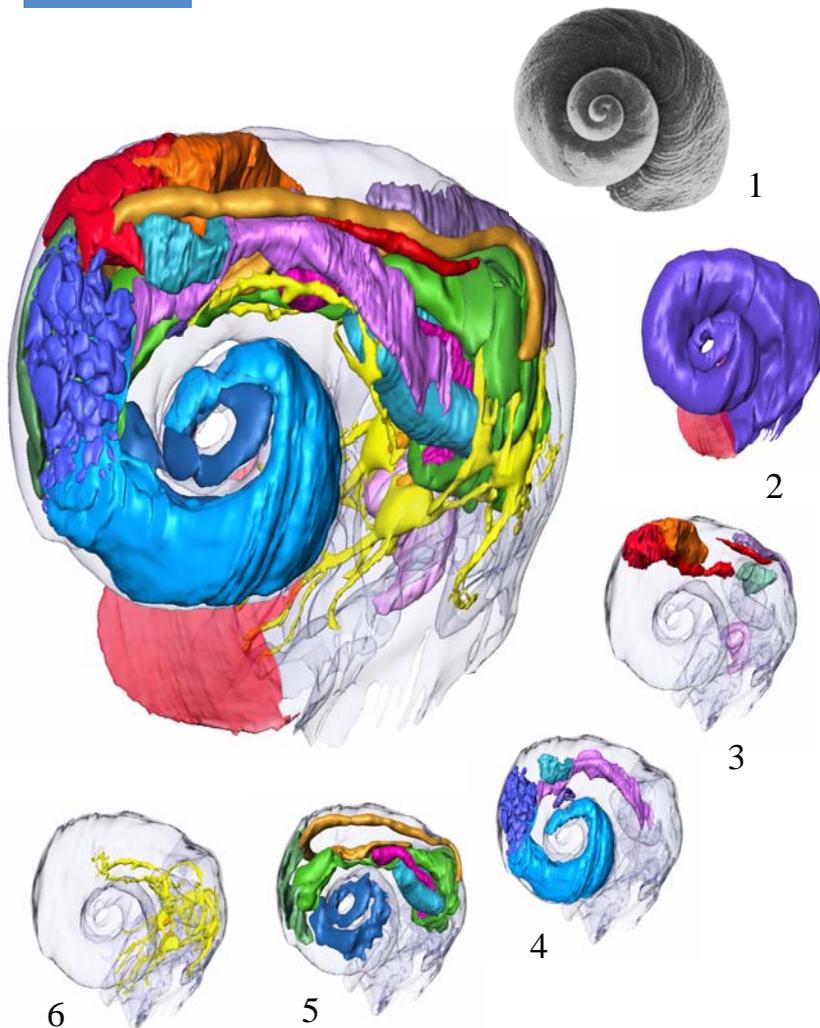


The Microanatomy of *Leptogyra constricta* Marshall, 1988 and *Leptogyropsis kalinovae* Marshall, 1988 (Gastropoda, Neomphalida)



Introduction & Methods

The helicoid microgastropods (1-2 mm shell diameter) *Leptogyra constricta* and *Leptogyropsis kalinovae* from sunken wood off New Zealand (depth about 1000 m), have been originally classified among the poorly defined Skeneidae (Vetigastropoda, Trochoidea) based on shell characters, external morphology and radula fine-structure.

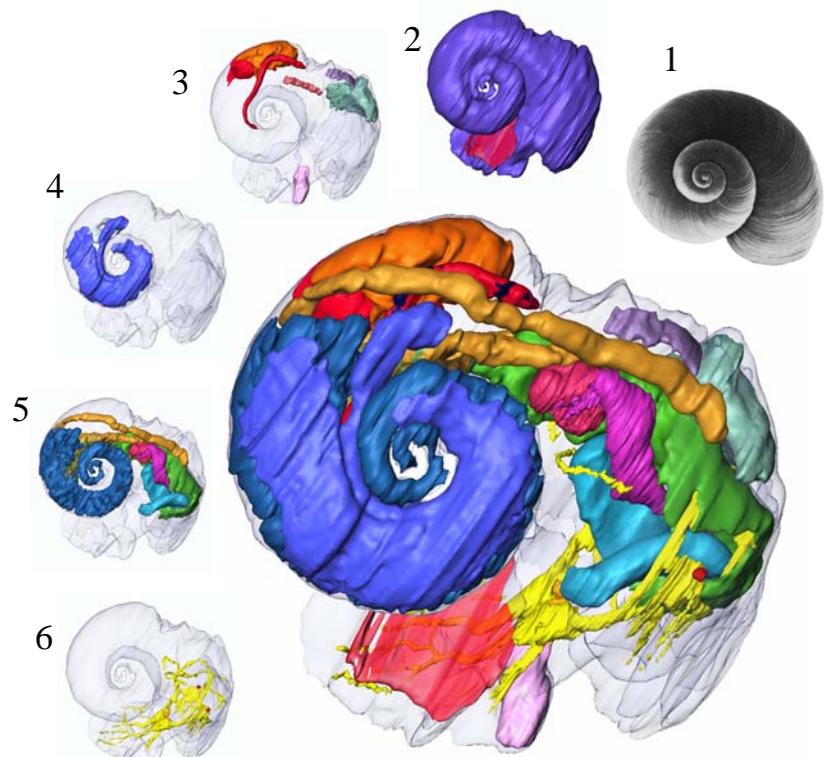
To scrutinize the systematic placement we investigated the microanatomy and histology of the two above mentioned species by means of serial semithin sectioning followed by computer-aided 3D-reconstruction (software AMIRA™).

Results

The soft body of *Leptogyra constricta* is characterized as follows:

Blunt snout; round propodium with short lateral outgrowths; four head appendages: penis, accessory penis and two laterally placed, smooth cephalic tentacles; several smooth epipodial tentacles; single pedal gland; single bipectinate gill with skeletal rods; single (left), kidney; monotocardian heart bypassed by rectum; hermaphroditic genital system with separated receptaculum; rhipidoglossate radula with a bifid radular caecum; one pair of radular cartilages; two digestive glands; hypoathroid and streptoneurous nervous system; no eyes; a single (left) osphradium; statocysts with a single statolith inside ...

▼ 3D-reconstructions of *Leptogyropsis kalinovae*



▲ 3D-reconstructions of *Leptogyra constricta*

... All examined specimens of *Leptogyropsis kalinovae* were females with simple oviduct and separated receptaculum seminis. This species resembles the former in most anatomical characters, differences are a single digestive gland, asymmetrically orientated radular cartilages, oesophageal papillae and a pair of reduced eyes.

Discussion

The anatomical data clearly exclude *Leptogyra constricta* and *Leptogyropsis kalinovae* from the Trochoidea - Skeneidae and the Vetigastropoda as a whole, but strongly suggest a systematic position among the likewise rhipidoglossate Neomphalida, where the small, helicoid *Melanodrymia* shows most similarities. Preliminary data on shell structure (Steffen Kiel pers. comm.) and molecular studies (Yasunori Kano pers. comm.) confirm this result. The "sunken wood habitat" might have served as an ecological bridge between the ancestral regular deep benthos and the hydrothermal vent habitat otherwise typical for Neomphalida.

- 1 SEM image of the shell (from Marshall 1988, J Nat Hist 22, 949-1004)
- 2 Surface of soft body (blue) with operculum (red)
- 3 Vascular & excretory system: auricle, ventricle & blood sinus (red), hypobranchial gland (violet), gill (turquoise), foot gland (pink)
- 3 Genital system: ovary + oviduct in *L. kalinovae* (dark blue), testis (light blue), receptaculum seminis (violet, gray in *L. kalinovae*), gonoduct (ilac), blind sac (turquoise).
- 4 Alimentary system: pharynx, oesophagus & stomach (light green), digestive glands (dark green & dark blue), radular cartilages (light blue), radula (purple), brown: intestine
- 5 Nervous system (yellow) and statocysts (orange). *L. kalinovae* with eyes (red).