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Rhabdocrinus scotocarbonarius (WRIGHT), A CRINOID FROM THE CARBONIFEROUS 'GRIOTTE' LIMESTONE OF PALENCIA, NORTHWEST SPAIN

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ABSTRACT

A specimen of the Carboniferous crinoid species *Rhabdocrinus scotocarbonarius* (Wright) is recorded from an outcrop near Barruelo de Santullán, Palencia Province, N Spain. This represents only the sixth crinoid species to be recorded from the pre-Westphalian Carboniferous rocks of Spain. The specimen is described and comparisons made with other material allocated to *Rhabdocrinus* including *Rhabdocrinus vatagini* Arendt.

Keywords: Crinoids, Poteriocrinitidae *Rhabdocrinus,* Carboniferous, Pre-Westphalian, Palencia, Spain.

RESUMEN

En una localidad cerca de Barruelo de Santullán, provincia de Palencia, N de España, se ha hallado un ejemplar del crinoideo carbonífero *Rhabdocrinus scotocarbonarius* (Wright). Este ejemplar representa únicamente la sexta especie de crinoideo citada en España de materiales carboníferos pre-westfalienses. Se describe el ejemplar y se realizan comparaciones con otro material atribuido a *Rhabdocrinus,* concretamente, *R. vatagini* Arent.

Palabras clave: Crinoideos, Poteriocrinitidae, *Rhabdocrinus,* Carbonífero, Pre-Westfaliense, Palencia, España.

INTRODUCTION

A well preserved crinoid calyx collected by the writer's son during field work in the area of Barruelo de Santullán, Palencia Province, has been identified as *Rhabdocrinus scotocarbonarius* (Wright). The outcrop yielding the specimen lies some 300 m west of the village of Revilla, near Barruelo (Fig. 1), and consists of a series of compact grey limestones which become nodular upwards. These limestones, the Villabellaco Limestones, are of late Dinantian and early Namurian age. More particularly, the succession consists of approximately 11.5 m of limestones ranging in age from an horizon near the top of the Tournaisian containing the conodont *Doliognathus latus* Branson & Mehl (unpublished personal research) to an horizon in the Arnsbergian (E2) Stage of the Namurian. These limestones lie in an inverted position on sandstones and shales of Westphalian age (locality 134 of C.H.T., Wagner-Gentis, 1963, p. 11). The Limestone succession therefore represents a very condensed sequence.

Although the crinoid calyx described below was not collected *in situ* it was found as a loose nodule lying just below horizons yielding poorly preserved goniatites including *Goniatites granosus aciculare* Pareyn, specimens of which may also be collected as loose nodules. Because of the nature of the outcrop there was every reason to believe that the specimen had not been moved more than a few centimetres, if at all, and its age is therefore very late Visean or very early Namurian (i.e. early Pendelian).

The paucity of the crinoid fauna in the Carboniferous is in marked contrast to the faunas of the British Carboniferous succession. This was demonstrated clearly by Breimer (1962) who monographed the Palaeozoic crinoids of Spain. Breimer showed that only eleven species referable to eight genera were known from the Carboniferous rocks of Spain, of which only one species, *Pandelocrinus* sp., was of Dinantian age. Of the other crinoids, three of the Namurian species, namely *Pimlicocrinus latus* Wright, *Aorocrinus* sp. and *Platycrinus* sp. are known from outcrops in the vicinity of Rabanal de los Caballeros in Palencia Province; the fourth Namurian species, *Nunnacrinus stellaris* (de Koninck & Le Hon, 1854) in from Leon Province. The specimen described below as *Rhabdocrinus scotocarbonarius* (Wright) is therefore only the sixth crinoid species to be recorded from the pre-Westphalian Carboniferous rocks of Spain. However, Breimer (1962, p. 185) who records four species of crinoid from the Moscovian (=Westphalian C & D) of Palencia Province, records two other species of uncertain Carboniferous age.

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SYSTEMATIC PALAEONTOLOGY

SUB-PHYLUM CRINOZOA Matsumo, 1929
CLASS CRINOIDEA Wachsmuth & Springer, 1885
Order CLADIDA Moore & Laudon, 1943
Family **Poteriocrinitidae** Austin & Austin, 1842

Discussion: While formally recognising the genus *Rhabdocrinus,* Wright (1944) also stated that the genus could not be accommodated in the family Poteriocrinitidae because of the nature of the radial facets. Nevertheless, in a subsequent publication, and after study of further material, Wright (1950) included *Rhabdocrinus* within the Poteriocrinitidae, noting their similarities. Ramsbottom (1960) reverted to the earlier position, considering that *Rhabdocrinus* was sufficiently distinctive to place the genus in the new family Rhabdocrinidae, characterised by wide radial facets.

Arendt (1962) revised the definition of the Rhabdocrinidae to accomodate some new, but rather fragmentary, material from the Moscow Basin. This material, named as *Rhabdocrinus vatagini,* showed the development of radial facets which only occupied a part of the upper surface of the radials. The family definition was revised to take this into account.

Examination of the type material of *Rhabdocrinus carbonarius* in the Royal Scottish Museum collections shows that the radial facets are normally very wide and may sometimes occupy virtually the whole width of the upper surface. In contrast, the shape of the radial facets of the Russian species, *R. vatagini* shows similarities to that of *Poteriocrinites,* the major difference being the presence of fine radial ridges in the former. In some respects, therefore, *R. vatagini* appears to be intermediate between *Poteriocrinites* and *Rhabdocrinus.* Not surprisingly, Moore *et al.* (1978) regard the separation of the Rhabdocrinidae as a distinct family as being invalid, and have reinstated *Rhabdocrinus* in the family Poteriocrinidae.

Genus *Rhabdocrinus* J. Wright, 1944
Type species: *Poteriocrinites scotocarbonarius* J. Wright, 1937

Rhabdocrinus scotocarbonarius (J. Wright, 1937) (Figs. 2A-D)

1914 ?*Poteriocrinus* sp. J. Wright, pl. 20, fig. 7.
1920 *Poteriocrinus* ?near *plicatus* Austin; J. Wright, 382, pl. 15, fig. 3.
1925 *Poteriocrinus plicatus* Austin; J. Wright, 288.
1935 *Poteriocrinus plicatus* Austin, P. cf. *plicatus, P. crassus* Miller; J. Wright, 207.
1937 *Poteriocrinus scotocarbonarius* Wright; J. Wright, 397, pl. 13 figs. 10-12; pl. 14 figs. 1-5; pl. 15 figs. 10, 13; pl. 16 figs. 1, 3, 7.
1939 *Poteriocrinus scotocarbonarius* Wright; J. Wright, 14, pl. 9 figs. 12-14.
1943 *Poteriocrinites scotocarbonarius* Wright; Bassler & Moody, 644.
1944 *Rhabdocrinus scotocarbonarius* (Wright); J. Wright, 266, pl. 10 figs. 1-15; pl. 11 figs. 1-14.
1950 *Rhabdocrinus scotocarbonarius* (Wright); J. Wright, 13, pl. 2 figs. 1, 9, 18; pl. 3 figs. 1-3, 5, 6, 8-21.

Figure 1: Situation sketch. * outcrop yielding the crinoid specimen.

Material: A single calyx deposited in the collection of the Instituto Tecnológico GeoMinero de España, Madrid (Catalogue No. 8.125).

Description: Calyx a truncated cone. Arms and stem are not preserved, although a variable number of vertically compressed brachials remain fused with some radials.

Dimensions:

Height of calyx	23.5 mm
Maximum diameter of calyx (at top)	28.8 mm
Minimum diameter of calyx (at base)	13.6 mm

The infrabasals (IBB) are 5 in number, all of equal size and represent approximately one quarter of the height of the calyx. The basals (BB) are slightly wider than high, are all of approximately equal size and nearly twice the height of IBB. The radials (RR) are markedly wider than high except for the right posterior radial (RPR), which is only slightly so. RPR projects slightly above the level of the remaining RR. The upper surfaces of RR are slightly excavated to form a concave articulatory facet for the brachials (BrBr). The articulatory facet occupies the whole width of RR and tends to slope outwards and downwards (Figs. 2A, 2C). The radianal (RA) lies to the left of and slightly below RPR. The anal (X) plate lies above the posterior basal (PB) and in contact with the left side of RA. The right proximal plate (RX) of the anal tube lies above RA. Both X and RX bear small plates of the anal tube. The RPR bears two complete brachial plates with wedge-like brachials (BrBr) underlying each complete Br.

Over the whole calyx, the plate sutures are excavated, with deep, localised pit-like depressions at the points of intersection of three sutures. Plate ornament consists of variably irregular small well separated nodes or low vermiform ridges which may fuse to form an irregular reticulum. The aboral surface forms a broad, shallow, truncated cone (Fig. 2A). The margin of the calyx is acutely angled and the aboral surface of IBB is finely radially ridged (Fig. 2C).

Remarks: Comparison of the Revilla specimen with the holotype and other material of *R. scotocarbonarius* shows a number of minor differences, probably not of specific value:

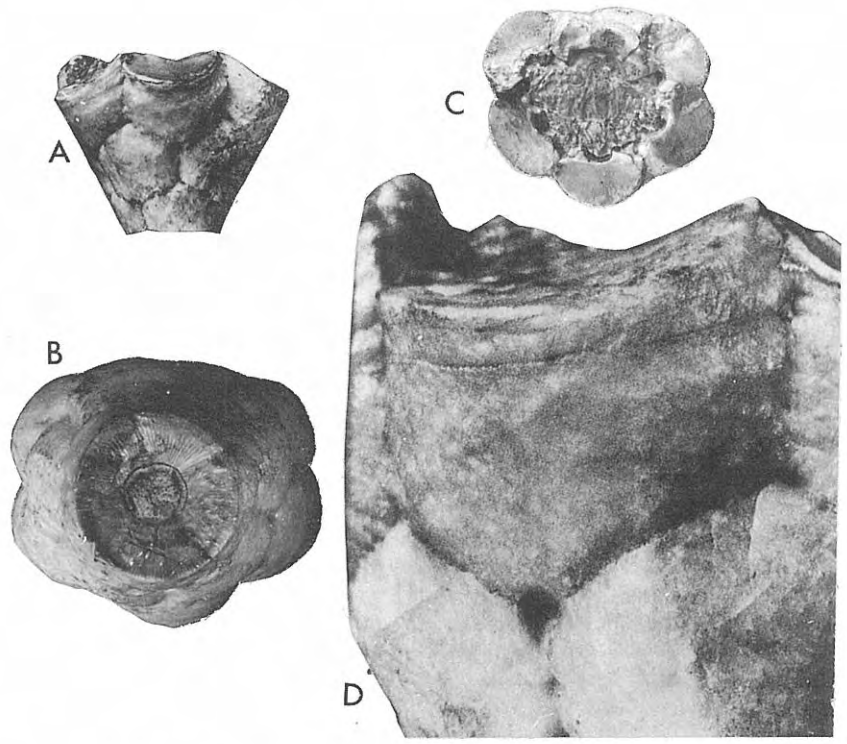

Figure 2: A. *Rhabdocrinus scotocarbonarius* (Wright), near Revilla, Barruelo de Santullán, Palencia Province, N Spain. No. 8.125. x 1. Anterior view of the calyx. B. The same specimen, x 1.6. A basal view of the calyx to show the somewhat steep, striated slope of the BB leading to the column socket. C. The same specimen, x 1. A ventral view of the calyx, which lacks the tegmen, showing the large, striated, brachial facets. D. The same specimen, x 4.7. An enlargement of the right anterior radial with several compressed, partly interlocking PBrBr in position.
Specimen in Museo del Instituto Geológico y Minero de España, Madrid.

1. The absence of very strong pit-like depressions at the points of intersection of sutures in the Revilla specimen. Deep depressions are present but are minor in comparison with those in some of the Scottish specimens.

2. Relatively weakly convex brachial and radial plates and an acute margin at the infra-basal / columnar junction in the Revilla specimen.

3. Only weakly developed ornament.

4. Nature of the relationship of the primibrachials to the infrabrachials. The most important feature, the nature of the primibrachials, is incompletely preserved. Up to four PBrBr are present, plates occupying the full width of RR alternating with wedgeshaped plates of one third to two thirds the width (Fig. 2D). The BrBr plates are not separated by an interbrachial plate (IBr) as in specimens figured by Wright (1950, plate II), However, this feature may have developed at a later stage in the assembly of the arms unfortunately not preserved in the Revilla specimen.

Rhabdocrinus scotocarbonarius was recorded by Wright (1950 p. 14) from limestone bands in the Lower Limestone Group of Scotland. The base of the Namurian probably lies at the base of the Top Hosie Limestone, the highest limestone member of the Group. Thus the Lower Limestone Group must be largely of Dinantian (Lower Carboniferous) age as suggested by George *et al.* (1976, p. 47). The specimen from Revilla described above is therefore approximately the same age as the Scottish specimens in view of its occurrence in beds immediately underlying those with lowermost Namurian goniatites in the Villabellaco Limestone. A very late Dinantian age is probable but the nature of the outcrop and the very condensed succession means that transport over a distance of only a few centimetres would be sufficient to alter the age determination quite appreciably.

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BIBLIOGRAPHY

Arendt, J.A. 1962. *Rhabdocrinus vatagini* sp. nov. from the Lower-Carboniferous of the Moscow region. *Paläontologische Zeitschrift,* **2,** 117-121 (in Russian transl. in *International Geological Review,* **5,** 1674-1677).

Bassler, R.S. & Moody, M. W. 1943. Bibliographic and faunal

index of Palaeozoic Pelmatazoan Echinoderms. *Geological Society of America Special Paper No. 45.* 733 pp.

Breimer, A. 1962. A monograph on Spanish Palaeozoic Crinoidea. *Leidse Geologische Mededeligen,* **27,** 189 pp.

George, T.N., Johnson, G.A.L. & Mitchel, M. 1976. A correlation of Dinantian rocks in the British Isles. *Special Report of the Geological Society of London* No. 7, pp. 1-87.

Koninck, L.G. de & Le Hon, H. 1854. Récherches sur les Crinoides du Terrain Carbonifère de la Belgique. *Mémoires de l'Académie Royale de la Belgique,* **XXVIII,** 214 pp.

Moore, R.C., Gary Lane, N. & Strimple, H.L. 1978. The order Cladida Moore & Laudon 1943. In: *Treatise on Invertebrate Paleontology. Part T, Echinodermata 2, Crinoidea,* T578-T759 (Moore, R.C. ed.). The University of Kansas Press & the Geological Society of America, Boulder.

Ramsbottom, W.H.C. 1960. Synopsis of Families and Genera described in Mr Wright's monograph. Section VII, pp. 335-341 In: "Monograph of the British Carboniferous Crinoidea" (J. Wright), Vol. 2. *Palaeontographical Society Monograph.*

Wagner-Gentis, C.H.T. 1963. Lower Namurian goniatites from the Griotte Limestone of the Cantabric Mountain Chain. *Notas y Comunicaciones del Instituto Geológico y Minero de España,* **69,** 5-42.

Wright, J. 1914. On the occurrence of crinoids in the Lower Carboniferous Limestones of Fife. *Transactions of the Edinburgh Geological Society,* **10,** 148-162.

Wright, J. 1920. On Carboniferous crinoids from Fife, with notes on some localities and provisional lists of species. *Transactions of the Geological Society of Glasgow,* **16,** 363-92.

Wright, J. 1925. Notes on the occurrence of crinoids in the Carboniferous Limestones in Scotland. *Transactions of the Edinburgh Geological Society,* **11,** 275-99.

Wright, J. 1935. New crinoids from Coplow Knoll, Clitheroe, with a list of Carboniferous Limestone crinoid species. *Geological Magazine,* **72,** 193-213.

Wright, J. 1937. Scottish Carboniferous crinoids. *Geological Magazine,* **74,** 385-411.

Wright, J. 1939. The Scottish Carboniferous Crinoidea. *Transactions of the Royal Society of Edinburgh,* **60,** part 1 (No. 1) 1-78.

Wright, J. 1944. *Rhabdocrinus* n.g., from the Scottish Carboniferous Limestone. *Geological Magazine,* **81,** 266-271.

Wright, J. 1950. A Monograph on the British Carboniferous Crinoidea, part 1. *Palaeontographical Society Monograph,* 1 - 24.

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