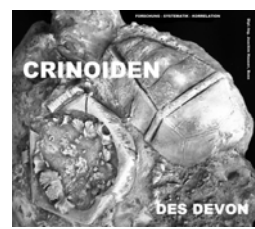


Pithocrinus abbreviatus n.sp. (Crinoidea, Camerata) and the first
report of *Diamenocrinus jouani* OEHLERT, 1891
from the Santa Lucía Formation of the Cantabrian Mountains
(Province León, northern Spain)

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1 Introduction

HAUSER & LANDETA described in 2013 a new genus *Alejecrinus* from this outcrop. Further investigations during an excursion in the Elsa region in October 2013 provided several crinoids and brachiopods. A new taxon has been discovered in the same beds as well as remains of one crinoid only known in the Siegenian of the Armorican Massif. Both findings will be described in this paper.



↑Text-Figure 1 shown one of the marly parts (outcrop of *Pithocrinus abbreviatus* in the top of the Santa Lucía Formation near the hamlet of Aleje, Cantabrian Mountains, Spain, were the crinoids are found)

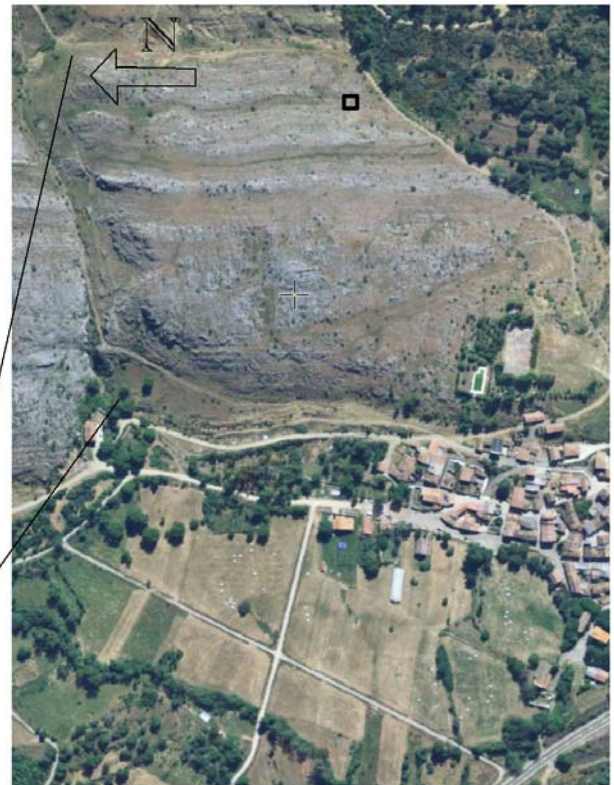
2 Geology and Age (by Fernando Gómez LANDETA)

The new taxon was found at more or less forty meters of the top of Santa Lucía Formation. Along with it there were collected: one more specimen of the blastoid *Cordyloblastus* aff. *C. alejensis*, four species of *Storthingocrinus* aff. *Storthingocrinus haugi* (two in bath preservation), same specimens of the brachiopod *Uncinulus orbignanus*, *Atrythyris* sp. aff. *A. campomanesi* (VERNEUIL & ARCHIAC, 1845), and *Schizophoria hipponix*, as well as unidentified fragments and stems of crinoids, corals and bryozoans. This fauna is typical of upper member of Santa Lucía, levels 16-17 of GARCIA-ALCALDE, 1996, in the transition of Lower-Middle Devonian and must also roughly correspond with level Crinoid-3 of BREIMER, 1962: 175, text-fig. 40 although none of the crinoids of this level were found. The exact transition was determined by the magnetostratigraphic technique by ELLWOOD et al., 1996, in the El Puerto creek section, 45 km. to the W of Aleje outcrop, as lying at sixty meters under the top of the formation. Given that in the two sections Santa Lucía Formation have roughly the same

thickness, (240-250 m.), and the total identity of facies between both sections, the new taxon, at forty meters of the top as stated, must correspond in age to the base of Eifelian.



Chronostratigraphy			Region	
			Asturias	León
Upper Devonian	Famennian	Upper	Eremita	Eremita
		Middle	?	?
		Lower		Fueyo
	Frasnian	Pineres	Conglomerate Crémenes Nocedo	
Middle Devonian	Givetian		Candás	Valdoré Portilla
			Naranco	Huergas
	Eifelian		Moniello	Santa Lucía
	Lower Devonian	Emsian	Upper	Aguión
Lower			La Ladróna	La Pedrosa
?		Pragian	Bañugues	Felmin
Lochkovian		Upper	Nieva	Nieva
		Lower	Furada	San Pedro
		Rañeces Group	La Vid Group	Abelgas
			4	Este
			3	
			2	
			1	



↑ Text-Figure 2: Chronostratigraphy of the north-spanish Devonian (Asturias und León) after GARCIA-ALCALDE, J.L., CARLS, P., ALONSO, M.U.P., LÓPEZ, J.S., SOTO, F., TRUOLS-MASSONI, M. & VALENZUELA-RIOS, J.I. (2002): p. 69, fig. 6.2.; right photo shown the locus typicus of *Pithocrinus abbreviatus* n. sp. near the hamlet of Aleje (Cantabrian Mountains, northern Spain) (the □ show the exact outcrop in the profile)

Kurzfassung: Ein neuer Vertreter des Taxons *Pithocrinus* (*Pithocrinus abbreviatus* n.sp.) wird aus der Santa Lucía Formation von Aleje (Kantabrisches Gebirge, Provinz León, Nordspanien) beschrieben. Erstmals liegt ein Vertreter der Diamenocriniten [*Diamenocrinus jouani* (OEHLERT, 1891)] aus dem Eifelium vor.

Abstract: A new representative of the taxon *Pithocrinus* (*Pithocrinus abbreviatus* n.sp.) is described from the Santa Lucía Formation of Aleje, Cantabrian Mountains (Province León, northern Spain). At the first time *Diamenocrinus* [*Diamenocrinus jouani* (OEHLERT, 1891)] was found in a strata of Eifelian age.

Resumen: Se describe un nuevo taxón del género *Pithocrinus*, (*Pithocrinus abreviates* n. sp.), procedente de la Formación Santa Lucía en Aleje (León, Norte de España). También se cita por primera vez la presencia del género *Diamenocrinus*, [*Diamenocrinus jouani* (OEHLERT, 1891)], en los niveles de edad Eifeliense de la misma localidad.

Schlüsselwörter: *Pithocrinus*, Systematik, Kantabrisches Gebirge, Nordspanien, Aleje, Santa Lucía Formation, Emsium

Key-Words: *Pithocrinus*, Systematics, Cantabrian Mountains, northern Spain, Aleje, Santa Lucía Formation, Emsian

3 **Systematics** (by Joachim HAUSER)

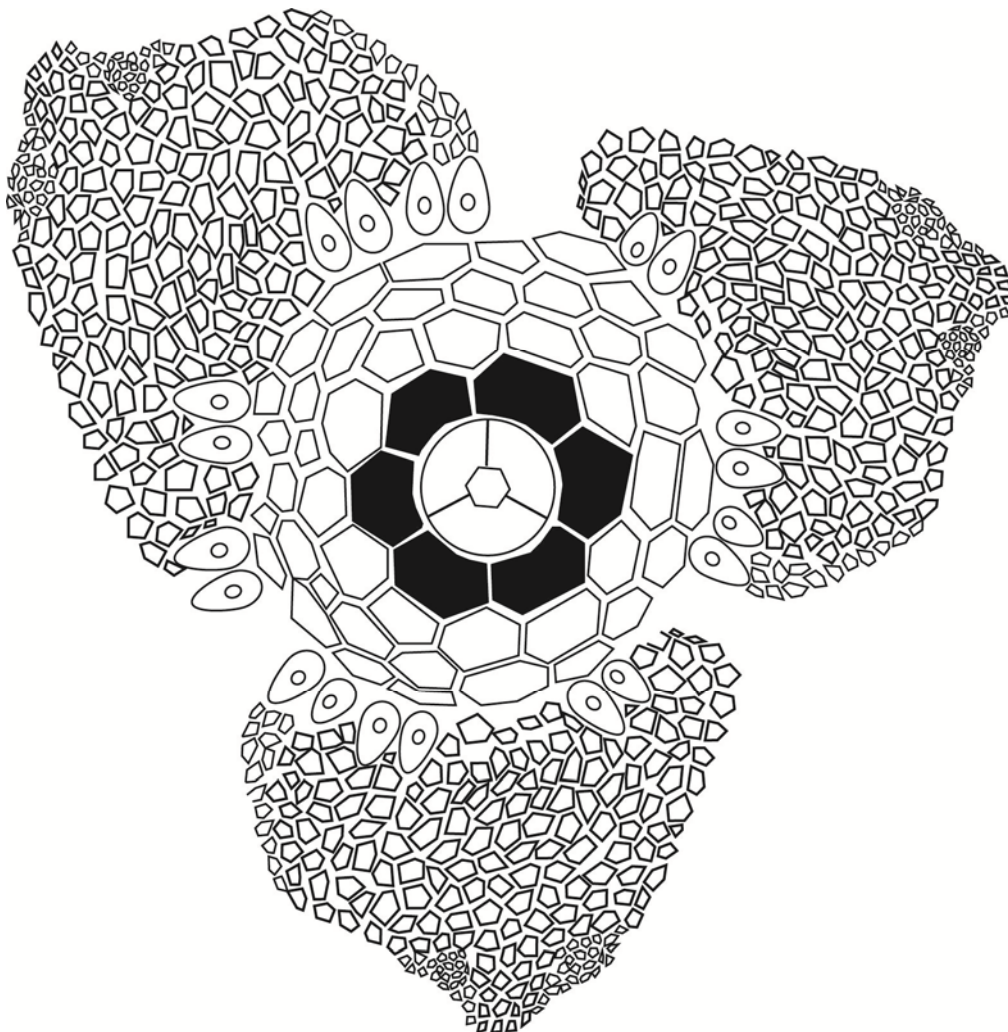
Classe Crinoidea J. S. MILLER, 1821
Sub-classe Camerata WACHSMUTH & SPRINGER, 1885
Order Monobathrida MOORE & LAUDON, 1943
Sub-order Compsocrinina UBAGHS, 1978
Family Periechocrinacea BRONN, 1849
Sub-Family Periechocrinidae BRONN, 1849
Genus *Pithocrinus* KIRK, 1945



Stratigraphical range Upper Emsian (Lower Devonian) – Lower Givetian (Middle Devonian)

Geographical distribution: *Pithocrinus* was found the Lower Givetian (Traverse Group) of the Michigan Basins (Alkali Quarry), North-America, northern Spain in the boarder Emsian / Eifelian, Santa Lucía Formation of the Cantabrian Mountains (Ciñera, Quejo, Aleje, Grandoso) and the Emsian (Aguíón Formation) of Asturian coast (Arnao, Xivares).

Type species: *Pithocrinus cooperi* KIRK, 1945



↑Text-Figur 3: Plate-diagram of *Pithocrinus abbreviatus* n.sp.; black = Radialia

Derivatio nominis: *abbreviatus* (lat.) after the typical short form of this taxon.

Holotyp: The specimen in text-figure 4a-b.

Locus typicus: Outcrop 300 m. to the E of the village of Aleje, Province León, Cantabrian Mountains, northern Spain.

Stratum typicum: Top of the Santa Lucía Formation, Lower Eifelian, Middle Devonian.

Material: Three complete specimens from the Locus typicus of *Babiacrinites pyramidalis* near the hamlet of Quejo (Babia region, Cantabrian Mountains, Prov. León. One specimen, the holotype, from Aleje.

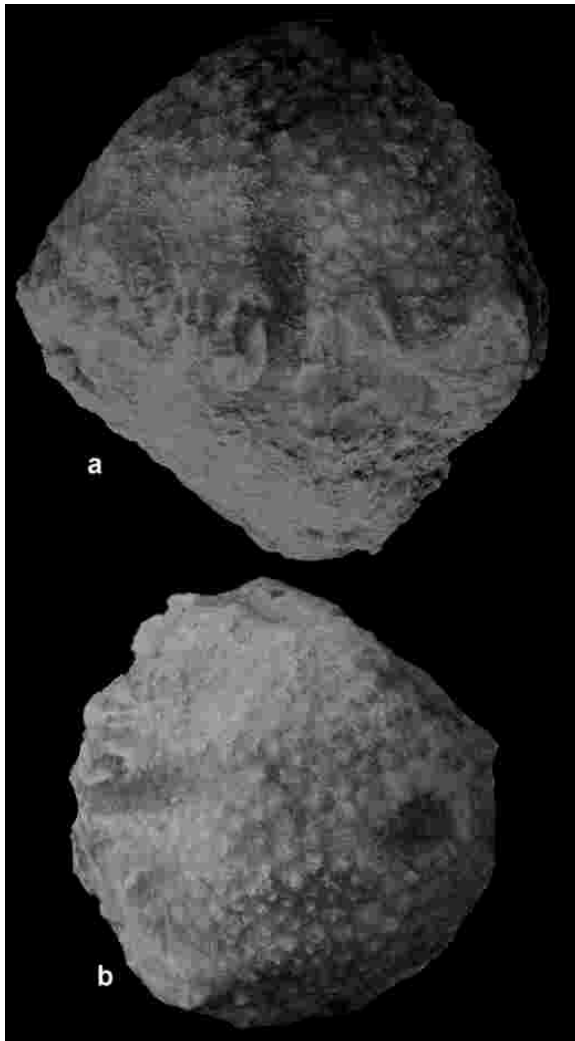
Diagnosis: Bowl-shaped *Pithocrinus* with convex plates and round tubercles and relative dimensions dorsal-cup / tegmen = 1 to 1.

Description: A bowl-shaped *Pithocrinus* with a plate structure between that of the typical *Pithocrinitis* and that of *Babiacrinites*. The dorsal-cups of adult clayces shown convex plates, that of juvenile cups show small round tubercles all without other ornamentations. Typical for this new taxon is the relations of the cup and the tegmen; they has had the +/- the same hight.



Interesting note to the association: in the level were the cups of *Pithocrinus abbreviatus* was found no other *Pithocrinites* taxons occurs. So it is improbable that this species is only a juvenile representative of the other known *Pithocrinus*.

↓Text-Figures 4a-b: Holotyp of *Pithocrinus abbreviatus* n.sp. from Aleje; fig. 4b = tegmen of the holotyp



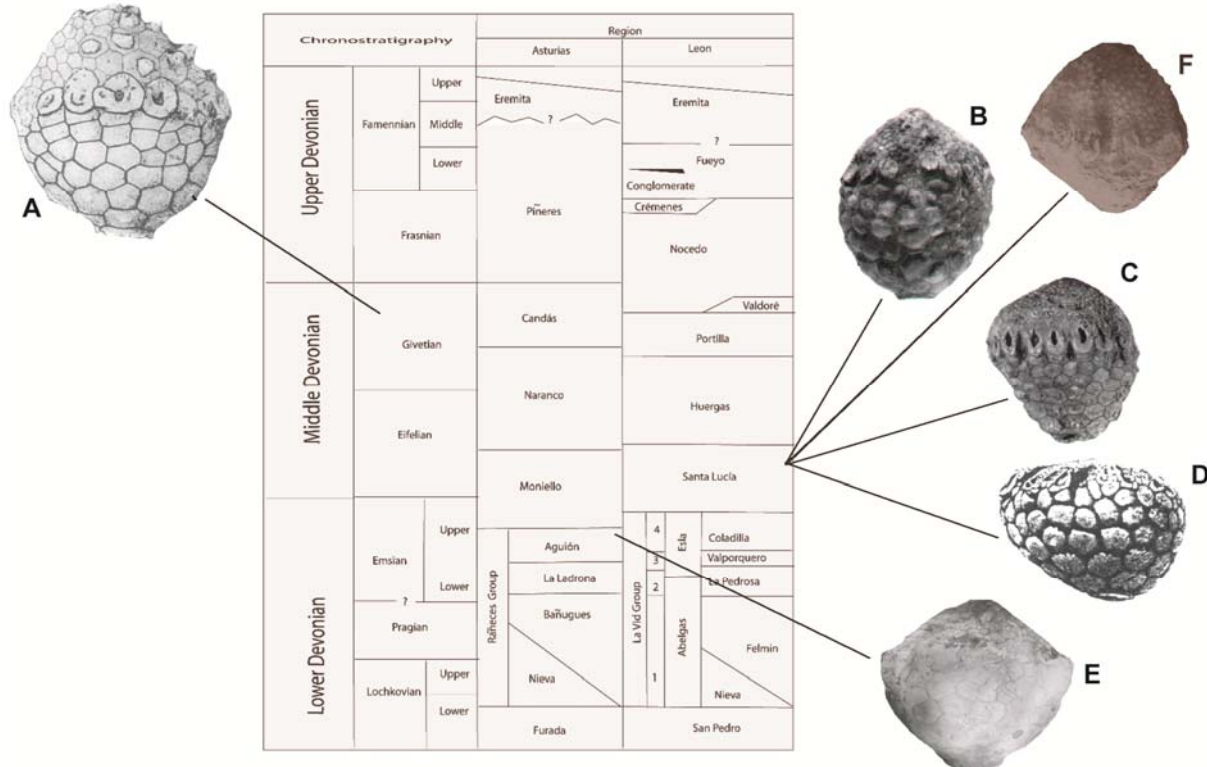
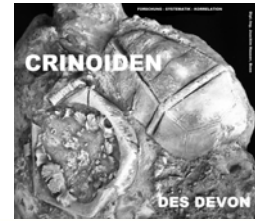
Relations: The new species is closely related to the taxon *Babiacrinites costulatus*. But this species shown spines on the surface of the dorsal-cup and the proportion dorsal-cup / tegmen are not 1 to 1 like in *Pithocrinus abbreviatus*.



↑Text-Figure 5: Holotyp of *Babiacrinites costulatus* HAUSER & LANDETA, 2009

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5



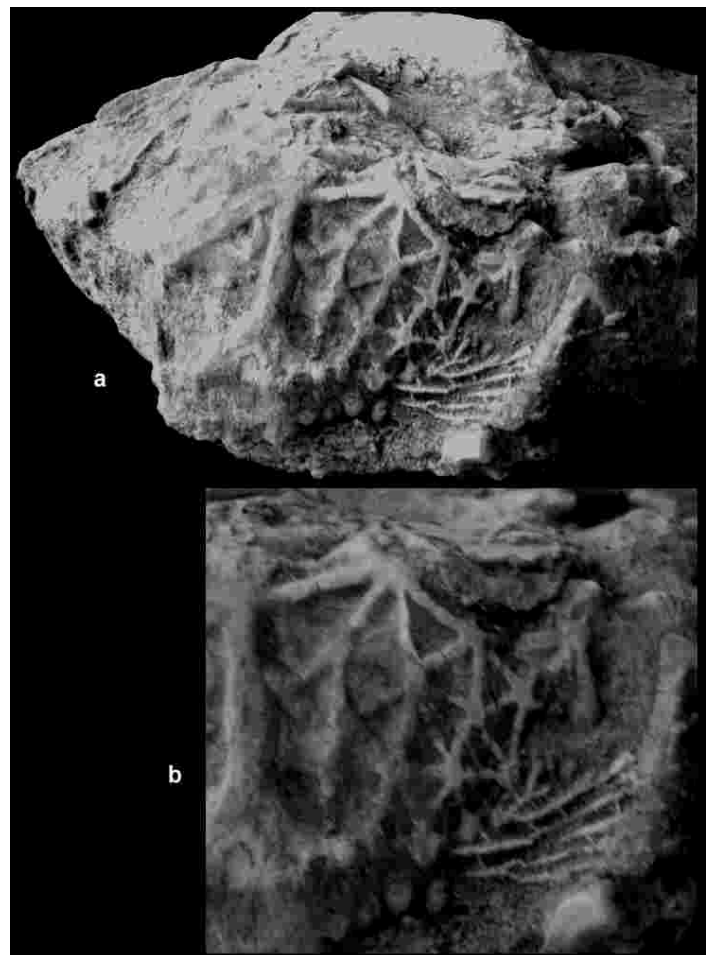
↑ **Text-Figure 6:** Stratigraphical distribution of *Pithocrinus*. **A** = *Pithocrinus cooperi* KIRK, 1945 (early Givetian); **B** = *Pithocrinus ovatus* BREIMER, 1962 (Santa Lucía Formation, Upper Emsian); **C** = *Pithocrinus spinosus* (Santa Lucía Formation, boarder Emsian / Eifelian); **D** = *Pithocrinus waliszewskii* (OEHLERT, 1896); **E** = *Pithocrinus miluasi* HAUSER & LANDETA, 2009 (Aguión Formation, Upper Emsian); **F** = *Pithocrinus abbreviatus* n.sp. (Santa Lucía Formation, Upper Emsian). Chronostratigraphy of the spanish Devonian (Asturias and León) after GARCIA-ALCALDE, J.L., CARLS, P., ALONSO, M.U.P., LÓPEZ, J.S., SOTO, F., TRUOLS-MASSONI, M. & VALENZUELA-RIOS, J.I. (2002): p. 69, fig. 6.2.

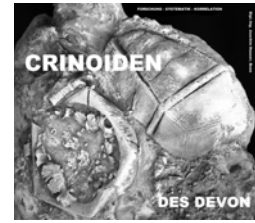
Dimensions: Hight = 28 mm, diameter_{max.} 25 = mm

First report of *Diamenocrinus jouani* OEHLERT, 1891 from the Santa Lucía Formation of the Cantabrian Mountains

It was strange to find an incomplete calyce of *Diamenocrinus jouani* in a strata of Eifelian age. This taxon was only known from Siegenian (Pragian) outcrops of the Massif Armoricain, France until now (e.g. LE MENN, 1985). The specimens show the typical characteristics of the *Diamenocrinites*: the distinctly – in the distal part of the caylce bi-seriell - brachia wrinkles and star-shaped IBr-plates.

→ **Text-Figure 6a-b:** *Diamenocrinus jouani* OEHLERT, 1891 from Aleje; figure b = IBrBr-section





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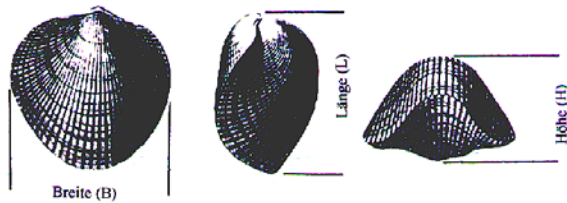
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Description of plate 1

- Figure 1: *Pithocrinus abbreviatus* n.sp. (Holotype from Aleje); Figure 1a: Tegmen; height = 28 mm, diameter_{r,max.} = 25 mm
Figure 2: *Diamenocrinus jouani* OEHLERT, 1891; height: 20 mm; diameter = 30 mm; figure 2a = IBrBr-section
Figure 3: *Storthingocrinus* aff. *S. haugi* OEHLERT, 1896; small dorsal-cup with fine tubercles; height: 7, diameter = 7
Figure 4: *Cimicinella* aff. *C. bordini* (VERNEUIL, 1850)
Figure 5: *Uncinulus* sp. indet
Figure 6: *Uncinulus orbignyianus* (VERNEUIL, 1850)
Figure 7: *Dicamara* sp. indet
Figure 8: *Atrythyris* sp. aff. *A. campomanesi* (VERNEUIL & ARCHIAC, 1845)
Figure 9: *Hexarhystis ferronensis* ALVAREZ, 1990
Figure 10: *Indentatrypa* sp.



Dimensions of the brachiopods in [mm]:

- Figur 4: B= 11; L= 17; H= 7
Figur 5: B= 7; L= 7; H= 4
Figur 6: B= 10; L= 11; H= 8
Figur 7: B= 6; L= 8; H= 4
Figur 8: B= 12; L= 12; H= 6
Figur 9: B= 16; L= 19; H= 8
Figur 10: B= 15; L= 15; H= 3



Plate 1

