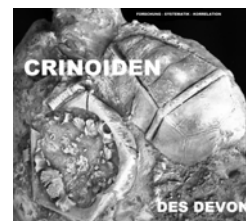


***Cantharocrinus melladoe* n.sp. (Crinoidea, Camerata) from the Santa Lucía Formation (Lower Eifelian) of Grandoso (Province León, Northern Spain)**

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1 Einleitung (von Joachim HAUSER)

Der altbekannte Wasserriß nahe der Ortschaft Grandoso findet bereits in der Arbeit von VERNEUIL, 1850 im Rahmen seiner geologischen Übersichtskarte Erwähnung. Der Wasserriß erschließt großflächig die Santa Lucía Formation und ist seit Jahrzehnten Anlaufpunkt für geologische Führungen, die regelmäßig von der Universität Oviedo für Wissenschaftler aus aller Herren Länder organisiert werden. Der Fundort mag heutzutage ein guter Aufschlußpunkt für Probennahmen von Mikrofossilien sein; was jedoch die Makrofossilien betrifft, wirkt der Fundort sehr überlaufen. Umso interessanter ist ein Fund einer vollständigen Krone in Matrix durch Felix COLLANTES, Palencia, der dem Verfasser dieses Stück anlässlich der Abfassung der Arbeit HAUSER & LANDETA, 2007 zur Einsichtnahme zur Verfügung stellte. Nach einer neuerlichen kritischen Durchsicht der Fotoaufnahme handelt es sich bei diesem Stück nicht um einen Vertreter von *Storthingocrinus haugi* (vergl. HAUSER & LANDETA, 2007, pl. 2, fig. 10) sondern um eine neue Art, die im Folgenden unter *Cantharocrinus melladoe* n.sp. beschrieben wird.

Introduction (by Fernando Gomez LANDETA)

In the Devonian of the north part of León province, the outcrop of Grandoso, next to Colle hill, both famous for its Emsian fauna, was known since old. Here next to the hamlet, the hard limestones of Santa Lucía Formation conforms a table or “mesa” cut in a beautiful scenery by the small stream “Arroyo Cabanilles”. In the shale partings of the limestones, one interesting fauna of crinoids was described by BREIMER, 1962, adjudicating to it a Upper Emsian age and cantoned in the lower part of the formation, (his **crin 2.** level). Years ago a local collector made available to the authors one specimen from this outcrop who was at first classified as *Storthingocrinus* aff. *haugi*, (see HAUSER&LANDETA, 2007:pl. 2, fig. 10), now a new inspection shows that in reality it is a different taxon. Then in this paper we describe the new species *Cantharocrinus melladoe* n.sp., giving also a new interpretation of the geology of the outcrop.

Kurzfassung: Aus der Santa Lucía Formation (Unteres Eifelium) der Province León, Kantabrisches Gebirge, Nordspanien, wird ein neuer Vertreter von *Cantharocrinus* BREIMER 1962 (*C. melladoe* n.sp.) beschrieben. Dieses Stück erlaubt erstmals die Diagnose der Brachia von *Cantharocrinus*. Die stratigraphische Reichweite von *Cantharocrinus* im nordspanischen Devon (Provinz Asturien und León) geht vom unteren Emsium bis zum unteren Eifelium.

Schlüsselwörter: *Cantharocrinus*, Crinoiden, Systematik, Santa Lucía Formation, Unteres Eifelium, Grandoso, Geologie, Nordspanien, Asturien, León.

Key-Words: *Cantharocrinus*, crinoids, systematics, Santa Lucía Formation, Lower Eifelian, Grandoso, geology, northern Spain, Asturias, León.

Abstract: *Cantharocrinus melladoe* n.sp. is described from the Lower Eifelian (Santa Lucía Formation) of northern Spain. The new species comes from the famous outcrop Grandoso NW of Colle, province León. This crinoid allowed at the first time to study the brachia and the stem of *Cantharocrinus*. The stratigraphical range of *Cantharocrinus* in the Devonian of northern Spain (province Asturias and León) is known from Lower Emsian to Lower Eifelian.

Resumen: Se describe *Cantharocrinus melladoe* n.sp. de la Formación Santa Lucía (Devónico, Norte de España). La nueva especie procede del famoso afloramiento de Grandoso, al NW de Colle, en la provincia de León. El ejemplar permite por primera vez el estudio de los brazos y el pedúnculo del género *Cantharocrinus*. Se establece provisionalmente que el rango del mismo en el Devónico cantábrico, abarca del Emsiense inferior al Eifeliense inferior.

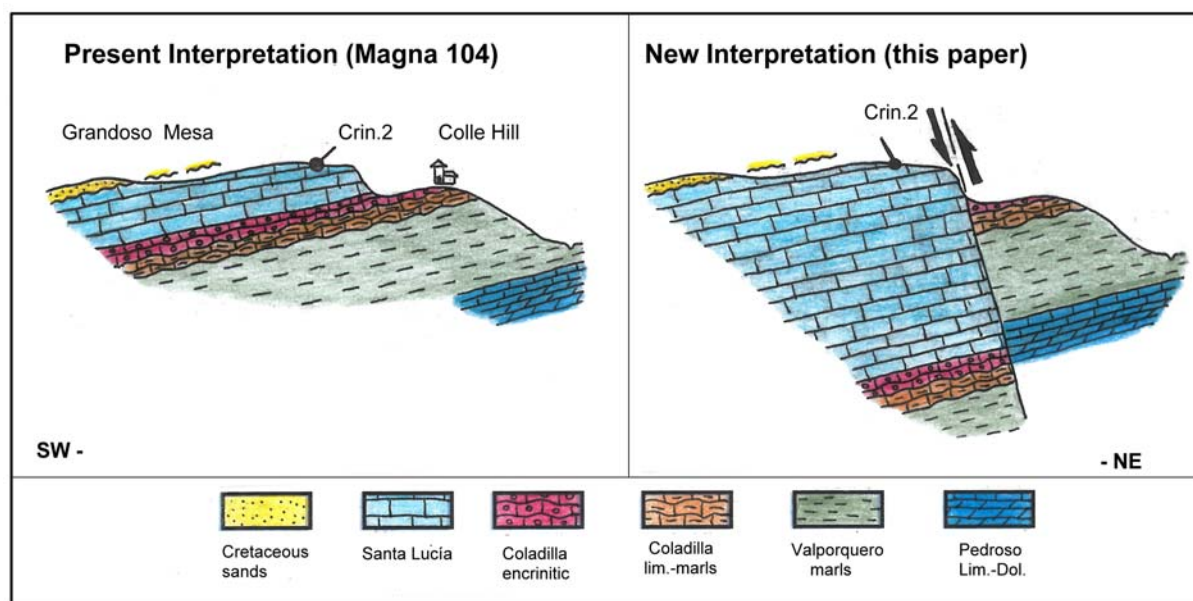
2 Geology (by Fernando Gomez LANDETA)

The holotype of the new species of *Cantharocrinus*, was found in a sub horizontal marly interbed intercalated in the gray limestones of Santa Lucía Formation, who outcrops in the left margin of Arroyo (creek) Cabanilles, roughly one kilometre to the NE of the hamlet of Grandoso, in the northern part of León province.

The crinoid fauna of this point was studied by BREIMER, 1962. This author describes from here three new species of crinoids namely *Pithocrinus ovatus*, *P. spinosus*, *Corocrinus? grandosensis*. Following COMTE, 1959, who studied the brachiopods of this level, he puts the beds in the Upper Emsian, and following the geologic cartography then in progress by members of Leiden University, he puts the level in the lower part of Santa Lucía Formation naming it as level **Crin 2.** of the four he founded in the Cantabrian Devonian, (see his Fig. 40, and pag. 176).

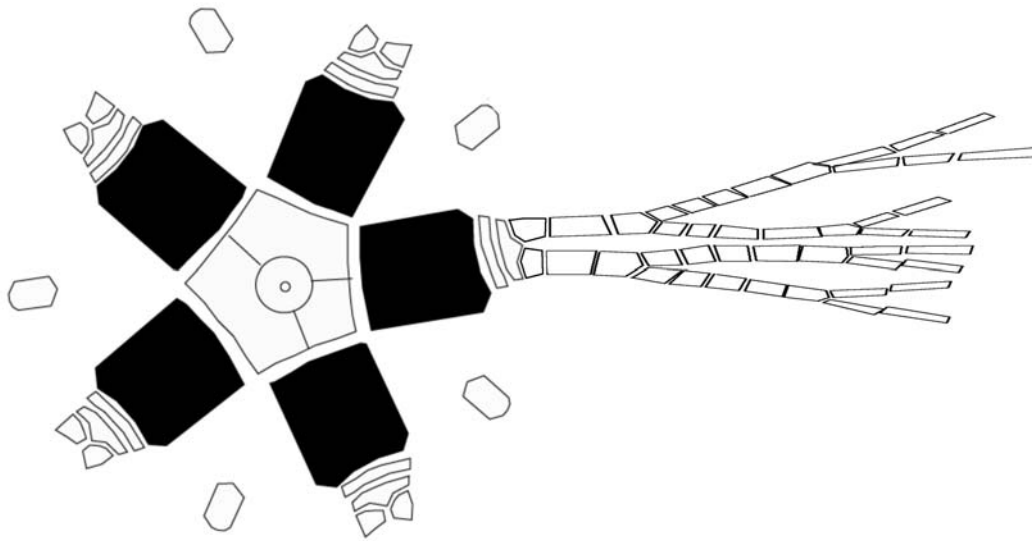
In the area north of Grandoso, the hard limestone beds of Santa Lucía Formation form a “mesa” or better “cuesta” slightly (10-15 degrees), inclined to the south. This mesa ends abruptly to the north forming a rectilinear WNW-ESE cliff which extends for more than two kilometres from the NW of Grandoso to the westward proximity of the hamlet of Colle. At the feet of this cliff high 10-15 meters, and composed by hard resistant limestone, lies the soft beds of La Vid Group conforming the famous Colle hill, deposit of the outstanding Emsian fauna. The geological disposition who states the current cartography

(MAGNA, sheet 104, BOÑAR, for example), is as represented in the left section of our **figure 1**, shows as BREIMER a normal contact between formations. Then the crinoid level (Crin 2.), must be at 20 or so meters over the base of Santa Lucía, (10-15 m. of the cliff, plus a few meters more in the “cuesta”). For our part (HAUSER & LANDETA, 2007), we have found the same species of crinoids as described by BREIMER, 1962, in other three points of the Cantabrian Devonian (EL Mugarón, Asturias, Quejo and Ciñera, León). This peculiar association forms a level 2-3 m. thick, cantoned **next to the top** of Moniello-Santa Lucía Formations. All three points are geographically spaced for more than one hundred kilometers along the length of the “Cantabrian arch”, and all are in the same geological unit (Somiedo nappe), as in Grandoso, in no other level of the Formation have whatever of this crinoids being found. We arrive at either in Grandoso the crinoid level is at the base of Santa Lucía, at variance with the rest of sectors, or it is at its top, and then the Formation has in Grandoso a thickness of a few more than 30 meters. This last view is difficult to maintain given that a little to the west (ej. Adrados), or to the east (Sabero or Esla valleys), this thickness is constant and is 150-200 m. there are not sedimentological evidences of a condensation, paleorelief or the like in Grandoso sector. In other order of things the possibility of a accurate datation of this levels are misleading given that the brachiopod fauna (*Glossinulus mimicus*, *Rhipidomella subdisconformis*, *Paraspirifer* sp.), cited by LOBATA, 1984: MAGNA 104, span the interval Emsian-Eifelian. Then, given our convincing that the cited crinoid association is a marker bed cantoned always at the same stratigraphic level as we demonstrated in the rest of areas, furthermore; one who constitutes one important time reference as it marks the base of Middle Devonian in the Cantabrian, given also the mentioned conspicuously rectilinear Santa Lucía cliff, with abundance of joints and calcite veins parallel to it in the limestone, we arrive at that this cliff marks the southern limb of a WNW-ESE fault who puts in contact the top of La Vid Group with the upper part of Santa Lucía. This interpretation is drafted in the right section of our text-figure 1. Another fact reinforce this view and is that as seen in text-figure 1, the discordant fluvial sands of the Cretaceous, outcropping to the South, must have carved its valley in the upper concordant soft marly beds of Huergas Formation, arresting its penetration when the erosive base level reached the contact with the hard limestones of Santa Lucía. With respect to the vertical component of the fault we evaluate it in roughly 150 meters, having in account that the total thickness of Santa Lucía as stated, must be in this sector 150-200 m. and that only its upper 30 m. are exposed. As shown in the cartography (MAGNA 104), the prolongation of the fault must affect the Cretaceous putting it in tectonic contact with the Stefanian in the sector to the SE of Colle, then we deduct that it is a thrust fault with its NE block elevated, being the fault a branch of the Sabero-Gordon fault whose last movement was in the Alpine orogenic phase. We conclude then that the new *Cantharocrinus* species as well as the crinoids of BREIMER’s level Crin.2 of Grandoso are cantoned in the upper part of Santa Lucía Formation and have a lower Eifelian age. To end this part only mention the paper that sometimes the crinoids play in to solve geological problems, even in areas as this one that was visited and studied by so many people over a period of 150 years, (see the reproduction of the map by VERNEUIL, 1850 in the **Annex**).



↑ **text-figure 1:** Geological cross sections in a NE-SW line at mid distance between Colle and Grandoso. **Left section**, depicts a normal contact as can be deduced from the current cartography (MAGNA 104, etc.). **Right section**, depicts our interpretation of a faulted contact between La Vid Group and Santa Lucía Formation. Indicated are the Formations (Pedrosa – Valporquero – Coladilla), of the La Vid Group, Santa Lucía Formation and discordant Cretaceous.

3 Systematics (by Joachim HAUSER)



↑ text-figure 2: plate diagram of *Cantharocrinus* BREIMER, 1962, (close related to that of *Amblacrinus*); black = Radialia

Classe Crinoidea J. S. MILLER, 1821
Sub-classe Camerata UBAGHS, 1978
Order Monobathrida MOORE & LAUDON, 1943
Sub-order Glyptocrinina MOORE, 1952
Super-Family Platycrinitacae AUSTIN & AUSTIN, 1842
Family Hapalocrinidae JAEKEL, 1895
Genus *Cantharocrinus* BREIMER, 1962

Stratigraphical range Lower Devonian – Middle Devonian

Cantharocrinus melladoae n.sp.
Text-figure 3a-b, 5a-c

- v *Storthingocrinus haughi* HAUSER & LANDETA, 2007, pl. 2, fig. 10
- v *Cantharocrinus* aff. *minor* HAUSER & LANDETA, 2007, pl. 1, fig. 9

Derivatio nominis: We dedicate the species to the memoir of the spanish Palaeontologist MARÍA TERESA RODRIGUEZ MELLADO, who in 1949 described a new crinoid in the same stratigraphic level where the new *Cantharocrinus* was founded.

Locus typicus: Limestone “mesa” near Grandoso 2,5 km. NW of Colle, Province León, Cantabrian Mountains, northern Spain.

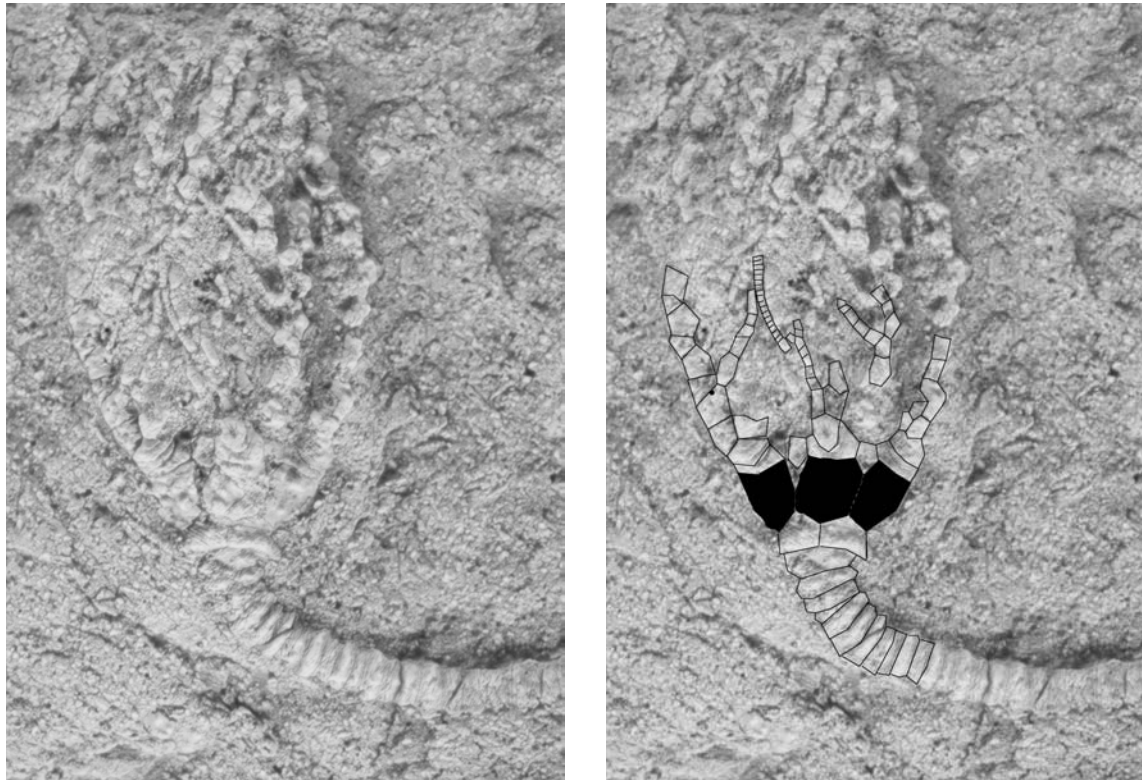
Stratum typicum: Santa Lucía Formation, Upper Emsian, Lower Devonian.

Holotyp: The holotyp is the crown in text-figure 3a-b. The holotyp is stored in the collection of Felix COLLANTES, Palencia. The holotyp is stored in the Department of Paleontology of the Universidad de Oviedo (Asturias, Spain), DPO 128645.

Diagnosis: A *Cantharocrinus* with low, broader, reverse bowl-shaped base and three visible, sign-shaped radialia decorated with a combination of point- and stripe shaped ornaments and isotom branched arms. The structure of the brachia: I BR 1 – I Br 2 – Ax₁ – II Br 1 – II Br 2 – Ax₂ – III Br 1 – III Br 2.

Diagnose: Ein *Cantharocrinus* mit niedriger, breiter, umgekehrt schalenförmiger Basis und drei sichtbaren, schildförmigen Radialia verziert mit punkt- und streifenförmigen Reliefs sowie isotom verzweigten Armen. Aufbau der Brachia: I BR 1 – I Br 2 – Ax₁ – II Br 1 – II Br 2 – Ax₂ – III Br 1 – III Br 2.

↓ text-figure 3a: Holotype of *Cantharocrinus melladoae* n.sp. ↓ text-figure 3b shown the holotype with drafts of the plate-sutures; black plates = Radialia



Beschreibung: Der Beschreibung liegt eine vollständige, etwas verwaschene Krone in Matrix zugrunde, die auch einen Teil des Stiel zeigt. Mit der niedrigen, umgekehrt schalenförmigen, breiten Basis alternieren drei schildförmige Radialia, die mit einem punkt- und streifenförmigen Relief verziert sind. Zwei sichtbare Primibrachialia sind im distalen Bereich der Radialia in das Skelett der Dorsalkapsel implementiert. Den hufeisenförmigen Gelenkfacetten entspringen zwei kräftige Armstämme, die sich im weiteren Verlauf isotom verzweigen. Aufbau der Brachia: I BR 1 – I Br 2 – Ax₁ – II Br 1 – II Br 2 – Ax₂ – III Br 1 – III Br 2. Der Stiel setzt sich aus einer gleichmäßigen Folge von niedrigen, außen kantigen und breiten, außen abgerundeten Columnalgliedern zusammen.



← text-figure 4a-d: Holotype of *Cantharocrinus simplex* BREIMER, 1962 after photos of BREIMER, 1962, pl. 11, figs. 8-11

a



b

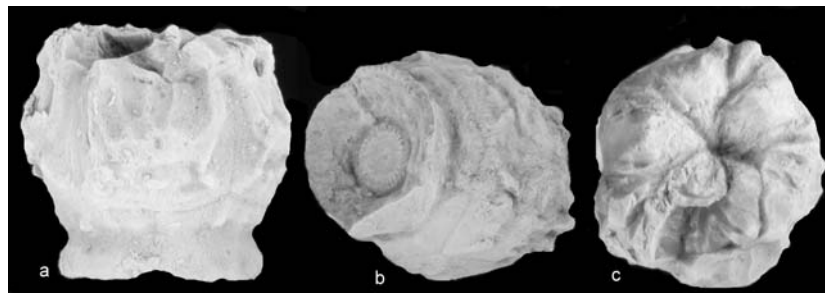


c

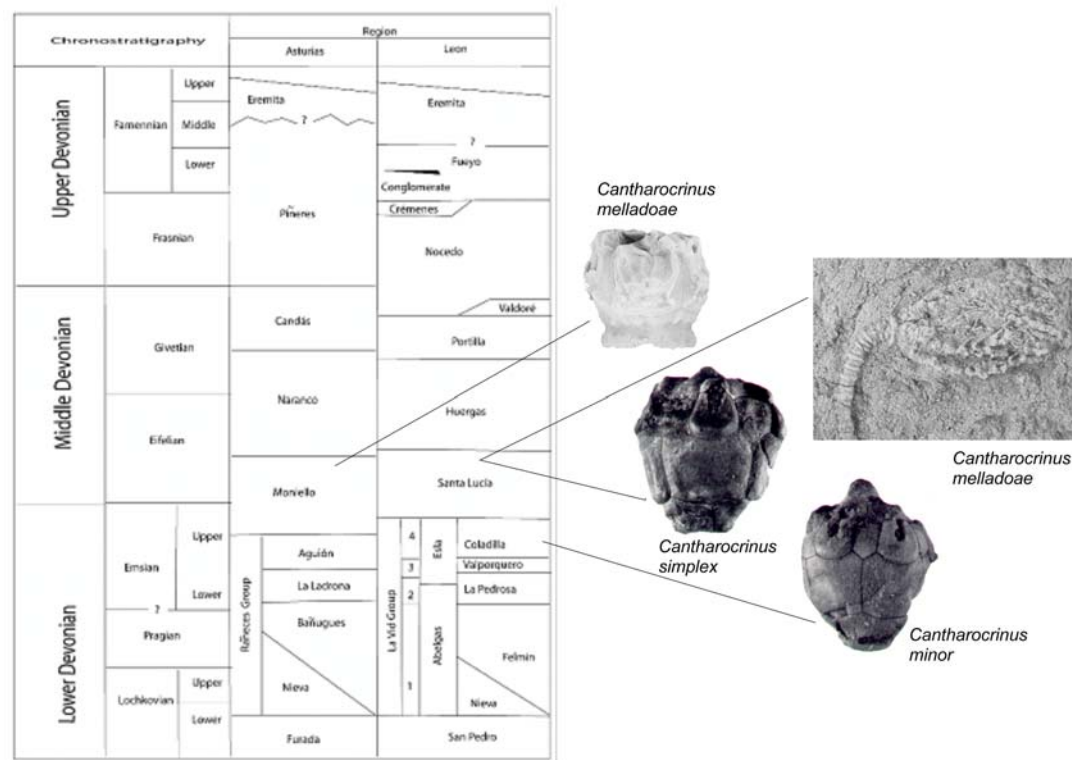


d

Description: The holotype shows part of the stem, cup and base of arms over a slightly weathered limestone slab. The cup is complete showing three sign-shaped radials which are decorated with a point-shaped and stripe-shaped ornaments alternate with the low bowl-shaped, wide basal. Two visible primibrachialia are implemented in the distal area of the radials. Two strong isotom branched arms arise from the horseshoe-shaped joint facets. The structure of the brachia: I BR 1 – I Br 2 – Ax₁ – II Br 1 – II Br 2 – Ax₂ – III Br 1 – III Br 2. The stem shown square and wide outside rounded columnalia.



↑ text-figure 5a-c: Paratype of *Cantharocrinus melladoae* n.sp. of the collection Fernando Gomez LANDETA, Oviedo; Moniello Formation, Lower Eifelian of Arnao (Asturias); dimensions: high = 1,6 cm.; max. diameter = 1,8 cm.



↑ text-figure 6: 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; right figures shown the stratigraphical range of all known species of *Cantharocrinus* in the Devonian of northern Spain

Verwandschafts- und Unterscheidungsmerkmale: Am nächsten verwandt ist *Cantharocrinus melladoe* mit dem von BREIMER, 1962: 120 beschriebenen *Cantharocrinus simplex*. Hiervon unterscheidet sich die neue Art durch die Breite der Kelchbasis, der deutlich ausgebildeten Krempe und die signifikant hervortretenden reliefartigen Verzierungen der Radialia.

Diagnostic characteristics: The new species *Cantharocrinus melladoe* is more or less close related to *Cantharocrinus simplex* BREIMER described in his monograph 1962. The visible differences are low, broader, reverse bowl-shaped base and the characteristic point- and stripe shaped ornaments.

Dimensions: Hight (calyce) = 0,4 cm.; hight (complete specimen) = 1 cm.; max. diameter = 0,5 cm.

Supplement-fauna: The brachiopod-fauna of the stratum typicum is described in detail by COMTE, 1959. The crinoid-fauna is not very rich (see BREIMER, 1962:176). Dominant elements are *Orthocrinus* and *Pithocrinus*.

Acknowledgements:

Our special thanks goes to Dr. Winfried KOENSLER, Bad Honnef, Germany. He had the kindness to read this paper correction. Felix COLLANTES DEL CAMPO, Palencia, made the holotype available for study and posterior safe repository in the Palaeontological Department of the University of Oviedo.

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