

## The Early Cambrian origin of thylacocephalan arthropods


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*Zhenghecaris shankouensis* gen. et sp. nov. is one of the largest 'bivalved' arthropods of the Lower Cambrian Maotianshan Shale fauna. Its non-mineralized carapace was dome-like, laterally compressed, armed with rostral features, and probably enclosed the entire body of the animal. *Zhenghecaris* was provided with elliptical stalked lateral eyes. The carapace design, external ornament and visual organs of *Zhenghecaris* suggest affinities with the Thylacocephala, an extinct (Lower Silurian to Upper Cretaceous) group of enigmatic arthropods whose origins remain poorly understood. The bivalved arthropods *Isoxys* and *Tuzoia* (Lower and Middle Cambrian) are two other potential thylacocephalan candidates making this group of arthropods a possible new component of Cambrian marine communities. *Zhenghecaris*, *Isoxys*, and *Tuzoia* are interpreted as nektonic animals that probably inhabited the lower level of the water column in shallow shelf settings at depths of perhaps 100-150 m or less. Their feeding mode either in the water column (e.g., mesozooplankton) or on the substrate (e.g., small epibenthos, detritus) is uncertain, although some of these arthropods were possibly mid-water predators (e.g., *Isoxys* with raptorial appendages).

**Key words:** Arthropoda, *Zhenghecaris*, Lagerstätte, Cambrian, Maotianshan Shale, China.

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