ACTA PALAEONTOLOGICA POLONICA

Vol. 38, No. 1/2, p. 119–120, Warszawa, 1993

Paper reviews

Affinities of the Heterocorallia

Fedorowski J. 1991. Dividocorallia, a new subclass of Palaeozoic Anthozoa. *Bulletin de l'Institut royal des Sciences Naturelles de Belgique* 61, 21-105.

Fedorowski in this paper proposes that the Early Devonian (Emsian) coral Pseudopetraia *devonica* Soshkina 1951 (Fig. 1C, D) is ancestral to the heterocorals (Fig. 1E, F), being different from them only in preserving of a rugosan-like calyx, totally absent in the heterocorals (Fig. 1F). According to Fedorowski Pseudopetraia shares with the true heterocorals the mode of septal formation by peripheral division of already existing septa, which start their development in the center of the corallite, beginning from a single axial septum (oblique septum).

Indeed, such a mode of septal formation can be inferred for the heterocorals, as suggested by centrifugal growth of skeletal elements (Wrzołek 1981: p. 515) and by apparent bifurcations of septa at the corallite periphery (Fig. 1E). On the other hand the septal insertion pattern, i.e. sequence of insertion of new septa, potentially useful to establish affinity of the Calyxcorallia with either heterocorals or rugosans were presented only indirectly by Fedorowski (1991), who indicated a heterocoral-like arrangement of axial septal segments in *Pseudopetraia*, Stylostrotion and Sudetiphyllia He assumed, that the septal insertion pattern can be deduced from a single transverse section (Fedorowski 1991: p. 24). According to his view, the oldest part of a transverse section, the oblique septum, occurs in the axis, than septa of subsequent generations develop towards periphery.

This has not been confirmed in the calyxcorals (nor even in the heterocorals). In Pseudopetraia devonica Soshkina 1951 (Fedorowski 1991: Figs 24, 25, Pl. 1: 12-14) septa change orientation in the axial parts of corallites and may even lose connection with each other. This makes any reconstructions of septal insertion patterns based solely on septal arrangement unreliable. Weyer (1991) has inferred a rugosan insertion pattern in the Early Devonian (Pragian) Pseudopetraia *issa* Weyer 1991 from the serial transverse sections and from the rugosan arrangement of longitudinal furrows of the epitheca (as in Fig. 1B).

It appears thus that an interpretation of arrangement of axial septal segments is not a reliable way to recognize patterns of septal insertion in the Calyxcorallia. On the other hand the latter group (Fig. 1C, D), as presented by Fedorowski (1991) displays some features typical for the Rugosa (Fig. 1A, B):

1) theca, that precedes in its development formation of septa,

2) growth of peripheral parts of septa starting from the periphery towards axis (Fedorowski 1991: Fig. 12),

3) presence of the first and second order septa.

To prove or disprove the opinion that some Calyxcorallia may be ancestral to the Heterocorallia, as they do not have the homologues of the cardinal, counter and lateral septa of the Rugosa (Fedorowski 1991: p. 48, right column, point 3) additional evidence is required. It can be potentially obtained by an analysis of septal traces at the external surface of corallite or identification of insertion points of new septa in serial sections. Until this is done the phylogenetical relationships of Pseudopetraia and similar corals (Calyxcoralliaof Fedorowski 1991) with the Rugosa and/or the Heterocorallia will remain obscure.

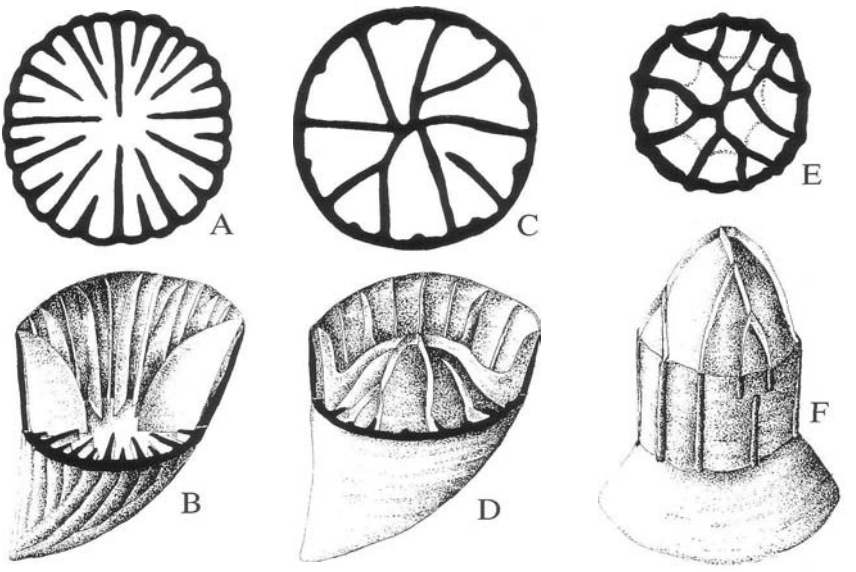

Fig. 1. Schematic presentation of corallite organization in discussed groups – transverse sections and oblique side views with frontal calical segments removed in B and D. ❑A, B. Rugosa. ❑C, D. Calyxcorallia. OE, F. Heterocorallia.

References

Weyer D. 1991. *Pseudopetraia* Soshkina 1951 (Anthozoa, Rugosa) aus dem Unterdevon des Thüringischen Schiefergebirges. *Abhandlungen* und *Berichte fur* Naturkunde und *Vorge*schichte 15, 9-24.

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Tomasz Wrzołek, Katedra Paleontologii i *Stratygrafii* Uniwersytetu *Śląskiego*, ul. *Będzińska* 60, 41-200 *Sosnowiec,* Poland.