

**Fossil Asterozoa (Echinodermata) of Argentina**Sergio Martínez<sup>1</sup> & Claudia del Río<sup>2</sup>

1. Universidad de la República, Facultad de Ciencias, Dpto. de Evolución de Cuencas, Iguá 4225, 11400 Montevideo, Uruguay; smart@fcien.edu.uy
2. Claudia J. del Río. Museo Argentino de Ciencias Naturales B. Rivadavia, A. Gallardo 470, C1405DJR, Buenos Aires, Argentina; claudiajdelrio@gmail.com

Received 07-VII-2014. Corrected 10-X-2014. Accepted 13-X-2014.

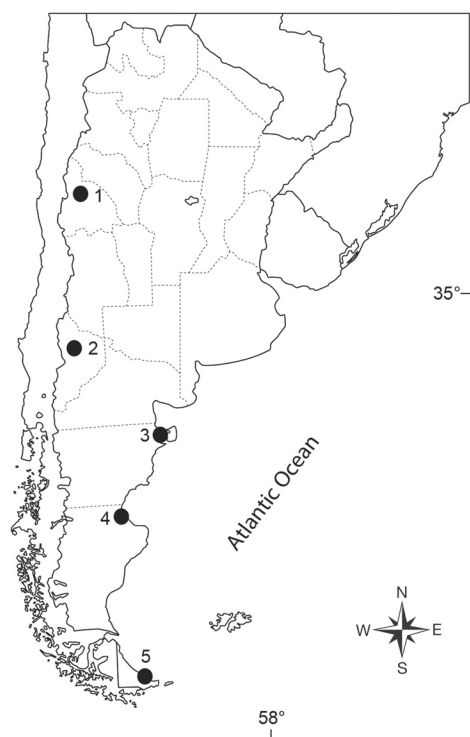
**Abstract:** The fossil Asterozoa of Argentina have received scant attention. Marine rocks of Early Devonian-Late Miocene age yield ten species of Asterozoa (four Asteroidea and six Ophiuroidea), including the new Neogene record of *Astropecten* sp. presently introduced. Due to homonymy, *Marginix* nomen novum is proposed as a substitution of *Marginura* (Ophiuroidea, Encrinasteridae). Rev. Biol. Trop. 63 (Suppl. 2): 1-6. Epub 2015 June 01.

**Key words:** Asterozoa, Ophiuroidea, Asteroidea, Devonian, Cretaceous, Tertiary, Argentina.

Although uncommon in South America, fossil Asterozoa of Argentina are fairly well documented but have received scant attention. This is a brief reference to these findings (Fig. 1), also incorporating to the list a new record of the genus *Astropecten* for the Neogene of Patagonia. It was recorded a total of 10 species: four from the Devonian (three ophiuroids and one asteroid), one from the Cretaceous (asteroid), one from the Maastrichtian-Danian (asteroid), one from the Eocene (ophiuroid), and three from the Miocene (two ophiuroids and one asteroid). It must be pointed out that those merely mentions of high taxonomic ranks (e.g. Bertels, 1965; Pérez et al., 2011), and any reference without factual basis (e.g. de Sáez, 1928) have been excluded from the present summary.

Abbreviations used in this paper:

CNP-PIIc. Centro Nacional Patagónico, Paleontological Collection, Argentina  
 CORD PZ. Museo de Paleontología, Universidad Nacional de Córdoba, Argentina.  
 CPBA. Cátedra de Paleontología de la Universidad de Buenos Aires, Argentina.



**Fig. 1.** Localities mentioned in the text. 1. Jachal. 2. Pampa Tril. 3. Península Valdés. 4. Punta Maqueda. 5. Punta Torcida.

IMGP. Göttinger Geologisch-Paläontologischen Instituts.

MACN- Pi. Colección de Paleontología Invertebrados, Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Argentina.

MLP. Museo de La Plata, Argentina.

NYSM. New York State Museum, USA.

## TAXONOMY

Class Asteroidea Blainville, 1830

Order Paxillosida Perrier, 1884

Family Astropectinidae Gray, 1840

Genus *Pentasteria* Valette, 1929

*Pentasteria (Archastropecten) wilckensis*  
(de Loriol, 1905)

Fig. 2 A

1905. *Astropecten Wilckensis* de Loriol, p. 25 pl. III. Figs. 8 - 9.

1905. *Astropecten Wilckensis*: Wilckens, p. 55.

1929. *Astropecten Wilckensis*: Valette, p. 416.

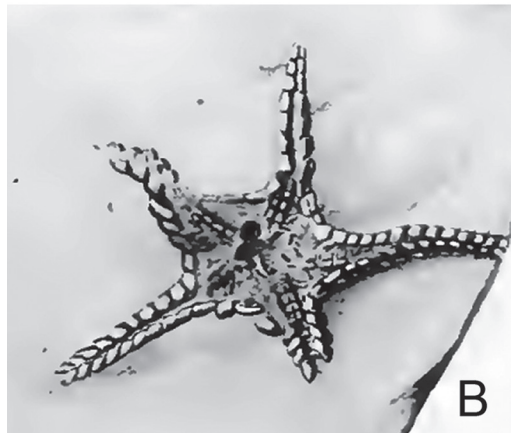
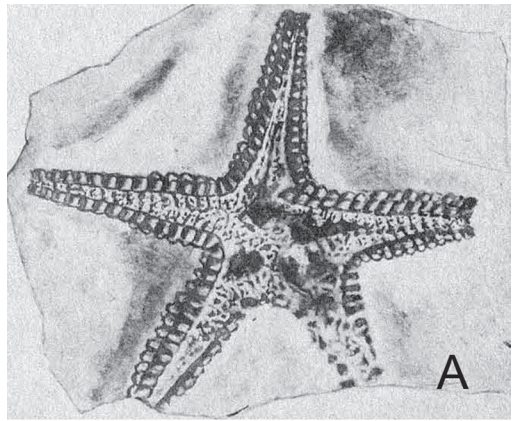
1944. *Astropecten Wilckensis*, Hérengruer, p. 45.

1955. *Archastropecten wilckensis*: Hess, p. 45.

**Type material:** Presumably lost. Hess (1955:46) proposed as Holotype the specimen illustrated in Plate 3, Figure 8 from de Loriol (1905), here reproduced in Fig. 2 A.

**Geographic and stratigraphic distribution:** “Cerro Cazador, Patagonie méridionale. Crétacé” (de Loriol, 1905); Wilckens (1905) precises the location in Sierra Dorotea, “h” and “i” beds of Cerro Cazador strata; today included in the Maastrichtian-Danian Río Chico Formation, Argentina (Malumián & Panza, 2000).

**Comments:** According to Hess (1960) and Spencer & Wright (1966), *Archastropecten* Hess, 1955 is a subgenus of *Pentasteria* Valette, 1929.



**Fig. 2.** A. *Pentasteria (Archastropecten) wilckensis* (de Loriol, 1905) (from de Loriol, 1905: pl. 3, Fig. 8). B. *Argentinaster bodenbenderi* Ruedemann, 1916 (Holotype, from Ruedemann, 1916: pl. 18, Fig. 6).

*Astropecten* sp.

Fig. 3 A

**Type material:** MACN- Pi 5414.

**Geographic and stratigraphic distribution:** Two km south from Punta Maqueda, Santa Cruz Province, Argentina. Chenque Formation, Early Miocene.

**Comments:** The present comprises the first mention of this genus for the Neogene strata of Argentina. The preservation of the available material prevent us to identify it at species level.

Genus *Tethyaster* Sladen, 1889  
*Tethyaster antares*  
Fernández, Pérez, Luci & Carrizo

2014. *Tethyaster antares* Fernández, Pérez,  
Luci & Carrizo, p. 214, Figs. 4 - 5.

**Type material:** Holotype CPBA 16991  
(Fernández *et al.* 2014).

**Geographic and stratigraphic distribu-  
tion:** Lowermost beds of the Mulichinco  
Formation at the Pampa Tril locality (37° 15' S  
- 69° 47' W), Neuquén Basin, Argentina. Early  
Cretaceous (Fernández *et al.*, 2014).

Order Valvatida Perrier, 1884  
Family Promopalaeasteridae Schuchert, 1914  
Genus *Promopalaeaster* Schuchert 1914  
*Promopalaeaster ? quadriserialis*  
Haude, 1995

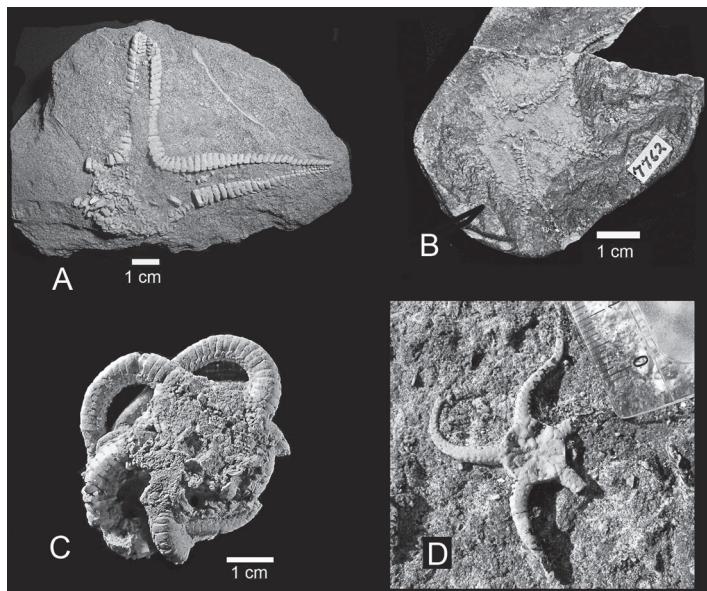
1897. Seesterne: Kayser, p. 303. (*partim*)  
1995. *Promopalaeaster ? quadriserialis* Haude,  
p. 58, Figs. 8 - 9.  
2010. Ofiuroides. Benedetto, Fig. 5.32.4.

**Type material:** Holotype Fig. 9A of Haude  
(1995) (latex pull of IMGP Gö 494-(VII)-  
86. Paratypes IMGP Gö-494-(VI)-84, -(VII)-  
87, -(IX)-97a, b, -(IX)-101a, b, -(IX)-101Sa,  
b, -(VII)-115, -(V)-118; CORD PZ-151.4(?)  
(Haude, 1995).

**Geographic and stratigraphic distribu-  
tion:** Surroundings of Jachal, San Juan Pro-  
vince. Talacasto Formation, Early Devonian  
(Haude 1995, 2010).

Class Ophiuroidea Gray, 1840  
Order Oegophiurida Matsumoto, 1915  
Family Encrinasteridae Schuchert 1914  
Genus *Marginix* nomen novum

**Comments:** Haude (1995) erected the  
genus *Marginaster*, but the name was occu-  
pied by *Marginaster* Perrier, 1881 (Asteroidea,  
Poraniidae). In consequence, Haude (1999)  
proposed the new name *Marginura* as a substi-  
tute. But *Marginura* Sellnick, 1926 (p. 38)  
(Arthropoda, Arachnida, Acari) also occupies  
this name; therefore we propose *Marginix*  
nomen novum as a replacement of *Marginura*



**Fig. 3.** A. *Astropecten* sp. (photo from the authors). B. *Marginix yachalensis* (Ruedemann, 1916), rubber pull from the Holotype (see also comment in Haude 1999) (photo from Ed Landing, NYSM). C. *Ophioderma bonaudoae* Martínez & del Río, 2008, Holotype (photo from the authors). D. *Ophiocrossota kollebergerorum* Caviglia, Martínez & del Río, 2007, specimen w/n in the field (photo from the authors).

Haude (non *Marginura* Sellnick) The new name retains the stem “margin”, adding the latin suffix - ix.

*Marginix yachalensis*  
(Ruedemann, 1916)  
Fig. 3.B

1897. “Bruchstück eines Seesternes”: Kayser, p. 303. pl. 12., Fig. 2.  
1916. *Encrinaster yachalensis* Ruedemann, p.117, pl 18, Figs. 1 - 5.  
1966. *Encrinaster jachalensis*: Castellaro, p. 46.  
1995. *Marginaster yachalensis*: Haude, p. 64, Figs. 10 - 11.  
1999. *Marginura yachalensis*: Haude, p. 292.  
2013. *Marginura yachalensis*: Martin-Medrano & García-Barrera, p. 505.

**Type material:** Holotype NYSM 7762.

**Other material:** Haude (1995): IMGP Gö 494(II)-69a, IMGP Gö 494(II)-69b, -(V)-119; CORD PZ 151.1

**Geographic and stratigraphic distribution:** Surroundings of Jachal, San Juan Province. Talacasto Formation, Early Devonian (Haude 1995, 2010).

Family Furcasteridae Stürtz, 1886  
Genus *Furcaster* Stürtz, 1886  
*Furcaster separatus* Haude 1995

**Type material:** Holotype: an individual from IMGP Gö 494-(VII) J88, there is a cast named as Abb. 12A, B; Paratype I: -tGP Gö 494-(XI)-1 H (Haude, 1995).

**Geographic and stratigraphic distribution:** Surroundings of Jachal, San Juan Province. Talacasto Formation, Early Devonian (Haude 1995, 2010).

Order Ophiurida Müller & Troschel, 1840  
Family Ophiodermatidae Ljungman, 1867  
Genus *Ophioderma* Müller & Troschel, 1842  
*Ophioderma bonaudoae*  
Martínez & del Río, 2008  
Fig. 3.C

2005. Ophiurida: Martínez et al., p.63.  
2008. *Ophioderma bonaudoae* Martínez & del Río, p. 47, plate 1, Figs. A - G.

**Type material:** Holotype CNP-PIIc 00233, Paratype CNP-PIIc 00234 (Martínez & del Río, 2008)

**Geographic and stratigraphic distribution:** Estancia San Lorenzo, 18 km west to Punta Norte, Península Valdés, Chubut Province, Argentina. Puerto Madryn Formation, Late Miocene (Martínez & del Río 2008).

Family Ophiurinae Gregory, 1897  
Genus *Argentinaster* Ruedemann, 1916  
*Argentinaster bodenbenderi*  
Ruedemann, 1916  
Fig. 2. B

1897. “Stelleriden und Ophiuriden”: Kayser, p. 303.  
1916. *Argentinaster bodenbenderi* Ruedemann, 1916, p.118, pl.18, Figs. 6-7. Figs. 38 - 39.  
1966. *Argentinaster bodenbenderi*: Castellaro, p.47  
1966. *Argentinaster bodenbenderi*: Spencer & Wright, p. U93.  
1989. *Argentinaster*: Waisfeld, p. 276.  
1995. *Argentinaster bodenbenderi*: Haude, p. 72, Figs. 13 - 14.

**Type material:** Holotype NYSM 7760 (number not provided in the original paper).

**Other Material:** IMGP Gö 494-(III)-73a, b. -(III)-74a, b, -(VI)-80, -(XII)-107, -(XII)-108; CORD PZ 131-2 (Haude 1995).

**Geographic and stratigraphic distribution:** Surroundings of Jachal, San Juan Province. Talacasto Formation, Early Devonian (Haude 1995, 2010).

Family Ophiuridae Müller & Troschel, 1840  
Genus *Ophiura* Lamarck 1801  
“*Ophiura*” *elegantoides*  
Furque & Camacho, 1949

1949. *Ophiura elegantoides* Furque & Camacho, p. 277, pl.1, Fig. 1.



2005. *Ophiura elegantoides*: Malumián & Olivero, p. 350.

**Type material:** Not stated in the original paper. Presumably lost.

**Geographic and stratigraphic distribution:** Punta Torcida, Isla Grande de Tierra del Fuego. According to Furque and Camacho (1949), the specimen was recorded in the “Estratos de Leticia”, of Late Cretaceous age, today placed in the Punta Torcida Formation (Lower Eocene) (Olivero & Malumián, 1999). More recently, Malumián and Olivero (2005) mention to have recorded numerous fragments of this species in the “coastal exposures” of the Leticia Formation (Upper-Middle Eocene).

Genus *Ophiocrossota* Clark, 1928  
*Ophiocrossota kollemborgorum*  
Caviglia, Martínez & del Río 2007  
Fig. 3. D

2007. *Ophiocrossota kollemborgorum* Caviglia, Martínez & del Río, p. 150, Figs. 2 - 3.

**Type material:** Holotype MLP 12465, Paratype: MLP 12466 (Caviglia et al., 2007).

**Geographic and stratigraphic distribution:** Two km south from Punta Maqueda, Santa Cruz Province, Argentina. Chenque Formation, Early Miocene (Caviglia et al., 2007).

#### ACKNOWLEDGMENTS

We are very grateful to Ed Landing for giving information and photos of NYSM specimens, to Lionel Cavin for the search of de Loriol’s type material, and to Rodrigo Salvador, Antonio Carlos Siqueira Fernandes and Luic Villier for providing bibliography.

#### RESUMEN

**Fósiles de Asterozoa (Echinodermata) de Argentina.** Se registran 10 especies de Asterozoa fósiles de Argentina (cuatro Asteroidea y seis Ophiuroidea), desde el Devónico Temprano hasta el Mioceno Tardío, incluyendo un nuevo registro de *Astropecten* sp. Por homonimia,

*Marginix* nomen novum es propuesto para sustituir a *Marginura* (Ophiuroidea, Encrinasteridae).

**Palabras claves:** Asterozoa, Ophiuroidea, Asteroidea, Devónico, Cretácico, Terciario, Argentina.

#### REFERENCES

- Benedetto, J. L. (2010). *El Continente de Gondwana a través del tiempo. Una Introducción a la Geología Histórica*. Córdoba: Academia Nacional de Ciencias.
- Bertels, A. (1965). Noticia sobre el hallazgo de restos de equinodermos en el Paleoceno de General Roca (Pcia. Río Negro). *Ameghiniana*, 4, 84-99.
- Castellaro, H. A. (1966). *Guía Paleontológica Argentina. Parte I: Paleozoico*. Buenos Aires, Argentina: Consejo Nacional de Investigaciones Científicas y Técnicas.
- Caviglia, S. E., Martínez, S., & del Río, C. J. (2007). A new Early Miocene species of *Ophiocrossota* (Ophiuroidea) from Southern Patagonia, Argentina. *Neues Jahrbuch für Geologie und Paläontologie*, 245, 147-152.
- De Sáez, M. D. (1928). Un nuevo equinodermo fósil argentino. *Revista del Museo de La Plata*, 32, 57-60.
- Fernández, D. E., Pérez, D. E., Luci, L., & Carrizo, M. A. (2014). An Early Cretaceous astropectinid (Echinodermata, Asteroidea) from Patagonia (Argentina): A new species and the oldest record of the family for the Southern Hemisphere. *Andean Geology*, 41, 210-223.
- Furque, G. & Camacho, H. H. (1949). El Cretácico Superior de la costa Atlántica de Tierra de Fuego. *Revista de la Asociación Geológica de Argentina*, 4, 263-297.
- Haude, R. (1995). Echinodermen aus dem Unter-Devon der argentinischen Praekordillere. *Neues Jahrbuch für Geologie und Paläontologie*, 197, 37-86.
- Haude, R. (1999). Der verzögerte Ersatz eines Homonyms: Marginaster Haude, 1995. *Neues Jahrbuch für Geologie und Paläontologie*, 12, 292-294.
- Haude, R. (2010). Ophiuroids in the Lower Devonian of the Argentine Precordillera. In M. Reich, J. Reitner, V. Roden, & B. Thuy (Eds.), *Echinoderm Research 2010, 7th European Conference on Echinoderms* (p. 46-47). Göttingen: University of Göttingen.
- Hérengrer, L. (1944). Sur la présence d’Astéries (*Astropecten carthusiae* nov. sp.) dans le Valanginien de la Chartreuse (Isère). *Travaux de l’Laboratoire Géologie Faculté des Sciences Grenoble*, 24, 33-47.
- Hess, H. (1955). Die fossilen Astropectiniden (Asteroidea). Neue Beobachtungen und Übersicht über die bekannten Arten. *Schweizer Paläontologische Abhandlungen*, 71, 1-113.



- Hess, H. (1960). Über die Abgrenzung der Astropectiniden-Gattungen *Pentasteria* Valette und *Archastropecten* Hess. *Eclogae geologicae Helvetiae*, 53, 329-331.
- Kayser, E. (1897). Beiträge zur Kenntnis einiger paläozoischer Faunen Süd-Amerikas. *Zeitschrift der Deutschen Geologischen Gesellschaft*, 49, 274-317.
- De Loriol, P. (1905). Notes pour servir à l'étude des Échinodermes. *Revue suisse de zoologie*, 2, 1-36.
- Malumián, N. & Panza, J. (2000). Hoja Geológica 5172-III Yacimiento Río Turbio 1:250.000. *Servicio Geológico Minero Argentino, Boletín*, 247, 1-108.
- Malumián, N., & Olivero, E. B. (2005). Shallow-water late middle Eocene crinoids from Tierra del Fuego: New southern record of a retrograde community structure. *Scientia Marina*, 69, 349-353.
- Martínez, S., & del Río, C. J. (2008). A new, first fossil species of *Ophioderma* Müller and Troschel, 1842 (Echinodermata: Ophiuroidea) (Late Miocene, Argentina). *Zootaxa*, 1841, 43-52.
- Martínez, S., del Río, C. J., & Demichelli, M. (2005). Primer registro de ofiuroides (Echinodermata: Ophiuroidea) en la Formación Puerto Madryn (Mioceno Tardío Temprano, Chubut, Argentina). *Actas VIII Jornadas de Zoología, Uruguay (Publicación Especial de la Sociedad Zoológica de Uruguay)*, 63.
- Martin-Medrano, L. & García-Barrera, P. (2013). Análisis del registro fósil de ofiuroides (Echinodermata) en el continente Americano. *Boletín de la Sociedad Geológica Mexicana*, 65, 497-509.
- Olivero, E. B., & Malumián, N. (1999). Eocene stratigraphy of Southeastern Tierra del Fuego Island, Argentina. *Bulletin of American Association of Petrology and Geology*, 83, 295-313.
- Pérez, D. E., Fernández, D. E., & Comerio, M. (2011). Primer registro corpóreo de ofiuroides (Echinodermata: Asterozoa: Ophiuroidea) para el Mesozoico de América del Sur. *Reunión Anual de Comunicaciones de la Asociación Paleontológica Argentina*, Resúmenes, 45-46.
- Perrier, E. (1881). Description sommaire des espèces nouvelles d'asteries. *Bulletin of Museum of Comparative Zoology, Harvard College*, 9, 1-31.
- Ruedemann, R. (1916). Two new starfishes from the Silurian of Argentina. Paleontological contributions from the New York State Museum. *New York State Museum Bulletin*, 189, 116-120.
- Sellnick, M. (1926). Alguns novos Acaros (Uropodidae) myrmecófilos e termitófilos. *Arquivos Museum Rio de Janeiro*, 26, 29-56.
- Spencer, W. K., & Wright, C. W. (1966). Asterozoans. In R. C. Moore (Ed.), *Treatise on Invertebrate Paleontology, Part U. Echinodermata 3* (pp. 1-107). Kansas: Geological Society of America and University of Kansas Press.
- Valette, A. (1929). Note sur une nouvelle espèce d'*Astropecten* du Bathonien de Tremblay Nièvre). *Bulletin de la Société géologique de France*, 4, 415-418.
- Waisfeld, B.G. (1989). Comunidad de *Bridgerocrinus* (Crinoidea: Scytalocrinidae) en la Formación Talacasto (Devónico) de la Precordillera de San Juan, Argentina. *Ameghiniana*, 25, 273-279.
- Wilckens, O. (1905). Die Lamellibranchiaten, Gastropoden etc. der oberen Kreide Südpatagonien. *Berichte der Naturforschenden Gesellschaft Freiburg im Breisgau*, 15, 91-156.