

NEW RECORDS OF FRESHWATER AND LAND SNAILS FROM SOUTHERN CHIAPAS, MEXICO, IN COLECCIÓN NACIONAL DE MOLUSCOS (THE NATIONAL COLLECTION OF MOLLUSCS)

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ABSTRACT: We report here on unpublished records of terrestrial and freshwater molluscs from sites in southern Chiapas (Mexico) held in the National Collection of Molluscs (Colección Nacional de Moluscos). The material was collected at various times between 1988 and 2023. The collections, comprising 342 specimens, include 18 families (14 terrestrial and four freshwater), 34 genera (30 terrestrial and four freshwater), and a total of 54 species and subspecies, of which four are introduced (*Melanooides tuberculata* (freshwater snail), *Allopeas gracile*, *Opeas hannense* and *Subulina octona* (land snails)). The most abundant taxa are *Microceramus concisus concisus* (47 individuals), *Pyrgodomus microdinus microdinus* (44 ind.), *Glyphyalinia indentata paucilirata* (32 ind.), *Paralaoma coloba* (24 ind.) and *Helicina ghiesbreghti* (23 ind.). Twenty-three terrestrial species are new records for the state.

KEY WORDS: biodiversity; distribution; introduced species; native continental molluscs; southern Mexico

INTRODUCTION

Mexico is among the most zoologically diverse nations of the world (third in amphibians and reptiles) (CONABIO 2023). High endemism and genetic diversity, the range of climates and the complexity of its geological history contribute to making it one of the 17 most megadiverse countries (ESPINOSA ORGANISTA et al. 2008), a product, also, of its position on the boundary of the Nearctic and Neotropical regions (RZEDOWSKI 1978). Within Mexico, Chiapas is among the most diverse states, holding 11.7% of Mexico's reptiles, 8.8% of amphibians, and 800 species of diurnal butterflies which represent 40% of all butterfly species in the country (DE LA MAZA & CARABIAS 2011). The state's varied physiography contributes to this, giving rise to great local variation in climate and ecosystems (GONZÁLEZ-ESPINOSA et al. 2004).

To date, 22 families and 158 species and subspecies of terrestrial and freshwater molluscs are known from Chiapas, representing about 9.3% of the national fauna (NARANJO-GARCÍA & FAHY 2010, NARANJO-GARCÍA & SMITH 2014, TOVAR-JUÁREZ et al. 2020). THOMPSON (2011), however, states that roughly 35% of the freshwater and terrestrial molluscs in Mexico and Central America are known, and as AVENDAÑO-GIL et al. (2013) suggest, there is much more to be discovered in Chiapas. This paper reports on unpublished records from the state held in the National Collection of Molluscs of the Institute of Biology of the National Autonomous University of Mexico (UNAM).

MATERIALS AND METHOD

Most of the specimens were collected from a site 7.3 km north of Ciudad Cuautemoc, deposited at the National Collection of Mollusks of the Institute of Biology of the National Autonomous University of Mexico (UNAM), while the remaining specimens come from other sites, collected by the lead author (Fig. 1). The features describing the sites are shown in Table 1.

The collecting sites showed different degrees of human intrusion; at Custepec and La Perla undergrowth vegetation was removed for shade coffee cultivation, and at Las Champas below the tree canopy the undergrowth showed signs of human intervention. The site at Ciudad Cuautémoc was a ravine in 1988, but in 2023 the habitat had been destroyed by the widening and construction of a more modern road to enable cattle farming. El Silencio possesses an old railway, and the body of water has been invaded by an introduced grass. At Lagos de Colon we observed hydrobioids (“with narrow environmental tolerance” CZAJA *et al.* 2020). It is an attraction for swimmers; further development could threaten these species.

Specimens were collected manually, taken directly from below rocks, trees and river banks, and

under fallen logs or weeds. Also, about 100 gr of humus at each site was taken, which was placed in zip lock plastic bags. The conchological material was placed into flasks and labelled. The living material was relaxed and later placed into bottles with 35% alcohol solution, in which specimens remained for 24 hours. After that time, they were transferred into 70% alcohol. In the laboratory, humus was sieved through a series of sieves (3 mm, 0.96 mm and 0.5 mm) from where the shells were sorted. The genera key for Mexican terrestrial molluscs (FAHY 2003) was used for the initial taxonomic identification. Selected taxonomic articles were then used to achieve specific identification, and a number of specimens were compared to material from the National Mollusc Collection (Colección Nacional de Moluscos, Instituto de Biología, Universidad Nacional Autónoma de México). Here we follow the classification given by BOUCHET *et al.* (2017) and accepted names from the platform MolluscaBase.

Institutional abbreviation: CNMO – Colección Nacional de Moluscos, Instituto de Biología, Universidad Nacional Autónoma de México.

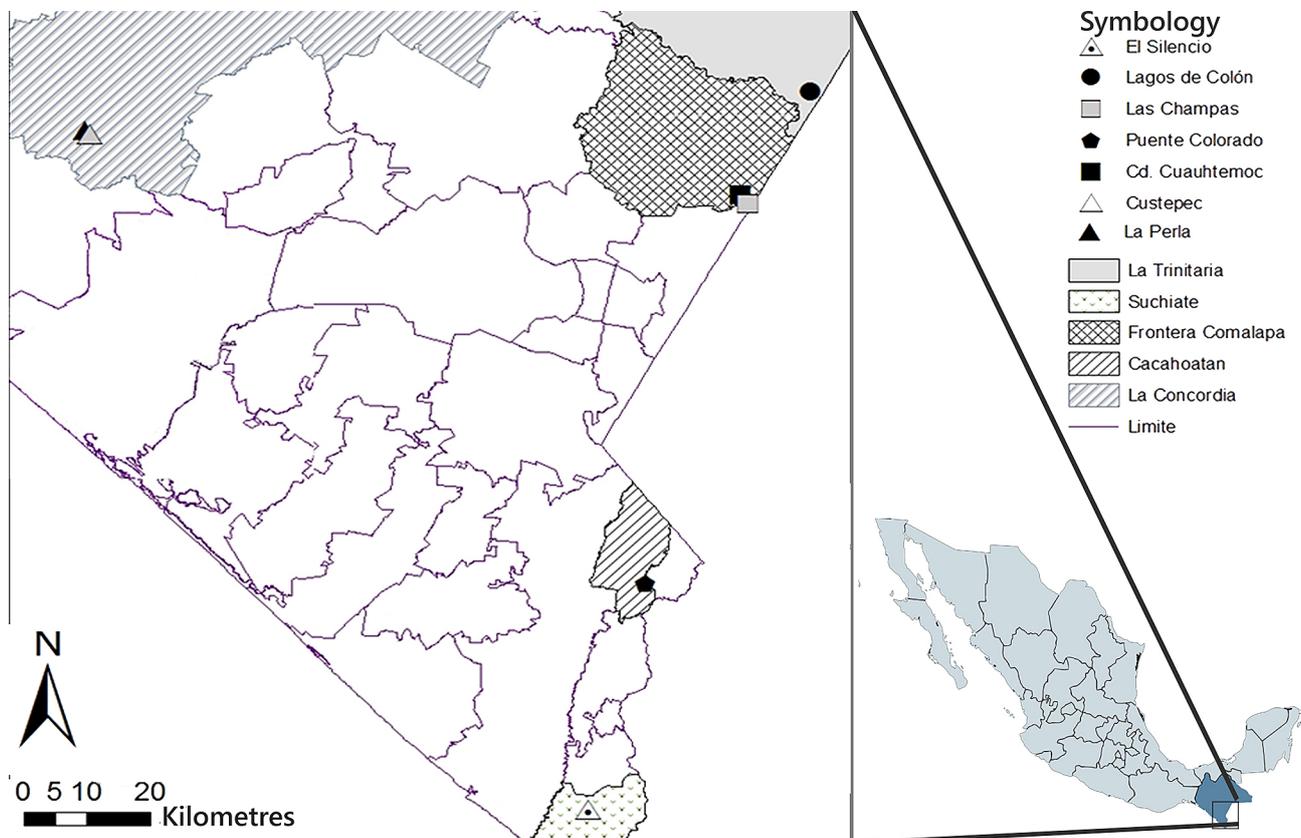


Fig. 1. Map showing the collection sites in the corresponding municipalities of the State of Chiapas



Table 1. Characteristics of the collecting sites

Locality	Municipality	Coordinates	Climate	Vegetation	Source
Custepec	La Concordia	15°46'34.5"N 92°58'31.5"W	Warm subhumid and humid semi-warm with summer rainfall (CW)	Types are oak – pine and tropical rain forests	INEGI 2010
La Perla	La Concordia	15°46'08"N 92°58'15.25"W, 15°46'0.05"N 92°50'0.75"W	Warm subhumid and humid semi-warm with summer rainfall (CW)	Types are oak – pine and tropical rain forests	INEGI 2010
Puente Colorado	Cacahoatán	15°02'14.61"N 92°08'35.18"W	Warm humid to humid temperate with 4,124 mm of annual rain	Tropical rain forest and oak – pine forest	SEDESOL 2011a
Area Voluntarily Destined for Conservation by the local community, named “El Silencio”	Suchiate	14°40'27.30"N 92°13'48.70"W	Warm humid with summer rains with 1,223 mm of annual rain	Forest is tropical deciduous	SEDESOL 2011b
Ciudad Cuauhtémoc	Frontera Comalapa	15°39'57.11"N 92°00'14.62"W	Subhumid warm to wet semi-warm with summer rains	Tropical deciduous forest	INAFED 2010
Las Champas	Frontera Comalapa	15°38'57.39"N 91°59'25.27"W	Subhumid warm to wet semi-warm with summer rains	Tropical deciduous forest	INAFED 2010
Lagos de Colón	La Trinitaria	15°49'37.83"N 91°53'46.47"W	Warm subhumid with rain in summer	Forest is tropical deciduous	RIVERO TORRES 2007

RESULTS

Of the material studied, 337 specimens are native to Mexico, pertaining to 30 genera and 17 families (Tables 2, 3 & 4).

The most abundant species were *Microceramus concisus concisus* (13.5% of the total), *Pyrgodomus microdinus microdinus* (12.7%), *Glyphyalinia indentata paucilirata* (9.2%), *Paralaoma coloba* (6.9%) and *Helicina ghiesbreghti* (6.6%). Together they comprise 49.0% of total species abundance (Fig. 2).

The abundance per site was highest in Ciudad Cuauhtémoc with 74.9% of the total number of species, which is attributed to the presence of 260 specimens, the smallest number of species was obtained at El Silencio, with less 1% of the total number of species (Fig. 3). Richness per site was highest in Ciudad Cuauhtémoc with 33 species (61.1% of the total) and lowest at El Silencio with only one species (1.9%) (Fig. 4). Ten specimens of four introduced species (in two families) were also found (Table 4). An account of type locality, distribution and remarks is provided for each species.

FRESHWATER SNAILS

Family Physidae Fitzinger, 1833

Genus *Mayabina* Taylor, 2003

Mayabina tapanensis (Crosse et Fischer, 1882)

Type locality. Mexico, Oaxaca, near San Pedro Tapanatepec (THOMPSON 2011).

Distribution. Known from Oaxaca, Mexico to southern Guatemala (THOMPSON 2011).

Remarks. The species possesses an attractive, bright brown shell. This is the only native freshwater species that has been recorded in the area of Tapachula until now.

TERRESTRIAL SNAILS

Family Helicinidae Ferussac, 1822

Genus *Helicina* Lamarck, 1799

Helicina cordillerae Pfeiffer, 1857

New record for the state

Type locality. Mexico, Veracruz, Volcán de Orizaba, Rancheria de Jacale (THOMPSON 2011).

Distribution. Veracruz (THOMPSON 2011), Chiapas (this paper): Las Champas.

Remarks. Our two specimens resemble closely the species *H. cordillerae* in general shape, although they are smaller, which makes our identification provisional. MARTENS (1890–1901) gave the following measurements for it: height 12.5, 11.5 mm, width 10, 9 mm; its height/width ratio being 0.8; our specimens are height 5.9, 6.4 mm; width 8.6, 7.5 mm, height/width ratio: 0.7, and 0.8. The shell is globose sub-depressed with one spiral reddish-brown band above the suture, whorls 5, lip reflected, one specimen is juvenile, without reflected lip. Our specimens differ from *H. cordillerae* in not showing three spiral bands and their sizes are smaller, as indicated above.

Helicina cordillerae was known only from the state of Veracruz (THOMPSON 2011); this record will increase the known distribution of the species, assuming that this provisional identification is correct.

Helicina ghiesbreghti Pfeiffer, 1856

Type locality. Mexico, Chiapas (MARTENS 1890–1901).

Distribution. Mexico, Central, western and northern Chiapas (NARANJO-GARCÍA & SMITH 2014); Tabasco and Guatemala (THOMPSON 2011). Chiapas (this paper): Puente Colorado, Custepec and La Perla.

Remarks. *Helicina ghiesbreghti* is widely distributed in Chiapas. It possesses a helicoid depressed shell, with a keel in the body whorl and a protruding folded peristome. It can be found above ground in damp places.

Helicina delicatula Shuttleworth, 1852

Type locality. Mexico, Veracruz, Córdoba, Atoyac (THOMPSON 2011).

Distribution. Veracruz, Córdoba, Atoyac (THOMPSON 2011). Chiapas (this paper): Las Champas.

Remarks. Height 7.1 mm, width 8.5, whorls 5 1/4, height/width: 0.8, with a wide reddish-brown band

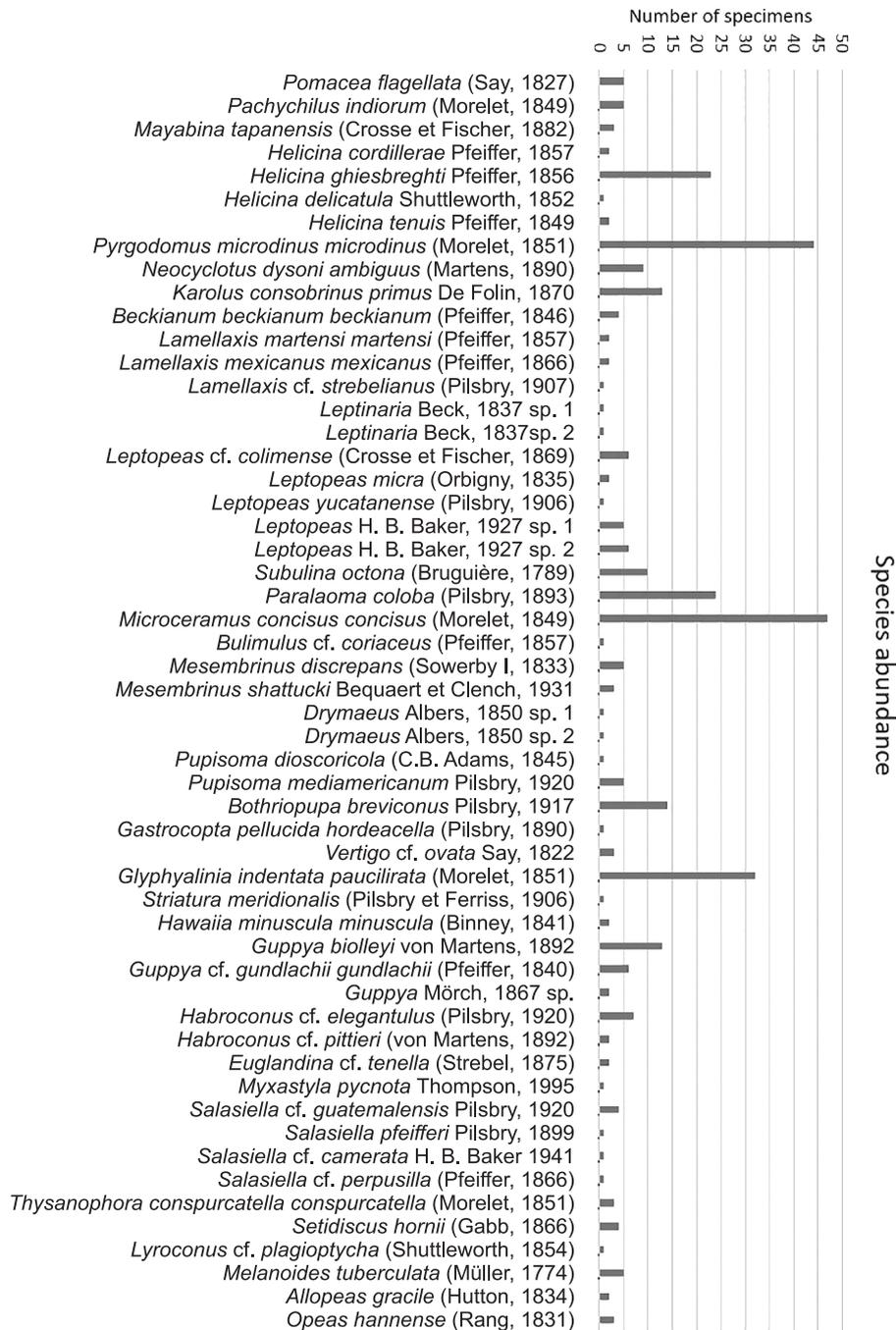


Fig. 2. Abundance of species from southern Chiapas



Table 2. Native species of freshwater snails from southern Chiapas. Symbols used: ES – El Silencio (Suchiate), LC – Lagos de Colón, T – total number of specimens

Family	Species	Locality	T
Ampullariidae	CNMO 8348 <i>Pomacea flagellata</i> (Say, 1827)	LC	5
Pachychilidae	CNMO 8160 <i>Pachychilus indiorum</i> (Morelet, 1849)	LC	5
Physidae	CNMO 8416 <i>Mayabina tapanensis</i> (Crosse et Fischer, 1882)	ES	3

above the shoulder, it is a juvenile without the reflected lip. Measurements of the species in MARTENS (1890–1901) are height: 6.5 and 9 mm, width 8 and 11 mm, height/width ratio = 0.8. It was previously known from Veracruz and this record will increase its known distribution.

Helicina tenuis Pfeiffer, 1849

Type locality. Panama, San Yago, Prov. Veraguas (RICHLING 2004).

Distribution. Along the Pacific versant, it is found from Guerrero, Mexico to Panama; along the Gulf of Mexico versant in Veracruz, Mexico, then in Guatemala and various other Central American countries through to Colombia (THOMPSON 2011). Chiapas (this paper): Puente Colorado.

Remarks. The species is widely distributed in Mexico. The shell has a tall spire and a denticle in the basal outer lip (RICHLING 2004).

Genus *Pyrgodomus* Crosse et Fischer, 1893

Pyrgodomus microdinus microdinus (Morelet, 1851)

Type locality. Guatemala, Vera Paz (THOMPSON 2011).

Distribution. Widely distributed from Tamaulipas and Guerrero, Mexico to Punta Arenas, Costa Rica (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. This is a small, handsome species that reaches a height of 4 mm. The shell is conical with strong sutures and bulging whorls. Specimens fit

well the description and size that the species reaches according with RICHLING (2004). It can be found in calcium rich soils (THOMPSON 2011).

Family Neocyclotidae Kobelt et Möllendorff, 1897

Genus *Neocyclotus* Fischer et Crosse, 1886

Neocyclotus dysoni ambiguus (Martens, 1890)

Type locality. Mexico, Soledad, between Córdoba and Orizaba Veracruz (MARTENS 1890–1901).

Distribution. Mexico: Chiapas, Oaxaca, Tabasco, Veracruz (THOMPSON 2011). Chiapas (this paper): Puente Colorado, Custepec.

Remarks. This species has a brown helicoid shell, with an olivaceous hue and a round peristome (BARTSCH & MORRISON 1942). It can be found above ground and in beds of leaf litter; this group of snails possesses a bright orange body and red tentacles.

Family Ferussaciidae Bourguignat, 1883

Genus *Karolus* de Folin, 1870

Karolus consobrinus primus De Folin, 1870

Type locality. *Karolus primus*: Mexico, Veracruz (THOMPSON 2011).

Distribution. From northeast Mexico to Nicaragua (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Most of our specimens are juvenile, two adults are slightly smaller (1.9 mm) than the measurement (2.0 mm) given by PILSBRY (1909–1910).

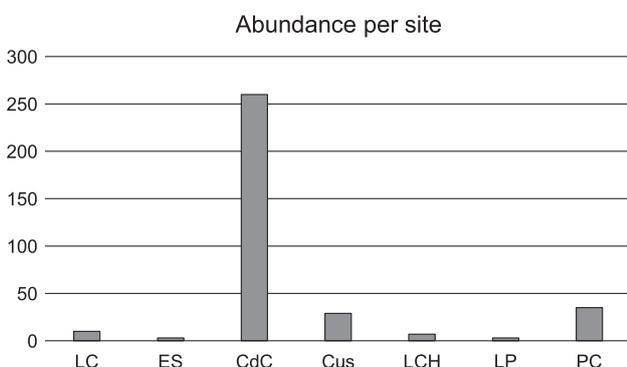


Fig. 3. Abundance of species per site. Symbols used: CdC – Ciudad Cuauhtémoc, Cus – Custepec (La Concordía), ES – El Silencio (Suchiate), LC – Lagos de Colón, LCH – Las Champas (Frontera Comalapa), LP – La Perla, PC – Puente Colorado (Cacahoatán)

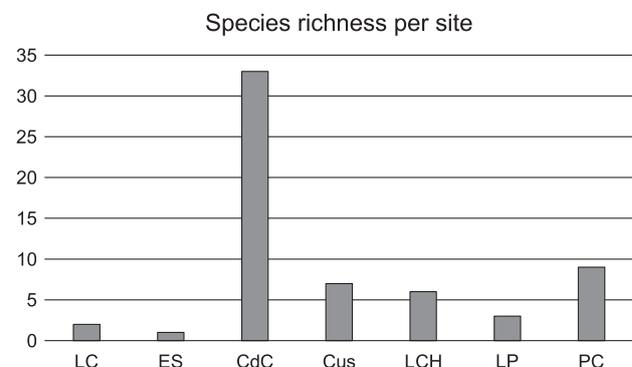


Fig. 4. Diversity of species per site. Symbols used: CdC – Ciudad Cuauhtémoc, Cus – Custepec (La Concordía), ES – El Silencio (Suchiate), LC – Lagos de Colón, LCH – Las Champas (Frontera Comalapa), LP – La Perla, PC – Puente Colorado (Cacahoatán)

Table 3. Native species of land snails from southern Chiapas with locality and total number of specimens. Symbols used: CdC – Ciudad Cuauhtémoc (Frontera Comalapa), Cus – Custepec (La Concordía), LC – Lagos de Colón, LCH – Las Champas, LP – La Perla (Maravilla Tenejapa), PC – Puente Colorado (Cacahoatán), T – total number, Nr – new record, Chis – Chiapas, Mex/Chis – Mexico and Chiapas

Family	Species	Locality & specimens number	T	Nr
Helicinidae	CNMO 8329 <i>Helicina cordillerae</i> Pfeiffer, 1859	LCH 2	2	Chis
	CNMO 7872 <i>Helicina ghiesbreghti</i> (Pfeiffer, 1856)	PC 1 Cus 21 LP 1	23	
	CNMO 8337 <i>Helicina delicatula</i> Shuttleworth, 1852	LCH 1	1	
	CNMO 8339 <i>Helicina tenuis</i> (Pfeiffer, 1849)	LCH 1 PC 1	2	
	CNMO 7878, 8315 <i>Pyrgodomus microdinus microdinus</i> (Morelet, 1851)	CdC 26, 18	44	
Neocyclotidae	CNMO 7699, 7700, 7809 <i>Neocyclotus dysoni ambiguus</i> (von Martens, 1890)	PC 7 Cus 2	9	
Ferussaciidae	CNMO 7702, 8347 <i>Karolus consobrinus primus</i> (De Folin, 1870)	CdC 13	13	
Achatinidae	CNMO 7867 <i>Beckianum beckianum beckianum</i> (Pfeiffer, 1846)	Cus 1 PC 3	4	
	CNMO 7877 <i>Lamellaxis martensi martensi</i> (Pfeiffer, 1856)	CdC 2	2	
	CNMO 8308 <i>Lamellaxis mexicanus mexicanus</i> (Pfeiffer, 1866)	CdC 2	2	
	CNMO <i>Lamellaxis</i> cf. <i>strebelianus</i> (Pilsbry, 1907)	CdC 1	1	Mex/Chis
	CNMO 8338 <i>Leptinaria</i> (Beck, 1839) <i>Leptinaria</i> sp. 1	CdC 1	1	
	CNMO 7862 <i>Leptinaria</i> (Beck, 1839) <i>Leptinaria</i> sp. 2	Cus 1	1	
	CNMO 8316 <i>Leptopeas</i> cf. <i>colimense</i> (Crosse et Fischer, 1869)	CdC 6	6	Chis
	CNMO 8303 <i>Leptopeas micra</i> (Orbigny, 1835)	PC 2	2	
	CNMO 8320 <i>Leptopeas yucatanense</i> (Pilsbry, 1906)	CdC 1	1	Chis
	CNMO <i>Leptopeas</i> (H. B. Baker, 1927) <i>Leptopeas</i> sp. 1	PC 5	5	
CNMO 8336 <i>Leptopeas</i> (H. B. Baker, 1927) <i>Leptopeas</i> sp. 2	CdC 6	6		
Punctidae	CNMO 8305, 8310 <i>Paralaoma coloba</i> (Pilsbry, 1893)	CdC 24	24	Mex/Chis
Urocoptidae	CNMO 8311 <i>Microceramus concisus concisus</i> (Morelet, 1849)	CdC 47	47	
Bulimulidae	CNMO 8317 <i>Bulimulus</i> cf. <i>coriaceus</i> (Pfeiffer, 1856)	LCH 1	1	Chis
	CNMO 8314 <i>Drymaeus discrepans</i> (Sowerby, 1833)	CdC 5	5	Mex/Chis
	CNMO 8304 <i>Drymaeus shattucki</i> Bequaert et Clench, 1931	CdC 3	3	Chis
	CNMO 8319 <i>Drymaeus</i> Albert, 1850 <i>Drymaeus</i> sp. 1	CdC 1	1	
	CNMO 8325 <i>Drymaeus</i> Albert, 1850 <i>Drymaeus</i> sp. 2	CdC 1	1	
Valloniidae	CNMO 8333 <i>Pupisoma mediamericanum</i> (Pilsbry, 1920)	CdC 1	1	
	CNMO 8318 <i>Pupisoma dioscoricola</i> (C. B. Adams, 1845)	CdC 5	5	Chis
Gastrocoptidae	CNMO 8321, 8323 <i>Gastrocopta pellucida hordeacella</i> (Pilsbry, 1890)	CdC 14	14	Chis
Vertiginidae	CNMO 7701 <i>Bothriopupa breviconus</i> (Pilsbry, 1917)	CdC 1	1	Mex/Chis
	CNMO 8330 <i>Vertigo</i> cf. <i>ovata</i> Say, 1822	CdC 3	3	Chis
Gastrodontidae	CNMO 8313, 8346 <i>Glyphyalinia indentata paucilirata</i> (Morelet, 1851)	CdC 24, 8	32	Chis
	CNMO 8331 <i>Striatura meridionalis</i> (Pilsbry et Ferriss, 1906)	LCH 1	1	
Pristilomatidae	CNMO 8324, 8334 <i>Hawaiiia minuscula minuscula</i> (Binney, 1840)	CdC 1, 1	2	
Euconulidae	CNMO 8335 <i>Guppya biolleyi</i> Martens, 1892	CdC 13	13	Chis
	CNMO 8342 <i>Guppya</i> cf. <i>gundlachi gundlachi</i> (Pfeiffer, 1840)	CdC 6	6	Chis
	CNMO 7865 <i>Guppya</i> (Mörch, 1867) <i>Guppya</i> sp.	Cus 2	2	
	CNMO 8343 <i>Habroconus</i> cf. <i>elegantulus</i> (Pilsbry, 1919)	CdC 7	7	Chis
	CNMO 8345 <i>Habroconus pittieri</i> (von Martens, 1892)	CdC 2	2	Chis



Family	Species	Locality & specimens number	T	Nr
Spiraxidae	CNMO 7863, 7861 <i>Euglandina</i> cf. <i>tenella</i> (Strebel, 1875)	Cus 1 LP 1	2	Chis
	CNMO 7870 <i>Myxastyla pycnota</i> (Thompson, 1995)	Cus 1	1	Mex/Chis
	CNMO 8309, 8340 <i>Salasiella guatemalensis</i> (Pilsbry, 1920)	CdC 4	4	
	CNMO 8344 <i>Salasiella</i> cf. <i>camerata</i> (Baker, 1941)	CdC 1	1	Chis
	CNMO 7873 <i>Salasiella pulchella</i> (Pfeiffer, 1856)	LP 1	1	
	CNMO 8341 <i>Salasiella perpusilla</i> Pfeiffer, 1860	LCH 1	1	Chis
Thysanophoridae	CNMO 8326, 8332 <i>Thysanophora conspurcatella conspurcatella</i> (Morelet, 1851)	CdC 2, 1	3	Chis
	CNMO 8322 <i>Setidiscus horni</i> (Gabb, 1866)	CdC 4	4	Chis
	CNMO 8327 <i>Lyroconus</i> cf. <i>plagioptycha</i> (Shuttleworth, 1854)	CdC 1	1	

Family Achatinidae Swainson, 1840

Genus *Beckianum* H. B. Baker, 1961

Beckianum beckianum beckianum (Pfeiffer, 1846)

Type locality. Polynesia, Opara (SALVADOR et al. 2018), PILSBRY (1906) pointed out that *B. beckianum* was not found in Polynesia and that the species resembles more the specimens from Polvón, Nicaragua.

Distribution. Mexico to Brazil (THOMPSON 2011, SANTOS SILVA et al. 2021). Recorded in Jamaica (ROSENBERG & MURATOV 2006), in greenhouses in Europe (HORSÁK et al. 2020) and in Hawaii (COWIE 2000). Chiapas (this paper): Custepec.

Remarks. The whorls are shorter than in *Allopeas gracile*, with uneven sculpture. Our sample shows the typical shape and sculpture of the description of the species. It is found in tropical rain forest (GOODNIGHT & GOODNIGHT 1956) in southeastern Chiapas (TOVAR-JUÁREZ et al. 2020).

Genus *Lamellaxis* Strebel et Pfeffer, 1882

Lamellaxis martensi martensi (Pfeiffer, 1857)

Type locality. Mexico Veracruz, Córdoba (THOMPSON 2011).

Distribution. It is found in Mexico (Veracruz, Quintana Roo, Yucatán and Nayarit) and Guatemala (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. The shell is conical and tall, reaching a height of ca. 10 mm, and is characterised by a short lamella in the middle of the columella.

Lamellaxis mexicanus mexicanus (Pfeiffer, 1866)

Type locality. Mexico, Veracruz, Mirador (THOMPSON 2011).

Distribution. Eastern Mexico in Tamaulipas to Honduras and Nicaragua (THOMPSON 2011, TOVAR-

JUÁREZ et al. 2020). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. The adult and one juvenile shells were found 7.3 km north of Ciudad Cuauhtémoc. The adult shell closely resembles the types of *Lamellaxis mexicanus mexicanus* in measurements and shape. It measures in height 7.8 mm, width 3.4 mm, height/width ratio = 2.29 and has 6 whorls, while *Lamellaxis m. mexicanus* measures in height 7–9 mm, width 3–4 mm; height/width ratio 2.33, 2.5, with 6 1/2 and 7 whorls (von MARTENS 1890–1901, PILSBRY 1906). The young specimen has 4 whorls, height 3.7 mm, width 1.9 mm. Whorls rounded, suture well marked, first whorl with very fine growth threads. Columella with a small swollen protuberance at the first third basal section. Sculpture of marked fine growth lines, aperture small. This young specimen is either *Lamellaxis mexicanus mexicanus* or another subspecies of *Lamellaxis mexicanus*. More specimens are needed to identify this specimen with certainty since this one shows a finer sculpture than the adult specimen.

Lamellaxis cf. *strebelianus* (Pilsbry, 1907)

New record for the state and Mexico

Type locality. Nicaragua, Polvón, Dept. León (PILSBRY 1907–1908).

Distribution. Known only from the type locality (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Whorls rounded, suture well marked, first whorl with very fine growth threads, the riblets become thicker. Columella with a small swollen edge at the first basal third section. Sculpture of marked fine riblets, separated from each other by about twice the width of the riblet, in between riblets are fine growth lines. Aperture small.

Genus *Leptinaria* Beck, 1837

Leptinaria sp. 1

Distribution. Collected at 7.3 km north of Ciudad Cuauhtémoc, Chiapas, Mexico.

Remarks. A young specimen with 2 1/3 whorls shell, the first two whorls smooth, then sculptured with growth lines between spaced riblets. The columella covers the tiny umbilicus and possess an acute basal fold or lamella. Height of shell 1.3 mm and width 1.2 mm. Aperture trapezoidal.

Leptinaria sp. 2

Distribution. Collected approximately 4 km from the town of Custepec, Chiapas, Mexico.

Remarks. This species of *Leptinaria* has a tall conical shell and reaches 8 mm in height. It very much resembles *Leptinaria convoluta* Martens, 1898; nonetheless, it is slightly larger than *L. convoluta* and does not bear the parietal lamella that the other does, both *L. convoluta* and our specimen bear the truncate columella and a fold just above it.

Genus *Leptopeas* H. B. Baker, 1927

Leptopeas cf. *colimense* (Crosse et Fischer, 1869)

New record for the state

Type locality. Mexico, Colima (CROSSE & FISCHER 1869).

Distribution. Colima and Veracruz, Mexico (PILSBRY 1906) and Panama (PILSBRY 1930). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Our specimens more closely resemble *L. colimense* in general shape and size. *L. colimense* measurements are in height 15.5 mm and width 3.25 mm, our largest specimen is in height 13.0 mm, width 3.0 mm, other three specimens range from to 5.1–8.8 mm in height and 2.1–2.5 in width. Two more specimens are fragmented. Our largest specimen shows a slightly larger aperture relative to the size of the body whorl than the specimen shown in the Manual of Conchology vol. 18 (PILSBRY 1906: table 29, figs 92, 94). It has been recorded from Colima and Veracruz, Mexico (PILSBRY 1906) and Panama (PILSBRY 1930).

Leptopeas micra (Orbigny, 1835)

Type locality. Bolivia, in the foothills on the eastern extreme of the Andes close to Santa Cruz de la Sierra (PILSBRY 1906).

Distribution. This species has a very ample distribution in Mexico, Central America and the West Indies

(PILSBRY 1906, THOMPSON 2011). Chiapas (this paper): Puente Colorado.

Remarks. Two specimens which measure 6.6 and 7.9 mm in height and 2.3 mm and 2.5 mm in width, whorls 5 and 6 respectively. This species possesses a tall shell with round whorls, and strongly marked suture. Specimens show a sculpture of marked stria that became obsolete in the body whorl. Our specimens have measurements similar to those given by PILSBRY (1946) which are: height 7 mm, width 2.3 mm.

Leptopeas yucatanense (Pilsbry, 1906)

New record for the state

Type locality. Yucatan, Ticul (PILSBRY 1906).

Distribution. Yucatan (BEQUAERT & CLENCH 1938), Belize. Orange Walk District (DOURSON et al. 2018). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Height 7.1 mm, width 2.3 mm, whorls 6. Our specimen is very close to *Leptopeas yucatanense* as described by DOURSON et al. (2018). The first whorl is smooth with very fine growth lines here and there, half second whorl with faint low riblets, then riblets are well marked over the rest of shell. Suture very well marked, whorls slightly laterally flat, shoulder of third to fifth whorls well marked on right side of shell, aperture trapezoidal, 1.1 mm in length.

Leptopeas sp. 1

Distribution. Known so far from the Municipality of Cacahoatán, Puente Colorado, Chiapas, Mexico.

Remarks. This delicate, tall shell bears a weak spiral lamella located at the end of the columella. One specimen is adult, the tallest has 9 whorls, the others fluctuate between 7 and 8 whorls, height 8.1 to 12 mm, width 2.5 to 3 mm. The species has a tall slender shell; the first whorl is smooth then few growth lines are noticed, subsequent whorls with growth lines that eventually thicken but do not become ribs, the suture is well marked, the body whorl slightly flat on the periphery, the aperture trapezoidal also slender (taller than wide), the small umbilicus covered with the bend columella. At the age of seven whorls the species can reproduce, four shells bear two to three eggs inside the body whorl.

Table 4. Introduced species of land and freshwater snails in southern Chiapas. Symbols used: CdC – Ciudad Cuauhtémoc (Frontera Comalapa), PC – Puente Colorado (Cacahoatán), T – total number of specimens

Family	Species	Locality & number of specimens	T
Thiaridae	CNMO 7859 <i>Melanoides tuberculata</i> (Müller, 1774)	PC	5
Achatinidae	CNMO 7876, 8306 <i>Allopeas gracile</i> (Hutton, 1834)	PC 1, CdC 1	2
	CNMO 8307 <i>Opeas pumilum</i> (Pfeiffer, 1840)	CdC	3
	CNMO 7874 <i>Subulina octona</i> (Bruguière, 1792)	PC	10

***Leptopeas* sp. 2**

Distribution. It is known from 7.3 km north of Ciudad Cuauhtémoc, Chiapas, Mexico.

Remarks. *Leptopeas* sp. 2: the six specimens of this lot are of young age, and the shell is more robust than those of *Leptopeas* sp. 1. The growth lines are stronger, almost as riblets, the aperture trapezoidal but wider. The largest specimen measures in height 4.1 mm, width 2.1 mm and possess 4 1/6 whorls. The first two whorls smooth, then it has fine riblets that stop in the middle of the whorl in subsequent whorls. Suture well marked, columella nearly straight and partly covering the tiny umbilicus. The five other shells are approximately 2 whorls of age. All specimens are too young to be placed into a known species.

Family Punctidae Morse, 1864

Genus *Paralaoma* Iredale, 1913

***Paralaoma coloba* (Pilsbry, 1893)**

New record for the state and Mexico

Type locality. Nicaragua, Department of Chinandega, Polvón (PILSBRY 1893, THOMPSON 2011).

Distribution. Laguna de Apoyo (LÓPEZ et al. 2015) and Nicaragua (PILSBRY 1893). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Shell measures: height 1.16 mm, width 1.90 mm, umbilicus 0.23 mm, whorls 4. The embryonic shell has fine spiral parallel lines. Teleoconch with fine riblets over growth lines, three spaced rows of bristles on the periphery, one above the shoulder, another at the middle of body whorl, and the third one around the umbilicus, bristles also widely spaced. Specimens fit the features seen in the SEM photograph of *P. coloba* at the Academy of Natural Sciences of Philadelphia site. Specimens fragile, 9 of 19 incomplete, five of them broken.

Family Urocoptidae Pilsbry, 1898

Genus *Microceramus* Pilsbry et Vanatta, 1898

***Microceramus concisus concisus* (Morelet, 1849)**

Type locality. Yucatán, Mexico (MORELET 1849).

Distribution. Mexico (Yucatán and Campeche), Guatemala, Belize, Honduras, and Nicaragua (THOMPSON 2011); Chiapas (BEQUAERT 1957, AVENDAÑO et al. 2013). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. This species was previously known in the northern and southern Lacandon rainforest (BEQUAERT 1957, AVENDAÑO et al. 2013). The record near Ciudad Cuauhtémoc is the southernmost site of the species known in the state of Chiapas.

Family Bulimulidae Tryon, 1867

Genus *Bulimulus* Leach, 1814

***Bulimulus* cf. *coriaceus* (Pfeiffer, 1857)**

New record for the state

Type locality. Mexico, state of Veracruz (THOMPSON 2011).

Distribution. Oaxaca, Tabasco and Veracruz (THOMPSON 2011). Chiapas (this paper): Las Champas.

Remarks. A young specimen, of 4 whorls, height 6.2 mm, width 4.2 mm. Sutures slightly impressed, whorls leaning to globose. This specimen, compared with *Bulimulus coriaceus* from Atoyac, Veracruz, shows the same general features, being a young specimen that does not show all the features of the adult, which makes us to a certain degree unsure of the identification.

Family Orthalicidae Albers, 1860

Genus *Mesembrinus* Albers, 1850

***Mesembrinus discrepans* (Sowerby I, 1833)**

New record for the state and Mexico

Type locality. El Salvador, Conchagua (SOWERBY 1833).

Distribution. Costa Rica, Nicaragua, El Salvador, Guatemala (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Our specimens are a bit smaller (height 4.8–14.4 mm and width 3.8–7.1 mm) than the measurements (height 17–18 mm, width 7.5–8 mm) given by PILSBRY (1899) or MARTENS (1890–1901) (height 16 mm, width 8 mm). *Mesembrinus discrepans* and the specimens from near Ciudad Cuauhtémoc show brown slanting streaks that could be few or numerous, as PILSBRY (1899) describes. *Mesembrinus* from near Ciudad Cuauhtémoc has the brown band close to the umbilicus plus and additional band at the level of the posterior extreme of the aperture just below the suture, this agrees with the description of the species in MARTENS (1890–1901).

***Mesembrinus shattucki* (Bequaert et Clench, 1931)**

New record for the state

Type locality. Mexico, Yucatán, Chichen Itza (BEQUAERT & CLENCH 1931, THOMPSON 2011).

Distribution. Mexico: Yucatán, Quintana Roo and Guatemala (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. The tip of the apex is not pinkish brown as in the original description of *Mesembrinus shattucki*. In our specimens the lower two bands are complete as in *M. shattucki*, however, instead of having two more bands our specimens bear three bands, the one be-

low the suture is a fading band and, the subsequent two bands below are broken (as brown spots) and slightly narrower if compared with the upper bands of *M. shattucki*. We consider that the absence of pinkish brown colour of the apex and one more band in our specimens is not enough to regard these specimens as another species. Rather, this might be intraspecific variation.

Genus *Drymaeus* Albers, 1850

Drymaeus sp. 1

Distribution. Throughout tropical and subtropical America from Argentina north to México, and throughout the West Indies to Florida (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. The young specimen measures height 0.9 mm, width 0.9 mm. The specimen is almost one whorl that expands rapidly, the sculpture is typical of the *Drymaeus* apex, spiral puncta. The suture is deep, aperture wide, columella white and straight.

Drymaeus sp. 2

Distribution. Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Height 3.0 mm, width 2.4 mm, whorls 2 3/4. Apex light brown with the typical sculpture of the genus present in the two first whorls, then the sculpture becomes moderately strong wrinkles, and over the wrinkles fine cancellated sculpture appears that continues over the body whorl to the edge of the shell. After the second whorl four light brown bands are visible over the body whorl. The first band is near and below the suture, two bands are located in the middle of the body whorl and the fourth band is found below the shoulder. Shoulder with angular periphery.

Family Valloniidae Morse, 1864

Genus *Pupisoma* Stoliczka, 1873

Pupisoma dioscoricola (C. B. Adams, 1845)

New record for the state

Type locality. Jamaica (ADAMS 1845).

Distribution. The species is found from south of the United States, Central America, the Caribbean, the Galapagos Islands to South America (Brazil and Argentina) (HAUSDORF 2007). HAUSDORF (2007) pointed out that it is probably from the tropical old world (Africa, eastern Asia), since other species in the subgenus *Ptychopatula* thrive there. From the data given in HAUSDORF (2007) we could imply that the natural distribution of *Pupisoma dioscoricola* is Holoarctic, and the same time we humans have contributed with its spread around the world. Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. HAUSDORF (2007) noticed that it is possible to find specimens of *P. dioscoricola* with short riblets or devoid of them and sometimes both morphotypes in the same population. Our four specimens have small granules at the apex, then spaced riblets on the following whorls. In between the short riblets there is fine cancellated sculpture. One of the specimens is perhaps fully grown, while the other three are not.

Pupisoma mediamericanum Pilsbry, 1920

Type locality. Mexico, Veracruz-Llave: 150 m above Orizaba (HAUSDORF 2007).

Distribution. Mexico to Colombia, recorded in Chiapas at Comalapa, Sumidero, Comitán, Ocosingo, La Trinitaria (HAUSDORF 2007). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. The specimen measures: height 1.8 mm, width 1.4 mm, height/width ratio $1.8/1.4 = 1.2$, whorls 4. It shows at the apex small granules, the rest of the shell with spaced shallow riblets and small granules in the middle of them.

Family Vertiginidae Stimpson, 1851

Genus *Bothriopupa* Pilsbry, 1898

Bothriopupa breviconus Pilsbry, 1917

New record for the state and for Mexico

Type locality. Guatemala, Mountains west of Livingston, Department of Izabal (THOMPSON 2011).

Distribution. Guatemala, near Cavech Village (HINKLEY 1920, THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. This minute snail has a globose ovate-conic shell with scattered pits.

Genus *Gastrocopta* Wollaston, 1878

Gastrocopta pellucida hordeacella (Pilsbry, 1890)

New record for the state

Type locality. United States, Texas, New Braunfels as *Pupa hordeacella* (THOMPSON 2011).

Distribution. West Indies, Mexico, and Guatemala (BEQUAERT & MILLER 1973, THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. All specimens from both dates present the regular number of teeth of the subspecies; four specimens, however, show the three basal teeth enlarged compared with the other nine specimens.

Genus *Vertigo* Müller, 1774

Vertigo cf. *ovata* Say, 1822

New record for the state

Type locality. United States, Philadelphia, Pennsylvania (THOMPSON 2011).



Distribution. Mexico: Baja California Norte, Sonora, Veracruz, San Luis Potosí, West Indies (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Two adult and one young specimen. On the adults the basal teeth are supported by a basal lamella; thickness of basal lamella increases towards the middle. Shell of specimens is conical and the aperture possesses 6 teeth. Our adult specimens (1, 2) present a minute infraparietal tooth. The young specimen lacks teeth. The species is close to *Vertigo ovata*, however *V. ovata* is more obese than our specimens that present whorls less capacious, *V. ovata* also does not bear the basal lamella that supports the basal teeth.

Family Gastrodontidae Tryon, 1866

Genus *Glyphyalinia* von Martens, 1892

Glyphyalinia indentata paucilirata (Morelet, 1851)

New record for the state

Type locality. Guatemala, Salama, Department Baja Vera Paz (as *Helix paucilirata* Morelet, 1851) and United States, Texas, Lee County (as *Zonites indentatus umbilicatus* Cockerell, 1893) (THOMPSON 2011).

Distribution. Midwest and central United States to Guatemala, also in Mexico from Baja California Sur, Durango, Jalisco, Michoacán, Puebla, State of Mexico and Morelos (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc. This is the first record of the species in Chiapas.

Remarks. The shells of these specimens have spaced indented radiating lines and a small umbilicus as in the species description.

Genus *Striatura* Morse, 1864

Striatura meridionalis (Pilsbry et Ferriss, 1906)

Type locality. United States, Texas, along the Guadalupe River, above New Braunfels (THOMPSON 2011).

Distribution. United States (New York, Michigan, Arizona, New Mexico, Texas), Mexico (Chihuahua, Sonora, Nuevo León, Puebla, Veracruz, Chiapas) and Nicaragua (THOMPSON 2011, VAN DEVENDER et al. 2012, PEARCE & DRESCHER 2017, TOVAR-JUÁREZ et al. 2020). Chiapas (this paper): Las Champas.

Remarks. The fragment measures height: 0.6 mm, width: 1.1 mm. The shell is a translucent, embryonic shell, with fine parallel spiral lines with fine granules on top of them, the rest of shell with fine growth slanting lines and on the top fine granules reminiscent of filigree.

Family Pristilomatidae Cockerell, 1891

Genus *Hawaiia* Gude, 1911

Hawaiia minuscula minuscula (Binney, 1841)

Type locality. United States, Ohio (BINNEY 1840).

Distribution. This species is broadly distributed in North America (Alaska and Maine southward to Costa Rica), the Antilles, Japan, Hawaii, Pitcairn, Tahiti, England (in greenhouses), and Ireland (PILSBRY 1946). In Mexico it has been found in Baja California, Sonora, Chihuahua, Nuevo León, San Luis Potosí, Tamaulipas, Veracruz, Campeche, Yucatán, and Chiapas (THOMPSON 2011). It has been recorded in Palenque (MARTENS 1890–1901), southern Lacandon rainforest (NARANJO-GARCÍA 2011), and Ocozocoautla, Chiapas (NARANJO-GARCÍA & SMITH 2014). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. The two specimens are juvenile; their morphological features closely resemble those of the species description.

Family Euconulidae H. B. Baker, 1928

Genus *Guppya* Mörch, 1867

Guppya biolleyi von Martens, 1892

New record for the state

Type locality. Costa Rica, Hacienda Helvetia, in the Costa Cuca (MARTENS 1890–1901).

Distribution. Costa Rica, Nicaragua, Guatemala and Mexico (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Our specimens are a bit smaller than the measurements given by MARTENS (1890–1901: 114) for the species; the two largest specimens are height 1.7 and 1.7 mm, and width 2.0 and 2.1 mm with 4 whorls, Martens measurements are: height 2.0 mm, width 2 mm with 5 whorls. The aperture of the specimens from our locality is incomplete, which might explain the differences in size with those given by Martens.

Guppya cf. gundlachii gundlachii (Pfeiffer, 1840)

New record for the state

Type localities. *Helix gundlachii* Pfeiffer, 1840: Cuba. Synonyms: *Helix pusilla* Pfeiffer, 1839: Cuba. *Helix simulans* C. B. Adams, 1849: Jamaica (THOMPSON 2011).

Distribution. From Florida and Texas south to Panama, Venezuela and Trinidad and the West Indies (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc. This is the first record of the genus in Chiapas.

Remarks. Five specimens are juvenile, the only adult measures height 1.3 mm, width about 2.0 mm,

whorls 3 3/4. Shell fragmented on the body whorl and slightly in the aperture. This species is very close in general shape to *G. gundlachii* which measures height 1 2/3 mm and width 2.5 mm, with 5 whorls according to MARTENS (1890–1901).

Guppya sp.

Distribution. Central America, Mexico, southern United States, and the West Indies (THOMPSON 2011). Chiapas (this paper): Custepec.

Remarks. This species of *Guppya* very much resembles *Guppya sterkii* (Dall, 1888) (from north-eastern United States), which has an imperforate depressed shell, measures 0.75 mm high and 1.22 mm wide, and has 3 1/2 whorls (PILSBRY 1946). However, the specimens at the CNMO are twice the size of *G. sterkii*. Our specimens also bear a depressed spire and a tiny umbilicus. Furthermore, one specimen measures 2 mm height and 3 mm width and has 4 5/6 whorls, while the second has a height of 1.5 mm and a width of 2.5 mm, and 4 whorls. This species of *Guppya* comes from the locality of Custepec.

Genus *Habroconus* Fischer et Crosse, 1872

Habroconus cf. *elegantulus* (Pilsbry, 1920)

New record for the state

Type locality. Mexico, San Luis Potosí, canyon and waterfalls near Valles (THOMPSON 2011).

Distribution. From Mexico, Central America, the West Indies to South America (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. This species of *Habroconus* was found in Frontera Comalapa at the Ciudad Cuauhtémoc site of this study. The species is close to *Habroconus elegantulus* (Pilsbry, 1919), which has a height of 3.2 mm, a diameter of 3.3 mm, and 6 1/2 whorls. The specimens at the CNMO is 2.5 mm high, 2.5 mm in diameter, and have 4 to 5 1/2 whorls. Hence, our specimen is smaller than *H. elegantulus*. This is the first record of the genus in Chiapas.

Habroconus cf. *pittieri* (von Martens, 1892)

New record for the state

Type locality. Costa Rica, San Francisco de los Ríos near San José (MARTENS 1890–1901).

Distribution. Costa Rica, Nicaragua, Mexico (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. Adult height 2.6 mm, width 3.0 mm, whorls 5 1/2, aperture incomplete; juvenile specimen of about 3 or 4 whorls, aperture fragmented. Our specimens closely resemble *Habroconus pittieri* in the general shape of shell, height and aperture. The specimen from near Ciudad Cuauhtémoc is about

the same size of MARTENS' (1890–1901) specimen, which is height 2.5 mm and width 3.5 mm, slightly wider than ours.

Family Spiraxidae H. B. Baker, 1939

Genus *Euglandina* Crosse et Fischer, 1870

Euglandina cf. *tenella* (Strebel, 1875)

New record for the state

Type locality. Mexico, Veracruz, “Callejones” forest between half an hour and an hour southeast of Veracruz City (MARTENS 1890–1901).

Distribution. It is found in the vicinity of Veracruz City (THOMPSON 2011). Chiapas (this paper): Custepec, La Perla.

Remarks. There are two specimens at the CNMO closely resembling the species *E. tenella* (Strebel, 1875): one is a subadult and the second is more developed. The measurements given by STREBEL (1875) and MARTENS (1890–1901) for *E. tenella* present a height of 32 mm and diameter of 15 mm, height/width ratio = 2.13; our more developed specimen is 27.4 mm in height and has a diameter of 12.9 mm, height/width ratio = 2.12, so is somewhat smaller and differs slightly from *E. tenella*. More material is needed to finally determine the species at the CNMO.

Genus *Myxastyla* Thompson, 1995

Myxastyla *pycnota* Thompson, 1995

New record for the state and Mexico

Type locality. Guatemala, Gorge along the Selequa River, 12 km from La Democracia, Huehuetenango Dept. (THOMPSON 1995).

Distribution. Huehuetenango, Guatemala (THOMPSON 2011). Chiapas (this paper): Custepec. This is the first record of the species in Chiapas.

Remarks. The specimen at the CNMO fully matches the description of the species given by THOMPSON (1995).

Genus *Salasiella* Strebel, 1878

Salasiella cf. *guatemalensis* Pilsbry, 1920

Type locality. Guatemala, Gualan (THOMPSON 2011).

Distribution. Guatemala (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. This specimen is close to *Salasiella guatemalensis* Pilsbry, 1919 (1920) in length, however, the latter species is 25% wider. The specimens available possess more slender shells when compared with *S. guatemalensis*. Both *S. guatemalensis* and our specimen have a rather large aperture, being more than half the length of the shell. The specimen from 31 December 1988 (CNMO 8340) is adult, since the interior contains the remains of an egg. The three specimens of 19 December 2018 (CNMO 8309) are just fragments



(two apices, some other pieces) and the more complete specimen has half the body whorl without the aperture. We need more material to determine if the specimens found at this site are *S. guatemalensis* or a new species of *Salasiella*.

Salasiella pfeifferi Pilsbry, 1899

Type locality. Mexico, Chiapas (MARTENS 1890–1901).

Distribution. Chiapas in Mexico, Costa Rica, Turubares [sic!] (MARTENS 1890–1901, PILSBRY 1907–1908); JACOBSON (1968) also recorded the species in Nicaragua. Chiapas (this paper): La Perla. This is the first record of the species in the state of Chiapas since MARTENS' time (1890–1901).

Remarks. The CNMO *Salasiella pfeifferi* (as *S. pulchella*) specimen differs from the species description (PILSBRY 1907–1908) in the following features: it lacks the light buff streaks, and the shell height/width ratio is 2.74 versus 2.8 in the type material.

Salasiella cf. camerata H. B. Baker 1941

New record for the state

Type locality. Mexico, Puebla, Tepexic, below Necaxa; 2,200 ft. alt. (BAKER 1941).

Distribution. In the state of Puebla, Mexico (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. This species resembles *Salasiella camerata* Baker, 1941 in the general shape of the shell, both have a short spire and a large aperture. Nonetheless, *S. camerata* is two times larger, and its aperture is 80 percent the total length of the shell, while in our specimen the aperture is 78% the length of shell. The apex in *S. camerata* is wider and rounded, whereas in our specimen the apex is slightly more acute and slender. Table 5 summarises dimensions of the type specimen of *S. camerata* and those of our specimens.

Table 5. Dimensions of the type specimen of *S. camerata* and those of our specimens. Measurements were calculated from the drawing in BAKER (1941: plate 5, figs 4 and 5). H/W – height/width ratio

Species	Height mm	Width mm	H/W	Whorls
<i>Salasiella camerata</i> (type specimen)	9.0	3.2	2.81	–
<i>Salasiella camerata</i> (young specimen)	4.3	2.2	1.95	–
<i>Salasiella</i> sp.	3.2	1.6	2.0	3

THOMPSON (2011) refers to the species with a question mark, and in MolluscaBase *Salasiella camerata* is cited as taxon inquirendum, non the less our specimens show similar features as the figures showed by BAKER (1941) and do not resemble any

other described *Salasiella*. More shell material and live specimens are needed to further study the species and solve the status of *Salasiella camerata*.

Salasiella cf. perpusilla (Pfeiffer, 1866)

New record for the state

Type locality. Mexico, Veracruz, Mirador (THOMPSON 2011).

Distribution. Mexico, Guatemala and Honduras (MARTENS 1890–1901, PILSBRY 1907–1908). Chiapas (this paper): Las Champas.

Remarks. The flank of the shell is roundish and inclined, thus the shell narrows toward the anterior extreme. Our specimen resembles in general shape the shell of *Salasiella perpusilla* (Pfeiffer, 1866). PILSBRY (1907–1908) also mentioned that the species could measure 4.5 mm in height, whereas our specimen is larger by about 1 mm, as it measures in height 5.3 mm, width 2.4 mm and it has 4 whorls.

Family Thysanophoridae Pilsbry, 1926

Genus *Thysanophora* Strebel et Pfeffer, 1880

Thysanophora conspurcatella conspurcatella (Morelet, 1851)

New record for the state

Type locality. Mexico, Yucatán, Merida (THOMPSON 2011).

Distribution. Mexico (Campeche, Tabasco, Yucatán, Veracruz and Tamaulipas) and Guatemala (THOMPSON 2011). According to THOMPSON (2011) it is distributed from Tamaulipas to Yucatán and Guatemala. Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. The specimen measures: height 1.1 mm, width 1.95 mm, whorls 2 1/2. It is rather worn, but the growth lines are well marked. The single specimen from 31 December 1988 (CNMO 8332) is a young one if compared with measurements given by PILSBRY (1926), which was one whorl larger and of height 2 mm, and width 3.5 mm. It shows the fine slanting riblets of the species (PILSBRY 1940) and the distinguishing outline. Specimens from 19 December 2018 (CNMO 8326) measure: height 1.4 mm each one, width 2.3 and 2.8 mm, whorls 3 and 3 1/2. The smaller is well-preserved and shows the typical sculpture of the apex, while the larger has half a whorl broken, it is worn (weathering), and shows no sculpture of the apex.

Genus *Setidiscus* H. B. Baker, 1927

Setidiscus hornii (Gabb, 1866)

New record for the state

Type locality. United States, Arizona, Pinal County, Old Fort Grant, at the junction of Aravaipa and San Pedro Rivers (THOMPSON 2011).

Distribution. United States, Texas, New Mexico, Arizona, most of the northern states of Mexico, Baja California Sur and Nicaragua (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc. As far as we are able to ascertain, this is the first record of the species in Chiapas.

Remarks. Specimens show the typical features that distinguish the species, one specimen has the apex broken.

Genus *Lyroconus* H. B. Baker, 1927

***Lyroconus* cf. *plagiptycha*
(Shuttleworth, 1854)**

Type locality. Puerto Rico, Humacoa (THOMPSON 2011).

Distribution. The southern states of United States, Mexico, Central America, Colombia and the West Indies (THOMPSON 2011). Chiapas (this paper): Ciudad Cuauhtémoc.

Remarks. The shell fragment shows the slanting lines on the apex as on other species in this genus. The shell measures (approximately) height: 2.0 mm, umbilicus 0.5 mm, and it is possible to count about 3 whorls, the columella is well preserved.

INTRODUCED MOLLUSCS

Family Thiaridae Gill, 1871

Genus *Melanoides* Olivier, 1804

***Melanoides tuberculata* (Müller, 1774)**

Type locality. Africa, South East Asia (PACE 1973, WELTER-SHULTES 2012).

Distribution. Africa, Asia, Australia, the Pacific Islands. In America it is present from Mexico and throughout Central America (THOMPSON 2011). Chiapas (this paper): Puente Colorado.

Remarks. This introduced freshwater species was first recorded by ABBOTT (1973) in Veracruz and is now widely distributed throughout Mexico (CONTRERAS-ARQUIETA et al. 1995, CONTRERAS-ARQUIETA 1998, CRUZ-ASCENCIO et al. 2003, NARANJO-GARCÍA & CASTILLO-RODRÍGUEZ 2017).

Family Achatinidae Swainson, 1840

Genus *Allopeas* H. B. Baker, 1935

***Allopeas gracile* (Hutton, 1834)**

Type locality. India, Mirzapur (PILSBRY 1906).

Distribution. Cosmopolitan (CHRISTENSEN & WEISLER 2013). Chiapas (this paper): Ciudad Cuauhtémoc, Puente Colorado.

Remarks. Our two specimens show the similar shape of the species as illustrated by PILSBRY (1906, 1946). Measurements of our specimens are in height: 6.0 and 7.2 mm, width 1.9 and 2.2 mm, whorls 5 and 6. These two specimens are shorter than described by PILSBRY (1946) (height 10 mm, width 3 mm and 8 whorls). Our younger specimen has a finer profile; however, the sculpture is well marked.

In the study on the biology of the species, CAPINERA (2017) concludes that although the snail is omnivorous the quantity of foliage it consumes is not enough for it to be considered a major pest snail.

Genus *Opeas* Albers, 1850

***Opeas hannense* (Rang, 1831)**

Synonym. *Opeas pumilum* (L. Pfeiffer, 1840)

Type locality. Senegal, Hann, western Africa (RANG 1831).

Distribution. It was found in Mexico at Baja California (SMITH et al. 1990), Tabasco, as well as in Guatemala, Nicaragua and Panama; in addition, it has been introduced to other parts of the world (THOMPSON 2011). It is also reported from Puerto Rico (VAN DER SCHALIE 1948) and Argentina (VIRGILLITO & MIQUEL 2013).

Remarks. A terrestrial species, it does not seem to be a pest, since observations of *O. hannense* (as *Opeas pumilum*) in eight greenhouses in New York City showed no damage to the foliage or blossoms of roses. In addition, the author thought that the snails may have been feeding on plants and mulch (KARLIN 1956). Nonetheless, in Costa Rica this species was found to feed more frequently on the roots of Gramineae, Rubiaceae and Compositae, among others (LEANDRO CASTANEDA 1993). It is believed that *O. hannense* has been dispersed around the world through commerce (PILSBRY 1906, CHRISTENSEN & KIRCH 1981).

Genus *Subulina* Beck, 1837

***Subulina octona* (Bruguière, 1789)**

Type locality. Guadalupe Island and Santo Domingo (BRUGUIÈRE 1789–1792, DEISLER & ABBOTT 1984).

Distribution. It has been registered in the United States (Florida, Philadelphia), Africa, Sri Lanka, East Indies (PILSBRY 1946), Cuba (HERRERA-URIA 2016), Brazil (OLIVEIRA et al. 2015), Argentina (RUMI et al. 2010), Malaysia (UCHIDA et al. 2013), Zimbabwe



(VAN BRUGGEN 1981), and in Mexico in Campeche, Tabasco, Chiapas, San Luis Potosí, Tamaulipas, Veracruz, and Yucatán (THOMPSON 2011). Chiapas (this paper): Puente Colorado.

Remarks. This species has a tall shell (up to 17 mm) with a truncated columella. It has been introduced

widely around the world. In Brazil it was found to be one of the land molluscs serving as the intermediate host of the lung worm *Angiostrongylus cantonensis* (Chen, 1935), the nematode responsible for eosinophilic meningitis in humans (CARVALHO et al. 2012, MORASSUTTI et al. 2014).

DISCUSSION

Twenty-nine families and 158 species (and subspecies) of terrestrial molluscs have been recorded for the state (NARANJO-GARCÍA & SMITH 2014, TOVAR-JUÁREZ et al. 2020), equivalent to 16.4% of the total of the non-marine mollusc fauna of Mexico. As a result of this work 23 species are new records for Chiapas, giving a total of 181 species and 32 families for the state (NARANJO-GARCÍA & SMITH 2014, TOVAR-JUÁREZ et al. 2020). See Table 3 for new additions, which were marked with “Chis” for Chiapas or “Mex/Chis” for Mexico and Chiapas.

Drymaeus discrepans, *Lamellaxis* cf. *strebelianus*, *Myxastyla pycnota*, *Bothriopupa breviconus*, and *Paralaoma coloba* are new records for Mexico, all of them were previously known from Central America (Guatemala, El Salvador and Nicaragua). *Bothriopupa breviconus* and *Myxastyla pycnota* were described in Guatemala and now are recorded for the first time in Chiapas; in addition, these three species are new records in the Mesoamerican biogeographical dominion sensu MORRONE (2006).

Families of terrestrial molluscs recorded for the first time in Chiapas are: Vertiginidae (with the genera *Bothriopupa*, *Gastrocopta* and *Vertigo*), and Punctidae (with *Paralaoma coloba*).

In the area considered we are recording the freshwater species *Pomacea flagellata* and *Pachychilus indiorum* (Table 2), known previously from other places in Chiapas as from the Lacandon rainforest (BEQUAERT 1957, RAMÍREZ et al. 2022).

Snails present in other parts of Mexico yet recorded for the first time in Chiapas are: *Mesembrinus shattucki*, *Glyphyalinia indentata paucilirata*, *Euglandina* cf. *tenella*, *Thysanophora conspurcatella conspurcatella*, *Gastrocopta pellucida hordeacella*, *Pupisoma dioscoricola dioscoricola*, *Guppya biolleyi*, *Guppya* cf. *gundlachii gundlachii*, *Habroconus* cf. *elegantulus*, *Salasiella* cf. *camerata* and *Vertigo* cf. *ovata*.

In addition, the native species *Pyrgodomus microdinus microdinus*, *Lamellaxis martensi martensi*, and *Mayabina tapanensis* and the introduced *Melanoides tuberculata* are new records for the sites referred to in this study.

The number of species Chiapas share with its neighbours is 31 with Veracruz (of 293 species), 9 with Oaxaca, 23 with Tabasco, 19 with Campeche and 51 with Guatemala (of 292 species) (THOMPSON 2011). To date, the state of Veracruz has been the most studied Mexican state since the early European expeditions to the Americas (the collecting effort was the highest there) (FISCHER & CROSSE 1870–1902, MARTENS 1890–1901). Chiapas with a less strong collecting effort has 10.5% of the number of species of Veracruz, while it shares with Guatemala 17.5% of the species. With the data available until now, Chiapas shows a closer faunal affinity with that of Guatemala as was observed previously (NARANJO-GARCÍA 1993).

The Custepec area has been subjected to coffee cultivation since the early XX century (PÉREZ-GROVAS GARZA 2013). Coffee, as well as cacao (GORDILLO RUIZ 2013) is regularly grown under the cover of other vegetation. This type of agroforestry system closely resembles a natural forest (TSCHARNTKE et al. 2011); hence, our results are interesting because they reflect part of the malacofauna that one could have expected in a non-developed forest.

On the other hand, the introduced *Melanoides tuberculata* was already present in northeastern Chiapas (Lacandon rainforest) (RAMÍREZ et al. 2022) where the snail was not very abundant, and at Puente Colorado it was also present in low numbers and showed signs of predation. Introduced land molluscs found in this study possibly arrived through the cultivation and management of coffee plants, and pasture for cattle over the plains around Ciudad Cuauhtémoc.

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