

# **Circulatory organs in the cerci of polyneopteran insects**

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The cerci are paired abdominal appendages at the rear end of many insects. They are true extremities which form in most cases long segmented structures which are densely covered with various sensilla. They function as backward directed antennae which serve important functions like triggering flight reaction. The sensory cells as well as the other living tissue hosted in the cerci require a continuous supply of haemolymph. In ancestral hexapods the cerci are supplied by cercal arteries which originate from the rear end of the dorsal vessel. This connection was probably lost during evolution and various other haemolymph guiding structures evolved like channels, diaphragms, or complex auxiliary pumping organs. The present study focuses on the functional morphology of cercal circulatory organs in the cockroach *Periplaneta americana* using semithin serial sections, microCT and the computer software AMIRA for 3D-reconstruction. Observation of the haemolymph flow pattern at the base of the cercus will be analysed in addition to try to elucidate the mechanism behind the flow in the cercus. The results will be used together with preliminary data from other major taxa to reconstruct the evolution of the circulatory organs within the polyneopteran clade.