



Pradocrinus asturianus n.sp. a new Camerate crinoid from the Aguión Formation (Middle Emsian, Lower Devonian) of Xivares

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Introduction

In 2012 HAUSER, J. & LANDETA, F. G. discussed the stratigraphical und geographical distribution of *Pradocrinus* DE VERNEUIL, 1850 (Crinoidea, Camerata) in the Lower Devonian of northern Spain (Asturias and León).

During a field-trip in 2017 of my friend Fernando Gómez LANDETA, Oviedo, he found a wonderful preserved dorsal cup of the (“famous” and “rare”) crinoid taxon *Pradocrinus*. This finding is not the first one in Asturias: small findings are located at the classic outcrop Cap La Vela near the hamlet of Arnao. The outcrop Xivares mentioned for Devonian crinoid at first by HAUSER & LANDETA, 2007:46-51. The authors described a new *Gasterocoma* (*G. xivaresensis*) from the more or less green-red marly shales of the Aguión Formation (Middle Emsian, Lower Devonian). The outcrop is a small exposure close to the Cantabrian (Atlantic) ocean; only a few m² are not covered with vegetation; so the chance of finding are reduced of some more or less marly stones falling year by year from the cliff. Some years ago, a friend of Fernando, Emilio QUIRÓS GONZALEZ † found a small but complete *Pradocrinus* in the rubble of the beach. A further finding is a big destroyed (half) *Pradocrinus* from this outcrop by Fernando (now in the collection of J. HAUSER). The crinoid described in this paper is the best preserved dorsal-cup of *Pradocrinus* from the Asturian coastline, and belong to a new taxon: *Pradocrinus asturianus* n.sp.

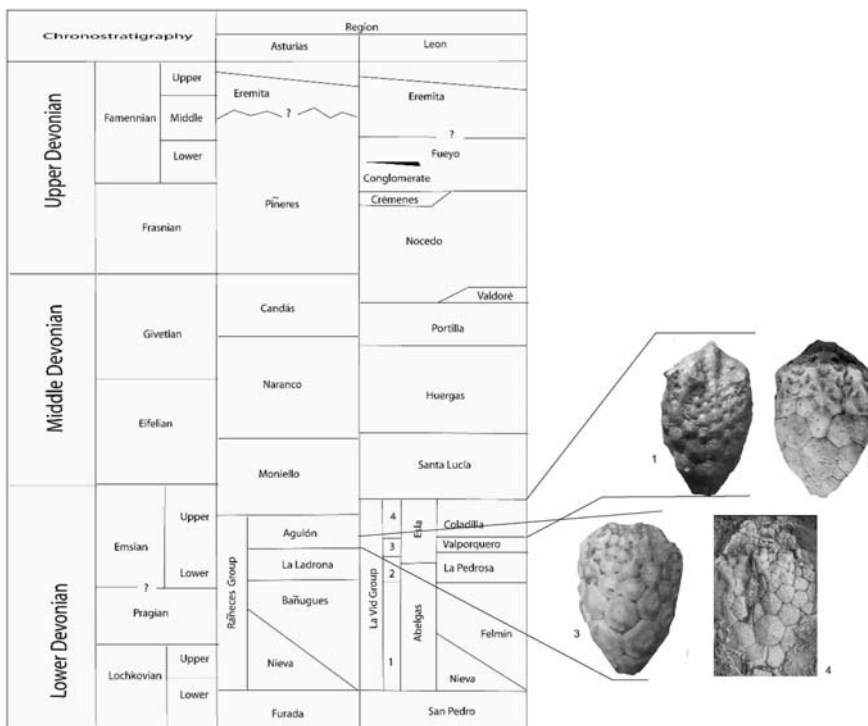
Kurzfassung: Aus dem asturischen Küstenprofil bei Xivares (Nordspanien) NW von Gijón wird aus der Aguión Formation, Oberes Emsium, Unterdevon, ein neuer Vertreter des Taxons *Pradocrinus* DE VERNEUIL, 1850 (*Pradocrinus asturianus* n.sp.) beschrieben. Diese Form zeichnet sich insbesondere durch die konstant glatten Kelchplatten der Dorsalkapsel aus.

Abstract: A new camerate crinoid taxon *Pradocrinus asturianus* n.sp. is discussed from the green-red marly shales of the Aguión Formation (Middle Emsian, Lower Devonian) of a cliff called Pozo de los Muiles near the hamlet of Xivares.

Resumen: Se describe un nuevo taxón del crinoideo camerado *Pradocrinus asturianus* n.sp., procedente de las margas rojiverdes de la Aguión Formation (Middle Emsian, Lower Devonian), de un acantilado costero cerca de Xibares (Cabo de Peñas, Asturias).

Schlüsselwörter: *Pradocrinus*, Systematik, Unterdevon, Nord-Spanien, Asturien, Leon, Xivares, Mittel-Devon.

Key-Words: *Pradocrinus*, systematics, Lower Devonian, Northern Spain, Asturias, Leon, Xivares, Middle Devonian.



←Textfigure 1: Stratigraphical distribution of the taxon *Pradocrinus* in Emsian of Northern Spain

- 2) Santa Lucía
La Vid Group, ?Coladilla
Formation, Lower Devonian
?Grandoso
Santa Lucia Formation, Upper
Emsian, Lower Devonian
Quejo
La Vid Group, ?Coladilla
Formation, Lower Devonian
4) Arnao
Aguión Formation (lower part),
Middle Emsian, Lower Devonian
3) Xivares
Aguión Formation (lower part),
Middle Emsian, Lower Devonian
1) Cabornera
La Vid Group, ?Coladilla
Formation, Lower Devonian



Systematics

Classe Crinoidea J. S. MILLER, 1821
Sub-Classe Camerata WACHSMUTH & SPRINGER, 1885
Order Monobathrida MOORE & LAUDON, 1943
Sub-Order Compsocrinina UBAGHS, 1978
Super-Family Periechocrinacea BRONN, 1849
Family Periechocrinidae BRONN, 1849
Genus *Pradocrinus* DE VERNEUIL, 1850

Stratigraphical Range:
Lower to Upper Emsian, Lower Devonian

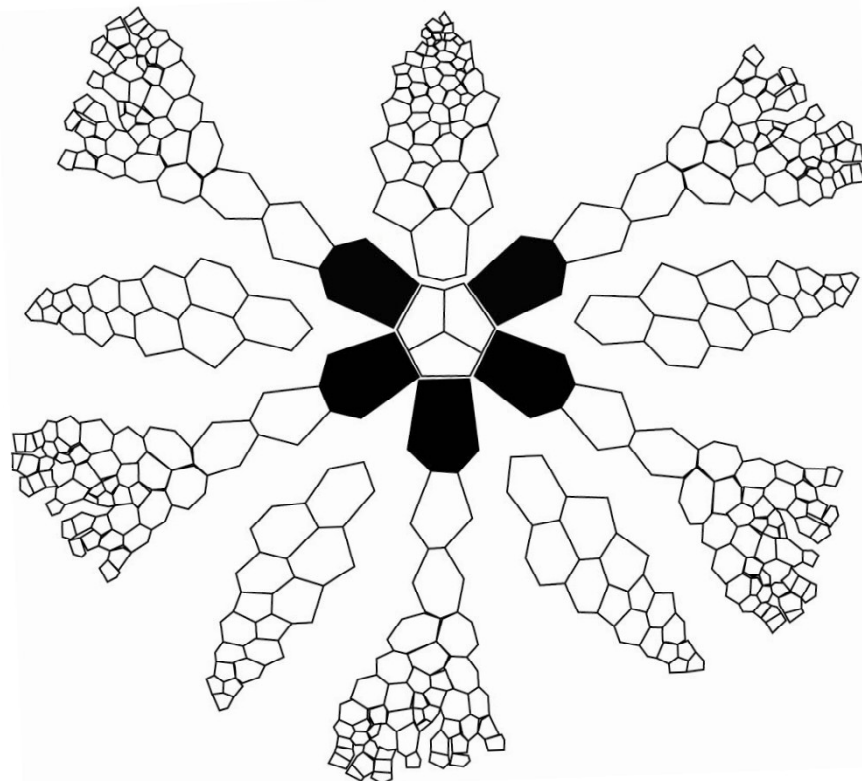
Type specimen *Pradocrinus baylii* DE VERNEUIL, 1850

← **Textfigure 2:** Holotyp of *Pradocrinus baylii* DE VERNEUIL, 1850: pl. 4, fig. 11a-11b

Holotype of *Pradocrinus baylii*: BREIMER, 1962:27 intend the specimen figured by DE VERNEUIL, 1850: pl. 4, fig. 11a-11b as the holotype of *Pradocrinus baylii*. The specimen is stored in the VERNEUIL collection of the Ecole National supérieure des Mines at Paris.

Locus typicus of *Pradocrinus baylii*: The holotype of *Pradocrinus baylii* was found at the northern slope of the hill on which the church of the small village Colle is built.

Stratum typicum of *Pradocrinus baylii*: BREIMER, 1962:27 supposes the red detrital limestone band at the top of the La Vid Formations. After experience by the authors it is more probably that the holotype comes from brown marly La Vid Shale.

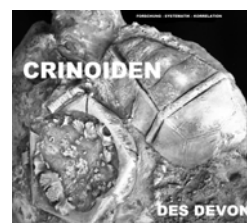


↑ **Text-figure 3:** Plate diagram of *Pradocrinus* after HAUSER & LANDETA, 2013:25, fig. 11

Pradocrinus asturianus n.sp.
Plate 1, Figures 1, 1a-1c, Text-figures 4 & 8

Locus typicus of *Pradocrinus asturianus*: North part of the beach of Xivares near the cliff called Pozo de los Muiles 6 km NW of Gijón, Asturias (Coord. LAT. 43° 34' 10'' / LNG. 5° 43' 30'').

Stratum typicum of *Pradocrinus asturianus*: Aguion Formation (redish marly Limestone in the Lower part of the Formation), Upper Emsian, Lower Devonian.



↓ **Holotyp of *Pradocrinus asturianus*:**

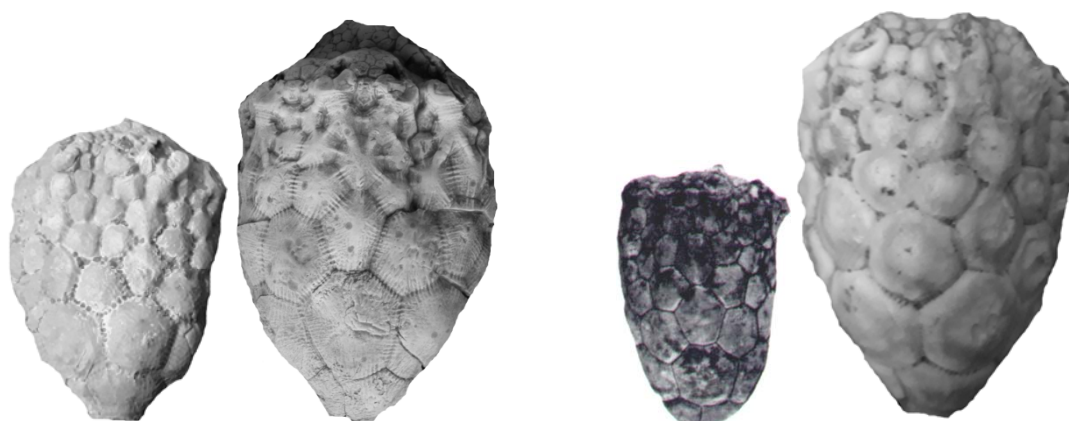


Diagnosis of *Pradocrinus baylii* DE VERNEUIL, 1850 after BREIMER, 1962 (29):

“A genus of the family *Periechocrinidae* characterized by a very high, urn-shaped calyx, composed of very thin, slightly convex plates with radial ornamentation; rays marked by a fine rib, passing on the free arms two fixed primibrachs, first one hexagonal, second one axillary and heptagonal; incorporation of two secundibrachs per half-ray; non-depressed interradii, composed of seven to nine plates, merging with the tegmen; posterior interradius with median series of plates, forming a rib where it passes into the tegmen; very low tegmen, composed of rather large plates, with a central nodose plate; anus directly opening through the tegmen; ten stout densely biserial arms. Stem unknown.”

← Text-figure 4: Holotyp of *Pradocrinus asturianus* n.sp.

Remarks of of *Pradocrinus asturianus*: The new taxons has no ornamentations on the plates; only the plate-to-plate-borders show the typical “small connection strips”. All plates are concave gives *Pradocrinus asturianus* n.sp. a more or less funnel-shaped character. The tegmen is much more lower, and the plates of the IBB higher than that of *Pradocrinus baylii*. A further remark of the new taxon: the rectal opening is in a much more lower position of the tegmen compared with *Pradocrinus baylii*.



↑ text-figures 5-8 (from left to right) growth-series of *Pradocrinus baylii* and *Pradocrinus asturianus*: Figure 5-6: *Pradocrinus baylii* collection Fernando Gómez LANDETA, Oviedo; brown-marly Coladilla Formation, La Vid Group, Upper Emsian; Santa Lucía, Cantabrian Mountains; Figure 7-8: *Pradocrinus asturianus* n.sp. (Figure 7: Coll. Mus. Inst. Geol. Min. Madrid; La Vid-Shale of Cole(?); Fig. 8 = Holotype of *Pradocrinus asturianus* Coll. Fernando Gómez LANDETA, Oviedo)

Dimensions: Hights: 8,5 cm, max. diameter = 6,5 cm.

Supplement fossils: The biodiversity in the Aguion Formation is impressive. The frequent compounds of this formation are brachiopods, crinoids (e.g. *Vasocrinus*, *Trybliocrinus*, *Storthingocrinus*, *Stammocrinus*, *Pyxidocrinus*) and also blastoids (Colle!).

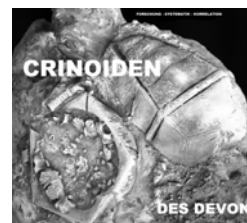
Geographical distribution: *Pradocrinus baylii* seems to be an endemic crinoid only found in the Emsian of the north-spanish Lower Devonian. Another questions concern the evolution of *Pradocrinus*. Perhaps this taxon is a special lineage of *Pithocrinus* which is very common in some members of the spanish Emsian.

Acknowledgements: My special thanks go to my friend, Fernando Gómez LANDETA, Oviedo. He found the nearly perfect calyce of the holotyp of *Pradocrinus asturianus*, and gave some important contributions to this paper.

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Description of Plate 1

Figure 1, 1a-1c: *Pradocrinus asturianus* n.sp. from the north part of the beach of Xivares near the cliff called Pozo de los Muiles 6 km NW of Gijón, Asturias (Coordinates LAT. 43° 34' 10'' / LNG. 5 ° 43' 30''); Aguión Formation (reddish marly Limestone in the Lower part of the Formation), Upper Emsian, Lower Devonian.

Hights: 8,5 cm, max. diameter = 6,5 cm

Figure 1 & 1c: CD-view of the Holotyp, Figure 1a: View of the IBB-part of the type, Figure 1b: view of the tegmen

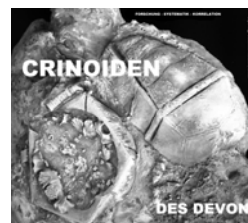
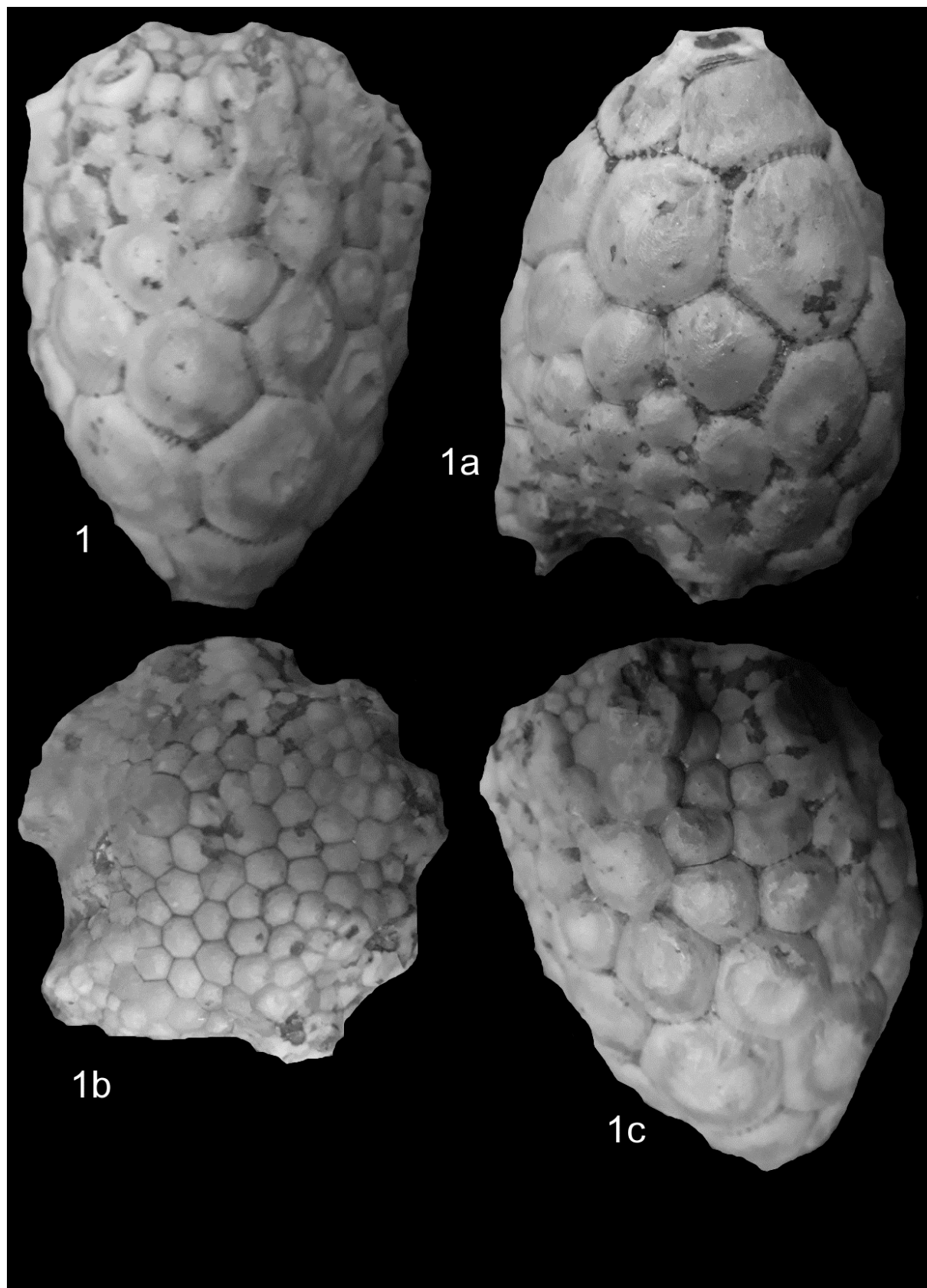
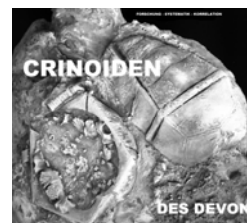


Plate 1





Description of Plate 2

Figure 1-1a: *Pradocrinus baylii* DE VERNEUIL, 1850; Fig. 1a = CD-section; dimensions: height 7,8 cm, diameter: 5 cm; collection Fernando Gómez LANDETA, Oviedo; brown-marl Coladilla Formation, La Vid Group, Upper Emsian; Santa Lucía, Cantabrian Mountains

Figure 2 & 6: *Pradocrinus baylii* DE VERNEUIL, 1850; dimensions: fig. 2: height 4,5 cm, diameter 2,8 cm; fig. 6: height 3 cm, diameter 2,2 cm; small (fig. 6) and medium (fig. 2) calyces from the red detrital marl and limestone bands of the Aguion Formation, Upper Emsian, Cantabrian Mountains; Quejo, Cantabrian Mountains

Figure 3: *Pradocrinus baylii* DE VERNEUIL, 1850; calyce in matrix; dimensions: height 7,5 cm, diameter: 4,5 cm; exchange Fernando Gómez LANDETA, Oviedo; brown-marl Coladilla Formation, La Vid Group, Upper Emsian; Santa Lucía, Cantabrian Mountains

Figure 4: *Pradocrinus baylii* DE VERNEUIL, 1850; fragment of a calyce in red matrix (exchange Felix COLLANTES, Palencia); dimensions: height 5,5 cm, diameter 3,5 cm; maybe from Grandoso, ? Santa Lucía Formation, Cantabrian Mountains

Figure 5: *Pradocrinus baylii* DE VERNEUIL, 1850; fragment from the top of the La Vid Shale (exchange Felix COLLANTES, Palencia); dimensions: height 4,5 cm, diameter 4 cm; Colle, Cantabrian Mountains

Figure 7: *Pradocrinus baylii* DE VERNEUIL, 1850; depressed calyce in red matrix; dimension: 4,4 cm, diameter 3 cm; Aguion Formation, Upper Emsian; Arnao, Asturias

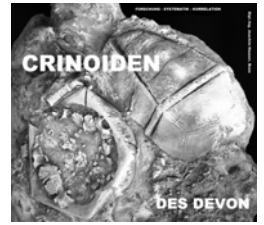


Plate 2

