Bdellacoma in the Hunsrück Slate (Lower Devonian, Germany): **Reidentification of Urasterella verruculosa (Asteroidea, Bdellacomidae)**

Summary

• Bdellacoma Salter, 1857, is confirmed present in the Hunsrück Slate. Urasterella verruculosa Lehmann, 1957, is reidentified as *Bdellacoma verruculosa*. *Bdellacoma* is an asteroid. However it is Order *incertae cedis*.

The Problem

- Occurrence of *Bdellacoma* Salter, 1857, in the Hunsrück Slate was mentioned three times by W. K. Spencer and once by G. Ubaghs, but no specimens were cited (Spencer 1940, 1950; Ubaghs 1953; Spencer & Wright 1966).
- No specialist on the fauna of the Hunsrück Slate has listed *Bdellacoma*.

The Solution

- Inquiry to the Natural History Museum, London, turned up specimens BMNH E13627 and E13630 from the Hunsrück Slate labeled *Bdellacoma*.
- The specimens have recognizably preserved pedicellariae of a highly distinctive morphology.
- Isolated values of these pedicellariae were described as the supposed ostracod Bursulella Jones, 1887.



from Boczarowski (2001)

- Boczarowski (2001) recognized stereom microstructure and reinterpreted *Bursulella* as echinoderm pedicellariae.
- Sutton et al. (2003, 2005) identified the *Bursulella* animal as *Bdellacoma* and made other important observations on Bdellacoma.
- This confirms identification of the BMNH specimens as *Bdellacoma* sp.

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Next Problem

• The BMNH specimens also match the Hunsrück Slate asteroid Urasterella verruculosa Lehmann, 1957.

The Solution

• Examination of the holotype of *U. verruculosa* confirms the presence of bursulella-type pedicellariae and establishes that it is a species of Bdellacoma.

[No. Ow 173 in the Institute for Paläontologie, Rheinische Friedrich-Wilhelms Universität in Bonn]

• The holotype has a large convex madreporite with madreporiform markings located in aboral interradial position.



Ow 173 holotype Bdellacoma verruculosa (Lehmann, 1957)

- Demonstration of a madreporite of asteroid type requires transfer of the family Bdellacomidae from the Ophiuroidea to the Asteroidea.
- The Hunsrück Slate asteroid Urasterella verruculosa is reidentified as Bdellacoma verruculosa new combination (Asteroidea, Bdellacomidae).

Additional observations

- Eight additional specimens of *U. verruculosa* were acquired for study: MPRI 55 – MPRI 62.
- Ribbon-like arms join at the mouth frame; there is no interbrachial disk
- The disk and arms have similar texture and almost no thickness

• The only plates of any solidity are the plates of the mouth frame, the madreporite and the pedicellariae







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• The plates of the mouth frame and the madreporite make a visible circlet on x-ray film. There is no buccal slit.

• Pedicellariae form an organized fringe at the edges of the arms but are irregularly arranged on the aboral surface of the arms. The regular spacing of the fringe pedicellariae is organized by the spacing of the adambulacral plates.





• Almost all pedicellariae have closed valves, but one pedicellaria has its valves open 180 degrees.

• Shallow open channel for radial water vessel. The perradial suture is straight. Alternating ambulacral plates of the flooring plate type with T-shaped ridge. Polonica No. 59:1-219. Jones, T. R. 1887. Notes on some Silurian Ostracoda. Kungliga Boktryckeriet, PA Norstedt & Söner, Floor of each podial basin formed equally from two successive ambulacral plates.

• Pyritized traces of tube feet in MPRI 58. The ends of the flattened tube feet are lobed and do not suggest suckers.



Significance and discussion



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• The position and markings of the madreporite in *Bd. verruculosa* establish that *Bdellacoma* is an asteroid. Assignment of *Bdellacoma* to the Asteroidea by Sutton et al. (2005) on the basis of pedicellariae is thereby confirmed. *Bdellacoma* is not an anomalous ophiuroid.

 Identification as an asteroid, Order incertae cedis, raises new questions, especially concerning the presence and nature of the sublateral plates described by Spencer (1940). Sublateral plates have not yet been recognized in *Bd. verruculosa*.

• The fossil record of *Bdellacoma*, including microfossils (Kesling & Chilman 1978), ranges from Early Silurian to Early Carboniferous, with localities in England, Gotland, Poland, Germany and USA (MO, IA, OH).

Ow 173 holotype Bdellacoma verruculosa (Lehmann, 1957)

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