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COMATULID AND ROVEACRINID CRINOIDS FROM  
THE CRETACEOUS OF CENTRAL POLAND

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Two crinoid species: *Glenotremites* sp. and *Styracocrinus peracutus* (Peck) from Albian-Cenomanian deposits in Central Poland are described. The isolated arms elements found in the same sample as the cups were the basis for the reconstruction of the arms structure in both species.

**Key words:** Crinoidea, Cretaceous, Poland.

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## GENERAL REMARKS

Cretaceous crinoids from Poland are little known and rarely described. Up to now only *Marsupites* from the Upper Cretaceous of Kraków region was listed (Smoleński 1906, Panow 1934), *Glenotremites paradoxus* (Goldfuss) from the Upper Cretaceous of Opole region was described by Wegener (1913), (in Wegener's paper the species appeared under the name *Glenotremites tietensi*) and recently, Merta (1972) described the cup of the *Bourgeticrinus utriculatus* (Valette) from the Senonian of Kraków Up-land; stem fragments of the *Bourgeticrinus* from the Upper Cretaceous of Puławy region are also mentioned by Kongiel (1937).

Comatulid crinoids are fairly common fossils in the Cretaceous of Europe and North America (see for example Gislen 1924, 1925; Rasmussen 1961; Žitt 1980). Similarly, roveacrinid crinoids are common in the Cretaceous of Germany (Jaekel 1918, Sieverts 1932, 1933), England, France, (Douglas 1908, Peck 1955, Rasmussen 1961, 1971) and North America (Peck 1943, Scott *et al.* 1977). Roveacrinids (*Orthogonocrinus* and *Roveacrinus*) from the Cretaceous of Bohemia were described by Nekvasilova and Prokop (1963). Cretaceous roveacrinids were not known from Poland up to now.

Crinoids described in this paper come from gray marls found in the borehole W-20 in the vicinity of Barcin-Piechcin (Kujawy region), at

the depth of 68.5 m (fig. 1). The marls, covered with Quarternary deposits, overlie sandstones with plant remnants and carbonaceous intercalations. In the upper part, the sandstones contain phosphorites and glauconite, and this part of the profile is regarded as belonging to the Albian, while underlying sandstones — to the Barremian and Aptian. In marls, at the depth of 65.5 meters *Inoceramus cripsi* was discovered which indicates Cenomanian (Wierzbowski *et al.* 1978). Apart from crinoids, thinshelled bivalve fauna (probably epiplanctic), belemnites and small brachiopods belonging to *Terebratulina martiniana* d'Orbigny have been found. Similar marly deposits with an analogous faunal assemblage of the Albian age from the Hannover region are described by Schmid (1971). One can also expect to find these minute crinoids in the marly deposits in other regions of the Upper Cretaceous of Poland.

Material described is housed at the Institute of Paleobiology of the Polish Academy of Sciences, Warsaw, for which the abbreviation ZPAL is used. SEM pictures were taken at the SEM Laboratory of the Faculty of Geology, Warsaw University, and the Nencki Institute of Experimental Biology, Warsaw.

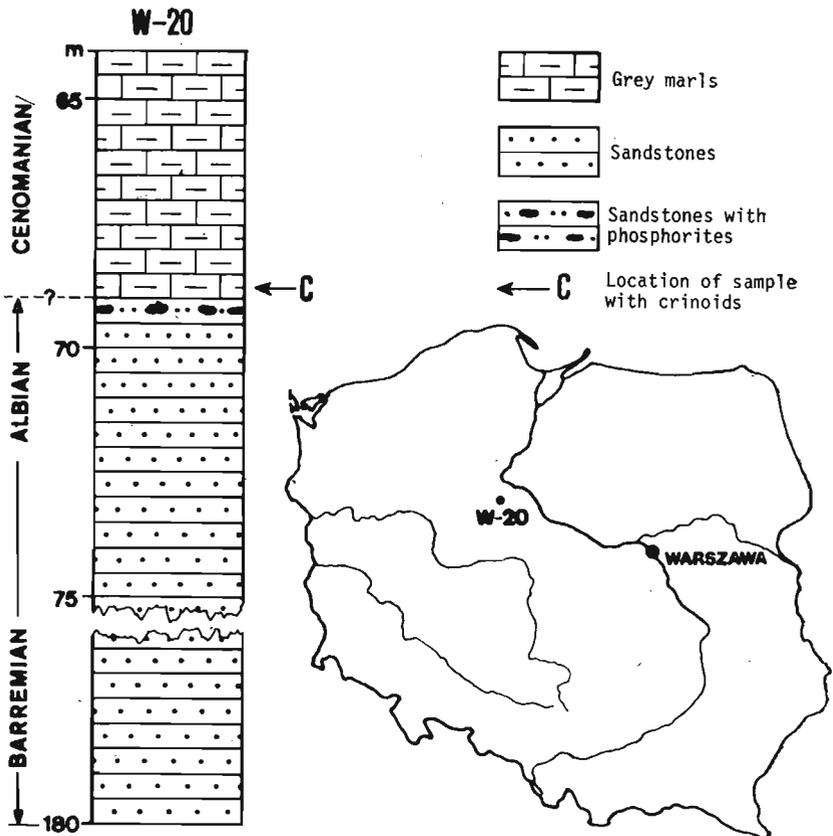


Fig. 1. Location and geological section of the borehole W-20.

## SYSTEMATIC DESCRIPTION

Order **Comatulida** A. H. Clark, 1908  
 Family **Notocrinidae** Mortensen, 1918  
 Genus *Glenotremites* Goldfuss, 1829

*Glenotremites* sp.  
 (pl. 9: 1—8, pl. 10: 1—6)

*Material.* — 2 centrodorsals, 56 brachials and 18 cirrals.

*Description.* — Centrodorsal small (1.1—1.6 mm in diameter), pentagonal in outline, strongly flattened. Dorsal star small but distinct; except for the distal star whole dorsal surface covered with about 30 cirral sockets (pl. 9: 1). They are densely packed. Crenulation not present on cirral socket surfaces. Ventral surface of centrodorsal inwardly bent. Basals marks readily visible, centrodorsal cavity narrow and deep (pl. 9: 2). Both found and illustrated specimens are relatively small and represent probably juvenile individuals.

Several brachials found in the same sample are regarded as belonging to the same species. IBr1 flat and wide (pl. 9: 7), with weakly developed synarthrial articulation with the IBr2; the latter is at the same time IAx (pl. 10: 3). It appears that there was only one division of the arms. Secundibrachials display oblique muscular and syzygial articulations (pl. 9: 3—4, 6, 8). Pinnular sockets appear only above IAx. Some brachials bear spiny outgrowths near the dorsal edge. Brachials with a weakly crenulated rim around the outer edge were found (pl. 9: 5). As some brachials have one articulation surface of the muscular type and the other — of the synarthrial type, as well as a pinnular socket, they cannot be IBr1 but secundibrachials at most. Synarthrial articulation existed probably between IIBr1—2 (see Rasmussen 1971, 1978). Cirrals are elliptical in cross-section; proximal ones short and wide, distal ones elongated (pl. 10: 1—2).

*Remarks.* — As no basals or radials were found, and centrodorsals belong to juvenile individuals, specific assignment of the investigated specimens cannot be established. Described forms closely resemble the representatives of the *Glenotremites loveni* (Carpenter) (see Rasmussen 1971) and *Glenotremites paradoxus* (Goldfuss) (see Rasmussen 1961).

Order **Roveacrinida** Sieverts-Doreck, 1952

Family **Roveacrinidae** Peck, 1943

Genus *Styracocrinus* Peck, 1955

*Styracocrinus peracutus* (Peck, 1943)

(pl. 11: 1—8, pl. 12: 1—6)

1943. *Drepanocrinus peracutus* Peck: 463, pl. 76: 9—22, 26, 28  
 1955. *Styracocrinus peracutus* (Peck); Peck: 1022, pl. 106: 10—12.  
 1955. unidentified primiaxials Peck: pl. 106: 14—15.  
 1961. *Styracocrinus peracutus* (Peck); Rasmussen: 383, pl. 56: 1—35.  
 1961. brachial of Roveacrinidae; Rasmussen: pl. 56: 11.  
 1971. *Styracocrinus peracutus* (Peck); Schmid: 73—75, pl. 1: 9—15.  
 1978. *Styracocrinus peracutus* (Peck); Peck: fig. 613—2.

*Material.* — 6 cups and 34 brachials.

*Remarks.* — Investigated cups show all the typical characteristics of the species

and fall within its range of variability. The described specimens seem a little less slender on the photographs (pl. 11: 1—2) as the dorsal parts of the cup are damaged.

Several types of isolated brachials, which are also assigned to this species, were found in the same sample as the cups. The element interpreted as IBr1 (pl. 11: 4, 6—8) (proximal muscular articulation surface morphologically closely corresponds to the articulation on the radials (pl. 11: 8)) has a distal articulation surface of the cryptosynarthral type (pl. 11: 8). Although this element corresponds in general outline to the IBr1 illustrated by Peck (1978), the details of the outline differ. As the cups of this species are extremely variable, it seems that one can expect to find a similar variability in some arm elements. Two types of brachials, which may be considered as IBr1 were found (pl. 11: 6, 7); they are a mirror-image of each other and appear in the sample with a more or less similar frequency. They differ in that the distal articulation surface slopes outwards or inwards in regard to the calyx. Hence problems emerge concerning the interpretation of the IBr1—2 articulation. Such interpretation problems of the IBr1—IBr2 articulation were encountered already by Jaekel (1918) and Peck (1943) in the case of *Drepanocrinus*. One can also suppose that both IBr1 found in the studied material may belong to *Styracocrinus peracutus* (Peck). The two types of brachials from the point of view of mechanical properties, do not differ from each other. Thus the existence of these two types of IBr1 can solely be treated as the expression of intraspecific variability. Of course, the corresponding articulation surface of the IBr2 also had to slope outwards or inwards in regard to the calyx. Unfortunately, only IBr2 with an outwardly sloping articulation surface was found in the material studied. The absence of IBr2 with an articulation surface sloping in the opposite direction can be explained, however, by the small number (34) of brachials present in the studied sample. IBr2 (= IAx) (pl. 12: 5—6) corresponds closely to the ones illustrated in the literature. IIBrBr also correspond fairly well to the ones hitherto illustrated (pl. 12: 1—3). It seems that all articulations of the secundibrachials, starting with the axillary, are of the muscular type.

*Occurrence.*—Albian-Cenomanian of the USA (Texas) and Poland, Albian of north-western Germany and Cenomanian of England.

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## LILIWCE COMATULIDA I ROVEACRINIDA Z KREDY CENTRALNEJ POLSKI

### Streszczenie

Z osadów albu-cenomanu Kujaw opisano dwa gatunki liliowców: *Glenotremites* sp. oraz *Styracocrinus peracutus* (Peck); ten ostatni nie był dotychczas znany w kredzie Polski.

W oparciu o izolowane brachialia znalezione w tej samej próbie co kielichy, przeprowadzono rekonstrukcję budowy ramion u obydwu liliowców. U liliowca *Styracocrinus peracutus* (Peck) stwierdzono występowanie dwu typów elementów, które odpowiadają IBr1 i które są wobec siebie jak lustrzane odbicia. Zinterpretowano ten fakt jako przejaw zmienności wewnątrzgatunkowej

#### EXPLANATION OF PLATES 9—12

##### Plate 9

##### *Glenotremites* sp. Scale bar 0.5 mm

1. Aboral view of centrodorsal showing small dorsal star and densely packed cirral sockets without crenulation. ZPAL CaII/1.
2. Oral view of centrodorsal showing basal impressions and narrow dorsal cavity. ZPAL CaIII/2.
- 3—4, 6, 8. Brachials with both articulations of the muscular type: some of them bear small spiny outgrowths on the dorsal side. ZPAL CaIII/117, ZPAL CaIII/6, ZPAL CaIII/5, ZPAL CaIII/118.
5. Brachial showing one facet with weakly crenulated rim. ZPAL CaIII/4.
7. Distal view of first primibrachial showing synarthrial articulation. ZPAL CaIII/3.

##### Plate 10

##### *Glenotremites* sp. Scale bar 0.2 mm

1. Distal cirral in lateral view. ZPAL CaIII/119.
2. Articulation surface of distal cirral. ZPAL CaIII/116.
3. Proximal view of second primibrachial showing synarthrial articulation with the first primibrachial and small spiny outgrowths on the dorsal side.
- 4, 6. Brachials with syzygial articular facets; second facet is of muscular type. ZPAL CaIII/108. ZPAL CaIII/113.
5. Secundibrachial (probably second) with synarthrial articulation, second facet of muscular type with pinnular socket. ZPAL CaIII/111.

##### Plate 11

##### *Styracocrinus peracutus* (Peck). Scale bar 0.2 mm

1. Lateral view of calyx showing articular facet of arms, strongly sloping outwards, aboral part of cup destroyed. ZPAL CaIII/8.
2. Dorsal view of calyx showing destroyed aboral part of calyx and well developed supports of arms articulation surface. ZPAL CaIII/7.
3. Calyx, arm articulation facet showing large neural canal and a long and narrow ligamentary field. ZPAL Ca/III/8.
4. Proximal facet of IBr1 corresponding to the facet of radial plate (see fig. 3). ZPAL CaIII/115.

5. Distal articular facet of IAx. ZPAL CaIII/11.
6. Lateral view of first primibrachial showing vacuolar sculpture and distal articulation facet sloping inwards; dorsal surface to the left. ZPAL CaIII/9.
7. Lateral view of first primibrachial. Distal articulation facet sloping outwards; dorsal surface to the left. ZPAL CaIII/17.
8. Distal, cryptosynarthial facet of IBr1. Dorsal surface at the top. ZPAL CaIII/114.

## Plate 12

*Styracocrinus peracutus* (Peck). Scale bar 0.2 mm

- 1—2. Lateral view of secundibrachials. ZPAL CaIII/15, ZPAL CaIII/10.
3. Dorsal view of secundibrachial showing vacuolar sculpture. ZPAL CaIII/16.
4. Proximal surface of IBr1. ZPAL CaIII/13.
5. Ventral view of primiaxillary (IBr2) showing cryptosynarthial facet corresponding to the articulation facet of IBr1 (see plate 8). ZPAL CaIII/12.
6. Lateral view of primiaxillary showing strongly sloping proximal facet. ZPAL CaIII/14.

