
Chaetoderma felderi — a new giant caudofoveate species from the Gulf of Mexico (Mollusca: Aplacophora)

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ABSTRACT. *Chaetoderma felderi* is a new species of Caudofoveata from the upper slope of the Gulf of Mexico. This is the first “giant” representative of the taxon whose size (407 mm in length when alive) is more than twice as large as any previously known caudofoveates. The description is based on a specimen found at the depth of 850-610 m during a recent NSF-sponsored dredge-sampling cruise of R/V Pelican in the Gulf of Mexico.

Introduction

Benthic caudofoveates are distributed almost globally except in Antarctic and sub-Antarctic waters and in the Black and Baltic Seas. It is a taxon so far comprised of about 150 described and ready to be described species; nearly one third belong to the family Chaetodermatidae. Despite the small species number, in many localities they are an important part of the deep-sea benthos due to their numerical abundance [Salvini-Plawen, 1975]. Benthic Caudofoveata are usually <50 mm in length, and covered by glistening aragonite sclerites that identify them as belonging to the Aplacophora. The description here of an outstanding giant chaetodermatid species from the upper slope of the Gulf of Mexico gives us a chance to widen our notions about the diversity of Caudofoveata.

Methods and material

Methods for studying caudofoveates and the taxonomic characters used here are given in full in Scheltema and Ivanov [2000, 2004], with some techniques emended here. The characters are based on external appearance, including measurements of the anterior, neck, anterior and posterior trunk, and posterium (Fig. 1A), the ratio of neck to total length and the ratio of anterior and posterior trunk lengths to total length; on the morphology of sclerites from anterior to posterior including the base, blade, longitudinal axis, keels, ridges and grooves and isochromes (lines of equal color when viewed under cross

polarized light) (Fig. 2); and on the morphology of isolated radulae (Fig. 1D, E).

Fragments of cuticle within sclerites from 8 points of different body regions (Fig. 1B) were placed in household bleach (hypochlorite) for 3-5 minutes; the fragments were thoroughly washed and then sclerites separated onto a slide, air-dried, and mounted. For scanning electron microscopy (SEM) stubs, the same techniques as for slides were used. Stubs were covered by double-coated carbon conductive tabs and coated with gold.

The radula was dissected and cleared of tissue in bleach and washed thoroughly before mounting in a small drop of glycerine on a slide. It was then covered with a small, round coverslip raised by small bits of broken coverslips. The preparation was then covered by a larger coverslip and Histomount®, sealing in the glycerine.

The holotype as an entire specimen in alcohol, sclerites and radula slides was deposited in the Zoological Museum of Moscow State University (ZMMU).

Specimen was initially frozen aboard ship and subsequently transferred to 10% formalin and finally to 80-90% ethanol; a tissue subsample was fixed in 80-90% ethanol for gene-sequencing studies. After specimen had been fixed, it was dissected longitudinally; the cuticle was damaged and lost on different parts of the body. Total length — 332 mm (407 mm in living condition — D.L. Felder, pers. comm.), greatest diameter on posterior trunk — 10 mm.

Taxonomy

Chaetoderma Lovén, 1845

Lovén, 1845: 116.

Type species *Chaetoderma nitidulum* Lovén, 1845 (monotypy).

Diagnosis. Mollusca belonging to the burrowing aplacophoran taxon with cuticle entire (Caudofoveata or Chaetodermomorpha), most 10-50 mm in length, with distinct body regions of neck, anterior trunk, posterior trunk, and short posterium not tail-