

REPORT ON THE INTERNATIONAL INDIAN OCEAN EXPEDITION
COLLECTIONS OF CUMACEA IN THE SMITHSONIAN INSTITUTION
WASHINGTON*

A. RADHADEVI AND C. V. KURIAN

Central Marine Fisheries Research Institute, Cochin-682 018

ABSTRACT

The studies on the Cumacea obtained by the International Indian Ocean Expedition deposited in the Smithsonian Institution suggest that the Cumacean fauna along the east coast of Africa (Durban Bay, Nossi-Be-Madagascar, Grand Comoro Island) is very rich. They show affinities with those of Australian and Phillipine Coasts. Family Nannastacidae is widely distributed along the east coast of Africa, Malaya Coast and Singapore Strait. It is also noted that most of them were obtained from shallow waters. Only very few species are restricted to deeper regions. *Campylaspis orientalis* Calman, *C. rubicunda* (Lilljeborg) are distributed at 2125 m depth off Madagascar.

The specimens are mostly benthic and they are abundant in a fine sandy bottom with a small percentage of silt and are rare in coarse and fine muddy deposits. Sometimes they occur in sand which contains soft and hard corals, sponges and *Sargassum*. *Nannastacus gibbosus* is present in large numbers at Palau Hantu (S. W. Singapore). The benthic collections from the Red Sea show that *Schizotrema aculeata* prefers a sandy bottom in a very shallow depth. It is also noted that two species namely *Nannastacus longirostris* and *Cumella limicola* which had been previously described from Mediterranean Coasts are widely distributed in the Nossi-Be-Madagascar area. *Cumella limicola* is known from west coast of Africa also.

The ecological habitat of the Cumacean fauna of the east coast of Africa are essentially intertidal rocks, large masses of compacted mud rocks, coral and rock patches on the hard sandy bottom with coral reefs and mangroves. *Leucon* sp. and *Hemilamprops* sp. are quite common in the Durban Bay, while *Nannastacus* sp. are observed from Nossi-Be-Madagascar areas and Singapore Coast.

INTRODUCTION

THE PRESENT paper deals with the Cumacea obtained by the International Indian Ocean Expedition (1963-'65) deposited in the Smithsonian Institution, Washington. The samples were collected from different stations in the East Coast of Africa, Red Sea, West Coast of India, West Coast of Thailand, West Coast of Malaya and Singapore Strait by the Research

Vessels 'Anton Bruun' and 'Te Vega'. The specimens include both benthic and planktonic forms and vary in length from 0.9 mm to 11.0 mm and belong to the families Bodotriidae, Nannastacidae, Leuconidae, Lampropidae and Diastylidae. They come from depths varying from intertidal regions to 2125 m.

The above work was carried out in the Pelagic Fishery Laboratory of CMFRI as part of the project on Cumacea sanctioned by ICAR. The authors are thankful to ICAR and Dr. E. G. Silas, Director, CMFRI for

* Part of the thesis for which Ph.D. degree was awarded to A. Radhadevi by the University of Cochin.

providing necessary facilities for carrying out the investigation. Our thanks are due to the Smithsonian Institution, Washington who provided the above materials for our study.

The collection consists of 198 specimens which are placed under 36 species. The labelled specimens are deposited in the Smithsonian Institution, Washington.

The following is a list of species :

Family : BODOTRIIDAE

Sub family : VAUNTHOMPSONIINAE

Glyphocuma inaequalis Hale
Glyphocuma sp.

Sub family : BODOTRIINAE

Bodotria scorpioides (Montagu)
Bodotria pulex (Zimmer)
Cyclaspis varians Calman
Iphinoe fagei Jones

Family : LEUCONIDAE

Leucon longirostris Sars
Leucon acutirostris Sars
Leucon sp.
Hemileucon levis Hale

Family : NANNASTACIDAE

Schizotrema sordidum Calman
Schizotrema aculeata Hale
Schizotrema sp.
Nannastacus gibbosus Calman
Nannastacus reptans Calman
Nannastacus minor Calman
Nannastacus lepturus Calman
Nannastacus longirostris Sars
Nannastacus sheardi Hale
Nannastacus inflatus Hale
Nannastacus subinflatus Hale
Nannastacus johnstoni Hale
Cumella hispida Calman
Cumella limicola Sars
Cumella turgidula Hale
Campylaspis orientalis Calman
Campylaspis rubicunda (Lilljeborg)
Campylaspis glabra Sars
Campylaspis maculata Zimmer
Campylaspis thompsoni Hale

Family : LAMPROPIDAE

Hemilamprops pellucida Zimmer
Hemilamprops diversa Hale
Hemilamprops sp.

Family : DIASTYLIDAE

Diastylis planifrons Calman
Diastylis sp.
Makrokyllindrus sp.

Genus *Glyphocuma* Hale

Glyphocuma inaequalis Hale

Glyphocuma inaequalis Hale, 1944. *Trans. Roy. Soc. S. Austral.*, 68 (2): 276-280, fig. 36.

Locality : Lat. 29°34' S, Long. 31°39' E,
1 immature ♂ 7.2 mm.

Immature male : Carapace one-fourth the total length of the specimen, with well marked dorsal carina, with four incisions from the ocular lobe to the middle of the carapace. Ocular lobe with large lenses ; granules indistinct. Basis of first peraeopod serrated in the outer margin, ischium without a tooth at its distal angle as in the type description. Third to fourth peraeopods with carpus having two or three long terminal setae. Pleopods poorly developed. Telsonic somite well produced in between the uropods. Peduncle with long and short spines on the inner margin.

Distribution : New South Wales.

Glyphocuma sp.

Locality : Lat. 30°09' S, Long. 31°37' E,
930 m, Agassiz trawl, 7.9.'64, 1 damaged ♂
10 mm.

Male : Since the cephalothoracic region is crushed and parts of the uropods are missing, identification upto the species was not possible. Lateral margin of the carapace dentate, first peraeopod very long, basis slender with numerous short plumose setae on the outer

margin. Peduncle longer than the telsonic somite, with eleven spines; endopod two segmented, first broader and longer than second, with two stout spines and numerous spinules on the inner margin and short spines on the outer margin. Exopod broken.

***Bodotria scorpioides* (Montagu)**

Cancer scorpioides Montagu, 1804. *Trans. Linn. Soc. London*, 7, p. 70, fig. 5.

Bodotria scorpioides Calman 1907. *Trans. Zool. Soc. London*, 18(1), p. 3. Stebbing, 1913. *Das Tierreich*, 39, pp. 25-26. Lomakina, 1958. *Opred. po faune SSSR*, 66, pp. 281-283, fig. 190.

Locality: Nossi-Be-Madagascar, 1 immature ♂ 3.5 mm & 1 ♀ 3.5 mm.

Immature male: Pseudorostrum short. First peraeopod much longer than the others. Exopod and endopod of uropod more than half of the peduncle; first joint of endopod more than twice as long as second, spines are not fully developed, the second joint with two unequal terminal spines. Exopod with four or five plumose setae on the inner margin and two unequal terminal spines. Female almost similar to that of male.

Distribution: British Isles, France, Norway, Mediterranean.

***Bodotria pulex* (Zimmer)**

Cuma pulex Zimmer, 1903. *Zool. Jb. (Syst.)*, 18, p. 166, ff. A-C.

Bodotria pulex Stebbing, 1913. *Das Tierreich*, 39, pp. 26-27. Harada, 1967. *Jap. J. Zool.*, 15(3) pp. 224-226.

Locality: Lat. 26°00' S, Long. 33°05' E, 135 m, Rock dredge, 22.8.64, 1 ♀ 5.5 mm.

Female: Pseudorostrum very short, carapace blunt with distinct dorso-median carina. Lateral carinae developed on the free pedigerous segments. Third maxilliped with basis twice

as long as the other segments combined together, fourth and fifth segments very broad with short plumose setae on the inner margin. Peduncle without spines or setae. Exopod and endopod of uropod sub-equal; endopod with six spines on the inner margin interspaced by small serrations. Exopod with six plumose setae.

Distribution: Enosima, Shimoda (Japan).

***Cyclaspis varians* Calman**

Cyclaspis varians Calman, 1912. *Proc. U. S. Nat. Mus.* 41, p. 610, figs. 1-5. Stebbing, 1913. *Das Tierreich* 39, p. 33.

Locality: Lat. 22°43' N. Long. 68°22' E, 28 m, shrimp trawl, 18.11.63, 1 ♀ 1.8 mm (immature).

Immature female: Body granular, pseudorostrum short, the dorsal edge is distinctly keeled and the anterior part is provided with short fine teeth. Peduncle of uropod longer than telsonic somite, but slightly shorter than exopod and endopod, endopod broader than exopod, with four spines on the inner serrated margin; exopod little longer than endopod, with two setae on the inner margin and two unequal terminal spines.

Distribution: USA, Vineyard sound, Woods Hole.

Genus *Iphinoe* Bate

***Iphinoe fagei* Jones**

Iphinoe fagei Jones, 1955. *Discovery Rep.* 54, Paris, pp. 285-287, figs. 3, 4; 1956. 'Atlantide' Report. Copenhagen, 4, p. 199.

Locality: Durban Bay, Dredge seived as they floated off barrel of mud, 1 immature ♂ 3 mm.

Immature male: Basis of third maxilliped only one and a half times as long as other

segments combined together, basis of first peraeopod with two or three plumose setae at its distal end. Peduncle of uropod with nine spines; the proximal joint of endopod with three short and one long stout spine and distal joint with ten spines on the inner margin. Exopod with five long plumose setae and three long terminal setae.

Distribution: South West Africa.

Genus *Leucon* Kroyer

Leucon longirostris Sars

Leucon longirostris Sars, 1871, *Ofv. Ak. Forh.*, 28, Stockholm, p. 78. Stebbing 1913, *Das Tierreich*, 39, p. 70.

Locality: Durban Bay, Ken Boss, 1 immature ♂ 2.8 mm.

Immature male: Pseudorostrum horizontal, carapace one-fourth the total length; median carina with seven teeth. Peduncle of uropod shorter than the first joint of endopod, with five slender spines. First joint of endopod three times as long as second, with seven spines; second joint with three spines. Exopod broken.

Distribution: N. Atlantic, mediterranean.

Leucon acutirostris Sars

Leucon acutirostris Sars, 1900, *Crust. Norway*, 3, p. 34, fig. 26. Stebbing 1913, *Das Tierreich*, 39, p. 73.

Locality: Durban Bay, Benthos, 1 ♀ 4 mm.

Female: Closely agrees with the previous records. Median carina on the anterior half of the carapace denticulate. Peduncle of uropod equal in length to endopod, with four strong spines on the inner margin, first joint long, with seven spines, second with four on the inner margin, exopod longer than endopod, with five setae on the inner margin and four on the terminal part.

Distribution: Coast of Norway.

Leucon sp.

Locality: Durban Bay, Ken Boss, 1 damaged ♀ 2.2 mm.

Female: Pseudorostrum turned upwards and more than half the length of the rest of the carapace. On the lower lateral margin of the pseudorostrum there are four teeth. Carapace less than one-fourth the total length; antero-lateral margin serrated. Basis of first peraeopod shorter than the remaining segments combined together; carpus more than twice as long as merus; propodus three-fourth the carpus. Pleon long, fifth pleon somite about twice as long as telsonic somite which is produced in between uropods. Peduncle of uropod longer than telsonic somite; exopod and endopod broken.

Genus *Hemileucon* Calman

Hemileucon levis Hale

Hemileucon levis Hale, 1945, *Trans. Roy. Soc. S. Austral.* 69, pp. 89-92, figs. 3, 4.

Locality: Durban Bay, Ken Bss, 1 ♂ 3 mm.

Male: Pseudorostrum well produced and horizontal, median carina of carapace bears anteriorly three teeth separated from another three behind. Antennal notch not clearly visible; antero-lateral margin of carapace provided with short teeth. Third maxilliped with broad basis and terminal portion expanded with three long plumose setae. Carpus of second peraeopod thrice the propodus; dactylus twice as long as propodus. Telsonic somite short and produced in between the uropods. Peduncle of uropod longer than telsonic somite, but shorter than exopod and endopod; endopod with seven stout spines on the inner margin.

Distribution: New South Wales.

Genus *Schizotrema* Calman*Schizotrema sordidum* Calman

Schizotrema sordidum Calman, 1911, *Trans. Zool. Soc. London*, 18, 4, pp. 341, 363, figs. 22-24. Stebbing, 1913, *Das Tierreich*, 39, p. 167.

Locality: Lat. 13°24' S, Long. 48°21' E, 1 ♀ 1.4 mm, Lat. 13°26' S, Long. 48°21' E, 1 ovi. ♀.

Female: Pseudorostral lobes short and upturned, carapace with three convexities, serrated with spines. First and second pedigerous segments with expanded lateral plates. Carpus of third, fourth and fifth peraeopods long; almost equal to basis. Peduncle of uropod very short; broad and more than twice as long as peduncle; with short spines on the inner margin. Exopod very short and terminal spine reaches up to the tip of endopod.

Distribution: Gulf of Siam.

Schizotrema aculeata Hale

Schizotrema aculeata Hale, 1945. *Rec. S. Austral. Mus.*, 8, 2, pp. 168-170, fig. 16.

Locality: Lat. 27°16'25" N, Long. 33°47' 00" E, sandy bottom, Ca 2', 5.1.65, 2 ♂♂ 1.3 mm 2 ♀♀ 1.1mm.

Male: Pseudorostral lobes little upturned, whole carapace covered with numerous short spines and stout paired spinules on the pleon segments. Endopod of uropod nearly twice as long as exopod and inner margin highly serrated, a long terminal spine and a short stout sub-terminal spine also present. Exopod with very long terminal spine.

Female specimen resembles male, but uropod relatively shorter.

Distribution: South and West Australia, Queensland.

Schizotrema sp.

Locality: Lat. 07°34' N, Long. 98°00' E 1 ♀ 1.4 mm.

Female: Antero-lateral angle of carapace provided with a strong curved tooth. Carapace with a median and two lateral convexities, with minute hairs on the surface. Pleon short, first five pleon somites provided with paired lateral spines. Peduncle as long as the telsonic somite; endopod more than twice as long as the peduncle, with inner margin finely serrated; exopod slender and less than half of the endopod, with a long terminal spine which reaches upto the extremity of endopod without spine.

Genus *Nannastacus* Bate*Nannastacus gibbosus* Calman

Nannastacus gibbosus Calman, 1911. *Trans. Zool. Soc. London*, 18, 4, pp. 356, figs. 16-21. Kurian, 1954. *Rec. Indian Mus.*, 52, Parts 2-4, p. 310. Gamo, 1963. *Sci. Rep. Yokohama Nat. Univ. Sec. 2*, pp. 45-48, figs. 11, 12.

Locality: Lat. 01°10' N, Long. 103°45' E, 0-1 m, 33 ♀♀ 1.7-2 mm; Lat. 01°16' N, Long. 103°48' E, 1 ♀ 1.5 mm; Lat. 06°12' S, Long. 105°37' E, 4 ♀♀ (ovigerous) 1.6-2 mm, 1 ♂ 1.6 mm; Lat. 13°24' S, Long. 48°17' E, 3 ♀♀ (2 ovigerous) 1.5-1.7 mm.

Female: Specimens closely agree with the description of Calman. Pseudorostrum short, antero-lateral margin of carapace deeply concave and provided with spines. Scattered hairs on the surface of body lesser in number compared to previous records. Peduncle of uropod short; endopod more than twice as long as peduncle with four or five inner marginal spines and a long terminal spine; in between the spines the endopod is highly serrated. Exopod only one-seventh of endopod with its terminal spine reaching upto three-fourth of endopod without terminal spine.

Male: Body longer than in female and covered with lesser number of hairs.

Distribution: Gulf of Siam, Japan, Andamans.

***Nannastacus reptans* Calman**

Nannastacus reptans Calman, 1911. *Trans. Zool. Soc. London*, 18 (4) pp. 356-357, figs. 22-28.

Locality: Lat. 06°12' S, Long. 105°37' E, 10.9.63, 1 ♀ 1.2 mm; Lat. 13°26' S, Long. 48°22' E, 1.0 m, and intertidal, 15.1.64, 1 ♀ (ovigerous) 2.5 mm, Mombasa, 1 ovigerous ♀.

Female: Seta on the branchial region or tooth on the thoracic or abdominal somite absent. Basis of second leg inflated and broad. Telsonic somite half the length of peduncle of uropod. Peduncle with two spines on the inner margin; endopod more than twice as long as peduncle with four inner marginal spines; exopod only one-eighth of endopod and its terminal spine reaches half the length of endopod without spines.

Distribution: Gulf of Siam.

***Nannastacus minor* Calman**

Nannastacus minor Calman, 1911. *Trans. Zool. Soc. London*, 18 (4) pp. 341, 351, figs. 1-3. Stebbing 1913. *Das Tierreich* 39, p. 171.

Locality: Lat. 06°12' S, Long. 105°37' E, 10.9.63, 1 ♀ 1 mm.

Female: Closely agrees with the description of Calman. First and second peraeopod with exopod not well developed. Peduncle of uropod short; endopod twice as long as peduncle; with three inner marginal spines; exopod one-third of endopod and terminal spine reaches beyond endopod without spine.

Distribution: Gulf of Siam.

***Nannastacus lepturus* Calman**

Nannastacus Lepturus Calman 1911. *Trans. Zool. Soc. London* 18, 4, pp. 341, 352, figs. 1-3. Stebbing, 1913. *Das Tierreich*, 39, p. 171.

Locality: Lat. 01°10' N, Long. 103°45' E, 0-1 m, 1 ♂ 1.7 mm.

Male: Specimen closely agrees with type description. Peduncle of uropod more than twice as long as telsonic somite, with five marginal spines; endopod with seven inner marginal spines; exopod about four-fifth of endopod, with a terminal spine of its own length.

Distribution: Suez Canal.

***Nannastacus longirostris* Sars**

Nannastacus longirostris Sars 1879. *Arch. Math. Naturvid. Kristiania*, 1878 p. 119, figs. 59-59. Stebbing, 1913. *Das Tierreich* 39, pp. 171-172, fig. 116.

Locality: Lat. 06°12' S, Long. 105°37' E, 10.9.63, 1 ♀ 1.1 mm; Lat. 13°24', Long. 48°17' E, 2 ovigerous ♀♀ 1.5-1.8 mm; Lat. 13°24' S, Long. 48°18' E, 0.3 m, 4 ♀♀ 1.3-1.5 mm; Lat. 13°26' S, Long. 48°22', E, 0-0.4 m, 1 ♂ 1.5 mm; Lat. 27°16'25" N, Long. 33°47'00" E, Sandy bottom 0-6 m, 5.1.65, 16 ♀♀ 1.6-2 mm, Nosse-Be Madagascar, 20 ♀♀ 1.5-1.7 mm, 8 ♂♂ 1.4 mm.

Male: Resembles type description, body hairy, pseudorostrum long and horizontal. Basis of first peraeopod with three spines on the inner margin; propodus longer than carpus or dactylus. Pleon shorter than cephalothorax; fifth pleon somite twice as long as telsonic somite. Endopod of uropod with four inner marginal spines and a terminal spine.

Female: Body more hairy than in male; peduncle of uropod with four thin spines on the inner margin; endopod with three. The ovigerous females examined shows 8-18 eggs in the brood pouch.

Distribution: Mediterranean.

Nannastacus sheardi Hale

Nannastacus sheardi Hale, 1945. *Rec. S. Austral. Mus.*, 8 (2) pp. 156-159, figs. 8, 9.

Locality: Lat. 06°12' S, Long. 105°37' E, 10.9.63, 1 immature ♂ 1 mm; Lat. 13°24' S, Long. 48°17' E, 1 ♂ 1.5 mm.

Male: Carapace more than one-third of total length. Peraeopods 1-4 with broad bases, fifth peraeopod short, merus and carpus subequal (carpus nearly twice as long as merus-Hale). Peduncle of uropod more than one-third as long as telsonic somite; exopod three-fourth as long as endopod without distal spine; endopod with four spines on the inner margin and two unequal terminal spines; terminal spine of exopod longer than its own length.

Distribution: S. Australia.

Nannastacus inflatus Hale

Nannastacus inflatus Hale, 1945. *Rec. S. Austral. Mus.* 8(2) pp. 159-162, figs. 10, 11. Kurian 1954, *Rec. Indian Mus.*, 52, parts 2-4, p. 310.

Locality: Lat. 01°19' N, Long. 103°45' E, 0-1 m, 1 ♂ 2.4 mm; Lat. 06°12' S, Long. 105°37' E, 1 ♀ 2 mm; Grand Comoro Island, 4 ♀♀ 1.2 mm, Andromanche Reef, 1 ovigerous ♀ 2.1 mm, Lat. 27°16'25" N, Long. 33°47'00" E, Sandy bottom, 5.1.65, 5 ♀♀ and 1 ♂.

Male: Closely resembles Hale's description, carapace highly granular; pseudorostral lobes project upwards. Endopod of uropod more than twice as long as peduncle with eight marginal spines and the space in between the spines highly serrated; exopod very short; terminal spine reaches beyond half the length of endopod without spine.

Female: Uropod shorter than that of male; endopod with three spines; terminal spine of

exopod reaches to half of the endopod. Ovigerous female bears 18 eggs in its brood pouch.

Distribution: S. Australia Kilakkari (S. India).

Nannastacus subinflatus Hale

Nannastacus subinflatus Hale, 1945. *Rec. S. Austral. Mus.*, 8 (2), pp. 162-165, figs. 12, 13.

Locality: Lat. 02°24' N, Long. 101°51' E, 0-1 m, 1 ♀ 1.1 mm.

Immature female: Closely resembles the type description. All the peraeopods end in a claw like spine; exopod not well developed. Exopod of uropod very short, terminal spine reaches as long as the endopod without spine (only half in the description of Hale).

Distribution: S. & W. Australia.

Nannastacus johnstoni Hale

Nannastacus johnstoni Hale, 1945. *Rec. S. Austral. Mus.* 8(2), pp. 165-168, figs. 14, 15. Kurian, 1954. *Rec. Indian Mus.*, 52, Parts 2-4, p. 310.

Locality: Lat. 13°26' S, Long. 48°21' E, 1.0 m, 1 ovigerous ♀ 2.2 mm; Lat. 13°23' S, Long. 48°13' E, 1.5 m, 11.1.64, 4 ♀♀ 1.2-2.3 mm; Lat. 11°42' S, Long. 167°51' E, 1 ovigerous ♀ 1.4 mm.

Female: Closely resembles the type description, body transparent; eyes wide apart; antero-lateral margin of carapace highly concave. Uropod with endopod more than twice as long as peduncle, with three inner marginal spines arranged with definite gaps; the space in between highly serrated. Exopod one-eighth of endopod; terminal spine reaches more than half of the length of endopod without spine.

Distribution: New South Wales, Sydney, Queensland, Andaman Islands.

Genus *Cumella* Sars*Cumella hispida* Calman

Cumella hispida Calman, 1911. *Trans. Zool. Soc. London*, 18(4), pp. 341, 347, figs. 15-18. Stebbing, 1913. *Das Tierreich*, 39, pp. 181-182. Hale, 1945. *Rec. S. Austral. Mus.* 8(3), p. 176, fig. 21.

Locality: Lat. 13°05' N, Long. 125°39' E, 1 ♀ 1.9 mm; Lat. 06°12' S, Long. 105°37' E, 0-0.2 m, 1 ♀ 2.6 mm.

Female: Carapace not hairy as in the type description, the mid-dorsal spine on the carapace absent. Peduncle of uropod little shorter or as long as the telsonic somite, with four marginal spines (two in type description); endopod with two; exopod three-fourth the endopod with a long terminal spine.

Distribution: Gulf of Siam, S. Australia.

Cumella limicola Sars

Cumella limicola Sars, 1879. *Arch. Math. Naturvid. Kristiania*, 4, p. 103, figs. 53, 54. Stebbing, 1913. *Das Tierreich*, 39, p. 183. Bacescu, 1951. *Fauna R.P.R.* 4, pp. 82-84, fig. 177.

Locality: Lat. 06°12' S, Long. 105°37' E, 10.9.63, 1 immature ♀, 1.8 mm; Lat. 13°23' S, Long. 48°13' E, 1.5 m, 11.6.64, 3 immature ♂♂, 1.7-2.2 mm; Lat. 13°21' S, Long. 48°11' E, 0.3 m, 13.1.64, 2 ♀♀ (1 ovigerous) 1.8-2.0 mm; Lat. 13°23' S, Long. 48°18' E, 2.3 m, 20.1.64, 1 ovigerous ♀ 2 mm; Lat. 13°24' S, Long. 48°22' E, 0.4 m, 1 ovigerous ♀ 2.4 mm; Lat. 13°26' S, Long. 48°22' E, 1.0 m, 15.1.64, 4 ♀♀ (2 ovigerous) 2.5 mm; Lat. 13°31' S, Long. 48°32' E, 0.2 m, 6 (♂♂, ♀♀) Mombassa, 2 ♀♀ (1 ovi.).

Ovigerous female: Carapace highly granular and hairy, thornlike hairs through out the surface of the body which clump together around the branchial region. Eye very distinct; anterior half of the carapace with three or

four teeth on the mid-dorsal region. Pleon slightly shorter than cephalothorax; telsonic somite longer than peduncle of uropod. Four marginal spines on the peduncle; endopod as long as peduncle, with two marginal spines; exopod short with its terminal spine reaching more than three-fourths the endopod without spine.

Immature male: Anterior half of carapace with two teeth projecting forward on the mid-dorsal region which are absent in the type description. Male less hairy than in female. Peduncle of uropod not longer than telsonic somite as in the type description; uropod similar to that of female.

Distribution: Mediterranean, Morocco.

Cumella turgidula Hale

Cumella turgidula Hale, 1945. *Rec. S. Austral. Mus.*, 8 (2), pp. 174-175, figs. 19, 20.

Locality: Lat. 13° 33' S, Long. 48° 20' E, 1.5-8.0 m, 1 ♂ 2.3 mm.

Male: Integument highly granular, no hairs on the carapace, eye with seven corneal lenses. Pleon shorter than cephalothorax. Telsonic somite as long as pleon somite and projected in between the uropods. Peduncle little longer than telsonic somite, with seven inner marginal spines; endopod with five spines.

Distribution: S. Australia.

Genus *Campylaspis* Sars*Campylaspis orientalis* Calman

Campylaspis orientalis Calman, 1911. *Trans. Zool. Soc. London*, 18 (4) pp. 341, 365, figs. 1-5. Stebbing, 1913. *Das Tierreich*, 39, p. 190.

Locality: Lat. 18° 24' S, Long. 42° 11' E, 2125 m, 13.10.64, 1 ♂ 6.5 mm.

Male: Almost agrees with type description. Pseudorostral lobes short; carapace covered

with slender hairs. Third maxilliped and peraeopods closely agree with the type; but uropod shows slight difference. Peduncle of uropod twice as long as endopod and serrated on its inner margin (not serrate — Calman) endopod slightly longer than exopod, with four inner marginal spines (with numerous spines — Calman).

Distribution: Korea.

Campylaspis rubicunda (Lilljeborg)

Cuma rubicunda Lilljeborg, 1855. *Orv. Ak. Forh.*, 12, p. 121.

Campylaspis rubicunda Stebbing, 1913. *Das Tierreich*, 39, pp. 190, 191. Jones, 1974. *Bull. Br. Mus. nat. Hist. (Zool.)*, 27(6), pp. 259-260.

Locality: Lat. 18°24' S, Long. 42°11' E, 2125 m, 13.10.64, 1 ♀ 4 mm, Durban Bay, Benthos, 1 ♀ 4 mm.

Female: Carapace granular, eye obsolete, basis of first peraeopod more than three-fourth the length of the remaining segments combined together; dactylus of second peraeopod long. Peduncle of uropod four times as long as telsonic somite, with six inner marginal spines; endopod little longer than exopod, but only half as long as the peduncle; inner margin serrated, with a long and two small terminal spines.

Distribution: Greenland, Norway, Atlantic Coast of N. America and Deep Atlantic.

Campylaspis glabra Sars

Campylaspis glabra Sars, 1879. *Arch. Math. Naturvid. Kristinia*, 4, p. 77, figs. 44-47. Stebbing, 1913. *Das Tierreich*, 39, pp. 191-192, fig. 128, Jones, 1974. *Bull. Br. Mus. nat. Hist. (Zool.)*, 27(6), pp. 252, 261.

Locality: Lat. 24°49' S, Long. 35°13' E, 73 m, Gear-Rock Dredge, 18.8.64, 1 ♂ 2 mm (immature).

Immature male: Body transparent, peduncle of uropod thrice as long as the telsonic somite, with ten short plumose setae; endopod three-fourths the peduncle; with seven inner marginal spines and three unequal terminal spines.

Distribution: Mediterranean, N. of England, Norway, W. Africa, Deep Atlantic.

Campylaspis maculata Zimmer

Campylaspis maculata Zimmer, 1907. *Zool. Anz.*, 31(2), p. 371. Stebbing, 1913. *Das Tierreich*, 39, p. 197. Kurian, 1954. *Rec. Indian Mus.*, 52, parts 2-4, p. 311. Jones, 1974. *Bull. Br. Mus. nat. Hist. (Zool.)*, 27(6) p. 255.

Locality: Durban Bay, Benthos, 1 ♂ 5 mm.

Male: Closely agrees with the type description. Carapace beset with numerous tubercles combined chain-wise in three lateral lines. Peduncle of uropod, twice as long as the subequal exopod and endopod, with fine serrations on both the margins, endopod with four spaced strong spines on the serrated inner margin and two unequal terminal spines.

Distribution: South Georgia, Andaman Islands.

Campylaspis thompsoni Hale

Campylaspis thompsoni, Hale, 1945. *Rec. S. Austral. Mus.*, 8 (2) pp. 183-186, figs. 24, 25.

Locality: Lat. 25°49' S, Long. 35°13', 73 m, Gear-Rock Dredge, 18.8.64, 1 ♂ 2.8 mm, 1 ♀ 3.1 mm.

Male: Resembles the type description, carapace transparent without granules, but with short hairs, dactylus of second peraeopod as long as the carpus and propodus combined together. Peduncle of uropod long with plumose setae arranged in two rows; endopod slightly shorter than exopod, which reaches three-fourths the peduncle; endopod with six

spines on the inner margin; the spaces in between the spines serrated.

Female: Inner edge of peduncle serrate; endopod slightly longer than exopod, with three strong spines on the inner margin and two unequal terminal spines.

Distribution: Tasmania.

Genus *Hemilamprops* Sars

Hemilamprops pellucida Zimmer

Hemilamprops pellucida Zimmer, 1908. *Wiss. Erg. deutschen Tiefsee-Exp.* 8, pp. 171, 172, pl. 39, figs. 53, 54, pl. 40, figs. 55-59. Stebbing, 1913. *Das Tierreich*, 39, p. 57, fig. 27. Jones, 1963. *N. Z. qpt. Sci. Industr. Res. Bull.*, 152, pp. 52-53, fig. 192.

Locality: Indian Ocean, Durban Bay, Ken Boss, 2 ovigerous ♀♀, 6-11 mm.

Female: Closely resembles *H. pellucida* from New Zealand (Jones, 1963). Integument pellucid, pseudorostrum short and blunt. Carapace with five teeth on its mid-dorsal line projecting forward followed by a row of denticles reaching backwards to about the middle of the carapace, antero-lateral border of the carapace serrated. Basis of first peraeopod with twelve-fourteen spines on its anterior convex side; peraeopods 3 and 4 with two segmented rudimentary exopods. Telsonic somite less than half the fifth pleon somite.

Distribution: Antarctic, S. Africa, New Zealand.

Hemilamprops diversa Hale

Hemilamprops diversa Hale, 1946. *Trans. Roy. S. Austral.*, 70 (1) pp. 183-188, figs. 3, 4.

Locality: Durban Bay, Ken Boss, 4 ♀♀ 3.6-5.5 mm, 1 immature ♂ 6 mm.

Female: Carapace less than one-fourth the total length of the animal with reticulate pattern. The median carina runs from the

ocular lobe to about three-fourths the length of carapace. Pleon longer than cephalothorax. Telson considerably longer than the peduncle of uropod. Peduncle with five slender spines on the distal half of the inner margin. Telson with five terminal spines and three pairs of slender lateral spines.

The immature male specimen closely resembles the type description.

Distribution: New South Wales, Tasmania.

Hemilamprops sp.

Locality: Durban Bay, Benthos, 15 damaged specimens (14 ♀♀ and 1 ♂) 3.5-7.0 mm.

Since carapace and uropods are completely damaged, identification upto species is not possible.

First and second peraeopod with well developed exopod and endopod, third and fourth with rudimentary exopods. First and second peraeopods broken. Bases of third and fourth peraeopods much longer than the other segments combined together. Telson longer than peduncle, with six pairs of lateral spines, five apical spines and a pair of long and stout subterminal spines. Peduncle of uropod with eight spines on the margin. Exopod and endopod broken.

Genus *Diastyllis* Say

Diastyllis planifrons Calman

Diastyllis planifrons Calman, 1912. *Proc. U. S. Nat. Mus.*, 41, pp. 605, 643, figs. 58-61. Stebbing, 1913. *Das Tierreich*, 39, pp. 91-92.

Locality: Durban Bay, 1 immature ♀ 3.2 mm.

Female: Carapace inflated, antero-lateral angle slightly indicated. Basis of third maxilliped distally expanded, propodus and dactylus sub-equal. First and second peraeopods with

well developed exopods and third and fourth with rudimentary exopods. Carpus of second peraeopod long, one and a half times longer than uropodus and dactylus combined together (twice in Calman's description), posterior part of telson long, with five pairs of rather slender lateral spines and two terminal spines.

Distribution: S. America, Straits of Magellan.

expanded; basis of first peraeopod longer than the combined length of the other segments; merus and carpus sub-equal. Basis of second peraeopod slightly shorter than the other segments joined together; carpus very long, four times longer than merus and longer than propodus and dactylus combined; carpus with eleven strong spines on the outer margin; dactylus very slender and $3\frac{1}{2}$ times longer than propodus. Third and fourth peraeopods similar and fifth little shorter.

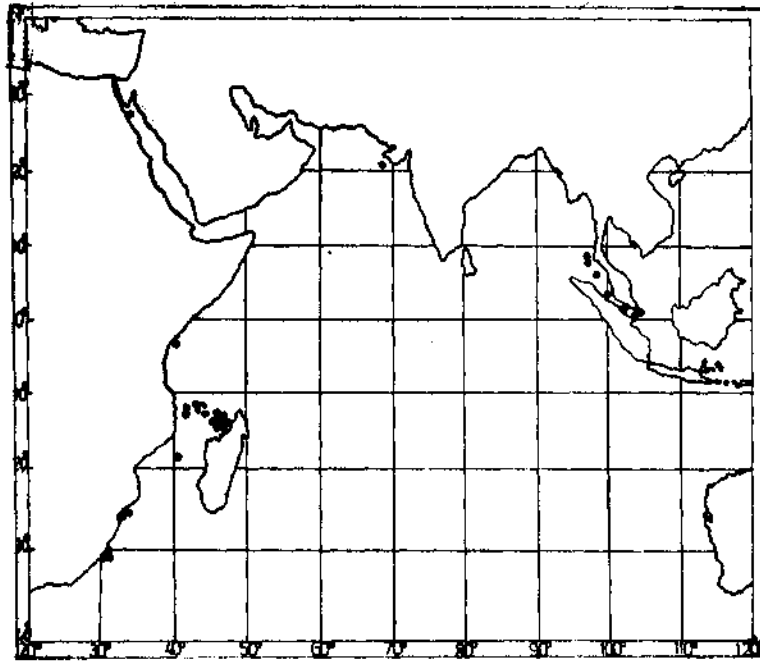


FIG. 1. Map showing the IOOE stations in the Indian Ocean from where Cumacea have been collected (● = Stations).

Diastylis sp.

Locality: Durban Bay, Benthos, 1 immature ♂ 7.5 mm.

Immature male: Eye indistinct. Third maxilliped slender; basis shorter than the other segments combined together; carpus longer than propodus and dactylus joined together. Basis of peraeopods 1-4 not greatly

Three pairs of pleopods, not fully developed, pre-anal part of the telson only one-third of the post-anal part which has a pair of terminal spines and a single pair of short lateral spines close to the terminal spines. Peduncle long, $2\frac{1}{2}$ times longer than the telson, with six spines on the inner margin. Endopod longer than exopod and less than half of the peduncle; first joint the longest with four spines, second

with three and third without spines; exopod with two un-equal terminal spines, without setae or spines.

Diastylis sp.

Locality: Durban Bay, Benthos, 1 damaged ♀ 9.3 mm.

Damaged female: Carapace granular, third maxilliped with basis longer than the other segments combined together, with plumose setae on the inner margins of all the segments. First peraeopod broken. Basis of second peraeopod expanded, shorter than the other segments combined together carpus very long, thrice as long as merus or propodus and longer than propodus and dactylus combined together. Third and fourth peraeopods similar, third longer than fourth.

Telson little more than half of the peduncle; post-anal part shorter than pre-anal part with five pairs of lateral spines and a pair of long and stout terminal spines and a pair of short sub-terminal spine. Peduncle very long, with thirteen inner marginal spines, endopod and exopod long and slender; first joint of endopod with four spines, second with two and third without spines, exopod without spines

on the margin and terminal ends of both exopod and endopod cut off.

Genus *Makrokyllindrus* Stebbing

Makrokyllindrus sp.

Locality: Durban Bay, Ken Boss, 1 damaged ♀.

Female: The whole body is covered with numerous tubercles and spines. Pseudostrostrum short, with two or three long spines and numerous short spines on its border. The lateral sides of carapace are also provided with numerous spines. All the five pedigerous segments free; third, fourth and fifth with paired mid-dorsal blunt spines.

Peraeopods slender, basis of first peraeopod shorter than combined length of others, with numerous spines on its convex margin and plumose setae on either side; carpus, propodus and dactylus sub-equal. Bases of peraeopods 3-4 with spines on outer margin and plumose setae on the inner margin, bases of fifth peraeopod devoid of spines and plumose setae. The first five pleon somite with paired mid-dorsal blunt spines as in pedigerous segments. Uropods broken.

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