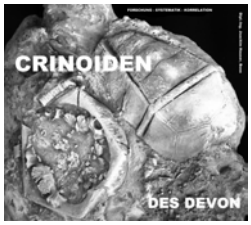

Pisocrinus asturianus n.sp. (Crinoidea, Inadunata) from the Lower Pragian of Punta de Llampero (Asturias, northern Spain)

Dipl.-Ing. Joachim HAUSER, Von-Sandt-Street 95, Germany 53225 Bonn,
E-Mail: crinoiden-aus-dem-devon@arcor.de; Internet: www.devon-crinoiden.de
& Fernando Gomez LANDETA, C/Monte Cerrau 11 2° K, 33006 Oviedo, España,
E-Mail: fglandeta@telecable.es
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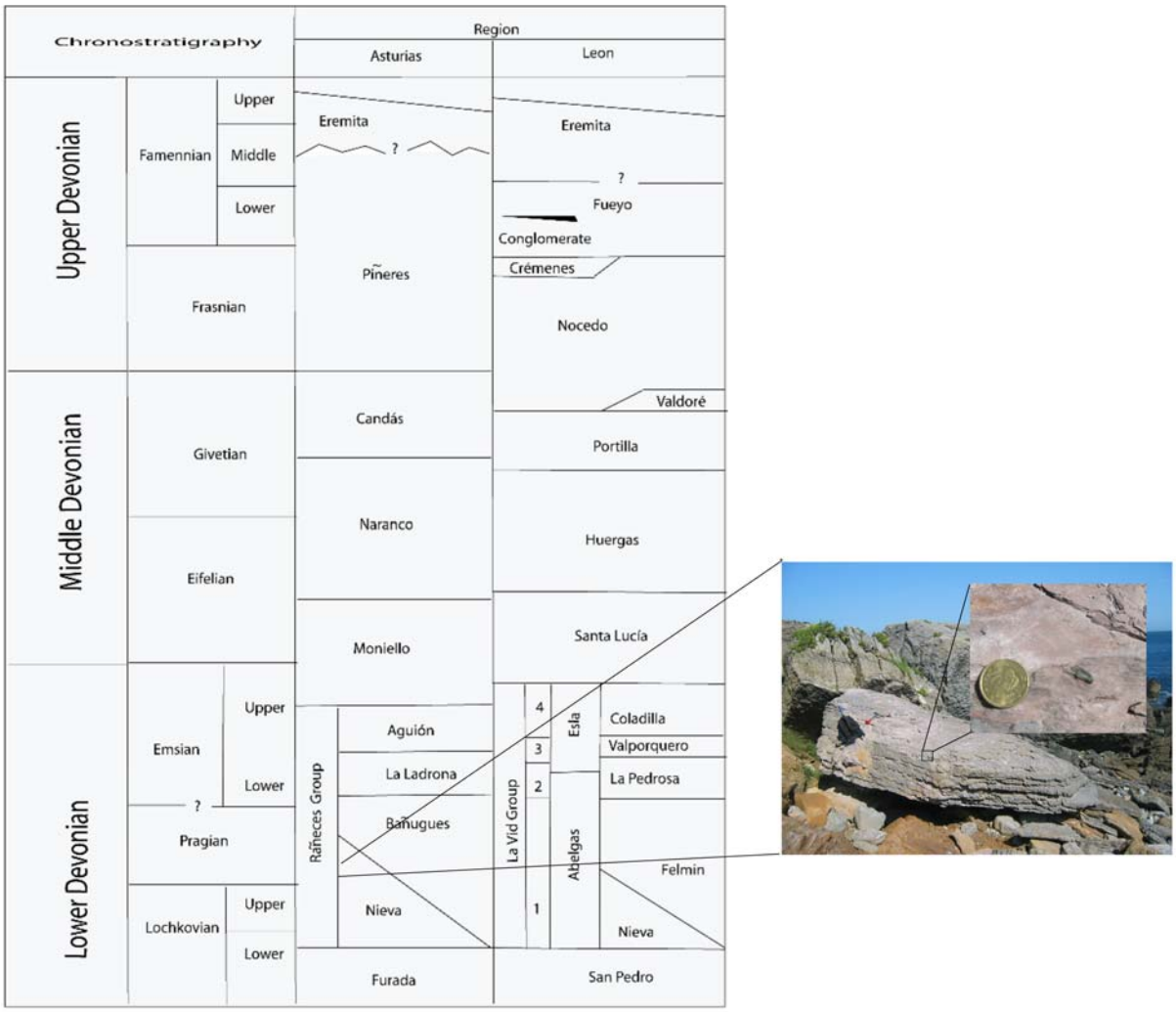
1 Introduction (by Joachim HAUSER)

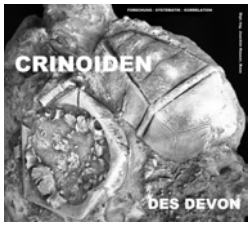
The asturian coast between Santa Maria del Mar and Gijon is known at the latest since the detailed geologic investigations of the section by RADIG, 1961 for his partly wonderful explanation and the rich fossil-world. However, on this occasion, were in the foreground rather fossils of outcrops which are relatively well exposed. This paper deals with a more badly accessible coastal-section in the Nieva Formation which is exposed in the area of the Punta de Llampero. Already RADIG, 1961:252 mentions from this layer group an extensive fauna which consists in particular of brachiopods, trilobits and tentaculitids. Crinoids were not described from the Nieva Formation up to now. The fossils shown in this paper come from an approx. 3 x 4 m rock which contrasts by his grey-pink colour with the surrounding rock material.



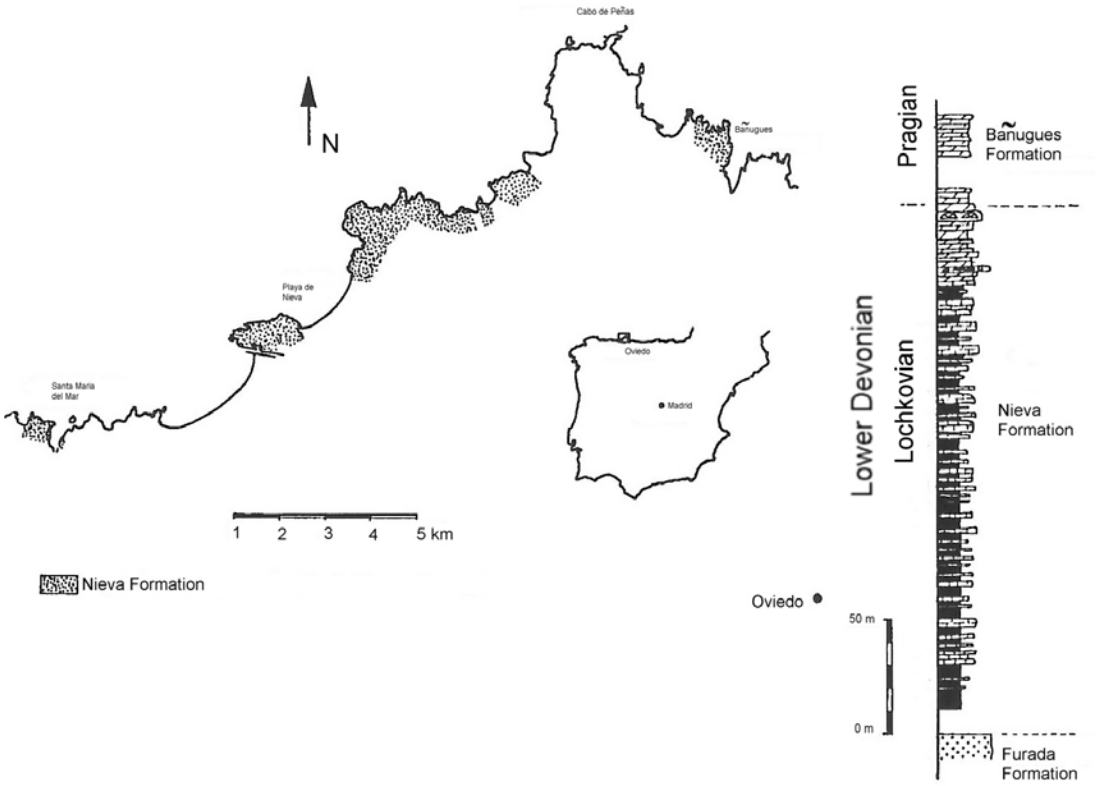
↑ text-figure_1: Chronostratigraphy of the spanish Devonian (Asturias and León) by GARCIA-ALCALDE, J.L., CARLS, P., ALONSO, M.U.P., LÓPEZ, J.S., SOTO, F., TRUOLS-MASSONI, M. & VALENZUELA-RIOS, J.I. (2002): p. 69, fig. 6.2 (left) with the locus typicus of *Pisocrinus asturianus* n.sp. (right)

2 Geology (by Fernando Gomez LANDETA)

Being this the first detailed description of crinoids in Nieva Formation, it proceeds a brief description of its stratigraphy and sedimentology in order to place the fauna in its context. La Formación Nieva, as defined by BARROIS, 1882, is the first full Devonian in the cantabrian sequence being the lowest of the three who compose the Complejo de Rañeces of the pioneers and spanning the interval Pragian – Lochkovian. According with VERA DE LA PUENTE (1986; see text-fig. 2), the sequence consists in a more or less cyclic alternation of grainstone, wackestone, in beds 1-5 meters thick with black pyritic shales in intervals of 1-10 meters. The limestones with erosive bases and lags of disarticulated brachiopods are interpreted as storm deposits, being the lutites the sediments of more calm periods, all deposited in a open shelf of moderate depth. The absence of corals among the abundant fauna points to a position well under the equatorial line for this Lower Devonian.



The thickness of the formation usually 50 – 100 m. in more internal areas (to the E-NE, in actual configuration), till no deposition further NE, must be maximal in the west coast of the peninsula of Cabo Peñas area where the crinoids have been found. In fact in this sector the Formation outcrops in spectacular cliffs for more than 5 kilometres, between the Nieva point and north of Verdicio beach. Despite this the difficulty of access to the cliffs prevent the confection of a detailed log of its stratigraphy, this difficulty compounded by the fact that given the structural position of the beds in the upper flank of the recumbent Peñas anticlinorium (JULIVERT, 1976) the horizontal disposition of the beds is perturbed by trains of folds interpretable as accommodation structures in the flexural edifice. Given this conditions the total thickness can only at best be estimated as a little less than 200 meters, in any case the thickest in the Cantabrian Devonian. To try to establish the position of the crinoidal level in the west cliff of the bay of Molín del Puerto with a minimum of precision, one cartography at the scale of 1:5000 (not shown in this work), has being done between this last point and the cape of Punta del Home 2 km. to the SW where lies the contact of Nieva with the lower Furada Formation. Although not completely satisfactory in its results we could approximate that the level must be 80 -120 meters over this contact, then roughly in the middle part of the Formation.
The crinoids have been found mainly in lose slabs in the surface of the limestone beds in its transition to the shale intervals. In the interior of the former the brachiopods which compose almost totality of the biota are present as disarticulated valves attesting to the big agitation already referred. The crinoids and brachiopods in the surface of the beds show little disarticulation pointing to at almost living conditions and upper in the shales the euxinic conditions prevented almost totally the existence of biota.



↑ text-figure_2: Map of the asturian coastline in the section from Santa Maria del Mar to Bañugues show the Nieva Formation and the general stratigraphical situation after VERA DE LA PUENTE, 1986: 78, text-fig. 1

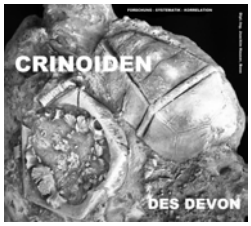
Kurzfassung: Aus dem unteren Pragium (Unterdevon) der asturischen Küste (Nordspanien) wird ein neuer Vertreter der Pisocriniten (*Pisocrinus asturianus* n.sp.), (Crinoidea, Inadunata) beschrieben.

Abstract: A new species of the fossil crinoid *Pisocrinus* (*Pisocrinus asturianus* n.sp.), Crinoidea, Inadunata, is described from the Lower Pragian (Lower Devonian) of northern Spain.

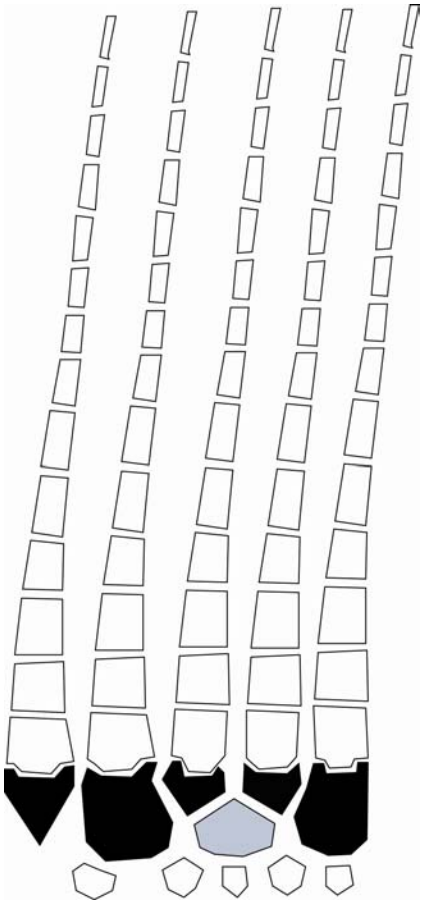
Resumen: Se describe una nueva especie del crinoideo *Pisocrinus (Pisocrinus asturianus n.sp.*), Crinoidea, Inadunata, procedent del Praguiense inferior, (Devónico Inferior), del Norte de España.

Schlüsselwörter: *Pisocrinus*, Systematik, Pragium, Unterdevon, asturische Küste, Nordspanien.

Key-Words: *Pisocrinus*, systematics, Pragian, Lower Devonian, Asturias, northern Spain.



3 Systematics (by Joachim HAUSER)



Classe Crinoidea J. S. MILLER, 1821
Subclasse Inadunata WACHSMUTH & SPRINGER, 1885
Order Disparida MOORE & LAUDON, 1943
Superfamily Pisocrinacea ANGELIN, 1878
Family Pisocrinidae ANGELIN, 1878
Genus *Pisocrinus* DE KONINCK, 1858

← text-figure 3: plate organisation of *Pisocrinus* after BATHER, 1893: 25, text-fig. 1; added with the structure of the brachia

Stratigraphical range: Middle Silurian – Lower Devonian

Type-species: *Pisocrinus pilula* DE KONINCK, 1858

Pisocrinus asturianus n.sp.
Figure 4a-c

2007 *Pisocrinus ubaghsi* HAUSER & LANDETA, 71: text-fig. 2, pl. 1, fig. 3

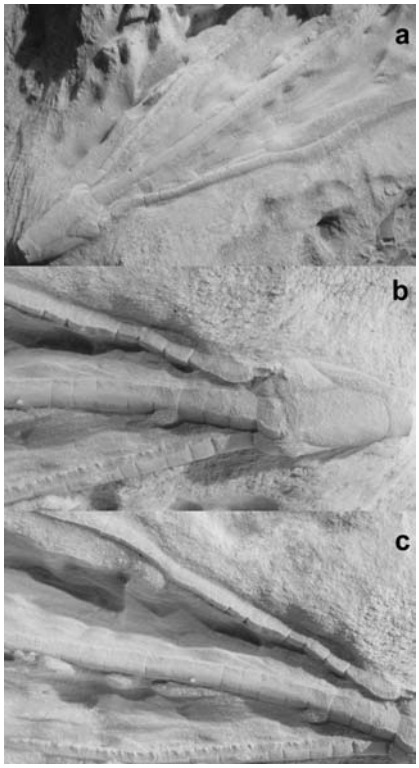
Derivatio nominis: The new species is named after the wonderful and geological very interesting northern spanish province Asturias.

Holotyp: The crown in text-fig. 4. The type will be stored in the collection of the Departamento de Paleontología de la Universidad de Oviedo (Asturias, España).

Locus typicus: East cliff of the headland called Punta de Llampero, 8 km. north of the village of Aviles, west section of the coast Cabo de Peñas (northern Spain).

Stratum typicum: Lower part of the Nieva Formation, Rañeces Group, Lower Pragium, Lower Devonian.

Material: Four more or less complete species and six dorsal cups.



→ text-figure 4a-c: Holotyp of *Pisocrinus asturianus* n.sp.

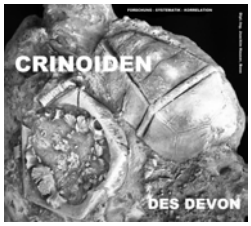
Diagnosis: A slender, very conical *Pisocrinus* (≈ twice as high than broadly) without "radial merlons".

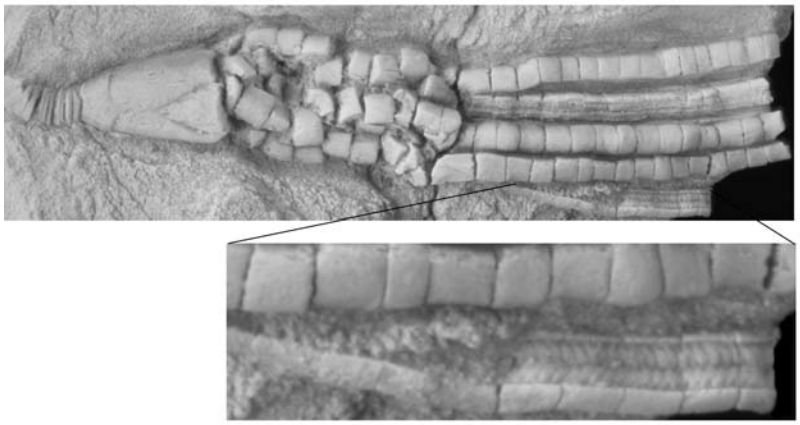
Description: The holotyp is an entire crown in matrix. Five, very low, small-flat basalia alternate with two long, almost rectangular formed basalia and a tongue-shaped superradial. The radial wreath is completed by three small, cuneiform plates.

Every brachia (atom) is build up of thirty short discreetly conical running up segments. A continuous oval ambulacral channel is to be recognised. In front of this channel there is a level hollow which shown clearly a pinnulae (specimen is stored in the collection of Fernando Gomez LANDETA, see textfig. 5). The pinnulae lie on top of each other with the sides packed and cover this hollow with both rows.

With this diagnosis of the arm-structures is shown for the first time, that *Pisocrinus* against the diagnosis MOORE et al, in 1978: T535 („First primibrach short, ……. and elongate; arms atomous and **nonpinnulate**“) disposed a pinnulate.

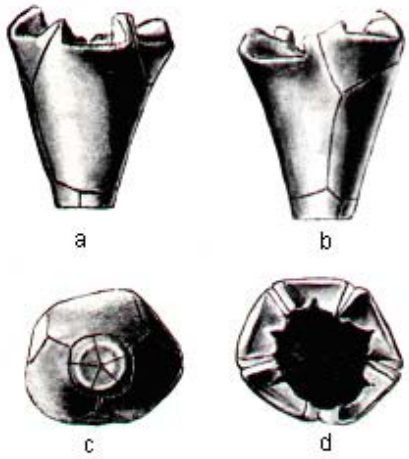
The sign decisive for kind this taxon are the missing "merlons" of the Radialia in the section of the joint facets. The whole cup surface is smooth. The crinoids coming from the locus typicus are slightly recognizable by her more or less intensive black colouring.





↑ text-figure_5: *Pisocrinus asturianus* n.sp. (collection Fernando Gomez LANDETA); more or less complete species which shown the pinnulae

Relations: *Pisocrinus asturianus* differ from *P. ubaghsi* in particular by the structure of the joint facets of the radials (always missing "merlons").



↑ Figure 6a-d: Holotyp of *Pisocrinus ubaghsi* BOUSKA, 1956 after draws of BOUSKA, pl. 3, fig. 7

Dimensions: Total hight of the crown: 3 cm and the calyce: 0,8 cm; width of the calyce: 0,5 cm.

Supplement-fauna (by Fernando Gómez LANDETA):

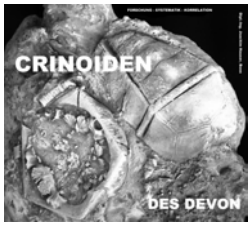
To try to establish the age of the crinoidal level we proceeded to a faunal collect in the immediate beds. Among the abundant fauna present we could classify with a certain confidence the following taxa:

Trilobites:
Acastella cf. roualt,i
Burmeisteria pradoana.

Brachiopods:
Microespharinchus cypris,
Dalmanella fascicularis,
Histerohowellella anceps.

Crinoids:
Flexibilia sp. Indet.,
Botryocrinus sp. (see HAUSER & LANDETA, 2007: pl. 1, fig. 3).

Others elements present but not classified are, brachiopods, tentaculitids, pelecypods, fishes, etc. The two taxa of trilobits have being described in Nieva Formation and can be either upper Lochkovian or Pragian. More precision we reach with the brachiopods *M. cypris* and *H. anceps*, the range of this two species and following GARCÍA-ALCALDE, 1996, is reduced to the intervals 5, 6 and 7 of his brachiopod zonation of the Cantabrian Devonian, being level 5 the base of Pragian, then indicating both taxons the **Lower Pragian** as the more probable age of the crinoids. To end this paragraph mention that the form *Pisocrinus ubaghsi*, has being found in the Armorica (France) in the Gedinien (Lochkovian).



Acknowledgements:

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