

Nannastacidae (Crustacea: Cumacea) from eastern Bass Strait, the south-eastern Australian slope, and Antarctica in the collections of Museum Victoria

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Abstract

Petrescu, I. 2006. Nannastacidae (Crustacea: Cumacea) from eastern Bass Strait, the south-eastern Australian slope, and Antarctica in the collections of Museum Victoria. *Memoirs of Museum Victoria* 63(2): 129–173.

Forty-five species of Nannastacidae were identified in collections in Museum Victoria from eastern Bass Strait and the south-eastern Australian slope. Twenty-eight are described as new: *Campylaspis anae*, *C. angelae*, *C. australiensis*, *C. edenensis*, *C. grossui*, *C. halei*, *C. hirsuta*, *C. latimera*, *C. longidentata*, *C. lynseyae*, *C. nowrae*, *C. poorei*, *C. rectangulata*, *C. sculpta*, *C. serrata*, *C. setifera*, *C. spinifera*, *C. tasmaniensis*, *C. trisulcata*, *Procampylaspis australiensis*, *P. spinifera*, *P. tasmaniensis*, *Styloptocuma australiense*, *S. granulosum*, *S. nodosum*, *S. poorei*, *S. spinosum*, *Styloptocumoides australiensis* and *Vemacumella bacescui*. The new genus *Styloptocumoides* is diagnosed and *Styloptocuma* Băcescu and Muradian, 1974 and *Vemacumella* Petrescu, 2001 are recorded for the first time from Australia. The new species *Procampylaspis poorei* is described from Antarctic waters.

Keywords

Crustacea, Cumacea, Nannastacidae, new taxa, new records

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Introduction

The most important studies on Australian Cumacea were made by the famous specialist, Herbert M. Hale, who dealt with 90% of Australian fauna between 1936 and 1949. He added 32 species of Nannastacidae to the Australian list, 29 being new to science. However, the first species known from this family from Australia were *Cumella cyclaspoidea*, *Cumella gibba*, and *Scherocumella nasuta*, described by Zimmer, 1914 from Shark Bay, Western Australia. Foxon (1932) described *Campylaspis pileus* from the Great Barrier Reef. Two other papers have since been published: Băcescu (1991) describing *Campylaspis wardi* and Tafe and Greenwood (1996) adding a new species of *Schizotrema*. Up to now, 40 species of Nannastacidae are known from Australia (Stoddart and Lowry, 2003).

The material in Museum Victoria selected for study was 27 samples collected during two sampling campaigns. One was in eastern Bass Strait at shallow shelf depths (see Coleman et al., 1997 for a discussion of the fauna of this sampling program). The second was on the south-eastern Australian continental slope between Sydney, New South Wales and eastern Tasmania (see Poore et al., 1994, for discussion of the diversity of isopods from these deep-water samples). Only nine of numerous samples were searched for nannastacids. Forty-five species of Nannastacidae including 28 new species, one in a new genus, were identified, bringing the total for Australia to 68. One additional new species was described from Antarctica.

Specimens are now registered in Museum Victoria, Melbourne (NMV) and representatives are in the “Grigore Antipa” National Museum of Natural History, Bucharest, Rumania (MGAB). Type localities are given in full but other records are given only by station number, and are expanded in the appendix.

Campylaspis Sars, 1865

Campylaspis Sars, 1865: 200.—Băcescu, 1992: 178–179.—
Stoddart and Lowry, 2003: 373–418.
Bacescua Muradian, 1979: 105.
Sarsicum Muradian, 1979: 104.

Type species. Cuma rubicunda Liljeborg, 1855.

Remarks. Species of *Campylaspis* are cumaceans with a bulky carapace, longer than 0.4 of total length, having a mandible with large pars incisiva and lacinia mobilis, acute pars molaris, and maxilliped 2 with a 3-toothed dactylus. Fifteen species are previously known from Australia; another 20 taxa are added from this study (19 of them being new to science).

Key to species of *Campylaspis* from Australian waters

1. Eye lenses present 2
 - Eye lenses absent 14
2. Carapace smooth without tubercles, spines, carinae or lateral sulcus 3
 - Carapace with tubercles, spines, carinae or a lateral furrow or sulcus 4
3. Uropodal peduncle 3 times as long as its endopod
 - *C. thompsoni* Hale, 1945
 - Uropodal peduncle 2.3 times as long as its endopod
 - *C. similis* Hale, 1945
4. Carapace with lateral sulcus, without ridges 5
 - Carapace without lateral sulcus, with ridges and carinae 7
5. Dactylus of pereopod 2 dilated distally
 - *C. latidactyla* Hale, 1945
 - Dactylus of pereopod 2 not dilated distally 6
6. Dactylus of pereopod 2 as long as carpus plus propodus
 - *C. unisulcata* Hale, 1945
 - Dactylus of pereopod 2 shorter than carpus plus propodus *C. minor* Hale, 1945
7. Carapace with single, lateral rounded carina
 - *C. uniplicata* Hale, 1945
 - Carapace with tubercles, spines, depressions and ridges 8
8. Carapace with ridges and lateral depressions 9
 - Carapace with tubercles, spines and ridges 10
9. One ridge delimiting 1 large lateral excavation and 2 in posterior half *C. rupta* Hale, 1945
 - Three lateral ridges delimiting 2 curved depressions *C. triplicata* Hale, 1945
10. Carapace covered with spiniform projections, spines on rest of body *C. echinata* Hale, 1945
 - Carapace covered with small tubercles 11
11. Carapace with very small tubercles anteriorly and dorsolaterally *C. roscida* Hale, 1945
 - Carapace with conical tubercles 12
12. Maxilliped 3, 3 times as long as wide
 - *C. pustulosa* Hale, 1945
 - Maxilliped 3, 2 times as long as wide
 - *C. aspera* Hale, 1945
13. Dactylus of maxilliped 2 with 3 long teeth, twice as long as propodus *C. longidentata* sp. nov.
 - Dactylus of maxilliped 2 with teeth shorter or as long as propodus 14
14. Carapace with lateral depressions 15
 - Carapace without lateral depressions 34
15. Carapace without ridges or carinae 16
 - Carapace with ridges or carinae 29
16. Carapace with sulcus open on anterior extremity of carapace 17
 - Carapace with sulcus not reaching the anterior extremity of carapace 25
17. Carapace smooth, excepting lateral depression 18
 - Carapace with tubercles 19
18. Uropodal peduncle robust, with median crest, twice as long as exopod *C. anae* sp. nov.
 - Uropodal peduncle slender, no median crest, 1.4 times as long as exopod *C. rectangularata* sp. nov.
19. Uropods long, elongated 20
 - Uropods short, robust 22
20. Carapace with several rows of tubercles
 - *C. tasmaniensis* sp. nov.
 - Carapace with 1–2 tubercles 21
21. Carapace with 1 pair of tubercles at basis of frontal lobe
 - *C. lynseyae* sp. nov.
 - Carapace with 1 pair of tubercles at basis of frontal lobe, 2nd under sulcus *C. spinifera* sp. nov.

- 22. Dactylus of pereopod 2 long 23
- Dactylus of pereopod 2 short 24
- 23. Pseudorostral lobes meeting for distance of 3 times length of ocular lobe *C. thetidis* Hale, 1945
- Pseudorostral lobes meeting for distance of half ocular lobe *C. sculpta* sp. nov.
- 24. Uropods with terminal short setae with oval structures *C. wardi* Băcescu, 1991
- Uropods with terminal short setae without oval structures *C. grossui* sp. nov.
- 25. Carapace with tubercles 26
- Carapace without tubercles 27
- 26. Integument with acute tubercles *C. australiensis* sp. nov.
- Integument with spiny tubercles *C. hirsuta* sp. nov.
- 27. Maxilliped 3 and pereopod 1 with large and concave merus *C. latimera* sp. nov.
- Maxilliped 3 and pereopod 1 without large and concave merus 28
- 28. Pereopod 2 with digitiform dactylus tip *C. halei* sp. nov.
- Pereopod 2 with straight dactylus tip *C. poorei* sp. nov.
- 29. Carapace with transversal dorsal carinae 30
- Carapace without transversal dorsal carinae 31
- 30. Carapace with 1 transversal dorsal carina *C. johnstoni* Hale, 1937
- Carapace with 2 transversal dorsal carinae *C. nowrae* sp. nov.
- 31. Carapace with dorsal tubercles *C. angelae* sp. nov.
- Carapace without tubercles 32
- 32. Pseudorostrum long, lobes meeting for a distance of sixth carapace length *C. pileus* (Foxon, 1932)
- Pseudorostrum short, lobes meeting for a distance shorter than eighth carapace length 33
- 33. Carapace with 2 lateral ridges delimiting 1 depression *C. edenensis* sp. nov.
- Carapace with 4 lateral ridges delimiting 3 depressions *C. trisulcata* sp. nov.
- 34. Carapace integument smooth *C. setifera* sp. nov.
- Carapace with long club-like setae, body and appendices highly serrated *C. serrata* sp. nov.

***Campylaspis anae* sp. nov.**

Figures 1, 2

Material examined. Holotype female, NSW, off Nowra, 34°59.52'S, 151°05.94'E, 204 m, coarse shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 14 Jul 1986 (stn SLOPE 1), NMV J52946.

Diagnosis. Carapace with long lateral sulcus, rectangular in dorsal view. Maxilliped 3 with large merus and carpus. Uropod peduncle more than 2.5 times as long as pleonite 6; exopod a little shorter than endopod.

Description. Body with smooth integument. Length: 3.5 mm.

Antenna 1, basal article of peduncle longest, median and apical articles equal; main flagellum 3-articulate, accessory flagellum minute, uniarticulate.

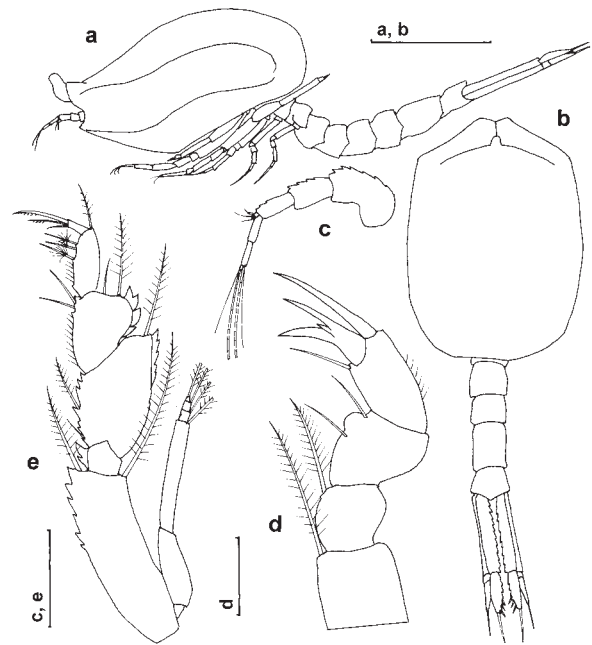


Figure 1. *Campylaspis anae* sp. nov. female holotype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 1; c, e, 0.25; d, 0.1.

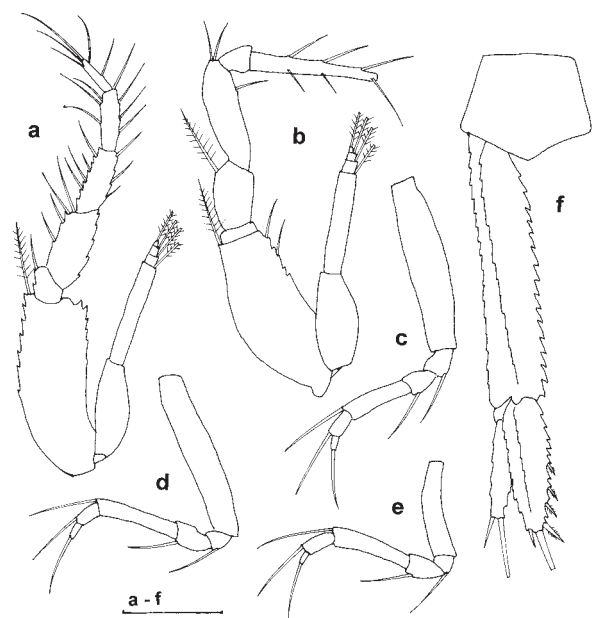


Figure 2. *Campylaspis anae* sp. nov. female holotype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a–f, 0.25.

Maxilliped 2 basis (fused with ischium) and merus with long plumose seta on distal inner corner, carpus produced bluntly between 2 simple setae on inner margin, propodus longer than carpus, as long as its distal outer strong seta, dactylus with 3 teeth shorter than propodal seta. Maxilliped 3 basis less than half as long as appendage, with serrated inner margin, with plumose seta on inner and outer distal corners, without outer process; ischium small; merus much bigger (second longest article), with serrated margins and plumose seta on outer distal corner; carpus as long as its distal outer strong seta, dactylus with 3 teeth shorter than propodal seta. Maxilliped 3 basis shorter than half length of appendage, with serrated inner margin, with plumose seta on inner and outer distal corners, without outer process; ischium small; merus larger (second longest article), with serrated margins and plumose seta on outer distal corner; carpus 0.65 of merus length, large, with strong serration on outer margin, 1 plumose seta on outer distal corner; propodus little shorter than carpus, much thinner; dactylus less than half of propodus, with 2 microserate terminal setae twice dactylus length.

Pereopod 1 basis less than half as long as appendage, with serrated margins; merus 2.6 times as long as ischium; carpus to dactylus progressively shorter, with numerous simple setae on both margins, dactylus with long terminal simple setae. Pereopod 2 basis less than half as long as appendage, with a plumose seta on inner distal corner; merus 4 times as long as ischium, with long plumose seta on inner margin; carpus 1.4 times as long as ischium and merus combined, 2 simple setae on its inner distal corner; dactylus with broken tip, 4 times as long as propodus, with several simple setae marginally. Pereopod 3 basis longer than rest of appendage, ischium as long as merus, ischium and merus with simple seta on inner distal corner; carpus twice as long as merus; dactylus with long stout terminal seta. Pereopods 4 and 5 with shorter basis and longer carpus than pereopod 3. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle more than 2.5 times as long as pleonite 6, with strong serrated inner margin and median crest, twice as long as exopod; exopod shorter than endopod, with subterminal and terminal (much longer) stout setae; endopod with median crest, with 4 microserate setae on inner margin and a long stout terminal seta.

Etymology. The species is dedicated to my lovely daughter, Ana-Maria.

Distribution. Off Nowra, NSW; 204 m depth.

Remarks. *Campylaspis anae* has a large lateral sulcus that does not reach the posterior extremity of the carapace. No other species previously known from Australia or from the western Pacific has such a sulcus. The shape of the carapace is similar to that of *C. ovalis* Stebbing, 1912 from South Africa which has an even larger sulcus that is confluent with the posterior extremity of the carapace. Of the 16 new species with a lateral sulcus described herein, *C. anae* is closest to the immature male holotype of *C. rectangulata*. It differs from *C. rectangulata* in possessing longer teeth on maxilliped 2, the merus of maxilliped 3 without a concavity and larger, the dactylus of

maxilliped 3 with shorter setae, the uropod with a longer and wider peduncle with a longitudinal median crest, shorter rami, and an endopod with four microserate setae on its inner margin (3 similar setae in *C. rectangulata*).

Campylaspis angelae sp. nov.

Figures 3, 4

Material examined. Holotype female, NSW, off Nowra, 34°59.52'S, 151°05.94'E, 204 m, coarse shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 14 Jul 1986 (stn SLOPE 1), NMV J52960.

Paratype: 1 female, dissected, type locality, NMV J52961.

Diagnosis. Carapace with a lateral sulcus, 2 dorsal parallel rows of tubercles on carapace, without eyes. Lateral keel on pleonites 1–5 and 2 parallel dorsal keels on pereonite 5 and pleonites 1–4, unique on last 2 pleonites. Antenna 1 short, robust. Maxilliped 3 with enlarged merus to propodus. Pereopod 1 with long ischium. Dactylus of pereopod 2 with finger-like tip. Serrated uropod with a median keel on peduncle.

Description. Body with smooth, highly calcified integument. Length: 2.55 mm.

Carapace almost half of body length, 1.8 times as long as high, with a large lateral sulcus delimited by a transverse crest on anterior part, meeting ventral undulated crest that unites anteroventral corner and oblique posterior crest on each side of carapace; 2 dorsal parallel rows of small tubercles, 1 tubercle on top of ocular lobe, another on pseudorostrum; antennal notch marked, anteroventral corner serrated, ventral margin smooth; prominent ocular lobe without eyes. Parallel dorsal crests on pereonite 6, pleonite 1–4, and single dorsal serrated crest on pleonites 5–6. Pleonites 1–4 produced laterally, pleonite 5 weakly produced laterally.

Antenna 1 short, robust, articles of peduncle decreasing in length distally, main flagellum 3-articulate ending with short aesthetascs; accessory flagellum tiny, uniarticulate.

Maxilliped 2 basis fused with ischium, with stout inner plumose seta, similar seta on merus, carpus with tooth and 2 simple setae on inner margin, propodus with strong robust seta on outer distal corner near articulation with short 3-toothed dactylus. Maxilliped 3 basis less than half as long as appendage, without outer process, with 2 long plumose setae on outer distal corner, ischium to propodus with serrated inner margins, merus second longest article, with 3 teeth and plumose seta on outer margin, carpus 0.66 merus length, with 3 long teeth and long plumose seta on outer margin, propodus as long as carpus, dactylus less than half as long as propodus, with terminal setae longer than dactylus.

Pereopod 1 basis longer than rest of articles combined, basis to propodus with serrated margins, short ischium with inner plumose seta, merus, carpus and propodus enlarged, merus second largest article, longer than carpus and propodus combined, dactylus and propodus subequal. Margins of merus-propodus serrated on both margins. Pereopod 2 basis less than half as long as appendage, with short simple seta on distal inner corner, merus 5 times as long as ischium, with simple seta on inner margin, carpus 1.66 times as long as merus, with short simple setae on distal inner corner, dactylus

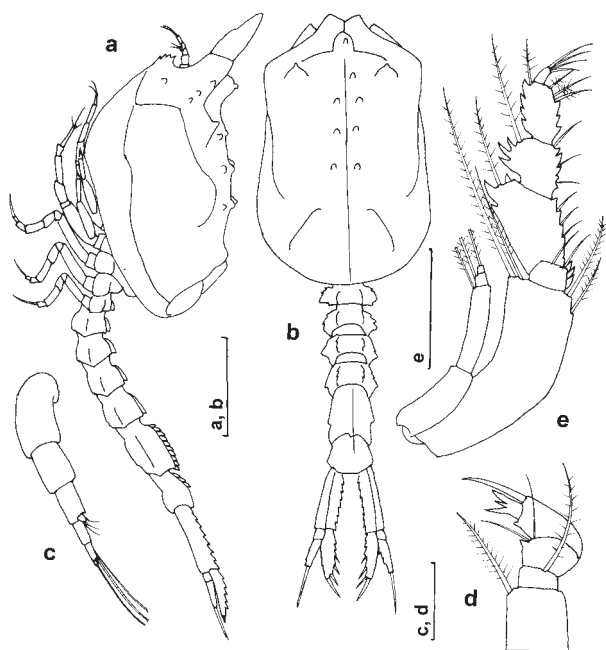


Figure 3. *Campylaspis angelae* sp. nov. female holotype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 0.5; c, d, 0.1; e, 0.2.

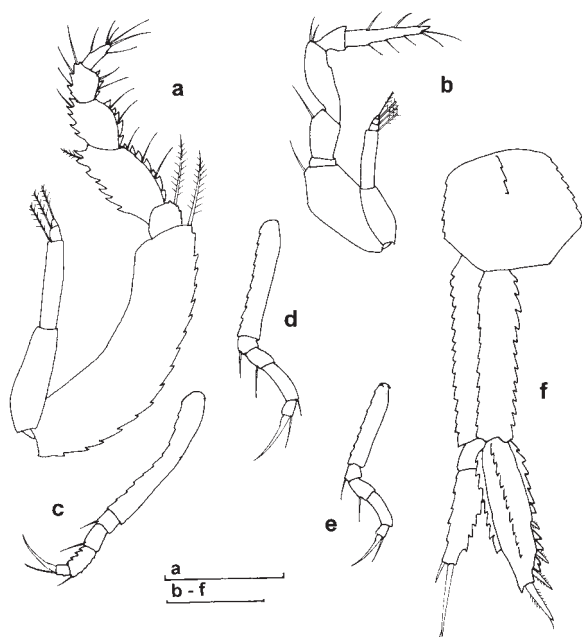


Figure 4. *Campylaspis angelae* sp. nov. female holotype: A, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; E, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a, 0.2; B-f, 0.25.

3 times as long as propodus, bluntly produced terminally, with 2 subterminal short simple setae, no evidence of terminal setae. Pereopod 3 basis longer than rest of articles combined, carpus little longer than merus, with only hair-like distal seta, dactylus fused with its terminal short stout seta. Pereopods 4 and 5 with progressively shorter basis than in pereopod 3, carpus twice as long as merus. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod with robust peduncle, 1.6 times as long as pleonite 6, with median serrated crest and serrated margins, 1.3 times as long as endopod; exopod little shorter than endopod, with strong serrated margins, 2 terminal robust setae, 1 long, endopod 1.15 times as long as exopod, with serrated margins and serrated median crest, 3 stout setae on inner margin and terminal robust microserrate seta.

Etymology. This species is dedicated to my wonderful, lovely and highly devoted wife, Angela.

Distribution. NSW, off Nowra, shelf break, 204 m.

Remarks. This new species has a carapace with a lateral sulcus posteriorly bordered by an oblique crest as in *C. pileus* Foxon, 1932. It differs mainly by a shorter pseudorostrum, small tubercles on the carapace, and shorter and more robust uropods with serrated margins. *C. angelae* is also more similar than other species of the genus to *C. calmani* Petrescu, 1995 from Indonesia, which also has a lateral sulcus with a transverse crest on the anterior part (close to the ocular lobe) and small tubercles. However, tubercles just border the sulcus in *C. calmani* and are otherwise disposed in *C. angelae*, the dactylus of pereopod 2 is with a digitiform extremity only in *C. angelae*, and there is a longitudinal serrated crest on the uropodal peduncle in *C. angelae*, missing in *C. calmani*. The new species is also related to *C. edenensis* sp. nov., which has an almost similar lateral sulcus but without tubercles, similar to pereopod 2 but with longer dactylar teeth than maxilliped 2, and uropodal peduncle without a longitudinal crest.

Campylaspis aspera Hale, 1945

Campylaspis aspera Hale, 1945: 209, figs 45, 46.

Material examined. 8 females, 1 male (stn SLOPE 1), NMV J52964; 2 females, 1 male (stn SLOPE 1), MGAB CUM 1613; 11 females, 7 males (stn SLOPE 45), NMV J52965; 2 females, 1 male (stn SLOPE 46), NMV J52966; 1 female (stn MSL-EG 20), NMV J52967.

Distribution. NSW, 11 m depth.

Remarks. The species was previously recorded by Hale (1945) from Eden, New South Wales, at 70 m depth. The geographic and depth ranges are considerably extended to South Australia, Victoria and Tasmania and from 800 m depth.

Campylaspis australiensis sp. nov.

Figures 5, 6

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°00.20'S, 148°37.70'E, 720 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 46), NMV J52415.

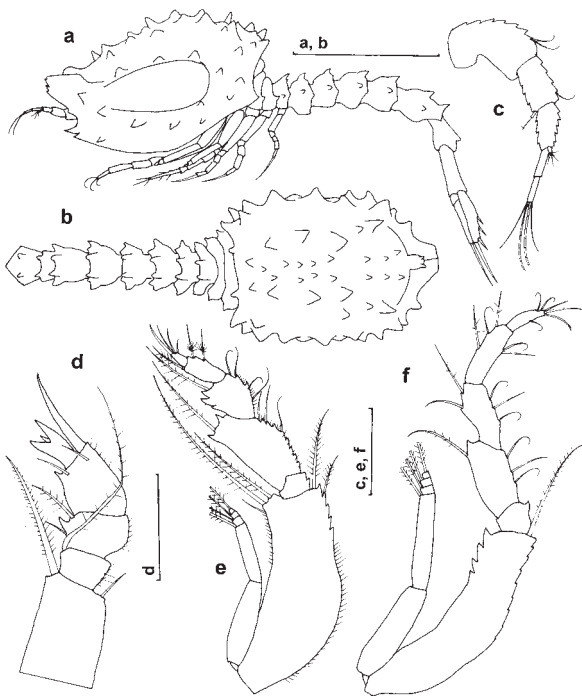


Figure 5. *Campylaspis australiensis* sp. nov. female holotype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3; f, pereopod 1. Scale (in mm): a, b, 1; c, e, f, 0.25; d, 0.2.

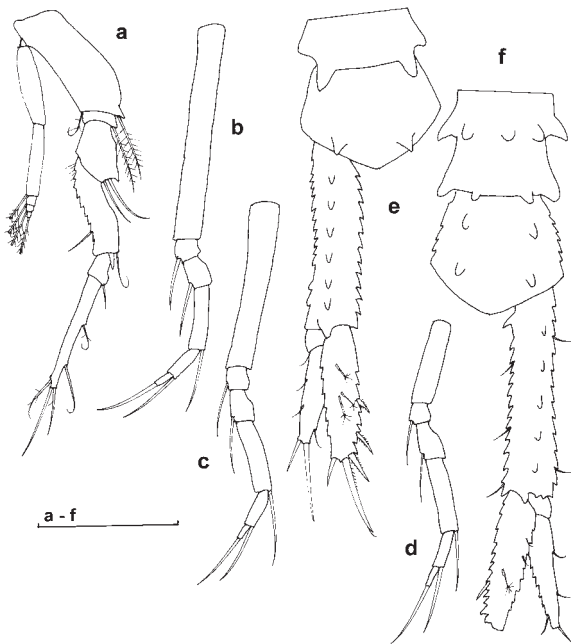


Figure 6. *Campylaspis australiensis* sp. nov. female holotype: a, pereopod 2; b, pereopod 3; c, pereopod 4; d, pereopod 5; e, pleonite 6 and left uropod; f, pleonite 6 and right uropod of other specimen. Scale (in mm): a–f, 0.5.

Paratypes: 5 females, 11 males, type locality, NMV J52933; 1 female, 2 males (stn SLOPE 46), MGAB CUM 1606; 1 manca, 1 female (stn SLOPE 47), NMV J52934; 2 males, 1 manca (stn SLOPE 48), NMV J52419; 1 manca (stn SLOPE 1), NMV J52413; 1 female, 1 male (stn SLOPE 45), NMV J52414; 1 immature male, dissected, NMV J52416.

Diagnosis. Carapace with acute tubercles, with a lateral sulcus. A pair of small dorsal tubercles on pereonite 5 and all pleonites, small lateral tubercle on pereonites 3–5 and pleonites 1–5. Antenna 1 accessory flagellum of 2 articles. Propodus of maxilliped 2 with long robust distal seta, longer than dactylar teeth. Merus and carpus of maxilliped 3 with teeth on outer margin. Dactylus of pereopod 2 3.7 times as long as propodus, with tapering extremity. Dactylus of pereopods 3–5 not fused with terminal seta. Uropod peduncle 1.8 times as long as pleonite 6, 1.4 times as long as endopod, with strongly serrated margins and longitudinal serrated crest, endopod slightly longer than exopod, with 3 microserrate setae on inner margin.

Description. Body with well calcified and hardened reticulated integument. Length: 3.06 mm.

Carapace 0.5 body length, 1.7 times as long as high, with a lateral sulcus, 0.5 of carapace length, open towards anterior part, bordered with acute tubercles, bigger dorsal tubercles, parallel row of smaller dorsal ones, 2 small tubercles on top of eyeless ocular lobe, antennal notch marked, pseudorostral lobes meeting a short distance in front of ocular lobe. Pereonites 3–5 with lateral small tubercle. Pleonites 1–5 with pair of dorsal small tubercles, pleonite 5 with constriction at about posterior one-third, armed with 2 or 3 small dorsal tubercles, lateral tubercle on pleonites 1–5, pleonite 6 with 1 or 2 pairs of small dorsal tubercles.

Antenna 1 peduncle with robust articles, with serrated margins, progressively shorter, main flagellum 3-articulate, longer than distal article of peduncle, accessory flagellum 2-articulate, shorter than basal article of main flagellum.

Maxilliped 2 with long plumose setae on inner margin of basis and merus, tooth and plumose seta on inner margin of carpus, propodus second longest article, with long robust distal seta, longer than dactylar teeth, with tooth on inner margin, dactylus with 3 short, robust teeth. Maxilliped 3 basis longer than rest of articles combined, with 2 long plumose setae on outer margin, merus second longest article, with 2 teeth and plumose seta on outer margin, carpus shorter than merus, with teeth on both margins and plumose seta on outer margin, propodus shorter than carpus, with 2 pappose setae on inner margin, dactylus half of propodus length, with short simple setae.

Pereopod 1 with slender articles, basis shorter than rest of articles combined, with plumose seta on inner distal corner, merus second longest article, 2.5 times as long as ischium, with small tooth and plumose seta on outer margin, carpus shorter than merus, propodus shorter than carpus, dactylus 0.6 propodus length, with short simple setae. Pereopod 2 basis less than one-third of entire pereopod length, with tooth and plumose seta on inner margin, merus with tooth and 2 simple setae on inner margin, carpus 1.6 times as long as merus, with stout and simple seta on distal margin, dactylus 3.7 times as long as propodus, with tapering tip and short setae. Pereopods

3–5 with progressively shorter basis and longer carpus, propodus longer than merus, dactylus with long stout terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 1.8 times as long as pleonite 6, 1.4 times as long as endopod, with strongly serrated margins and longitudinal serrated crest, exopod shorter than endopod, with subterminal stout seta and a terminal longer one, endopod with 3 microserrate setae on inner margin and more robust, longer terminal seta.

Etymology. The species bears the name of type locality – Australia.

Distribution. Tas., off Freycinet Peninsula, 600–720 m.

Remarks. The closest species to *Campylaspis australiensis* is *C. sagamiensis* Gamô, 1967 from Japan. Both species have similar tubercles on the carapace, pereon and pleon, and a lateral sulcus, but in *C. sagamiensis* the pleon has lateral ridges rather than tubercles; *C. sagamiensis* also differs in a longer propodus seta, shorter and more robust teeth on the dactylus of maxilliped 2, wider merus and dactylus with shorter terminal setae on maxilliped 3, and shorter more robust uropods.

Similar carapace tubercle patterns around the lateral sulcus also exist on *C. clavata* Lomakina, 1952 from the north-western Pacific, *C. horrida* Sars, 1870 from the Atlantic Ocean, *C. horridoides* Stephensen, 1915 from the Mediterranean and *C. antarctica* Calman, 1907 from Antarctica. *C. clavata* differs in having a longer ocular lobe (reaching the extremity of the carapace versus shorter in *C. australiensis*), shorter dactylus of pereopod 2 and longer uropod peduncle. *C. horrida* differs in having a sulcus not surrounded by acute tubercles, pleonite 6 without tubercles and a longer uropod peduncle. *C. horridoides* differs in fewer dorsal tubercles on the carapace, maxilliped 3 with more teeth on its outer margin and a longer uropod peduncle. *C. antarctica* differs in being without a lateral sulcus on the carapace and its pleonite 6 being without spines.

Campylaspis echinata Hale, 1945

Campylaspis echinata Hale, 1945: 204, figs 41, 42.

Material examined. 1 female (stn SLOPE 1), NMV J52969; 1 immature male (stn SLOPE 47), NMV J52970.

Distribution. NSW, 204 m depth.

Remarks. Hale, 1945 recorded the species from Eden, New South Wales, at 70 m depth; these records represent new geographic and depth extensions (Tasmania, from 600 depth).

Campylaspis edenensis sp. nov.

Figures 7–9

Material examined. Holotype female, NSW, off Eden, 37°07.30'S, 150°20.20'E, 520 m, grey coarse shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 20 Jul 1986 (stn SLOPE 19), NMV J52956.

Allotype: immature male, type locality, NMV J52957.

Paratypes: 3 females (stn SLOPE 19), NMV J52958; 2 females (stn SLOPE 19), MGAB CUM 1612; 1 female, dissected (stn SLOPE 19), NMV J52959.

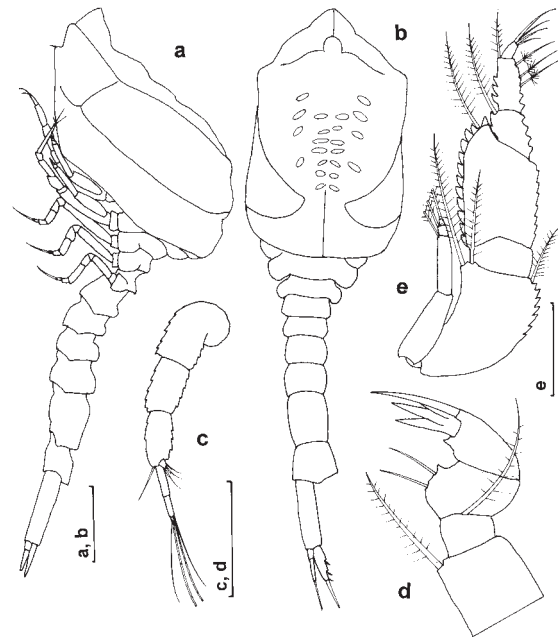


Figure 7. *Campylaspis edenensis* sp. nov. female paratype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 0.5; c, d, 0.2; e, 0.25.

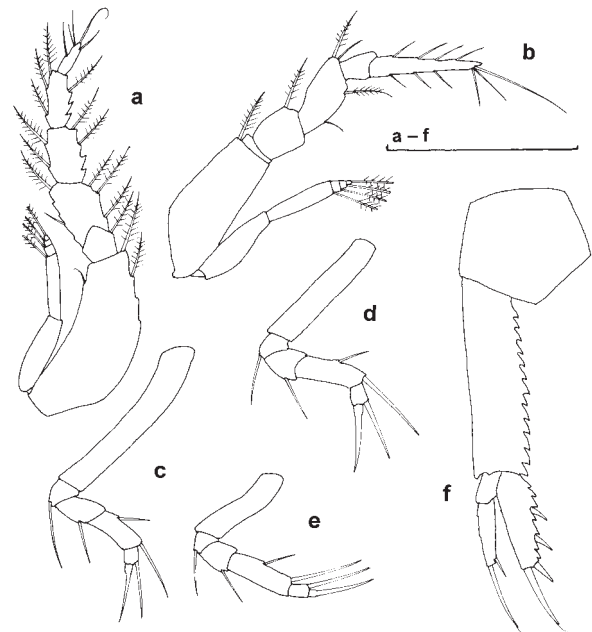


Figure 8. *Campylaspis edenensis* sp. nov. female paratype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a–f, 0.5.

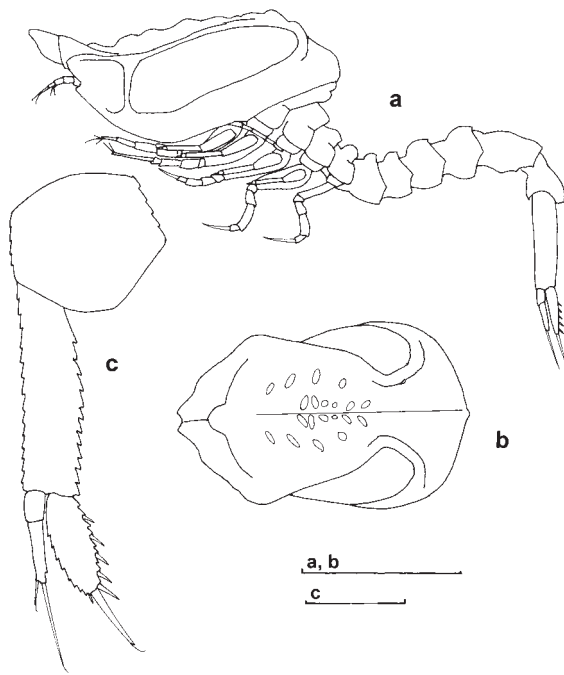


Figure 9. *Campylaspis edenensis* sp. nov. male allotype: a, body, lateral view; b, carapace, dorsal view; c, pleonite 6 and left uropod. Scale (in mm): a, b, 1; c, 0.25.

Diagnosis. Carapace with large, long lateral sulcus not reaching dorsal crest. Median dactylar tooth of maxilliped 2 longer than other two. Maxilliped 3 basis more than one-third of entire appendage. Pereopod 1 with numerous plumose setae on both sides. Pereopod 2 with digitiform tip of dactylus, with long simple subterminal seta. Pereopods 3–5 robust, dactylus fused with terminal seta. Uropod peduncle 1.7 times as long as pleonite 6, subequal rami.

Description of female. Body with well calcified glabrous integument. Length: 3.3 mm.

Carapace half body length, 2.2 times as long as high, large and long lateral sulcus not reaching dorsal crest, upper margin ending on tip of pseudorostrum, transverse ridge on sulcus at base of ocular lobe, large ocular lobe without eyes, numerous dorsal clear lenses, antennal notch small, ventral margin smooth, dorsal crest posteriorly. Pereon with 4 free thoracic segments. Pleon 0.38 body length.

Antenna 1 peduncle with serrated margins, proximal article longest, main flagellum 3-articulate, longer than distal article of peduncle, accessory flagellum tiny, uniaarticulate.

Maxilliped 2 basis fused with ischium, with plumose seta on inner distal corner, similar seta medially disposed on merus, carpus with short tooth and 2 simple setae on inner margin, propodus second longest article, with small tooth on inner margin and outer stronger seta, longer than dactylar teeth, dactylus fused with its 3 teeth, median one the longest. Maxilliped 3 basis more than one-third of entire maxilliped, with plumose seta on inner distal corner and 2 longer setae on

outer distal corner, merus second longest article, with serrated margins, stronger on outer margin, with plumose seta on outer distal corner, carpus as long as propodus, with 4 teeth on inner margin and 2 on outer one, propodus with 2 teeth and 4 pappose setae on inner margin, 3 teeth on outer margin, dactylus 0.35 of propodus, with simple short setae.

Pereopod 1 basis more than one-third of entire appendage, with serrated inner margin, plumose setae on basis to propodus, merus twice as long as ischium, carpus as long as propodus, with strong inner serration, dactylus 0.6 of propodus length, with simple short setae. Pereopod 2 basis little less than one-third of appendage, basis and merus with plumose seta on inner distal corner, merus 5 times as long as ischium, carpus 1.3 times as long as merus, with plumose seta and simple seta on distal inner corner, dactylus 3.5 times as long as propodus, with digitiform tip, few simple short setae on both margins, 3 subterminal simple setae, 1 much longer. Pereopods 3–5 with progressively shorter basis and longer carpus, carpus twice as long as merus in last pair, with simple robust seta on distal outer corner, dactylus fused with its terminal robust seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod with robust peduncle 1.7 times as long as pleonite 6, twice as long as rami, with serrated inner margin, exopod slightly shorter than endopod, with terminal longer robust seta, endopod with 2 stout setae on serrated inner margin, robust terminal seta shorter than endopod; terminal setae on rami with single subterminal setule.

Description of male. Body length: 3.5 mm.

Carapace with stronger ridges than in female.

Uropod peduncle 1.5 times as long as pleonite 6, twice as long as endopod, exopod little shorter than endopod, with 2 subterminal setae and a longer, more robust, terminal one, endopod larger than exopod, with terminal robust seta and 5 stout short setae on inner margin.

Etymology. The new species bears the name of Eden, a port town in south-eastern Australia.

Distribution. Off Eden, NSW; 520 m depth.

Remarks. The two species most similar to *Campylaspis edenensis* are *C. calmani* Petrescu, 1995 and *C. angelae*. *Campylaspis edenensis* is differentiated from *C. calmani* by having the sulcus not bordered by small tubercles and the dactylus of pereopod 2 with a digitiform tip. *Campylaspis edenensis* differs from *C. angelae* by a lack of carapace tubercles, dorsal serrated crests on the pereon and pleon, and the longitudinal crest on the uropod peduncle.

Campylaspis grossui sp. nov.

Figures 10, 11

Material examined. Holotype female. Vic., eastern Bass Strait, 11.2 km E of eastern edge of Lake Tyers, 37°51.41'S, 148°13.16'E, 32 m, sand-shell, Smith-McIntyre grab, Marine Science Laboratories, RV *Sarda*, 25 Sep 1990 (stn MSL-EG 27), NMV J27468.

Paratypes: 1 female (stn MSL-EG 27), NMV J27468; 1 female, dissected (stn MSL-EG 27), NMV J52952; 1 female, 1 male (stn MSL-EG 26), NMV J27467; 1 female (stn MSL-EG 26), MGAB CUM 1607; 1 immature male, NMV J 27469; 1 female, NMV J27470.

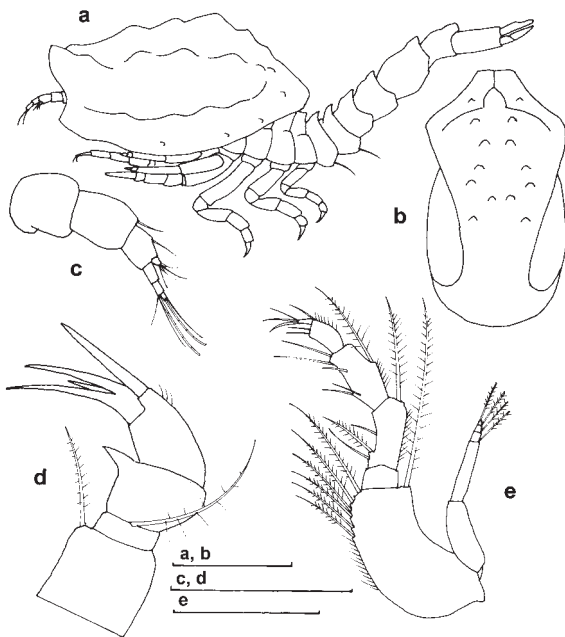


Figure 10. *Campylaspis grossui* sp. nov. female paratype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 1; c, d, 0.3; e, 0.5.

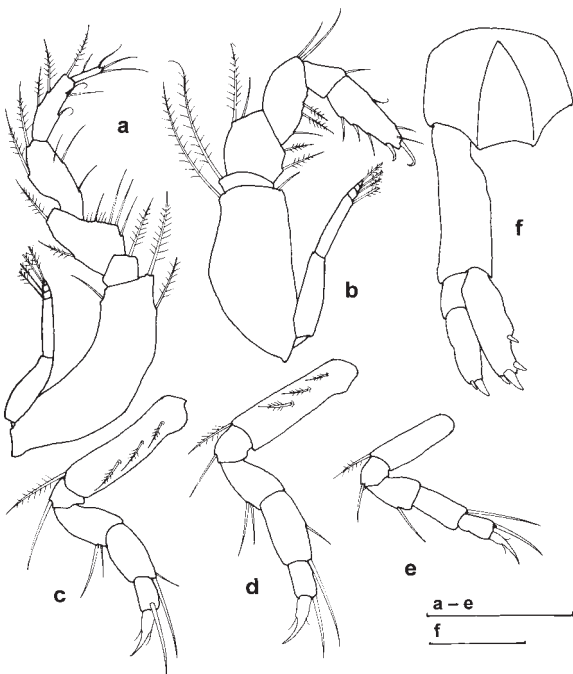


Figure 11. *Campylaspis grossui* sp. nov. female paratype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a–e, 0.5; f, 0.25.

Diagnosis. Carapace with large lateral sulcus (almost as long as carapace), not meeting on posterior end, with dorsal tubercles. Pleon with short segments. Maxilliped 2 with long dactylar teeth. Pereopod 1 with large merus with an inner concavity. Pereopod 2 with large articles, dactylus wide, with short stout terminal seta. Pereopods 3–5 robust, dactylus fused with short robust, terminal and curved seta. Uropod peduncle 1.4 times as long as pleonite 6, 1.5 times as long as its equal rami, exopod and endopod with very short robust terminal seta, 2 short robust setae on inner margin of endopod.

Description. Body with highly calcified glabrous integument. Length: 3.95 mm.

Carapace 0.5 body length, twice as long as high, with long lateral sulcus, opened towards anterior, not meeting at posterior end, large and small lateral and dorsal tubercles, antennal notch wide, pseudorostrum meeting in front of eyeless ocular lobe. Pereonites 1–4 covered almost completely by carapace. Pleon with anteroposterior compressed segments, shorter than carapace.

Antenna 1 short and robust, median article of peduncle longest, main flagellum as long as distal article of peduncle, 3-articulate, accessory flagellum tiny, uniaarticulate.

Maxilliped 2, long plumose seta on inner margin of basis and on distal article of merus, carpus with large tooth on inner margin, propodus second longest article, a long robust distal seta as long as dactylar teeth, dactylus with 3 teeth, 2 of them longer than propodus, median one-half of other two. Maxilliped 3 with wide basis, shorter than rest of articles combined, with 6 long plumose setae on inner margin and 1 on outer margin, ischium to dactylus slender, merus second longest article, with plumose seta on outer distal margin, carpus with plumose seta midway on outer margin, propodus 0.57 of carpus, dactylus short, slender, half of propodus, with short simple terminal setae.

Pereopod 1 basis less than half as long as appendage, with 2 plumose setae on inner margin, wide merus with inner concavity with numerous setae, carpus more slender than merus, second longest article, propodus shorter than merus, dactylus 0.5 of propodus, with short simple terminal setae. Pereopod 2 with short, very robust articles, basis less than half as long as appendage, long plumose seta on inner margin of basis, ischium and merus, carpus 1.2 times as long as merus, with 2 simple setae on distal inner corner, dactylus broad, twice propodus length, with short stout hooked terminal seta. Pereopods 3–5 robust, with progressively shorter basis, and longer carpus, dactylus fused with its robust terminal short seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 1.4 times as long as pleonite 6, 1.5 times as long as its equal rami, exopod and endopod with short robust terminal seta, 2 short robust setae on inner margin of endopod.

Etymology. The species is dedicated to the memory of the late Prof. Dr Alexandru V. Grossu (1910–2004) as a sign of gratitude for his moral and professional qualities as a brilliant scientist and mentor. He was the most important Romanian specialist in malacology, highly appreciated throughout the world, former director of “Grigore Antipa” National Museum of Natural

History (1955–1957), founder of its scientific journal, professor of zoology and Dean of the Faculty of Biology in Bucharest (1957–1962).

Distribution. Eastern Vic.; 32 m depth.

Remarks. *Campylaspis grossui* is closely related to *C. wardi* Băcescu, 1991 and *C. sculpta*. All three have a similar carapace, and short and robust pereopods and uropods. *Campylaspis grossui* differs from *C. wardi* in several characteristics: fewer tubercles on the carapace; longer teeth on the dactylus of maxilliped 2; more slender carpus of maxilliped 3; uropods with smooth margins; two short stout setae on the inner margin of endopod versus none; and terminal short setae without the oval structures characteristic of *C. wardi*. *Campylaspis grossui* differs from *C. sculpta* in the shape of the carapace in dorsal view, more robust antenna 1, maxilliped 3 and pereopod 1 with more slender articles, pereopod 2 with a much shorter dactylus (twice as long as the propodus in *C. grossui* versus four times in *C. sculpta*) and without a digitiform extremity, and more slender uropod rami with longer setae.

Campylaspis halei sp. nov.

Figures 12, 13

Material examined. Holotype female, Tas., off Freycinet Peninsula, 41°57.50'S, 148°37.90'E, 400 m, coarse shell, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 July 1986 (stn SLOPE 48), NMV J52940.

Allotype male: (stn SLOPE 48), NMV J52941.

Paratypes: 2 females, 1 immature male, 2 manca (stn SLOPE 1), NMV J52943; 2 females (stn SLOPE 47), NMV J52416; 2 females (stn SLOPE 47), MGAB CUM 1608; 3 females, 1 female, dissected (stn SLOPE 48), NMV J52942; 1 female (stn SLOPE 19), NMV J52420.

Diagnosis. Carapace with a small lateral sulcus. Accessory flagellum of antenna 1 2-articulate. Maxilliped 2 with subequal dactylar teeth. Merus of maxilliped 3 massive, merus, carpus and propodus with teeth on inner margin. Dactylus of pereopod 2 2.8 times as long as propodus, with a digitiform extremity. Uropod peduncle twice as long as pleonite 6 and its endopod, exopod 0.8 length of endopod, endopod with 5 microserate setae on inner margin.

Description of female. Body with calcified smooth integument. Length: 3.2 mm.

Carapace 0.45 length of entire body, with a small lateral sulcus, large ocular lobe without lenses, antennal notch distinct, anteroventral corner acute, ventral margin smooth. Pleon 0.36 body length.

Antenna 1 peduncle with serrated margins, distal article longer than median one, main flagellum 3-articulate, longer than last article of peduncle, basal article longer than rest of articles combined, accessory flagellum tiny, 2-articulate.

Maxilliped 2 basis fused with ischium, with plumose seta on inner distal corner, merus with similar seta medially, carpus with tooth and 2 long simple setae on inner margin, propodus second longest article, with robust outer seta longer than dactylar teeth, dactylus with 3 subequal teeth.

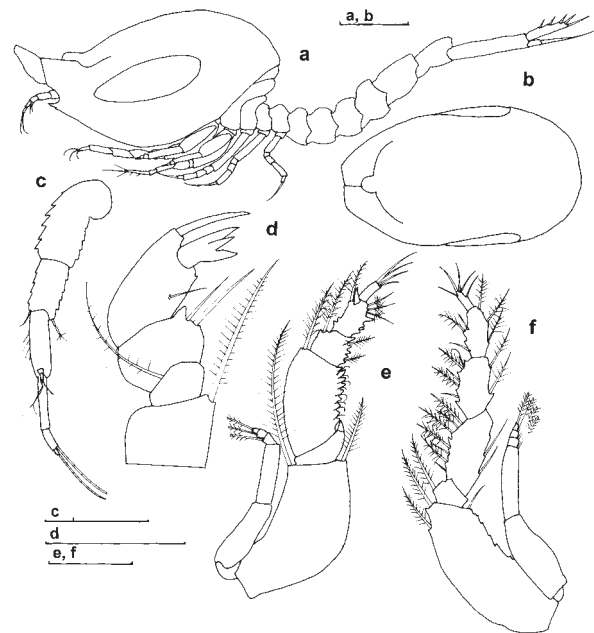


Figure 12. *Campylaspis halei* sp. nov. female paratype: a, body, lateral view; b, carapace, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3; f, pereopod 1. Scale (in mm): a, b, 0.5; c, 0.1; d, 0.1; e, f, 0.25.

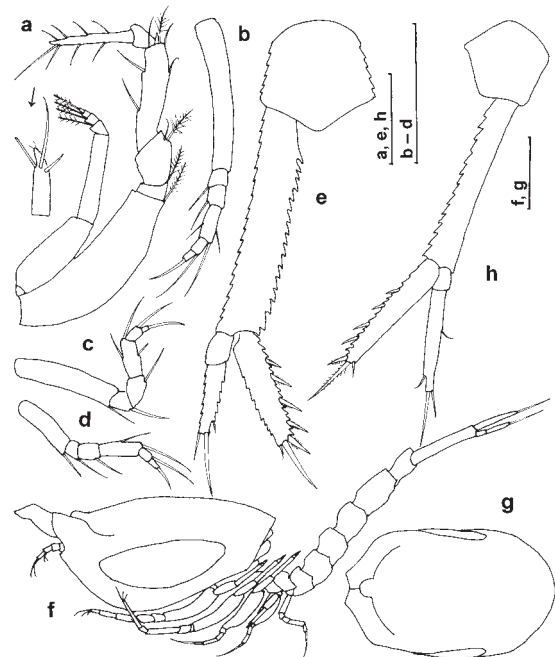


Figure 13. *Campylaspis halei* sp. nov. female paratype: a–e, male f–h: a, pereopod 2; b, pereopod 3; c, pereopod 4; d, pereopod 5; e, pleonite 6 and left uropod; f, body, lateral view; g, carapace, dorsal view; h, pleonite 6 and right uropod. Scale (in mm): a, e, h, 0.25; b–d, 0.5; f, g, 0.5.

Maxilliped 3 basis less than half as long as appendage, with plumose seta on inner distal corner and longer 1 on outer corner, inner distal corner of ischium with robust seta, merus second longest article, longer than carpus, propodus and dactylus combined, with row of teeth on inner margin and plumose seta on outer distal corner, carpus shorter than propodus, with serrated inner margin and plumose seta on outer distal corner, propodus with teeth on both margins, dactylus shorter than propodus, with terminal simple setae.

Pereopod 1 basis shorter than one-third of appendage length, with 2 plumose setae on inner margin, numerous plumose setae on inner margins of ischium to propodus, merus second longest article, carpus longer than propodus, propodus longer than dactylus, dactylus with simple setae. Pereopod 2 basis more than one-third length of appendage, plumose seta on inner distal corner of basis, ischium and merus, carpus twice as long as merus, with short stout seta, simple and plumose setae on inner distal corner, dactylus 2.8 times as long as propodus, digitiform dactylus tip with subterminal short simple seta. Pereopods 3–5 with progressively shorter basis and longer carpus, carpus and propodus with simple stout seta on outer distal corner, dactylus with stout terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod with serrated margins, peduncle twice pleonite 6, exopod shorter than endopod, with terminal robust seta shorter than exopod, endopod half peduncle length, with robust terminal seta and 5 microserrate setae on inner margin.

Description of immature male. Body length: 2.8 mm. Carapace less vaulted than in female, with similar sulcus. Antenna 2, pereopods 1–4 and exopods characteristic of an immature stage.

Uropod peduncle with less serrated margins, more slender and proportionally longer than in females, 2.3 times pleonite 6, rami longer than in females, endopod 0.77 peduncle length, rami equal, exopod with smooth margins, endopod with 5 stout setae on inner serrated margin.

Etymology. The species is dedicated to the memory of Herbert Mathew Hale (1895–1963), former director of the South Australian Museum (1928–1960), one of the most important specialists of Cumacea. He described most of the cumacean taxa known from Australian waters.

Distribution. NSW, off Freycinet Peninsula, Tas.; 400–600 m depth.

Remarks. *Campylaspis halei* has a smooth carapace surface with a relatively small lateral sulcus, extending over about half of the carapace. It resembles *C. latidactyla* Hale, 1945 but with a different extremity of the dactylus of pereopod 2 (digitiform tip in *C. halei*). Its sulcus is smaller than in *C. minor* Hale, 1945, where it is largely opened towards the anterior margin, and has a marked antennal notch absent in Hale's species (which has a much smaller size). *C. halei* is also similar to *C. latimera*, a species with a characteristic large merus on pereopod 1 and to *C. poorei* which has a narrower sulcus, slender pereopods 1 and 2 and a straight tip on the dactylus of pereopod 2 (digitiform in *C. halei*).

Campylaspis hirsuta sp. nov.

Figures 14, 15

Material examined. Holotype male, Vic., south of Point Hicks, 38°25'S, 149°00'E, 1500 m, compacted clay, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 22 Jul 1986 (stn SLOPE 27), NMV J52411.

Paratype: 1 immature male (stn SLOPE 46), NMV J52951.

Diagnosis. Carapace with 2 rows of dorsal tubercles provided with strong spines, spines on top of pseudorostrum, external row of tubercles with stronger spines, large lateral sulcus. Dorsal spines on pereon and pleon. Maxilliped 2 with dactylar teeth. Maxilliped 3 with long terminal seta on dactylus. Dactylus of pereopod 2 as long as propodus and carpus combined. Uropod peduncle 1.7 times as long as pleonite 6, 1.6 times as long as endopod.

Description. Body with integument strongly calcified. Length: 4.7 mm.

Carapace 0.4 body length, 1.8 times as long as high, with large lateral sulcus, pair of tubercles with strong spines at the posterior corners of the frontal lobe, 3 pairs in the median part and pair of smaller ones on posterior extremity, exterior row of 3 strong tubercles with spines on each side, ocular lobe acute, without eyes, pseudorostral lobes large and rounded, little upturned, with spines and long simple setae at the tip, antennal notch marked, anteroventral corner acute, ventral serration strong, long simple dorsal setae.

Antenna 1, median and distal article of peduncle subequal, shorter than main flagellum 3-articulate, accessory flagellum tiny, uniarticulate.

Maxilliped 2 with strong plumose seta on distal inner corner of basis and merus, ischium not visible, 2 simple setae on inner margin of carpus, propodus second longest article, with robust seta on distal outer corner, longer than dactylar teeth, dactylus with 3 teeth, median one shorter. Maxilliped 3 basis half entire appendage, with 2 short plumose setae and short distal serration on inner margin, 2 long plumose setae on outer distal corner, merus second longest article, with serrated inner margin, with tooth and plumose seta on outer margin, short carpus with serrated outer margin, propodus 1.4 times as long as carpus and twice as long as dactylus, dactylus with terminal simple long seta, 3 times dactylus length.

Pereopod 1 basis little less than half as long as appendage, with 2 long plumose setae on inner margin, serration on both distal sides, ischium with serrated inner margin with long plumose seta, merus second longest article, with numerous setae on both margins, carpus little shorter than merus, densely setose, propodus shorter than carpus, with numerous setae, twice as long as dactylus, dactylus with short simple setae. Pereopod 2 basis less than one-third rest of articles combined, with plumose seta on inner distal corner, simple seta on inner margin of merus, carpus 1.9 times as long as merus, short simple seta and longer plumose seta on its distal inner corner, dactylus 3.5 times as long as propodus, as long as propodus and carpus combined, with simple setae on both margins, subterminal and terminal simple long setae. Pereopod 3 basis large, plumose seta on distal inner corner of ischium and

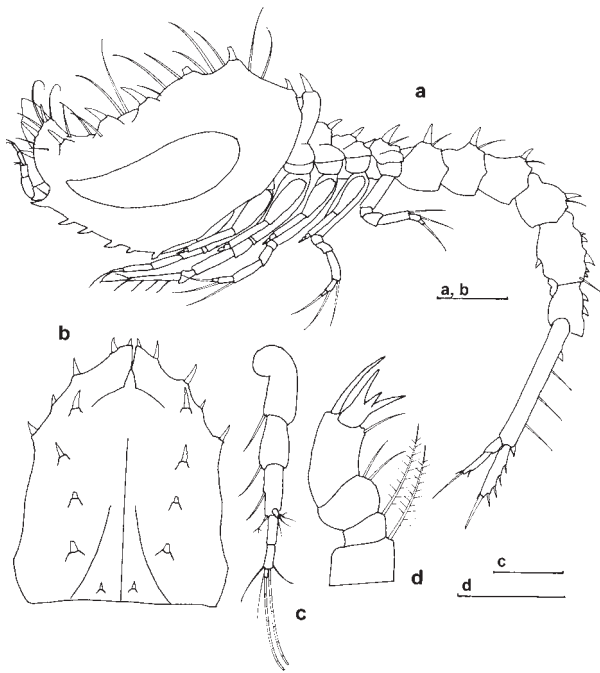


Figure 14. *Campylaspis hirsuta* sp. nov. female holotype: a, body, lateral view; b, carapace, dorsal view; c, antenna 1; d, maxilliped 2. Scale (in mm): a, b, 0.5; c, 0.25; d, 0.3.

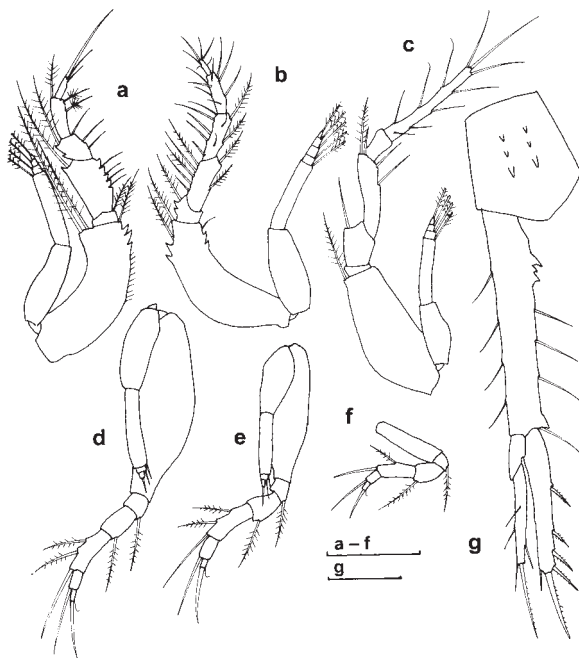


Figure 15. *Campylaspis hirsuta* sp. nov. female holotype: a, maxilliped 3; b, pereopod 1; c, pereopod 2; d, pereopod 3; e, pereopod 4; f, pereopod 5; g, pleonite 6 and left uropod. Scale (in mm): a–f, 0.5; g, 0.25.

merus, carpus little longer than merus, with 2 plumose setae on outer margin and robust seta on outer distal corner, small dactylus with stout terminal seta. Pereopod 4 similar to pereopod 3, with smaller basis and longer carpus. Pereopod 5 with 1 plumose seta on outer margin of carpus. 5 pairs of exopods incompletely developed.

Uropod peduncle 1.7 times as long as pleonite 6, 1.6 times as long as endopod, 3 proximal teeth and 4 simple setae on inner margin, exopod little shorter than endopod, with short simple subterminal seta, another seta on inner margin and robust microserrate terminal seta, endopod with 4 microserrate setae on inner margin, subterminal simple seta and terminal robust microserrate seta.

Etymology. The species is named “*hirsuta*” because of its integument with numerous setae and spines.

Distribution. South of Point Hicks, Vic., off Freycinet Peninsula, Tas.; 720–1500 m depth.

Remarks. Such a combination of characters, tubercles with spines on the carapace, carapace with a lateral sulcus, plus dorsal spines on the pereon and pleon as in *Campylaspis hirsuta*, is unique among species of *Campylaspis*. *C. spinosa* Calman, 1906 from the Mediterranean and the Atlantic Ocean has acute tubercles without spines on the carapace and dorsal spines on the pereon and pleon. The uropod endopod of *C. hirsuta* has four microserrate setae on the inner margin instead of three as in *C. spinosa*.

Campylaspis johnstoni Hale, 1937

Campylaspis johnstoni Hale, 1937: 37–56, fig. 2.

Material examined. 4 females, 2 males (stn SLOPE 1), NMV J52975; 1 female, 1 immature male (stn SLOPE 2), NMV J54127; 1 female (stn SLOPE 2), NMV J52963; 1 male (stn SLOPE 46), NMV J52974.

Distribution. Antarctica, Kerguelen Is., south-western Atlantic (Argentina), 204 m depth (Băcescu, 1992); NSW, Tas., 720 m depth.

Remarks. This is the first record of this widespread species from Australian waters and from such a depth (720 m).

Campylaspis latidactyla Hale, 1945

Campylaspis latidactyla Hale, 1945: 194, figs 33, 34.

Material examined. 1 female, 1 male (stn SLOPE 22), NMV J52971.

Distribution. Moreton Bay, Qld, NSW; 200 m depth.

Remarks. The species was first recorded by Hale, 1945 from Moreton Bay, Queensland; its distribution is now extended to the southern New South Wales shelf.

Campylaspis latimera sp. nov.

Figures 16–19

Material examined. Holotype subadult female, Tas., off Freycinet Peninsula, 42°00.20'S, 148°37.70'E, 720 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 46), NMV J52935.

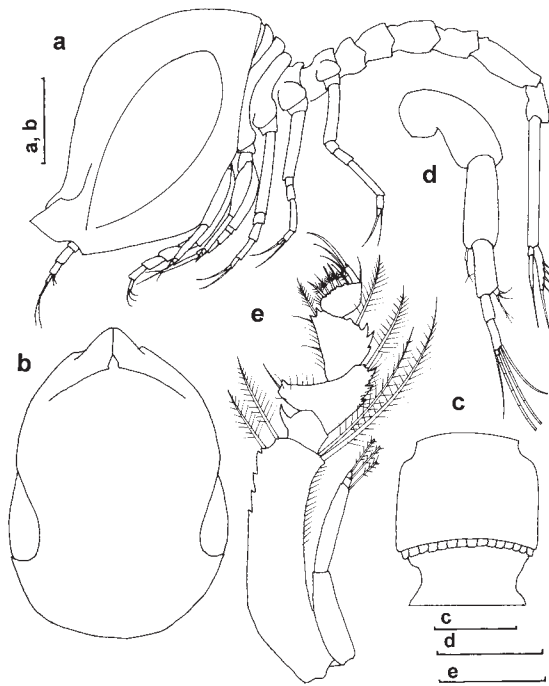


Figure 16. *Campylaspis latimera* sp. nov. female paratype: a, body, lateral view; b, carapace, dorsal view; c, fifth pleonite; d, antenna 1; e, maxilliped 3. Scale (in mm): a, b, 1; c, 0.25; d, 0.25; e, 0.5.

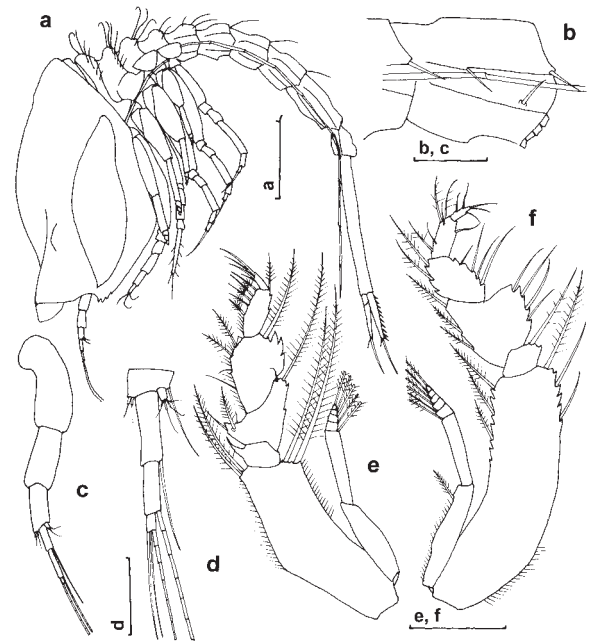


Figure 18. *Campylaspis latimera* sp. nov. male paratype: a, body, lateral view; b, pleonite, magnified; c, antenna 1; d, its flagella, magnified; e, maxilliped 3; f, pereopod 1. Scale (in mm): a, 1; b, c, 0.25; d, 0.1; e, f, 0.5.

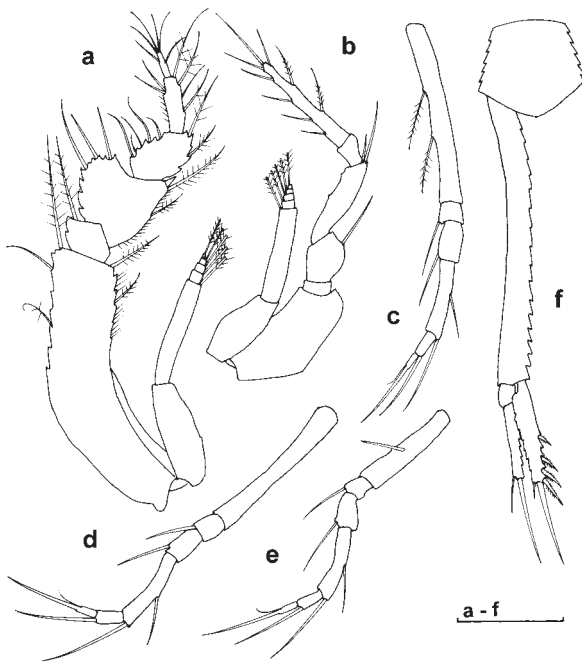


Figure 17. *Campylaspis latimera* sp. nov. female paratype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a–f, 0.5.

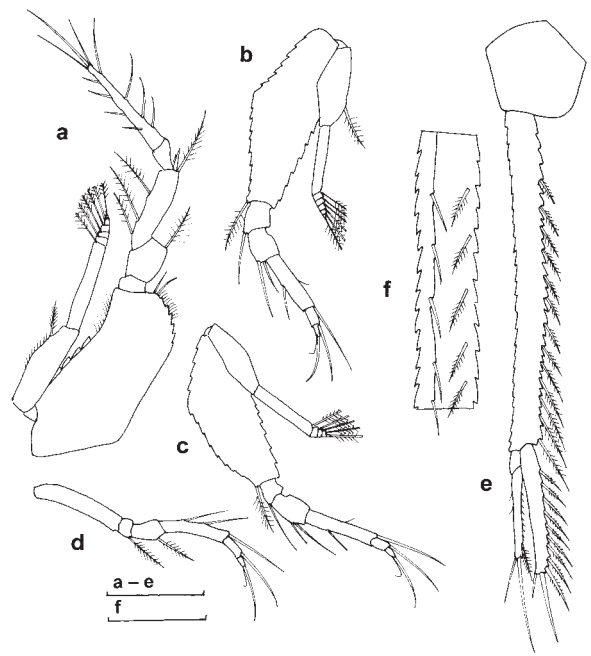


Figure 19. *Campylaspis latimera* sp. nov. male paratype: a, pereopod 2; b, pereopod 3; c, pereopod 4; d, pereopod 5; e, pleonite 6 and left uropod; f, detail of uropodal peduncle, magnified. Scale (in mm): a–e, 0.5; f, 0.25.

Allotype: male (stn SLOPE 45), NMV J52936.

Paratypes: 2 females, 1 manca (stn SLOPE 1), NMV J52937; 1 female (stn SLOPE 1) MGAB CUM 1609; 1 immature male (stn SLOPE 46), NMV J52938; 1 immature male, NMV J45784; 1 female, 1 immature male (stn SLOPE 48), NMV J52939.

Diagnosis. Carapace with a large lateral sulcus, small ocular lobe without eyes. Maxilliped 3 with large concave merus. Pereopod 1 with large merus. Pereopod 2 with long dactylus (3.8 times as long as propodus). Pereopods 3–5 dactylus fused with its terminal seta. Uropod peduncle 3 times as long as pleonite 6 and 2.8 times as long as endopod.

Description of female. Body with calcified, smooth integument. Length: 6.8 mm.

Carapace 0.44 body length, 1.7 times as long as high, large lateral sulcus occupying most of lateral side of carapace (0.7 of its length), ocular lobe small, acute, without eyes, antennal notch small, ventral margin smooth. Pleonites each with toothed posterior margin.

Antenna 1 basal article of peduncle the longest, distal one the shortest, main flagellum shorter than last article of peduncle, 3-articulate, accessory flagellum tiny, uniarticulate.

Maxilliped 3 basis more than half length of appendage, serrated inner margin with 2 plumose apical setae, 2 longer plumose setae on outer corner (not produced), ischium with strong tooth on inner margin, merus large and concave, produced with small tooth, serrated outer margin with plumose seta, carpus shorter than merus, with serrated outer margin and plumose seta, propodus shorter than carpus, with numerous inner plumose setae, dactylus half of propodus, with setae as long as article.

Pereopod 1 basis more than half length of appendage, serrated inner margin with 2 simple setae and long pappose seta on inner distal corner, 2 plumose setae on outer margin, ischium with pappose seta on serrated inner margin, merus large, second longest article, 3 simple setae on serrated inner margin and 2 plumose setae and spine on outer margin, carpus large with serrated margins with simple setae on inner margin and plumose on outer margin, shorter than merus, propodus shorter and thinner than carpus, with numerous plumose setae on outer margin, dactylus 0.5 of propodus, with short simple setae. Pereopod 2 basis less than half length of appendage, simple seta on inner margin of merus, 2 unequal simple setae on outer distal corner, dactylus 3.8 times as long as propodus, with plumose setae on inner margin and simple seta on outer margin, subterminal and terminal simple setae. Pereopods 3–5 with progressively shorter basis and longer carpus (twice as long as merus), dactylus fused with terminal stout seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 3 times as long as pleonite 6 and 2.8 times as long as endopod, serrated inner margin without setae, exopod slightly shorter than endopod, with subterminal simple stout setae, endopod with 4 microserrate setae on inner margin, terminal robust seta shorter than endopod.

Description of male. Body with numerous long simple setae on posterior margin of pereonites and of pleonites 1–4. Length: 6.5 mm. Carapace less vaulted than in female, lateral sulcus smaller, anteroventral corner serrated. Pleonites with lateral groove for protecting the flagellum of antenna, provided with

stout setae on its margins keeping flagellum within groove.

Antenna 1 shorter than in female, main flagellum of 3 articles, 1 aesthetasc on articles 2–3. Accessory flagellum tiny, uniarticulate. Maxilliped 3 with similar merus but thinner propodus than in female.

Pereopod 1 as in female. Pereopod 2 basis larger, plumose seta on inner margin of merus, carpus with plumose seta on inner distal corner, dactylus 3.5 times as long as propodus, as in female. Pereopods 3 and 4 basis broad, longer carpus in pereopod 4 (twice as long as merus), dactylus with stout terminal seta. Pereopod 5 carpus second longest article, little longer than in pereopod 4.

Uropod peduncle 3.35 times as long as pleonite 6, longer than in female, 2.65 times as long as endopod, rami little longer than in female, numerous plumose setae on serrated inner margin and a median groove for antenna provided with a lateral row of stout setae and a parallel one with plumose setae, exopod 0.8 length of endopod, with short subterminal stout seta, inner plumose seta and terminal stout long seta (longer than exopod), endopod with 9 microserrate long setae on inner margin and a terminal robust seta shorter than endopod.

Etymology. The species is named “*latimera*” because of the large merus of its maxilliped 3 and pereopod 1.

Distribution. Off Nowra, NSW, off Freycinet Peninsula, Tas.; 204–720 m depth.

Remarks. *Campylaspis latimera* differs from other species from this area with a lateral sulcus on the carapace by the characteristic shape and large size of the merus of the first pereopod. Maxilliped 3 also has a large merus with a concave inner margin and a large carpus. Both features are present in males and females. *C. anae* also has a large merus and carpus of maxilliped 3 but without the concavity of the merus; pereopod 1 of this species has slender articles. Also, the merus and carpus of maxilliped 3 of *C. rectangulata* are large, the merus with an inner concavity but not as evident as in *C. latimera* and pereopod 1 has only moderately large articles. *Campylaspis microdentata* Ledoyer, 1988 from off Comore Is. has a similar merus to maxilliped 3 but the carapace has no lateral sulcus and pereopod 1 has slender articles, shaped normally.

Campylaspis longidentata sp. nov.

Figures 20, 21

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°00.20'S, 148°37.70'E, 720 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 46), NMV J52944.

Diagnosis. Carapace with an oblique, concave ridge from dorsal side toward the lower margin, covered with pits and spines. Maxilliped 2 with long terminal teeth, longer than usual, propodus with long robust distal seta and dactylus also with long teeth. Maxilliped 3 with serrated margins. Pereopod 1 with serrated margins on basis to propodus, with slender articles. Pereopod 2 with dactylus 5 times as long as propodus, and with long digitiform extremity. Slender uropod peduncle 2.48 times as long as pleonite 6 and 1.9 times as long as equal rami.

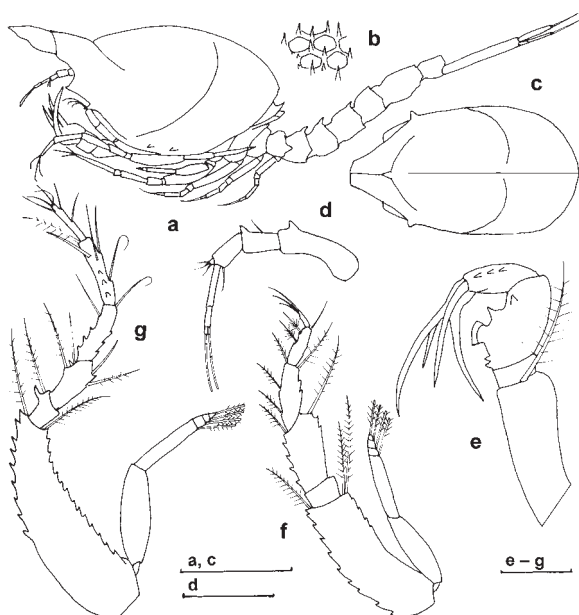


Figure 20. *Campylaspis longidentata* sp. nov. female holotype: a, body, lateral view; b, detail of its integument; c, carapace, dorsal view; d, antenna 1; e, maxilliped 2; f, maxilliped 3; g, pereopod 1. Scale (in mm): a, c, 1; d, 0.25; e–g, 0.25.

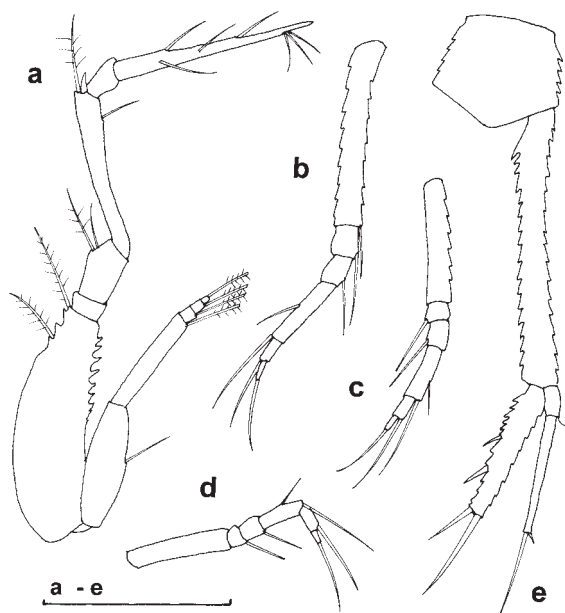


Figure 21. *Campylaspis longidentata* sp. nov. female holotype: a, pereopod 2; b, pereopod 3; c, pereopod 4; d, pereopod 5; e, pleonite 6 and right uropod. Scale (in mm): a–e, 0.5.

Description. Body elongated, with strongly calcified integument. Length: 3.7 mm.

Carapace about half of body, longer than high, covered with numerous pits bordered by little spines, antennal notch obvious, anterolateral corner acute, lower margin with tooth on anterior half, pseudorostral lobes meeting in front of eyeless ocular lobe at a distance longer than length of frontal lobe, concave ridge from dorsal side toward lower margin. A tooth on lateral plate of pereonite 5, a pair of dorsal teeth on pleonites 1–3.

Antenna 1 peduncle articles progressively shorter, basal and median articles with tubercle on inner margin, main flagellum 3-articulate, longer than distal article of peduncle, basal article of flagellum much more than half flagellum length, accessory flagellum tiny, uniaarticulate.

Maxilliped 2 basis with plumose seta on distal margin, ischium fused to basis, carpus second longest article, with 4 teeth (2 stronger) and axe-like tooth on inner margin, propodus with long robust distal seta, dactylus with 3 long teeth, median one shorter, twice as long as propodus. Maxilliped 2 visible between pereopod 1 and maxilliped 3 in lateral view. Maxilliped 3 basis shorter than 0.5 of appendage, with serrated margins, 2 plumose setae on outer distal corner, merus second longest article, with serrated margins and plumose seta on outer margin, carpus longer than propodus, with plumose seta on outer margin, propodus twice as long as dactylus, with 2 pappose setae on inner margin, dactylus with short simple terminal setae.

Pereopod 1 with slender articles, basis shorter than rest of articles combined, with serrated margins, plumose seta on distal inner and outer corner, tooth on inner margin of ischium, merus shorter than carpus, carpus shorter than propodus, propodus 1.6 times as long as dactylus, with simple setae. Pereopod 2 with slender articles, basis less than half length of appendage, plumose seta on inner distal corner, simple and plumose setae on inner margin of merus, carpus 2.8 times as long as merus, with robust short seta and plumose seta on its distal inner corner, dactylus 5 times as long as propodus, with long digitiform extremity, and simple setae on both margins. Pereopods 3–5, with progressively shorter basis and carpus, dactylus with long stout terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod slender, peduncle 2.5 times as long as pleonite 6 and 1.9 times as long as equal rami, with serrated inner margin, exopod with short stout terminal seta, endopod with 3 stout setae on inner margin and robust longer terminal seta.

Etymology. The name of the species is derived from the Latin “longa” – “long” and “dentata” – “with teeth”, due to the long teeth of maxilliped 2.

Distribution. Off Freycinet Peninsula, Tas.; 720 m depth.

Remarks. The texture of the carapace integument with pits and spines is as in *C. sagamiensis* Gamô, 1967 from Japan. It differs mainly in maxilliped 2 and pereopod 2 with a digitiform tip to the dactylus. The presence of such long dactylar teeth on maxilliped 2 is a unique feature within the genus *Campylaspis*.

Campylaspis lynseyae sp. nov.

Figures 22, 23

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°02.20'S, 148°38.70'E, 800 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 45), NMV J52962.

Paratypes: 2 immature males, 1 manca (stn SLOPE 45), NMV J52963.

Diagnosis. Carapace with large lateral sulcus, 0.53 body length, 1.7 times as long as high, large lateral sulcus (0.8 of carapace length). Small dorsal teeth on first 2 pleonites. Antenna 1 slender. Robust seta of propodus of maxilliped 2 as long as dactylar teeth. Maxilliped 3 slender, dactylus with long terminal simple setae. Pereopod 1 with merus twice as long as propodus, few setae on both margins. Pereopod 2 with digitiform tip of dactylus. Dactylus of pereopods 3–5 fused with its terminal stout seta. Uropod peduncle little more than twice pleonite 6 length, 1.7 times as long as endopod.

Description. Body with calcified smooth integument. Length: 2.36 mm.

Carapace 0.53 body length, 1.7 times as long as high, large lateral sulcus (0.8 of carapace length, 4.6 times as long as high), not meeting the dorsal side, frontal lobe with large base, pair of small tubercles at base of this lobe, ocular lobe with acute top, without eyes, long pseudorostrum not upturned, large siphon, small antennal notch, anteroventral corner acute, short serration of ventral margin in anterior part. Pleonites 1 and 2 with a pair of dorsal teeth and a lateral tubercle. Pereonite 6 with small tooth on posteroventral corner.

Antenna 1 basal article of peduncle the longest, with 2 long simple setae, main flagellum, 3-articulate, longer than distal article of peduncle, accessory flagellum minute.

Maxilliped 2 with plumose seta on distal inner corner of basis and median part of merus, tooth and 2 simple seta on inner margin of carpus, propodus second longest article, with robust seta on outer distal corner as long as dactylar teeth and tooth on inner margin, dactylus fused with its forked-like teeth, median one much shorter. Maxilliped 3 basis less than half as long as appendage, with 2 plumose setae on inner and outer margin, no outer process, long and slender merus, second longest article, with small inner concavity, and plumose seta on both margins, carpus half merus length, with 3 teeth on outer margin, propodus longer than carpus, dactylus shorter than propodus, with simple terminal setae much longer than propodus. Pereopod 1 basis less than half as long as appendage, merus 3 times as long as ischium, second longest article, carpus 0.6 length of merus, 1.25 of propodus, propodus twice as long as dactylus, few setae on ischium to dactylus, dactylus with simple short setae. Pereopod 2 basis less than half as long as appendage, plumose seta on inner margin of merus, carpus 1.4 times as long as merus, with simple and plumose seta on inner distal corner, dactylus 5 times as long as propodus, with few setae on both margins and a pronounced digitiform tip with 2 simple subterminal setae. Pereopods 3–5 with progressively shorter basis and longer carpus (carpus more than twice merus), dactylus fused with its terminal stout seta. Exopods in maxilliped 3 and pereopods 1, 2.

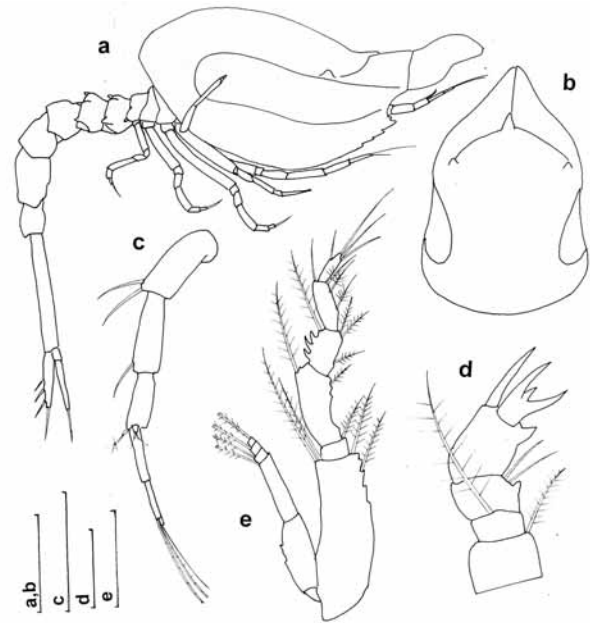


Figure 22. *Campylaspis lynseyae* sp. nov. female holotype: a, body, lateral view; b, carapace, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 0.5; c, 0.2; d, 0.1; e, 0.25.

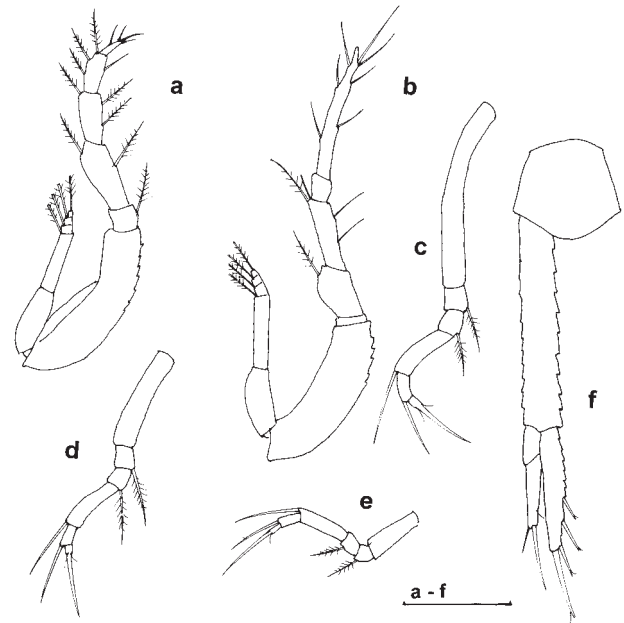


Figure 23. *Campylaspis lynseyae* sp. nov. female holotype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a–f, 0.25.

Uropod peduncle little more than twice length of pleonite 6, 1.7 times as long as endopod, serrated inner margin, without any setae, exopod 0.8 of endopod length, with short stout subterminal seta and much longer terminal one, endopod with 3 stout setae with subterminal setule on inner serrated margin and terminal robust seta.

Etymology. The species is dedicated to Lynsey Poore as a sign of gratitude for the kindness shown during my short visit to Melbourne.

Distribution. Off Freycinet Peninsula, Tas.; 800 m depth.

Remarks. The new species has a large lateral sulcus like *C. anae* and *C. rectangularata*. It differs from these species by presence of a pair of small tubercles on the base of the ocular lobe, longer antenna 1, slender maxilliped 3 and pereopod 1 and digitiform extremity of the dactylus of pereopod 2 (extremity broken in *C. anae*). *C. spinifera* also has a similar sulcus, a pair of tubercles on the base of the ocular lobe but with a supplementary tubercle with a spine on top on the lower margin of the sulcus near the anterolateral corner, a shorter, larger merus of maxilliped 3, and pereopod 2 with a tapering extremity to the dactylus.

Campylaspis nowrae sp. nov.

Figures 24, 25

Material examined. Holotype female, NSW, off Nowra, 34°51.90'S, 151°12.60'E, 770 m, crinoid dominated, WHOI epibenthic sled, G.C.B. Poore and C.C. Lu, RV *Franklin*, 15 Jul 1986 (stn SLOPE 6), NMV J 152945.

Diagnosis. Carapace with large lateral sulcus and 2 dorsal transverse ridges. Robust antenna 1. Maxilliped 3 with slender articles, dactylus with long terminal seta. Pereopod 1 with merus, carpus and propodus subequal, dactylus with long plumose subterminal seta. Pereopod 2 with digitiform extremity of long dactylus. Dactylus fused with its terminal seta in pereopods 3–5. Short uropods, peduncle 1.3 times as long as pleonite 6 and 1.7 times as long as equal rami, endopod with 2 stout setae on inner margin.

Description. Body with highly calcified integument, smooth. Length: 5.1 mm.

Carapace 0.49 body length, 2.3 times as long as high, with a large lateral sulcus posteriorly continued by a large concavity up to the median part, 2 dorsal transverse ridges in median part that reach upper side of sulcus, 2 small tubercles on lateral side of pseudorostrum, minute ocular lobe with a large base, without eyes, antennal notch large, no lateral and lower serration. Pleonites 1–4 with lateral acute expansions, pleonite 6 the longest.

Antenna 1 with robust articles, articles of peduncle progressively shorter toward the distal extremity, main flagellum 3-articulate, shorter than distal article of peduncle, accessory flagellum minute, uniarticulate.

Maxilliped 3 basis little shorter than rest of articles combined, with hairy margins, plumose setae on outer and inner distal corners, merus with small inner concavity, with plumose seta on outer serrated margin, propodus second longest article, dactylus half of propodus, with long simple terminal seta.

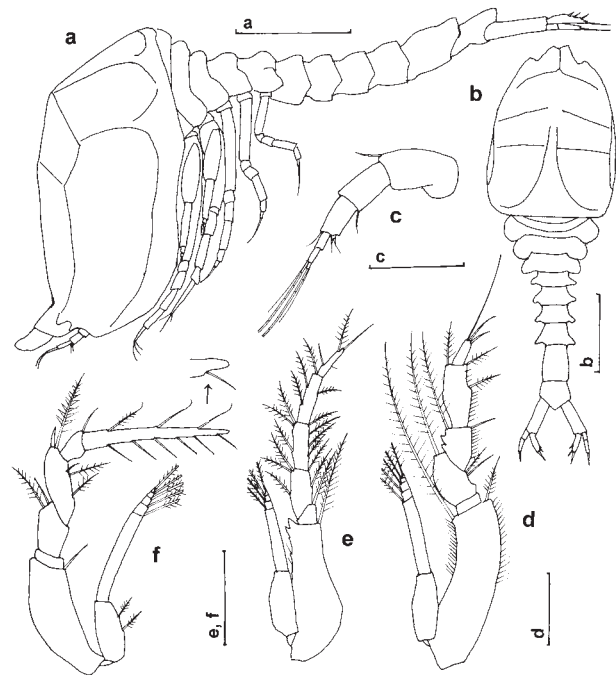


Figure 24. *Campylaspis nowrae* sp. nov. female holotype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 3; e, pereopod 1; f, pereopod 2. Scale (in mm): a, 1; b, 1; c, d, 0.25.

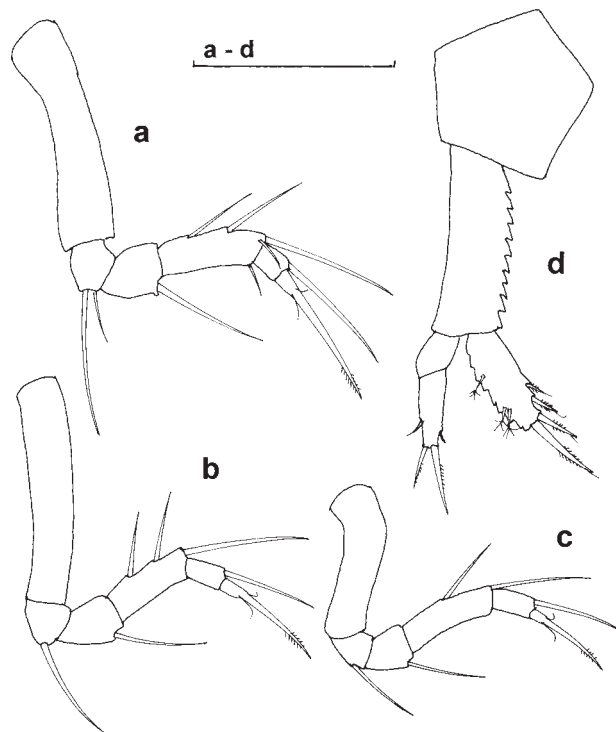


Figure 25. *Campylaspis nowrae* sp. nov. female holotype: a, pereopod 3; b, pereopod 4; c, pereopod 5; d, pleonite 6 and left uropod. Scale (in mm): a–d, 0.5.

Pereopod 1 basis less than half as long as appendage, with serrated outer margin and plumose seta on inner distal corner, merus, carpus and propodus subequal with numerous plumose setae on both margins, dactylus shorter than propodus, with plumose terminal seta. Pereopod 2 basis less than half as long as appendage, simple and plumose setae on inner margin of merus, carpus 1.7 times as long as merus, with stout seta and pappose seta on distal inner corner, dactylus 4.6 times as long as propodus, as long as merus, carpus and propodus combined, with lateral setae and digitiform short tip provided with short simple seta. Pereopods 3–5 with progressively shorter basis and longer carpus (carpus of 5th pair twice as long as merus), simple stout long setae on outer margin of carpus, 1 seta on its outer distal corner, dactylus fused with its terminal stout microserrate seta. Exopods on maxilliped 3 and pereopods 1, 2; with 2nd article very long.

Uropod peduncle 1.3 times as long as pleonite 6 and 1.7 times as long as equal rami, with serrated inner margin, exopod 2-articulate, with subterminal microserrate seta and a terminal longer one, endopod with 2 stout microserrate setae on inner margin, single subterminal setules and longer terminal seta (shorter than endopod), and 3 pedunculate setae.

Etymology. The species bears the name of a town in NSW near the type locality.

Distribution. Off Nowra, NSW; 770 m depth.

Remarks. The carapace of *C. nowrae* has two pairs of transverse dorsal crests in the median region similar to the carapace of form B of *C. johnstoni* Hale, 1937 found by Ledoyer (1993) in the Weddell Sea and *C. bulbosa* Jones, 1974 from the Atlantic coasts of south-western Africa. It differs in the posterior extremity of the carapace with a different arrangement of ridges, in much shorter uropods, and an endopod with two setae on its inner margin.

Campylaspis pileus Foxon, 1932

Cumella pileus Foxon, 1932: 393, figs 9, 10.

Material examined. 6 females (stn SLOPE 45), NMV J52976; 1 female (stn SLOPE 46), NMV J52977.

Distribution. Great Barrier Reef, Qld, Tas.; 22–800 m depth.

Remarks. These records extend the range of the species much further south, to Tasmania, and to greater depth (800 m).

Campylaspis poorei sp. nov.

Figure 26

Material examined. Holotype female, NSW, off Nowra, 34°51.90'S, 151°12.60'E, 770 m, crinoid dominated, WHOI epibenthic sled, G.C.B. Poore and C.C. Lu, RV *Franklin*, 15 Jul 1986 (stn SLOPE 6), NMV J52417.

Diagnosis. Carapace with long, thin narrow sulcus. Antenna 1 long. Maxilliped 2 with 3 short dactylar teeth, median one small. Merus of maxilliped 3 the 2nd longest article, dactylus with microserrate terminal setae. Pereopod 1 with slender and less setulated articles. Dactylus of pereopod 2 without digitiform

extremity. Uropod peduncle 1.6 times as long as pleonite 6 and 1.3 times longer than endopod, exopod shorter than endopod, endopod with 4 short microserrate setae on inner margin.

Description. Body with smooth integument. Length: 3.1 mm.

Carapace 0.43 of entire body length, twice as long as high, with long, thin lateral sulcus, big ocular lobe without eyes, antennal notch small, ventral margin smooth.

Antenna 1 long, proximal article of peduncle longest article, distal one longer than median article, main flagellum, 3-articulate, as long as last 2 articles of peduncle, accessory flagellum, minute, uniarticulate.

Maxilliped 2 basis with strong inner plumose seta, small tooth and 2 simple setae on inner margin of carpus, propodus second longest article, with robust seta on outer distal corner, longer than dactylar teeth, dactylus fused with 3 short teeth, median one minute. Maxilliped 3 basis half of appendage, 2 plumose setae on outer and inner distal corner, no outer process, merus second longest article, with serrate inner margin with plumose setae, long plumose seta on distal outer corner, carpus less than half merus, with strong serration and plumose seta on outer margin, propodus 1.5 times longer than carpus, with 2 pappose setae on inner margin, dactylus half of propodus, with microserrate setae longer than article.

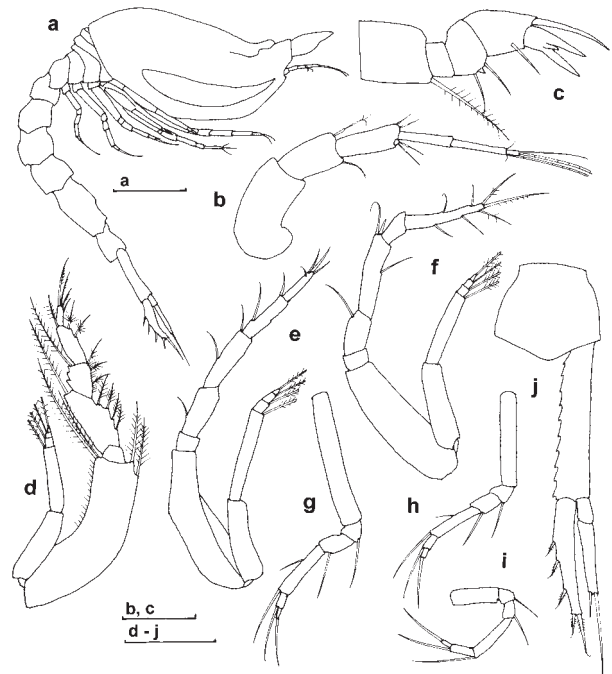


Figure 26. *Campylaspis poorei* sp. nov. female holotype: a, body, lateral view; b, antenna 1; c, maxilliped 2; d, maxilliped 3; e, pereopod 1; f, pereopod 2; g, pereopod 3; h, pereopod 4; i, pereopod 5; j, pleonite 6 and right uropod. Scale (in mm): a, 0.5; b, c, 0.1; d–j, 0.25.

Pereopod 1 basis shorter than rest of articles combined, margins smooth, merus 3 times as long as ischium, with simple seta on outer margin, carpus second longest article, with 2 simple curved setae on inner margin, propodus 0.8 of carpus length, with simple setae on inner margin, dactylus 0.7 propodus length, with simple short setae. Pereopod 2 basis shorter than rest of articles combined, simple seta on inner margin of merus, carpus 1.8 times as long as merus, with short stout seta and longer simple one on distal inner corner, dactylus 2.6 times as long as propodus, shorter than carpus, with few simple setae on both margins, subterminal and terminal plumose setae. Pereopods 3–5 with progressively shorter basis and longer carpus (carpus 3 times as long as merus in last pair), carpus with simple stout long seta on outer distal corner, dactylus with long stout terminal seta. Exopods on maxilliped 3 and pereopods 1, 2, with 2nd article long.

Uropod peduncle 1.6 times as long as pleonite 6 and 1.3 times as long as its endopod, with serrated inner margin, exopod 0.8 length of endopod, with long terminal robust seta, endopod with 4 short microserrate setae on inner margin and short microserrate terminal seta.

Etymology. The species is dedicated to Gary Poore, Museum Victoria, Melbourne, Australia, well-known specialist in Peracarida, as a sign of gratitude for offering me the opportunity to study this collection in his laboratory.

Distribution. Off Nowra, NSW; 770 m depth.

Remarks. The new species most resembles *C. minor* Hale, 1945. It differs in the lateral sulcus not reaching the anterior margin of the carapace, pereopod 1 has slender articles, without plumose setae, there are fewer plumose setae on pereopod 2, and the uropod endopod has three setae on the inner margin instead of two.

Campylaspis pustulosa Hale, 1945

Campylaspis pustulosa Hale, 1945: 207, figs 43, 44.

Material examined. 1 female, 1 male (stn SLOPE 1), NMV J52978; 1 female (stn SLOPE 2), NMV J52979; 2 females, 2 males (stn SLOPE 47), NMV J52980; 1 female, 1 male (stn SLOPE 47), MGAB CUM 1614; 2 females, 1 male (stn SLOPE 48), NMV J52981.

Distribution. Off Eden, NSW, Tas.; 70–600 m depth.

Remarks. New discoveries extend the range of this species from New South Wales to Tasmania and to 600 m depth.

Campylaspis rectangulata sp. nov.

Figures 27, 28

Material examined. Holotype immature male, NSW, off Nowra, 34°57.90'S, 151°08'E, 503 m, bryozoa and shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 14 Jul 1986 (stn SLOPE 2), NMV J54123.

Diagnosis. Carapace with large lateral sulcus, rectangular in dorsal view, with short thoracic and abdominal segments. Maxilliped 2 with short dactylar teeth, shorter than robust seta of propodus. Merus of maxilliped 3 with inner concavity,

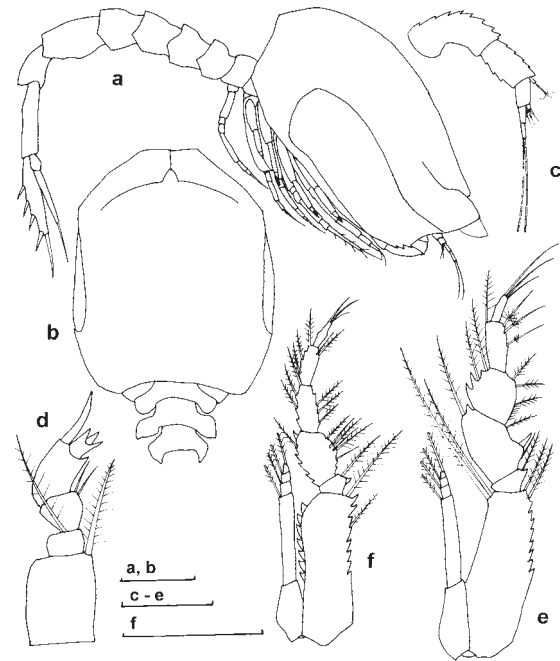


Figure 27. *Campylaspis rectangulata* sp. nov. female holotype: a, body, lateral view; b, carapace and pereon, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3; f, pereopod 1. Scale (in mm): a, b, 0.5; c–e, 0.25; f, 0.5.

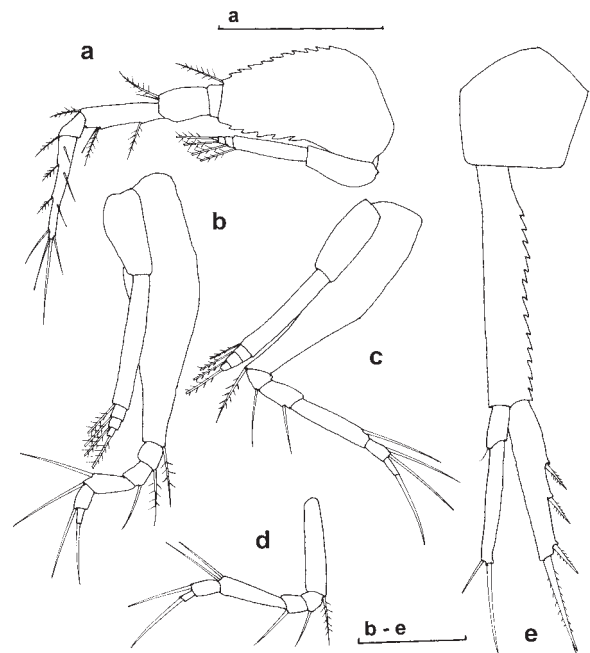


Figure 28. *Campylaspis rectangulata* sp. nov. female holotype: a, pereopod 2; b, pereopod 3; c, pereopod 4; d, pereopod 5; e, pleonite 6 and left uropod. Scale (in mm): a, 0.5; b–e, 0.25.

enlarged merus and carpus. Pereopod 1 with short articles (except enlarged merus), with numerous plumose setae. Dactylus of pereopod 2 without digitiform extremity. Uropod peduncle twice as long as pleonite 6 and 1.4 times as long as its equal rami, without setae, exopod with long robust terminal seta, endopod with 3 microserrate setae on inner margin and longer, more robust, terminal seta.

Description. Body with highly calcified smooth integument. Length: 3.5 mm.

Carapace 0.51 body length, covering first 4 pereonites in lateral view, 1.8 times as long as high, with large lateral sulcus (0.6 of carapace length, 3 times as long as high), frontal lobe with large base and small ocular lobe without eyes, antennal notch almost absent, anterolateral corner with short serration. Pleon elongated, 0.45 body length.

Antenna 1 peduncle with short and robust articles, with serrated margins, main flagellum 3-articulate, longer than distal article of peduncle, accessory flagellum tiny, uniarticulate.

Maxilliped 2 basis with strong plumose seta on inner margin, similar seta medially on distal margin of merus, carpus with 2 simple setae on inner margin, propodus second longest article, with robust curved seta on outer distal corner, longer than dactylar teeth, dactylus fused with 3 short, equal, teeth. Maxilliped 3 basis less than half as long as appendage, with serrated inner margin, with 2 plumose setae on inner distal corner and another 2 longer on outer distal corner, ischium with tooth and plumose seta on inner margin, merus second longest article, with inner concavity with setae, tooth and long plumose seta on outer margin, carpus enlarged, shorter than merus, with 2 teeth and 2 plumose setae on outer margin, propodus shorter than carpus, thinner, with 3 pappose setae on inner margin, dactylus 0.58 propodus length, with 3 long simple terminal setae.

Pereopod 1 basis less than half as long as appendage, with serrated margins (outer margin stronger), with 2 plumose setae on inner distal corner, short and robust articles with serrated margins and numerous plumose setae excepting dactylus with short simple ones, merus second longest article, carpus longer than propodus, propodus longer than dactylus. Pereopod 2 bulky, basis less than half as long as appendage, with serrated margins, short plumose seta on inner distal corner, 1 simple and 1 plumose seta on inner distal corner of merus, short carpus (1.5 times as long as merus), with short plumose seta on distal inner corner, dactylus 3 times as long as propodus, with a right-angled extremity, with simple and plumose setae on margins, long stout terminal seta, shorter than dactylus. Pereopods 3–5: pair 3 and 4 with enlarged basis, progressively shorter, carpus progressively longer (3 times as long as merus in 5th pair), dactylus with robust long terminal seta. Exopods, 5 pairs incompletely developed (characteristic of immature specimen).

Uropod peduncle twice as long as pleonite 6 and 1.4 times as long as equal rami, without setae, with serrated inner margin, exopod with long robust terminal seta, endopod with 3 microserrate setae on inner margin and longer, more robust, terminal seta.

Etymology. The name “*rectangulata*” describes the carapace in dorsal view, almost square.

Distribution. Off Nowra, NSW; 503 m depth.

Remarks. *Campylaspis rectangulata* is similar to *C. anae* (in the form of the carapace and similar antenna 1). It differs in having a maxilliped 2 with shorter teeth on the dactylus, a shorter robust distal seta on the propodus, merus of maxilliped 3 with an inner concavity and a stout seta (versus none) and shorter uropods with slender peduncle, longer subequal rami (versus exopod shorter than endopod in *C. anae*), and three microserrate setae on the inner margin of the endopod instead of four. Pereopods are sexually dimorphic.

Campylaspis sculpta sp. nov.

Figures 29, 30

Material examined. Holotype immature male, dissected, Vic., eastern Bass Strait, 7.3 km SSW of Cape Conran, 37°52.67'S, 148°42.06'E, 48 m, sand-shell, Smith-McIntyre grab, Marine Science Laboratories, RV *Sarda*, 28 Sep 1990 (stn MSL-EG 62), NMV J23259.

Paratypes: 1 immature male (stn MSL-EG 108), NMV J27471; 1 manca (stn MSL-EG 57), NMV J23258, 1 manca (stn MSL-EG 62), NMV J52955.

Diagnosis. Carapace highly sculptured, with short thoracic and abdominal segments. Maxilliped 3 and pereopod 1 with enlarged articles, except dactylus, propodus 2nd longest article after basis. Pereopod 2 with enlarged articles, with long dactylus, longer than basis, with digitiform tip. Pereopods 3–5 with short and robust articles, dactylus fused with robust terminal seta. Short and robust uropods, uropod peduncle 1.25 times as long as pleonite 6 and 1.3 times as long as equal rami. Exopod and endopod (wider than exopod) with rounded tips, with fine short setae.

Description. Body with strongly calcified and smooth integument. Length: 6.08 mm.

Carapace 0.49 body length, 1.9 times as long as high, with large, blunt tubercles around large lateral sulcus (0.8 of carapace length), pseudorostrum short, ocular lobe large, without lenses, pair of tubercles and transverse ridge at its base, antennal notch small, anterolateral corner continued towards ocular lobe by an oblique ridge.

Antenna 1 peduncle with short and robust articles, median article as long as distal one, main flagellum with 3 short and robust articles, shorter than last article of peduncle, median and distal article with an aesthetasc, accessory flagellum tiny, uniarticulate.

Maxilliped 3 basis half of appendage, with 2 plumose setae on inner distal corner and another longer 2 on distal outer corner, merus longer than carpus and ischium, shorter than propodus (0.7), with long plumose seta on outer margin, carpus about half propodus, with small tooth and plumose seta on outer margin, propodus 2nd longest article, with short plumose seta on outer margin and 2 fine setae on inner margin, dactylus 0.2 length of propodus, enlarged, with fine terminal seta.

Pereopod 1 basis half of appendage, with 3 long plumose setae on inner margin, enlarged ischium to dactylus, ischium with tooth and long plumose seta on inner margin, merus widest article, with plumose setae on inner margin, carpus as

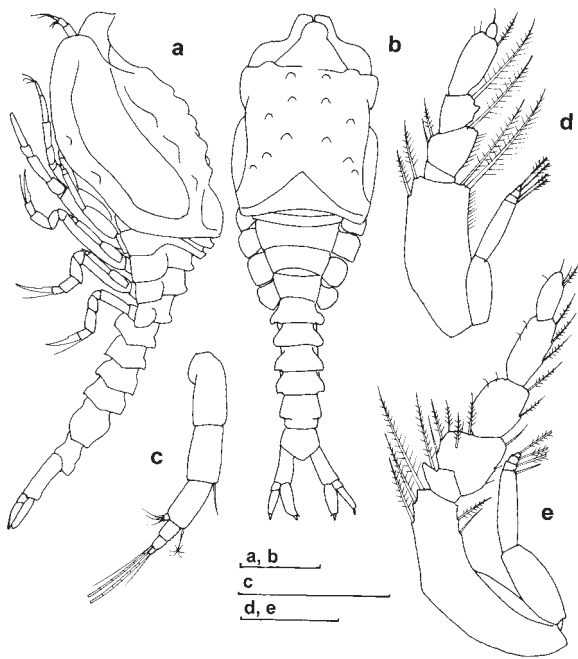


Figure 29. *Campylaspis sculpta* sp. nov. female holotype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 3; e, pereopod 1. Scale (in mm): a, b, 1; c, 0.5; d, e, 0.5.

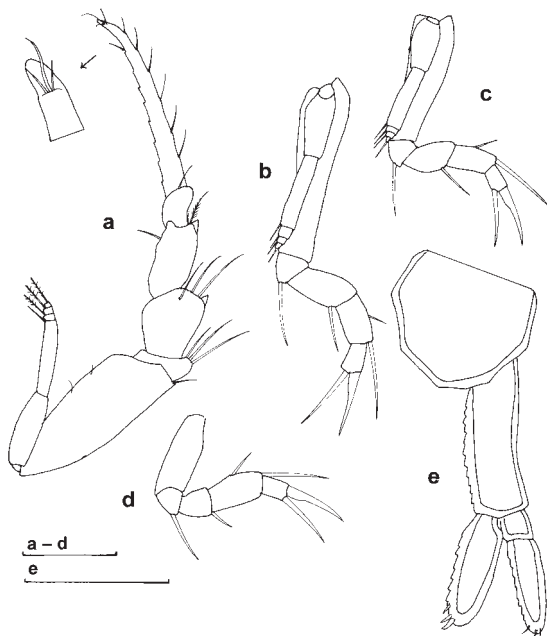


Figure 30. *Campylaspis sculpta* sp. nov. female holotype: a, pereopod 2; b, pereopod 3; c, pereopod 4; d, pereopod 5; e, pleonite 6 and right uropod. Scale (in mm): a–d, 0.5; e, 0.5.

long as merus, with plumose seta on outer margin, propodus, 2nd longest article, 1.1 times as long as carpus, with 3 plumose setae on outer margin, oval dactylus 0.7 of propodus length, with fine terminal seta. Pereopod 2 basis shorter, less than 3rd of appendage length, ischium with 3 simple setae on inner margin, robust merus, the widest article, with small tooth and 3 simple setae on inner margin, carpus little longer than merus, with small tooth and short plumose seta on inner distal corner, long, curved and with digitiform dactylus, 4.6 times as long as propodus, longest article, with 3 fine subterminal setae. Pereopod 3 basis more than half of appendage, merus twice as long as ischium, carpus 0.7 of merus length, with stout long seta on outer margin, propodus 0.6 of carpus length, with robust distal seta, dactylus fused with robust terminal seta. Pereopod 4 basis shorter than in previous pair, merus subequal to carpus, propodus little longer than in previous pair. Pereopod 5 with shorter basis, carpus 1.8 times as long as merus. Exopods, 5 pairs.

Pleonite 6 and uropod with hyaline fringes. Uropod short and robust, uropod peduncle 1.25 times as long as pleonite 6 and 1.3 times as long as equal rami, serrated inner margin, exopod and endopod (wider than exopod), with rounded tips and serrated inner margins, exopod with 3 fine terminal setae, endopod with 3 stout short setae, terminal one little longer.

Etymology. The name “*sculpta*” refers to the sculptured carapace.

Distribution. Eastern Vic.; 48–50 m depth.

Remarks. *Campylaspis sculpta* is similar to *C. wardi* Băcescu, 1991 and *C. grossui*. They have similar carapaces, short and robust pereopods and uropods. *C. sculpta* differs from *C. wardi* in: fewer tubercles on the carapace; larger sulcus; larger propodus (second longest article) and rounded dactylus of maxilliped 3; larger propodus and dactylus; rounded dactylus of pereopod 1; much longer dactylus of pereopod 2; and the uropod exopod with few terminal fine setae and the endopod with three stout ones, versus the endopod with terminal short setae with the oval structures characteristic of *C. wardi*. The shape of the carapace in dorsal view is different from *C. grossui*. The species also differ in: stronger antenna 1, tiny rounded dactylus of maxilliped 3 and enlarged and rounded dactylus of pereopod 1, versus slender antenna 1 and maxilliped 3 and pereopod 1 with larger articles and dactylus in *C. wardi* and *C. grossui*. Pereopod 2 has a much longer dactylus, four times as long as the propodus in *C. sculpta*, and with a digitiform extremity, versus twice as long in *C. wardi* and *C. grossui*, which have a normal extremity. The uropod rami are stronger than in *C. grossui* and it also has finer setae.

Campylaspis serrata sp. nov.

Figures 31, 32

Material examined. Holotype female, NSW, off Nowra, 34°51.90'S, 151°12.60'E, 770 m, crinoid dominated, WHOI epibenthic sled, G.C.B. Poore and C.C. Lu, RV *Franklin*, 15 Jul 1986 (stn SLOPE 6), NMV J45786.

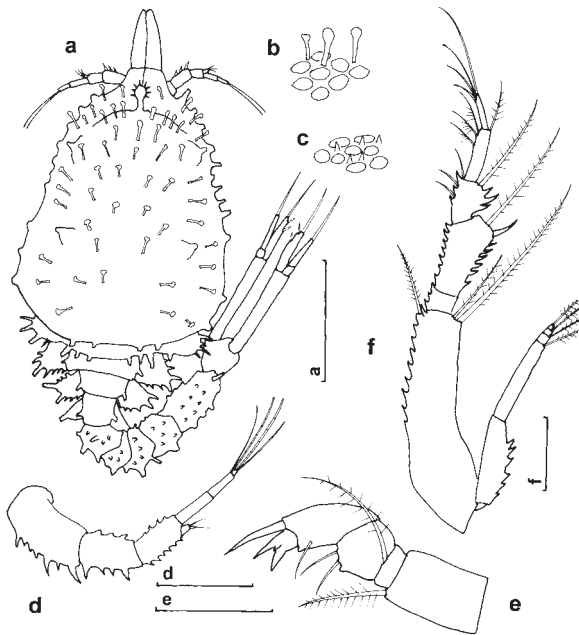


Figure 31. *Campylaspis serrata* sp. nov. female holotype: a, body, dorsal view; b, detail of integument from carapace; c, detail of integument of pereon and pleon; d, antenna 1; e, maxilliped 2. Scale (in mm): a, 1; d, 0.25; e, 0.2; f, 0.25.

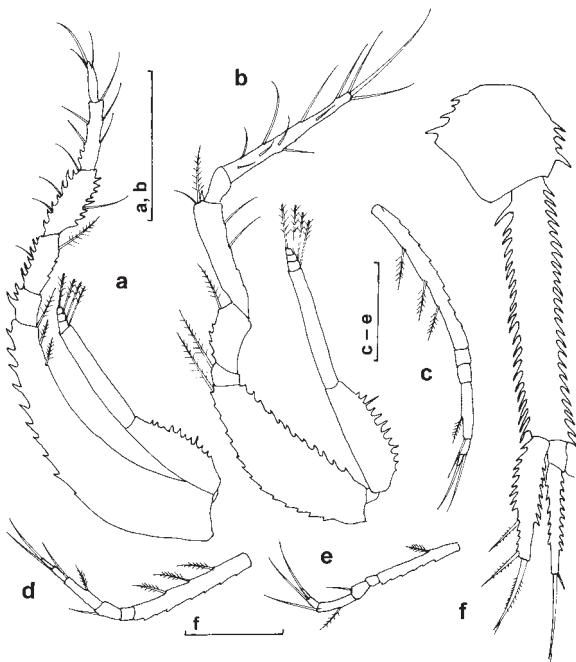


Figure 32. *Campylaspis serrata* sp. nov. female holotype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and right uropod. Scale (in mm): a, b, 0.5; c–e, 0.5; f, 0.25.

Diagnosis. Carapace covered with spines, small tubercles and long club-like setae interspersed with pits. Integument of pereon and pleon with pits and small spines. Antenna 1, maxilliped 3, pereopods 1 and 2 and uropods with densely serrated margins. Maxilliped 3 with merus second longest article, with long outer spine, carpus with 3 outer teeth, dactylus with long simple setae longer than article. Pereopod 1 with slender articles, with few setae. Pereopod 2 with long dactylus with straight tip. Uropod peduncle 2.25 times as long as pleonite 6 and 1.9 times as long as exopod, exopod little longer than endopod.

Description. Body with integument densely pitted, with bludgeon-like setae, small tubercles and spines on carapace and with small spines on rest. (The only specimen, holotype, is not in good shape, being a little dorsally compressed and twisted). Length: 4.5 mm.

Carapace about half body length, 1.3 times as long as wide, almost triangular in dorsal view, pair of small tubercles in median region, bigger one on branchial part and larger ones with spine on top at base of frontal lobe, integument densely pitted, with long spines and club-like setae, ocular lobe with spoon-like tip with crown of small spines, without eyes, pseudorostral lobes straight. Lateral plates of pereon with long spines, integument covered with pits and small spines. Pleon with pits and spines (longer ones are broken).

Antenna 1 peduncle with strongly serrated articles, main flagellum 3-articulate, longer than distal article of peduncle, accessory flagellum minute, uniarticulate.

Maxilliped 2 with strong plumose setae on inner margin of basis and distally on merus, carpus with small tooth and 2 simple setae on inner margin, propodus 2nd longest article, with robust seta on outer distal corner, longer than dactylar teeth, dactylus with 3 teeth, median one minute. Maxilliped 3 with slender articles, basis less than half as long as appendage, with plumose seta on inner margin and 2 longer ones on outer distal corner, no outer process of basis, merus second longest article, with strong tooth and plumose seta on outer distal corner, carpus shorter than merus, with 3 teeth on outer margin, propodus little longer than carpus, with 3 papose setae on inner margin, dactylus 0.75 of propodus length, with long simple setae, longer than dactylus.

Pereopod 1 with slender articles, basis longer than rest of articles combined, with 3 plumose setae on outer margin, ischium with 3 teeth (one larger) on inner margin, merus little shorter than carpus, with plumose seta on outer margin, carpus 2nd longest article, with simple setae, propodus subequal to merus, with simple setae, dactylus 0.57 of propodus length, with long simple setae. Pereopod 2 basis more than 3rd of appendage length, with plumose seta on distal inner corner, ischium and merus with similar seta, carpus 1.7 times as long as merus, with small tooth and long plumose seta on inner distal corner, dactylus 3.75 times as long as propodus, with numerous simple setae, and 1 terminal longer simple stout seta. Pereopods 3–5 with serrated margins, progressively shorter, with plumose setae, progressively shorter carpus (3 times as long as merus in 3rd pair), with plumose seta on inner margin and stout simple one on distal corner, dactylus with long stout simple terminal seta. Exopods on maxilliped 3 and pereopods 1, 2; with serrated bases.

Uropod peduncle 2.25 times as long as pleonite 6 and 1.9 times as long as exopod, with highly serrated margins, exopod little longer than endopod, with serrated margins and robust terminal seta, endopod with serrated margins, with 2 long microserrate setae on inner margin and a longer, more robust, terminal one.

Etymology. The name of the species describes the serrated appendages.

Distribution. Off Nowra, NSW; 770 m depth.

Remarks. Another species of *Campylaspis* with such highly serrated appendages is *C. echinata* Hale, 1945 (described only from the male). *C. serrata* has a differently textured carapace integument, densely pitted, with long spines and bludgeon-like setae, an ocular lobe with a spoon-like tip with a crown of small spines, uropods with the exopod slightly longer than the endopod, and the endopod with two microserrate long setae on the inner margin instead of one.

Campylaspis setifera sp. nov.

Figures 33, 34

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°00.20'S, 148°37.70'E, 720 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 46), NMV J52953.

Paratypes: 1 female, 1 dissected female (stn SLOPE 46), NMV J52954; 1 female (stn SLOPE 46), MGAB CUM 1611.

Diagnosis. Carapace high and smooth. Antenna 1 with long main flagellum. Dactylus of maxilliped 2 with short teeth. Maxilliped 3 with enlarged articles, merus 2nd longest article. Pereopod 1 with elongated articles with numerous plumose setae, merus second longest article. Pereopod 2 with long carpus, 2.5 times as long as merus, short dactylus with digitiform extremity. Dactylus of pereopods 3–5 fused with terminal stout seta. Long uropods, uropod peduncle 2.4 times as long as pleonite 6 and twice as long as endopod, with 8 microserrate setae on inner margin, endopod little longer than exopod, with 12 microserrate setae on inner margin.

Description. Body with highly calcified smooth integument. Length: 4.7 mm.

Carapace bulky, 0.51 body length, 1.3 times as long as high, oval in dorsal view, with short straight truncated pseudorostrum, ocular lobe with large base and minute tip, without lenses, antennal notch minute, lower margin smooth. Pereon 0.07 of entire body length, last 2 segments more visible. Pleon 0.41 body length, elongate.

Antenna 1 peduncle basal article the longest, rest progressively shorter, main flagellum 3-articulate, longer than last 2 articles of peduncle combined, accessory flagellum tiny, unarticulate.

Maxilliped 2 basis and merus with strong plumose seta, ischium visible, carpus with tooth and simple seta on inner margin, propodus with inner tooth and simple seta, outer robust seta on distal corner, dactylus with 3 equal teeth shorter than propodal seta. Maxilliped 3 with enlarged articles, massive basis less than half as long as appendage, with 2 pappose setae on

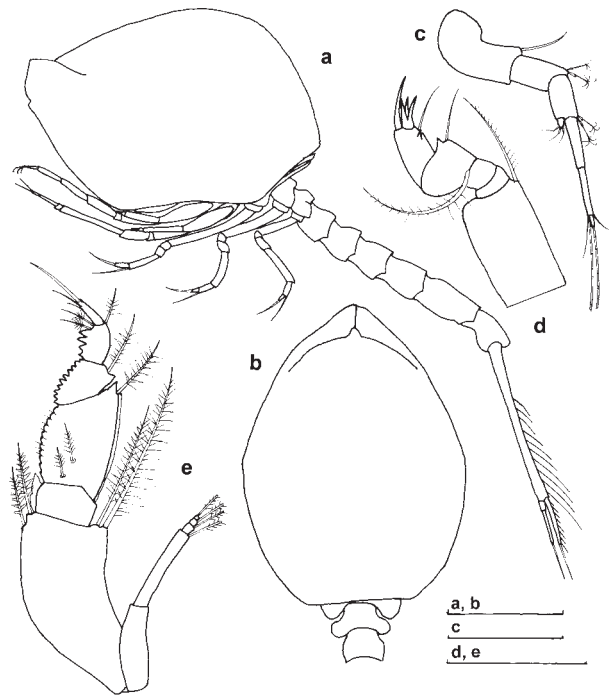


Figure 33. *Campylaspis setifera* sp. nov. female paratype: a, body, lateral view; b, carapace and pereon, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 1; c, 0.2; d, e, 0.5.

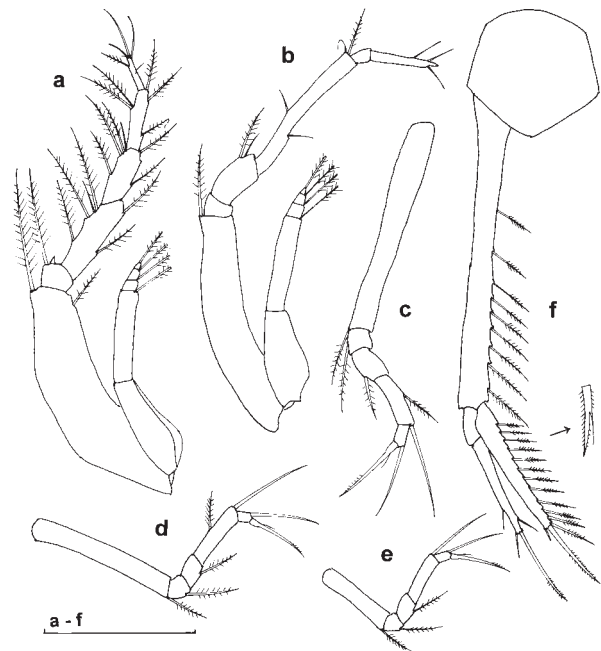


Figure 34. *Campylaspis setifera* sp. nov. female paratype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a–f, 0.5.

inner distal corner and an other 2, longer, on outer corner, ischium with hyaline outer crest, merus 2nd longest article, with 2 plumose setae medially, serrated inner margin, tooth and pappose seta on outer margin, carpus shorter than merus, with stronger serration on inner margin, tooth and pappose seta on outer margin, propodus shorter than carpus, with 4 teeth on inner margin, dactylus shorter than propodus, with simple setae.

Pereopod 1 basis longer than half of appendage, with long plumose seta on inner distal corner, ischium with tooth and long plumose seta on inner margin, merus 2nd longest article, with plumose setae on both margins, carpus as long as propodus, with plumose setae on both margins, propodus with plumose setae, dactylus almost half of propodus, with simple and plumose setae. Pereopod 2 basis less than half as long as appendage, with plumose seta on inner distal corner, merus with a similar one, carpus long, 2.5 times as long as merus, short dactylus (4 times as long as propodus), with digitiform extremity with few simple short setae. Pereopods 3–5 basis longer than half of appendage in 3rd pair, progressively shorter in next 2, carpus progressively longer, twice as long as merus in 5th pair. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 2.4 times as long as pleonite 6 and twice as long as endopod, with 8 microserrate long setae on inner margin, exopod with a long microserrate stout seta, endopod 8 little longer than exopod, with 12 microserrate setae on inner margin and longer terminal seta.

Etymology. The species is named “*setifera*” because of the unusual feature for a female.

Campylaspis, numerous setae on the uropods typical of males.

Distribution. Off Freycinet Peninsula, Tas.; 720 m depth.

Remarks. The new species is closer to *C. thompsoni* Hale, 1945 than to other species of the genus. It is strongly vaulted above the carapace, has a massive maxilliped 3 with numerous teeth on the margins of the merus and carpus, the pereopod 1 with numerous plumose setae, the merus being the second longest article, and the dactylus of pereopod 2 has a digitiform tip, and long uropods. *C. setifera* differs in: the ocular lobe is without lenses; antenna 1 has a longer main flagellum; maxilliped 2 has three dactylar teeth instead of four; the propodus of maxilliped 3 also has inner teeth, longer carpus and shorter dactylus in pereopod 2; and the uropod is totally different, almost male-like, with numerous microserrate setae on its peduncle and endopod (no setae on the peduncle and four setae on the endopod in *C. thompsoni*). *C. setifera* is the only species from this material without a sulcus, tubercles or spines on the carapace.

Campylaspis spinifera sp. nov.

Figures 35, 36

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°00.20'S, 148°37.70'E, 720 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 46), NMV J52931.

Paratypes: 14 females, 10 immature males, 1 female, dissected, NMV J52932; 2 females (stn SLOPE 46), MGAB CUM 1610.

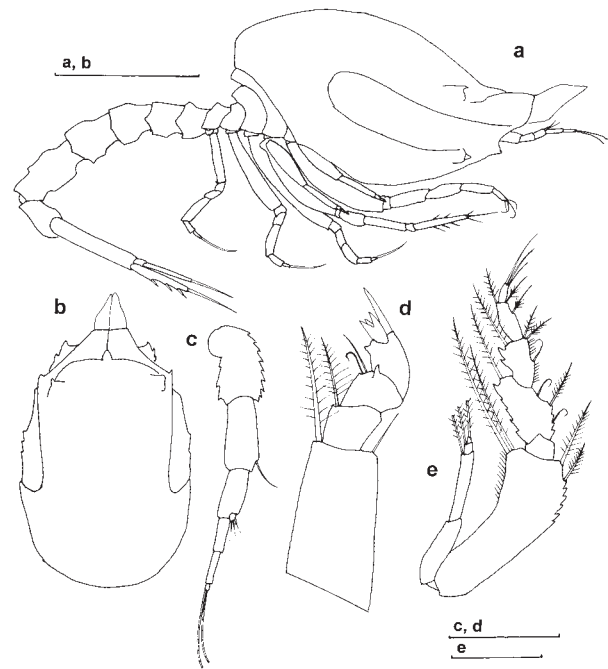


Figure 35. *Campylaspis spinifera* sp. nov. female paratype: a, body, lateral view; b, carapace, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 1; c, d, 0.2; e, 0.25.

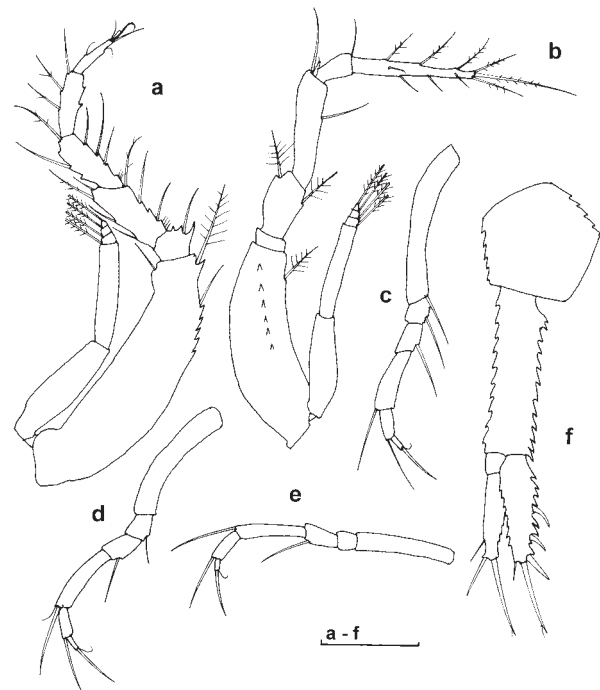


Figure 36. *Campylaspis spinifera* sp. nov. female paratype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a–f, 0.25.

Diagnosis. Carapace with a lateral sulcus, tubercles with spines at the base of frontal lobe and near the anterolateral corner, ocular lobe without lenses. Pereopod 1 basis less than half as long as appendage, with slender articles. Pereopod 2 carpus 1.8 times as long as merus and with straight extremity of dactylus. Uropod peduncle 1.4 times as long as pleonite 6 and its endopod, with serrated margins, exopod little shorter than endopod, with terminal robust long seta, endopod with 3 stout setae on inner serrated margin and robust long terminal seta.

Description. Body elongated, with smooth integument. Length: 3.9 mm.

Carapace 0.47 of entire body length, longer than high, with lateral sulcus, pair of tubercles provided with apical strong spines at base of frontal lobe and near pointed anterolateral corner, antennal notch small, ocular lobe small, without lenses, pseudorostrum straight.

Antenna 1 peduncle with progressively shorter articles, main flagellum 3-articulate, longer than distal article of peduncle, accessory flagellum minute, unarticulate.

Maxilliped 2 plumose long seta on inner margin of basis and merus, 2 simple setae and tooth on inner margin of carpus, propodus with robust seta on outer margin, longer than dactylar teeth, dactylus with 3 equal teeth. Maxilliped 3 basis half of appendage, with 2 plumose setae on distal inner and outer corners, merus second longest article, with tooth and plumose seta on outer margin, shorter carpus, with 2 teeth and plumose seta on outer margin, slender propodus as long as carpus, with 2 pappose setae on inner margin, dactylus half of propodus, with simple terminal setae longer than dactylus.

Pereopod 1 basis less than half as long as appendage, with slender articles, 6 strong serrations on inner margin of ischium, merus and carpus, with fewer simple and plumose setae, merus 2nd longest article, progressively shorter articles from carpus to dactylus, dactylus with short simple setae. Pereopod 2 basis longer than one-third of rest of articles combined, merus with plumose seta on inner and outer margin, carpus 1.8 times as long as merus, with short robust seta and a simple one on inner distal corner, dactylus 3.4 times as long as propodus, with simple and plumose setae and straight extremity. Pereopods 3–5 with slender articles, progressively shorter basis and longer carpus, twice as long as merus in 5th pair. Exopods on maxilliped 3 and pereopod 1, 2.

Uropod peduncle 1.4 times as long as pleonite 6 and its endopod, with serrated margins, exopod little shorter than endopod, with terminal robust long seta, endopod with 2 stout setae on inner serrated margin and robust long terminal seta. Terminal setae with 1 subterminal setule in both rami.

Etymology. The name of the species reflects the presence of characteristic spines on the carapace.

Distribution. Off Freycinet Peninsula, Tas.; 720 m depth.

Remarks. This species is more similar to *C. lynseyae* than to others. It differs in: a pair of tubercles with a spine on top near the anterolateral margin of the carapace; shorter dactylar teeth of maxilliped 2; larger merus of maxilliped 3; a tapering dactylus of pereopod 2; and shorter and stronger serrated uropods.

Campylaspis tasmaniensis sp. nov.

Figures 37–39

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°02.20'S, 148°38.70'E, 800 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 45), NMV J52947.

Allotype: male (stn SLOPE 45), NMV J52948.

Paratypes: 1 female, 2 manca (stn SLOPE 45), NMV J52949.

Diagnosis. Carapace, pereon and pleon with numerous tubercles. Basal article of main flagellum of antenna 1 enlarged. Dactylar teeth of maxilliped 2 as long as robust seta of propodus, median tooth much smaller. Maxilliped 3 basis short, dactylus with long terminal simple setae. Pereopods with slender articles. Pereopod 1 propodus as long as merus, longer than carpus. Pereopod 2 with long dactylus with straight extremity. Uropod peduncle 2.3 times as long as pleonite 6 and endopod, with serrated margins, exopod little shorter than endopod, with subterminal microserrate seta and longer robust terminal seta, endopod with 3 stout setae on inner serrated margin, a subterminal and a terminal microserrate robust seta.

Description of female. Body with tubercled reticulated integument, without setae or spines. Length: 5.4 mm.

Carapace half body length, 2.1 times as long as high, with lateral sulcus that rises from anterolateral part and fuses with similar sulcus from other side, 2 parallel dorsal rows of acute tubercles, 2 transverse parallel rows of tubercles at base of frontal lobe, rows of tubercles delimiting the sulcus, 3 spines on upper side of sulcus toward tip of pseudorostrum, small antennal notch, anterolateral corner acute, short serrated ventral margin, ocular lobe minute, without lenses, pseudorostrum long and straight.

Antenna 1 proximal article of peduncle the longest, distal article longer than median one, short main flagellum 3-articulate, basal one enlarged, accessory flagellum minute, 1-articulate.

Maxilliped 2 with plumose long seta on inner margin of basis and merus, 2 simple setae and tooth on inner margin of carpus, propodus with robust seta on outer margin, as long as dactylar teeth, dactylus with 3 teeth, median one much shorter. Maxilliped 3 basis less than half as long as appendage, with 1 plumose seta on distal inner and outer corners, merus 2nd longest article, with long plumose seta on outer margin and simple and plumose setae on inner margin, carpus half of merus, with 3 teeth and long plumose seta on outer margin, slender propodus 1.6 times as long as carpus, dactylus 0.6 of propodus length, with simple long terminal setae (3.5 times as long as dactylus).

Pereopod 1 basis less than half as long as appendage, with slender articles, serration on inner margin of merus and carpus, with fewer simple and plumose setae, propodus and dactylus with simple setae, merus 2nd longest article, propodus as long as merus and longer than carpus, dactylus with short simple setae. Pereopod 2 basis more than one-third of rest of articles combined, with plumose seta on distal inner and outer corner, merus with plumose seta on inner and outer margin, carpus 1.8 times as long as merus, with short robust seta, a plumose long seta on inner distal corner, dactylus 4 times as long as propodus,

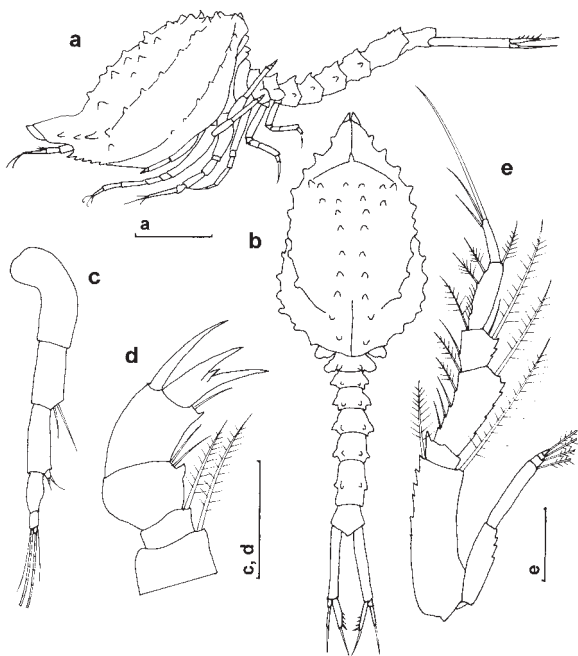


Figure 37. *Campylaspis tasmaniensis* sp. nov. female holotype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 1; c, d, 0.2; e, 0.25.

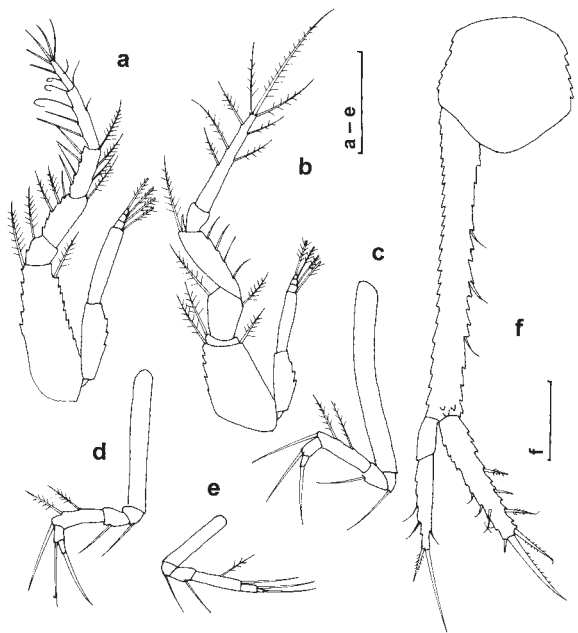


Figure 38. *Campylaspis tasmaniensis* sp. nov. female holotype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a–e, 0.5; f, 0.25.

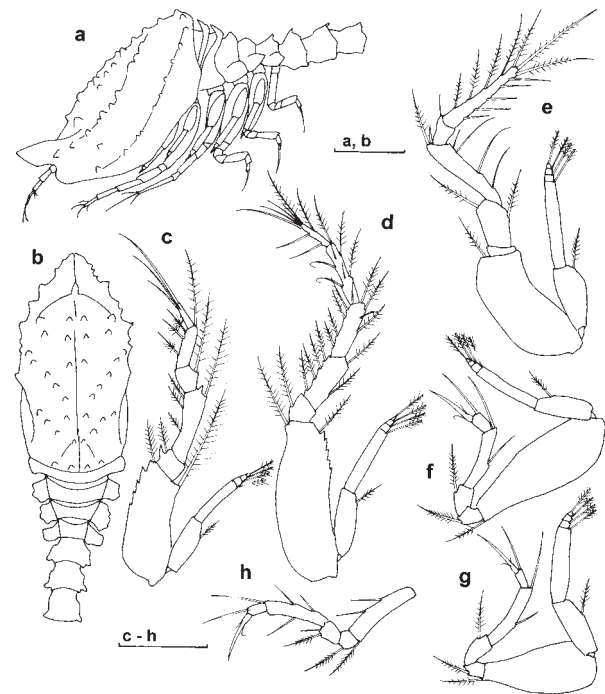


Figure 39. *Campylaspis tasmaniensis* sp. nov. male allotype: a, body, lateral view; b, body, dorsal view; c, maxilliped 3; d, pereopod 1; e, pereopod 2; f, pereopod 3; g, pereopod 4; h, pereopod 5. Scale (in mm): a, b, 1; c–h, 0.5.

with plumose setae and straight extremity. Pereopods 3–5 with slender articles, progressively shorter basis and longer carpus, twice as long as merus in 5th pair, 2 plumose setae on outer margin of carpus in pair 3 and 4, dactylus with stout long terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 2.3 times as long as pleonite 6 and endopod, with serrated margins, exopod little shorter than endopod, with subterminal microserrate seta and longer simple terminal seta, endopod with 3 stout setae on inner serrated margin, subterminal and terminal microserrate robust setae.

Description of male. Body with integument as in female, last 3 pleonites missing. Carapace with more dorsal tubercles, lateral sulcus shorter than in female, sulcus from each side separated, carapace more compressed laterally than in female.

Maxilliped 3 basis shorter, a half of appendage, merus more slender than in female, propodus with longer plumose seta on outer margin, dactylus with long terminal setae as in female.

Pereopod 1 with more numerous plumose setae on all articles including dactylus. Pereopod 2 dactylus shorter than in female, 3 times as long as propodus (versus 4 times), with more setae. Pereopods 3, 4 with large basis characteristic of males, 3–5 with more plumose setae, dactylus fused with terminal robust seta.

Etymology. The species bears the name of the type locality – Tasmania.

Distribution. Off Freycinet Peninsula, Tas.; 800 m depth.

Remarks. The general body shape is reminiscent of *C. sagamiensis* Gamô, 1967 but without pits and spines on the integument, with a larger lateral sulcus, with a bulky basal article of the main flagellum of antenna 1, an accessory flagellum with one article, not with two. *C. tasmaniensis* also is close to *C. mosambica* Ledoyer, 1988 but with more tubercles on the carapace, and the dactylus of maxilliped 3 with a much longer terminal seta.

***Campylaspis thetidis* Hale, 1945**

Campylaspis thetidis Hale, 1945: 212, figs 47, 48.

Material examined. 5 females (stn SLOPE 1), NMV J52982; 1 female (stn SLOPE 21), NMV J52983.

Distribution. Off NSW, 75 m depth.

Remarks. The species is recorded from a greater depth than previously, now down to 209 m depth.

***Campylaspis thompsoni* Hale, 1945**

Campylaspis thompsoni Hale, 1945: 183, figs 24, 25.

Material examined. 2 females, 6 males (stn SLOPE 1), NMV J54121; 1 female, NMV J52984; 3 females, 1 male (stn SLOPE 22), NMV J52985; 6 females (stn SLOPE 27), NMV J52412; 2 females, 1 manca (stn SLOPE 46), NMV J54126; 1 female (stn SLOPE 45), MGAB CUM 1615; 1 female, 2 males (stn SLOPE 47), NMV J52987; 1 female, 1 male (stn SLOPE 48), NMV J52988.

Distribution. NSW, Vic., surface to 80 m depth.

Remarks. The new records extend the species' range into Victoria.

***Campylaspis triplicata* Hale, 1945**

Campylaspis triplicata Hale, 1945: 200, figs 37, 38.

Material examined. 1 female, 1 male (stn SLOPE 6), NMV J52989; 3 females (stn SLOPE 19), NMV J52990; 1 female (stn SLOPE 22), NMV J52991; 1 female, 2 males (stn SLOPE 45), NMV J52992; 2 females, 1 male (stn SLOPE 45), MGAB CUM 1616; 2 females (stn SLOPE 46), NMV J53017.

Distribution. Qld, NSW, Tas.; 12–800 m depth.

Remarks. Previously known from Queensland in shallow water the species' range is extended to New South Wales and Tasmania and to greater depths (800 m).

***Campylaspis trisulcata* sp. nov.**

Figures 40, 41

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°02.20'S, 148°38.70'E, 800 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 45), NMV J52950.

Diagnosis. Carapace large, with 3 lateral sulci. Propodus of maxilliped 2 with robust outer seta longer than dactylar teeth. Maxilliped 3 with 2 long plumose setae on outer distal corner,

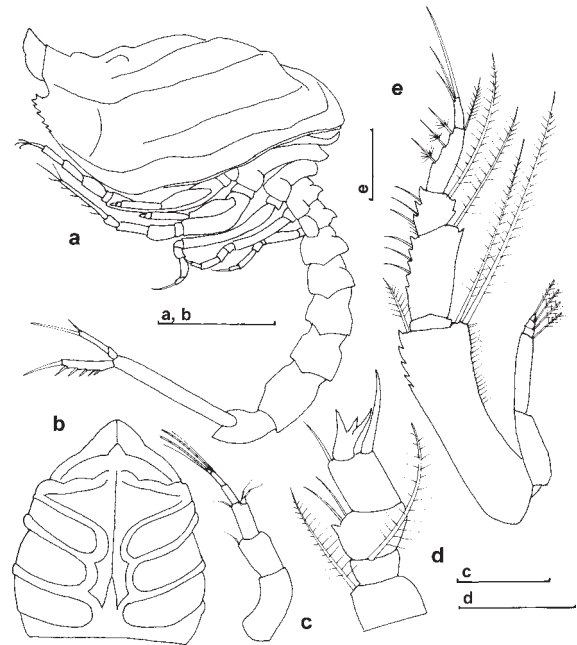


Figure 40. *Campylaspis trisulcata* sp. nov. female holotype: a, body, lateral view; b, carapace, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, b, 1; c, 0.25; d, 0.3; e, 0.25.

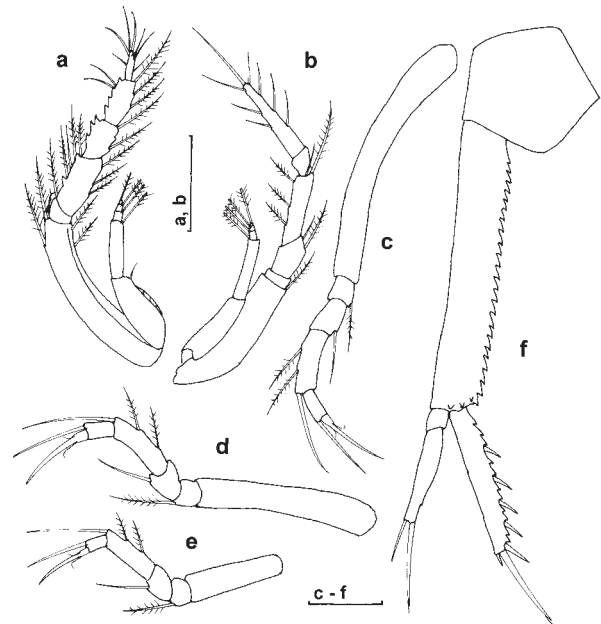


Figure 41. *Campylaspis trisulcata* sp. nov. female holotype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a, b, 0.5; c–f, 0.25.

merus 2nd longest article, simple terminal setae twice as long as dactylus. Pereopod 1 with short articles, with numerous plumose setae. Pereopod 2 with carpus 1.3 times as long as merus, dactylus 3 times as long as propodus. Uropod peduncle 2.3 times as long as pleonite 6 and 1.9 times as long as endopod, with serrated inner margin, exopod shorter than endopod, with robust terminal seta, endopod with 5 stout setae on serrated inner margin, long robust terminal seta.

Description. Body with strongly calcified, smooth, integument. Length: 5.1 mm.

Carapace 0.46 body length, twice as long as high, 1.1 times as long as wide, with 3 lateral sulci with strongly elevated margins, transverse lateral ridge at level of base of frontal lobe, ocular lobe without eyes, antennal notch small, anterolateral corner with short serration.

Antenna 1 short, peduncle with progressively shorter articles, main flagellum 3-articulate, little longer than last article of peduncle, accessory flagellum minute, uniarticulate.

Maxilliped 2 strong, with long plumose setae on basis and merus, tooth and 2 simple setae on carpus, propodus 2nd longest article, with robust outer seta longer than dactylar teeth, dactylus with 3 teeth, median one shorter. Maxilliped 3 basis little less than half as long as appendage, with 2 long plumose seta on outer distal corner, merus 2nd longest article, strongly serrated on inner margin, with tooth and plumose seta on outer margin, carpus 0.55 of merus length, long plumose seta on outer margin, propodus 0.75 of merus length, with 3 pappose setae on inner margin, simple terminal setae twice as long as dactylus.

Pereopod 1 with short articles, with numerous plumose setae, basis little less than half as long as appendage, merus to propodus with serrated margins, merus 2nd longest article, carpus shorter than merus, propodus longer than carpus and 1.5 times as long as dactylus, dactylus with simple setae. Pereopod 2 basis less than half as long as appendage, plumose seta on inner margin of basis and merus, with carpus 1.3 times as long as merus, with simple seta and plumose seta on distal inner corner, dactylus 3 times as long as propodus, with simple setae, terminal one subequal to dactylus. Pereopods 3–5 basis longer than rest of articles combined, shorter in last pair, carpus twice as long as merus, dactylus fused with terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 2.3 times as long as pleonite 6 and 1.9 times as long as endopod, with serrated inner margin, exopod shorter than endopod, with robust terminal seta, endopod with 4 stout setae on serrated inner margin, single subterminal setule and long robust terminal seta shorter than endopod.

Etymology. The name “*trisulcata*” reflects the presence of three lateral sulci on the carapace.

Distribution. Off Freycinet Peninsula, Tas.; 800 m depth.

Remarks. *C. trisulcata* is similar to two other species with three or four lateral ridges on the carapace delimiting depressions (sulci): *C. triplicata* Hale, 1945 from Australia and *C. sinuosa* Gamô, 1960 from Japan. *C. triplicata* has four lateral ridges delimiting three depressions, and a massive merus on maxilliped 3. *C. sinuosa* is much closer, with four lateral ridges on the carapace but bordering only two depressions, not three as in

C. trisulcata (more evident in dorsal view). It also differs in: the dactylus of maxilliped 2 with four teeth (three in *C. trisulcata*); a massive maxilliped 3 with teeth on the propodus and short setae on the dactylus (versus smooth propodus and long terminal setae of dactylus); shorter uropods; and an endopod with two setae on its inner margin (versus four setae in *C. trisulcata*).

***Campylaspis uniplicata* Hale, 1945**

Campylaspis uniplicata Hale, 1945: 189, figs 29, 30.

Material examined. 2 females (stn SLOPE 1), NMV J52993; 2 females (stn SLOPE 1), MGAB CUM 1617; 1 manca (stn SLOPE 2), NMV J52995; 2 females (stn SLOPE 45), NMV J52994; 1 female (stn SLOPE 47), NMV J52996.

Distribution. East of Port Hacking, NSW and Tas.; 100–800 m depth.

Remarks. Originally described from New South Wales, the species is now known in Tasmanian waters and from greater depths (800 m).

***Campylaspis unisulcata* Hale, 1945**

Campylaspis unisulcata Hale, 1945: 187, figs 27, 28.

Material examined. 2 females (stn SLOPE 22), NMV J52997; 1 female (stn SLOPE 45), NMV J54120; 7 females, 2 males (stn SLOPE 46), NMV J52998; 2 females, 1 male (stn SLOPE 46), MGAB CUM 1618.

Distribution. East of Port Hacking, NSW, 100 m depth.

Remarks. The species is now recorded from Tasmania and at greater depth, 800 m.

***Procampylaspis* Bonnier, 1896**

Procampylaspis Bonnier, 1896: 541.—Hale, 1945: 214.—Băcescu, 1992: 251.—Stoddart and Lowry, 2003: 373–418.

Type species. *Procampylaspis echinata* Bonnier, 1896.

Remarks. The genus is well-defined by the rake-like dactylus of maxilliped 2 and by a long ischium on pereopod 1. One species is known from Australia but three new species are described in this study.

Key to species of *Procampylaspis* from Australian waters

1. Carapace without dorsal tubercles *P. australiensis* sp. nov.
- Carapace with dorsal tubercles 2
2. Carapace with 1 dorsal tubercle *P. sordida* Hale, 1945
- Carapace with dorsal tubercles in 2 parallel rows (5 in female, 4 in male) *P. spinifera* sp. nov.

***Procampylaspis australiensis* sp. nov.**

Figures 42–44

Material examined. Holotype female, NSW, off Nowra, 34°59.52'S, 151°05.94'E, 204 m, coarse shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 14 Jul 1986 (stn SLOPE 1), NMV J53000.

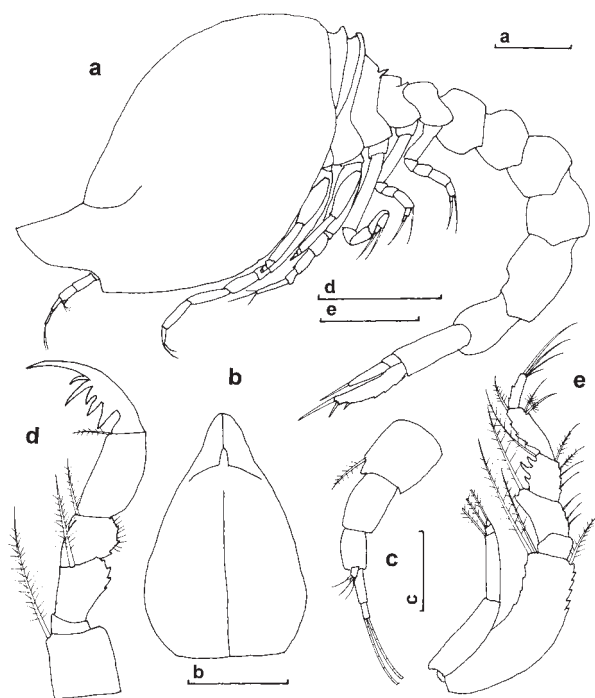


Figure 42. *Procampylaspis australiensis* sp. nov. female paratype: a, body, lateral view; b, carapace, dorsal view; c, antenna 1; d, maxilliped 2; e, maxilliped 3. Scale (in mm): a, 0.25; b, 0.5; c, 0.1; d, 0.2; e, 0.25.

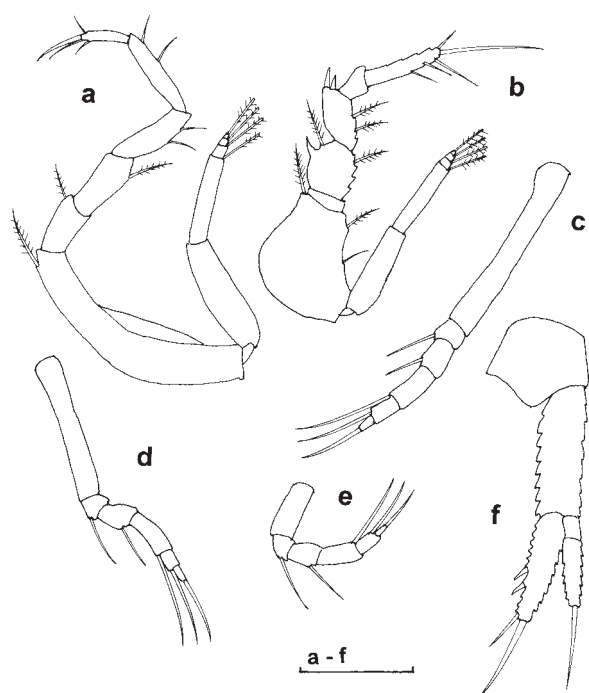


Figure 43. *Procampylaspis australiensis* sp. nov. female paratype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and right uropod. Scale (in mm): a–f, 0.25.

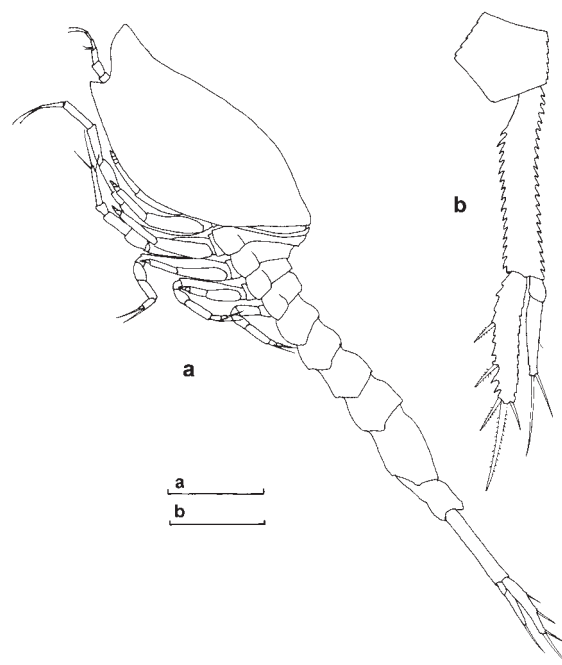


Figure 44. *Procampylaspis australiensis* sp. nov. male allotype: a, body, lateral view; b, pleonite 6 and right uropod. Scale (in mm): a, 0.5; b, 0.25.

Paratypes: 1 immature male, 1 female (stn SLOPE 45), NMV J53001; 1 female, dissected (stn SLOPE 1), NMV J53002.

Diagnosis. Carapace large, with smooth integument. Maxilliped 2 with 6 dactylar teeth. Merus of pereopod 1 as long as carpus, shorter than propodus. Pereopod 2 with short and bulky articles, dactylus twice as long as propodus. Uropod peduncle 1.4 times as long as pleonite 6, 1.1 times as long as its endopod, endopod with 3 inner setae, little longer than exopod.

Description of female. Body with smooth integument. Length: 2.6 mm.

Carapace 0.46 body length, 1.6 times as long as high, with middorsal ridge, short ocular lobe devoid of lenses, pseudorostral lobes 3 times as long as tip of ocular lobe, antennal notch small, ventral margin smooth.

Antenna 1 peduncle with progressively shorter and robust articles, main flagellum 3-articulate, longer than distal article of peduncle, accessory flagellum minute, uniaarticulate.

Maxilliped 2 basis and merus with pappose seta on inner margin, carpus and propodus with plumose seta on inner margin, propodus second longest article, dactylus fused with its 6 teeth, first 3 teeth progressively shorter toward distal end, 4th tooth longer, 5th tooth half of previous one, curved, 6th tooth the longest, 1.7 times as long as 5th one, barely curved. Maxilliped 3 basis half of appendage, with plumose seta on inner distal corner, 2 longer setae on outer margin, merus with tooth and plumose seta on outer margin, carpus with 3 teeth and plumose seta on outer margin, propodus 2nd longest

article, with 2 pappose setae on inner margin, dactylus half of propodus, with simple long setae.

Pereopod 1 merus as long as carpus, shorter than propodus, dactylus half of propodus, with short simple terminal setae. Pereopod 2 with short and bulky articles, basis 3rd of appendage length, with plumose seta on inner and outer distal corners, merus with tooth and plumose seta on inner margin, carpus little longer than merus, with 2 short stout setae on distal inner corner, dactylus twice as long as propodus with few simple setae. Pereopods 3–5 with progressively shorter basis (as long as rest of articles combined in 3rd pair), dactylus with simple stout terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 1.4 times as long as pleonite 6, 1.1 times as long as endopod, with serrated margins, exopod shorter than endopod with terminal long stout seta, endopod with 3 inner setae, robust terminal seta.

Description of immature male. Body length: 3 mm.

Carapace, less vaulted than in female, 2.1 times as long as high. Exopods, 5 pairs not fully developed.

Uropod longer than in female, peduncle 2.4 times as long as pleonite 6, strongly serrated, 1.5 times as long as endopod, exopod 0.7 of endopod length, with stout subterminal seta and terminal seta twice as long, endopod with 3 microserate setae on strongly serrated inner margin, subterminal short microserate seta and a terminal, more robust and longer seta.

Etymology. The name “*australiensis*” refers to Australia.

Distribution. Off Nowra, NSW, off Freycinet Peninsula, Tas.; 204–800 m.

Remarks. The new species differs from other species of *Procampylaspis* in the following combination of female characteristics: the carapace is without spines or tubercles and maxilliped 2 has six teeth on the dactylus. The only known species of *Procampylaspis* from Australian waters is *P. sordida* Hale, 1945 which has a dorsal conical tubercle on the carapace and maxilliped 2 with five dactylar teeth; the first one, more slender than in this species, is longer than the third tooth, and the fifth tooth is shorter.

***Procampylaspis poorei* sp. nov.**

Figures 45, 46

Material examined. Holotype female, Antarctica, Eastern Prydz Bay, off the Larsemann Hills, 68°54.88'S, 76°37.03'E, 667–716 m, epibenthic sled, P.M. O'Loughlin, RSV *Aurora Australis*, 18 Feb 1993 (stn AA93 158), NMV J53009.

Diagnosis. Carapace with 3 dorsal tubercles, a pair medially and 1 in posterior half, ocular lobe eyeless, close to anterior extremity of pseudorostrum, with spine on top. Maxilliped 2 with 1st dactylar tooth longer than 2nd tooth and shorter than 3rd one, 5th tooth twice as long as 3rd tooth. An inner tooth on ischium of maxilliped 3, 2 teeth on outer margin of merus and carpus. Pereopod 1 with slender articles, merus as long as carpus. Dactylus of 2nd pereopod 2 twice as long as propodus, with plumose setae. Uropod peduncle 1.7 times as long as

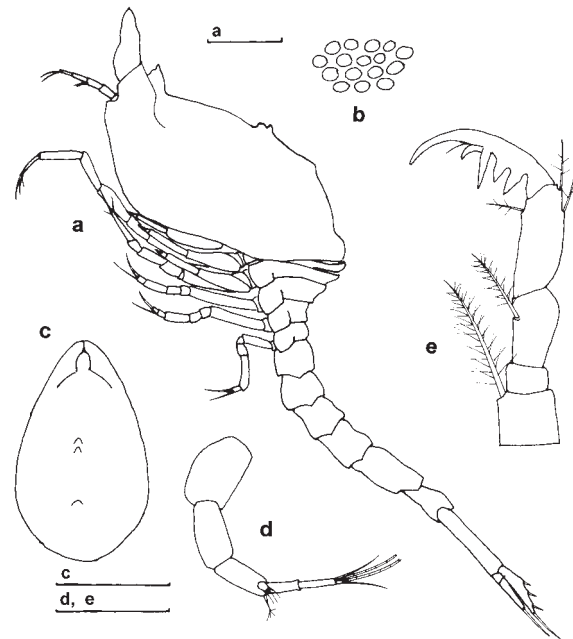


Figure 45. *Procampylaspis poorei* sp. nov. female holotype: a, body, lateral view; b, detail of integument of carapace; c, carapace, dorsal view; d, antenna 1; e, maxilliped 2. Scale (in mm): a, 0.5; c, 1; d, e, 0.2.

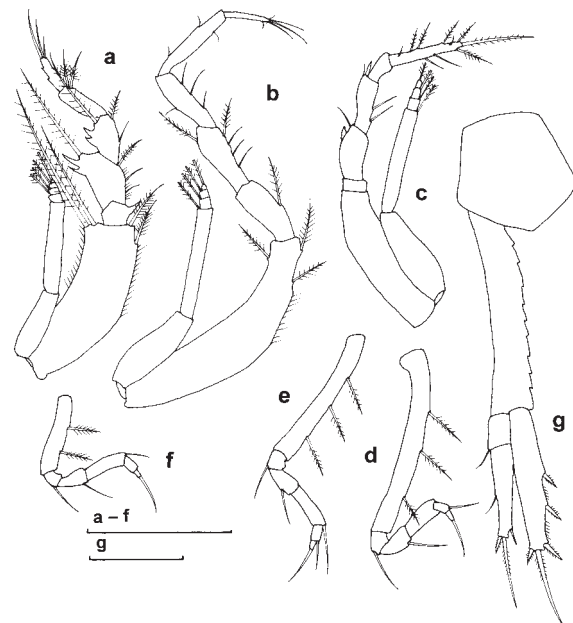


Figure 46. *Procampylaspis poorei* sp. nov. female holotype: a, maxilliped 3; b, pereopod 1; c, pereopod 2; d, pereopod 3; e, pereopod 4; f, pereopod 5; g, pleonite 6 and right uropod. Scale (in mm): a–f, 0.5; g, 0.25.

pleonite 6 and 1.4 times as long as endopod, endopod longer than exopod, with 3 microserrate setae on inner margin.

Description. Body with highly calcified integument. Length: 3.8 mm.

Carapace 0.46 body length, twice as long as high, with 3 dorsal tubercles on midline, a close pair medially and 1 in posterior half, covered with pitted integument, ocular lobe eyeless, close to anterior extremity of pseudorostrum, with spine on top, antennal notch small, lower margin smooth.

Antenna 1 with progressively shorter articles of peduncle, main flagellum 3-articulate, longer than distal article of peduncle, accessory flagellum minute, uniarticulate.

Maxilliped 2 with pappose seta on inner distal margin of basis and carpus, propodus second longest article, with short plumose seta on inner margin, 1st dactylar tooth longer than 2nd tooth and shorter than 3rd one, 5th tooth twice as long as 3rd tooth. Maxilliped 3 with 2 plumose setae on inner and outer distal corner, inner tooth on ischium, 2 teeth and plumose seta on outer margin of merus and carpus, merus 2nd longest article, carpus as long as propodus, dactylus 0.68 times as long as propodus, with long simple terminal setae.

Pereopod 1 with slender articles, basis less than half as long as appendage, merus as long as carpus, propodus twice as long as carpus, second longest article, dactylus half of propodus. Pereopod 2 basis shorter than rest of articles combined, merus with tooth and simple seta on inner margin, carpus slightly longer than merus, with 2 simple setae on inner distal corner, dactylus twice as long as propodus, with plumose setae. Pereopods 3–5 with progressively shorter basis (as long as half of appendage in 3rd and 4th pair), with plumose setae on outer margin, dactylus with long stout terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 1.7 times as long as pleonite 6 and 1.4 times as long as endopod, exopod shorter than endopod, with subterminal microserrate seta and terminal robust longer seta, endopod with 3 microserrate setae on inner margin and robust, longer, terminal seta.

Etymology. The species is dedicated to Gary Poore, Principal Curator, Museum Victoria, Melbourne, Australia, specialist in Peracarida, as a sign of gratitude.

Distribution. Eastern Prydz Bay, off the Larsemann Hills, Antarctica; 667–716 m depth.

Remarks. The only species of *Procampylaspis* with fewer than five dorsal tubercles or spines on the carapace is *P. compressa* Zimmer, 1907 which has two pairs of spines versus three dorsal median tubercles as in *P. poorei*. The new species also differs from *P. compressa* in: ocular lobe with one median spine on the tip instead of two as in *P. compressa*; antenna 1 with a longer main flagellum; and the first and second dactylar teeth of maxilliped 2 are separated up to the basis (versus not separated) and the maxilliped 3 has fewer teeth on its articles.

Procampylaspis sordida Hale, 1945

Procampylaspis sordida Hale, 1945: 215, fig. 49.

Material examined. 1 female (stn SLOPE 27), NMV J53011; 3 females

(stn SLOPE 45), NMV J53012; 7 females, 1 male (stn SLOPE 46), NMV J53013; 2 females (stn SLOPE 46), MGAB CUM 1620.

Distribution. Off Eden, NSW and Tas.; 60–800 m depth.

Remarks. Hale recorded the species from New South Wales. New records are from Tasmania at 800 m depth.

Procampylaspis spinifera sp. nov.

Figures 47–50

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°00.20'S, 148°37.70'E, 720 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 46), NMV J53003.

Allotype male: (stn SLOPE 45), NMV J53004.

Paratypes: 2 immature males (stn SLOPE 46), NMV J53006; 1 female, dissected (stn SLOPE 45), NMV J53007; 1 male, dissected (stn SLOPE 46), NMV J53008; 1 female (stn SLOPE 46), MGAB CUM 1619.

Diagnosis. Carapace with 5 pairs of dorsal spines, pair of spines on top of ocular lobe, anterolateral margin with strong serration. Pair of dorsal spines on pereonites 3–5 and pleonite 1. Strongly serrated basal article of antenna 1 peduncle. Maxilliped 2 with 5 dactylar teeth, 1st one as long as 3rd, 5th tooth twice as long as 3rd tooth. Maxilliped 3 with strong tooth on outer margin of merus. Pereopod 1 with merus longer than carpus but shorter than propodus. Pereopod 2 with spine on inner margin of merus, dactylus 2.8 times as long as propodus. Dactylus of pereopods 3–5 fused with terminal seta. Uropods with serrated peduncle, 2.27 times as long as pleonite 6, 1.9 times as long as endopod, exopod 0.7 endopod length, endopod with 3 microserrate setae on inner margin.

Description of female. Body without setae on integument. Length: 4.1 mm.

Carapace 0.43 body length, 2.1 times as long as high, with 5 pairs of dorsal spines, pair of spines on top of ocular lobe, ocular lobe long, without eyes, anterolateral margin with strong serration. A pair of dorsal spines on pereonites 3–5 and pleonite 1.

Antenna 1 basal article of peduncle with 3 strong teeth on inner margin, peduncle with progressively shorter articles, main flagellum 3-articulate, much longer than distal article of peduncle, accessory flagellum minute, uniarticulate.

Maxilliped 2 with pappose seta on inner margin of basis and merus, merus to propodus with serrated outer margin, propodus 2nd longest article, with plumose seta on outer margin, dactylus with 5 teeth, 1st one as long as 3rd, 5th tooth twice as long as 3rd tooth. Maxilliped 3 basis almost half of appendage, with plumose seta on inner margin and 2 longer setae on outer margin, ischium with tooth on inner margin, strong tooth on outer margin of merus, 3 teeth on outer margin of carpus, propodus shorter than carpus, dactylus shorter than propodus, dactylus with simple long terminal setae.

Pereopod 1 basis less than half as long as appendage, with merus longer than carpus, but shorter than propodus, dactylus with simple terminal setae. Pereopod 2 basis shorter than rest of articles combined, with spine on inner margin of merus, carpus 1.4 times as long as merus, with 3 stout setae on distal

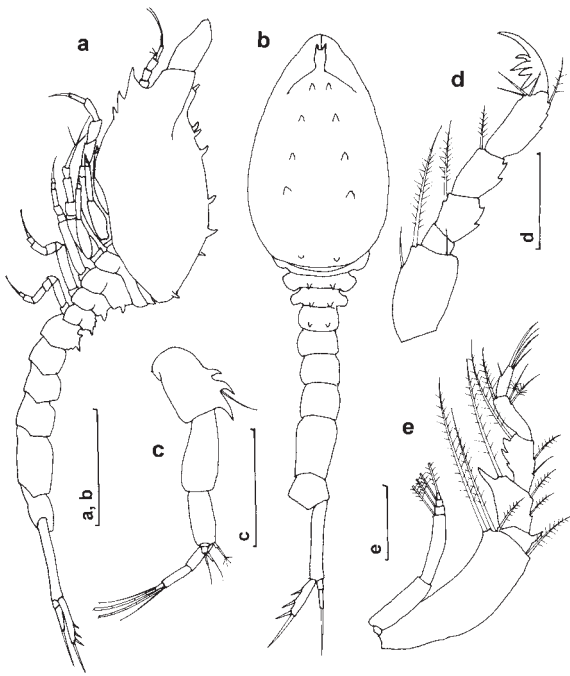


Figure 47. *Procampylaspis spinifera* sp. nov. female paratype: a, body, lateral view; b, body, dorsal view; c, carapace, dorsal view; d, antenna 1; e, maxilliped 2. Scale (in mm): a, b, 1; c, 0.2; d, 0.25; e, 0.25.

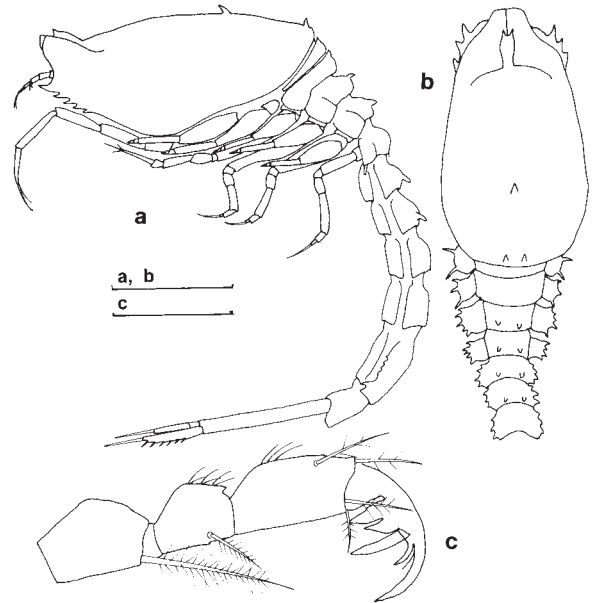


Figure 49. *Procampylaspis spinifera* sp. nov. male allotype: a, body, lateral view; b, body, dorsal view; c, maxilliped 2. Scale (in mm): a, b, 1; c, 0.2.

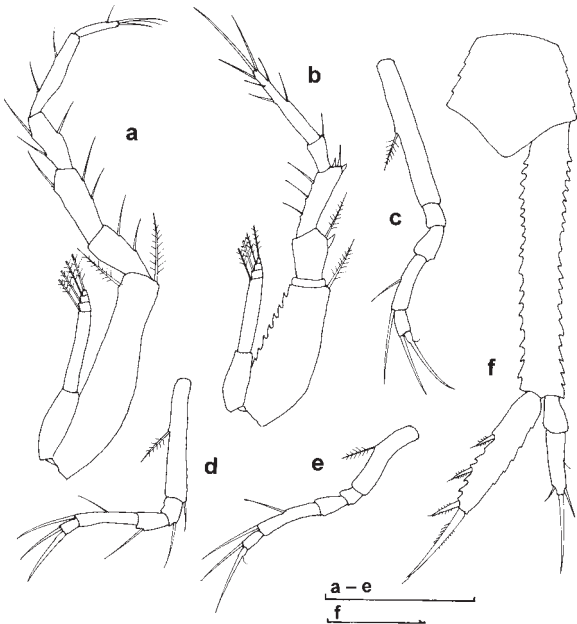


Figure 48. *Procampylaspis spinifera* sp. nov. female paratype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and right uropod. Scale (in mm): a-e, 0.5; f, 0.25.

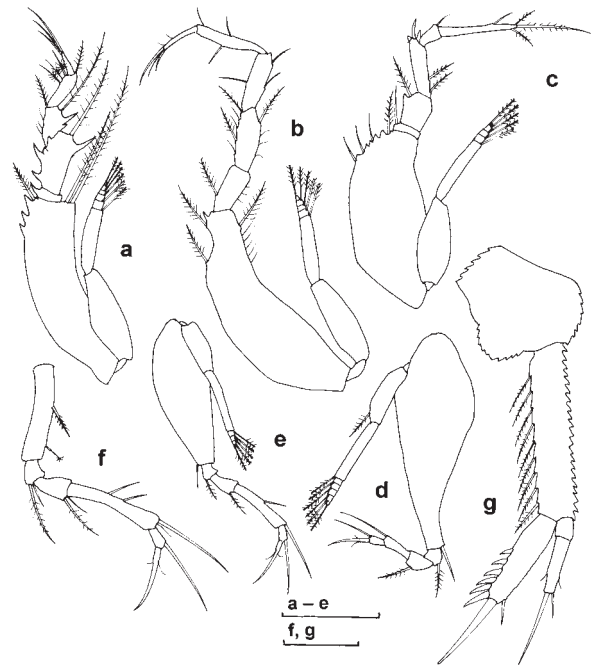


Figure 50. *Procampylaspis spinifera* sp. nov. male allotype: a, maxilliped 3; b, pereopod 1; c, pereopod 2; d, pereopod 3; e, pereopod 4; f, pereopod 5; g, pleonite 6 and right uropod. Scale (in mm): a-e, 0.5; f, g, 0.25.

inner corner, dactylus 2.8 times as long as propodus, with simple setae. Pereopods 3–5 with progressively shorter basis, with plumose seta on outer margin and longer carpus (carpus twice as long as merus in 5th pair), dactylus fused with terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod with serrated peduncle, 2.27 times as long as pleonite 6, 1.9 times as long as endopod, exopod 0.7 endopod length, with short subterminal stout seta and longer terminal robust seta, endopod with 3 microserrate setae on inner margin and more robust and longer terminal seta.

Description of male. Body length: 5.4 mm. Carapace with median dorsal small tubercle and pair of tubercles near posterior extremity, pair of small tubercles on top of eyeless ocular lobe not reaching extremity of pseudorostrum, lower margin shortly serrated in anterior half.

Maxilliped 2 with 3rd tooth of dactylus more slender than in female. Maxilliped 3 with more serrated basis and merus on inner margin, carpus with 2 teeth on inner margin (3 in female).

Pereopod 1 as in female, with larger basis. Pereopod 2 with fewer stout distal setae on carpus, dactylus with terminal plumose seta instead of simple one in female, larger basis. Pereopod 5, with longer carpus than in female. Exopods, 5 pairs.

Uropod peduncle with serrated margins and numerous plumose setae on inner margin, 1.7 times as long as pleonite 6, 1.8 times as long as endopod, exopod 0.8 of endopod length, with subterminal and terminal stout simple seta, endopod with 6 stout setae on inner margin, seta subterminal and robust longer terminal seta.

Etymology. The Latin name “*spinifera*” describes the presence of numerous spines on the body and appendages.

Distribution. Off Freycinet Peninsula, Tas.; 720–800 m depth.

Remarks. *P. spinifera* is close to *P. spinosa* Petrescu, 2001 from the south-eastern Pacific Ocean (American coast), both having numerous dorsal spines on the carapace. These number five pairs in females of *P. spinifera* and 12 in females of *P. spinosa*. The setae on the dactylus of pereopod 2 are simple in *P. spinifera* while plumose in *P. spinosa*.

Procampylaspis tasmaniensis sp. nov.

Figures 51, 52

Material examined. Holotype male, dissected, Tas., off Freycinet Peninsula, 42°02.20'S, 148°38.70'E, 800 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 45), NMV J53010.

Diagnosis. Carapace with 2 dorsal parallel rows of 4 small tubercles on posterior extremity. Lateral small spines on pereon and pleon. Maxilliped 2 with 1st tooth of dactylus as long as the 3rd one, 5th tooth 1.3 times as long as 3rd tooth, 1st and 2nd teeth enlarged. Maxilliped 3 with teeth on outer margin of merus and carpus. Ischium of pereopod 1 2nd longest article. Pereopod 2 with dactylus 3.7 times as long as propodus. Carpus of 5th pereopod 3.7 times as long as merus. Dactylus of pereopods 3–5 fused with its terminal seta. Uropod peduncle 2.7 times as long as pleonite 6, 2.4 times as long as exopod.

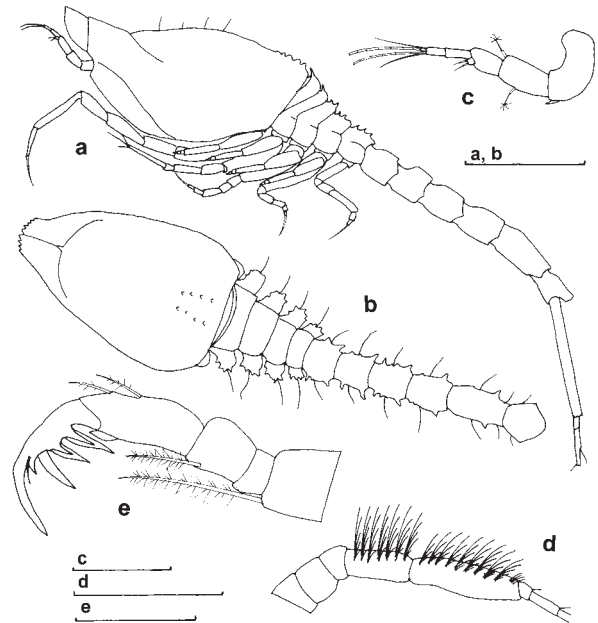


Figure 51. *Procampylaspis tasmaniensis* sp. nov. male holotype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, antenna 2; e, maxilliped 2. Scale (in mm): a, b, 1; c, 0.25; d, 0.5; e, 0.2.

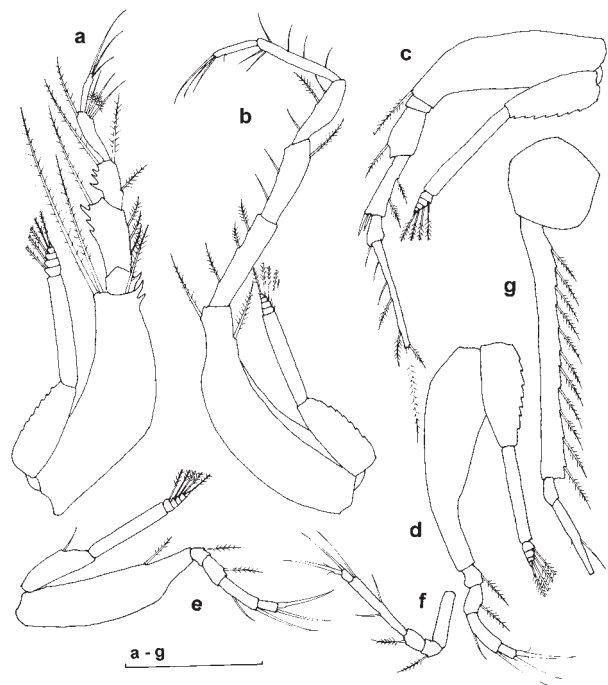


Figure 52. *Procampylaspis tasmaniensis* sp. nov. male holotype: a, maxilliped 3; b, pereopod 1; c, pereopod 2; d, pereopod 3; e, pereopod 4; f, pereopod 5; g, pleonite 6 and left uropod. Scale (in mm): a–g, 0.5.

Description. Body with calcified integument. Length 4.6 mm.

Carapace 0.39 entire body length, twice as long as high, with parallel row of 4 dorsal small tubercles on posterior extremity, a ridge starting behind the pseudorostrum obliquely going backwards medially reaching the lower margin, antennal notch marked, ocular lobe minute, eyeless, few fine setae on integument, smooth lower margin.

Antenna 1 short and robust, articles of peduncle progressively shorter, main flagellum 3-articulate, longer than distal article of peduncle, accessory flagellum minute, uniaarticulate. Antenna 2 of with several groups of setae on outer margins of last 2 segments of peduncle.

Maxilliped 2 with strong long pappose seta on inner distal corner of basis and carpus, propodus second longest article, 2 plumose setae on outer margin, 1st tooth of dactylus as long as 3rd one, 5th tooth 1.3 times as long as 3rd tooth, 1st and 2nd teeth enlarged, separated up to basis. Maxilliped 3 basis longer than rest of articles combined, with 2 teeth on inner distal corner, 2 long plumose setae on outer distal corner, merus second longest article, with 3 plumose setae on inner margin, 3 teeth and plumose seta on outer margin of merus and carpus, propodus longer than carpus, dactylus 0.7 of propodus

Pereopod 1 basis less than half as long as appendage, ischium 2nd longest article, merus as long as propodus, carpus shorter than propodus, longer than dactylus, dactylus with stout terminal long seta. Pereopod 2 basis shorter than rest of articles combined, plumose seta on inner distal corner of basis and merus, carpus 1.4 times as long as merus, 2 stout setae on distal inner corner of carpus, dactylus 3.7 times as long as propodus, with long terminal plumose seta. Pereopods 3 and 4 with progressively shorter basis, longer than rest of articles combined, dactylus fused with terminal seta. Pereopod 5 with shorter basis and longer carpus, 3.7 times as long as merus, dactylus fused with terminal seta. Exopods on maxilliped 3 and pereopods 1–4.

Uropod peduncle 2.7 times as long as pleonite 6, with plumose setae on inner margin, 2.4 times as long as exopod, endopod broken off.

Etymology. The species bears the name of the collecting area – Tasmania.

Distribution. Off Freycinet Peninsula, Tas.; 800 m depth.

Remarks. *P. bonnieri* Calman, 1906 from the Mediterranean and eastern Pacific (Petrescu, 2000) share with *P. tasmaniensis* a carapace with spines on the posterior extremity and a minute ocular lobe. The new species has fewer tubercles/spines on the posterior extremity of the carapace, no row of spines near the lower margin of the carapace, dactylar teeth of a different shape, maxilliped 3 without strong teeth on the inner margin of the merus, pereopod 1 with its ischium longer than the propodus, and longer uropods.

Scherocumella Watling, 1991

Scherocumella Watling, 1991b: 754.—Stoddart and Lowry, 2003: 373–418.

Type species. *Nannastacus longirostris* Sars, 1879.

Remarks. The carapace is as in the genus *Nannastacus* and the lenses grouped in two lateral pairs as always in *Nannastacus*. The pseudorostral lobes meet each other in front of the eyelobe, from base to top, similar to the genus *Cumella* and the uropodal peduncle is as long or even longer than pleonite 6, as in *Cumella*. Five species and one subspecies are known from Australia.

Key to species of *Scherocumella* from Australian waters

1. Pseudorostral lobes long 2
- Pseudorostral lobes short 3
2. Carapace with a dorsal hump behind frontal lobe
..... *S. nasuta camelus* Zimmer, 1914
- Carapace with no dorsal hump
..... *S. nasuta nasuta* Zimmer, 1914
3. Pereon and pleon with dorsal tubercles 4
- Pereon and pleon without tubercles 5
4. Carapace with serrated dorsal and lateral rows
..... *S. vieta* Hale, 1949
- Carapace without serrated rows
..... *S. clavata* Hale, 1945
5. Uropod peduncle longer than pleotelson
..... *S. sheardi* Hale, 1945
- Uropod peduncle shorter than pleotelson
..... *S. nichollsi* Hale, 1949

Scherocumella nichollsi Hale, 1949

Nannastacus nichollsi Hale, 1949: 227, figs 1, 2.—Băcescu, 1992: 240.

Scherocumella nichollsi.—Watling, 1991b: 754.—Stoddart and Lowry, 2003: 417.

Material examined. 1 female (stn MSL-EG 77), NMV J26637; 1 male (stn MSL-EG 78), NMV J26638; 1 female (stn MSL-EG 104), NMV J26639.

Distribution. Garden I., WA and Vic.; 6–25 m depth.

Remarks. Previously known from the type locality, the species is now recorded from eastern Victoria, at 25 m depth.

Scherocumella sheardi Hale, 1945

Nannastacus sheardi Hale, 1945 : 156, figs 8, 9.—Băcescu, 1992: 243.

Scherocumella sheardi.—Watling, 1991b: 754.—Stoddart and Lowry, 2003: 417.

Material examined. 3 females (stn MSL-EG 105), NMV J26640.

Distribution. Gulf St. Vincent, SA and eastern Vic.; surface to 4 m depth.

Remarks. The species was described by Hale from specimens collected at Brighton, Gulf St Vincent, SA. The species has now been discovered in eastern Bass Strait, Victoria from 27 m depth.

Schizotrema Calman, 1911

Schizotrema Calman, 1911: 341, 360–361.—Watling, 1991b: 755.—Băcescu, 1992: 259.—Stoddart and Lowry, 2003: 418.

Type species. *Schizotrema depressum* Calman, 1911.

Remarks. In *Schizotrema*, the carapace is high as in *Nannastacus*, higher than in *Cumella*; the eyes are always as in *Nannastacus*, but the pseudorostral lobes are completely separated from base to top, not like in *Nannastacus*, *Scherocumella* or *Cumella*. The uropodal peduncle is as long as or shorter than pleonite 6, as in *Nannastacus*.

Key to species of *Schizotrema* from Australian waters

1. Exopod of uropod at least 0.3 times as long as endopod 2
- Exopod of uropod at least 0.25 times as long as endopod 3
2. Last pereonite and 1st pleonite with a pair of strong dorsal spines *S. aculeatum* Hale, 1936
- Last pereonite and 1st pleonite without spines *S. nudum* Tafe and Greenwood, 1996
3. Carapace with dorsal and lateral spines *S. resimium* Hale, 1949
- Carapace without spines *S. leopardinum* Hale, 1949

Schizotrema aculeatum Hale, 1936

Schizotrema bifrons aculeata Hale, 1936: 430, fig. 18.

Schizotrema aculeata.—Hale, 1945: 168, fig. 16.

Schizotrema aculeatum.—Lowry and Stoddard, 2003: 418.

Material examined. 1 female (stn SLOPE 2), NMV J45780.

Distribution. NSW, Gulf St Vincent, SA and WA: 2–503 m depth.

Remarks. The species' range is extended to New South Wales and to greater depths.

Styloptocuma Băcescu and Muradian, 1974

Styloptocuma Băcescu and Muradian, 1974: 74.—Băcescu, 1992: 262.—Petrescu and Watling, 1999: 306.

Americuma Watling, 1991a: 580–581.

Cumella (*Styloptocuma*).—Watling, 1991b: 752.

Type species. *Styloptocuma antipai* Băcescu and Muradian, 1974.

Remarks. *Styloptocuma* is characterised by pseudorostral lobes reaching the extremity of the ocular lobe, the ocular lobe without visual elements, and uropods with long peduncles, twice or even longer than pleonite 6. The genus has not previously been recorded from Australia.

Key to species of *Styloptocuma* from Australian waters (females only)

1. Carapace dorsally and ventrally serrated 2
- Carapace without serration 4
2. Carapace only with ventral serration *S. granulorum* sp. nov.
- Carapace with dorsal and ventral serration 3
3. Carapace with a lateral serrated row *S. spinosum* sp. nov.
- Carapace without lateral serrated row *S. poorei* sp. nov.

4. Dactylus of pereopod 2 twice as long as propodus *S. australiense* sp. nov.
- Dactylus of pereopod 2 quarter length of propodus *S. nodosum* sp. nov.

Styloptocuma australiense sp. nov.

Figures 53, 54

Material examined. Holotype female, NSW, off Nowra, 34°51.90'S, 151°12.60'E, 770 m, crinoid dominated, WHOI epibenthic sled, G.C.B. Poore and C.C. Lu, RV *Franklin*, 15 Jul 1986 (stn SLOPE 6), NMV J53062.

Paratype: 1 female (stn SLOPE 6), NMV J53063.

Diagnosis. Carapace short, with long pseudorostrum, lower margin smooth. Integument with few setae on carapace, smooth on rest of body. Pereopod 1 with carpus as long as propodus. Dactylus of pereopod 2 twice as long as propodus. Uropod peduncle 2.8 times as long as pleonite 6, with serrated inner margin 1.3 times as long as endopod, exopod shorter than endopod, endopod with 4 setae on inner margin and robust curved terminal seta.

Description. Body elongate, integument carapace covered with sparse setae. Length: 3.2 mm.

Carapace shorter than one-third body length, 1.7 times as long as high, long pseudorostrum (0.4 of entire carapace length), antennal notch absent, lower margin smooth, ocular lobe eyeless, reaching extremity of pseudorostral lobes, conical in dorsal view. Pleon 0.55 body length.

Antenna 1 peduncle with progressively shorter articles, median article with tubercle with 2 sensory setae, main flagellum 3-articulate, longer than distal article of peduncle, median and distal article with 1 aesthetasc, accessory flagellum minute, uniaarticulate.

Maxilliped 3 basis shorter than rest of articles combined, with 2 plumose setae on inner margin and 4 (2 long, 2 short) plumose setae on outer distal corner, short ischium, merus shorter than carpus, merus and carpus with long plumose seta on outer margin, propodus 2nd longest article, with 2 pappose setae on inner margin, dactylus longer than merus, with 2 stout curved terminal setae.

Pereopod 1 basis less than half as long as appendage, ischium shorter than merus, carpus longer than merus, as long as propodus, dactylus 0.4 propodus length, with long simple stout terminal seta. Pereopod 2 less than half as long as appendage, merus with seta on inner margin, carpus almost twice as long as merus, with 1 seta on inner margin and 2 on outer margin, 2 stout setae on distal inner corner, dactylus twice as long as propodus, with simple setae. Pereopods 3–5 with progressively shorter basis and longer carpus (twice as long as merus in 5th pair), propodus longer than merus, dactylus with a long stout terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 2.8 times as long as pleonite 6, with serrated inner margin, 1.3 times as long as endopod, exopod shorter than endopod, with a stout terminal seta, endopod with 4 setae on inner margin and robust curved terminal seta.

Etymology. The species bears the name of type locality – Australia.

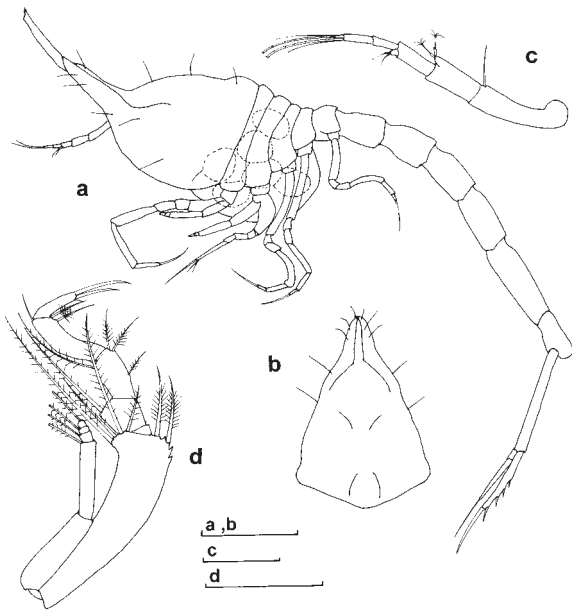


Figure 53. *Styloptocuma australiense* sp. nov. female holotype: a, body, lateral view; b, carapace, dorsal view; c, antenna 1; d, maxilliped 3. Scale (in mm): a, b, 0.5; c, 0.1; d, 0.2.

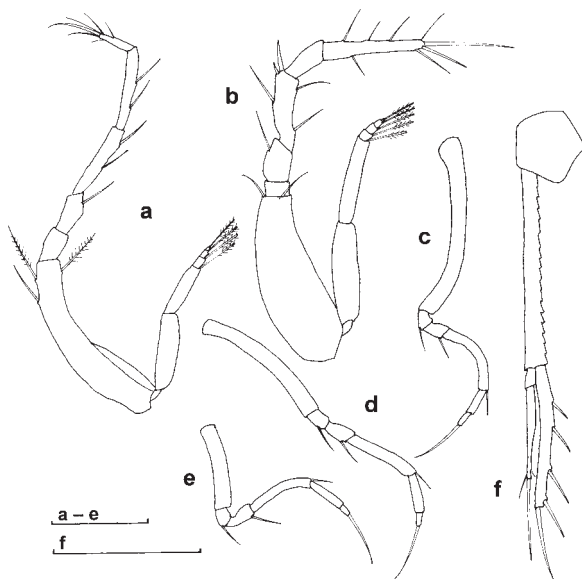


Figure 54. *Styloptocuma australiense* sp. nov. female holotype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and left uropod. Scale (in mm): a-e, 0.25; f, 0.5.

Distribution. Off Nowra, NSW; 770 m depth.

Remarks. This is the first record of the genus *Styloptocuma* from Australian waters. It was previously known from the deep Atlantic (Băcescu, 1992) and Eastern Pacific (Petrescu, 1991; Petrescu and Watling, 1999). *Styloptocuma australiense* is morphologically similar to *S. angustatum* Jones, 1984 from the Western Atlantic (Brazil): both have a carapace without spines or tubercles, a similar anterolateral margin and almost similar pereopods 1 and 2. The new species differs in having a longer pseudostrum, shorter carapace, and uropod endopod with four setae on the inner margin instead of three.

Styloptocuma granulorum sp. nov.

Figures 55, 56

Material examined. Holotype female. Vic., S of Point Hicks, 38°25'S, 149°00'E, 1500 m, compacted clay, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 22 Jul 1986 (stn SLOPE 27), NMV J53067.

Diagnosis. Carapace with short pseudostrum, antennal notch large, lower margin serrated. Pleon with spines and setae. Antenna 1 with basal article of peduncle longer than rest of articles combined. Merus of maxilliped 3 with tooth on outer margin. Carpus of pereopod 1 longer than propodus, propodus twice as long as dactylus. Carpus of pereopod 2 twice as long as merus, dactylus 3 times as long as propodus. Carpus of pereopod 5 more than 3 times as long as merus. Uropod peduncle 2.1 times as long as pleonite 6, 0.8 endopod length, exopod shorter than endopod, endopod with 6 microsetae on inner margin.

Description. Body with hairy granulous integument. Length: 4.08 mm.

Carapace more than 3rd body length, more elevated on posterior extremity, 1.9 times as long as high, ocular lobe bulky, eyeless, reaching extremity of pseudostrum, short siphon, antennal notch large, anterolateral corner acute, lower margin strongly serrated, numerous setae.

Antenna 1 proximal article of peduncle 1.65 times length of rest of articles combined, median article without an evident tubercle, main flagellum 3-articulate, twice as long as distal article of peduncle, accessory flagellum minute, uniarticulate.

Maxilliped 3 basis half of appendage, with 2 plumose setae on inner distal corner and 2 much longer on distal outer corner, merus and carpus with tooth and plumose seta on outer margin, carpus longer than merus, propodus 2nd longest article, dactylus half of propodus, with strong stout curved terminal seta.

Pereopod 1 basis less than half as long as appendage, carpus 2.1 times as long as merus, twice as long as propodus, propodus twice as long as dactylus, dactylus with long robust terminal seta, numerous simple setae especially on propodus and dactylus. Pereopod 2 basis less than half as long as appendage, carpus twice as long as merus, with stout seta on inner distal corner, dactylus 3 times as long as propodus, with long simple stout terminal seta. Pereopods 3-5 with progressively shorter basis and longer carpus (carpus more than 3 times as long as merus in last pair), dactylus fused with

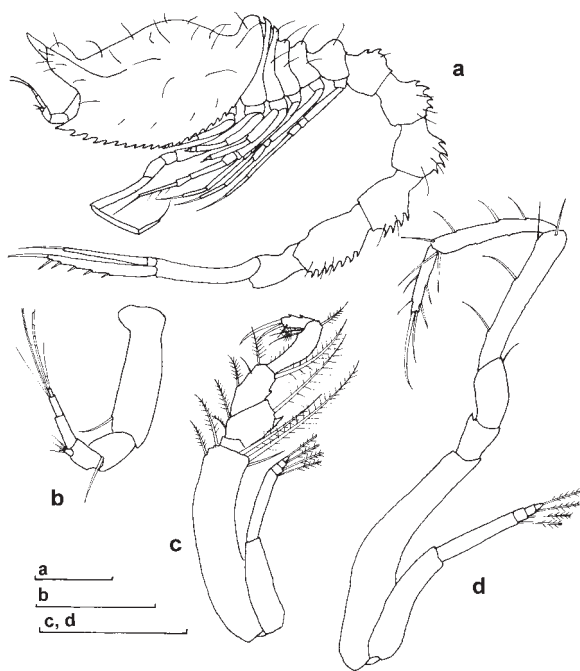


Figure 55. *Styloptocuma granulosum* sp. nov. female holotype: a, body, lateral view; b, antenna 1; c, maxilliped 3; d, pereopod 1. Scale (in mm): a, 0.5; b, 0.2; c, d, 0.5.

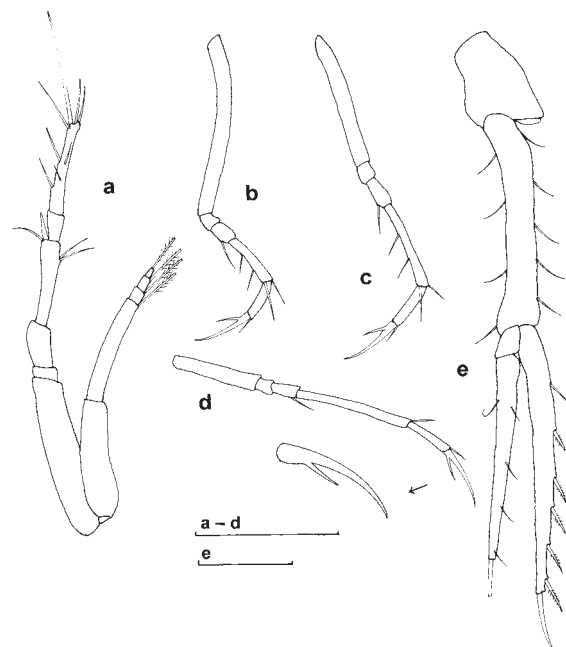


Figure 56. *Styloptocuma granulosum* sp. nov. female holotype: a, pereopod 2; b, pereopod 3; c, pereopod 4; d, pereopod 5; e, pleonite 6 and left uropod. Scale (in mm): a–d, 0.5; e, 0.25.

its stout terminal seta, with inner spine (see detail). Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 2.1 times as long as pleonite 6, with fine setae on both sides, 0.8 endopod length, exopod slightly shorter than endopod, with robust terminal seta (broken), endopod with 6 microserrate setae on inner margin and terminal robust short simple seta.

Etymology. In Latin “*granulosum*” means granular and describes the integument.

Distribution. S of Point Hicks, Vic.; 1500 m depth.

Remarks. *Styloptocuma granulosum* differs mainly from other species of *Styloptocuma* described in this paper in a longer carapace with a smooth upper margin and serrated lower margin. *Styloptocuma cristatum* Jones, 1984 from the Gulf of Biscay has a longer carapace but with dorsal spines on the carapace, lateral spines on the pleon and uropods with shorter rami.

Styloptocuma nodosum sp. nov.

Figures 57–60

Material examined. Holotype female, Vic., S of Point Hicks, 38°25'S, 149°00'E, 1500 m, compacted clay, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 22 Jul 1986 (stn SLOPE 27), NMV J53064.

Allotype: male (stn SLOPE 27), NMV J53065.

Paratypes: 3 females, 1 immature male, 7 manca, 1 adult male, dissected (stn SLOPE 27), NMV J53066.

Diagnosis. Carapace with short pseudorostrum, without antennal notch, slightly serrated lower margin. Antenna 1 with tooth on distal article of peduncle. Carpus and propodus of pereopod 1 subequal. Carpus of pereopod 2 3 times as long as merus, dactylus with subterminal long seta. Uropod peduncle 2.9 times as long as pleonite 6 and 1.3 times as long as its equal rami.

Description of female. Body with few hairs on carapace. Length: 4.7 mm.

Carapace third of body length, 1.6 times as long as high, with short upturned pseudorostrum (0.3 of carapace length), with knotty surface and few long setae, antennal notch absent, lower margin slightly serrated, ocular lobe eyeless. Pleon more than half body length.

Antenna 1 slender, basal article of peduncle much longer than rest of articles combined, median article with minute tubercle, distal one with strong tooth, main flagellum shorter than last article of peduncle, accessory flagellum tiny.

Maxilliped 2 with pappose long seta on inner distal corner of basis and merus, carpus 2nd longest article, with pappose setae on inner margin, dactylus half length of propodus, with stout terminal seta. Maxilliped 3 basis longer than rest of articles combined, with 4 plumose setae along distal margin (2 much longer), merus as long as carpus, with plumose seta on outer margin of both, propodus 2nd longest article, dactylus little less than half as long as propodus, with longer stout terminal setae.

Pereopod 1 basis less than half as long as appendage, merus more than twice length of ischium, carpus 1.8 times as long as merus, as long as propodus, twice as long as dactylus, dactylus

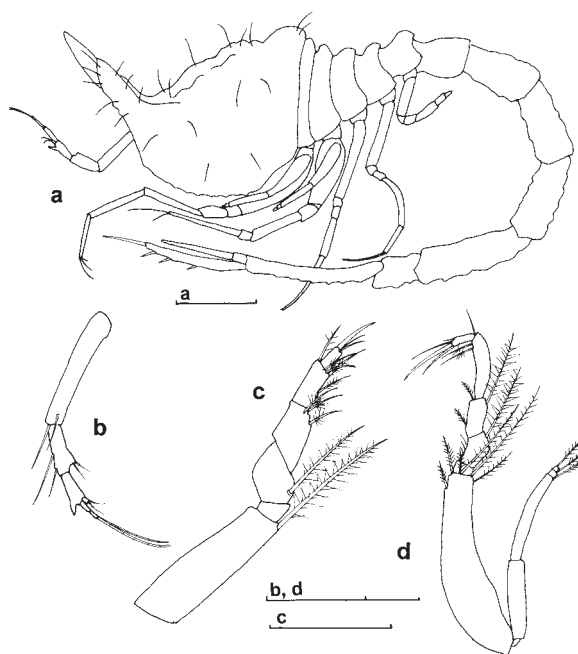


Figure 57. *Styloptocuma nodosum* sp. nov. female holotype: a, body, lateral view; b, antenna 1; c, maxilliped 2; d, maxilliped 3. Scale (in mm): a, 0.5; b, d, 0.5; c, 0.2.

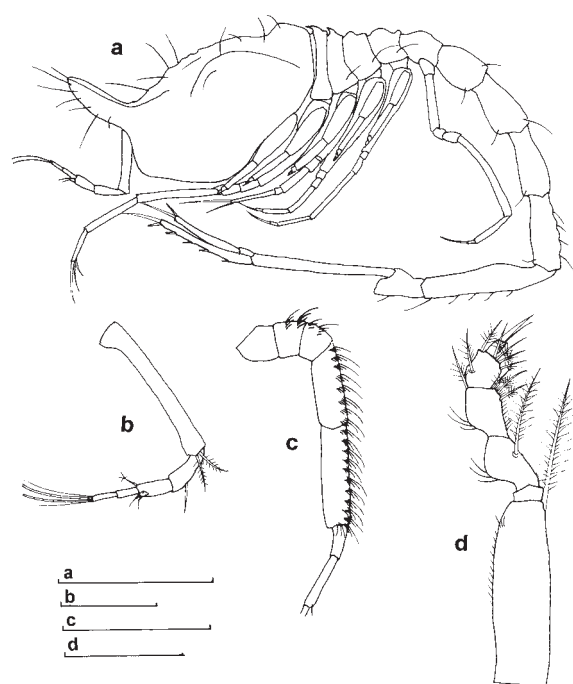


Figure 59. *Styloptocuma nodosum* sp. nov. male allotype: a, body, lateral view; b, antenna 1; c, antenna 2; d, maxilliped 2. Scale (in mm): a, 1; b, 0.25; c, 0.5; d, 0.2.

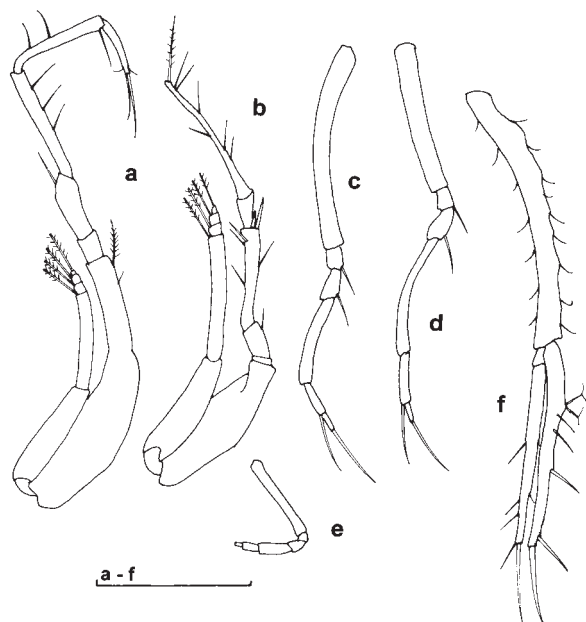


Figure 58. *Styloptocuma nodosum* sp. nov. female holotype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 4; f, pereopod 5; g, pleonite 6 and left uropod. Scale (in mm): a–f, 0.5.

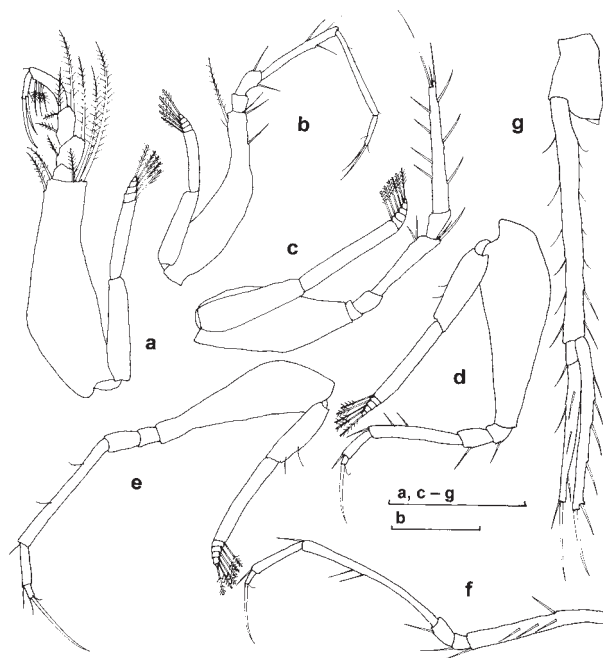


Figure 60. *Styloptocuma nodosum* sp. nov. male allotype: a, maxilliped 3; b, pereopod 1; c, pereopod 2; d, pereopod 3; e, pereopod 4; f, pereopod 4; g, pleonite 6 and left uropod. Scale (in mm): a, c–g, 0.5; b, 0.5.

with terminal stout curved seta. Pereopod 2 basis 3rd of appendage length, fine seta on inner margin of merus, carpus 3 times as long as merus, with 2 stout setae on inner distal corner, dactylus one-fourth as long as propodus, with subterminal long plumose seta (less than half of dactylus). Pereopod 3 basis longer than half of entire pereopod, carpus 3 times as long as merus, propodus little longer than merus, with distal stout seta, dactylus with terminal stout seta. Pereopod 4 with shorter basis and carpus longer than in previous pair. Pereopod 5 much shorter than previous pairs, basis half of appendage, terminal seta missing (limb is regenerated or individual is first molt after manca 2). Exopods on maxilliped 3 and pereopods 1, 2; with 2nd article very long.

Uropod peduncle 2.9 times as long as pleonite 6 and 1.3 times as long as its equal rami, fine setae on both sides, exopod with terminal stout seta (one-third of exopod length), endopod with 2 pedunculate setae, 2 slender simple and 2 stout setae on inner margin and longer terminal seta (as in exopod).

Description of male. Body with knotty surface only on pleonite 4. Length: 5.1 mm. Carapace, pseudorostrum with long setae, large lateral swelling on branchial region, more pronounced anterolateral corner, smooth lower margin.

Antenna 1 with similar peduncle, main flagellum longer than in female. Antenna 2 (fig. 59c) with ranks of setae on articles 2–5 of peduncle.

Maxilliped 2 with larger articles, more setulose. Maxilliped 3 with longer basis.

Pereopod 1 as in female, carpus and propodus equal, longer than in female (3 times as long as merus), with shorter dactylus. Pereopod 2 as in female, subterminal seta of dactylus simple, not plumose. Pereopods 3 and 4 with large basis, longer than rest of appendage in 3rd pair, shorter in 4th, carpus 3 times as long as merus in 3rd pair, 4.5 times longer in 4th pair, long stout terminal seta. Pereopod 5 with shorter and more slender basis than in previous pairs, carpus 5 times as long as merus, propodus 0.4 of carpus. Exopods, 5 pairs, stronger than in female.

Uropod peduncle with straight margins, 2.7 times as long as pleonite 6, 1.4 times as long as endopod, exopod little shorter than endopod, endopod with 5 setae on inner margin.

Etymology. The name “*nodosum*” means “knotty” in Latin and describes the body surface.

Distribution. S of Point Hicks, Vic.; 1500 m depth.

Remarks. *Styloptocuma nodosum* differs from other species in this paper in its knotty integument, a carapace without spines, its slightly serrated lower margin of the carapace in females, being without an antennal notch and with a more upturned pseudorostrum. It resembles *S. extans* Jones, 1984 from the deep Atlantic but has a shorter pseudorostrum, the integument not knotty, and a spiny pleon.

Styloptocuma poorei sp. nov.

Figure 61

Material examined. Holotype female, Tas., off Freycinet Peninsula, 42°00.20'S, 148°37.70'E, 720 m, coarse shelly sand, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 46), NMV J53068.

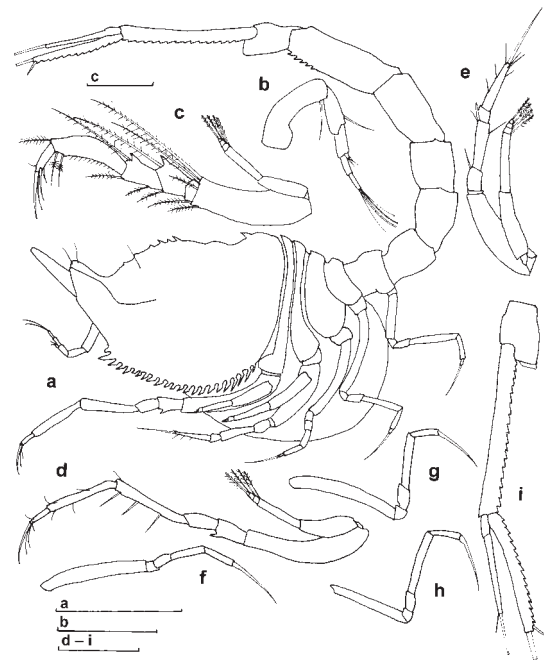


Figure 61. *Styloptocuma poorei* sp. nov. female holotype: a, body, lateral view; b, antenna 1; c, maxilliped 3; d, pereopod 1; e, pereopod 2; f, pereopod 3; g, pereopod 4; h, pereopod 5; i, pleonite 6 and left uropod. Scale (in mm): a, 0.5; b, 0.2; c, 0.1; d–i, 0.25.

Diagnosis. Carapace with short, little upturned pseudorostrum, with several dorsal spines and strongly serrated lower margin. Short serration on pleonite 5. Propodus of maxilliped 3 as long as ischium, merus and carpus combined. Carpus of pereopod 1 longer than propodus. Dactylus of pereopod 2 3.8 times as long as propodus. Uropod peduncle with serrated inner margin, 2.9 times as long as pleonite 6 and 1.3 times as long as endopod, endopod twice as long as exopod, with 1 seta on inner serrated margin.

Description. Body with weakly calcified smooth integument. Length: 2.8 mm.

Carapace 0.31 body length, 1.4 times as long as high, short pseudorostrum (0.18 carapace length), 7 dorsal median spines, 1 near posterior extremity, first 2 on frontal lobe, antennal notch not marked, lower margin strongly serrated.

Antenna 1 basal article of peduncle little longer than other 2 articles combined, median article with small tubercle, main flagellum longer than last article of peduncle, accessory flagellum minute, uniarticulate.

Maxilliped 3 basis less than half as long as appendage, 2 long plumose setae on outer distal corner, a tooth and a plumose seta on outer margin of merus and carpus, propodus 2nd longest article, as long as ischium, merus and carpus combined, dactylus with stout terminal curved seta, longer than dactylus.

Pereopod 1 basis less than half as long as appendage, carpus longer than propodus. Pereopod 2 basis less than half as long as appendage, carpus twice as long as merus, with 2 stout spines on

distal inner corner of carpus, dactylus 3 times as long as propodus, with a stout terminal seta longer than dactylus. Pereopods 3–5 with progressively shorter basis and longer carpus (3.4 times longer carpus than merus in 5th pair), dactylus fused with its terminal seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle with a serrated inner margin, 2.9 times as long as pleonite 6 and 1.3 times as long as endopod, endopod twice as long as exopod, with 1 subterminal seta on inner serrated margin.

Etymology. The species is dedicated to Gary Poore, Principal Curator, Museum Victoria, Melbourne, Australia, well known specialist in Peracarida, as a sign of gratitude.

Distribution. Off Freycinet Peninsula, Tas.; 720 m depth.

Remarks. The new species differs from other species of *Styloptocuma* in this collection in the carapace with a few dorsal spines, a strongly serrated entire lower margin, lacking a lateral row of spines and a relatively smooth pereon and pleon. Such a combination of characters may also be found in *S. subductum* Jones, 1984 from the Atlantic but that species has the lower margin of its carapace serrated only on the anterior half and the uropod endopod has four setae on the inner margin instead of one as in *Styloptocuma poorei*.

***Styloptocuma spinosum* sp. nov.**

Figures 62, 63

Material examined. Holotype female, NSW, off Nowra, 34°57.90'S, 151°08'E, 503 m, bryozoa and shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 14 Jul 1986 (stn SLOPE 2), NMV J53018.

Paratype: 1 female (stn SLOPE 2), NMV J53019.

Diagnosis. Carapace with middorsal row of spines, another lateral and lower margin densely serrated. Dorsal serrated crest on pleonites 1–5. Pereopod 1 with propodus 2nd longest article. Pereopod 2 with dactylus 3 times as long as propodus. Last 3 pairs of pereopods slender. Uropod peduncle serrated on inner margin, twice as long as pleonite 6 and 1.5 times as long as its equal rami.

Description. Body elongate, with weakly calcified integument. Length: 2.36 mm.

Carapace 3rd of body length, 1.7 times as long as high, pseudorostrum quarter of carapace length, slightly upturned, siphon longer than carapace, a middorsal row of spines, 1 bigger spine on ocular lobe, ocular lobe eyeless, reaching extremity of pseudorostral lobes, a median row of spines near lower serrated margin, scattered setae. Pereon glabrous. Pleon elongate, 0.58 of body length, with dorsal serrated crest on pleonites 1–5, without setae.

Antenna 1 basal article of peduncle 2.5 times as long as rest of articles combined, median article longer than distal one, without visible tubercle, main flagellum longer than last article of peduncle, accessory flagellum minute.

Maxilliped 3 basis half of appendage, with 2 plumose setae on outer margin, merus and carpus with plumose seta on outer distal corner, propodus 2nd longest article, twice as long as dactylus.

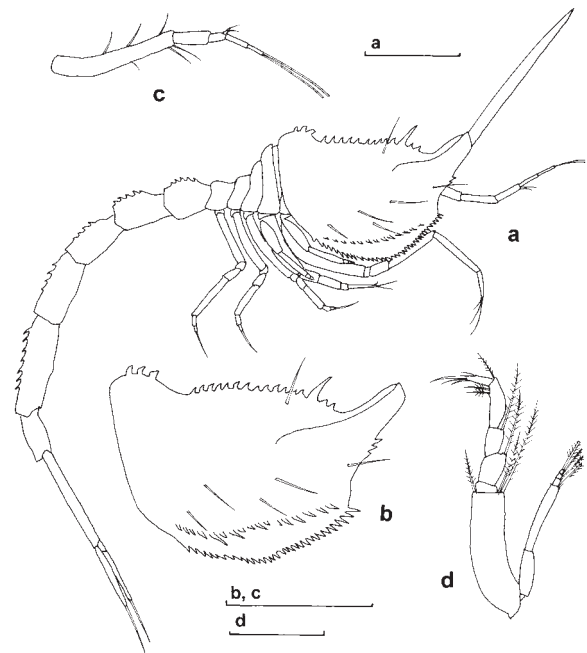


Figure 62. *Styloptocuma spinosum* sp. nov. female holotype: a, body, lateral view; b, carapace, lateral view, magnified; c, antenna 1; d, maxilliped 3. Scale (in mm): a, 0.5; b, c, 0.5; d, 0.25.

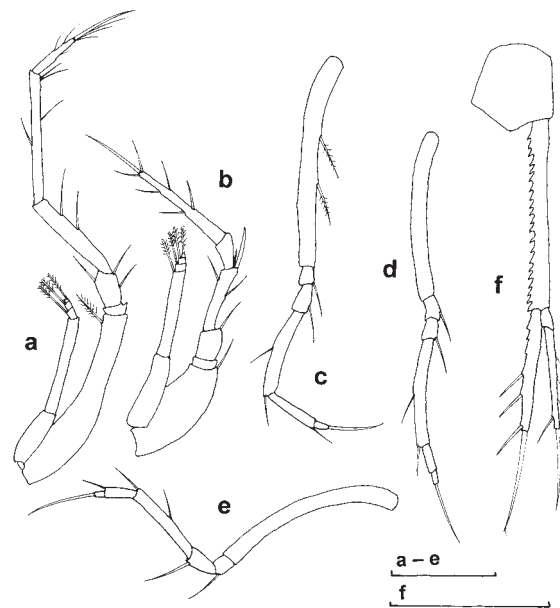


Figure 63. *Styloptocuma spinosum* sp. nov. female holotype: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pleonite 6 and right uropod. Scale (in mm): a–e, 0.25; f, 0.5.

Pereopod 1 basis shorter than rest of articles combined, ischium with small tooth on inner margin, merus twice as long as ischium, carpus 4 times merus and dactylus combined, propodus 2nd longest article, twice as long as carpus, dactylus with slender terminal long seta. Pereopod 2 basis one-third of appendage length, simple seta on distal inner corner of basis and merus, carpus twice as long as merus, with 2 unequal stout setae on inner distal corner, dactylus 3 times as long as propodus, with simple setae. Pereopods 3–5 slender, basis longer than rest of articles combined in 3rd pair, progressively shorter in pairs 4 and 5, carpus progressively longer in pairs 3–5, carpus 5 times as long as merus in 5th pair. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle serrated on inner margin, twice as long as pleonite 6 and 1.5 times as long as its equal rami, exopod with few fine setae on outer margin and a stout terminal seta, endopod with 3 setae on inner margin and a terminal seta longer and more robust than in exopod.

Etymology. The name of the species reflects the numerous spines of carapace.

Distribution. Off Nowra, NSW; 503 m depth.

Remarks. Some features of the carapace, about 20 dorsal spines, a lateral row of spines near the lower densely serrated margin combined with dorsal serration of the pleon, make *Styloptocuma spinosum* unique within Australian species of the genus. Such carapace armature may also be found in *S. antipai* Băcescu and Muradian, 1974 from the deep western Atlantic and *S. echinatum* Jones, 1984 from the eastern Atlantic. The new species differ in the glabrous pereon, absence of lateral rows of spinules on the pleon and the shorter carpus of pereopod 2.

Styloptocumoides gen. nov.

Type species. *Styloptocumoides australiensis* sp. nov., here designated.

Diagnosis. Carapace with short pseudorostrum, eyeless ocular lobe reaches its extremity. 5 free pedigerous somites. No trace of exopods in maxilliped 3 or pereopods in females.

Gender. Masculine.

Etymology. The new genus looks like *Styloptocuma* Băcescu and Muradian, 1974.

Remarks. The closest genus to *Styloptocumoides* is *Styloptocuma* Băcescu and Muradian, 1974, especially regarding the carapace, with the ocular lobe reaching the tip of the pseudorostrum. The main difference is the total absence of exopods in the females of *Styloptocumoides*. A second difference is five instead of four free thoracic segments.

Styloptocumoides australiensis sp. nov.

Figure 64

Material examined. Holotype female, NSW, off Nowra, 34°51.90'S, 151°12.60'E, 770 m, crinoid dominated, WHOI epibenthic sled, G.C.B. Poore and C.C. Lu, RV *Franklin*, 15 Jul 1986 (stn SLOPE 6), NMV J53060.

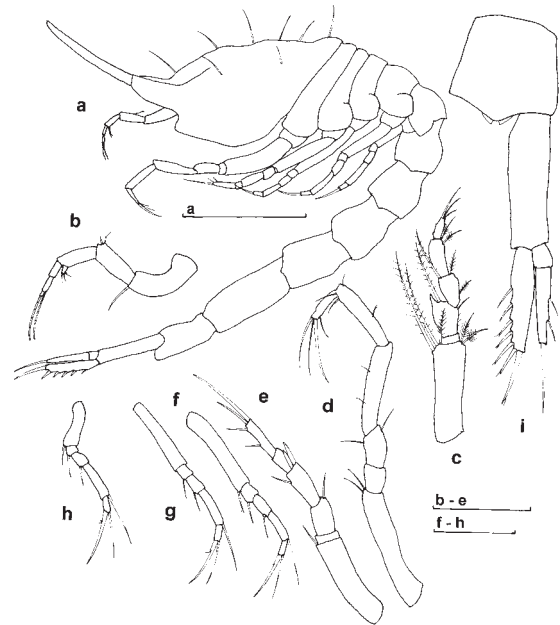


Figure 64. *Styloptocumoides australiensis* sp. nov. female holotype: a, body, lateral view; b, antenna 1; c, maxilliped 3; d, pereopod 1; e, pereopod 2; f, pereopod 3; g, pereopod 4; h, pereopod 5; i, pleonite 6 and right uropod. Scale (in mm): a, 0.5; b–e, i, 0.2; f–h, 0.25.

Diagnosis. Pseudorostrum 0.38 of carapace length, ocular lobe eyeless, reaching its tip, few setae on carapace, no spines on entire body, smooth lower margin of carapace. Basal article of peduncle of antenna 1 shorter than rest of articles combined, short main flagellum. Maxilliped 3 with a strong tooth on outer margin of merus. Pereopod 1 with carpus 2nd longest article, dactylus with long curved robust terminal seta. Pereopod 2 with carpus little longer than merus, with 2 robust short setae on its distal inner corner, short dactylus. Pereopods 3–5 progressively shorter, with dactylus fused with its terminal seta. No exopods. Short and robust uropods, peduncle twice as long as pleonite 6 and its endopod, endopod slightly longer than exopod, with 6 setae on inner margin.

Description. Body with weakly calcified integument. Length: 2.6 mm.

Carapace one-third body length, twice as long as high, with pseudorostrum 0.38 of carapace length, ocular lobe reaches its extremity, with some dorsal undulation viewed from lateral side, with few setae, antennal notch marked, lower margin smooth, siphon long.

Antenna 1 basal article of peduncle shorter than rest of articles combined, main flagellum short, 3-articulate, as long as distal article of peduncle, with short aesthetascs, accessory flagellum minute, uniarticulate.

Maxilliped 3 basis with 2 plumose setae on inner distal corner, 3 on outer one (2 much longer), merus with strong tooth and plumose seta on outer margin, carpus shorter than

merus, with plumose seta on outer margin, propodus slightly longer than merus, with 2 pappose setae on inner margin, short dactylus with stout long terminal seta.

Pereopod 1 basis less than half as long as appendage, carpus 2nd longest article, dactylus little less than half as long as propodus, with terminal long curved robust seta. Pereopod 2 basis less than half as long as appendage, simple seta on inner margin of merus, carpus little longer than merus, with 2 short robust setae on inner distal corner, dactylus 1.6 times as long as propodus, with long robust terminal seta. Pereopods 3–5 with progressively shorter basis and longer carpus (3 times as long as merus in last pair), dactylus fused with its stout terminal seta. Exopods absent in maxilliped 3 and pereopods 1, 2.

Uropod short and robust, peduncle twice as long as pleonite 6 and its endopod, exopod slightly shorter than endopod, with robust terminal seta, endopod with 6 setae on inner margin and terminal robust seta shorter than in exopod.

Etymology. The species bears the name of the collecting place – Australia.

Distribution. Off Nowra, NSW; 770 m depth.

Remarks. The female of *Styloptocumoides australiensis* has pereopods as in *Styloptocuma poorei* but maxilliped 3 has a shorter propodus in *S. australiensis*; maxilliped 3 and pereopods 1 and 2 are without exopods, and obviously shorter and larger uropods.

Vemacumella Petrescu, 2001

Vemacumella Petrescu, 2001: 1675–1677.

Type species. *Vemacumella heardi* Petrescu, 2001.

Remarks. The genus has the general aspect of *Cumella* but with a higher carapace, eyeless ocular lobe like in *Styloptocuma*, pseudorostral lobes meeting in front of ocular lobe like in *Cumella*, not as in *Styloptocuma*; median article of antennal peduncle with a tubercle as in *Styloptocuma* but absent in *Cumella*.

Vemacumella bacescui sp. nov.

Figures 65, 66

Material examined. Holotype female, Tas., off Freycinet Peninsula, 41°57.50'S, 148°37.90'E, 400 m, coarse shell, WHOI epibenthic sled, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986 (stn SLOPE 48), NMV J53069.

Paratype: 1 female (stn SLOPE 6), NMV J53070.

Diagnosis. Carapace with middorsal row of spines, anterolateral corner strongly serrated, ocular lobe eyeless. Short and robust antenna 1, median article of peduncle with small tubercle. Basis and merus of maxilliped 3 with strong inner serration. Carpus of pereopod 1 2nd longest article, as long as propodus and dactylus combined. Carpus of pereopod 2 with long stout seta on inner distal corner, short dactylus. Uropod peduncle 1.7 times as long as pleonite 6 and 1.3 times as long as endopod, endopod longer than exopod, with 4 stout setae on inner serrated margin.

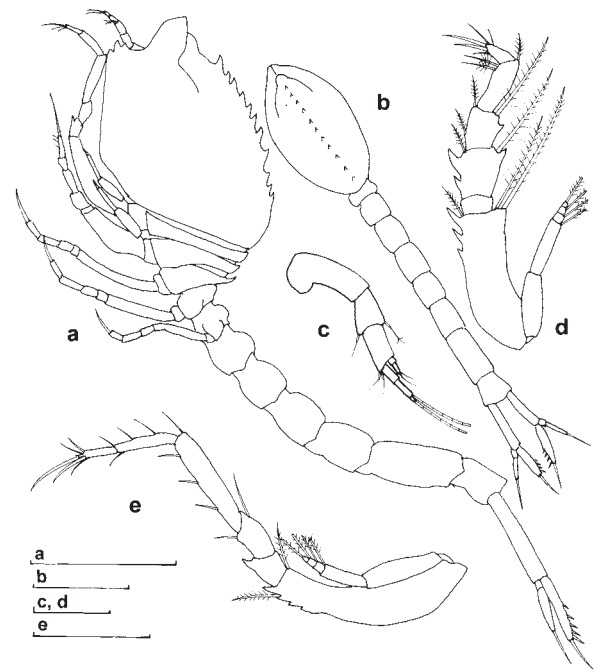


Figure 65. *Vemacumella bacescui* sp. nov. female holotype: a, body, lateral view; b, body, dorsal view; c, antenna 1; d, maxilliped 3; e, pereopod 1. Scale (in mm): a, 0.5; b, 0.5; c, d, 0.1; e, 0.2.

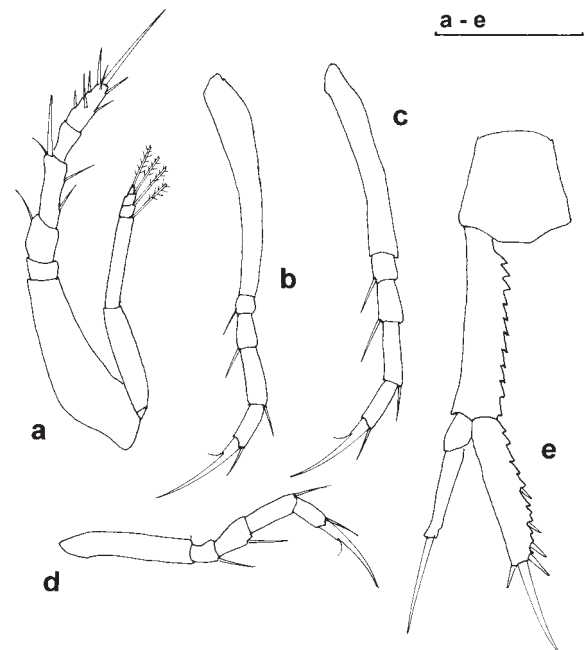


Figure 66. *Vemacumella bacescui* sp. nov. female holotype: a, pereopod 2; b, pereopod 3; c, pereopod 4; d, pereopod 5; e, pleonite 6 and left uropod. Scale bar: a–e, 0.2

Description. Body strongly calcified, integument smooth. Length: 2.4 mm.

Carapace 0.33 body length, 1.6 times as long as high, with a median dorsal row of spines reaching frontal lobe, short pseudorostrum meeting in front of ocular lobe, ocular lobe eyeless, antennal notch marked, anterolateral corner strongly serrated, lower margin smooth.

Antenna 1 proximal article of peduncle the longest, median one the shortest, with tubercle provided with pedunculate seta, main flagellum slightly shorter than distal article of peduncle, 3-articulate, accessory flagellum 2-articulate, almost reaching the extremity of basal article of main flagellum.

Maxilliped 3 basis less than half as long as appendage, with 3 strong teeth on inner margin, 2 long plumose setae on outer distal corner, without outer process, merus 2nd longest article, with 2 strong teeth on inner margin, long plumose seta on outer margin of merus and carpus, propodus longer than carpus, with 2 pappose setae on inner margin, dactylus 0.5 propodus length, with 2 stout terminal setae.

Pereopod 1 basis shorter than rest of articles combined, with strong serration on inner margin, tooth on inner margin of ischium, merus longer than ischium, carpus 2nd longest article, as long as propodus and dactylus combined, dactylus with stout slender terminal seta. Pereopod 2 basis shorter than rest of articles combined, merus with simple seta on inner margin, carpus 1.7 times as long as merus, with long stout seta on inner distal corner, dactylus 1.75 times as long as propodus, with numerous short simple setae on both margins, long stout simple terminal seta. Pereopods 3–5 with progressively shorter basis (longer than half of appendage in 3rd pair) and longer carpus (twice as long as merus in 5th pair), dactylus fused with its terminal stout seta. Exopods on maxilliped 3 and pereopods 1, 2.

Uropod peduncle 1.7 times as long as pleonite 6 and 1.3 times as long as endopod, exopod 0.9 times length of endopod, with long robust terminal seta, endopod with 4 stout setae on inner serrated margin and robust terminal seta.

Etymology. The species is dedicated to the memory of the late Mihai C. Băcescu (1908–1999), member of the Romanian Academy, former director of “Grigore Antipa” National Museum of Natural History from Bucharest, one of the highest world authorities on Crustacea Peracarida, as a sign of homage and gratitude for all he offered to his last student.

Distribution. Off Nowra, NSW, off Freycinet Peninsula, Tas.; 400–770 m depth.

Remarks. This is the first record of the genus in the western Pacific (Australia) and second description of a species of *Vemacumella* Petrescu. *Vemacumella bacescui* has in common with *Vemacumella heardi* Petrescu, 2001 (described from the south-eastern Pacific) a carapace longer than one-third of the body length, five free pereonites, antenna 1 with a tubercle on the median article of the peduncle, accessory flagellum 2-articulate, and relatively short uropods with serrated margins and unequal rami. *Vemacumella bacescui* differs in having more numerous dorsal spines on the carapace and the basis of maxilliped 3 without an outer process. Other morphological

characters are sexually dimorphic, the Australian species being described from a female while the American one is from a male.

Acknowledgements

I am more than grateful to Dr Gary Poore, Principal Curator at Museum Victoria, Melbourne, Australia, for offering me the possibility to work in his lab, the hospitality of his home, and for the material lent for study; and to Lynsey Poore, his wife, for the kindness and warmth she generously gave during my staying in Melbourne. I extend my posthumous gratitude to my mentor, the late Prof. Mihai Băcescu, for all he transmitted to his last student in Crustacea.

References

- Bate, S. 1865. Carcinological gleanings, 1. *Annals and Magazine of Natural History* (ser. 3) 15: 86.
- Băcescu, M. 1991. *Campylaspis wardi* sp. nov. and *Gynodiastylis nordaustriana* sp. nov. from the littoral waters of northern Australia. *Travaux du Museum d'Histoire naturelle "Grigore Antipa"* 31: 317–322.
- Băcescu, M. 1992. Cumacea II (Fam. Nannastacidae, Diastylidae, Pseudocumatidae, Gynodiastylidae et Ceratocumatidae) in: Gruner, H.E., and Holthuis, L.B. (eds), *Crustaceorum Catalogus* 8: 175–265. SPB Academic Publishing: The Hague.
- Băcescu, M., and Muradian, Z. 1974. *Campylaspenis*, *Styloptocuma*, *Atlantocuma*, new genera of Cumacea from the deep waters of the Atlantic. *Revue Roumaine de Biologie. Biologie Animale* 19: 71–78.
- Bonnier, J. 1896. Résultats Scientifiques de la Campagne du “Caudan” dans le Golfe de Gascogne- Août- Septembre 1895 – Édirophthalmes. *Annales de l'Université de Lyon* 26: 527–689.
- Calman, W.T. 1906. The Cumacea of the Puritan Expedition. *Mitteilungen Zoologisches Station Neapel* 17: 422–423.
- Calman, W.T. 1907. Cumacea. *National Antarctic Expedition 1901–04. Natural History II, Zoology* 6: 1–6.
- Calman, W.T. 1911. On new and rare Crustacea of the Order Cumacea from the collection of the Copenhagen Museum – Part II. The Families Nannastacidae and Diastylidae. *Transactions of the Zoological Society of London* 18: 341–400.
- Coleman, N., Gason, A.S.H., and Poore, G.C.B. 1997. High species richness in the shallow marine waters of south-east Australia. *Marine Ecology Progress Series* 154: 17–26.
- Foxon, G.E.H. 1932. Report on stomatopod larvae, Cumacea and Cladocera. *Scientific Report, Great Barrier Reef Expedition* 4: 375–398.
- Gamô, S. 1960. On six new species of cumacean Crustacea, genus *Campylaspis* (Nannastacidae) from Japan. *Zoological Magazine, Tokyo* 69: 369–387. (In Japanese, with English summary)
- Gamô, S. 1962. On the cumacean Crustacea from Tanabe Bay, Kii Peninsula. *Publications of the Seto Marine Biological Laboratory* 10: 153–210.
- Gamô, S. 1967. Studies on the Cumacea (Crustacea, Malacostraca) of Japan. Part II. *Publications of the Seto Marine Biological Laboratory* 15: 245–274.
- Hale, H.M. 1936. Cumacea from a South Australian reef. *Records of the South Australian Museum* 5: 404–438.
- Hale, H.M. 1937. Cumacea and Nebaliacea. *Australasian Antarctic Expedition, 1911–14. Scientific Reports. Series C. - Zoology and Botany* 2: 5–45

- Hale, H.M. 1945. Australian Cumacea. No. 9. The Family Nannastacidae. *Records of the South Australian Museum* 8: 145–218.
- Hale, H.M. 1949. Australian Cumacea No. 16. The Family Nannastacidae. *Records of the South Australian Museum* 9: 226–245.
- Jones, N.S. 1974. *Campylaspis* species (Crustacea, Cumacea) from the deep Atlantic. *Bulletin of the British Museum (Natural History) (Zoology)*, 27: 247–300.
- Jones, N.S. 1984. The family Nannastacidae (Crustacea, Cumacea) from the deep Atlantic. *Bulletin of the British Museum (Natural History) (Zoology)* 46: 207–289.
- Ledoyer, M. 1988. Cumacés (Crustacea) profonds de la région de l'Île de Mayotte, Canal de Mozambique, Océan Indien (Campagne Benthédi, 1977). *Mésogée* 48: 131–172.
- Ledoyer, M. 1993. Cumacea (Crustacea) de la campagne EPOS 3 du R.V. "Polarstern" en Mer Weddell, Antarctique. *Journal of Natural History* 27: 1041–1096.
- Liljeborg, W. 1855. Om Hafs- crustaceer vid Kullaberg i Skaane. *Ofversigt af Konglige Svenska Vetenskaps-Akademiens Förhandlingar* 12: 121.
- Lomakina, N.V. 1952. Novye vidy kumovyh rakov (Cumacea) iz dalnevostochnykh morei. *Trudy Zoologicheskii Institut, Akademia Nauk SSSR* 12: 1–301.
- Muradian, Z. 1979. On two new species of *Campylaspis* (Cumacea, Nannastacidae) and some comments on the criteria for the diagnosis in the genus with the establishment of two new subgenera: *Sarsia* and *Bacescua*. *Revue Roumaine de Biologie Série Biologie Animale*, 24: 104,105.
- Petrescu, I. 1991. Contributions to the knowledge of the family Leuconidae (Crustacea, Cumacea) with the description of three new species: *Heteroleucon bacescui* n. sp., *Leucon adela* n. sp. and *Leucon meredithi* n. sp. *Revue Roumaine de Biologie (Série de Biologie Animale)* 36: 15–20.
- Petrescu, I. 1995. Cumaceans (Crustacea, Peracarida) from the shallow waters of Indonesia. *Beaufortia* 45: 27–49.
- Petrescu, I. 2000. Additional data on some deep-sea Nannastacidae (Crustacea: Cumacea) collected by R/V "Vema". *Travaux du Museum National d'Histoire Naturelle "Grigore Antipa"* 42: 55–74.
- Petrescu, I. 2001. New deep-sea Nannastacidae (Crustacea, Cumacea) from the Eastern Pacific collected by R.V. "Vema". *Journal of Natural History* 35: 1657–1680.
- Petrescu, I., and Watling, L. 1999. Revision of genus *Americuma* Watling, 1991 (Crustacea: Cumacea) with the redescription of *Styloptocuma heardi* (Băcescu, 1979) based on neotype material. *Travaux du Museum National d'Histoire Naturelle "Grigore Antipa"* 41: 299–308.
- Poore, G.C.B., Just, J., and Cohen, B.F. 1994. Composition and diversity of Crustacea Isopoda of the southeastern Australian continental slope. *Deep-Sea Research* 41: 677–693.
- Sars, G.O. 1865. Om den aberrante krebsdyrgruppe Cumacea og dens nordiske Arter. *Forhandlinger i Videnskaps-Selskapet in Kristiania* 1864: 202.
- Sars, G.O. 1870. Nye Dybvands-Crustaceer fra Lofoten. *Forhandlinger i Videnskaps-Selskapet in Kristiania* 1869: 158–165.
- Sars, G.O. 1879. Middelhavets Cumaceer. *Archiv Mathematik og Naturvidenskab*. Christiania 4: 13–22.
- Stebbing, T.R.R. 1912. The Sympoda (Part VI of South African Crustacea; for the marine investigations in South Africa). *Annals of the South African Museum* 10: 150–152.
- Stephensen, K. 1915. Isopoda, Tanaidacea, Cumacea, Amphipoda (excl. Hyperidae). *Report of the Danish Oceanographic Expedition, 1908-1910* 2: 29.
- Stoddart, H.E., and Lowry, J.K. 2003. Cumacea. Pp. 373–418 in: Beesley, P.L., and Houston, W.W.K. (eds), *Zoological Catalogue of Australia. Crustacea: Malacostraca: Peracarida: Amphipoda, Cumacea, Mysidacea*. CSIRO Publishing: Melbourne. (also at <http://www.deh.gov.au/cgi-bin/abrs/fauna/>)
- Tafe, D.J., and Greenwood, J.G. 1996. A new species of *Shizotrema* (Cumacea: Nannastacidae) from Moreton Bay, Queensland. *Memoirs of the Queensland Museum* 39: 381–389.
- Watling, L. 1991a. Revision of the cumacean family Leuconidae. *Journal Crustacean Biology* 11(4): 569–582.
- Watling, L. 1991b. Rediagnosis and revision of some Nannastacidae (Crustacea: Cumacea). *Proceedings of the Biological Society Washington* 104: 751–757.
- Zimmer, C. 1907. Neue Cumaceen von der Deutschen und Schwedischen Südpolar-Expeditionen aus der Familien der Cumiden, Vaunthompsoniiden, Nannastaciden und Lampropiden. *Zoologischer Anzeiger* 31: 367–371.
- Zimmer, C. 1914. Cumacea. *Fauna Südwest-Australiens* 5: 184–187.
- Zimmer, C. 1952. Indochinesische Cumaceen. *Mitteilungen aus dem Zoologischen Museum in Berlin* 28: 5–36.

Appendix.

Station data from Museum Victoria collections. That which is prefixed AA is from Prydz Bay, Antarctica. Those prefixed MSL-EG were collected off East Gippsland, Victoria, by tenth-metre-square Smith-McIntyre grab from RV *Sarda* and donated by the Marine Sciences Laboratories (see Coleman et al., 1997). Those prefixed SLOPE were collected by WHOI epibenthic sled during cruises on RV *Franklin* by Museum Victoria on the south-eastern Australian continental slope (see Poore et al., 1994).

Antarctica

AA93 158, Eastern Prydz Bay, off the Larsemann Hills, 68°54.88'S, 76°37.03'E, 667–716 m, epibenthic sled, P.M. O'Loughlin, RSV *Aurora Australis*, 18 Feb 1993.

Victoria, eastern Bass Strait

MSL-EG 18, 14 km SW of Marlo, 37°54'S, 148°25.7'E, 26 m, sand-shell, 12 Aug 1989.

MSL-EG 20, 23 km SSW of Marlo, 37°49'S, 148°25.7'E, 11 m, sand-shell, 12 Aug 1989.

MSL-EG 26, 7.8 km ESE of eastern edge of Lake Tyers, 37°51.65'S, 148°10.60'E, 38 m, sand-shell, 25 Sep 1990.

MSL-EG 27, 11.2 km E of eastern edge of Lake Tyers, 37°51.41'S, 148°13.16'E, 32 m, sand-shell, 25 Sep 1990.

MSL-EG 28, 15.7 km E of eastern edge of Lake Tyers, 37°51.19'S, 148°16.28'E, 36 m, sand-shell, 25 Sep 1990.

MSL-EG 57, 5.4 km SW of Cape Conran, 37°51.28'S, 148°43.73'E, 50 m, sand-shell, 28 Sep 1990.

MSL-EG 62, 7.3 km SSW of Cape Conran, 37°52.67'S, 148°42.06'E, 48 m, sand-shell, 28 Sep 1990.

MSL-EG 67, 13.3 km E of eastern edge of Lake Tyers, 37°51.70'S, 148°14.60'E, 37 m, coarse sand, 4 Jun 1991.

MSL-EG 77, 11.7 km W of Pt Ricardo, 37°49.89'S, 148°30.13'E, 27 m, coarse sand, 4 Jun 1991.

MSL-EG 78, 11.7 km W of Pt Ricardo, 37°49.89'S, 148°30.13'E, 27 m, coarse sand, 4 Jun 1991.

MSL-EG 104, 11.7 km W of Pt Ricardo, 37°49.89'S, 148°30.13'E, 27 m, coarse sand, Feb 1991.

MSL-EG 105, 11.7 km W of Pt Ricardo, 37°49.89'S, 148°30.13'E, 27 m, coarse sand, Feb 1991.

MSL-EG 108, 15.5 km SW of Pt Ricardo, 37°53.14'S, 148°28.94'E, 45 m, medium sand, Feb 1991.

South-eastern Australian continental slope

SLOPE 1, NSW, off Nowra, 34°59.52'S, 151°05.94'E, 204 m, coarse shell, G.C.B. Poore et al., RV *Franklin*, 14 Jul 1986.

SLOPE 2, NSW, off Nowra, 34°57.90'S, 151°08.00'E, 503 m, bryozoa and shell, G.C.B. Poore et al., RV *Franklin*, 14 Jul 1986.

SLOPE 6, NSW, off Nowra, 34°51.90'S, 151°12.60'E, 770 m, crinoid dominated, G.C.B. Poore and C.C. Lu, RV *Franklin*, 15 Jul 1986.

SLOPE 19, NSW, off Eden, 37°07.30'S, 150°20.20'E, 520 m, grey coarse shell, G.C.B. Poore et al., RV *Franklin*, 20 Jul 1986.

SLOPE 21, NSW, off Eden, 36°57.40'S, 150°18.80'E, 220 m, muddy shell, G.C.B. Poore et al., RV *Franklin*, 20 Jul 1986.

SLOPE 27, Vic., S of Point Hicks, 38°25.00'S, 149°00.00'E, 1500 m, compacted clay, G.C.B. Poore et al., RV *Franklin*, 22 Jul 1986.

SLOPE 45, Tas., off Freycinet Peninsula, 42°02.20'S, 148°38.70'E, 800 m, coarse shelly sand, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986.

SLOPE 46, Tas., off Freycinet Peninsula, 42°00.20'S, 148°37.70'E, 720 m, coarse shelly sand, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986.

SLOPE 47, Tas., off Freycinet Peninsula, 41°58.60'S, 148°38.80'E, trawl, 500–600 m, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986.

SLOPE 48, Tas., off Freycinet Peninsula, 41°57.50'S, 148°37.90'E, 400 m, coarse shell, M.F. Gomon et al., RV *Franklin*, 27 Jul 1986.