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Jumping spiders (Araneae: Salticidae) from Miocene Mexican amber

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Abstract

A compilation of jumping spiders (Araneae: Salticidae) from the Miocene amber of Chiapas, southwestern Mexico is provided. A total of 65 new fossil records are enumerated, of which three are members of the subfamily Lyssomaninae, five of the subfamily Spartaeinae, and 57 of the subfamily Salticinae, including a new record of the subtribe Freyina and 19 new records of the tribe Dendryphantini, ten of which are from the subtribe Marpissina and four of the subtribe Dendryphantina. In addition, based on recent changes in the salticid taxonomy, *Maevia eureka* Riquelme & Menéndez-Acuña, 2017 is transferred to the genus *Paramaevia* Barnes, 1955. The fossil record of jumping spiders in Mexico is the earliest known in the southernmost part of North America. Accordingly, the new records help to understand current distribution patterns of the family Salticidae in North America and the Neotropics.

Key words: Miocene, Marpissina, Dendryphantina, Lapsiini, Freyina, *Lyssomanes*, *Maevia*.

1. Introduction

Jumping spiders (Araneae: Salticidae) in the mid-Cenozoic are generally known from amber deposits of the Dominican Republic (Poinar 1992; Wunderlich 2004; Penney 2005, 2008). In the coeval amber deposits of Chiapas, a southern state in Mexico, jumping spiders are less well known, as well as the localities where they are found (Riquelme & Hill 2013; Riquelme & Menéndez-Acuña 2017). Four fossil records have been previously published (Petrunkevitch 1971; García-Villafuerte & Penney 2003), including the description of two species (Riquelme & Menéndez-Acuña 2017; García-Villafuerte 2018). In the present contribution, an inventory of fossil salticids is made with material reviewed from three separate collections. A compilation of 65 new records of Miocene salticids is presented below (Table 1). The fossil material comes from outcrops near the towns of Simojovel, Totolapa, and Estrella de Belén in the Chiapas Highlands, Mexico.

The lithology and sedimentary record of the amber deposits in Totolapa and Estrella de Belén are associated with those amber outcrops in Simojovel (Riquelme et al. 2014b; Riquelme et al. 2015), which have been assigned to the Mazantic and Balumtum strata from early to mid-Miocene, ca. 23-15 million years (Perrilliat et al. 2010; Riquelme et al. 2015). Currently, Simojovel, Totolapa, and Estrella de Belén are the major fossil deposits of a Miocene Konservat-Lagerstätte whose most conspicuous characteristic is that it shows an exceptionally preserved palaeobiota, with abundant terrestrial arthropods (Riquelme et al. 2014b; Riquelme et al. 2015). The botanical source of amber from Totolapa and Simojovel is a legume tree of the genus *Hymenaea* Linné (Lambert et al. 1989; Langenheim 2003; Riquelme et al. 2014b), as well as the amber from Estrella de Belén (Riquelme et al. 2014a; Riquelme et al. 2015). Chiapas amber has chemical signatures in common with plant resins of extant legume *Hymenaea courbaril* Linné and *Hymenaea verrucosa* Gaertner, which are now distributed in the tropics (Langenheim, 2003; Riquelme et al. 2014a, 2015). Sediments, palynoflora and palaeobiota correlated with the amber deposits suggest a lowland-fluvial environment close to a coastal plain (Graham 1999; Langenheim 2003; Perrilliat et al. 2010; Riquelme et al. 2014a).

2. Material and methods

The fossil specimens treated in this study are currently deposited in the Colección de Paleontología, Universidad Autónoma del Estado de Morelos (CPAL-UAEM), located in Cuernavaca, Morelos, Mexico. Additional material is deposited in the Museo del Ámbar de Chiapas (MACH), and Museo del Ámbar Lilia Mijangos (MALM), both located in San Cristóbal de las Casas, Chiapas, Mexico. These collections are formally certified by the Instituto Nacional de Antropología e Historia (INAH), a federal agency that protects the palaeontological heritage in Mexico. Preparation of the material and methods used here are presented in Riquelme & Menéndez-Acuña (2017). Microphotographs were acquired using multiple image-stacking ($Z \geq 25$) via a Carl Zeiss microscope. Taxonomic treatment and morphological identification for *Lyssomanes* Hentz, 1845 follows Galiano (1980), Reiskind (1989), Wunderlich (2004), and Richman et al. (2011); for Lapsiini follows Maddison (2006, 2019); for Freyina follows Edwards (2015); for *Marpissina* follows Barnes (1958), Maddison (1996, 2015), Wunderlich (2004), Edwards (2005), and Richman et al. (2011). Nomenclature follows Maddison (2015) and the World Spider Catalog (2020).

Abbreviations: CPAL-UAEM: Colección de Paleontología, Universidad Autónoma del Estado de Morelos (Morelos, Mexico). MALM: Museo del Ámbar Lilia Mijangos (Chiapas, Mexico). MACH: Museo del Ámbar de Chiapas (Chiapas, Mexico).

3. Systematic palaeontology

Class Arachnida Cuvier, 1812

Order Araneae Clerck, 1757

Family Salticidae Blackwall, 1841

Subfamily Lyssomaninae Blackwall, 1877

Genus *Lyssomanes* Hentz, 1845

Lyssomanes sp. indet.
Fig. 1A; Table 1

Material: Three new records, amber inclusions: CPAL.18: subadult male, complete specimen (Fig. 1A); MACH.124: juvenile; MACH.125: juvenile.

Locality and horizon: CPAL.18, MACH.124, and MACH.125: México, Chiapas, Simojovel, Monte Cristo, 17°8′10″ N, 92°41′47″ W. Mazantic shale and Balumtum sandstone strata, early–middle Miocene.

Identification and remarks: CPAL.18,MACH.124, and MACH.125 match *Lyssomanes* due to their eyes arrangement that typically shows the anterior lateral eyes dorsally of the anterior median eyes, forming four rows of eyes, with the third ocular row being narrower than the fourth, as well as the presence of spindly and setose legs. Thus, these two juveniles and one subadult male essentially agree with the description of the genus *Lyssomanes* (Galiano 1962, 1980; Richman et al. 2011, 2017). *Lyssomanes* is the only genus of the subfamily Lyssomaninae that is widely distributed in Mexico, although little studied, with 16 extant species recorded from north to south of the country, including *Lyssomanes spiralis* F.O. Pickard-Cambridge, 1900 from southern Chiapas (Richman et al. 2011), and a juvenile fossil specimen reported in Chiapas amber (García-Villafuerte & Penney 2003). *Lyssomanes* have also been previously recorded in Miocene Dominican amber (Reiskind 1989; Wunderlich 2004; Penney 2005).

Subfamily Spartaeinae Wanless, 1984

Tribe Lapsiini Maddison, 2015

Lapsiini sp. indet.
Fig. 1B; Table 1

Material: Five new records, amber inclusions: CPAL.69: adult male, complete specimen; CPAL.78: adult male, complete specimen; CPAL.91: adult male, complete specimen; CPAL.92: adult male, complete specimen; CPAL.95: adult male, complete specimen (Fig. 1B).

Locality and horizon: CPAL.69, CPAL.78, CPAL.91, CPAL.92, CPAL.95: Mexico, Chiapas, Simojovel, Monte Cristo, 17°8′10″ N, 92°41′47″ W. Mazantic shale and Balumtum sandstone strata, early–middle Miocene.

Identification and remarks: CPAL.69, CPAL.78, CPAL.91, CPAL.92, and CPAL.95 have a median apophysis on the male palp, which excludes them from the subfamily Salticinae (Maddison & Hedin 2003; Maddison 2006, 2015). Therefore, only lyssomanines and lapsiines share this unique trait among Neotropical non-salticines (Maddison 2006; Maddison & Needham 2006; Maddison 2019). But these fossil specimens are easily distinguished from the subfamily Lyssomaninae because they lack the four-row arrangement of the eyes (Maddison 2015). Besides the reduction to two retromarginal cheliceral teeth, no other morphological synapomorphies are known for lapsiines (Maddison 2019). The monophyly of the tribe relies mostly in several molecular data (Maddison 2015). A fossil species of lapsiine in Chiapas amber was previously published (García-Villafuerte 2018), and extant members of Lapsiini are generally known from South America, with the exception of the species *Amilaps mayana* Maddison, 2019, which has been recently described in southern Mexico (Maddison 2019). It seems that the provisional placement of *A. mayana* within Lapsiini, even lacking the teeth synapomorphy, responds to the fact that the species falls outside both, Lyssomaninae and Salticinae, but shares with other lapsiines the presence of a median apophysis in the male palp (Maddison 2019). According to this, the retromarginal cheliceral teeth are not distinguishable in the fossil specimens studied here (as a consequence of the position of the body within the resin or due to its state of conservation), but since they fall outside Lyssomaninae and Salticinae, we preliminarily placed them in the tribe Lapsiini. These new fossil records help to understand current distribution patterns of lapsiines in the southernmost part of North America and the Neotropics.

Subfamily Salticinae Blackwall, 1841

Tribe *Incertae sedis*
Figs. 1C, D, 2A; Table 1

Material: 37 new records, amber inclusions: CPAL.01: juvenile; CPAL.03: juvenile; CPAL.10: juvenile; CPAL.20: juvenile; CPAL.21: subadult male, complete specimen (Fig. 1C); CPAL.22: juvenile; CPAL.24: juvenile; CPAL.26: juvenile; CPAL.39: juvenile; CPAL.40: adult female, partially complete specimen; CPAL.46: juvenile; CPAL.51: adult male, complete specimen; CPAL.52: juvenile; CPAL.53: subadult male; CPAL.63: juvenile; CPAL.64: juvenile; CPAL.71: juvenile; CPAL.77: adult female, complete specimen; CPAL. 81: male adult, complete specimen (Fig. 1D); CPAL.96: juvenile; MACH.25: juvenile; MACH.126: juvenile; MACH.127: male adult, complete specimen; MACH.128: juvenile; MACH.129: juvenile; MACH.131: juvenile; MACH.138: adult male; complete specimen (Fig. 2A); MALM.58: juvenile; MALM.59: juvenile; MALM.110: adult male, complete specimen; MALM.111: juvenile; MALM.112: subadult male, complete specimen; MALM.113: adult male, complete specimen; MALM.114: juvenile; MALM.115: juvenile; MALM.501: adult male, partially complete specimen; MALM.502: juvenile.

Locality and horizon: CPAL.01, CPAL.22, and CPAL.26: Mexico, Chiapas, Salto de Agua, Estrella de Belén, 17°22′5″ N, 91°57′43″ W. CPAL.03, CPAL.51, and CPAL.53: Mexico, Chiapas, Totolapa, Río Salado, 16°33′2″ N, 92°41′29″ W. CPAL.10: Mexico, Chiapas, Simojovel, La Pimienta, 17°8′29″ N, 92°45′46″ W. CPAL.20, CPAL.24: Mexico, Chiapas, Totolapa, Río Panachen, 16°32′45″ N, 92°41′29″ W. CPAL.21, CPAL.39, CPAL.46, CPAL.52, CPAL.71, CPAL.77, MACH.126,

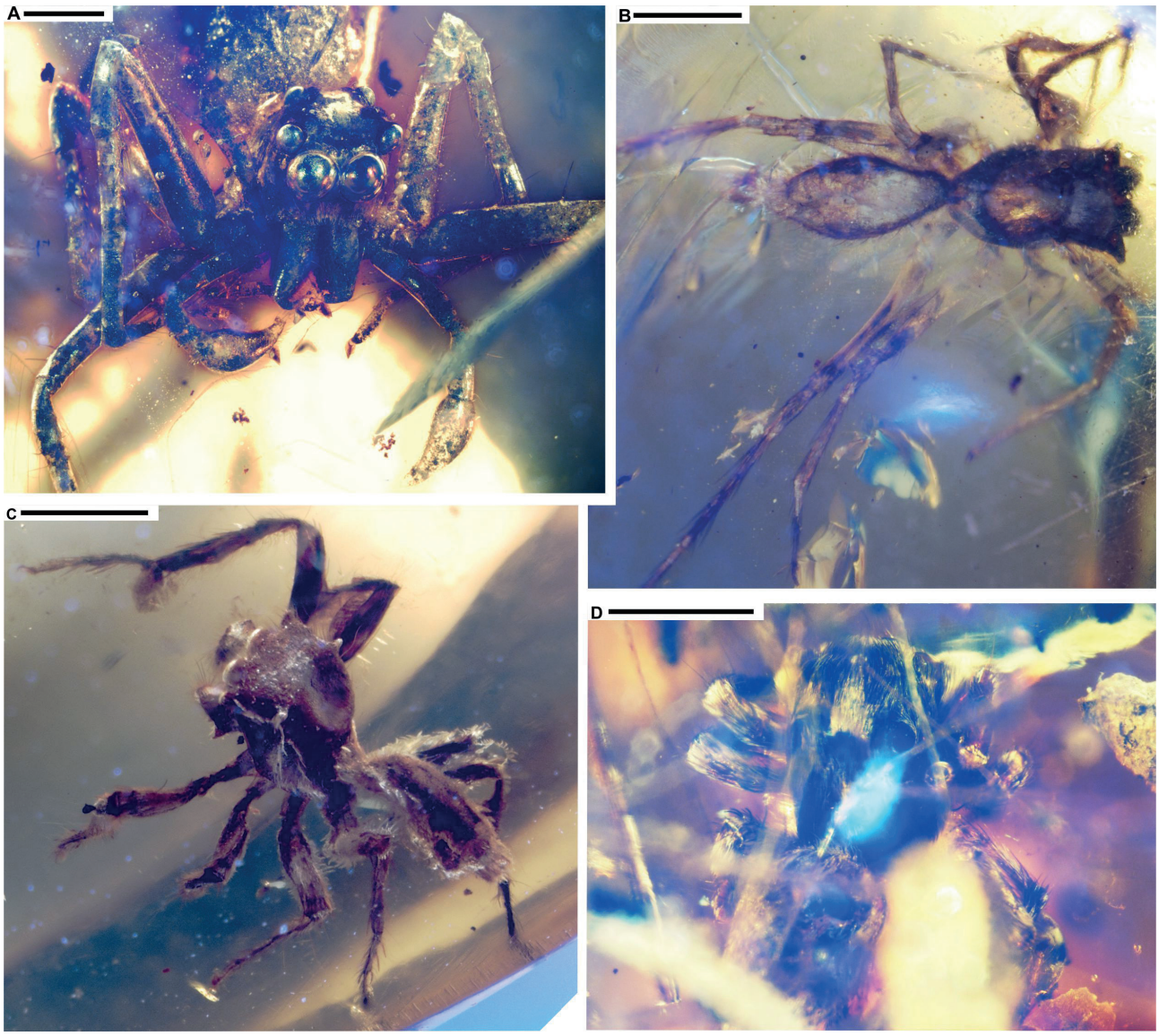

Fig. 1. New records of jumping spiders (Araneae: Salticidae) from Miocene Mexican amber. (A): CPAL.18, *Lyssomanes* sp. indet., frontal view. (B): CPAL.95, Lapsiine sp. indet., dorsal view. (C): CPAL.21, Salticinae: Tribe Incertae sedis, dorsolateral view. (D): CPAL.81, Salticinae: Tribe Incertae sedis, dorsal view. Scale bar in all photomicrographs 1 mm.

MACH.127, MACH.128, MACH.129, MACH.131, MALM.58, MALM.59, MALM.111, MALM.112: Mexico, Chiapas, Simojovel, Monte Cristo, 17°8′10″ N, 92°41′47″ W. CPAL.40, CPAL.64, CPAL.81, MACH.25, MACH.138, MALM.113, MALM.114, MALM.115, MALM.501, MALM.502: Mexico, Chiapas, Simojovel, Los Pocitos, 17°8′18″ N, 92°43′41″ W. CPAL.63, MALM.110: Mexico, Chiapas, Huitiupán, Huitiupán, 17°10′13″ N, 92°41′24.5″ W. CPAL.96: Mexico, Chiapas, Simojovel, Guadalupe Victoria, 17°7′58″ N, 92°48′91″ W. Mazantic shale and Balumtum sandstone strata, early–middle Miocene.

Identification and remarks: Adult and immature specimens are placed in Salticinae by their eye arrangement, in which the anterior lateral eyes and anterior median eyes form a single row, as well as the absence of tarsal claw on the palp, which are considered synapomorphies of salticines (Maddison & Hedin 2003; Maddison 2015). Most of the fossil material reviewed consists of immature specimens that do not have unambiguously recognizable differences in somatic characters. Another nine adult specimens have been significantly altered by the taphonomic process; some anatomical parts are lost or seriously damaged by organic decay or hidden by cloudy amber. Therefore, these fossil specimens are preliminary considered as representatives of the subfamily Salticinae of an uncertain tribe position. In addition, the subadult male CPAL.21 (Fig. 1C) and the adult female CPAL.40, are roughly different morphotypes from each other, they potentially fall into the Clade Salticoida as suggested in Maddison (2015). On the other hand, CPAL.81 (Fig. 1D) and MACH.138 (Fig. 2A), both adult

males, closely resemble *Habronattus* F. O. P.-Cambridge, 1901, but the male palp is not clearly distinguished because it is covered by cloudy amber. Accordingly, it is premature to place them in the subtribe Harmochirina. We decided to place them preliminarily as *incertae sedis* until we have a detailed view of the male palp. The fossil record of the subfamily Salticinae in the coeval amber deposits of the Dominican Republic predominantly includes the tribes Euophryini, Sarindini, and Gophoini (World Spider Catalog 2020).

Tribe Dendryphantini Menge, 1879

Dendryphantini sp. indet.
Table 1

Material: Five new records, amber inclusions: CPAL.48: juvenile; CPAL.73: adult male, complete specimen; CPAL.80: adult male, complete specimen; MACH.117: adult female, complete specimen; MACH.136: adult male, complete specimen.

Locality and horizon: CPAL.48, MACH.117, MACH.136: Mexico, Chiapas, Simojovel, Monte Cristo, 17°8′10″ N, 92°41′47″ W. CPAL.73: Mexico, Chiapas, Simojovel, Guadalupe Victoria, 17°7′58″ N, 92°48′91″ W. CPAL.80: Mexico, Chiapas, Simojovel, Los Pocitos, 17°8′18″ N, 92°43′41″ W. Mazantic shale and Balumtum sandstone strata, early–middle Miocene.

Identification and remarks: CPAL.48, CPAL.73, CPAL.80, MACH.117 share morphological traits that match Dendryphantini (Maddison & Hedin 2003), such as the general body form, the first pair of legs robust, and the narrow and shoe-shaped form of the male palp as seen in CPAL.73, CPAL.80, and MACH.136. However, an additional placement within the subtribe Marpissina or subtribe Dendryphantina is speculative at this time. Insect inclusions and plant debris partially cover the bodies of spiders. The raw amber needs additional preparation that does not damage the specimens. Dendryphantini as proposed in Maddison (2015) coincides with Marpissoida (*sensu* Maddison & Hedin 2003). Dendryphantini is currently a group with some of the highest species number within the family Salticidae, with 4 subtribes, 72 genera and nearly 744 valid species described worldwide (Maddison 2015). Fossil members of the tribe Dendryphantini (subtribe Synagelina) have previously been recorded in Dominican amber (World Spider Catalog 2020). The new records expand the distribution of Dendryphantini to the northernmost part of Middle America in the Miocene, ca. 23 Ma.

Subtribe Marpissina Simon, 1901

Marpissina sp. indet.
Fig. 2B, C; Table 1

Material: Ten new records, amber inclusions: CPAL.13: adult female, complete specimen (Fig. 2B); CPAL.35: adult male, complete specimen; CPAL.37: adult male, complete specimen; CPAL.50: male adult, complete specimen; CPAL.67: juvenile; MACH.31: juvenile; MACH.41: adult male, complete specimen (Fig. 2C); MACH.73: adult female, complete specimen; MALM.01: adult male, complete specimen; MALM.02: adult male, complete specimen.

Locality and horizon: CPAL.13, CPAL.67, MALM.01: Mexico, Chiapas, Simojovel, Monte Cristo, 17°8′10″ N, 92°41′47″ W. CPAL.35: Mexico, Chiapas, Simojovel, La Pimienta, 17°8′29″ N, 92°45′46″ W. CPAL.37, CPAL.50: Mexico, Chiapas, Totolapa, Río Salado, 16°33′2″ N, 92°41′39″ W. MACH.31, MACH.41, MACH.73, MALM.02: Mexico, Chiapas, Simojovel, Los Pocitos, 17°8′18″ N, 92°43′41″ W. Mazantic shale and Balumtum sandstone strata, early–middle Miocene.

Identification and remarks: All specimens have a slightly flattened and elongated body, which is considered a shared derived trait in Marpissina (Maddison 2015). The extant marpissines reviewed in Barnes (1958) and later in Edwards (2005) do not show clear morphological synapomorphies; they are grouped predominantly by molecular traits (Maddison & Hedin 2003; Maddison 2015). On the other hand, CPAL.13 (Fig. 2B), CPAL.35, CPAL.37, and MACH.41 (Fig. 2C), must be treated separately as distinct morphotypes within marpissines, but details of the female epigynum and male palp are currently difficult to observe. The New World marpissines are widely distributed in the Mexican territory (Richman et al. 2011; World Spider Catalog 2020), including the living species *Metacyrba venusta* (Chickering, 1946) recorded from Chiapas (Richman et al. 2011), and the Miocene species *Maevia eureka* Riquelme & Menéndez-Acuña, 2017. Initially, Riquelme & Menéndez-Acuña (2017) stated that *M. eureka* belongs to the "*Paramaevia*" group, formerly included in the genus *Paramaevia*, until Edwards (1977) considered *Paramaevia* as a synonym of *Maevia*. Afterwards, the synonymy of *Paramaevia* was rejected by Prószyński (2017), and recently *Paramaevia* was considered a valid genus by the World Spider Catalog (2020). According to this, the fossil species is re-named as *Paramaevia eureka* (Riquelme & Menéndez-Acuña, 2017) comb. nov.

Subtribe Dendryphantina Menge, 1879

Dendryphantina sp. indet.
Fig. 2D; Table 1

Material: Four new records, amber inclusions: CPAL.17: adult male, with partially degraded opisthosoma; CPAL.23: adult male, complete specimen (Fig. 2D); CPAL.34: adult male, complete specimen; and CPAL.38, adult male, complete specimen.

Locality and horizon: CPAL.17, CPAL.38: Mexico, Chiapas, Simojovel, Los Pocitos, 17°8′18″ N, 92°43′41″ W. CPAL.23: Mexico, Chiapas, Totolapa, Río Panachen, 16°32′45″ N, 92°41′29″ W, 2015; CPAL.34: Mexico, Chiapas, Simojovel, Monte Cristo, 17°8′10″ N, 92°41′47″ W, 2017. Mazantic shale and Balumtum sandstone strata, early–middle Miocene.

Identification and remarks: CPAL.17, CPAL.38, CPAL.23, and CPAL.34 match Dendryphantina by its general body form, including the enlarged leg I and the shoe-shaped cymbium. CPAL.23 is a morphotype separated from the other two adults, but its male palp is partially visible (Fig. 2D). The other three specimens, CPAL.17, CPAL.34, and CPAL.38 are potentially conspecific, but a rough area in the amber does not allow a sharp focus on the male palp. Extant dendryphantines are consistently found in the Mexican territory (World Spider Catalog 2020). However, there are no previous fossil records of the subtribe Dendryphantina in Chiapas amber or Dominican amber.

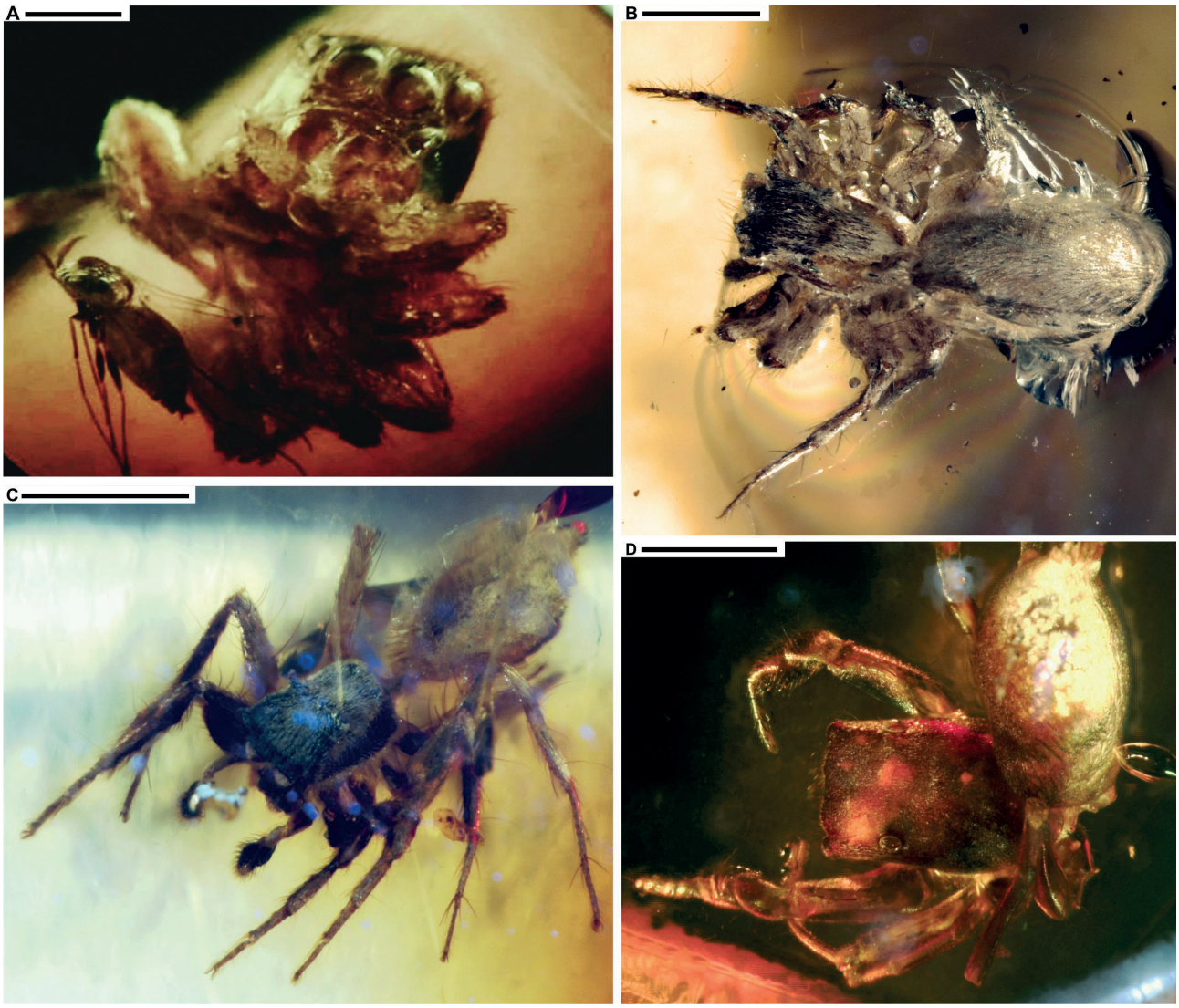

Fig. 2. New records of jumping spiders (Araneae: Salticidae) from Miocene Mexican amber. (A): CPAL.138, Salticinae: Tribe Incertae sedis, frontal view. (B): CPAL.13, Marpissina sp. indet., dorsal view. (C): MACH.41, Marpissina sp. indet., dorsal view. (D): CPAL.23, Dendryphantina sp. indet., dorsal view. Scale bar in all photomicrographs 1 mm.

Tribe Aelurillini Simon, 1901

Subtribe Freyina Edwards, 2015

Freyina sp. indet.
Table 1

Material: One new record, amber inclusion: CPAL.79: Adult male, with strongly degraded opisthosoma.

Locality and horizon: CPAL.79: Mexico, Chiapas, Simojovel, Los Pocitos, 17°08′18″ N, 92°43′41″ W, 2019. Mazantic shale and Balumtum sandstone strata, early–middle Miocene.

Identification and remarks: CPAL.79 matches Freyina by a subdistal and subproximal prolateral leg tibial macrosetae and conspicuous setal tufts in the legs basal segment, which is consistent with the criteria proposed by Edwards (2015) and Maddison (2015). Also, the prosomal pattern of lateral longitudinal bands of white scales below the posterior lateral eyes (PLE) is clearly visible, which is an informal trait that can help to recognize putative members of Freyina (Maddison 2015). Currently, this group is almost exclusively Neotropical, with few introduced species reaching northern Mexico (Edwards & Ruiz 2013). Several extant species of six genera are recorded in the Mexican territory, including *Nycerella delecta* (Peckham & Peckham, 1896), which has been previously reported in Chiapas (Richman et al. 2011).

4. Discussion

We highlight recent advances in identifying fossil material of jumping spiders from the Miocene amber-bearing beds of Mexico, which until now have not been sufficiently studied. What we have glimpsed here is the underlying connection between the Miocene jumping spiders of southwestern Mexico and the extant diversity of several related groups in North America and the Neotropics. This has a direct implication for determining the distribution patterns and phylogenetic relationships of the family in this region. The diversification and extinction of Chiapas amber palaeobiota, including jumping spiders, which most likely took place in allopatry, is preliminarily discussed in Riquelme & Hill (2013), as well as the geological evolution of the Chiapas amber area, with implications of salticids dispersal. Accordingly, fossil salticids from Chiapas amber are significantly diverse at the subfamily level with close relatives of living species. Therefore, the relatively modern forms of the Neogene amber deposits in Chiapas and the Dominican Republic suggest a broader divergence since the Miocene within the tropics of the Middle America. The geological evolution of the southern region of Mexico, Central America and the Antilles from the Palaeogene to Neogene that caused short-term cyclical changes in climate (Meneses-Rocha 2001; Gutiérrez-García &Vásquez-Domínguez 2013) may have driven the early dispersal and introduction of salticids to new areas in Central America and southern North America over short periods of geological time spanning the Miocene to Pliocene. To our knowledge, the fossil record of jumping spiders in Mexico is the earliest known in the southernmost part of North America.

Currently, there is a high loss of fossil spiders by commercial trade in the Chiapas amber area. However, the specimens listed here are now housed in three different Mexican repositories that are part of a current conservation strategy of fossil material. This inventory is also a useful step in terms of conservation of fossil heritage in Mexico.

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Table 1. New records of jumping spiders (Araneae: Salticidae) from Miocene Mexican amber.

Specimen	Subfamily/Tribe	Subtribe/Genus	Locality	Collection Year	State	Repository
CPAL.01	Salticinae: Incertae sedis		Salto de Agua, Estrella de Belén	2017	Juvenile	CPAL-UAEM
CPAL.03	Salticinae: Incertae sedis		Totolapa, Río Salado	2015	Juvenile	CPAL-UAEM
CPAL.10	Salticinae: Incertae sedis		Simojovel, La Pimienta	2017	Juvenile	CPAL-UAEM
CPAL.13	Salticinae: Dendryphantini	Marpissina	Simojovel, Monte Cristo	2017	Adult female	CPAL-UAEM
CPAL.17	Salticinae: Dendryphantini	Dendryphantina	Simojovel, Los Pocitos	2017	Adult male	CPAL-UAEM
CPAL.18	Lyssomaninae	*Lyssomanes*	Simojovel, Monte Cristo	2017	Subadult male	CPAL-UAEM
CPAL.20	Salticinae: Incertae sedis		Totolapa, Río Panachen	2015	Juvenile	CPAL-UAEM
CPAL.21	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2017	Subadult male	CPAL-UAEM
CPAL.22	Salticinae: Incertae sedis		Salto de Agua, Estrella de Belén	2015	Juvenile	CPAL-UAEM
CPAL.23	Salticinae: Dendryphantini	Dendryphantina	Totolapa, Río Panachen	2015	Adult male	CPAL-UAEM
CPAL.24	Salticinae: Incertae sedis		Totolapa, Río Panachen	2015	Juvenile	CPAL-UAEM
CPAL.26	Salticinae: Incertae sedis		Salto de Agua, Estrella de Belén	2015	Juvenile	CPAL-UAEM
CPAL.34	Salticinae: Dendryphantini	Dendryphantina	Simojovel, Monte Cristo	2017	Adult male	CPAL-UAEM
CPAL.35	Salticinae: Dendryphantini	Marpissina	Simojovel, La Pimienta	2017	Adult male	CPAL-UAEM
CPAL.37	Salticinae: Dendryphantini	Marpissina	Totolapa, Río Salado	2018	Adult male	CPAL-UAEM
CPAL.38	Salticinae: Dendryphantini	Dendryphantina	Simojovel, Los Pocitos	2018	Adult male	CPAL-UAEM
CPAL.39	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	CPAL-UAEM
CPAL.40	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2018	Adult female	CPAL-UAEM
CPAL.46	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	CPAL-UAEM
CPAL.48	Salticinae: Dendryphantini		Simojovel, Monte Cristo	2018	Juvenile	CPAL-UAEM
CPAL.50	Salticinae: Dendryphantini	Marpissina	Totolapa, Río Salado	2019	Adult Male	CPAL-UAEM
CPAL.51	Salticinae: Incertae sedis		Totolapa, Río Salado	2019	Adult male	CPAL-UAEM
CPAL.52	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2019	Juvenile	CPAL-UAEM
CPAL.53	Salticinae: Incertae sedis		Totolapa, Río Salado	2019	Subadult male	CPAL-UAEM
CPAL.63	Salticinae: Incertae sedis		Huitiupán, Huitiupán	2018	Juvenile	CPAL-UAEM
CPAL.64	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2018	Juvenile	CPAL-UAEM
CPAL.67	Salticinae: Dendryphantini	Marpissina	Simojovel, Monte Cristo	2018	Juvenile	CPAL-UAEM
CPAL.69	Spartaeinae: Lapsiini		Simojovel, Monte Cristo	2018	Adult male	CPAL-UAEM
CPAL.71	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	CPAL-UAEM
CPAL.73	Salticinae: Dendryphantini		Simojovel, Guadalupe Victoria	2018	Adult male	CPAL-UAEM
CPAL.77	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2019	Adult female	CPAL-UAEM
CPAL.78	Spartaeinae: Lapsiini		Simojovel, Monte Cristo	2019	Adult male	CPAL-UAEM
CPAL.79	Salticinae: Aelurillini	Freyina	Simojovel, Los Pocitos	2019	Adult male	CPAL-UAEM
CPAL.80	Salticinae: Dendryphantini		Simojovel, Los Pocitos	2019	Adult male	CPAL-UAEM
CPAL.81	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2014	Adult male	CPAL-UAEM
CPAL.91	Spartaeinae: Lapsiini		Simojovel, Monte Cristo	2019	Adult male	CPAL-UAEM

Specimen	Subfamily/Tribe	Subtribe/Genus	Locality	Collection Year	State	Repository
CPAL.92	Spartaeinae: Lapsiini		Simojovel, Monte Cristo	2019	Adult male	CPAL-UAEM
CPAL.95	Spartaeinae: Lapsiini		Simojovel, Monte Cristo	2019	Adult male	CPAL-UAEM
CPAL.96	Salticinae: Incertae sedis		Simojovel, Guadalupe Victoria	2018	Juvenile	CPAL-UAEM
MACH.25	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2014	Juvenile	MACH
MACH.31	Salticinae: Dendryphantini	Marpissina	Simojovel, Los Pocitos	2014	Juvenile	MACH
MACH.41	Salticinae: Dendryphantini	Marpissina	Simojovel, Los Pocitos	2014	Adult male	MACH
MACH.73	Salticinae: Dendryphantini	Marpissina	Simojovel, Los Pocitos	2014	Adult female	MACH
MACH.117	Salticinae: Dendryphantini		Simojovel, Monte Cristo	2018	Adult female	MACH
MACH.124	Lyssomaninae	*Lyssomanes*	Simojovel, Monte Cristo	2018	Juvenile	MACH
MACH.125	Lyssomaninae	*Lyssomanes*	Simojovel, Monte Cristo	2018	Juvenile	MACH
MACH.126	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	MACH
MACH.127	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Adult male	MACH
MACH.128	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	MACH
MACH.129	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	MACH
MACH.131	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	MACH
MACH.136	Salticinae: Dendryphantini		Simojovel, Monte Cristo	2018	Adult male	MACH
MACH.138	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2014	Adult Male	MACH
MALM.01	Salticinae: Dendryphantini	Marpissina	Simojovel, Monte Cristo	2019	Adult male	MALM
MALM.02	Salticinae: Dendryphantini	Marpissina	Simojovel, Los Pocitos	2019	Adult male	MALM
MALM.58	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	MALM
MALM.59	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2018	Juvenile	MALM
MALM.110	Salticinae: Incertae sedis		Huitiupán, Huitiupán	2017	Adult male	MALM
MALM.111	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2017	Juvenile	MALM
MALM.112	Salticinae: Incertae sedis		Simojovel, Monte Cristo	2017	Subadult male	MALM
MALM.113	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2017	Adult male	MALM
MALM.114	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2017	Juvenile	MALM
MALM.115	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2017	Juvenile	MALM
MALM.501	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2017	Adult male	MALM
MALM.502	Salticinae: Incertae sedis		Simojovel, Los Pocitos	2017	Juvenile	MALM