Description of a new genus and species of the subfamily Arcoscalpellinae Zevina, 1978 (Cirripedia: Thoracica: Scalpellidae) from deep waters of the South China Sea

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A deep-sea pedunculate barnacle of the family Scalpellidae, subfamily Arcoscalpellinae, collected from deep waters of the South China Sea is studied. Sinoscalpellum gen. nov. is erected to accommodate Sinoscalpellum sinensis sp. nov. The new genus differs from the other genera by the inframedian latus narrow and long, umbo at basi-rostral angle and protruded to below rostrum. A key to genera of the subfamily Arcoscalpellinae is provided.

http://www.zoobank.org/urn:lsid:zoobank.org:pub:061A3277-012E-4808-B7BA-3180CF910CD7

Keywords: Cirripedia; Thoracica; new genus; new species; deep waters; South China Sea

Introduction

The family Scalpellidae Pilsbry, 1907 includes five subfamilies, of which three (Scalpellinae, Meroscalpellinae, Arcoscalpellinae) have been found in China seas Liu and Ren 1985, 2007; Chan et al. 2009). The subfamily Arcoscalpellinae Zevina 1978 was erected based on the type genus Arcoscalpellum Hoek, 1907. The diagnosis of the subfamily is: capitular plates closely packed with almost no space between, carina slightly convex, umbo apical or sub-apical, umbos of scutum and tergum apical. To date, 13 genera Amigdoscalpellum Zevina, 1978*; Anguloscalpellum Zevina, 1978 (Graviscalpellum was listed as synonym by Young in 2007); Arcoscalpellum Hoek, 1907*; Catherinum Zevina, 1978*; Diceroscalpellum Zevina, 1978; Pilsbryiscalpellum Zevina, 1978; Planoscalpellum Zevina, 1978; Tarasoviium Zevina, 1978*; Teloscalpellum Zevina, 1978*; Trianguloscalpellum Zevina, 1978*; Welmerium Zevina, 1978; Verum Zevina, 1978* and Vertebroscalpellum Newman and Ross, 1998 have been placed in Arcoscalpellinae (Zevina 1978, 1980, 1981; Newman 1996; Newman and Ross 1998).

Seven genera have been reported from the China Seas (* in list above) (Liu and Ren 1985, 2007; Chan et al. 2009). In the present study, one new genus and one new species of Arcoscalpellinae are described from deep waters of the South China Sea.

Material and methods

Material for this study was collected by the Expedition of Deep Waters in the South China Sea by the Institute of Oceanology, Chinese Academy of Sciences in September

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2011. A benthic specimen was collected in water depths > 1200 m at station MBACAS007 (17°15.0209′N, 111°20.1947′E) by Agassiz trawl. The material examined is deposited in the Institute of Oceanology, Chinese Academy of Sciences, Qingdao, China.

The specimen was examined under a dissecting microscope, measured in millimetres, and drawn.

Description

Subclass CIRRIPEDIA Burmeister, 1834
Superorder THORACICA Darwin, 1854
Order SCALPELLIFORMES Buckeridge and Newman, 2006
Family SCALPELLIDAE Pilsbry, 1907
Subfamily ARCOSCALPELLINAE Zevina, 1978

Sinoscalpellum gen. nov.

Diagnosis
Capitulum with 14 calcified plates, fully covered, narrow membranous interspace between plates. Carina arched, umbo apical; upper latus rectangular, umbo at sub-medial of scutal margin, inframedian latus narrow and long, umbo at basi-rostral angle, protruded to below rostrum. Peduncle short, with transverse scales.

Type species
Sinoscalpellum sinensis sp. nov.

Etymology
Sino- from Latin for China, in combination with Scalpellum.

Remarks
The subfamily Arcoscalpellinae is composed of 13 genera. The characters of the new species do not allow it to be accommodated within known genera, so we erected a new genus to accommodate it. The new genus is similar to the genus Planoscalpellum Zevina by the umbo of the upper latus at the sub-medial of scutal margin. The new genus is similar to the genus Verum Zevina by having the following characteristics: apex of carinal latus not extending beyond carinal margin and inframedian latus triangular, umbo basal. But it differs from these by the inframedian latus narrow and long, umbo at basi-rostral angle and protruded to below rostrum.

There is only one species in the genus: Sinoscalpellum sinensis sp. nov.

Key to genera of the subfamily

1. Peduncle long and slender, about twice length of capitulum ......................

...........................................................
Vertebroscalapellum Newman & Ross
Peduncle shorter than length of capitulum .............................................. 2
2. Inframedian latus narrow and long, umbo at basi-rostral angle, protruded to below rostrum .................................................. *Sinocalpellum* gen. nov. Umbo of inframedian latus not at basi-rostral angle and not protruded to below rostrum ................................................................. 3

3. Umbo of upper latus at sub-medial of carinal margin of scutum .......... .......................... *Planoscalpellum* Zevina
   Umbo of upper latus at apical or sub-apical ........................................ 4

4. Inframedian latus broad, with four to six sides ....................................... 5
   Inframedian latus triangular or baciliform .......................................... 6

5. Carinal latus horny projected .................................................. *Tarasovium* Zevina
   Carinal latus not horny projected .................................................. *Welmerium* Zevina

6. Umbo of inframedian latus basal or sub-basal ...................................... 7
   Umbo of inframedian latus sub-medial or apical and sub-apical ............ 8

7. Umbo of carinal latus beyond carinal margin .... *Pilsbryiscalpellum* Zevina
   Umbo of carinal latus not beyond carinal margin .............................. *Verum* Zevina

8. Umbo of inframedian latus sub-medial ............................................ *Catherinum* Zevina
   Umbo of inframedian latus apical or sub-apical ................................ 9

9. Umbo of carinal latus protruded at carinal margin ............................. 10
   Umbo of carinal latus not protruded at carinal margin ..................... 11

10. Carinal latus horny, umbo basi-carinal end .......... *Diceroscalpellum* Zevina
    Carinal latus not horny, umbo at median part of carinal margin .......... ................................................. *Anguloscalpellum* Zevina

11. Apex of inframedian latus not reach the margin of upper latus ............ .......................... *Amigdoscalpellum* Zevina
    Apex of inframedian latus reach the upper latus ............................. 12

12. Umbo of carinal latus apex .................................................. *Trianguloscalpellum* Zevina
    Umbo of carinal latus not at apex ............................................. 13

13. Umbo of carinal latus at middle of the carinal margin .... *Arcoscalpellum* Hoek
    Umbo of carinal latus at basi-carinal angle ................................. *Teloscalpellum* Zevina

*Sinocalpellum sinensis* sp. nov.
(Figure 1)

*Holotype*
K120110-3. Capitulum: length 7.6 mm, width 3.8 mm. Peduncle: length 1.2 mm, width 0.8 mm. Attached on sediment grain. Agassiz trawl. Collected from South China Sea, St.MBMCAS007, 17°15.0209′ N, 112°20.1947′ E. 13 September 2011. Depth 1238 m. Xu Kui-Dong, Zhang Jun-Long and Ning Ping Coll.
Diagnosis

Female, capitulum large, shuttle-shaped, 14 calcified plates fully covered, white, membranous interspace narrow, growth lines indistinct. Scutum larger, irregular rectangular, growth line weak, umbo apical, slightly covered tergum, rostral margin

Figure 1. *Siniscalpellum sinensis* sp. nov. (A) Side view of body; (B) dorsal view of carinal latus; (C) ventral view of rostrum, inframedian latus and rostral latus; (D) soft body; (E) labrum and palp; (F) mandible; (G, H) maxilla I; (I) maxilla II; (L) caudal appendage and basal part of cirrus VI; (J) intermediate segment of cirrus IV; (K) intermediate segment of cirrus VI.
arched, rostral part of tergal margin slightly concave, lateral margin slightly arched. Tergum large, triangular, umbo apical, rostral margin straight, carinal margin slightly median concave, scutal margin nearly straight. Carina arched, dorsal surface smooth, longitudinal hollow absent or indistinct, umbo apical. Upper latus rectangular, scutal margin straight, umbo on sub-medial of scutal margin, tergal and carinal margins straight, median of basal margin slightly concave. Carinal latus rectangular, narrow and long, ratio of long and wide about 14:5, umbo at basi-carinal angle, two lateral plates intersecting each other on dorsal surface, upper carinal angle slightly acute, basi-rostral angle acute and reaching low-rostral angle of inframedian latus. Rostral latus triangular, rectangular in ventral view; scutal margin longer than basi-margin, at upper part of protuberances of inframedian latus, umbo at upper rostral angle. Inframedian latus narrow and long, funnel-shape, rostral margin slightly concave, carinal margin longest, slightly arched, scutal margin straight, tergal margin straight and short, umbo at basi-rostral angle, as acute angle below rostral latus and protruded beyond rostral latus. Rostrum small, round triangular, between umbos of two rostral latera.

Peduncle shorter than capitulum, with transverse scales; attached to sediment grain.

Dorsal surface of prosoma smooth.

Labrum bullate, crest with a row of small teeth. Mandible with three teeth, inferior angle pectinate. Cutting edge of maxilla I with a notch and setae, with three large spines above and four spines below. Maxilla II with distinct notch on frontal portion, with setae, maxillar lobe slender and long. Palp small, conical, with setae.

Numbers of segments of cirri I–VI of holotype as follows:

\[
\begin{array}{cccccccc}
  & I & II & III & IV & V & VI \\
 10 & 12 & 17 & 18 & 17 & 18 & 18 & 19 & 18 & 18 & 17 \\
\end{array}
\]

Anterior ramus of cirrus I shorter than posterior. Anterior and posterior rami of II–VI sub-equal in length, slender and long, each of intermediate segments bears four or five pairs of setae on anterior margin, dorsal margin of segments with small teeth. Caudal appendage slender, five segments, with setae. Penis absent. Dwarf male not known.

**Etymology**

The *sinensis* is from Latin for Chinese.

**Habitat**

Based on this record, the new species, which has not yet been found elsewhere in tropical deep seas, should be attached to sediment grains.
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