

## New state records of the humped spider *Zosis geniculata* (Olivier, 1789) (Araneae: Uloboridae) in Mexico

Nuevos registros estatales de la araña jorobada *Zosis geniculata* (Olivier, 1789) (Araneae: Uloboridae) en México

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**Abstract.** The humped spider *Zosis geniculata* (Olivier, 1789) is a tropicopolitan spider of the venomless family Uloboridae (Araneae). This species has been recorded for Mexico without a specific locality or state being mentioned, hereby being recorded for the states of Chiapas, Coahuila, Jalisco, Nuevo León, Tamaulipas and Yucatán either via the study of vouchered specimens, the revision of photographic records from the citizen science platform iNaturalist or digital records of scientific collections. A brief diagnosis is provided for the family and the species.

**Key words:** Araneomorphae; cribellate spider; geographic distribution.

**Resumen.** La araña jorobada *Zosis geniculata* (Olivier, 1789) es una araña tropicopolita de la familia Uloboridae (Araneae) que carece de veneno. Esta especie ha sido registrada para México sin que se mencione alguna localidad o estado en específico, siendo aquí registrada para los estados de Chiapas, Coahuila, Jalisco, Nuevo León, Tamaulipas y Yucatán, ya sea a través del estudio de especímenes, la revisión de registros fotográficos de la plataforma de ciencia ciudadana iNaturalist, o de registros digitales de colecciones biológicas. Se proporciona una diagnosis breve de la familia y el género.

**Palabras clave:** Araneomorphae; araña cribelada; distribución geográfica.

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Uloboridae (Arachnida: Araneae) is a family of cribellate, three-clawed and entelegyne araneomorph spiders which usually have eight eyes, though there is an exception to this latter character in the species of the genus *Miagrammopes* O. Pickard-Cambridge, 1870 which only have four. This family is also characterized for having its metatarsi IV dorsally compressed and curved under the calamistrum as well as for being one of the few spider families which lack venom glands altogether (Jocqué and Dippenaar-Schoeman 2007; Opell 2017). Uloboridae is currently comprised by 19 genera and 288 species which are found all over the world (World Spider Catalog 2023). In Mexico, this family is represented by seven genera: *Ariston* O. Pickard-Cambridge, 1896, *Hyptiotes* Walckenaer, 1837, *Miagrammopes* O. Pickard-Cambridge, 1870, *Philoponella* Mello-Leitão, 1917, *Siratoba* Opell, 1979, *Uloborus*

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Latreille, 1806, and *Zosis* Walckenaer, 1841 (de Luna and García-Barrios 2018; World Spider Catalog 2023).

The genus *Zosis* is comprised by three species: *Zosis costalimae* (Mello-Leitão, 1917), native to Brazil; *Zosis geniculata* (Olivier, 1789), native to much of the Western Hemisphere (from southern USA to Brazil, including the West Indies) and introduced in many countries of the Old World and *Zosis peruana* (Keyserling, 1881), native to South America (from Colombia to Argentina) (World Spider Catalog 2023). A revision of this genus is due, as *Z. costalimae* and *Z. peruana* might be synonyms of *Z. geniculata*, not being fully recognized by Opell (1979). The validity of the subspecies *Zosis geniculata fusca* (di Caporiacco, 1948) and *Zosis geniculata timorensis* (Schenkel, 1944) is hereby questioned, as their diagnostic characters could fall into the intraspecific variation of *Z. geniculata* (Schenkel 1944; di Caporiacco 1948); type specimens need to be revised.

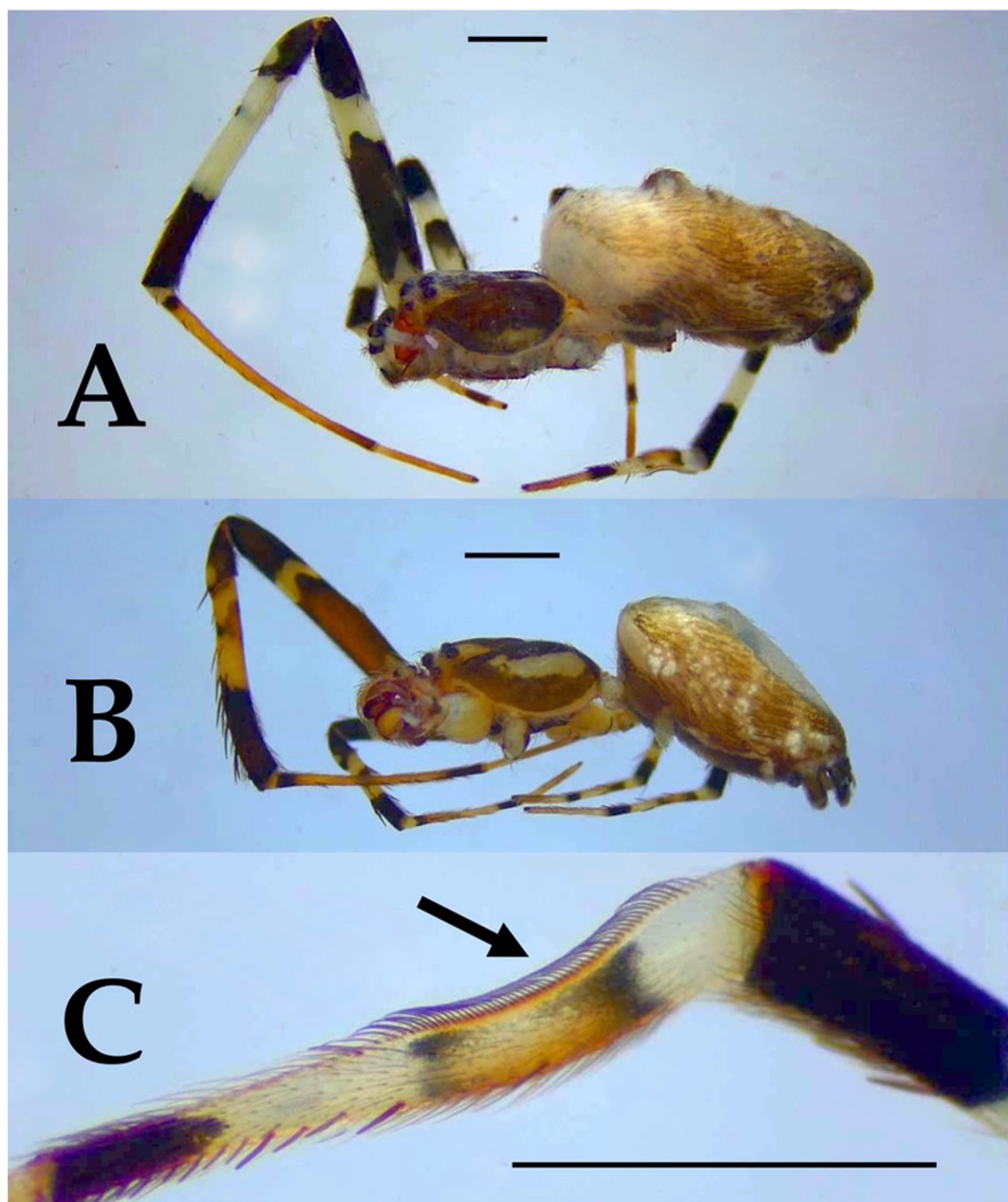
Due to its wide distribution, *Z. geniculata* is considered a tropicopolitan species. Although it was mentioned for Mexico in the work of Opell (1979) and a map is provided, the state divisions are not clear, and the mark could point to either Nayarit or southern Sinaloa in western Mexico; no other mentions in the literature for this species in the country could be found (World Spider Catalog 2023). Twenty-one (21) physical vouchers of *Z. geniculata* are present in the arachnological collection of the Facultad de Ciencias Biológicas de la Universidad Autónoma de Nuevo León; they were determined using the keys and descriptions of Jocqué and Dippenaar-Schoeman (2007) and Ubick (2017) for family-level identification, and those of Muma and Gertsch (1964) and Opell (1979, 2017) for genus and species-level identification. Mexican records from the citizen science platform iNaturalist (2023) were reviewed and corroborated on the 16th of August 2023 and corroborated by checking the more prominent external characters of the species: the “humped” opisthosoma (Figs. 1A-B), the black, grey and white banded legs which lack obvious tufts of setae (Figs. 1A-B), the noticeably curved metatarsi IV (Fig. 1C), and the spiky egg-sac; this resulted in 12 confirmed observations of *Z. geniculata* for the country (those with obscured data were omitted), including 4 from Chiapas, 1 from Jalisco, 6 from Tamaulipas and 1 from Yucatán (Fig. 2). Additionally, the GBIF database was consulted, it contained 3 additional records for Mexico from the states of Chiapas, Coahuila and Tamaulipas.

***Zosis geniculata* (Olivier, 1789)**  
(Figs. 1A-C, 2, 3A-B)

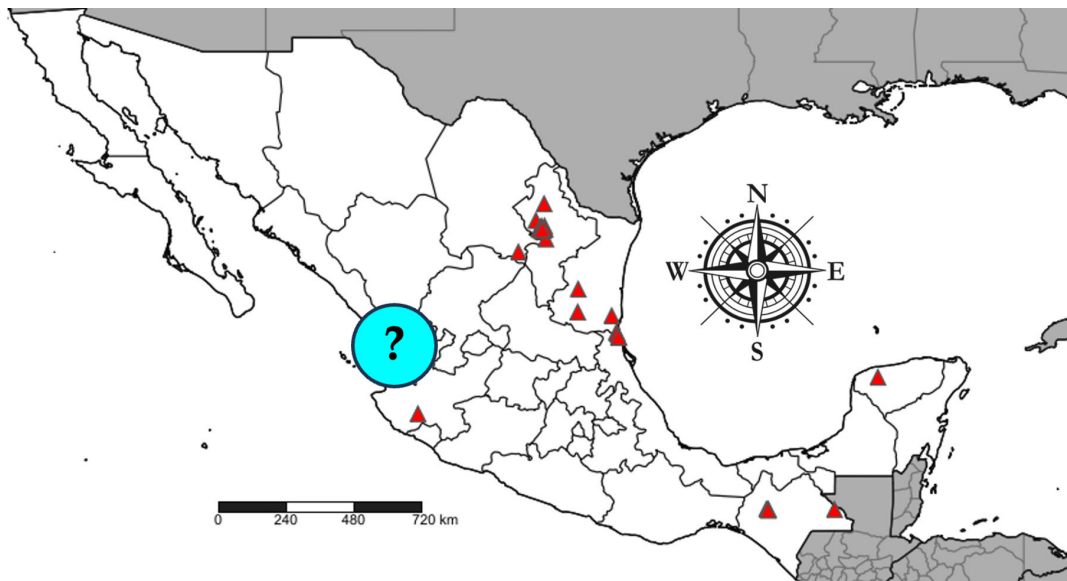
**Diagnosis.** Based on the works of Muma and Gertsch (1964), Opell (1979, 2017), Jocqué and Dippenaar-Schoeman (2007), Salvatierra *et al.* (2014) and de Luna and García-Barrios (2018). The cribellate araneomorph spiders of the family Uloboridae typically possess eight eyes in two rows, with the genus *Miagrammopes* having only four. Female Uloboridae have a sclerotized epigynum (entelegyne condition) (Fig. 3B); male Uloboridae have a complex palp tarsus with a cymbium that covers most of the structures (entelegyne condition) (Fig. 3A). There are three tarsal claws in each leg tarsus. Among the eight (or four) eyed entelegyne cribellate families found in North America, Uloboridae stands out for having rows of long trichobothria in the femora II, III and IV; a dorsally concave metatarsus IV at the level of the calamistrum, which in turn occupies more than 50% of its length; less than four pairs of ventral spines in tibiae I and II; and complete lack of venom glands.

Spiders of the genus *Zosis* differ from the rest of the Mexican Uloboridae in the following characteristics: eight eyes (Figs. 1A-B), unlike *Miagrammopes* which has only four. Posterior lateral eyes not in tubercles, unlike in *Hyptiotes* (Figs. 1A-B). Carapace of males are nearly round, those of male *Uloborus* are pear-shaped, and those of male *Siratoba* are oval. Male palpus lack a conspicuous conductor (Fig. 3A), this structure is very prominent in the palp of male *Ariston* (swan-shaped conductor) and male *Philoponella* (the spur and basal lobe

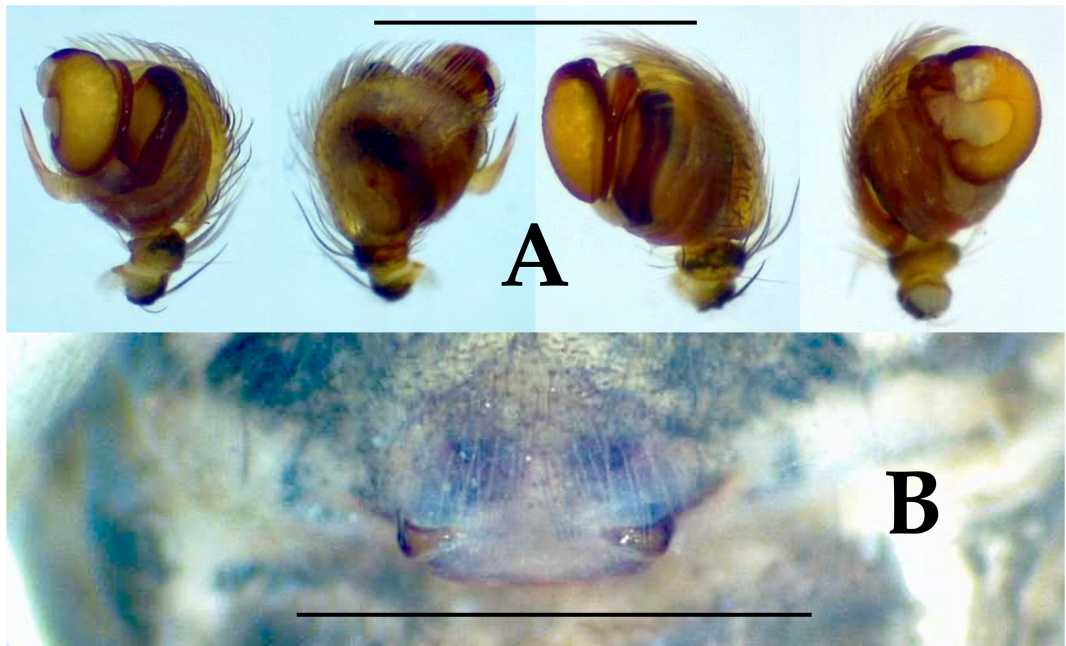
of the conductor extends from the base of the median apophysis). Female epigynum has two median lobes (Fig. 3B), unlike in female *Philoponella* and *Ariston* which lack lobes, and female *Siratoba* which has a single median lobe. *Zosis geniculata* is the only species of its genus which has been recorded in North and Central America.



**Figure 1.** *Zosis geniculata* from Nuevo León, Mexico; all scale bars: 1 mm. **A.** Lateral view of adult female (left legs omitted). **B.** Lateral view of adult male (left legs omitted). **C.** Lateral view of metatarsus IV of adult female, arrow points to the calamistrum. / *Zosis geniculata* de Nuevo León, México; todas las barras de escala: 1 mm. **A.** Vista lateral de la hembra adulta (se omitieron patas izquierdas). **B.** Vista lateral del macho adulto (se omitieron patas izquierdas). **C.** Vista lateral del metatarso IV de la hembra adulta, flecha señala el calamistro.



**Figure 2.** Records of *Zosis geniculata* in Mexico as red triangles; blue circle with “?” corresponds to the point given by Opell (1979). / Registros de *Zosis geniculata* en México como triángulos rojos; el círculo azul con “?” corresponde al punto dado por Opell (1979).



**Figure 3.** *Zosis geniculata* from Nuevo León, Mexico; all scale bars: 1 mm. **A.** Male pedipalp tarsus at various angles. **B.** Female epigynum, ventral view. / *Zosis geniculata* de Nuevo León, México; todas las barras de escala: 1 mm. **A.** Tarso del pedipalpo del macho en varias vistas. **B.** Epigino de la hembra, vista ventral.

**Material examined.** *Zosis geniculata*. **MEXICO. Nuevo León.** 12 females, Municipality of Guadalupe, 25°40'58.4"N 100°12'04.7"W, 459m a.s.l., Panteón “La Paz”, 26-VIII-2012, col. Alejandro Maeda Obregón (FCB-AORBI007). 2 males, 6 females, Municipality of Monterrey,

25°40'46.6"N 100°20'04.2"W, 552m a.s.l., Panteón "Dolores", 15-VIII-2012, col. Gustavo Adolfo Flores Lechuga (FCB-AORBI008). 16 females, 2 juveniles, Municipality of Monterrey, 25°40'46.6"N 100°20'04.2"W, 552m a.s.l., Panteón "Dolores", 5-X-2012, col. Manuel de Luna (FCB-AORBI009). 1 male, 3 juveniles, Municipality of Guadalupe, Cerro de la Silla, 14-III-2016, col. Massimo Nigenda Quesada (FCB-AORBI011). 1 female, Municipality of Monterrey, Colonia Niño Artillero, 16-XI-1978, col. Guadalupe Camarillo Gaytán (FCB-AORBI012). 9 females, 2 juveniles, Municipality of Monterrey, 25°42'24.1"N 100°21'10.8"W, 553.6m a.s.l., Panteón "El Roble", 20-IX-2008, col. Segio Alberto Luna Peña (FCB-AORBI013). 1 female, 2 juveniles, Municipality of Monterrey, 25°43'07.7"N 100°21'18.7"W, 551.1m a.s.l., Panteón "San Jorge", 8-II-2013, col. Alejandra de Jesús Rodríguez Recio (FCB-AORBI014). 1 male, 1 female, Municipality of Guadalupe, Cerro de la Silla, 20-I-2013, col. Fabiola A. Ríos Peña (FCB-AORBI015). 5 females, 2 juveniles, Municipality of Santiago, "Cola de Caballo" waterfalls, 9-XII-2012, col. José Luis González Velasquez (FCB-AORBI016). 1 male, 1 female, 2 juveniles, Municipality of San Nicolás de los Garza, 25°45'23.8"N 100°17'57.1"W, 498.3m a.s.l., Panteón Municipal, 2-II-2009, col. José Luis Núñez Garibay (FCB-AORBI017). 1 female, 2 juveniles, Municipality of Hidalgo, Potrero Chico, 7-III-2010, col. Daniel Alejandro Martínez González (FCB-AORBI018). 1 female, 2 juveniles, Municipality of Guadalupe, Cerro de la Silla, 20-I-2013, col. Kenia Slendy Mandujano Sánchez (FCB-AORBI019). 1 female, 1 juvenile, Municipality of Apodaca, Panteón, 4-X-2008, col. Euridice Muñiz Chavez (FCB-AORBI020). 3 females, Municipality of San Pedro Garza García, Río Santa Catarina, 16-IV, col. Javier Pavel Santano Moreno (FCB-AORBI021). 1 male, Municipality of Monterrey, Ciudad Universitaria UANL (Mederos), 17-VIII-2013, col. Jesús Emanuel Mendieta (FCB-AORBI022). 3 females, Municipality of San Nicolás de los Garza, Colonia Villa Azul, 21-II-2009, col. Neftalí Miguel Marín Valbuena (FCB-AORBI023). 1 female, 2 juveniles, Municipality of Guadalupe, 30-VII-1978, col. Laura E. Rodríguez L. (FCB-AORBI024). 1 male, 3 females, 1 juvenile, Municipality of Monterrey, 25°39'35.3"N 100°16'35.0"W, 523.9m a.s.l., Panteón "El Jardín", col. Edith Pacheco Villarreal (FCB-AORBI025). 3 females, Municipality of Hidalgo, La Turbina, 16-I-2013, col. Armando Azael Lozano Arevalo (FCB-AORBI026). **Tamaulipas**. 1 male, 2 females, 2 juveniles, Municipality of Aldama, Rancho Santa Marta, 17-IX-2010, Antonio Cantú de Leija (FCB-AORBI010). 3 females, Municipality of Ciudad Victoria, Panteón "Del Refugio", 5-IV-2010, col. Luis Jesús Cortez de la Fuente (FCB-AORBI027).

**Photographic records (iNaturalist).** *Zosis geniculata*. **MEXICO. Chiapas.** Municipality of Tuxtla Gutiérrez, 16°45'06.8"N 93°06'10.8"W, 24-IX-2022, photo by "maetageidy". Municipality of Tuxtla Gutiérrez, 16°46'12.0"N 93°09'45.0"W, 23-XII-2020, photo by "kevinadrian00". Municipality of Tuxtla Gutiérrez, 16°46'10.0"N 93°06'55.7"W, 17-X-2020, photo by "matteocasella". Municipality of Tuxtla Gutiérrez, 16°44'08.3"N 93°07'00.9"W, 3-VII-2020, photo by "belenjd\_tutor". **Jalisco.** Municipality of El Grullo, 19°48'09.6"N 104°13'07.9"W, 14-VIII-2022, photo by "carlospalomera". **Tamaulipas.** Municipality of Tampico, 22°13'59.1"N, 97°51'40.0"W, 28-V-2023, photo by "manzanaresjc". Municipality of Tampico, 22°24'27.9"N 97°55'16.2"W, 26-V-2023, photo by "manzanaresjc". Municipality of Tampico, 22°14'30.6"N 97°51'05.9"W, 16-IV-2023, photo by "romanrene". Municipality of Altamira, 22°21'31.9"N 97°54'42.4"W, 20-III-2023, photo by "ag18". Municipality of Altamira, 22°21'32.2"N 97°54'42.3"W, 17-III-2023, photo by "ag18". Municipality of Tampico, 22°14'47.8"N 97°51'39.6"W, 4-V-2017, photo by "guillernohsosa-tovar". **Yucatán.** Municipality of Merida, 20°58'05.3"N 89°37'47.5"W, 28-X-2022, photo by "itsmelucy".

**Online records (GBIF).** *Zosis geniculata*. **MEXICO. Chiapas.** 1 specimen, Municipality of Ocosingo, 16°45'36.0"N 91°00'25.2"W, Área Natural Protegida Lacandona, 15-VII-2004, deposited in the Colección Nacional de Arácnidos [CNAN], Instituto de Biología [IB], Universidad Nacional Autónoma de México [UNAM] (voucher number 4775) (CONABIO

2023). **Coahuila**. 1 male, Municipality of Saltillo (not Gómez Farías, Tamaulipas, as stated on the website), 24°57'00.0"N 101°02'00.0"W, 26-XII-1971, deposited in the Denver Museum of Nature & Science – Arachnology (catalog numbers ZA.938; 1998-121) (Denver Museum of Nature & Science 2023a). **Tamaulipas**. 1 specimen, Municipality of Gómez Farías, 23°02'22.0"N 99°09'02.6"W, 20-XII-1970, deposited in the Denver Museum of Nature & Science – Arachnology (catalog numbers ZA1183, 1999-94) (Denver Museum of Nature & Science 2023b).

*Zosis geniculata* had been reported for western Mexico without clearly defining a locality or a state (Opell 1979), with the records presented and compiled in this publication it is reported for the states of Chiapas, Coahuila, Jalisco, Nuevo León, Tamaulipas and Yucatán (Fig. 2). In his listing of the spider fauna of the state of Chiapas, García-Villafuente (2009) only mentioned the genus *Zosis*, it is likely that it is *Z. geniculata*. Such as with the case of the woodlouse spider *Dysdera crocata* C.L. Koch, 1838 (Araneae: Dysderidae), this is another example of a species of spider that can be confidently identified to the level of species with photographic records due to its conspicuous external characteristics (Figs. 1A-C), making citizen science platforms such as iNaturalist a valuable tool to assess its distribution (de Luna *et al.* 2022). It is very likely that more state records are added in the following years.

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