

## Soft-tissue attachments in orthocerid and bactritid cephalopods from the Early and Middle Devonian of Germany and Morocco

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In the Early to Middle Devonian shale sequences of Germany and Morocco, pyritised and secondarily limonitised cephalopod remains are common. Details of the soft-tissue attachment structures are sometimes preserved on the internal moulds of the body chamber and phragmocone of these cephalopods. Some of the studied Orthocerida show a very faint annular elevation and a dorsal furrow. A few Bactritida show a distinctive annular elevation with two circular bands. The bands form a paired or threefold lobe at the dorsum of the shell. Morphological differences between Orthocerida and Bactritida suggest different soft part morphologies. A comparison of the attachment scars shows that the Bactritida are intermediate between the Orthocerida and ammonoids with regard to their muscle attachment scars. The shape of the muscle scars are interpreted as indication for a planktonic lifestyle in Orthocerida and a comparatively active, nektonic lifestyle in Bactritida and ammonoids. The new genus *Acanthomichelino-ceras* is erected. *Acanthomichelino-ceras commutatum*, *Cycloceras* sp., *Bactrites gracile*, *Bactrites* sp. A, *Bactrites* sp. B, and *Bactrites* sp. C are described.

**Key words:** Cephalopoda, Bactritida, Orthocerida, soft-tissue attachment, muscle scars, Emsian, Eifelian, Morocco, Ger-many.

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