morphology and color patterns associated with the species (see diagnosis); this resulted in 196 confirmed observations of *L. riparia* for the country, including 3 from Aguascalientes, 24 from Chihuahua, 1 from Ciudad de México, 6 from Coahuila, 14 from Guanajuato, 6 from Hidalgo, 1 from Nayarit, 7 from Querétaro, 4 from San Luis Potosí, 1 from Tabasco and 2 from Zacatecas, which constitute additional new state records (Fig. 2).

Labidura riparia (Pallas, 1773)

(Figs. 1-2)

Diagnosis. Based on the works of Burr (1910), Brindle (1966, 1971a, 1971b), Langston and Powell (1975), Arnold and Drew (1979), Helfer (1987), Hoffman (1987), Choate (2001), Engel (2003), Maes and Haas (2006) and through the examination of a large series of specimens at the CNIN-UNAM. This is a large (up to 26 mm in total length) and colorful earwig (Figs. 1A-B) with notable intraspecific color variation, including melanistic (Nishikawa and Han 2015) and hypomelanistic (Trnka and Rada 2015) variants. The head is pale to reddish-orange and can bear or completely lack dark markings (it can be completely black in melanistic individuals). The pronotum has a reddish-orange midline and the lateral margins are yellowish or cream colored although it can be completely cream-colored in very old, preserved specimens, as well as in hypomelanistic individuals.

The tegminas have an external margin that is also yellowish or cream-colored and the internal margins, where both tegmina meet, have orange to red coloration. The visible part of the wings is black and yellow. All but the last abdominal tergite are black or dark brown in the middle while the lateral margins are usually light brown or yellowish (this is reduced in melanistic individuals). The last tergite is light brown, sometimes with reddish tinges. Legs are light brown, rarely they have dark markings. The forceps are symmetrical and light brown in color, being darker distally; these structures are sexually dimorphic: in the males the cerci are noticeably longer and separated from one another and the teeth are reduced (Fig. 1A), with the exception of a strong tooth just passing the midpoint of each cercus; in the females, the cerci are shorter, closer together and are strongly toothed basally (Fig. 1B). The antennae are comprised by 25 to 31 segments and are uniformly colored either light brown, yellow, or orange. Male genitalia are shown in Figs. 1C-D, the parts are named after Burr (1915) and Kamimura (2006). All these characteristics set Labiduridae and by extension the genus *Labidura* and *L. riparia*, apart from all the North American earwig families, genera, and species. The only species in the Western Hemisphere that *L. riparia* can be realistically confused with is *L. xanthopus*, recorded from South America; there is controversy on whether *L. xanthopus* is a valid species or just a variant of *L. riparia* (Brindle 1966, 1971a, b; Girod and Matzke 2020). The most apparent difference is the presence of longitudinal keels in the distal portion of the tergal plates 6-9 of the adult male *L. xanthopus*, these are lacking in the adult male *L. riparia* (Brindle 1966, 1971a, b). While female *L. xanthopus* are usually more slender and more strikingly colored than those of *L. riparia*, there are no certain characters to distinguish them (Brindle 1971a, b).

Known distribution in Mexico: “Northern” **Baja California** and **Sonora**, without a specific locality or municipality being mentioned (Langston and Powell 1975), omitted by Sakai (2004). **Oaxaca** in the Municipality of San Pedro Taviche (Río San Antonio [Río Antonio]) (Burr 1911), amended by Sakai (2004). **Veracruz** in the Municipalities of Córdoba (Burr 1911) and Heroica Veracruz (Hebard 1917). **Tamaulipas** in the Municipality of Tampico (Burr 1914), omitted by Sakai (2004).

Material examined. *Labidura riparia*. **MEXICO.** **Baja California.** 2 males, 2 females, Ciudad Morelos, 2-I-1981, col. M. Duarte M. (UNAM-CNIN). 1 male, Bahía de los Ángeles, 24-VII-1964, col. H. González A. (UNAM-CNIN). 1 female, Isla las Animas, 11-XI-1985, col. M. Galicia (UNAM-CNIN). **Baja California Sur.** 1 male, Punta San Basilio, 5-IV-1997, col. W. L. Forment (UNAM-CNIN). **Colima.** 11 males, 10 females, 3 juveniles, Isla Socorro, 7-XI-1988 and 5-X-1989, col. L. Cervantes and A. Cadena (UNAM-CNIN). **Durango.** 1 female, Mapimi (gas station), 26°31'29"N, 104°07'38"W, 5-VIII-2014, col. D. Brzoska and J. Shetterley (UNAM-CNIN). **Guerrero.** 1 female, Chilpancingo, 20-VI-1983, col. L. Cendrero (UNAM-CNIN). **Jalisco.** 2 males, 8 females, Estación de Biología Chamela, 12-XII-1988, E. Ramírez T. L. (UNAM-CNIN). 1 male, 5 females, km 70 road Barrera de Navidad – Puerto Vallarta, San Mateo, 10-VIII-1990, col. J. Villa (UNAM-CNIN). 1 male, Barra de Navidad – Puerto Vallarta, Río San Nicolas, 6-XII-1991, col. J. Villa and E. Ramirez (UNAM-CNIN). 7 males, 3 females, 6 unsexed, El Limón, San Buenaventura, 5-XI-1996, 7-XI-1997, col. S. Zaragoza (UNAM-CNIN). 1 male, km 87 road 200, Estanque, col. E. Gonzalez (UNAM-CNIN). 1 female, Río San Nicolas, 26-XI-1990, col. E. Gonzalez (UNAM-CNIN). **Michoacán.** 1 male, Tuzantla, 30-IV-1978 (UNAM-CNIN). **Morelos.** 2 females, Huautla, Estación CEAMISH, 9-10-VI-1996, col. S. Zaragoza (UNAM-CNIN). 1 female, Cuernavaca, Colonia Loma Bonita, in a house, col. R. Núñez Bazán (FCF-DERMA073). **Nuevo León.** 4 males, 2 females, 1 juvenile, Nacataz, Garcia (FCF-DERMA020). 1 juvenile, Nacataz, Garcia (FCF-DERMA022). 1 female, Zuazua, 1-VI-

2022 (FCF-DERMA024). 1 male, Guadalupe, Cerro de la Silla, 28-IV-2022, Karen Sofia Rueda Noy (FCF-DERMA029). 1 male, 2 females, Salinas Victoria, Valle Castilla, 4-V-2022, Alan Rivera Arias (FCF-DERMA030). 3 males, Santa Catarina, Parque Ecológico La Huasteca, 12-V-2022, Luis Fernando Guillen Silva (FCF-DERMA031). 1 juvenile, Galeana, Laguna de Labradores, 24°48'52.9"N, -100°07'01.2"W, 22-IV-2022, Manuel de Luna (FCF-DERMA031). 1 female, García, 17-VII-2020, Manuel de Luna (FCF-DERMA043). **Oaxaca**. 1 male, Río Xiquila, Ignacio Teotitlán, 5-XI-1988 (UNAM-CNIN). 1 juvenile, Salina Cruz, 18-IX-1962, col. F. Martín F. (UNAM-CNIN). 1 male, km 116 road Tuxtepec-Palomares, 22-XI-1990, col. A. Cadena (UNAM-CNIN). **Puebla**. 1 male, 2 unsexed, Río Calapa, Axusco, 4-XI-1988 (UNAM-CNIN). **Quintana Roo**. 2 males, José María Pino Suárez, 24-II-1984, col. L. Cervantes (UNAM-CNIN). 1 female, Playa Aventuras, Tulum, X-1981, col. E. Pech (UNAM-CNIN). **Sinaloa**. 1 male, Los Mochis, 19-X-1982, col. C. Beultespacher (UNAM-CNIN). **Sonora**. 1 female, Navojoa, 18-X-1982, col. L. R. B. (UNAM-CNIN). 1 male, 1 female, Navojoa, 1-XI-1986, col. F. Arias (UNAM-CNIN). 2 males, 4 females Isla Tiburón, 11-VIII-1985 and 6-XI-1985, col. L. Cervantes and M. García (UNAM-CNIN). 1 female, Presa Adolfo Ruiz Cortinez, 7-XI-1986, col. E. Mariño (UNAM-CNIN). **Tamaulipas**. 1 female, Río Purificación, 17-XI-1977, col. E. Mariño (UNAM-CNIN). **Veracruz**. 1 female, Córdoba (UNAM-CNIN). **Yucatán**. 1 male, Hacienda Xacantun km. 11 road Merida-Puerto Progreso, 21°04'49.1"N, 89°37'95.3"W, 11-IX-1994, col. E. Barrera (UNAM-CNIN). **NICARAGUA**. 3 males, 1 female, Las Flores, Finca Tellez, 20-XI-1987, col. J. M. Maes (UNAM-CNIN). 1 female, León (UNAM-CNIN). 2 females, 1 juvenile, León, Santa Clara, V-1987, col. J. Tellez (UNAM-CNIN).

Labidura xanthopus. **PERU**. Lomas. 1 male, 30-VIII-1948, col. I. Bolívar (UNAM-CNIN).

Photographic records (iNaturalist). *Labidura riparia*. **MEXICO**. **Aguascalientes**. Municipality of Jesús María, 21°59'7"N, -102°19'52"W, 2-I-2023, photo by "maferto_". Municipality of Jesús María, 21°59'7" N, -102°19'53"W, photo by "dian_munozzz". Municipality of Aguascalientes, 21°59'10"N, -102°12'1"N, photo by "mvgr". **Chihuahua**. Municipality of Meoqui, 28°19'43"N, -105°25'55"W, photo by "gisy". Municipality of Meoqui, 28°15'29"N, -105°29'13"W, photo by leonardohe. Municipality of Meoqui, 28°19'21"N, -105°24'46"W, photo by "jessedruiz". Municipality of Meoqui, 28°24'2"N, -105°36'8"W, photo by "simongaona1". Municipality of Meoqui, 28°24'58"N, -105°34'59"W, photo by "alberto_28". Municipality of Meoqui, 28°23'22"N, -105°33'11"W, photo by "julianisaias_ford79". Municipality of Meoqui, 28°19'59"N, 105°35'44"W, photo by "gerardo296". Municipality of Meoqui, 28°16'44"N, -105°29'22"W, photo by "juanloredo". Municipality of Meoqui, 28°16'47"N, -105°28'59"W, photo by "yadirachavira". Municipality of Rosales, 28°15'55"N, -105°34'0"W, photo by "elizabethgalvez". Municipality of Meoqui, 28°15'40"N, -105°29'50"W, photo by "leonardohe". Municipality of Meoqui, 28°16'6"N, -105°28'18"W, photo by "victor365dankiel". Municipality of Meoqui, 28°15'47"N, -105°29'38"W, photo by "leonardohe". Municipality of Meoqui, 28°15'47"N, -105°29'38"W, photo by "leonardohe". Municipality of Meoqui, 28°15'47"N, -105°29'38"W, photo by "leonardohe". Municipality of Meoqui, 28°15'47"N, -105°29'38"W, photo by "leonardohe". Municipality of Meoqui, 28°19'47" N, -105°32'10"W, photo by "fmondacaf". Municipality of Delicias, 28°11'50"N, -105°28'58" W, photo by "fmondacaf". Municipality of Meoqui, 28°15'47"N, -105°29'38"W, photo by "leonardohe". Municipality of Meoqui, 28°17'38"N, -105°26'0"W, photo by "leonardohe". Municipality of Meoqui, 28°15'47"N, 105°29'38"W, photo by "leonardohe". Municipality of Chihuahua, 28°37'7"N, -106°7'18"W, photo by "rualire". Municipality of Chihuahua, 28°34'5"N, -106°11'2"W, photo by "letebile". Municipality of Delicias, 28°11'3"N, -105°27'59"W, photo. Municipality of Chihuahua, 28°40'52"N, -106°7'56"W, photo by "milkitty". **Ciudad de México**. Municipality of Iztacalco, 19°23'23.01"N, -99°7'31.378"W, photo by "emmanuelenciso". **Coahuila**.

Municipality of Torreon, 25°36'7.56"N, -103°22'19.3836", photo by "cavach". Municipality of Múzquiz, 27°53'13.8768"N, -101°31'41.4588"W, photo by "alegatocamarena". Municipality of Torreon, 25°33'22.6908"N, -103°21'39.7368"W, photo by "rosbelin". Municipality of Sabinas, 27°52'35.0292"N, -101°9'56.9088"W, photo by "raquellaloma". Municipality of Sabinas, 27°52'35.1212"N, -101°9'56.8584"W, photo by "raquellaloma". Municipality of Ramos Arizpe, 25°34'45.6888"N, -101°5'12.5952"W, photo by "arturoc". **Guanajuato.** Municipality of Leon, 21°10'23.7432"N, -101°41'12.2244"W, photo by "carlosernestogs". Municipality of Acámbaro, 19°57'44.4276"N, -101°0'7.8048"W, photo by "alexmor". Municipality of Salvatierra, 20°12'45.5688"N, -100°52'31.3648"W, photo by "laraj448". Municipality of Valle de Santiago, 20°20'51.9396"N, -101°19'33.2832"W, photo by "renato84". Municipality of León, 21°11'5.4492"N, -101°40'52.5468"W, photo by "idlegrraphics". Municipality of León, 21°11'5.4492" N, -101°40'52.5468"W, photo by "idlegrraphics". Municipality of Acámbaro, 20°6'4.7772"N, -100°51'11.4048"W, photo by "alexmor". Municipality of León, 21°11'5.4492" N, -101°40'52.5468"W, photo by "idlegrraphics". Municipality of Leon, 21°8'8.3904"N, -101°32'48.5592"W, photo by "mikegrimaldo". Municipality of Acambaro, 19°59'54.0312"N, -100°51'10.674"W, photo by "alexmor". Municipality of Acambaro, 19°59'53.934"N, -100°51'10.6128"W, photo by "alexmor". Municipality of Silao de la Victoria, 20°51'12.4164"N, -101°23'27.726"W, photo by "saira_covarrubias". Municipality of Acambaro, 20°1'44.2704"N, -100°43'16.2996"W, photo by "pancholinjaimé". Municipality of Irapuato, 20°38'34.4004"N, -101°20'19.3704"W, photo by "franciscoasos". **Hidalgo.** Municipality of Tecozautla, 20°33'8.1828"N, -99°41'17.1924"W, photo by "luis818". Municipality of Alfajayucan, 20°26'45.0636"N, -99°21'17.1828"W, photo by "merary09". Municipality of Ixmiquilpan, 20°26'45.0636"N, -99°21'17.1828"W, photo by "ashes49". Municipality of Alfajayucan, 20°26'2.5836"N, -99°21'21.816"W, photo by "briss1008". Municipality of Alfajayucan, 20°26'2.5836"N, -99°21'21.816"W, photo by "avelina4". Municipality of Alfajayucan, 20°26'21.0912"N, -99°22'29.208"W, photo by "briss1008". **Nayarit.** Municipality of Santiago Ixcuintla, 21°50'33.7704"N, -105°53'8.8296"W, photo by "santanadnl". **Querétaro.** Municipality of San Juan del Río, 20°21'17.2884"N, -100°2'1.2912"W, photo by "alvaro_atrogularis". Municipality of Tequisquiapan, 20°31'29.5212"N, -99°54'22.0068"W, photo by "hailenugc". Municipality of Querétaro, 20°24'36.8712"N, -100°4'16.8924"W, photo by "ragata". Municipality of San Juan del Río, 20°24'36.8712"N, -100°4'16.8924"W, photo by "mas64ter". Municipality of Corregidora, 20°31'0.3648"N, -100°26'23.7084"W, photo by "branrivera". Municipality of Querétaro, 20°48'41.0436"N, -100°26'53.53.7252"W, photo by "jossgv". Municipality of Querétaro, 20°36'18.468"N, -100°29'17.6568"W, photo by "anaalvarezh". **San Luis Potosí.** Municipality of Soledad de Graciano Sanchez, 22°14'5.982"N, -100°51'51.6924"W, photo by "lindaperales04". Municipality of San Luis Potosí, 22°9'23.292"N, 100°59'8.3476"W, photo by "manuelkv". Municipality of San Luis Potosí, 22°7'7.2696"N, -100°59'59.3088"W, photo by "manfrax". Municipality of Matehuala, 23°39'1.3284"N, -100°38'34.224"W, photo by "the_beagle". **Tabasco.** Municipality of Macuspana, 17°52'40.5408", -92°28'23.2575"W, photo by "angelgperalta". **Zacatecas.** Municipality of Fresnillo, 23°12'9.288"N, -102°47'53.6388"W, photo by "charlyvc". Municipality of Villa García, 22°7'24.132"N, -101°59'6.1908"W, photo by "ramiro82".

Labidura riparia has been reported for Mexico for the states of Baja California, Oaxaca, Sonora, Tamaulipas, and Veracruz (Burr 1911, 1914; Hebard 1917; Langston and Powell 1975; Sakai 2004). With the new records, it is also recorded for Aguascalientes, Baja California Sur, Chihuahua, Coahuila, Colima, Durango, Guanajuato, Guerrero, Hidalgo, Jalisco, Nayarit, Michoacán, Morelos, Nuevo León, Puebla, Querétaro, Quintana Roo, San Luis Potosí, Sinaloa, Tabasco, Yucatán, and Zacatecas; this leaves only Campeche,

Chiapas, Estado de México, and Tlaxcala as the only Mexican states without records of *L. riparia*. To our knowledge, this is the first time that the distribution of a species of earwig is monitored through a citizen science platform; this is possible for *L. riparia* since it is the only member of its group in the region and is very easily distinguished from the rest of the North American earwigs without the need of examining minute details of its morphology under a stereomicroscope or the dissection of the male genitalia. Great chromatic variation was found in the specimens examined and the photographs revised, but a clear pattern in the distribution of the variants could not be found, therefore, we conclude that this is just the normal, albeit dramatic, intraspecific variation of the species (Nishikawa and Han 2015; Trnka and Rada 2015).

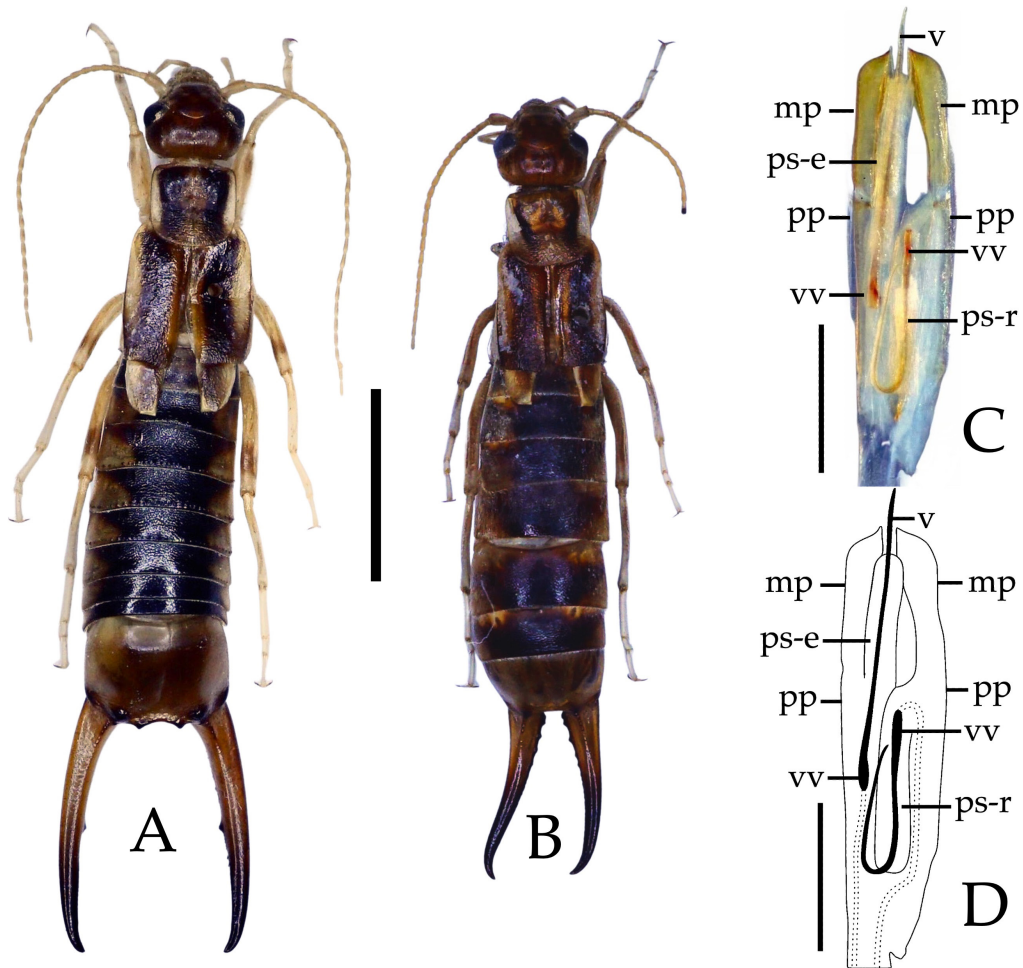


Figure 1. *Labidura riparia* from Nuevo León, Mexico. For A and B, scale bars: 5 mm; for C and D, scale bars: 1 mm. **A.** Dorsal aspect of adult male. **B.** Dorsal aspect of adult female. **C.** Photo of male genitalia. **D.** Illustration of male genitalia. For C and D the abbreviations are the following: mp = metaparameres, pp = proparameres, ps-e = prepucial sack (erect), ps-r = prepucial sack (repose), v = virga, vv = virga vesicle. / *Labidura riparia* de Nuevo León, México. Para A y B, barras de escala: 5 mm; para C y D, barras de escala: 1 mm. **A.** Aspecto dorsal de un macho adulto. **B.** Aspecto dorsal de una hembra adulta. **C.** Foto de los genitales masculinos. **D.** Ilustración de los genitales masculinos. Para C y D las abreviaturas son las siguientes: mp = metaparámetros, pp = proparámetros, ps-e = saco prepucial (erecto); ps-r = saco prepucial (reposo), v = virga, vv = vesícula de la virga.

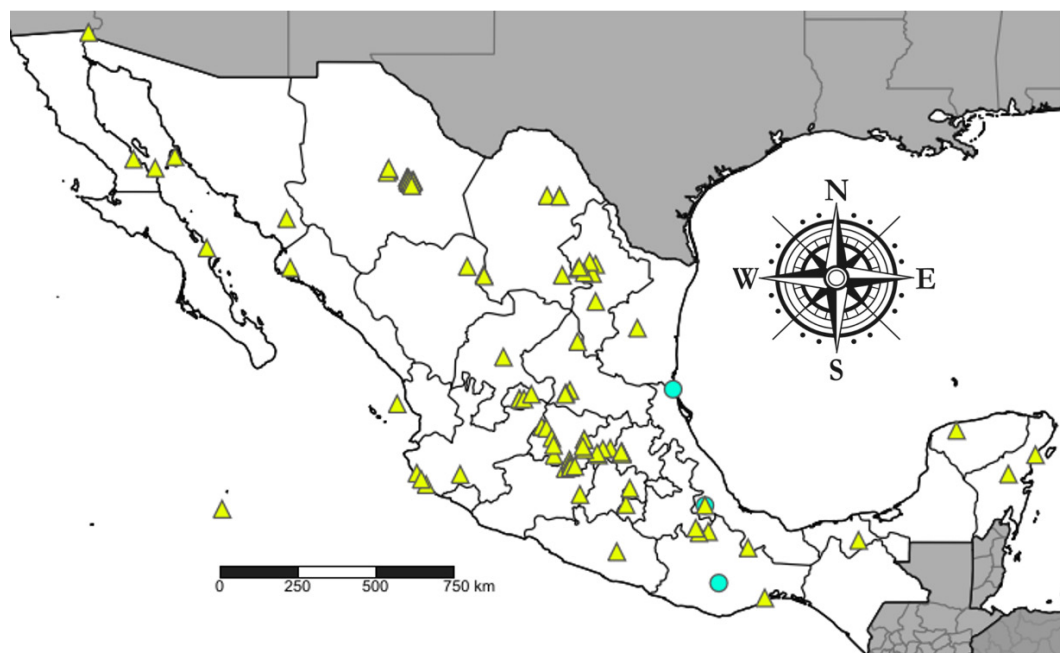


Figure 2. Records of *Labidura riparia* in Mexico. New records represented with yellow triangles. Old records represented with blue circles; those of Langston and Powell (1975) could not be pointed, as they only mentioned “northern Baja California and Sonora”. / Registros de *Labidura riparia* en México. Nuevos registros representados por triángulos amarillos. Registros antiguos representados por círculos azules; aquellos de Langston y Powell (1975) no pudieron ser señalados, pues solo mencionaron “norte de Baja California y Sonora”.

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