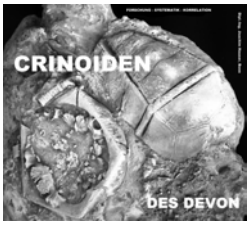

Babiacrinites costulatus n.sp. from the Santa Lucia Formation (boarder Emsian / Eifelian) of the Cantabrian Mountains and the Asturian coastline (Northern Spain)

by
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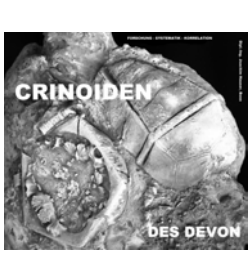
with 7 pages, 5 text-figurs and 1 plate (pre-published via Internet 26. March 2009; corrections 08. March 2011)

1 Einleitung (von Joachim HAUSER)

The extensive open profile in immediate neighborhood of La Vid (HAUSER & LANDETA, 2007:17-18, Textfig. 7) is for many years a fertile site of the discovery for crinoids.

↑ Text-Figur 1: Photo shows a part of the section near La Vid-Ciñera (Cantabrian Mountain, Northern Spain).

From there comes, for example, a small rock with two crowns of *Costalocrinus ibericus* KAMMER, 2001.



↑ Text-Figur 2: *Costalocrinus ibericus* KAMMER, 2001. Two crowns with stems and parts of the arms from La Vid – Ciñera section.

However, the main finding amount of the crinoids lies with the Pithocriniten. They appear regularly often in or on the rock situations and the preservation is mostly more badly as the same findings from the profile near Quejo. Also the fauna composition of both profiles is identical as much as possible. Nevertheless, in case of more exact consideration the fauna elements which distinguish both places are recognizable. For example, *Sphaerocrinus wolfgangschmidti* HAUSER & LANDETA, 2007 and *Bactrocrinites onondagensis* GOLDRING, 1954 was found only in Quejo. Also findings of *Babiacrinites pyramidalis* could not be ascertained up to now in Ciñera section. By the examination of our crinoids of the last years we identified a cup as a new representative of the *Babiacrinites*. This finding, as well as another cup in the collection HAUSER should be introduced in this paper.

Abstract: From the section La Vid – Ciñera (the Cantabrian Mountains, province León, northern Spain), Santa Lucia Formation (border area Emsian - Eifelian) a new representative of the Babiacriniten (*Babiacrinites costulatus* n.sp) is described. Regarding the time span of *Babiacrinites*, genera the two described species (*P. pyramidalis, P. costulatus*), are only known in three sections in the Cantabrian area, namely La Vid-Ciñera and Quejo in León, and El Pical-Mugarón in Asturias.

Kurzfassung: Aus dem Profil La Vid – Ciñera (Kantabrisches Gebirge, Provinz León, Nordspanien) wir aus der Santa Lucia Formation (Grenzbereich Emsium - Eifelium) ein neuer Vertreter der Babiacriniten (*Babiacrinites costulatus* n.sp.) beschrieben. *Babiacrinites* liegt im Kantabrischen Gebirge, Provinz León (La Vid-Ciñera und Quejo) und in Asturien (El Pical-Mugarón) mit zwei Arten vor: *B. pyramidalis* HAUSER & LANDETA, 2007 und *B. costulatus* n.sp..

Resumen: Se describe una nueva especie del género *Babiacrinites*, (*Babiacrinites costulatus n.sp.),* encontrado en la Formación Santa Lucía,(Eimsiense superior - Eifeliense inferior), en el techo de la sección de La Vid-Ciñera, (León, Norte de España). Las dos especies conocidas de *Babiacrinites*, (*piramidalis, costulatus*), aparecen puntualmente en tres secciones de la Zona Cantábrica: La Vid-Ciñera y Quejo en León y El Pical-Mugarón en Asturias.

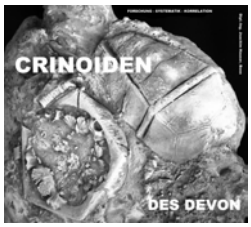
Key-words: Crinoids, *Babiacrinites,* systematics, Asturian, León (Cantabrian Mountains), northern Spain, Santa Lucia Formation.

Schlüsselwörter: Crinoiden, *Babiacrinites,* Systematik, Asturien, León (Kantabrisches Gebirge), Nordspanien, Santa Lucia Formation.

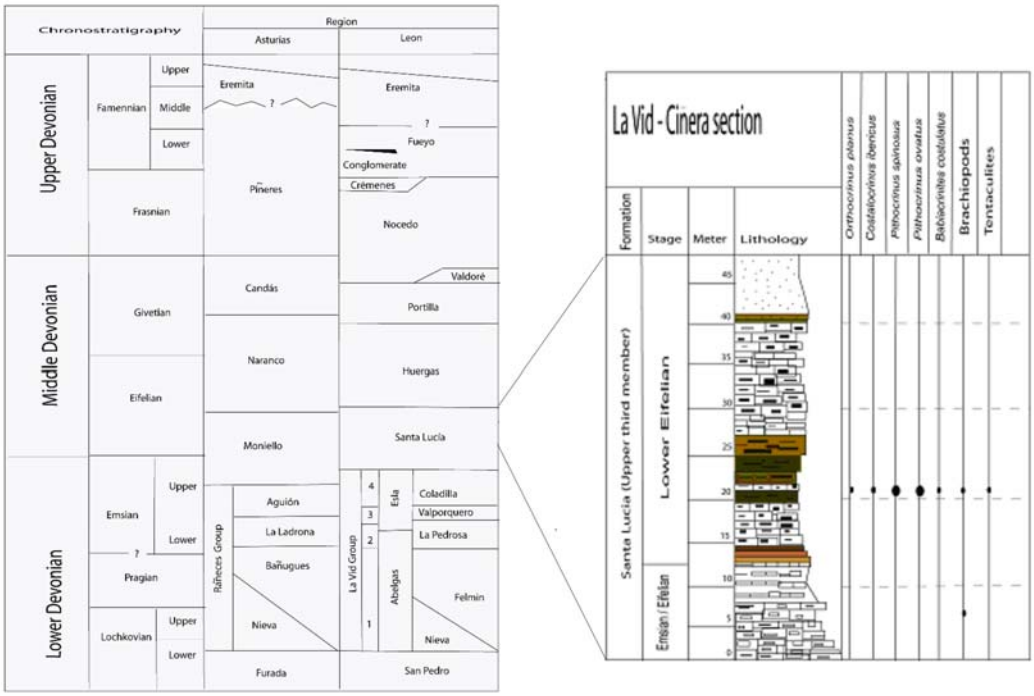
2 Stratigraphy, fauna and age of the section of La Vid - Ciñera (by Fernando Gómez LANDETA)

The stratotype of *Babiacrinites costulatus* n.sp. lay in the section of La Vid – Ciñera, in León, first described in HAUSER & LANDETA, 2007:17-18, Textfig. 7. As can be seen in the Text-Figur 3 the specimens where gathered in one interval one meter thick of grey marl on the upper third part of Santa Lucía Formation. This marl is resting over a bar of encrinal limestone and roughly 20 meters under the top of the formation in its contact with Huergas Formation.

The age of the interval can be ascertained precisely comparing with the section of El Puerto Creek, roughly 2,5 km to the SEE, where the transit Emsian – Eifelian was accurately established using the magnetostratygraphyc technique by ELLWOOD et al., 2006, there the transition lower-middle Devonian, rests in the upper third member of the Santa Lucía Formation 60 meters under the contact with Huergas Formation. Observing the lithology despicted in their Figure 2 with our section, (see also Figure 11 of GARCIA-ALCALDE et al. 1979), we arrive that a marker horizon in both sections is the top of the last massive coral framestone exposed, which is 0,5 meters in El Puerto, and 4-5 meters in La Vid-Ciñera, at the floor of the marl level where the transition was established in the former section. Also relevant is the brachiopod fauna, with many elements common in both transitional levels, among them *Plicathyris alejensis* ALVAREZ, 1990, *Adolfia cabedana obesa* (HALL, 1857), *Retzia* aff. *R. circulescens* STRUVE, 1976*, "Eodevonaria"* cf. *arcuata* (GUERICH, 1905) etc, (Faunal Interval 17 in ELLWOOD et.al.,2006, "RESTE 1" in HAUSER & LANDETA, 2007:18, Fig. 7, see also plate 1 in this paper). With this evidence we conclude that *Babiacrinites costulatus* n.sp., is cantoned in Lower Eifelian, in its stratotype and roughly 7-8 meters over the transition with lower Devonian.



As parastratotype for the new taxon we establish the section EL PICAL-MUGARÓN in Asturias coast sector. There *Babiacrinites costulatus* n.sp. was found 60-70 meters under the top of Moniello Formation equivalent to Santa Lucía Formation in León, (misidentified with *Babiacrinites pyramidalis* in HAUSER & LANDETA 2007:16, Textfig. 6).

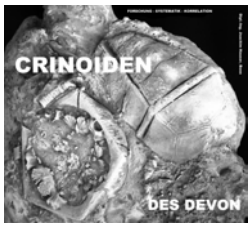


Text-Figur 3: Stratigraphic and fossils of the section La Vid - Ciñera, Cantabrian Mountains, Northern Spain
Chronostratigraphy of the Spanish Devonian (Asturias and León) by GARCIA-ALCALDE, J.L., CARLS, P., ALONSO, M.U.P., LÓPEZ, J.S., SOTO, F., TRUOLS-MASSONI, M. & VALENZUELA-RIOS, J.I. (2002): p. 69, fig. 6.2; description of the stratigraphic column in HAUSER & LANDETA, 2007:18, Textfig. 7).

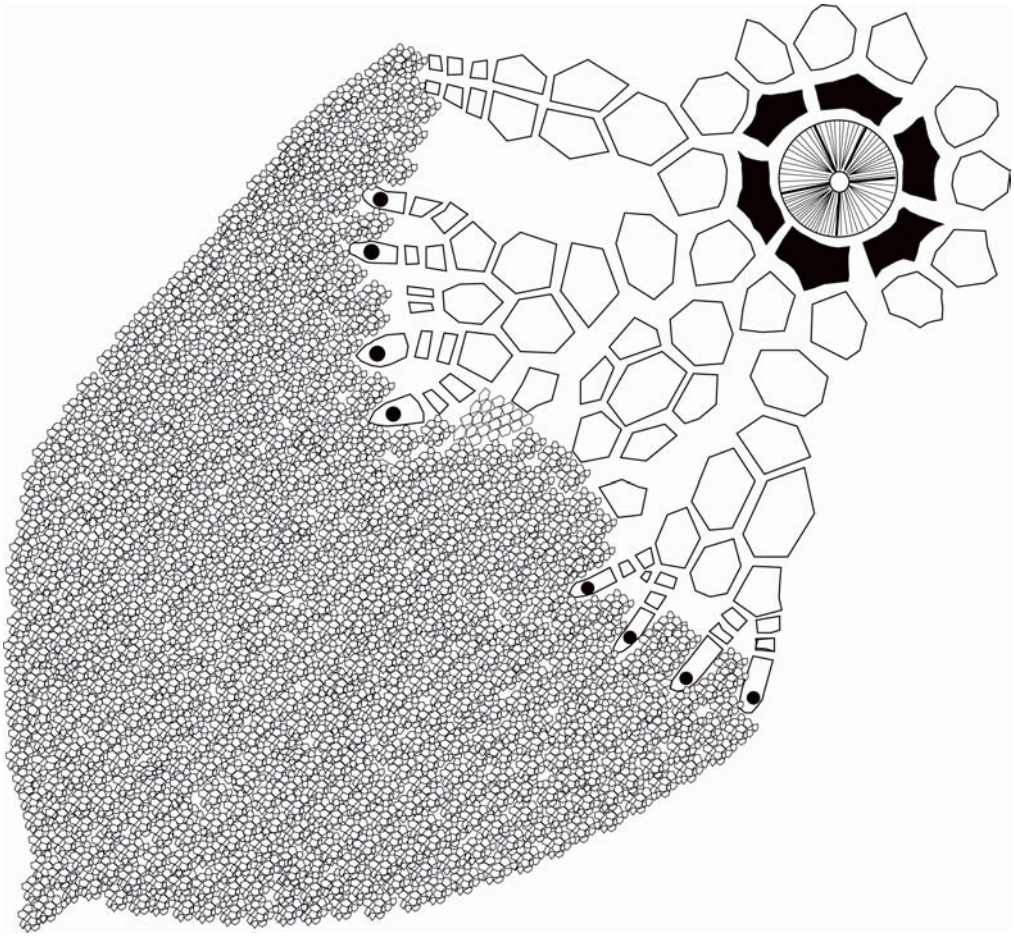
Regarding the time span of *Babiacrinites*, genera we find that the two described species (*P. pyramidalis, P. costulatus*), are only known in three sections in the Cantabrian area, namely La Vid - Ciñera and Quejo in León, and El Pical-Mugarón in Asturias. The vertical span in the three equivalent intervals is purely punctual. The doubt arises whether this short duration is real or an artefact caused by the lack of conditions suitable for the conservation of crinoids both at lower levels with reefal facies, or at the upper ones with detritial deep facies.

More speculative is the explanation of the curious geographic arrangement of crinoid taxa in the time equivalent sections of La Vid-Ciñera and Quejo, separated now 60 km. In fact in the former one we only find Periechocrinid crinoids with spinose calyx, namely *Pithocrinus spinosus* and *Babiacrinites costulatus*, the opposite is true in Quejo with *Pithocrinus ovatus* and *Babiacrinites pyramidalis* (the only exception to this rule is some forms *ovatus* in La Vid-Ciñera, among a preponderance of *spinosus* forms). It is a general fact that the defensive spinosity increased greatly in Middle Devonian not only in crinoids but also in brachiopods and trilobites among others, but the question is way in the same ecological environment, in one place they needed defensive devices and not in the other. Another possible explanation can be sexual dimorphism in both genera, but apart that very little is known of this character in crinoids, the problem rests for the causes of this geographic segregation.

How of the work of HERMANN SCHMIDT, 1938, there were with the echinoderms, however, still other reasons to develop spines on the crinoids. One reason could be the breath function about their skin (SCHMIDT, 1938:311). The stings (probably, however, also with Lower Devonian crinoids mostly very much distinctively to their long arms) served absolutely also for the enlargement of the surface. SCHMIDT leads back the sting education less on a defence of parasites than rather on the living space of the crinoids. Presumably (SCHMIDT, 1938:311) existed in ground nearness at times increasingly H_2S and free CO_2. To these life-hostile environmental conditions some kinds adapted themselves by enlargement of the surface (improvement of the respiration) and by the assignment of local-engaged life-style (e.g. *Monstrocrinus, Eifelocrinus*).



3 Systematics (by Joachim HAUSER)



Classe Crinoidea J. S. MILLER, 1821
Subclasse Camerata WACHSMUTH & SPRINGER, 1885
Order Monobathrida MOORE & LAUDON, 1943
Suborder Compsocrinina UBAGHS, 1978
Superfamily Periechocrinacea BRONN, 1849
Familie Periechocrinidae BRONN, 1849

Genus *Babiacrinites* HAUSER & LANDETA, 2007

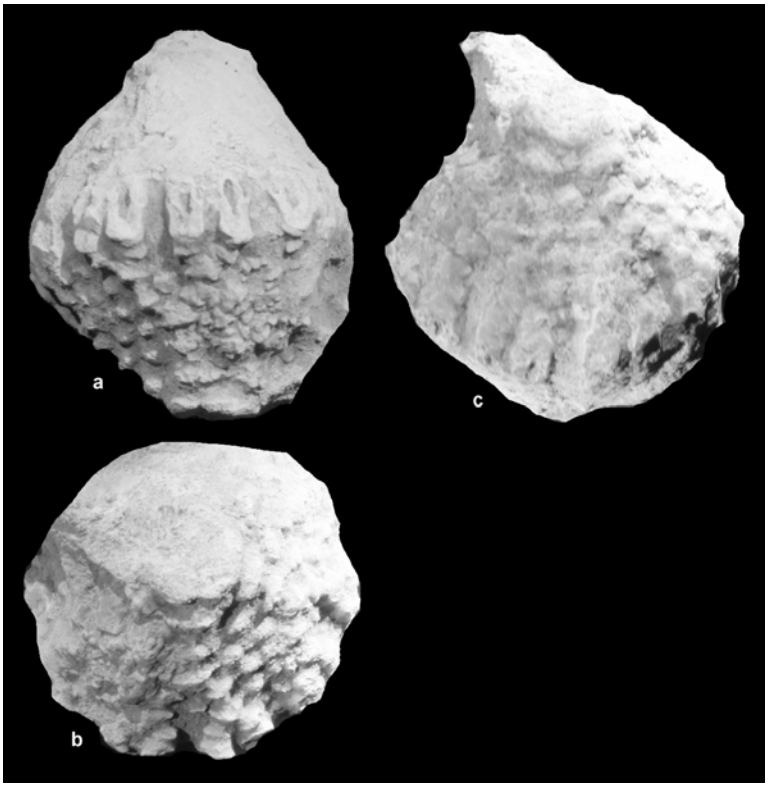
← Textfig.4: Diagram of *Babiacrinites* after HAUSER & LANDETA, 2007: 27, Textfig. 3.

Type-species *Babiacrinites pyramidalis* HAUSER & LANDETA, 2007

Stratigraphical distribution boarder Emsian - Eifelian

Derivatio nominis The new species is named after the small spines on the plaques of the dorsal cup.

Babiacrinites costulatus n.sp.
Text-Figur 5 a-c



Holotyp: The holotyp is the calyce in Textfig. 5a-c. The holotyp is stored in the Geological Institut of the University of Oviedo.

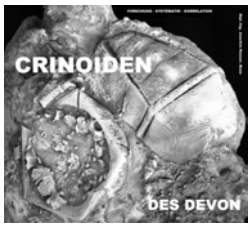
← Textfig.5a-c: Holotyp of *Babiacrinites costulatus* n.sp.

Locus typicus:.La Vid – Ciñera section, Cantabrian Mountains, Northern Spain (Description of the stratigraphic column in HAUSER & LANDETA, 2007:18, Textfig. 7).

Stratum typicum: Santa Lucia Formation, boarder Emsian – Eifelian.

Material: Three more or less complete calyces. Two from La Vid section (León, Cantabrian Mountains), one of the coast of Asturias (Arnao section)

Diagnosis: Diagnosis like in HAUSER & LANDETA, 2007:27. In addition to these signs points *Babiacrinites costulatus* shows a thick net from fine, short, sharp running up stings on every plaques of the dorsal cup.



Description and relations: A typical *Babiacrinites* with low, bowl-shaped calyce and a remarkably high tegmen in whose highest point a big, almost round rectum opening is arranged. These signs and ten biserial arm approaches can be transferred casually to *Babiacrinites pyramidalis*. In contrast to this species *B. costulalus* disposes always a distinctive net of short partly sharp running small spines on every plaques of the dorsal cup.

The lineage of *Babiacrinites* among the many genera of the Periechocrinid family that precede it in the Cantabrian Devonian, must be traced based in morphological grounds in the genera *Pyxidocrinus* MUELLER in ZEILER & WIRTGEN, 1855, of upper Emsian age, and with more doubts (given that the only known specimen is now unavailable to direct study), the most related species seems to be *Pyxidocrinus sanmigueli* ASTRE, 1925, with the same arrangement of calyx plates and fine rib ornamentation.

Dimensions and other fossils of the stratotype: See description of the plate 1.

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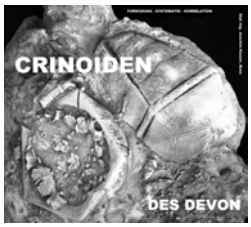

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Description of plate 1

Fig 1: *Babiacrinites costulatus* n.sp. (paratyp); calyce on matrix from the La Vid – Ciñera section (Cantabrian Mountains, León); Santa Lucia Formation, boarder Emsium – Eifelium; dimensions: wide = 2 cm, high = 2,2 cm (in the collection of Fernando Gómez LANDETA).

Fig. 2: *Babiacrinites costulatus* n.sp. (paratyp); calyce on matrix from the El Mugarón section (Arnao) (Asturian coast); Monielle Formation, boarder Emsium – Eifelium; dimensions: wide = 2,5, high = 3 cm (in the collection of Fernando Gómez LANDETA).

Fig. 3: *Babiacrinites costulatus* n.sp. (holotyp) from the La Vid – Ciñera section (Cantabrian Mountains, León); Santa Lucia Formation, boarder Emsium – Eifelium; dimensions: wide: 2 cm, high = 2,5 cm.

Fig. 4a-c: *Plicathyris alejensis* ALVAREZ, 1990 from the La Vid – Ciñera section (Cantabrian Mountains, León) ("Reste 1" after HAUSER & LANDETA, 2007:18, Textfig. 7) ; Santa Lucia Formation, boarder Emsium – Eifelium; dimensions: wide = 3,5 cm, high = 3 cm.

Fig. 5a-c: *Adolfia cabedana obesa* (HALL, 1857) from the La Vid – Ciñera section (Cantabrian Mountains, León); ("Reste 1" after HAUSER & LANDETA, 2007:18, Textfig. 7), Santa Lucia Formation, boarder Emsium – Eifelium; dimensions: wide: 2,6 cm, high = 1,8 cm.

Fig. 6a-c: *Retzia* aff. *R. circulescens* STRUVE, 1976; from the El Mugarón section (Arnao) (Asturian coast); Monielle Formation, boarder Emsium – Eifelium; dimensions: wide = 2 cm, high = 2 cm.

Fig. 7: "*Eodevonaria"* cf. *arcuata* (GUERICH, 1905); ("Reste 1" after HAUSER & LANDETA, 2007:18, Textfig. 7), Santa Lucia Formation, boarder Emsium – Eifelium; dimensions: wide: 1,8 cm, high = 0,8 cm.

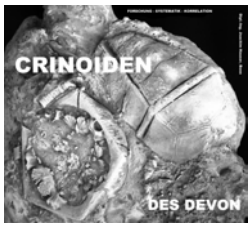

Plate 1