

Checklist of echinoderms (Echinodermata) from the Southern Mexican Pacific: a historical review

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Abstract: The echinoderms of the Southern Mexican Pacific have been studied for three centuries, but discrepancies in the nomenclature of some species have pervaded through time. The objective of this work is to present the first updated checklist of all valid species and synonyms, and a historical review of the study of the echinoderms of the Southern Mexican Pacific is also presented. The checklist is based on an exhaustive published literature search and records of specimens deposited in museum and curated reference collections. There are 162 species of echinoderms in the Southern Mexican Pacific from 96 genera, 54 families and 20 orders. The State of Guerrero presented a total of 135 species, Oaxaca 94 and Chiapas 15. We updated the list and added five new records of the species (*Microphiopholis platydisca*, *Ophiostigma tenue*, *Arbacia stellata*, *Thyone bidentata*, *Chiridota rigida*) for the Southern Mexican Pacific and one for the Mexican Pacific (*Encope laevis*). This checklist expands the number of species known for the study area; nevertheless studies suggest that still more species are yet to be discovered. Rev. Biol. Trop. 63 (Suppl. 2): 87-114. Epub 2015 June 01.

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The phylum Echinodermata is represented approximately by 7000 living species, and 13000 fossil species, and comprises five living classes (Pawson, 2007). In the Mexican Pacific, the taxonomy and ecology of the echinoderm species have been studied for more than a hundred years, being the Gulf of California the most extensively studied area (Solís-Marín et al., 2013).

The Southern Mexican Pacific (SMP) comprises the States of Guerrero, Oaxaca and Chiapas. This is a region with a high marine biodiversity and endemism, besides it has

a large number of habitats (i.e. coral reefs, mangroves, coastal lagoons) and represents the main dispersal route to Mexico for species from Central America (Arriaga-Cabrera et al., 1998; Reyes-Bonilla & López-Pérez, 1998). A large amount of information has been published regarding the echinoderm fauna of the SMP, resulting in a research history that can be divided into three periods.

The first expedition carried out at the coasts of the SMP was *Albatross* in 1891. The leading scientist of the expedition was Alexander Agassiz, who collected marine specimens from

the Eastern Pacific. The expedition resulted in the reports of Ludwig (1894) (Holothuroidea), Agassiz (1898, 1904) (Echinoidea), Lütken and Mortensen (1899) (Ophiuroidea) and Ludwig (1905) (Asteroidea). Although *Albatross* was the only expedition into the SMP during the 19th century, numerous taxonomic contributions were produced for this area mostly for Asteroidea (Gray, 1871; Perrier, 1875, 1878; Sladen, 1899) and Echinoidea (Agassiz, 1863, 1872, 1873, 1881, 1898; Lockington, 1876; Rathbun, 1886).

During the 20th century (in 1904 and 1905) the *Albatross* made a final expedition to the SMP. This expedition resulted in the extensive work of H.L. Clark (1920) about the Eastern Tropical Pacific Asteroidea. Along with the *Albatross*, during 1931-1941, the *Velero III* surveyed the SMP. As a result of the *Velero III* expeditions, Deichmann (1941, 1958) (Holothuroidea), H.L. Clark (1948) (Echinoidea) and Ziesenhenné (1940) (Ophiuroidea) published extensive works on the echinoderms of the area. During 1937-1938, the New York Zoological Society organized an expedition to the Eastern Pacific (*Zaca*) under the direction of William Beebe, which generated the works of Deichmann (1938) (Holothuroidea) and H.L. Clark (1940) (Asteroidea, Ophiuroidea, Echinoidea). In addition, during this century, there was an increase in systematic studies of echinoderms from the SMP. In particular, researchers such as H.L. Clark (1907a, 1907b, 1914, 1915, 1917, 1920, 1922, 1925, 1940, 1948), Deichmann (1936, 1937, 1938, 1941, 1958) and Caso (1944, 1945, 1946, 1948a, 1948b, 1949, 1951, 1954, 1958, 1962, 1963, 1964, 1965, 1967a, 1967b, 1970, 1977, 1978a, 1978b, 1979, 1980a, 1980b, 1983, 1986) produced a vast number of publications.

Recently, the study of echinoderms in the Southern Mexican Pacific has not only focused on systematics, but also on ecology (Benítez-Villalobos, 2001; Lirman et al., 2001; Calderón-Aguilera & Reyes-Bonilla, 2006; López-Pérez et al., 2008; Zamorano & Leyte-Morales, 2005a, 2005b, 2009), bioerosion (Herrera-Escalante et al., 2005; Benítez-Villalobos

et al. 2008b), reproduction (Benítez-Villalobos & Martínez-García, 2012; Benítez-Villalobos et al., 2012, 2013), and symbiosis (Granja-Fernández et al., 2013b).

Notwithstanding that the knowledge of the echinoderms in the SMP has increased since the 19th century, the large amount of work in the area has generated a myriad of names that not only have often been misspelled, but have also created longstanding taxonomic problems. To overcome this trend, the main goal of this contribution is to present the first updated checklist of all valid and synonymous names of echinoderms from the SMP based on published literature and from specimens deposited in collections, which will be useful as a baseline for future taxonomic, ecological and marine resource management studies.

MATERIALS AND METHODS

We present a list of all known valid names and synonyms of echinoderm species (classes Asteroidea, Ophiuroidea, Echinoidea and Holothuroidea) from Guerrero (GRO), Oaxaca (OAX), Chiapas (CHIS) and the Gulf of Tehuantepec (GT), México. The Gulf of Tehuantepec comprises the States of Oaxaca and Chiapas; some of the records in the area do not mention a specific State, thus we refer to them as Gulf of Tehuantepec.

The checklist is based on an exhaustive published literature search (131 references) and records of specimens deposited in museums or properly curated reference collections (AMNH-American Museum of Natural History, New York; AMS-Australian Museum, Sydney; CAS-California Academy of Sciences, San Francisco; FMNH-The Field Museum, Chicago; ICML-UNAM-Colección Nacional de Equinodermos “Dra. Ma. Elena Caso”, Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México, México City; LACM-Los Angeles County Museum, Los Angeles; MACN-Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires; MCZ-Museum of Comparative Zoology, Cambridge; UMAR-Colección de

equinodermos de la Universidad del Mar, Puerto Ángel, México; USNM-National Museum of Natural History, Washington; YPM-Yale Peabody Museum of Natural History, New Haven).

Systematic arrangements follow the criteria of A.M. Clark (1989, 1993, 1996), A.M. Clark and Mah (2001) and Mah (2014) for the Asteroidea; Smith et al. (1995), Stöhr et al. (2014) for the Ophiuroidea; Mortensen (1928, 1935, 1943a, 1943b, 1948, 1950, 1951), Kroh and Smith (2010) and Kroh and Mooi (2014) for the Echinoidea; Pawson and Fell (1965), Rowe (1969), Solís-Marín et al. (2009), Smirnov (2012) and WoRMS (2014) for the Holothuroidea. The taxonomic status of all species (valid names and synonyms) was tracked in the literature back to the original description, and was constructed with the help of systematics experts. The current checklist includes only those synonyms that have been used in the SMP, but some species can have a larger synonym list in other geographic areas.

RESULTS AND DISCUSSION

Historical review

Asteroidea: A total of 39 references addressed the Asteroidea in the SMP. During the 19th century, only six works were written; in the 20th century 24 references were published and during the current one, nine works have been published (Fig. 1A). The authors who contributed with the highest number of works were H.L. Clark (1907b, 1920, 1940), Caso (1944, 1945, 1948b, 1970, 1977, 1979) and A.M. Clark (1989, 1993, 1996).

The study of Asteroidea in the SMP began in 1867 when Verrill (1867a, 1867b) mentioned the presence of *Phataria unifascialis* in Acapulco, Guerrero. Four years later, Gray (1871) described *Luidia latiradiata* as *Platasterias latiradiata* for the Gulf of Tehuantepec, which was thought to be a living fossil species of Somasteroidea, an extinct group from the Orvidician (Fell, 1962b). The species was further transferred to Luidiidae and no longer considered as a survivor member of this

archaic group (Blake, 1972). Based on specimens donated by the Museum of Comparative Zoology, Cambridge to the Museum of Natural History of Paris, Perrier (1875) recorded *Nidorellia armata*, *Pharia pyramidatus*, *Heliaster kubiniji* and *Heliaster microbrachius* from Acapulco, Guerrero.

The 20th century was the period with the highest addition of Asteroidea to the SMP fauna (20 species). Ludwig (1905) described *Eremicaster pacificus*, *Pseudarchaster pulcher*, *Mediaster transfuga*, *Hymenaster violaceus*, *Zoroaster hirsutus* and *Freyella insignis* from Acapulco and other areas of the Tropical Eastern Pacific. Ludwig (1905) also reported *Porcellanaster waltharii* from Acapulco, now considered as a synonym of *Eremicaster crassus* (A.M. Clark, 1989). It is important to note that *P. waltharii* has been incorrectly spelled as *P. waltherii* (A.M. Clark, 1989), in contrast with the original spelling (Ludwig, 1905). Döderlein (1936) added *Pentacaster cumingi* from Acapulco to the list, which had also been named as *Oreaster occidentalis* in some studies (Clark H.L., 1940; Salcedo-Martínez et al., 1988). Caso (1977) described *Asterina agustincasoi* based on specimens collected in Ixtapa Island (Guerrero) but O'Loughlin (2002) synonymized this species with *Meridiastra modesta*. Luke (1982) published a catalog of the benthic invertebrate collections of the SCRIPPS institution of oceanography and recorded for the first time *Ceramaster leptoceramus* for the SMP, which was collected in the Gulf of Tehuantepec. Salcedo-Martínez et al. (1988) published an inventory of benthic macroinvertebrates in rocky bottoms of Zihuatanejo (Guerrero). This work represented the first inventory of marine fauna from Guerrero and added the species *Mithrodia bradleyi*. Years later, Solís-Marín et al. (1993) recorded *Luidia bellonae*, *Luidia columbia*, *Linckia columbiae*, *Astropecten ornaticus* and *Heliaster helianthus* for Guerrero and Oaxaca. The 20th century era concluded with the work of Gamboa-Contreras and Tapia-García (1998) from the Gulf of Tehuantepec, the authors included the record of *Luidia foliolata*, *Astropecten armatus*, *Astropecten*

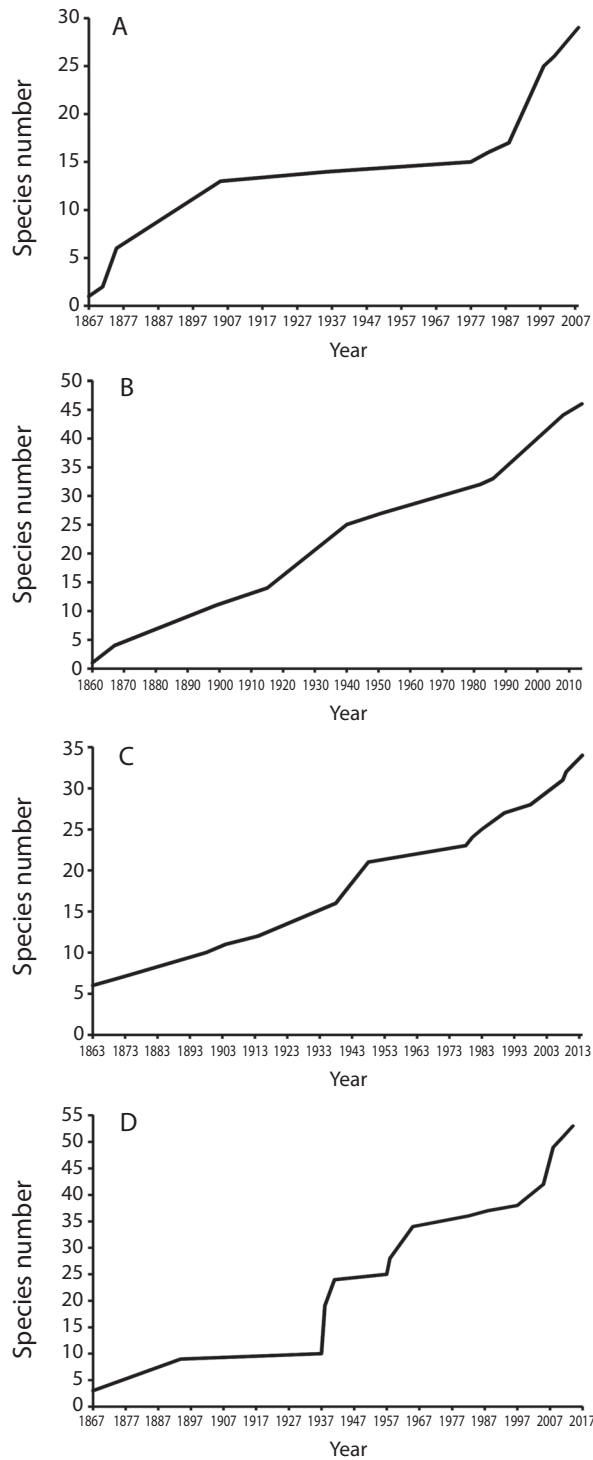


Fig. 1. Species accumulative curves for echinoderm species in the Southern Mexican Pacific. A) Asterozoidea, B) Ophiurozoidea, C) Echinozoidea, D) Holothurozoidea.

regalis and *Astropecten verrilli*. It is important to emphasize that *A. regalis* has been reported in the Greater Antilles, the Caribbean, the Gulf of México as well as in areas of the Eastern Pacific such as Costa Rica, Panamá and México (Solís-Marín et al., 2005; Honey-Escandón et al., 2008; Pawson et al., 2009; Alvarado et al., 2010; Miloslavich et al., 2010). *Astropecten verrilli* was called *Astropecten californicus* (e.g. Verrill, 1914; Honey-Escandón et al., 2008); but according to Döderlein (1917) the valid species is the former.

So far, the current century is the era with the lowest number of new records of Asteroidea for the SMP. A.M. Clark and Mah (2001) reported *Heliaster polybrachius*, while Benítez-Villalobos et al. (2008a) and Honey-Escandón et al. (2008) added *Luidia superba*, *Luidia tessellata* and *Asteropsis carinifera*. The species *Gymnasteria spinosa* has been reported

in the SMP as *Asteropsis spinosa* (Benítez-Villalobos et al., 2008a; Honey-Escandón et al. 2008), but according to Perrier (1875) the valid species is *A. carinifera*. According to Benítez-Villalobos et al. (2008a) and Bastida-Zavala et al. (2013), *Leiaster teres* inhabits Oaxaca (USNM E6635). This specimen was collected by Ricketts between 1940-1943 in Puerto Escondido during an expedition conducted in the Gulf of California; therefore the record is not valid for Oaxaca.

All species of Asteroidea that have been collected from the SMP are deposited in all the consulted museums, except the YPM. The collections with a major number of deposited species were ICML-UNAM (13), LACM (9) and the USNM (9) (Table 1).

Ophiuroidea: The Ophiuroidea is represented by the lowest number of publications

TABLE 1

Checklist of valid names (in bold) and synonyms of the echinoderms from the Southern Mexican Pacific. Distribution in the Southern Mexican Pacific and museum records in brackets. Numbers following brackets refer to literature where the taxa were listed, see references section. For acronyms see material and methods section.

All taxa are listed as originally reported in the literature

CUADRO 1

Lista de nombres válidos (en negritas) y sinonimias de los equinodermos del Pacífico Sur Mexicano. La distribución dentro del Pacífico Sur Mexicano y los registros de museos se presentan en corchetes. Los números después de los corchetes se refieren a la literatura en donde se reportó a los taxa, ver la sección de referencias. Para los acrónimos ver la sección de material y métodos. Todos los taxa se enlistan tal cual fueron reportados en la literatura

Phylum Echinodermata Brugière, 1791

Class Asteroidea Blainville, 1830

Order Paxillosida Perrier, 1884

Family Luidiidae Sladen, 1889

Genus *Luidia* Forbes, 1839

Luidia bellonae Lütken, 1865 [GRO, OAX; LACM] ^{8, 116}

Luidia (Alternaster) bellonae Lütken, 1865 ^{13, 87}

Luidia columbia (Gray, 1840) [GRO, OAX, GT; CAS, LACM, MACN, MCZ] ⁸

Luidia brevispina Lütken, 1871 ⁷⁵

Luidia columbiae (Gray, 1840) ⁷⁵

Luidia (Petalaster) columbia (Gray, 1840) ^{13, 87}

Luidia foliolata (Grube, 1866) [GT] ⁷⁵

Luidia latiradiata (Gray, 1871) [OAX, CHIS, GT; MACN, MCZ] ⁸

Astropecten latiradiatus (Gray, 1871) ^{103, 104}

Luidia (Platasterias) latiradiata (Gray, 1871) ^{13, 44, 87, 114, 116}

Platasterias latiradiata Gray, 1871 ^{19, 20, 23, 34, 66, 71, 82, 112, 123}

Luidia superba A.H. Clark, 1917 [OAX] ⁸

Luidia (Alternaster) superba A.H. Clark, 1917 ^{13, 87}

Luidia tessellata Lütken, 1859 [GRO, OAX, CHIS; CAS] ⁸

Luidia (Petalaster) tessellata Lütken, 1859 ^{13, 87, 114}



- Family Astropectinidae Gray, 1840
 Genus *Astropecten* Gray, 1840
Astropecten armatus Gray, 1840 [GRO, OAX, CHIS, GT; CAS, ICML-UNAM, LACM, MACN, AMNH, USNM] 8, 13, 75, 87, 114
Astropecten ornatissimus Fisher, 1906 [GRO; CAS, ICML-UNAM] 87, 116
Astropecten regalis Gray, 1840 [GRO, CHIS, GT; ICML-UNAM, LACM] 75, 87, 114
Astropecten verrilli de Loriol, 1899 [GT]
Astropecten californicus Fisher, 1906 75
- Family Porcellanasteridae Sladen, 1883
 Genus *Eremicaster* Fisher, 1905
Eremicaster crassus (Sladen, 1883) [GRO, OAX; USNM] 8
Eremicaster crassus gracilis (Sladen, 1883) 13
Porcellanaster waltherii Ludwig, 1905 93
Eremicaster pacificus (Ludwig, 1905) [GRO; USNM] 44
Porcellanaster pacificus Ludwig, 1905 93
- Family Pseudarchasteridae Sladen, 1889
 Genus *Pseudarchaster* Sladen, 1889
Pseudarchaster pulcher Ludwig, 1905 [GRO] 73, 93
- Order Valvatida Perrier, 1884
- Family Asterinidae Gray, 1840
 Genus *Meridiastra* O'Loughlin, 2002
Meridiastra modesta (Verrill, 1870) [GRO; ICML-UNAM] 87
Asterina agustincasoii Caso, 1977 35, 45, 101, 116
- Family Goniasteridae Forbes, 1841
 Genus *Ceramaster* Verrill, 1899
Ceramaster leptoceramus (Fisher, 1905) [GT] 84, 94
 Genus *Mediaster* Stimpson, 1857
Mediaster transfuga Ludwig, 1905 [GRO; MCZ, USNM] 73, 84, 93
- Family Oreasteridae Fisher, 1911
 Genus *Nidorellia* Gray, 1840
Nidorellia armata (Gray, 1840) [GRO, OAX; ICML-UNAM, UMAR] 8, 13, 67, 87, 103, 104, 110, 116
 Genus *Pentaceraster* Döderlein, 1916
Pentaceraster cumingi (Gray, 1840) [GRO, OAX; ICML-UNAM, LACM, UMAR] 8, 13, 67, 87, 129
Oreaster occidentalis Verrill, 1870 56, 94, 110
- Family Asteropseidae Hotchkiss & A.M. Clark, 1976
 Genus *Asteropsis* Müller & Troschel, 1840
Asteropsis carinifera (Lamarck, 1816) [OAX; ICML-UNAM, UMAR] 8
Asteropsis spinosa (Gray, 1840) 13, 87
- Family Mithrodiidae Viguier, 1878
 Genus *Mithrodia* Gray, 1840
Mithrodia bradleyi Verrill, 1870 [GRO, OAX; ICML-UNAM, UMAR] 8, 13, 87, 110
- Family Ophidiasteridae Verrill, 1870
 Genus *Linckia* Nardo, 1834
Linckia columbiae Gray, 1840 [GRO] 116
 Genus *Pharia* Gray, 1840
Pharia pyramidatus (Gray, 1840) [GRO, OAX; AMS, ICML-UNAM, LACM, MCZ, AMNH, UMAR] 8, 10
Pharia pyramidata (Gray, 1840) 38, 56, 94, 127, 129
Pharia pyramidatus pyramidatus (Gray, 1840) 13, 87
Ophidiaster pyramidatus Gray, 1840 103
- Genus *Phataria* Gray, 1840
Phataria unifascialis (Gray, 1840) [GRO, OAX; AMS, CAS, ICML-UNAM, LACM, MCZ, AMNH] 8, 13, 38, 56, 87, 94, 110, 112, 121, 127, 129
Linckia unifascialis Gray, 1840 103, 104, 124, 125

Order Velatida Perrier, 1884

Family Pterasteridae Perrier, 1875

Genus *Hymenaster* Wyville-Thomson, 1873

Hymenaster violaceus Ludwig, 1905 [GRO; USNM] 46, 53, 73, 93, 116

Order Forcipulatida Perrier, 1884

Family Heliasteridae Viguier, 1878

Genus *Heliaster* Gray, 1840

Heliaster helianthus (Lamarck, 1816) [GRO; ICML-UNAM] 116

Heliaster kubiniji Xantus, 1860 [GRO; AMS, ICML-UNAM, LACM, MCZ, AMNH] 38, 49, 87, 103, 104, 116

Heliaster microbrachius Xantus, 1860 [GRO, OAX, CHIS, GT; AMS, FMNH, ICML-UNAM, LACM, MCZ, USNM] 8, 13, 38, 49, 87, 114, 116

Heliaster microbrachia Xantus, 1860⁹⁷

Heliaster polybrachius H.L. Clark, 1907 [GRO] 47

Family Zoroasteridae Sladen, 1889

Genus *Zoroaster* Wyville-Thomson, 1873

Zoroaster hirsutus Ludwig, 1905 [GRO; CAS, USNM] 47, 53, 74, 93, 116

Order Brisingida Fisher, 1928

Family Freyellidae Downey, 1986

Genus *Freyella* Perrier, 1885

Freyella insignis Ludwig, 1905 [GRO] 93

Class Ophiuroidea Gray, 1840

Order Euryalida Lamarck, 1816

Family Asteronychidae Verrill, 1899

Genus *Asteronyx* Müller & Troschel, 1842

Asteronyx longifissus Döderlein, 1927 [GRO; ICML-UNAM] 87

Order Ophiurida Müller & Troschel, 1840

Family Ophiomyxidae Ljungman, 1867

Genus *Ophiomyxa* Müller & Troschel, 1840

Ophiomyxa panamensis Lütken & Mortensen, 1899 [GRO; ICML-UNAM] 87

Family Ophiacanthidae Ljungman, 1867

Genus *Ophiacantha* Müller & Troschel, 1842

Ophiacantha moniliformis Lütken & Mortensen, 1899 [GRO; USNM] 69, 87, 95

Genus *Ophiotoma* Lyman, 1883

Ophiotoma paucispina (Lütken & Mortensen, 1899) [OAX; ICML-UNAM]

Ophiacantha paucispina Lütken & Mortensen, 1899^{8, 87}

Family Ophiuridae Müller & Troschel, 1840

Genus *Ophiura* Lamarck, 1801

Ophiura (Ophiuroglypha) irrorata irrorata (Lyman, 1878) [OAX; LACM]

Ophiura irrorata (Lyman, 1878)^{77, 94}

Genus *Ophiomisidium* Koehler, 1914

Ophiomisidium leurum Ziesenhenné, 1940 [OAX; LACM] 69, 77, 131

Genus *Amphiophiura* Matsumoto, 1915

Amphiophiura superba (Lütken & Mortensen, 1899) [GRO; USNM]

Ophioglypha superba Lütken & Mortensen, 1899⁹⁵

Genus *Ophiernus* Lyman, 1878

Ophiernus adpersus adpersus Lyman, 1883 [GRO] 87

Ophiernus adpersus annectens Lütken & Mortensen, 1899 [GRO; USNM]

Ophiernus polyporus Lütken & Mortensen, 1899⁹⁵

Ophiernus polyporum Lütken & Mortensen, 1899⁶⁹

Ophiernus seminudus Lütken & Mortensen, 1899 [GT; AMS] 51, 77

Genus *Stegophiura* Matsumoto, 1915

Stegophiura ponderosa (Lyman, 1878) [OAX] 77

Amphiophiura ponderosa (Lyman, 1878)⁹⁴



Family Amphiuroidae Ljungman, 1867

Genus *Amphioplus* Verrill, 1899

Amphioplus coniertodes H.L. Clark, 1918 [GRO; USNM] ⁸⁷

Genus *Amphiura* Forbes, 1843

Amphiura arcystata H.L. Clark, 1911 [GRO; MCZ] ⁵⁶

Amphiura seminuda Lütken & Mortensen, 1899 [OAX, GT; LACM] ^{75, 77, 94}

Amphiura serpentina Lütken & Mortensen, 1899 [GRO; USNM] ^{69, 95}

Genus *Amphichondrius* Nielsen, 1932

Amphichondrius granulatus (Lütken & Mortensen, 1899) [GRO, OAX; MCZ] ⁷⁷

Amphichondrius granulatus Nielsen, 1932 ⁵⁶

Amphichondrius laevis Ziesenhenné, 1940 [OAX; LACM] ^{69, 77, 131}

Genus *Amphiodia* Verrill, 1899

Amphiodia (Amphisipina) urtica (Lyman, 1860) [OAX; MCZ] ⁷⁷

Amphiodia urtica (Lyman, 1860) ⁵⁶

Amphiodia platysipina Nielsen, 1932 [GRO; ICML-UNAM] ⁸⁷

Amphiodia sculpilis Ziesenhenné, 1940 [GRO, OAX; AMS, LACM, MCZ] ^{69, 77, 108, 131}

Amphiodia tabogae Nielsen, 1932 [GRO; ICML-UNAM, LACM] ⁸⁷

Genus *Amphipholis* Ljungman, 1866

Amphipholis squamata (Delle Chiaje, 1828) [GRO, OAX; LACM] ^{77, 110}

Genus *Dougaloplus* Clark A.M., 1970

Dougaloplus gastracanthus (Lütken & Mortensen, 1899) [GRO; USNM]

Amphioplus gastracanthus (Lütken & Mortensen, 1899) ⁵¹

Amphiura gastracantha Lütken & Mortensen, 1899 ^{69, 87, 95}

Genus *Microphipholis* Turner, 1985

Microphipholis platydisca (Nielsen, 1932) [GRO, OAX; LACM, MCZ]

Genus *Ophiocnida* Lyman, 1865

Ophiocnida hispida (Le Conte, 1851) [GRO, OAX; ICML-UNAM, UMAR] ^{77, 80, 87}

Genus *Ophiophragmus* Lyman, 1865

Ophiophragmus marginatus (Lütken, 1856) [OAX; ICML-UNAM, LACM] ^{8, 42, 77, 87}

Ophiophragmus papillatus Ziesenhenné, 1940 [GRO, OAX; LACM] ^{69, 77, 80, 131}

Genus *Ophiostigma* Lütken, 1856

Ophiostigma tenue Lütken, 1856 [GRO, OAX; LACM, MCZ]

Family Ophiotrichidae Ljungman, 1867

Genus *Ophiothrix* Müller & Troschel, 1840

Ophiothrix (Ophiothrix) rudis Lyman, 1874 [GRO, OAX; ICML-UNAM, LACM, UMAR] ^{8, 76, 77, 80}

Ophiothrix rudis Lyman, 1874 ^{9, 25, 87, 94, 110, 127}

Ophiothrix (Ophiothrix) spiculata Le Conte, 1851 [GRO, OAX; ICML-UNAM, LACM, MCZ, USNM] ^{8, 76, 77, 80}

Ophiothrix spiculata Le Conte, 1851 ^{25, 38, 42, 51, 87, 110, 127}

Genus *Ophiothela* Verrill, 1867

Ophiothela mirabilis Verrill, 1867 [GRO, OAX; ICML-UNAM, UMAR] ^{8, 76, 77, 80, 87}

Family Ophiactidae Matsumoto, 1915

Genus *Ophiactis* Lütken, 1856

Ophiactis savignyi (Müller & Troschel, 1842) [GRO, OAX; ICML-UNAM, LACM, UMAR, USNM] ^{8, 9, 17, 25, 38, 56, 76, 77, 80, 87, 94, 95, 110, 127}

Ophiactis simplex (Le Conte, 1851) [GRO, OAX; ICML-UNAM, LACM, UMAR] ^{8, 9, 76, 77, 80, 87, 94, 110, 127}

Family Ophionereididae Ljungman, 1867

Genus *Ophionereis* Lütken, 1859

Ophionereis annulata (Le Conte, 1851) [GRO, OAX; FMNH, ICML-UNAM, LACM, MCZ, UMAR] ^{8, 51, 76, 77, 79, 80, 87, 110, 121, 127}

Ophionereis dictyota Ziesenhenné, 1940 ²⁵

Ophionereis perplexa Ziesenhenné, 1940 [GRO; ICML-UNAM] ⁸⁷

Family Ophiocomidae Ljungman, 1867

Genus *Ophiocoma* L. Agassiz, 1835

Ophiocoma aethiops Lütken, 1859 [GRO, OAX; FMNH, ICML-UNAM, LACM, UMAR] ^{8, 11, 25, 38, 51, 56, 76, 77, 80, 87, 94, 110, 121, 124, 125, 127}

Ophiocoma alexandri Lyman, 1860 [GRO, OAX; ICML-UNAM, LACM, MCZ, UMAR] ^{8, 11, 15, 25, 38, 51, 56, 69, 76, 77, 80, 87, 94, 96, 110, 124, 125, 127, 130}

Family Ophiodermatidae Ljungman, 1867

Genus *Ophioderma* Müller & Troschel, 1840

Ophioderma panamensis Lütken, 1859 [GRO, OAX; ICML-UNAM, LACM, UMAR] 76, 77, 80

Ophiocryptus granulosus Nielsen, 1932 8, 9, 25, 77, 87

Ophioderma panamense Lütken, 1859 21, 47, 52, 81

Ophiura panamensis (Lütken, 1859) 124, 125

Ophioderma teres (Lyman, 1860) [GRO, OAX; ICML-UNAM, LACM, UMAR] 8, 25, 51, 76, 77, 80, 87

Ophiura teres Lyman, 1860 125

Ophioderma variegata Lütken, 1856 [GRO, OAX; ICML-UNAM, LACM] 8, 77

Ophioderma variegatum Lütken, 1856 25, 56, 87

Genus *Diopederma* H.L. Clark, 1913

Diopederma daniana (Verrill, 1867) [GRO, OAX, CHIS, GT; ICML-UNAM, LACM, UMAR, USNM] 8, 77

Diopederma danianum (Verrill, 1867) 25, 56, 75, 87, 94, 114

Family Ophiolepididae Ljungman, 1867

Genus *Ophiolepis* Müller & Troschel, 1840

Ophiolepis fulva H.L. Clark, 1940 [OAX; LACM, MCZ] 56, 69, 77

Ophiolepis pacifica Lütken, 1856 [GRO, OAX; ICML-UNAM, UMAR] 8, 76, 77, 80, 87

Ophiozona pacifica (Lütken, 1856) 25

Ophiolepis variegata Lütken, 1856 [GRO, OAX, GT; ICML-UNAM, LACM, USNM] 8, 25, 38, 42, 56, 75, 77, 87, 94

Genus *Ophiomusium* Lyman, 1869

Ophiomusium glabrum Lütken & Mortensen, 1899 [OAX; ICML-UNAM] 8, 77, 87, 94

Ophiomusium variabile Lütken & Mortensen, 1899 [GRO; MCZ, USNM] 51, 69, 87, 95

Class Echinoidea Leske, 1778

Order Cidaroida Claus, 1880

Family Ctenocidaridae Mortensen, 1928

Genus *Aporocidaris* A. Agassiz & H.L. Clark, 1907

Aporocidaris milleri (A. Agassiz, 1898) [GRO; ICML-UNAM, USNM] 36, 87, 100, 116

Porocidaris milleri A. Agassiz, 1898 5, 6

Family Cidaridae Gray, 1825

Genus *Eucidaris* Pomel, 1883

Eucidaris thouarsii (L. Agassiz & Desor, 1846) [GRO, OAX; ICML-UNAM, LACM, MCZ, USNM] 8, 13, 18, 22, 36, 56, 87, 94, 116, 127, 128

Genus *Hesperocidaris* Mortensen, 1928

Hesperocidaris asteriscus H.L. Clark, 1948 [GRO, OAX; ICML-UNAM, UMAR] 8, 13, 36, 110, 116, 127, 129

Order Diadematoidea Duncan, 1889

Family Diadematidae Gray, 1855

Genus *Astropyga* Gray, 1825

Astropyga pulvinata (Lamarck, 1816) [GRO, OAX, CHIS; CAS, ICML-UNAM, LACM, MCZ] 8, 13, 22, 36, 38, 56, 57, 81, 87, 114, 116

Genus *Centrostephanus* Peters, 1855

Centrostephanus coronatus (Verrill, 1867) [GRO; ICML-UNAM] 36, 87, 116, 129

Genus *Diadema* Gray, 1825

Diadema mexicanum A. Agassiz, 1863 [GRO, OAX; ICML-UNAM, LACM, MCZ, UMAR, USNM, YPM] 1, 2, 3, 4, 6, 7, 8, 9, 13, 14, 18, 36, 55, 58, 59, 60, 68, 85, 87, 89, 90, 91, 106, 109, 110, 116, 124, 125, 126, 127, 128, 129

Centrechinus mexicanus (A. Agassiz, 1863) 23, 57, 81, 130

Order Arbacioida Gregory, 1900

Family Arbaciidae Gray, 1855

Genus *Arbacia* Gray, 1835

Arbacia stellata (Blainville, 1825; ?Gmelin, 1788) [GRO; MCZ]



Order Camarodonta Jackson, 1912

Family Echinometridae Gray, 1855

Genus *Echinometra* Gray, 1825

Echinometra mathaei oblonga (Blainville, 1825) [GRO]

Echinometra oblonga (Blainville, 1825)¹²⁹

Echinometra vanbrunti A. Agassiz, 1863 [GRO, OAX, CHIS; CAS, ICML-UNAM, LACM, MACN, MCZ, UMAR, USNM] 1, 8, 13, 18, 56, 57, 68, 87, 94, 114, 116, 121, 127, 128, 129

Echinometra vanbrunti A. Agassiz, 1863 2, 22, 37, 38, 106, 110, 124, 125, 126

Heliocidaris stenopora H.L. Clark, 1912 22, 81

Toxicidaris mexicana (L. Agassiz & Desor, 1846)^{1, 2}

Family Toxopneustidae Troschel, 1872

Genus *Toxopneustes* L. Agassiz, 1841

Toxopneustes roseus (A. Agassiz, 1863) [GRO, OAX; ICML-UNAM, LACM, MCZ, UMAR, USNM] 8, 13, 18, 24, 37, 38, 55, 57, 81, 87, 94, 109, 110, 116, 127, 128, 129

Boletia rosea A. Agassiz, 1863^{1, 2}

Lytechinus roseus (A. Agassiz, 1863)^{124, 125}

Genus *Tripneustes* L. Agassiz, 1841

Tripneustes depressus A. Agassiz, 1863 [OAX; UMAR]^{8, 13}

Family Strongylocentrotidae Gregory, 1900

Genus *Mesocentrotus* Tatarenko & Poltarau, 1993

Mesocentrotus franciscanus (A. Agassiz, 1863) [GRO; LACM]

Strongylocentrotus franciscanus (A. Agassiz, 1863)^{37, 57}

Genus *Strongylocentrotus* Brandt, 1835

Strongylocentrotus purpuratus (Stimpson, 1857) [GRO]^{37, 57}

Order Cassiduloida Claus, 1880

Family Cassidulidae L. Agassiz & Desor, 1847

Genus *Rhyncholampas* A. Agassiz, 1869

Rhyncholampas pacificus (A. Agassiz, 1863) [GRO, OAX; AMNH, AMS, CAS, ICML-UNAM, MCZ, USNM] 8, 87, 126

Cassidulus pacificus (A. Agassiz, 1863)^{13, 24, 41, 57, 81, 109, 116}

Pygorhynchus pacificus A. Agassiz, 1863^{1, 68, 124, 125}

Rhyncholampas pacifica (A. Agassiz, 1863)^{55, 122}

Rhynchopygus pacificus (A. Agassiz, 1863)^{2, 105, 106}

Order Clypeasteroidea A. Agassiz, 1872

Family Clypeasteridae L. Agassiz, 1835

Genus *Clypeaster* Lamarck, 1801

Clypeaster elongatus H.L. Clark, 1948 [GT]

Clypeaster elongata H.L. Clark, 1948⁷⁵

Clypeaster europacificus H.L. Clark, 1914 [GRO, OAX, CHIS; CAS, ICML-UNAM, LACM, MCZ] 40, 81, 87, 114, 116

Clypeaster ochrus H.L. Clark, 1914 [GRO, OAX; MCZ]^{40, 50, 56, 57, 68, 81, 116}

Clypeaster rotundus (A. Agassiz, 1863) [GRO, CHIS; MCZ]^{2, 40, 57, 81, 94, 116, 119}

Stoloniclypeus rotundus A. Agassiz, 1863^{124, 125}

Stolonoclypeus rotundus A. Agassiz, 1863^{1, 2, 68}

Family Mellitidae Stefanini, 1912

Genus *Mellita* L. Agassiz, 1841

Mellita grantii Mortensen, 1948 [GRO; MCZ]⁸³

Mellita kanakoffi Durham, 1961 [GRO; MCZ]⁸³

Mellita longifissa Michelin, 1858 [GRO, CHIS; CAS, ICML-UNAM, MCZ]^{2, 21, 40, 70, 81, 83, 87, 106, 107, 114, 116, 117}

Mellita notabilis H.L. Clark, 1947 [GRO, CHIS; CAS, ICML-UNAM, USNM]^{83, 87, 114, 117}

Mellita eduardobarrosi Caso, 1981^{39, 40, 88, 116}

Genus *Encope* L. Agassiz, 1840

Encope laevis H.L. Clark, 1948 [GRO; CAS]

Encope micropora L. Agassiz, 1841 [GRO, OAX, CHIS; ICML-UNAM, MCZ]^{8, 13, 40, 81, 87, 114, 116}

Encope micropora fragilis H.L. Clark, 1948 [GRO, GT; CAS, LACM, MCZ]⁴⁰

Encope fragilis H.L. Clark, 1948 57, 68, 71, 75, 116
Encope perspectiva L. Agassiz, 1841 [GRO, OAX; CAS, LACM] 40, 57, 81
Encope wetmorei A.H. Clark, 1946 [GRO; ICML-UNAM, LACM, USNM] 38, 40, 57, 87, 116

Order Holasteroidea Durham & Melville, 1957

Family Urechinidae Duncan, 1889

Genus *Cystechinus* A. Agassiz, 1879

Cystechinus loveni A. Agassiz, 1898 [GRO, OAX; MCZ, USNM] 5, 6, 68

Urechinus loveni (A. Agassiz, 1898) 41, 52, 99, 116

Family Pourtalesiidae A. Agassiz, 1881

Genus *Cystocrepis* Mortensen, 1907

Cystocrepis setigera (A. Agassiz, 1898) [GRO; MCZ, USNM]

Echinocrepis setigera A. Agassiz, 1898 5, 6, 68

Order Spatangoida Claus, 1876

Family Schizasteridae Lambert, 1905

Genus *Brisaster* Gray, 1855

Brisaster townsendi (A. Agassiz, 1898) [GRO]

Schizaster townsendi A. Agassiz, 1898 6

Family Prenasteridae Lambert, 1905

Genus *Agassizia* Valenciennes, 1846

Agassizia scrobiculata Valenciennes, 1846 [GRO, OAX; ICML-UNAM] 8, 13, 87

Family Brissidae Gray, 1855

Genus *Brissus* Gray, 1825

Brissus latecarinatus (Leske, 1778) [GRO; ICML-UNAM] 41, 87, 116

Genus *Meoma* Gray, 1851

Meoma ventricosa grandis Gray, 1851 [GRO, OAX; CAS, ICML-UNAM, LACM, MCZ, UMAR] 8, 13, 43, 87, 115, 116

Kleinia nigra A. Agassiz, 1863 1, 2

Meoma grandis Gray, 1851 2, 3, 4, 6, 24, 41, 55, 56, 81, 109, 119, 122, 126

Meoma nigra (A. Agassiz, 1863) 124, 125

Family Loveniidae Lambert, 1905

Genus *Lovenia* Desor, in Agassiz & Desor, 1847

Lovenia cordiformis A. Agassiz, 1872 [OAX; UMAR] 8, 13

Class Holothuroidea Selenka, 1867

Order Dendrochirotida Grube, 1840

Family Psolidae Burmeister, 1837

Genus *Lissothuria* Verrill, 1867

Lissothuria ornata Verrill, 1867 [GRO, OAX; CAS, ICML-UNAM, LACM] 8

Thyonepsolus beebei Deichmann, 1937 63, 64, 87, 110

Genus *Psolidium* Ludwig, 1887

Psolidium dorsipes Ludwig, 1887 [GRO, OAX; ICML-UNAM] 87

Psolidium gracile Ludwig, 1894 [GRO] 98

Family Sclerodactylidae Panning, 1949

Genus *Afrocucumis* Deichmann, 1944

Afrocucumis ovulum (Selenka, 1867) [GRO, OAX; ICML-UNAM, LACM, MCZ] 8, 87, 118

Euthyonidium ovulum (Selenka, 1867) 33, 63, 64, 110

Stolus ovulum Selenka, 1867 111, 125

Thyone ovulum (Selenka, 1867) 61, 63, 120

Genus *Neothyone* Deichmann, 1941

Neothyone gibber (Selenka, 1867) [GRO, OAX; ICML-UNAM, MCZ] 64, 87, 110, 118

Thyone gibber (Selenka, 1867) 63

Neothyone gibbosa Deichmann, 1941 [GRO, OAX; ICML-UNAM, MCZ, UMAR] 64, 87, 110

Genus *Pachythyone* Deichmann, 1941

Pachythyone lugubris (Deichmann, 1939) [GRO; LACM, USNM] 87

Pachythyone pseudolugubris Deichmann, 1941 [GRO, OAX; ICML-UNAM, LACM] 64, 87



- Genus *Neopentamera* Deichmann, 1941
Neopentamera anexigua Deichmann, 1941 [GRO; ICML-UNAM] ^{87, 118}
- Genus *Euthyonidiella* Heding & Paning, 1954
Euthyonidiella zacaе (Deichmann, 1938) [OAX; MCZ] ⁸
Phyllophorus (Urodemella) zacaе Deichmann, 1938 ¹¹⁸
Phyllophorus zacaе Deichmann, 1938 ^{63, 64}
- Family Phyllophoridae Östergren, 1907
- Genus *Pentamera* Ayres, 1852
Pentamera chierchiaе (Ludwig, 1887) [GRO, OAX; ICML-UNAM, MCZ] ¹¹⁰
Pentamera chierchia (Ludwig, 1887) ^{63, 87}
Pentamera zacaе Deichmann, 1938 [OAX; MCZ] ^{8, 63, 64}
- Genus *Thyone* Jaeger, 1833
Thyone bidentata Deichmann, 1941 [GRO; ICML-UNAM]
Thyone parafusus Deichmann, 1941 [GRO; ICML-UNAM] ^{87, 110}
Thyone strangeri Deichmann, 1941 [GRO; MCZ]
- Family Cucumariidae Ludwig, 1894
- Genus *Abyssocucumis* Heding, 1942
Abyssocucumis abyssorum (Théel, 1886) [GRO, OAX; ICML-UNAM, MCZ, USNM] ⁹⁴
Staurocucumis abyssorum (Théel, 1886) ^{8, 87}
- Genus *Cucumaria* Blainville, 1830
Cucumaria flamma Solis-Marín & Laguarda-Figueras, 1999 [GRO; ICML-UNAM, USNM] ^{87, 113, 118}
- Genus *Pseudocnus* Panning, 1949
Pseudocnus californicus (Semper, 1868) [GRO, OAX; ICML-UNAM, LACM, MCZ, UMAR, USNM] ^{8, 87}
Cucumaria californica Semper, 1868 ^{27, 31, 63, 64, 110}
- Genus *Trachythyone* Studer, 1876
Trachythyone peruana (Semper, 1868) [GRO, CHIS; ICML-UNAM, LACM] ^{87, 114}
Pentacta peruana (Semper, 1868) ^{42, 64}
- Genus *Leptopentacta* H.L. Clark, 1938
Leptopentacta panamica Deichmann, 1941 [OAX; LACM] ⁶⁴
- Family Ypsilothuriidae Heding, 1942
- Genus *Ypsilothuria* Perrier, 1886
Ypsilothuria bitentaculata (Ludwig, 1893) [GRO, OAX; MCZ] ⁹⁸
Sphaerothuria bitentaculata Ludwig, 1893 ⁹⁴
- Order Aspidochirotida Grube, 1840
- Family Holothuriidae Burmeister, 1837
- Genus *Holothuria* Linnaeus, 1767
Holothuria (Cystipus) inhabilis Selenka, 1867 [GRO]
Holothuria parinhabilis Cherbonnier, 1951 ³¹
Jaegerothuria inhabilis (Selenka, 1867) ¹¹⁰
Holothuria (Cystipus) rigida (Selenka, 1867) [GRO; ICML-UNAM] ⁸⁷
Holothuria rigida (Selenka, 1867) ³¹
Holothuria (Halodeima) atra Jaeger, 1833 [GRO, OAX; ICML-UNAM] ^{87, 97}
Holothuria atra Jaeger, 1833 ³¹
Holothuria (Halodeima) inornata Semper, 1868 [GRO]
Holothuria inornata Semper, 1868 ^{27, 31}
Holothuria (Halodeima) kefersteini (Selenka, 1867) [GRO, OAX, CHIS; ICML-UNAM, LACM, MCZ, UMAR, USNM] ^{87, 114, 118}
Holothuria kefersteini (Selenka, 1867) ^{16, 54, 119}
Holothuria (Paraholothuria) riojai Caso, 1963 ^{29, 31}
Ludwigothuria kefersteini (Selenka, 1867) ^{28, 65, 110}
Stichopus kefersteini Selenka, 1867 ^{111, 120, 125}
Holothuria (Mertensiothuria) hilla Lesson, 1830 [GRO, OAX; CAS, ICML-UNAM, LACM, UMAR, USNM]
Brandtothuria gyrifer (Selenka, 1867) ⁶⁵
Holothuria gyrifer (Selenka, 1867) ³¹
Holothuria (Thymiosycia) hilla Lesson, 1830 ⁸⁷

- Microthele (Paramicrothele) zihuatanensis* Caso, 1964 ^{30, 31}
- Holothuria (Mertensiothuria) leucospilota*** (Brandt, 1835) [GRO; ICML-UNAM] ^{87, 97}
- Holothuria leucospilota* (Brandt, 1835) ³¹
- Holothuria (Platyperona) difficilis*** Semper, 1868 [GRO, OAX; ICML-UNAM, UMAR] ^{87, 97}
- Holothuria difficilis* Semper, 1868 ³¹
- Microthele difficilis* (Semper, 1868) ¹¹⁰
- Holothuria (Selenkothuria) lubrica*** Selenka, 1867 [GRO, OAX; ICML-UNAM, LACM, MCZ, UMAR] ^{8, 87, 118}
- Cucumaria lubrica* (Selenka, 1867) ¹¹⁰
- Holothuria lubrica* Selenka, 1867 ^{26, 27, 31, 62, 111, 120, 125}
- Holothuria pseudolubrica* Cherbonnier, 1951 ^{27, 31}
- Selenkothuria lubrica* (Selenka, 1867) ^{65, 110, 127}
- Holothuria (Selenkothuria) portovallartensis*** Caso, 1954 [GRO, OAX; ICML-UNAM, UMAR] ^{8, 87}
- Holothuria portovallartensis* Caso, 1954 ¹²⁷
- Selenkothuria portovallartensis* (Caso, 1954) ⁶⁵
- Holothuria (Selenkothuria) theeli*** (Deichmann, 1938) [GRO, OAX; ICML-UNAM, UMAR] ^{8, 87}
- Holothuria theeli* (Deichmann, 1938) ¹²⁷
- Holothuria (Semperothuria) imitans*** Ludwig, 1875 [GRO, OAX; ICML-UNAM, UMAR] ^{8, 87, 97}
- Holothuria imitans* Ludwig, 1875 ¹²⁷
- Holothuria imitans* var. *polymorpha* Caso, 1962 ³¹
- Semperothuria imitans* (Ludwig, 1875) ⁶⁵
- Holothuria (Semperothuria) languens*** Selenka, 1867 [OAX]
- Holothuria languens* Selenka, 1867 ⁶³
- Holothuria (Stauropora) fuscocinerea*** Jaeger, 1833 [GRO, OAX; ICML-UNAM, UMAR] ⁸
- Holothuria fuscocinerea* Jaeger, 1833 ^{12, 127}
- Holothuria (Mertensiothuria) fuscocinerea* Jaeger, 1833 ⁸⁷
- Holothuria (Theelothuria) paraprinceps*** Deichmann, 1937 [GRO; ICML-UNAM] ⁸⁷
- Holothuria (Thymiosyca) arenicola*** Semper, 1868 [GRO, OAX; ICML-UNAM, UMAR] ^{8, 87}
- Holothuria arenicola* Semper, 1868 ^{63, 127}
- Holothuria (Thymiosyca) impatiens*** (Forskål, 1775) [GRO, OAX; CAS, ICML-UNAM, LACM, UMAR, USNM] ^{8, 9, 87, 97}
- Brandtothuria impatiens* (Forskål, 1775) ^{65, 110}
- Holothuria impatiens* (Forskål, 1775) ^{27, 31, 63, 127}
- Genus *Labidodemas* Selenka, 1867
- Labidodemas americanum*** Deichmann, 1938 [GRO, OAX; ICML-UNAM] ⁸⁷
- Labidodemas maccullochi*** (Deichmann, 1958) [GRO, OAX; ICML-UNAM] ^{87, 118}
- Irenothuria maccullochi* Deichmann, 1958 ³¹
- Family Stichopodidae Haeckel, 1896
- Genus *Isostichopus* Deichmann, 1958
- Isostichopus fuscus*** (Ludwig, 1875) [GRO, OAX; ICML-UNAM, MCZ, UMAR] ^{8, 87, 110, 127, 129}
- Stichopus fuscus* Ludwig, 1875 ^{27, 31, 32, 62}
- Family Synallactidae Ludwig, 1894
- Genus *Molpadiodemas* Heding, 1935
- Molpadiodemas neovillosus*** O'Loughlin & Ahearn, 2005 [GRO; USNM] ¹⁰²
- Genus *Pseudostichopus* Théel, 1886
- Pseudostichopus mollis*** Théel, 1886 [GRO] ⁹²
- Order Elasipodida Théel, 1882
- Family Laetmogonidae Ekman, 1926
- Genus *Pannychia* Théel, 1882
- Pannychia moseleyi*** Théel, 1882 [GRO; USNM] ⁹⁸
- Laetmophasma fecundum* Ludwig, 1893 ⁹²
- Genus *Laetmogone* Théel, 1879
- Laetmogone scotoeides*** (H.L. Clark, 1913) [GRO] ⁹⁸
- Family Deimatidae Théel, 1882
- Genus *Oneirophanta* Théel, 1879
- Oneirophanta mutabilis mutabilis*** Théel, 1879 [GRO, OAX]
- Oneirophanta mutabilis* Théel, 1879 ^{92, 94}

Family Psychropotidae Théel, 1882
Genus *Benthodytes* Théel, 1882
Benthodytes incerta Ludwig, 1893 [GRO; USNM]⁹²
Benthodytes sanguinolenta Théel, 1882 [GRO]⁹²

Order Molpadida Haeckel, 1896
Family Molpadiidae Müller, 1850
Genus *Molpadia* Cuvier, 1817
Molpadia musculus Risso, 1826 [GRO, OAX]^{48, 94, 98}
Ankyroderma danielsseni Théel, 1886⁹²

Order Apodida Brandt, 1835
Family Chiridotidae Östergren, 1898
Genus *Chiridota* Eschscholtz, 1829
Chiridota aponecrita H.L. Clark, 1920 [GRO, OAX; ICML-UNAM, UMAR]⁸⁷
Chiridota rigida Semper, 1868 [GRO, OAX; ICML-UNAM]
Family Synaptidae Burmeister, 1837
Genus *Euapta* Östergren, 1898
Euapta godeffroyi (Semper, 1868) [OAX, GRO]^{78, 86}

(27) in the SMP. In the 19th century there were published only four works, in the 20th century, 15 and in the 21st century, eight (Fig. 1B). The authors who have largely contributed to the study of Ophiuroidea in the area were Lyman (1860), Verrill (1867a, 1867b), Lütken and Mortensen (1899), Clark (1915, 1940), Boone (1926, 1938), Tortonesi (1933a), Ziesenhenné (1937, 1940), Caso (1951, 1979, 1986), Downey (1969), Rowe and Pawson (1977), Luke (1982), Salcedo-Martínez et al. (1988), Gamboa-Contreras and Tapia-García (1998), Benítez-Villalobos (2001), Zamorano and Leyte-Morales (2005a), Honey-Escandón et al. (2008), Granja-Fernández and López-Pérez (2011, 2012), Benítez-Villalobos et al. (2012) and Granja-Fernández et al. (2013b, 2014).

The brittle star *Ophiocoma alexandri* was the first ophiuroid reported in the SMP (Lyman, 1860). *Ophioderma teres*, *Ophioderma panamensis* and *Ophiocoma aethiops* were recorded in the SMP by Verrill (1867a, 1867b), since then the species have been frequently reported by a large number of authors (Table 1). One of the most seminal works on Eastern Pacific Ophiuroidea is that of Lütken and Mortensen (1899) who described almost 50 species for this area. They described six new species (*Ophiacantha moniliformis*, *Amphiophiura superba*, *Ophiernus adpersus annectens*, *Amphiura*

serpentina, *Dougaloplus gastracanthus*, *Ophiomusium variabile*, all of them collected in deep waters (902 to 4082 m depth) from Guerrero, and they also documented for the first time in the area the cosmopolitan *Ophiactis savignyi*. The species *Dougaloplus gastracanthus* was originally described as *Amphiura gastracanthus*, nevertheless Clark (1970) transferred the species to the genus *Dougaloplus*.

During the 20th century, a larger number of papers were published about Ophiuroidea in the SMP. Clark (1915) reported for the first time *Ophiernus seminudus*, *Ophiiothrix* (*Ophiiothrix*) *spiculata* and *Ophionereis annulata* for this area. Twenty five years later, Clark (1940) added seven reports of brittle stars (*Amphiura arcystata*, *Amphichondrius granulatus*, *Amphiodia* (*Amphisipina*) *urtica*, *Ophioderma variegata*, *Diopederma daniana*, *Ophiolepis fulva* and *Ophiolepis variegata*) to the area. Ziesenhenné (1940) described an important number of new species of Ophiuroidea (19) from the Eastern Pacific. He described the species *Ophiomisidium leurum*, *Amphichondrius laevis*, *Amphiodia sculptilis* and *Ophiophragmus papillatus* for the SMP (Guerrero and Oaxaca) in depths up to 91 m. Caso (1951) recorded *Ophiiothrix* (*Ophiiothrix*) *rudis* and *Ophiolepis pacifica* in Zihuatanejo, Guerrero. Luke (1982) added *Ophiura*

(*Ophiuroglypha*) *irrorata irrorata*, *Amphiura seminuda*, *Stegophiura ponderosa*, *Ophiactis simplex* and *Ophiomusium glabrum*, but except by *O. simplex* all species were collected from deep waters (up to 3 610 m depth). Finally, Caso (1986) recorded the presence of *Ophiophragmus marginatus*, and Salcedo-Martínez et al. (1988) cited *Amphipholis squamata* to the SMP.

During the current century, the unique work with new additions of Ophiuroidea to the SMP was published by Honey-Escandón et al. (2008) who reported 10 species (*Asteronyx longifissus*, *Ophiomyxa panamensis*, *Ophiotoma paucispina*, *Ophiernus adpersus adpersus*, *Amphioplus coniotodes*, *Amphiodia platyspina*, *Amphiodia tabogae*, *Ophiocnida hispida*, *Ophiothela mirabilis* and *Ophionereis perplexa*). It is important to note that both *O. adpersus adpersus* and *A. coniotodes* are species distributed in the Caribbean and the Gulf of México (Lyman, 1883; H.L.Clark, 1918; Pawson et al., 2009; Miloslavich et al., 2010), therefore the record of the species in the SMP should be treated with caution. Finally, *Ophiacantha paucispina* originally described by Lütken and Mortensen (1899) was transferred to the genus *Ophiotoma* (Clark, 1915; Martynov, 2010). The ophiuroid *Amphioplus (Unioplus) daleus* was reported in the Gulf of Tehuantepec at 590 km south of Puerto Ángel, Oaxaca (Turner & Hallan, 2011; Granja-Fernández & López-Pérez, 2012), however, since the original locality of recollection was off Mexican waters (Station 3414; 10 °14' N - 96° 28' W) (Lütken & Mortensen, 1899), we excluded the record from the current checklist.

Almost all the consulted museums had records of Ophiuroidea from the SMP, except CAS, MACN, AMNH and YPM. The museums with the highest number of species from the study area were LACM (24) and ICML-UNAM (23) (Table 1). Museum review render two new reports of Ophiuroidea, *Microphipholis platydisca* from Acapulco, Guerrero at 20.1 m depth (LACM 38-136) and Chacahua Bay, Oaxaca from 73.1 to 91.44 m depth (MCZ 5666), and *Ophiostigma tenue* from

Petatlán Bay, Guerrero at 45.7 m depth (LACM 34.138), and Chacahua Bay, Oaxaca from 73.1 to 91.44 m depth (MCZ 5668). The brittle star *M. platydisca* was originally described by Nielsen (1932) as *Amphipholis platydisca*, posteriorly the species was transferred to the genus *Microphipholis* (Turner, 1985).

Echinoidea: The Echinoidea is the class with the highest number of published works (64) from the SMP, most of them of Agassiz (1863, 1872, 1873, 1881, 1898, 1904), Caso (1946, 1948a, 1949, 1978a, 1978b, 1979, 1980a, 1980b, 1983) and Clark (1914, 1917, 1925, 1940, 1948). During the 19th century a total of 11 works were produced, while in the 20th and 21st century 36, and 17 were published, respectively (Fig. 1C).

During the 19th century, 10 species of echinoids were found for the first time in the SMP, all of them by Alexander Agassiz. Agassiz (1863), described the species *Diadema mexicanum*, *Echinometra vanbrunti*, *Toxopneustes roseus*, *Rhyncholampas pacificus* and *Clypeaster rotundus*, from Acapulco and recorded for the first time *Meoma ventricosa grandis* in the area. Agassiz (1872) also added *Mellita longifissa* for Acapulco. Finally, Agassiz (1898) described *Aporocidaris milleri*, *Cystechinus loveni* and *Cystocrepis setigera*, all of them from Acapulco at a depth of 3 436 m.

The 20th century had the highest addition of records of Echinoidea in the SMP. Agassiz (1904) did his last contribution adding to the list *Brisaster townsendi* from Acapulco, a species previously described from the Gulf of Panamá and 500 miles south Guaymas, Sonora. Clark (1914) described *Clypeaster ochrus* based in a specimen collected at Acapulco by the Hassler expedition in 1872. Grant and Hertlein (1938) in their important work on the West American Cenozoic Echinoidea reported for the first time the species *Astropyga pulvinata*, *Clypeaster europacificus*, *Encope micropora* and *Encope perspectiva* from Guerrero. Clark (1940) also recorded for the first time the species *Eucidaris thouarsii* in Zihuatanejo, Guerrero, and in 1948 the same author recorded *Mesocentrotus*

franciscanus, *Strongylocentrotus purpuratus*, *Encope micropora fragilis* and *Encope wetmorei* from Guerrero. It is paramount to emphasize that Clark (1948: 279) commented about *M. franciscanus*: “There is in the present collection a very good adult specimen from Petatlán Bay, but it seems quite improbable and needs confirmation”, and about *Strongylocentrotus purpuratus* (Clark, 1948: 281): “The Velero has secured specimens at 46 stations, of which the southernmost at Petatlán Bay, México. As the only other stations south of the United States at which *purpuratus* was secured are at or near Cedros Island, the Petatlán Bay record needs confirmation. The specimens labeled Petatlán are undoubtedly *purpuratus* but, as in the case of *franciscanus*, the locality is hard to credit”. Years later, Caso (1978b) reported *M. franciscanus* and *S. purpuratus* from White Friars and Petatlán (Guerrero). In the Mexican Pacific, both species are recorded in the northernmost area of the country (Baja California and Baja California Sur) and in the Gulf of California (Solís-Marín et al., 2005; Honey-Escandón et al., 2008), moreover there is no record of the species elsewhere in the Eastern Pacific (Alvarado et al. 2010); therefore this record should be treated with caution. Although the name *Strongylocentrotus franciscanus* has been recently used for authors as Honey-Escandón et al. (2008), this species was replaced to the genus *Mesocentrotus* (Tatarenko & Poltarau, 1993). Otherwise, Caso (1978a, 1980a, 1980b, 1983) recorded for the first time in the area the species *Hesperocidaris asteriscus*, *Centrostephanus coronatus*, *Mellita notabilis*, and *Brisssus latecarinatus*. Harold and Telford (1990) reported *Mellita grantii* and *Mellita kanakoffi* from Acapulco. *Mellita kanakoffi* is an echinoid with both recent and fossil records (Upper Pleistocene), but in the studied area only living specimens have been added (Harold & Telford, 1990). Finally, Gamboa-Contreras and Tapia-García (1998) reported the species *Clypeaster elongatus* from the Gulf of Tehuantepec. The other known report of this species is in the Eastern Pacific by Clark (1948) from the Galápagos Islands.

During the current century, Benítez-Villalobos *et al.* (2008a) and Honey-Escandón *et al.* (2008) reported *Tripneustes depressus*, *Lovenia cordiformis* and *Agassizia scrobiculata*. Further, Zamorano and Leyte-Morales (2009) conducted a study of echinoderms associated to coral reefs from Zihuatanejo and Acapulco and recorded for the first time the species *Echinometra mathaei oblonga* in the SMP. In the Eastern Pacific (México, Panamá and Galápagos Islands), *Echinometra mathaei oblonga* was named as *Echinometra oblonga* (Lessios, 2005; Solís-Marín *et al.*, 2005; Honey-Escandón *et al.*, 2008; Alvarado *et al.*, 2010) but since 1943 Mortensen indicated that the correct name for this species was the former.

The echinoids from the SMP are deposited in all the museums, except the FMNH. Most of the species are deposited in the ICML-UNAM (17 spp.) and MCZ (16 spp.). During museum revision, two new records were added to the fauna of the SMP, *Arbacia stellata* from Acapulco (MCZ 471), and *Encope laevis* from Bahía de Petatlán, Guerrero at depths of 9.1 to 18.3 m (CAS-IZ 87348.00). Along the Eastern Pacific (México, El Salvador, Nicaragua, Costa Rica, Panamá, Colombia, Perú), *A. stellata* has currently named as *Arbacia incisa* (Hooker *et al.*, 2005; Neira & Cantera, 2005; Solís-Marín *et al.*, 2005; Honey-Escandón *et al.*, 2008; Alvarado *et al.* 2010), but according to Mortensen (1935) the valid name is *A. stellata*. Meanwhile, *E. laevis* is an echinoid distributed in Nicaragua, Costa Rica and Colombia (Neira & Cantera, 2005; Alvarado *et al.*, 2010), therefore this is the first record of this species in the Mexican Pacific.

Holothuroidea: To date, the current number of references for the class Holothuroidea in the SMP is 35. During the 19th century there were only four works, during the 20th century 22 papers were published and only nine works during the current century (Fig. 1D). Caso (1954, 1958, 1962, 1963, 1964, 1965, 1967a, 1967b, 1986) and Deichmann (1936, 1937, 1938, 1941, 1958) were the authors with most

of the published works on Holothuroidea in the study area.

The 19th century addressed the lowest number of Holothuroidea reports in the SMP. Verrill (1867b) was the first to record Holothuroidea in the area; he reported *Afrocucumis ovulum*, *Holothuria (Halodeima) kefersteini* and *Holothuria (Selenkothuria) lubrica* from Acapulco. Twenty-seven years later, Ludwig (1894) added *Pseudostichopus mollis*, *Pannychia moseleyi*, *Oneirophanta mutabilis mutabilis*, *Benthodytes incerta*, *Benthodytes sanguinolenta* and *Molpadia musculus* from Guerrero.

The highest addition of records occurred during the 20th century. Deichmann (1937) reported *Isostichopus fuscus* from Acapulco. One year later, Deichmann (1938) made an important contribution on the holothurians from Lower California, Central America and the Galápagos islands. In this work, Deichmann reported for the first time in the study area *Lissothuria ornata*, *Neothyone gibber*, *Euthyonidiella zacae*, *Pentamera chierchiae*, *Pentamera zacae*, *Pseudocnus californicus*, *Holothuria (Semperothuria) languens*, *Holothuria (Thymiosycia) arenicola* and *Holothuria (Thymiosycia) impatiens*. *Euthyonidiella zacae* and *P. zacae* were originally described from Tangola-Tangola Bay, Oaxaca, México. In 1941, Deichmann reported *Neothyone gibbosa*, *Pachythyone pseudolugubris*, *Trachythyone peruana*, *Thyone strangeri* and *Leptopentacta panamica* from the studied area, but the type localities are located in the Gulf of California and Colombia (Deichmann, 1941). On the other hand, *T. strangeri* is the unique species with its type locality in the SMP (Isla Grande, Guerrero at 12.8 m depth). It is important to highlight that Deichmann (1941) made a mistake when recorded the latitude of the type locality as “170° 46’ N”, instead of “17° 46’ N”. Caso (1958) reported *Holothuria (Halodeima) inornata* from Zihuatanejo and Deichmann (1958) reported three more species of the genus *Holothuria (Holothuria (Mertensiothuria) hilla*, *Holothuria (Selenkothuria) portovallartensis* and *Holothuria (Semperothuria) imitans*) from

Guerrero and Oaxaca. Caso (1965) carried out the most important work on Holothuroidea from Zihuatanejo reporting a total of six new records (*Holothuria (Cystipus) inhabilis*, *Holothuria (Cystipus) rigida*, *Holothuria (Halodeima) atra*, *Holothuria (Mertensiothuria) leucospilota*, *Holothuria (Platyperona) difficilis* and *Labidodemas maccullochi*) for the SMP. Luke (1982) reported for the first time in the area *Abyssocucumis abyssorum* and *Ypsilothuria bitentaculata*, which are distributed in deep waters (more than 3000 m depth) (Solís-Marín et al., 2009; Massin & Hendrickx, 2011). Salcedo-Martínez et al. (1988) recorded *Thyone parafusus* in Zihuatanejo, Guerrero, which correspond to the only record of the species for the entire Eastern Pacific, being Salcedo-Martínez et al. (1988) and Honey-Escandón et al. (2008) the only authors addressing this species. Herrero-Pérezrul and Reyes-Bonilla (1997) added *Euapta godeffroyi* from Zihuatanejo. Finally, Solís-Marín and Laguarda-Figuera (1999) described *Cucumaria flamma* after material collected from Zihuatanejo.

In contrast to the other classes of echinoderms, the Holothuroidea have the highest number of records (12) during the 21st century. Despite the type localities for the species *Molpadiodemas neovillosus* are Caroline and Galápagos Islands, O’Loughlin and Ahearn (2005) reviewed material from Punta Maldonado, Guerrero (3 436 m). In the same year, Zamorano and Leyte-Morales (2005a) added *Holothuria (Selenkothuria) theeli* and *Holothuria (Stauropora) fuscocinerea* to the SMP. The work of Honey-Escandón et al. (2008) may be the most important work since it added 6 holothuroid records (*Psolidium dorsipes*, *Pachythyone lugubris*, *Neopentamera anexigua*, *Holothuria (Theelothuria) paraprinceps*, *Labidodemas americanum* and *Chiridota aponocrita*) for the study area. Massin and Hendrickx (2011) recorded the deep-water species *Psolidium gracile* (740-790 m depth) and *Laetmogone scotoeides* (1 180 - 1 420 m depth) from Guerrero.

The Holothuroidea of the SMP are deposited in the collections of CAS, ICML-UNAM,

LACM, MCZ, UMAR and USNM. The collection with the highest number of deposited species is the ICML-UNAM, with 32 species. The revision of the material in the ICML-UNAM added two new records for the Southern Mexican Pacific: *Thyone bidentata* from Playa del Hotel Caleta, Guerrero (ICML-UNAM 5.66.1), and *Chiridota rigida* from Playa Contramar, Guerrero (ICML-UNAM 5.74.11), Playa Las Gatas, Guerrero (ICML-UNAM 5.74.12), Estacahuite, Oaxaca (ICML-UNAM 5.74.14), Playa Panteón, Oaxaca (ICML-UNAM 5.74.15) and La Mina, Oaxaca (ICML-UNAM 5.74.16).

Diversity and distribution: The checklist of echinoderms from the Southern Mexican Pacific includes 162 species, 96 genera, 54 families, 20 orders and four classes (Table 1). The Holothuroidea were the most numerous with 52 species followed by the Ophiuroidea (46 species), Echinoidea (34) and Asteroidea (30) (Table 2). No records in the literature or in museum collections refer to the Crinoidea

from the SMP. The orders with the highest number of species were Ophiuroidea (Ophiuroidea, 45 species), Aspidochirotida (Holothuroidea, 22), Dendrochirotida (Holothuroidea, 22), Paxillosida (Asteroidea, 13) and Clypeasteroidea (Echinoidea, 13); while the orders Vela-tida and Brisingida (Asteroidea), Euryalida (Ophiuroidea), Arbacioida and Cassiduloida (Echinoidea), and Molpadida (Holothuroidea) were represented by a single species. The best represent families were Holothuriidae (Holothuroidea, 19 species) and Amphiuroidae (Ophiuroidea, 18 species). Both families are considered the most diverse and dominant in shallow tropical waters (O'Loughlin et al., 2007; Stöhr et al., 2012).

For the entire Mexican Pacific, Solís-Marín et al. (2013) reported 216 species, the Ophiuroidea being the most numerous with 63 species followed by the Asteroidea (59), Holothuroidea (53), Echinoidea (37) and Crinoidea (4) (Table 3). Similar trend is observed for the Gulf of California (232 species, Solís-Marín et al., 2013) and the Pacific side of Central America (282 species, Alvarado et al., 2010) where the Ophiuroidea and Holothuroidea are the most diverse (Table 3). It is important to note the following between studies: 1) the databases structures are different; while the present study and Alvarado et al. (2010) contain reports from published resources and museums, Solís-Marín et al. (2013) includes only museum records; 2) the studied areas are highly contrasting regarding coastal extension; while the present study includes approximately 1200 km along the coast of the States of Guerrero, Oaxaca

TABLE 2
Total number of echinoderm taxa for the Southern Mexican Pacific

Class	Orders	Families	Genera	Species
Asteroidea	5	14	18	30
Ophiuroidea	2	11	28	46
Echinoidea	8	16	23	34
Holothuroidea	5	13	27	52
TOTAL	20	54	96	162

CUADRO 2
Número total de taxa de equinodermos para el Pacífico Sur mexicano

TABLE 3
Number of echinoderm species per class within different areas of the Eastern Pacific. Data from Alvarado et al. 2010, Solís-Marín et al. 2013, and the present study

	Crinoidea	Asteroidea	Ophiuroidea	Echinoidea	Holothuroidea	Total	Coastline (km)
Southern Mexican Pacific	0	30	46	34	52	162	1 200
Mexican Pacific	4	59	63	37	53	216	7 800
Gulf of California	0	58	71	39	64	232	3 000
Central America Pacific	3	63	85	63	68	282	3 829

and Chiapas, the entire Mexican Pacific has 7 800 km, the Gulf of California, 3 000 km and Central America, 3 800 km. The results suggest that in just 40 % of the coastal line, the SMP comprises 70 % of the total echinoderm fauna compared with, for example, the Gulf of California. This suggests that the echinoderm biodiversity from the SMP is not small considering that the Gulf of California is extensively and far better studied.

According to our results, Guerrero was the State with the highest number of recorded species (135 spp.), followed by Oaxaca (94 spp.), Chiapas (15 spp.) and the Gulf of Tehuantepec (14 spp.). Specifically, the Holothuroidea were the most diverse in Guerrero (48 spp.) and Oaxaca (33 spp.), while the Echinoidea (7 spp.) and the Asteroidea (8 spp.) were the most diverse in Chiapas and the Gulf of Tehuantepec, respectively (Fig. 2).

Holothuroidea have not been recorded in the Gulf of Tehuantepec, but there are records of *Trachythione peruana* and *Holothuria (Halodeima) kefersteini* from Chiapas (Fig. 2). Of the 30 species of Asteroidea, 14 spp. were only reported in one State, most of them from Guerrero; while, *Astropecten armatus* and *Heliaster microbrachius* were widespread in the entire region. Twenty-seven species of Ophiuroidea were reported in one State, mostly for Guerrero, while *Diopederma daniana* was the only species distributed in the entire SMP.

Fifteen species of Echinoidea were reported in one State (mostly in Guerrero), but *Astropyga pulvinata*, *Echinometra vanbrunti*, *Clypeaster europacificus* and *Encope micropora* were widespread in the entire region. Finally, the Holothuroidea were distributed mostly in one State (22 spp.).

Respect to the most complete and recent works of echinoderms from the Mexican Pacific (Honey-Escandón et al. 2008) and Oaxaca (Bastida-Zavala et al., 2013), this work increases the number of known species in 35% for Guerrero, 62 % for Oaxaca, and 7 % for Chiapas. Compared with previous works, we found a substantial increase in regional diversity after the compilation of information from 131 references and the review of several specimens deposited in 11 museums and reference collections.

The historic revision of SMP echinoderms has allowed us to identify valid names, synonyms, misspelled names and erroneous distributions. The checklist provided in this study is an important baseline for future studies in western México, but also for the entire Eastern Tropical Pacific, given that most of the included species are widespread in the area and inhabit multiple substrates and habitats within the region.

Although the SMP is considered a poorly studied region within the Mexican Pacific (Bastida-Zavala et al., 2013), echinoderm

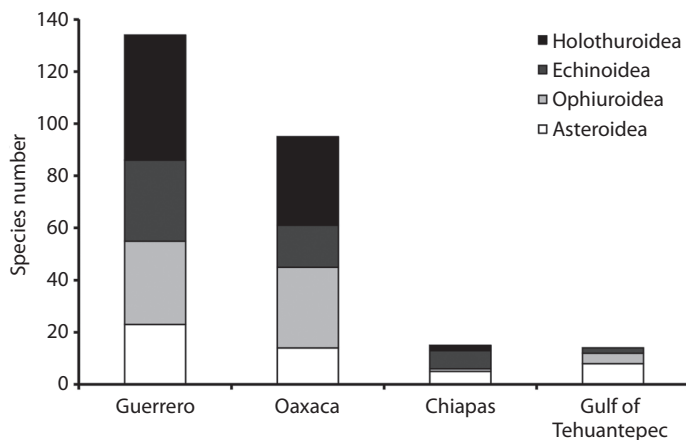


Fig. 2. Number of species for each class of echinoderms from the Southern Mexican Pacific.

studies have lasted over a century (1860-2013) and have resulted from intensive collaborative effort of national and overseas researchers in all disciplines but mainly in systematics. This contribution reveals that the SMP harbors a large number of echinoderm species (chiefly Ophiuroidea and Holothuroidea) being comparable to larger regions such as the Mexican Pacific and the Gulf of California (Table 3). Recent studies addressing the biodiversity of echinoderms in the area indicate, for example, that the States of Oaxaca and Chiapas could harbor two to three times the observed biodiversity (Granja-Fernández & López-Pérez, 2012; López-Pérez et al., 2012a).

Although the historical revision provides valuable information for systematics and ultimately for species management, it also provides an insight of the completeness and gaps regarding the knowledge of the echinoderm fauna in the SMP. In this regard, we encourage a full field survey for the entire region at different depths and across different habitats, especially in soft and rocky bottoms from Chiapas since ongoing in this area suggests its potential to render new records and species yet to be discovered. Currently, the States of Oaxaca and Chiapas have experienced an increase in anthropogenic pressure, mostly in the zones of Zihuatanejo and Acapulco (Guerrero), and Puerto Escondido and Bahías de Huatulco (Oaxaca) (CONANP, 2003; López-Pérez et al., 2012b), therefore these areas are required to be monitored.

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RESUMEN

Listado de los equinodermos (Echinodermata) del Pacífico sur de México: una revisión histórica. Los equinodermos del Pacífico Sur mexicano han sido estudiados por tres siglos, sin embargo discrepancias en la nomenclatura de algunas especies han prevalecido a través del tiempo. El objetivo de este trabajo es presentar la primera lista de especies actualizada de todos los nombres válidos y sinonimias, así como una revisión histórica del estudio de los equinodermos en el Pacífico Sur mexicano. La lista de especies se basa en una exhaustiva búsqueda de registros de literatura y de especímenes depositados en colecciones de referencia. Existen 162 especies válidas de equinodermos en el Pacífico Sur mexicano incluidas en 96 géneros, 54 familias y 20 órdenes. El estado de Guerrero presentó 135 especies, Oaxaca, 94 y Chiapas, 15. Se actualizó la lista de especies y se añadieron cinco nuevos registros de especies (*Microphiopholis platydisca*, *Ophiostigma tenue*, *Arbacia stellata*, *Thyone bidentata*, *Chiridota rigida*) para el Pacífico Sur mexicano y uno para el Pacífico mexicano (*Encope laevis*). Esta lista de especies incrementa el número de especies para el área de estudio, sin embargo, los estudios sugieren que aún existen más especies por ser descubiertas.

Palabras claves: Asteroidea, Ophiuroidea, Echinoidea, Holothuroidea, México.

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