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Paper review

Hexactinellid sponges from the epicontinental Triassic of Europe

Bodzioch, A. 1993. Sponges from the Epicontinental Triassic of Europe. In H. Hagdorn and A. Seilacher *Muschelkalk. Schöntaler Symposium 1991*, 235–244, 19 text-figs, 1 table. Goldschneck-Verlag, Stuttgart.

Bodzioch, A. 1994. Paleoecology of hexactinellid sponges from the epicontinental Triassic of Poland. In R.W.M. van Soest, Th.M.G. van Kempen, and J.C. Braekman (eds) *Sponges in Time and Space. Biology, Chemistry, Paleontology. Proceedings of the 4th International Porifera Congress Amsterdam/Netherlands/19–23 April 1993*, 35–44. A.A. Balkema, Rotterdam.

As in many other invertebrate groups, the Mesozoic hexactinellid sponges, especially the abundant and relatively well known Jurassic and Cretaceous ones, differ profoundly from those of the Paleozoic. The Paleozoic hexactinellids represent nearly the entire lyssacinosan grade of evolution i.e. loose, or only partly fused choanosomal skeletons. They may also contain spicules with some rays of the basic hexactine suppressed, up to diactine stage. To the contrary, the Jurassic and Cretaceous faunas are dominated by hexactinellid sponges of the order Hexactinosa, in which a choanosomal skeleton is composed exclusively of hexactines fused into a more or less regular linear series called dictyonal strands. The Triassic sponge faunas are thus crucial to understanding this evolutionary discrepancy. Most unfortunately hexactinellid sponges of this age, as often is the case with other coeval groups of marine organisms, remain poorly known. The reviewed papers dealing with new Triassic faunas could potentialy be very important for students of fossil sponges. They may be treated here jointly not only because of common author and time of publication, but also by being based on the same material with even the same photographs, and text-figures.

The paper published in the *Schöntaler Symposium* volume is clearly a review paper, despite the fact that it gives some descriptions of a supposedly new species of sponges. It presents, with original figures reproduced, earlier described siliceous sponges from the epicontinental Triassic of Europe, as well as their paleogeographical and stratigraphical distribution. This is a good idea, for this type of volume, as it makes access easier to dispersed papers, presenting a clear picture useful also for the nonspecialist. For the same reason, I believe, the author sums up the very recent paper on the lyssacinosan sponges from the Triassic of Poland (Pisera & Bodzioch 1991). In addition, 3 new species and one new genus are described and illustrated.

The paper in the *Sponges In Time and Space* volume, is mostly sedimentological and paleoecological in aspect, presenting reconstructions of sedimentary environments and proposing a model of environmental distribution of various sponge species. Five species are discussed without precising their taxonomic position, some are illustrated and generally characterized.

If both papers are compared, several of their aspects, both technical and merit, evoke some doubts. What is the reason, for example, for reprinting the original diagnoses of *Hexactinoderma trammeri* Pisera & Bodzioch 1991 and *Silesiaspongia rimosa* Pisera and Bodzioch 1991 (without quotation marks or any reference to the original paper) if they have been properly presented in a rather recent publication. Why is there no credit given to the paper from which *Conclusions* (located in the middle of the paper) are taken?

There are problems also on the merits. Both the diagnosis and photographs of *H. wolicensis* (figs 13A, B, D, but not 13C and E in the *Schöntaler Symposium*) do not show any difference in respect to those of the species *H. trammeri* Pisera & Bodzioch 1991, except for the wall thickness which is known to be variable (and which is clearly much thicker than alleged 3–5 mm as one can judge from the fig. 13A). On the other hand, the hexactines presented on fig. 13E cannot be dermal spicules of this species having in most cases rays of nearly equal length; they also do not show any traces of fusion, although dermal hexactines of *H. wolicensis* should have distal rays reduced and are fused with choanosomal skeleton, as it follows from the diagnosis and photograph (Fig. 13D). As one may judge from the photographs, the dermal spicules of *H. wolicensis* and loose hexactines are of different size. Similar spicules are common in acid resistant residue, and were earlier attributed *to Silesiaspongia rimosa* (see Pisera & Bodzioch 1991). There is thus no convincing evidence offered that *H. wolicensis* is not conspecific with the earlier described *H. trammeri.*

It is a little surprising to note that the type series on which the new genus and species *Calycomorpha triasina* has been based stays in the author's collection. According to the recommendation of ICZN (pointed out even on the cover page of this journal: *Acta Palaeontologica Polonica* 37/1, 1992) such materials should be deposited in public collections.

The proposed environmental reconstructions of sponge habitats in these papers may suggest a profound change in ecology, not only between the Triassic and Recent lyssacinosan sponges, but even between the Triassic and Jurassic ones. The Jurassic sponges of this group inhabited rather deep shelf and are associated mostly with originally muddy (although calcareous) sediments, while those of the Triassic clearly occurred also in more energetic settings characterized by grainstones. Unfortunately, Bodzioch's interpretations of sponge adaptations, are hardly convincing, and there are apparent inconsistencies between paleontological descriptions in one paper and comments on inferred morphological adaptations in the other. For instance, *Silesiaspongia rimosa* is described as a cup-shaped sponge in the *Schöntaler Symposium* volume and as a plate-like in *Sponges in Time and Space*. A similar discrepancy arises when the diagnosis and description of *H. wolicensis* in one paper is compared with its supposed mode of life reconstructed and discussed in the second, where it is shown anchored in the substrate with the long diactine spicules. This feature is mentioned neither in the diagnosis nor description and illustrations. Such an adaptation is typical rather of amphidiscophoran sponges and muddy low energy substrates, contrary to Bodzioch's model.

Hardly convincing is the discussion of the role of dermal spicules, that have been found only in some species (in fact probably all these sponges had some kind of dermal spiculation which was not fused and thus not preserved) as protecting sponges against canal clogging by sediment; in fact such a role is performed by the dermal membrane that bears ostia of much smaller diameter than the canal openings observed in the choanosomal skeleton or meshes between the dermal spicules embedded in it.

The firm statement that there is a relationship between the rigidity of the skeleton and wave energy is entirely contrary to what we know about Recent sponges (and not supported by Bodzioch's own data). In the most wave exposed settings sponges with their elastic skeleton supplied with only loose spicules occur, while those with a rigid skeleton are known either from deep-water, low energy areas, or more rarely shallow-water protected settings (caves and crevices).

In summary, in the light of the above listed critical remarks Bodzioch's papers, however generally interesting, must be treated with some caution.

References

Pisera, A. & Bodzioch, A. 1991. Middle Triassic lyssacinosan sponges from the Upper Silesia (southern Poland), and the history of hexactinosan and lychniscosan sponges. *Acta Geologica Polonica* **41**, 193–207.

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