CONTRIBUTION TO THE KNOWLEDGE OF THE ARACHNIDS IN THE YUCATAN PENINSULA, MEXICO (EXCLUDING ARANAE AND ACARI)[1]

[CONTRIBUCIÓN AL CONOCIMIENTO DE LOS ARÁCNIDOS DE LA PENÍNSULA DE YUCATÁN, MÉXICO (EX ARANEAE Y ACARI)]

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SUMMARY

The Chelicerata are the second group of arthropods with the highest diversity after insects and they can inhabit almost all types of environments. The most current classification recognizes 11 orders and estimates in the number of species vary from 52,000 to 100,000. We have made an extensive literature review on the diversity of arachnids in the Yucatan Peninsula (YP) (excluding spiders and ticks). In Mexico there are 834 known species which represent 6% of the worldwide diversity. In the YP 63 records were found (58 species and 5 genera) of arachnids, which represent 6.8% of the Mexican species. According to our research, 28 of the 58 species (48%) in the YP were also record in other parts of Mexico, the continent and the world. Undoubtedly, the state of Yucatan is the best represented of the YP. In order to have a better understanding of the diversity of arachnid species is important to promote biological compendiums and sampling programs, which will improve the representation of this group and probably increasing the number of local species.
Key words: biodiversity; species; Arachnids; Yucatan Peninsula; Mexico.

RESUMEN

Los quelicerados son el segundo grupo más diverso de artropodos después de los insectos y se pueden encontrar en casi todos los ambientes. Las clasificaciones recientes reconocen 11 órdenes y las estimaciones en el número de especies varia entre 52,000 a más de 100,000 especies. Se realizó una revisión bibliográfica extensa sobre la diversidad de arácnidos la Península de Yucatán (PY). En México se han registrado 834 especies lo cual representa el 6% de la riqueza mundial. Para la PY se lograron 63 registros (58 especies y 5 géneros) de arácnidos que representan el 6.8% de la riqueza de estos órdenes evaluada a nivel nacional. En 28 de las 58 especies (48%) se encontró que además de los reportes en la PY tenían registros en otras partes del país, del continente o del mundo. Sin duda, el estado de Yucatán ha sido el mejor muestreado de los tres estados de la PY. Para tener un conocimiento más amplio de la diversidad de especies de arácnidos es importante realizar estos compendios biológicos y campañas de colecta para mejorar la representatividad, con lo cual es probable que aumente localmente el número de especies.
Palabras clave: biodiversidad; especies; Arácnidos; Península de Yucatan; México.

INTRODUCTION

The Phylum Arthropoda (arthropods) is the largest and most successful of the animal phyla, representing about 80% of known species. Following insects, chelicerates are the second group with the highest diversity of modern arthropods (Dunlop 2010; Zhang 2011). Whereas many arthropods show three main body tagmas (head, thorax and abdomen), chelicerates have two: the cephalothorax (prosoma) and the abdomen (opisthosoma). This is the result of a 'fusing' of the head and thorax regions and four pairs of legs. Chelicerates were originally predators, but the group has diversified to use all the major feeding strategies: predation, parasitism, herbivory, scavenging and eating decaying organic matter.

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Pycnogonida (sea spiders) and Xiphosura (horseshoe crabs) are the marine orders of chelicerates (Harvey 2002; Nyffeler and Pusey 2014: Nyffeler *et al.,* 2016).

Discovering relationships within the arachnids has proven to be difficult, with successive studies producing different results. A study based on the largest set of molecular data concluded that there were systematic conflicts in phylogenetic information, particularly affecting the orders Acariformes, Parasitiformes and Pseudoscorpiones, which have had much faster evolutionary rates (Sharma *et al.,* 2014). However, many author accept 11 orders as true Arachnids (Coddington *et al.,* 2004, Chapman 2009): mites and ticks (Acari) (for several author Acari most be a separate Class), scorpions (Scorpiones), true spiders (Aranae), tailless whip scorpions or cave spiders (Amblypygi), harvestmen or daddy longlegs (Opiliones), camel spiders, wind scorpions, or sun spiders (Solifugae), shorttailed whipscorpion (Schizomida), false scorpion or book scorpion (Pseudoescorpionida), microwhip scorpions (Palpigradi), hooded tickspiders (Ricinulei) and vinegarroons or whip scorpions (Uropygi) (Chapman 2009).

Estimates of the number of arachnid species vary from 52, 000 to 110, 000 (i.e. Chapman 2009; Francke 2014), with spiders and mites ranking among the most diverse of all animal orders and representing 85% of arachnids (Harvey 2002; Zhang 2011). Yet, more than half of arachnid species diversity remains unknown (Chapman 2009). In Mexico 11 orders of arachinds are represented, with thousands of reported species, indicating that it is a country rich in arachnid fauna. Most of the works focus on Aranae and Acari, while the rest of the orders have recived minimal attention. The contribution presented here provides full and updated literature and data on eight orders: Amblipygi, Opiliones, Scorpionida, Solifugae, Pseudoescorpionida, Palpigradi, Ricinulei and Schizomida. Furthermore, the distribution of species reported for the Yucatan Peninsula (YP) is discussed.

MATERIAL AND METHODS

We reviewed the newest published estimations of global diversity of arachnids. Published works, such as Adis and Harvey (2000), Harvey (2003), Chapman (2009), Blick and Harvery (2011) and Francke (2014) have proposed estimates regarding the number of arachnid species. In general, these estimates reveal a growing number of known species, except in the case of Uropygi, in which Chapman (2009) refers to 286 species and two years later Blick and Harvey (2011) found only 110 species worldwide. For the estimate of worldwide species richness, we followed the catalogue of Blick and Harvey (2011) because it is one of the most recent estimation and thorough catalogues.

Neither in YP nor Mexico exists a general review of terrestrial arachnid species. A review of Mexico could include thousands of species, especially mites and spiders; however it is merely an estimate due to the incomplete and fragmented knowledge of this group. In order to get the information about arachnids registered in the YP, we reviewed all available information (books, papers and on line catalogues from museums). Between 1998-2006 specific order compilations where published, in some cases, localities and state records published in older papers where not included. Aditional information on speleology from Palacios-Vargas (1993), Palacios-Vargas *et al.* (1997, 1998), Palacios-Vargas and Reddell (2013) and Hoffmann *et al.* (2004) was a significant contribution to knowledge of the species. In many cases, we did not review the original reference that indicates the species type locality, because this information was already referenced in many other general works (*v.g*. Reddell 1981; Vázquez 1996a-e; Harvey 2013a-f). In this review, we generated an update list of species in at least one of the states from the YP. When we found a genus not reported for the state, we nonetheless considered it because the specimen might later be determined and added to the list of valid species. The genus was not considered when we counted species. To confirm the species we checked the most recent reference and the Integrated Taxonomic Information System (ITIS) on-line database (http://www.itis.gov) excluding Opiliones, Pseudoscorpiones and Scorpiones. The distribution of the species is discussed, and references are included in Table 2.

RESULTS

Richness of arachnid species on a global scale and in Mexico

13,673 species within the arachnid orders considered in this review have been discovered on a global scale, of which 171 correspond to Amblypygi; 6,491 to Opiliones; 84 to Palpigradi; 3,444 to Pseudoescorpionida; 67 to Ricinulei; 1,922 to Scorpiones; 274 to Schizomida; 1,110 to Solifugae; and 110 to Uropygi. Along with Brazil, Colombia, Cuba, Guyana and the United States, Mexico is one of the few countries where every known order of arachnid species has been reported (Francke 2014).

In Mexico 834 species from the orders in this review have been registered. These species represent 6% of the global richness (Table 1). The most recent compilation of this information Francke (2014) affirms that the 27 Amblypygi species found in Mexico are mostly endemic. There are 238 known

Opiliones species, and the Palpigrai are well-represented with 20 species, Mexico being the country with greatest diversity of palpigrads in the world. Similarly, there are 159 Pseudoscorpionida species recorded, likely making Mexico the country with greatest diversity as soon as the most recently discovered species are recorded; 14 of the Ricinulei; 35 Schizomidae (although other sources consider 36; Harvey 2013d); 258 Scorpiones, mostly endemic to Mexico; 79 Solifugae and four Uropygi species.

Representation of arachnids in the Yucatan Peninsula

In the YP, all orders have been recorded except Uropygi (Delfín-González *et al.,* 2010), which has been reportedly found in border zones like Guatemala and are presumably present in the YP as well. Without exaggeration, none of these orders has been studied indepth, and although there are many reports concerning arachnid species, they have been sporadic, sparce and have made it difficult to record the diversity of these groups (Francke 2014).

Considering the YP as a biotic province, 63 records of arachnids (58 species and 5 genera) have been recorded, which represents 6.8% of the national richness (Table 1). From the review we obtained a list of 58 species with distribution in at least one of the states in the YP (Table 2).

Table 1. Species of arachnids recorded worlwide, in Mexico and in the Yucatan Peninsula. Blick and Harvey (2011) provide information for worldwide data, and Francke (2014) provides data on Mexican species. References for data from the Yucatan Peninsula is found in Table 2.

Orders	World	Mexico	Yucatan Peninsula	Campeche	Quintana Roo	Yucatan
Amblypygi	171	27	5	3	5	3
Opiliones	6,491	238	11	6	3	10
Palpigradi	84	20	1	1	1	1
Pseudoescorpionida	3,444	159	21	1	4	18
Ricinulei	67	14	1	-	1	1
Schizomida	274	35	2	1	1	2
Scorpiones	1,922	258	14	3	9	7
Solifugae	1,110	79	3	-	2	1
Uropygi	110	4	-	-	-	-
Total	13,673	834	58	15	26	43

Table 2. Species of arachnids recorded from the Campeche (CAMP), Quintana Roo (QROO) and Yucatan (YUC) states in Mexico. References for more information concerning species and distribution are listed in the final column.

ORDER/family	SPECIES	CAMP	QROO	YUC	References
AMBLYPYGI					
Phrynidae	*Paraphrynus chacmool* (Rowland 1973)	X	X	X	Reddell 1981; Vázquez 1996c; Harvey 2003; Hoffmann *et al.,* 2004; Armas 2001, 2006; Harvey 2013f; Palacios-Vargas and Reddell 2013
	Paraphrynus raptator (Pocock 1902)	X	X	X	Reddell 1981; Vázquez1996c; Hoffmann *et al.,* 2004; Armas 2001, 2006; Harvey 2013f
	Paraphrynus reddelli Mullinex 1979	X	X	X	Reddell 1981; Vázquez 1996c; Armas 2001, 2006; Harvey 2003, 2013f; Palacios-Vargas and Reddell, 2013
	Phrynus cozumel Armas 1995		X		Armas 2001, 2006; Harvey 2003, 2013f
	Phrynus parvulus Pocock 1902		X		Armas 2001, 2006; Harvey 2013f
OPILIONES					
Cosmetidae	*Erginulus bimaculatus* (Goodnight and Goodnight 1977)	X		X	Reddell 1981; Kury and Cokendolpher, 2000; Palacios-Vargas and Reddelll 2013
	Erginulus clavotibialis (P-C 1905)	X		X	Kury and Cokendolpher 2000

ORDER/family	SPECIES	CAMP	QROO	YUC	References
	Erginulus gervaisii (Sørensen 1932)			X	Kury and Cokendolpher 2000
	Erginulus roeweri (Goodnight and Goodnight 1947)			X	Reddell 1981; Kury and Cokendolpher 2000
	Holobonones compressus (P-C 1904)	X	X	X	Reddell 1981; Kury and Cokendolpher 2000
Sclerosomatidae	*Geaya yucatana* (Goodnight and Goodnight 1947)	X	X	X	Kury and Cokendolpher 2000
	Leiobunum dromedarium (P-C 1905)	X		X	Kury and Cokendolpher 2000
	Prionostemma tekoma (Goodnight and Goodnight 1947)			X	Kury and Cokendolpher 2000
Stygnommatidae	*Stygnomma maya* (Goodnight and Goodnight 1951)			X	Kury and Cokendolpher 2000
	Stygnomma spiniferum tancahense (Packard 1888)		X		Kury and Cokendolpher 2000
Zalmoxidae	*Pachylicus acutus* (Goodnight and Goodnight 1942)	X		X	Kury and Cokendolpher 2000
PALPIGRADI					
Eukoeneniidae	*Eukoenenia hanseni* (Silvestri 1913)		X	X	Reddell 1981; Vázquez 1996a; Harvey 2013a
	Eukoenenia sp.	X			Hoffmann *et al.*, 2004
PSEUDOESCORPIONIDA					
Bochicidae	*Vachoniun boneti* Chamberlin 1947			X	Reddell 1981; Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013
	Vachoniun chukum Muchmore 1982			X	Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013
	Vachoniun cryptum Muchmore 1977			X	Reddell 1981; Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell, 2013
	Vachoniun kauae Muchmore 1973			X	Reddell 1981; Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell, 2013
	Vachoniun loltun Muchmore 1982			X	Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell, 2013
	Vachoniun maya Chamberlin 1947			X	Reddell 1981; Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013
	Vachoniun robustum Muchmore 1982			X	Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013
Chernetidae	*Allochernes* sp.	X			Hoffmann *et al.*, 2004
	Chelodamus mexicolens R.V. Chamberlin 1925			X	Ceballos 2004; Harvey 2013b
	Coprochenes quintanarooensis Muchmore 1991		X		Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013
	Epichernes navarroi Muchmore 1991		X	X	Ceballos 2004; Villegas and Hernández 2006; Harvey 2013b
	Lustrochernes minor Chamberlin 1938			X	Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013
	Pachychernes attenuatus Muchmore 1991		X	X	Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell, 2013
	Parazaona cavicola Chamberlin 1938			X	Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013
Chthoniidae	*Mexichthonius unicus* Muchmore 1975	X			Ceballos 2004; Harvey 2013b
	Pseudochthonius troglobius Muchmore 1986			X	Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013

ORDER/family	SPECIES	CAMP	QROO	YUC	References
	Pseudochthonius yucatanus Muchmore 1977			X	Ceballos 2004; Harvey 2013b
Garypidae	*Garypus decolor* Muchmore 1991		X		Ceballos 2004; Harvey 2013b
Neobiiisidae	*Roncus* sp		X		Palacios-Vargas *et al.*, 1997
Olpiidae	*Pachyolpium paucisetosum* (Muchmore 1977)			X	Ceballos 2004; Harvey 2013b
	Planctolpium arboreum Hoff 1946			X	Ceballos 2004; Hatvey 2013b
Syarinidae	*Ideoblothrus maya* (Chamberlin 1938)			X	Ceballos 2004; Harvey 2013b; Palacios-Vargas and Reddell 2013
Withiidae	*Cacodemonius quartus* Hoff 1946			X	Ceballos 2004; Harvey 2013b
RICINULEI					
Ricinoididae	*Pseudocellus pearsei* (Chamberlin and Ivie 1938)		X	X	Reddell 1981; Palacios-Vargas 1993; Vázquez 1996e; Cokendolpher and Enríquez 2004; Harvey 2003 2013c; Hoffmann *et al.*, 2004; Palacios-Vargas and Reddelll 2013
	Pseudocryptocellus sp.		X		Palacios *et al.*, 1997, 1998.
SCHIZOMIDA					
Hubbardiidae	*Stenochrus goodnightorum* (Rowland 1973)			X	Vázquez 1996b; Harvey 2003, 2013d
	Stenochrus portoricensis Chamberlin 1922	X	X	X	Reddell 1981; Vázquez 1996b; Armas 2001; Harvey 2003, 2013d; Hoffmann *et al.*, 2004
	Schizomus sp.		X	X	Palacios-Vargas 1993; Palacios-Vargas *et al.*, 1997
SCORPIONES					
Buthidae	*Centruroides gracilis* (Lathreille 1804)	X	X	X	Sissom and Lourenco 1987; Pinkus-Rendón *et al.*, 1999; Armas 2001; Francke 2016
	Centruroides margaritatus (Gervais 1841)			X	Sissom and Lourenco 1987; Francke 2016
	Centruroides ochraceus (Pocock 1898)	X	X	X	Pinkus-Rendón *et al.*, 1999; Armas 2001; Hoffmann et al., 2004; Francke 2016
	Centruroides schmidti (Sissom 1995)		X		Armas 2001; Francke 2016
	Centruroides sissomi (Armas 1996)		X		Armas 2001; Francke 2016
	Centruroides thorellii (Kraepelin 1891)		X	X	Armas 2001; Francke 2016
Scorpionidae	*Cazierius* sp.			X	Hoffmann *et al.*, 2004
	*Diplocentrus actun (*Armas and Palacios-Vargas 2002)			X	Palacios-Vargas y Reddell, 2013; Francke 2016
	Diplocentrus anophthalmus (Francke 1977)			X	Reddell 1981; Hoffmann *et al.*, 2004; Palacios-Vargas and Reddell 2013; Francke 2016
	Diplocentrus cozumel Beutelspacher and Armas 1998		X		Beutelspacher and Armas 1998; Francke 2016
	Diplocentrus luisae (Guijosa 1973)		X		Armas 2001; Francke 2016
	Diplocentrus mitchelli (Francke 1977)	X			Reddell 1981; Hoffmann *et al.*, 2004; Palacios-Vargas and Reddell 2013; Francke 2016
	Diplocentrus reddelli (Francke 1977)			X	Palacios-Vargas and Reddell 2013; Francke 2016

ORDER/family	SPECIES	CAMP	QROO	YUC	References
	Diplocentrus roo (Armas and Martín-Frías 2003)		X		Francke 2016
	Diplocentrus taibeli (Caporiacco 1938)		X		Francke 2016
SOLIFUGAE					
Ammotrechidae	*Ammotrecha itzaana* Muma 1986			X	Vázquez 1996d; Harvey 2003, 2013e; AOS 2009
	Ammotrecha stollii (*Pocock* 1895)		X		Armas 2001; AOS 2009; Harvey 2013e
	Ammotrechesta tuzi Armas 2001		X		Armas 2001; Harvey 2003, 2013e; AOS 2009

DISCUSSION

The most recent compilation of information concerning the fauna of arachnids in the YP reviewed in this work, exhibited less diversity when compared with the fauna recorded in all of Mexico (≈ 7%). The orders pseudoscorpiones and scorpions demonstrated the greatest diversity of species found within Mexico. The records of genera should be carefully considered due to the Palearctic distribution of the *Roncus* (Palacios-Vargas *et al.*, 1997) and *Allochernes* (Hoffman *et al*., 2004) species (Harvey, 2013b). The genus *Pseudocryptocellus* (Ricinulei) cited by Palacios-Vargas *et al.*, (1997, 1998) was considered invalid. The genus *Schizomus* (Schizomida) registered by Palacios-Vargas (1993) and Palacios-Vargas *et al.*, (1997) apparently corresponds to an extended distribution range, given that certain authors reported the genus in northern and central Mexico, Guatemala and Belize (Reddell 1981); contradictorily, Harvey (2013d) mentioned that this genus is reported in Asia and Africa but not in America. It is therefore necessary to thoroughly review and clarify this issue. On the other hand, Hoffmann *et al.,* (2004) provided the first records of the genus *Cazierius* (Scorpionida) in Mexico. Before this discovery, the genus had been recorded in the West Indies, but not in Mexico (Francke 2016). Recorded specimens should be revised to corroborate the genus. According to our research, 28 of the 58 species (48%) in the YP were also recorded in other parts of Mexico, the continent and the world.

Five species of Amblypygi were recorded, with *Paraphrynus raptator* exhibiting a broad distribution throughout southeastern Mexico (Tabasco), Belize, Cuba, USA, Guatemala and Honduras. *Paraphrynus chacmool* and *Phrynus parvulus* were found in Belize and Guatemala, while *Paraphrynus reddelli* and *Phrynus cozumel* were reported only in the YP. We recorded only 11 species of Opiliones in the YP, despite its high species richness observed in all of Mexico. *Erginulus clavotibialis, Holobonones compressus, Leiobunum dromedarium* and *Pachylicus acutus* were recorded in southeastern Mexico (Chiapas, Oaxaca, Tabasco y Veracruz); *Erginulus gervaisii* is also reported in Veracruz, while *Erginulus bimaculatus*, *E. roeweri*, *Geaya yucatana*, *Prionostemma tekoma*, *Stygnomma maya* and *S. spiniferum* were only recorded in the YP. From the Palpigradi, only *Eukoenenia hanseni* has been recorded as having broad distribution across the Americas and Africa. This species is also widely reported in Mexico (Guerrero, Jalisco, Nuevo Leon, Puebla, San Luis Potosi, Tabasco, Tamaulipas, Veracruz). Pseudoscorpionida is the order that has the highest representation, with 21 species. Of these species, 18 have been recorded in the YP (*Coprochenes quintanarooensis*, *Epichernes navarroi*, *Garypus decolor*, *Ideoblothrus maya*, *Lustrochernes minor*, *Mexichthonius unicus*, *Pachychernes attenuatus*, *Pachyolpium paucisetosum*, *Parazaona cavicola*, *Pseudochthonius troglobius*, *P. yucatanus*, *Vachoniun boneti*, *V. chukum*, *V. cryptum*, *V. kauae*, *V. loltun*, *V. maya* and *V. robustum*). It is worth noting that the seven species of *Vachoniun* have been collected in the YP alone. The species reported in other states are *Chelodamus mexicolens* (Jalisco and Veracruz), *Cacodemonius quartus* (Chiapas) and *Planctolpium arboreum* (Jamaica and Dominican Republic). As in Palpigradi, one species of Ricinulei has been recorded, *Pseudocellus pearsei*, which is known to be distributed throughout Quintana Roo and Yucatan. Of the Schizomida two species have been recorded: *Stenochrus portoricensis*, with a broad distribution (Bermudas, Cuba, Ecuador, USA, México [Chiapas], Puerto Rico) and *S. goodnightorum*, which is only known from the type locality in Chichen Itza, Yucatan. Of the order Scorpiones, 14 species were recorded. The genus *Centruroides* has two species with wide distribution, with *C. gracilis* recorded in Neartic and Neotropical regions (The Antilles, Colombia, Cuba, USA, Guatemala, Honduras, Canary Islands, Panama and Mexico [Chiapas, Hidalgo, Oaxaca, Queretaro, San Luis Potosi, Tabasco, Tamaulipas, Veracruz]); and *C. margaritatus* recorded in Neotropical regions (Central America, Jamaica, Hispaniola, Colombia, Ecuador, Venezuela and likely Peru). *Centruroides ochraceus* and *C. schmidti* are reported in Veracruz and Chiapas. The last 10 species could be considered as endemic in the YP (*Centruroides sissomi*, *C. thorellii*, *Diplocentrus actun*, *D. anophthalmus*, *D. cozumel*, *D. luisae*, *D. mitchelli*, *D. reddelli*, *D. roo* and *D. taibeli*), and the records correspond to type locality. Finally, three species of Solifugae were recorded, *Ammotrecha stollii*, found throughout Costa Rica, El Salvador, USA, Grenada, Guatemala, Nicaragua and Mexico (Chiapas, Michoacan, Guerrero and Tabasco); *A. itzaana*; and *Ammotrechesta tuzi*, both of which are found only in the YP.

It is interesting that most species records (30 of 58) come from works when the species were originally described. It seems to be that in the YP, fauna of arachnids is mainly endemic, as suggested by some authors (*v.g.* Armas 2001; Francke 2014). However, this could reveal a lack of faunistics and sampling programs. The state of Yucatan is the state best represented from the YP, due to a strong interest in speleology (caves and cenotes) that has led to more samplings and a greater representation of arachnid fauna, including the works of Hoffmann (2004), Palacios-Vargas (1993, 2013), Reddell (1981) among many others.

It is thought that there has been a lack of interest in the fauna of arachnids in the YP (Arisqueta-Chablé *et al*., 2015). Nevertheless, studying the public importance (medical or veterinary) of arachnids in the YP, including species like the black widow *Latrodectus mactans*, *L. geometricus* (Castañeda-Gómez *et al.*, 2012) and ectoparasites such as *Amblyomma*, *Dermacentor*, *Haemaphysalis*, *Ixodes* and *Rhipicephalus* (Rodríguez-Vivas *et al.*, 2016), could help to promote projects that focus on surveillance and monitoring (also biodiversity) of arachnids in general. If sampling projects were implemented, the number of species could increase locally, but it is equally probable that the number of species remains the same, due to the predominately homogeneous physiography in the Yucatan Peninsula Biotic Province (Barrera 1962; Alvarez and de Lachica 1991). This phenomenon occurs among many other plant and animal groups (Manrique-Saide *et al.*, 2001; Morrone 2001), and arachnids could follow the same pattern. However, at a lower level of spatial analysis (i.e. localities) heterogeneity in the YP may be observed (e.g. soil, relief). Therefore it is necessary to design formal sampling programs to test these hypotheses.

CONCLUSION

Gathered and updated 63 records (58 species and 5 genera) for the YP of eight orders of Arachnids; wich represents 6.8% of the national species richness. The species richness was as follows: Amblypygi within 5 species; 11 species of Opiliones; 1 species of Palpigradi and Ricinulei; Pseudoscorpionida within 21 species; Schizomida with 2 species; 14 species of Scorpiones and 3 species of Solifugae for YP. A complete knowledge of arachnid diversity is difficult to obtain, due to the lack of specialized collections in Mexico (Arisqueta-Chablé *et al.*, 2015), specialists among all arachnid groups, projects which focus on biodiversity, and an excess of undescribed specimens (Harvey 2002; Francke 2014). It is important to perform these biological compendiums for many reasons. For example, when compared to that of other arthropods, the habitat requirements of these arachnids are more restricted, which makes them more vulnerable to local extinction processes by pollution, the destruction of their habitats by human activities, such as expansion of cattle ranches, forest harvesting, crops, population growth and pressures of human resettlements (Morrone 2001). This information is crucial when synthesizing dispersed information to generate a knowledge basis that will help improve conservation programs specifically designed for these groups of arachnids and other arthropods.

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