A comparison of anatomical data collected by computer tomography (micro-CT) and histological sections on small, skeneimorph Vetigastropoda

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Introduction

Anatomical and morphological data are crucial to shed some light onto the polyphyletic assemblage of skeneimorph vetigastropods. Until now histological semi-thin sectioning of plastic embedded material was the only way to get these data sets. Recent methodological progress allows to get computer tomographic (CT) data sets with high resolution in micrometer scale. In this study a specimen of *Protolira valvatoides* Warén & Bouchet, 1993 (diameter of soft parts approx. 1.7 mm, 1185 sections) was investigated by CT-scan. Anatomy and 3D reconstructions are compared with the data of a serially sectioned *Wanganella sp.* (diameter of soft parts approx. 0.95 mm, 480 sections).

Methods

Protolira valvatoides was first critical point dried. The CT-scan was performed in a „Gatan X-ray Ultra-Microscope“.

Wanganella sp. was serial sectioned using a rotatory microtom, diamond knife and was photographed digitally afterwards. All reconstructions were performed using the software Amira.

Voxel size: *P. valvatoides* 1.6 x 1.6 x 1.6 µm, *Wanganella sp.* 1.0 x 1.0 x 1.5 µm.

Discussion

CT-data are very helpful to get perfectly aligned section series without destroying critical point dried soft parts. Also it is a good method to investigate problematic specimens, e.g. those containing stones in the mantle cavity or hard minerals in the intestine, which cannot be sectioned with diamond knives, as in *P. valvatoides* here. However, the resolution of the CT-scans does not reach the same quality as a good histological section series photographed with digital camera setup. Especially small anatomic details like tiny nerves or histo-logical details are missing. Also the kidneys and genital-/reno-pericardial-ducts are problematic. CT-scans are extremely helpful getting a first, fast overview of the general anatomy, but they cannot replace semi-thin sectioning concerning the micro-anatomy and histology of such small gastropods.

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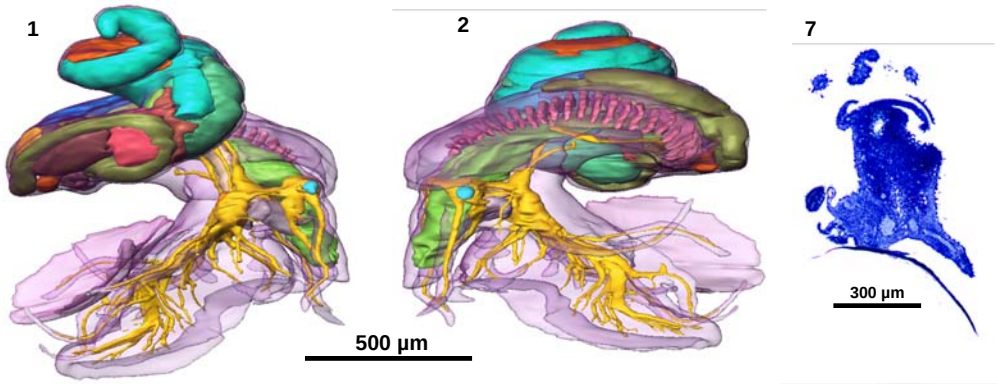
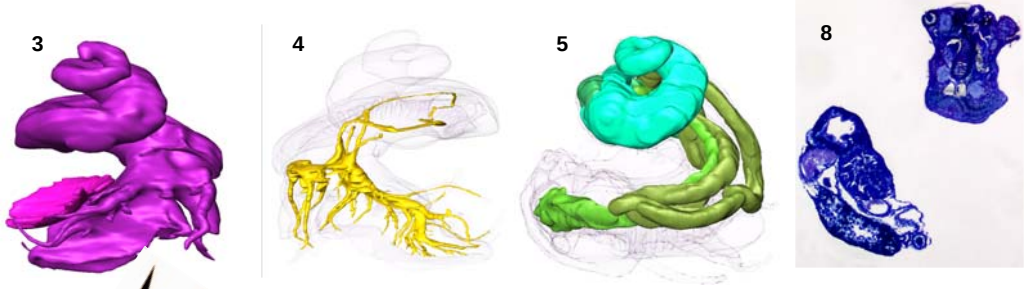
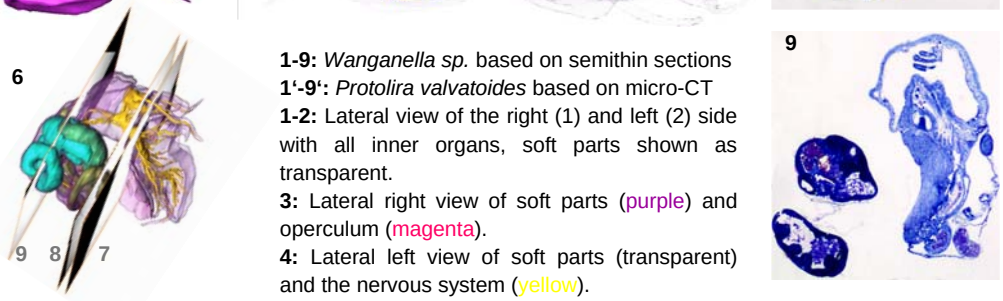
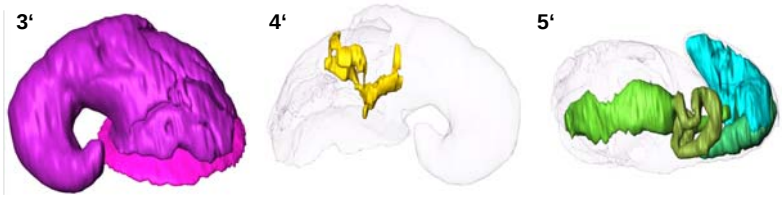
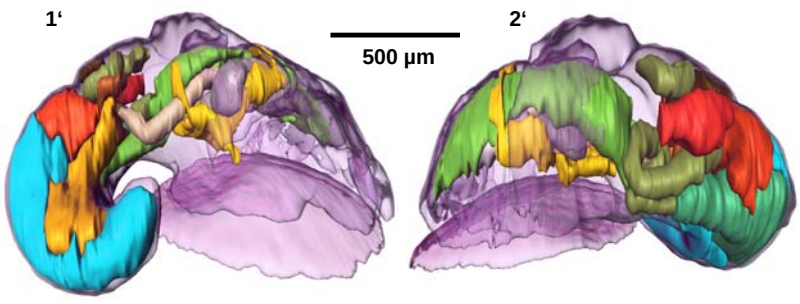
3 D-reconstructions of *Wanganella sp.; semi-thin section series*











3 D-reconstructions of *Protolira valvatoides; CT-scan*