The Microanatomy of *Ventsia tricarinata* Warén & Bouchet, 1993, a Skeneimorph Vetigastropod from Pacific Hydrothermal Vents (Mollusca)

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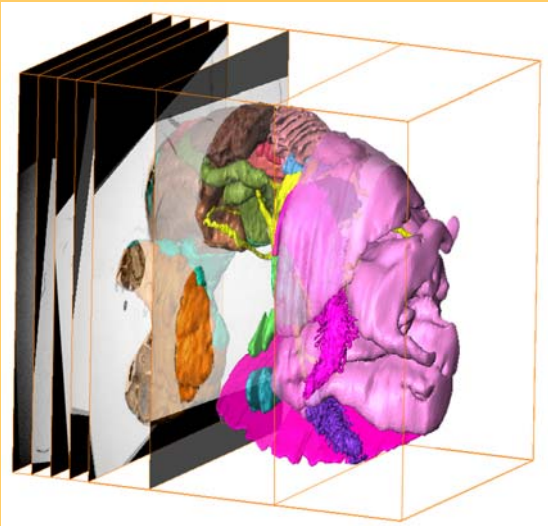
Introduction

The family Skeneidae (Mollusca: Vetigastropoda) is currently regarded as a polyphyletic lumping pot for small (max. 3 mm), rhipidoglossate gastropods showing signs of internal fertilisation. Here we describe the microanatomy of the small (max. 2.5 mm), helicoid hot-vent inhabitant *Ventsia tricarinata* Warén & Bouchet, 1993 from the Lau Basin, Fiji (1800 m depth) and discuss its phylogenetic affinities.

Material & Methods

Serial semithin sections were made through the softpart of an adult animal of *Ventsia tricarinata* (850 slices). Digital images of each mechanical slice were recorded on a light microscope, imported into the 3D-rendering software Amira™, converted to stacks, aligned and segmented manually. Then the abstracted organ contours were used to compute surface-models of several organ systems, to display these "materials" at any angle of view and to carry out some procedures of morphometric analysis.



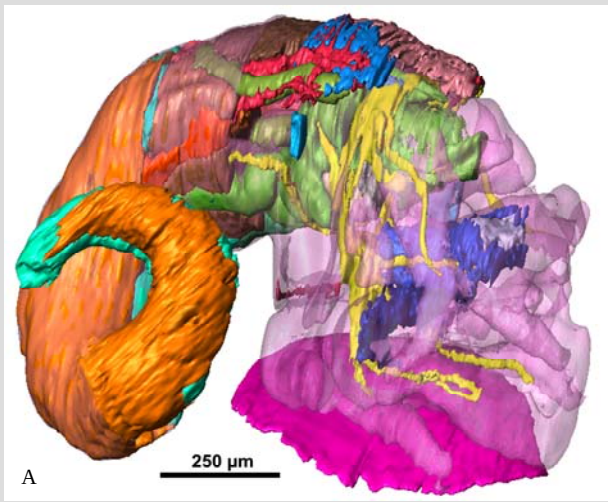
Discussion

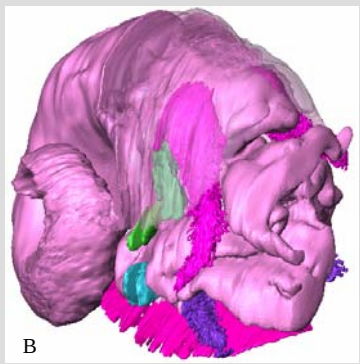
The presence of papillate cephalic and epipodial tentacles, a ctenidium with skeletal rods and bursicles, a papillary left excretory organ, a papillary anterior oesophagus, and statocysts with several statoconia all strongly suggest a position inside the Vetigastropoda. This is further strengthened by a ventricle encircling the rectum and a right kidney with large volume and a urinogenital opening. The remaining characteristics of *Ventsia* show a unique mosaic of plesiomorphic and apomorphic characters, which do not fit in any known vetigastropod subclade: The distinct appearance of epipodial tentacles and separate tentacular epipodial sense organs argues against an inclusion into the Trochoidea and thus Skeneidae, where combined epipodial tentacles are always present. Apomorphies like the single (left), monopectinate ctenidium, the presence of organs for inner fertilisation (penis or receptaculum seminis), a monotocardian heart and the lack of a right renopericaridal duct all are known to be homoplastic characters within basal gastropod groups.

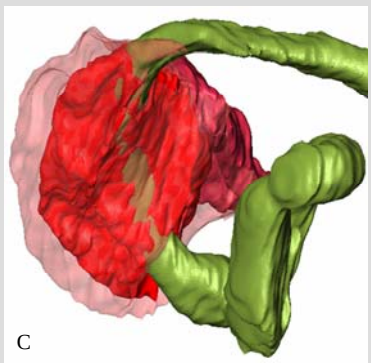
Lacking autapomorphies of all existing vetigastropod subclades the skeneimorph *Ventsia tricarinata* cannot be classified in the present system but deserves at least its own family. However, since most skeneimorph microgastropods await microanatomcial as well as molecular studies, it seems premature to establish a new superior taxon prior to a thorough phylogenetic analysis. At present, *Ventsia* seems best classified as "Vetigastropoda *incertae sedis*".

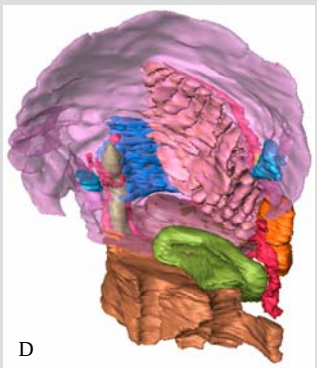
Results

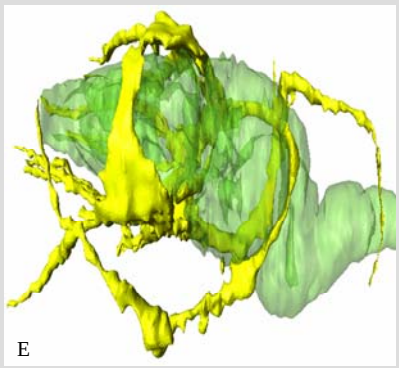
Ventsia tricarinata is characterized as follows: papillate cephalic and epipodial tentacles; one pair of epipodial sense organs (ESO); right neck-lobe with two tentacles; a single, left, monopectinate ctenidium with skeletal rods and bursicles; a monotocard heart; a ventricle encircling the rectum; a papillary left and a voluminous right kidney; a rhipidoglossate radula; a pair of radula cartilages; a papillary anterior oesophagus and two interstine loops; a hypo-athroid nervous system; two statocyts with several statoconia; a single left osphradium; a subradulary organ; separate sexes; a female genital apparatus consisting of an ovary with big yolky eggs covered by a thin vitelline layer and an oviduct, which generates an urinogenital duct with the right kidney; a male genital apparatus consisting of an lobate testis.











A: softpart (transparent) with all organs and operculum (pink) (*lateral right view*)
B: softpart with tentacles, mantel roof transparent (cephalic tentacles: light magenta, ESO: turquoise, operculum: pink, tentacles on the right neck-lobe green) (*dorso-lateral right view*)
C: ventricle encircling the rectum (auricle: dark red, intestinum/rectum green, pericard: transparent red, ventricle: red) (*lateral right view*)
D: mantle roof with pallial organs (blood vessels: red, gill: pink, hypobranchial gland: dark blue, interstinum/rectum: green, left kidney: brown, receptaculum seminis: dark orange, urongenitalduct: orange) (*dorsal view*)
E: nervous system (yellow) with anterior digestive tract (green) (*dorso-lateral left view*)