Geological Quarterly, 2005, **49** (1): 105–107

SHORT COMMUNICATION

Holocrinid columnals from the Upper Muschelkalk of the Holy Cross Mts. (eastern part of the Germanic Basin)

Mariusz A. SALAMON

Salamon M. A. (2005) — Holocrinid columnals from the Upper Muschelkalk of the Holy Cross Mts. (eastern part of the Germanic Basin). Geol. Quart., **49** (1): 105–107. Warszawa.

A few isolated columnals of a holocrinid have been found in Ladinian Upper Muschelkalk deposits (probably *Ceratites* Beds) in the Świślina valley (northern margin of the Holy Cross Mts.). Although they are poorly preserved and not diagnostic at species level, this is the first occurrence of the genus *Holocrinus* in the Upper Muschelkalk of the eastern part of the Germanic Basin. This crinoid indicates faunal immigration from the Tethys through reactivated East-Carpathian Gate.

Mariusz A. Salamon, Department of Palaeontology and Biostratigraphy, University of Silesia, Będzińska 60, PL-41-200 Sosnowiec, Poland, e-mail: paleo.crinoids@poczta.fm (received: March 30, 2004; accepted: October 11, 2004).

Key words: Germanic Basin, Holy Cross Mts., Triassic, Muschelkalk, crinoids Holocrinidae.

INTRODUCTION

The genus *Holocrinus* is represented in the Polish Muschelkalk by *H. acutangulus* (Meyer), *H. dubius* (Goldfuss) and *H. meyeri* Hagdorn et Głuchowski (Hagdorn and Głuchowski, 1993; Hagdorn *et al*., 1996; Salamon, 2003). These species occur in the Lower Muschelkalk exclusively. Until now, the Upper Muschelkalk has yielded only one representative of this genus, *H. doreckae* Hagdorn, which has hitherto only been found in south-west Germany (Hagdorn, 1983). Isolated encrinid ossicles probably belonging to *Encrinus liliiformis* Lamarck, from the Upper Muschelkalk (Fassanian-Longobardian) from the northern margin of the Holy Cross Mts. have recently been illustrated by Salamon (2003). Encrinids also occur in the Upper Muschelkalk of other parts of the Holy Cross Mts. and in Upper Silesia.

LOCALITIES

In March 2004 a previously unknown Upper Muschelkalk exposure in the Świślina valley yielded a few crinoid columnals showing the isocrinid crenulation pattern of the genus *Holocrinus*. However, due to their poor preservation, the up to 9 mm wide columnals can only be determined at genus level. As holocrinid remains have not been found before in the Upper Muschelkalk of Poland, further investigations in other outcrops of the *Entolium discites* Beds and/or *Ceratites* Beds of the Holy Cross Mts. were undertaken at Pierzchnica, Skrzelczyce, Zaborze, Brudzów, and Zajączków at the southwestern of the Holy Cross Mts., and Bliżyn, Nietulisko, Bukowie, Jarugi in the northeastern margin of the area (Fig. 1). However, additional pentagonal columnals were only found at Brudzów.

The Świślina valley is situated 300 m south-west of Nietulisko, a well known Upper Muschelkalk locality (Salamon and Boczarowski, 2003). There, six subpentagonal, pentagonal, or substellate columnals of *Holocrinus* sp. were found in the 0.7 m thick glauconitic and locally strongly marly limestones, with numerous individuals of the bivalve *Entolium discites* (Schlotheim) and rare, undetermined ceratites (Fig. 2A and B).

The fossil site of Brudzów is situated in the central part of the village. The exposure comprises 5 m of dark grey micritic limestones, interbedded with nodular limestones and shell-beds. Two poorly preserved pentagonal columnals with no articulation patterns preserved were found here (Fig. 3).

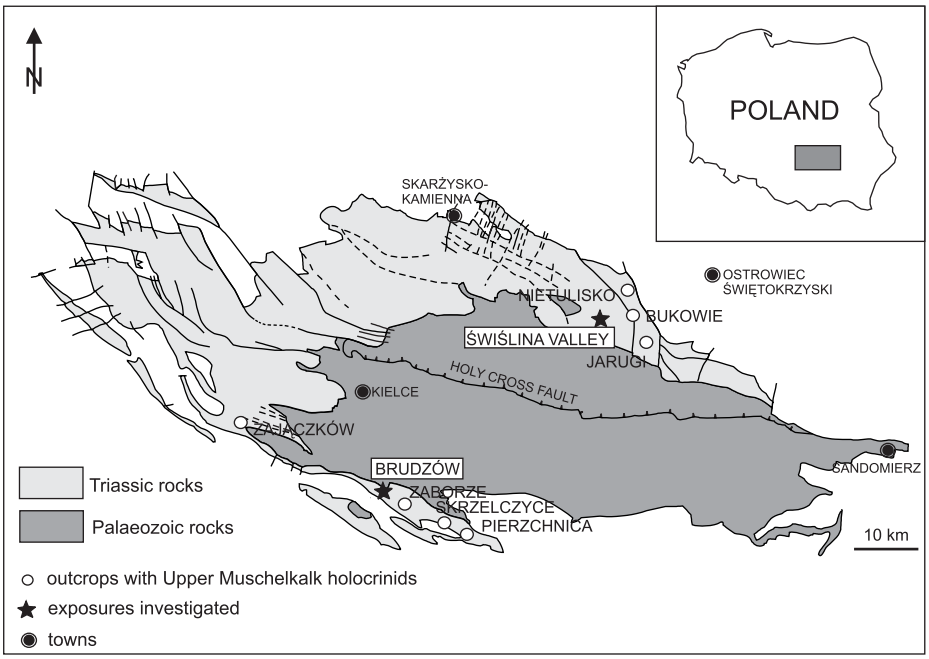

Fig. 1. Schematic geological map of the Holy Cross Mts. area (after Marynowski *et al*., 2002, slightly modified)

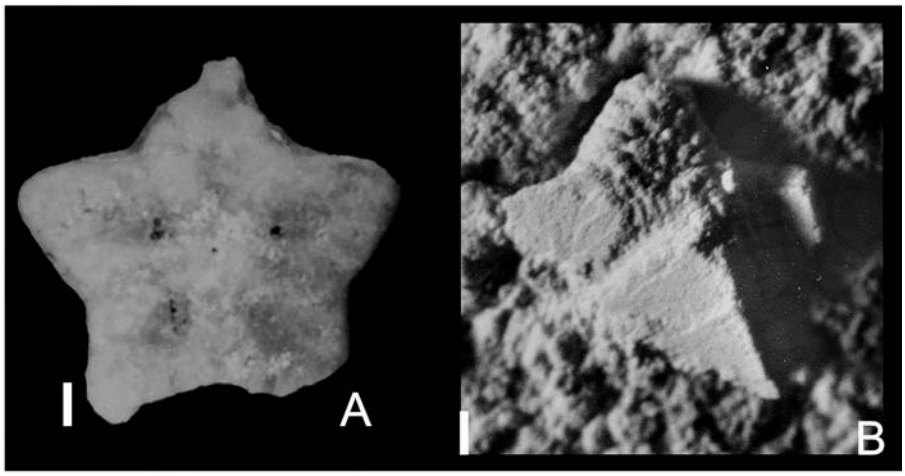

Fig. 2. *Holocrinus* sp. from the Upper Muschelkalk of the Świślina valley

A — proximal columnal, GIUS-7-2442s1; **B** — proximal columnal, GIUS-7-2442s2; scale bar 1 mm

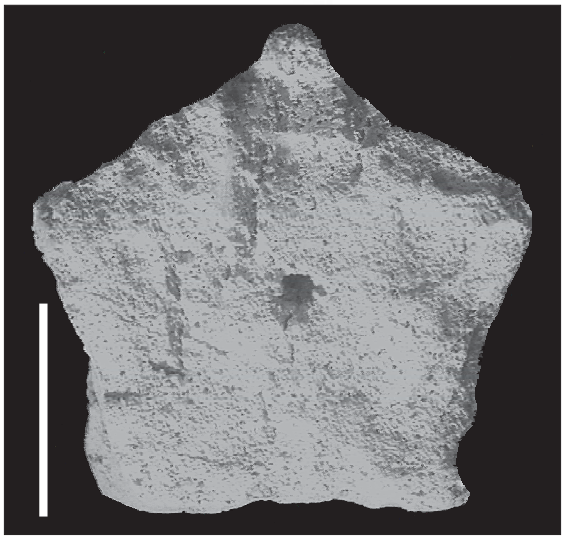

Fig. 3. Distal columnal(?) of *Holocrinus* sp. from the *Ceratites* Beds of Brudzów

GIUS-7-2442b1; scale bar 1 mm; the photographs were taken using a *Philips ESEM XL 30* microscope

DISCUSSION

Several species of *Holocrinus* have been described from the Germanic Muschelkalk, some of which are based on articulated and more or less complete individuals, others on isolated columnals. As some of the characters diagnostic at species level seem to be rather plastic, the species concept of the genus *Holocrinus* needs revision. However, the Lower Muschelkalk *Holocrinus* lineage (*H. acutangulus* – *H. dubius* – *H. meyeri*) shows an increase in size, whereas the Upper Muschelkalk *H. doreckae* does not even reach the size of *H. dubius* (Hagdorn, 1983, 1986; Głuchowski, 1986, 2000; Hagdorn and Głuchowski, 1993; Hagdorn *et al*., 1996, 1997; Salamon, 2003).

The columnals described here cannot be attributed to *H. doreckae*, which has subpentagonal to subcircular or circular columnals and does not reach 9 mm in diameter. Either it is an endemic species of the easternmost part of the Germanic Basin,

or, more probably, it is an immigrant from the Tethys. According to Salamon (2003), the East-Carpathian Gate was reactivated during latest Illyrian times while the *Entolium discites* Beds were deposited in the Holy Cross Mts. (see also Hagdorn, 1985; Hagdorn and Głuchowski, 1993). Although small-scale regional distribution patterns seem to be typical of the holocrinids within the Germanic Basin (e.g. *H. meyeri*; Hagdorn and Głuchowski, 1993; Hagdorn *et al*., 1996), the Holy Cross Mts. Upper Muschelkalk holocrinid was more likely an immigrant from the Tethys, together with *Encrinus liliiformis*. However, the Ladinian holocrinids from the northern Palaeotethys branch are poorly known.

Abbreviations of cited repositories: GIUS — Geological Institute of the University of Silesia, Sosnowiec, Poland.

Eight isolated, strongly abraded and with poorly visible crenulation pattern columnals; six from Świślina valley (GIUS-7-2442s) and two from Brudzów (GIUS-7-2442b).

REFERENCES

GŁUCHOWSKI E. (1986) — Crinoids from the Lower Gogolin Beds (Lower Muschelkalk) of the North-Eastern Part of Upper Silesia. Bull. Pol. Acad. Sc., Earth Sc., **34** (2): 179–187.

GŁUCHOWSKI E. (2000) — Triasowe liliowce basenu środkowoeuropejskiego. In: Historia basenów sedymentacyjnych a zapis paleontologiczny: 21–33. Kraków.

HAGDORN H. (1983) — *Holocrinus doreckae* n.sp. aus dem Oberen Muschelkalk und die Entwicklung von Sollbruchstellen im Steil der Isocrinida. N. Jb. Geol. Paläont. Mh.: 345–368.

HAGDORN H. (1985) — Immigration of crinoids into the German Muschelkalk Basin. In: Sedimentary and Evolutionary Cycles (eds. U. Bayer and A. Seilacher). Lect. Not. Earth Sc., **1**: 237–254.

HAGDORN H. (1986) — *Isocrinus*? *dubius* (Goldfuss, 1831) aus dem unteren Muschelkalk (Trias, Anis). Z. Geol. Wiss., **14**: 705–727.

HAGDORN H. and GŁUCHOWSKI E. (1993) — Palaeobiogeography and stratigraphy of Muschelkalk echinoderms (Crinoidea, Echinoidea) in Upper Silesia. In: Muschelkalk. Schöntaler Symp. 1991 (eds. H. Hagdorn and A. Seilacher): 165–176. Goldschneck. Stuttgart.

HAGDORN H., GŁUCHOWSKI E. and BOCZAROWSKI A. (1996) — The crinoid fauna of the Diplopora Dolomite (Middle Muschelkalk, Triassic, Upper Anisian) at Piekary Śląskie in Upper Silesia. Geol. Paläont. Mitt. Innsbruck, **21**: 47–75.

HAGDORN H., KONRÁD G. and TÖRÖK A. (1997) — Crinoids from the Muschelkalk of the Mecsek Mountains and their stratigraphical significance. Acta Geol. Hun., **40** (4): 391–410.

MARYNOWSKI L., SALAMON M. and NARKIEWICZ M. (2002) — Thermal maturity and depositional environments of organic matter in the post-Variscan succession of the Holy Cross Mountains. Geol. Quart., **46** (1): 25–36.

SALAMON M. (2003) — Środkowotriasowe liliowce (Crinoidea) obszaru świętokrzyskiego. Unpubl. Ph.D. thesis of the University of Silesia. Sosnowiec.

SALAMON M. and BOCZAROWSKI A. (2003) — The first record of *Aspiduriella* (Ophiuroidea) in the Upper Muschelkalk of Poland. Geol. Quart., **47** (3): 307–310.