

**OCCASIONAL PAPER NO. 155**

# **Records of the Zoological Survey of India**

**Littoral Meiofauna of Little Andaman**

**G. CHANDRASEKHARA RAO**

**Zoological Survey of India**

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**Littoral Meiofauna of Little Andaman**

**by**

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## INTRODUCTION

The meiofauna of Little Andaman is quite rich and varied with a large number of species of diverse invertebrate groups of animals inhabiting the algae, sand and mud sediments in the littoral region. Our present knowledge on the taxonomy, ecology and distribution of the meiofauna of these habitats on the island is limited to the few works of Rao (1970, 1972, 1975, 1980, 1989) and Salvini-Plawen and Rao (1973). Hence, a detailed investigation of the meiofauna of Little Andaman was considered necessary to have a comprehensive idea of the nature of the faunal element of the island. Keeping this in view, under the Annual Plan of work of Zoological Survey of India for the years 1989-91, a faunistic survey of the island was undertaken, diverse groups of the meiofauna collected and the material studied. Based on the results of the investigation, the present paper gives a systematic account of 120 species of the different groups, of which 8 species are described here as new to science. Part of the material of the different groups still remains to be studied in detail, identified and reported.

## AREA INVESTIGATED

The Little Andaman forms the southernmost of the Andaman group of islands in the Bay of Bengal, lying between latitudes  $10^{\circ} 30'$  and  $10^{\circ} 55'$  N and longitudes  $92^{\circ} 22'$  and  $92^{\circ} 37'$  E (Fig. 1). The island occupies a land area of 731.6 sq km, with a coastline of about 110 km. The island is mostly flat and about 80% of the land area is covered by tropical evergreen and deciduous rain forests. There are no major perennial rivers on the island. The rain fed brooks open into the serpentine creeks, which penetrate far inside the land. The climate

is typically tropical, with hot and humid conditions all through the year. The temperature ranges from 20°C to 35°C, with a daily variation of 5°C to 10°C between the maximum and the minimum. Relative humidity in the ambient atmosphere reaches about 80%. The heavy rainfall averages to about 3100 mm per annum spread from May to December. Rich mangroves occur on the island in several sheltered areas as bays, lagoons and creeks.

In the marine environment, the temperature of surface waters varies between 26°C and 32°C, while the salinity ranges from 22 to 35 ppt at different areas and months of the year. The coastline is largely fringed with rocky, sandy and muddy beaches, with extensive coral reefs at several places in the littoral region. The sandy beaches are quite extensive, with several sheltered and exposed situations. The sands are mostly silicious in composition and fine to coarse in texture. These sediments are sufficiently rich in organic detritus. Fine muddy beaches are more prominent near sheltered mangroves and creek areas. Algal weeds largely occurred on intertidal rocky beaches and in tide-pools.

#### MATERIAL AND METHODS

Collections of the meiofauna were made from sand, mud and algae in exposed littoral regions at eight stations around the island (Fig. 1). They are : (1) Bomila Creek, (2) Dugong Creek, (3) East Bay, (4) Butler Bay, (5) Hut Bay, (6) Harmindar Bay, (7) South Bay and (8) West Bay. Diverse groups of the meiofauna from sand and mud were collected following the standard methods of sieving and decantation recommended for the study (Hulings and Gray, 1971), while the algal fauna was separated by washing the weeds with 2% sea water formalin. The meiofaunal groups were identified and sorted out under a binocular microscope. The soft fauna was examined in fresh condition under a compound microscope, while the hard fauna was preserved in 5% neutral formalin containing 2% glycerine for subsequent study and identification. Measurements of the minute morphological parts are given in micrometres. Whole mounts of the

specimens were made in Canada Balsam or in glycerine jelly and ringed with nail polish. Type specimens of the new taxa described in the paper are deposited in the National Zoological Collections of the Zoological Survey of India at Calcutta.

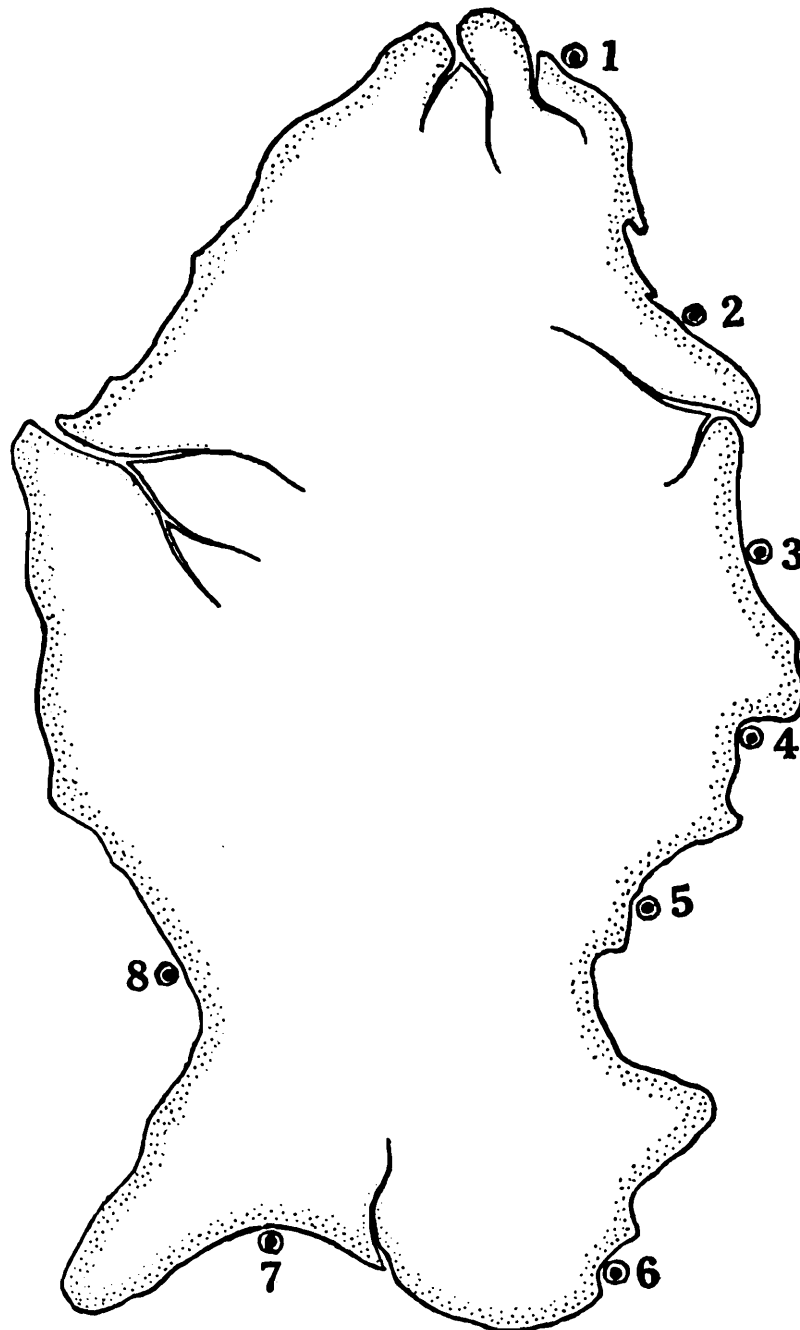


Fig. 1 : Map of Little Andaman, showing collection localities. 1. Bomila Creek, 2. Dugong Creek, 3. East Bay, 4. Butler Bay, 5. Hut Bay, 6. Harmindar Bay, 7. South Bay, 8. West Bay.

## SYSTEMATIC ACCOUNT

Phylum CNIDARIA

Class HYDROZOA

Order ACTINULIDA

Family HALAMMOHYDRIDAE

Genus *Halammohydra* Remane, 19271. *Halammohydra andamanensis* Rao1978. *Halammohydra andamanensis* Rao, *Bull. Zool. Surv. India*, 1 (2) : 147.

*Material examined* : 1 ex., Butler Bay, 21.3.90 ; 2 ex., Harmindar Bay, 25.3.90.

*Diagnostic features* : Aberrant cnidarians with elongated and sparsely ciliated body. Gastrovascular tube cylindrical. Aboral cone strikingly conical in shape, with little developed adhesive organ occupying about 1/3 of the cone. Two distinct whorls of aboral tentacles 3+5 in number alternate with a whorl of 5 statocysts of the lithostyle type. One of the posterior tentacles is always longer than the others. Cnidome consists of spherical stenoteles of two size categories and oval atrichous isorhizas. Sexes are separate with one gonad.

*Measurements* : Length 0.54—0.56 mm and maximum body diameter 0.06 mm.

*Remarks* : The specimens examined agreed fairly well with the original description of the species made from Rangat Bay, Middle Andaman, except for the slight variation in colour.

*Habitat* : Coarse sand mixed with fine shell gravel and little detritus 5—10 cm below surface between low and half-tide levels, intertidal zone.

*Distribution* : Andaman Islands in the Bay of Bengal.



2. *Halammohydra intermedium* n. sp.

(Fig. 2)

*Material examined* : 3 ex., Harmindar Bay, 25.3.90 ; 2 ex., South Bay 26.3.90 ; 1 ex., West Bay 28.3.90.

*Description* : All the six specimens examined morphologically belonged to the same population and attained a total length of 450 to 480  $\mu\text{m}$ . Body elongated, elliptical, tapers considerably towards aboral end, opapue and sparsely ciliated. Gastric tube is about 400  $\mu\text{m}$  long and 140  $\mu\text{m}$  in maximum diameter. The neck is short and thick, about 20  $\mu\text{m}$  long and 30  $\mu\text{m}$  wide. Aboral cone is pear-shaped, 50  $\times$  40  $\mu\text{m}$  in size, with well developed adhesive organ occupying about half of the upper part of cone. Adhesive organ cup-shaped and attains about 20  $\times$  20  $\mu\text{m}$  in size.

Two distinct whorls of long tentacles arise from the aboral cone, numbering 3+6. The first whorl of tentacles nearly is of the same size and about 280  $\mu\text{m}$  long, while the second whorl of tentacles is longer and considerably vary in length from 400—650  $\mu\text{m}$ . One of the posterior tentacles is always longer than the others. All the tentacles are uniformly thick all along their length. During locomotion the anterior tentacles are extended and directed forwards, while the posterior ones trail behind. Annulation of the tentacles is indistinct. Alternating with the posterior tentacles occur 3 statocysts of the lithostyle type, measuring about 5  $\mu\text{m}$  in diameter.

The cnidome consists of two types of nematocysts, *viz.*, stenoteles and euryteles. The stenoteles are of a single size category, oval and attain a size about 5.6—6.2  $\times$  4.8—5.2  $\mu\text{m}$ . The euryteles are also of one size category, oblong and reach 4.8—5.2  $\times$  3.2—3.6  $\mu\text{m}$ . In discharged condition, both the nematocysts with capsule and shaft together attain greater length, depending on the state of extension. The shaft bears stylets and apical spines.

The sexes are separate as in other species of the genus. Both the males and the females bear one gonad only extending between the epidermis and the gastrodermis of the gastric tube,

*Remarks:* Since the discovery of the curious hydrozoan *HalammoHYdra* Remane at Kiel Bay in 1924, 11 species of the genus were

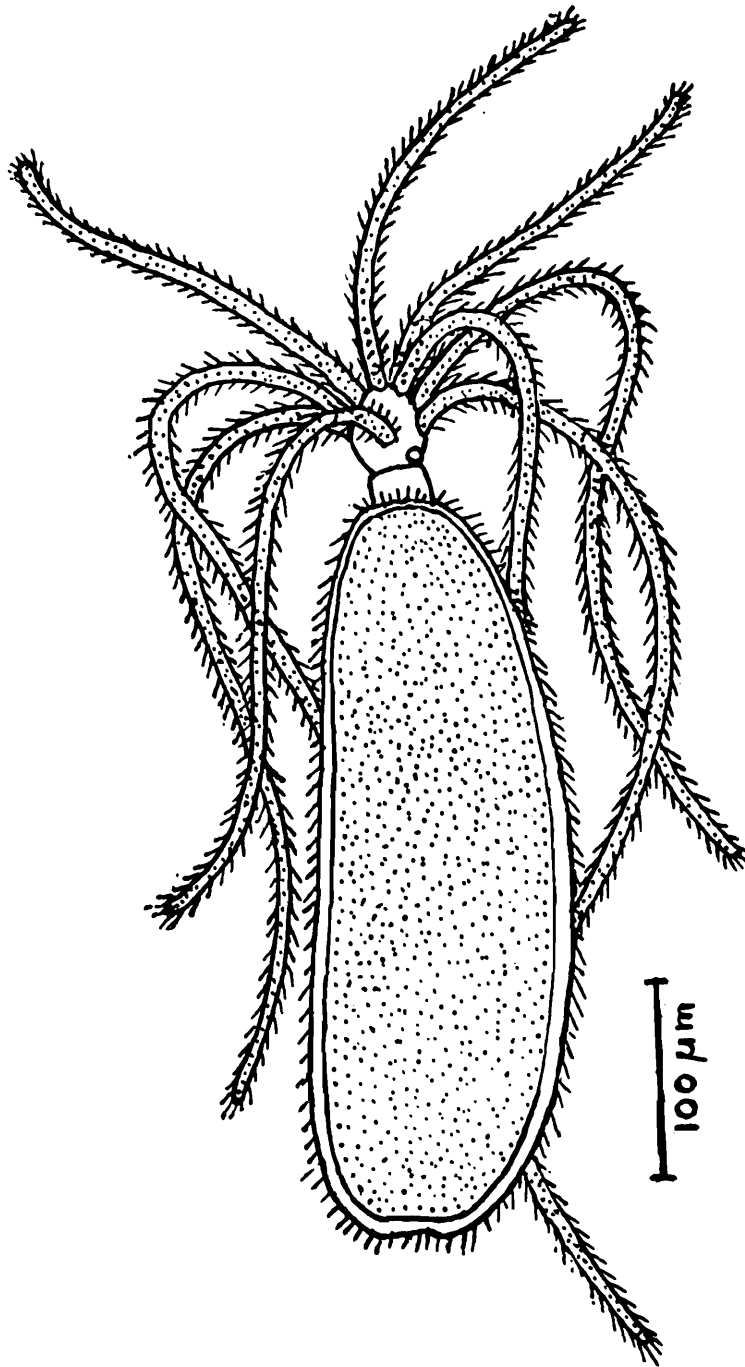


Fig. 2: *HalammoHYdra intermedium* n. sp. Habit.

described from different parts of the Atlantic and Indian Oceans. Among them, two species viz., *H. chauhani* Rao (1975) and *H. andamanensis* Rao (1978) were described from the Andaman Sea in the Bay of Bengal. The present discovery of one more new species of the genus from Andaman waters is of considerable zoogeographical and evolutionary significance. However, among the known species

of the genus, the new species *H. intermedium* is closely related to the two known Andaman species in the body size, gastric tube, neck and cnidome, aboral cone, number and disposition of tentacles. In fact, the new species occupies an intermediate position between the two known species in many of these morphological features, deriving its name *intermedium*. It is quite possible that the new species represents a transitional stage in the evolution of the genus in this region from *H. chauhani* to *H. andamanesis*, the latter species being well adapted to life in the lacunar interstitial system of marine beach sediments. However, the new species clearly differs from both the known species in body size and shape of gastric tube, neck, aboral cone and structure of cnidome as well as the number of tentacles and statocysts, making it imperative to erect a separate taxon.

*Diagnostic features* : Aberrant cnidarians with body entirely ciliated. Gastric tube elongate and elliptical. Aboral cone pear-shaped with well developed adhesive organ occupying about half of upper part of cone. Neck short and thick. Tentacles in two whorls of 3+6, alternating with 3 statocysts of the lithostyle type. Cnidome consists of stenoteles and euryteles of one size category. Sexes separate.

*Holotype* : Female specimen 480  $\mu\text{m}$  long with single ovary collected by the author on 25.3.90. Deposited in the National Zoological Collections, Z.S.I., Port Blair, Regd No. 2392.

*Type locality* : Coarse and medium sands with little detritus 5–10 cm below surface between low and half-tide levels, intertidal zone, Harmindar Bay, Little Andaman, India.

## Order HYDROIDA

### Family EUTIMIDAE

Genus *Anthohydra* Salvini-Plawen and Rao, 1978

### 3. *Anthohydra psammobionta* Salvini-Plawen and Rao

1973. *Anthohydra psammobionta* Salvini-plawen and Rao, *Z. Morph. Tiere*, 74 : 231.

**Material examined :** 2 ex., West Bay, 28.3.90.

**Diagnostic features :** Solitary hydrozoan polyp with one oral cirrhit of 24 solid and filiform tentacles which can partly be withdrawn inside the body. Body cylindrical with gastral cavity extending the whole length. Distinct pedal disc present for adhesion to solid substratum. Nematocysts are profusely distributed all over the tentacles. Stenoteles are absent. One or more lateral buds occur for sexual reproduction. Leads a semi-sessile mode of existence between sand grains of marine beaches.

**Measurements :** Length 1.0 – 1.2 mm and maximum body diameter 0.09 mm.

**Remarks :** The material examined confirmed well with the original description of the species made from Hut Bay, Little Andaman.

**Habitat :** Coarse sand with fine shell gravel and little detritus 10 cm below surface between low and mid-water levels, intertidal zone.

**Distribution :** The species is to be regarded as endemic to the Little Andaman Island as it has not been encountered on other islands of the Andaman-Nicobar Archipelago.

## Phylum PLATYHELMINTHES

### Class TURBELLARIA

### Order MACROSTOMIDA

### Family MACROSTOMIDAE

### Genus *Acanthomacrostromum* Papi and Swedmark, 1959

#### 4. *Acanthomacrostromum gerlachi* Ax

1971. *Acanthomacrostromum gerlachi* Ax, *Microfauna Meeresboden*, 8 : 1.

**Material examined :** 2 ex., Bomila Creek ; 19.3.90.

**Diagnostic features :** Aberrant turbellarian. Body flat, oblong and leaf-like. Head truncate and tail pointed. Internal skeleton of spicules directed posteriorly and posterolaterally in 6-8 transverse

rows. Spicule size increases from anterior end to posterior end. Mouth ventral and located about one-fourth of total body length from anterior end. Ventrolateral margins supplied with clusters of gland cells and the species is highly thigmotactic. Exclusively psammophilous.

*Measurements* : Length 0.4-0.8 mm and maximum width 0.1-0.2 mm.

*Remarks* : The material conforms well with the original description of the species from Maldives. As pointed out by Ax (1971), *A. spiculiferum* Papi and Swedmark (1959) recorded by Rao (1969) on Orissa coast is to be treated as *A. gerlachi*.

*Habitat* : Coarse sand with fine shell gravel 5 cm below surface between low and high tide levels, intertidal zone.

*Distribution* : Maldives, Lakshadweep, Indian subcontinent, Andaman Islands.

## Order SERIATA

### Family OTOPLANIDAE

#### Genus *Otoplana* Du Plessis, 1989

#### 5. *Otoplana* sp.

*Material examined* : 4 ex., Butler Bay, 21.3.90.

*Description* : Body elongated and dorsoventrally flattened, with numerous sensory bristles on the anterior margin. Mid-dorsal statocyst occurs about 2 head diameters from anterior end. Body transparent and highly thigmotactic. Adhesive papillae 8-10 pairs on tail. Central funnel tube of the copulatory organ is conical, while the stylets have bifurcated tips equal in length. Ventral proboscis located about half the length of body. Body contractile and highly thigmotactic..

*Measurements* : Length 0.6-0.8 mm and width 0.06-0.08 mm.

*Remarks* : The specific identification of the material needs further detailed study.

**Habitat :** Medium and coarse detritus sand 5-10 cm below surface between low and half-tide levels, intertidal zone.

Order NEORHABDOCOELA

Family POLYCYSTIDAE

Genus *Gyratrix* Ehrenberg, 1831

6. *Gyratrix hermaphroditus* Ehrenberg

1831. *Gyratrix hermaphroditus* Ehrenberg, *Z. Morphol. Okol.*, 3 : 255.

**Material examined :** 2 ex., Bomila Creek, 19.3.90.

**Diagnostic features :** Small unsegmented worms with spindle-shaped body. Pharynx bulbose and opens ventrally about half the length of body. A protrusible, glandulomuscular undivided proboscis at the anterior end present. Two dark eyes occur behind proboscis. Testis tubular and runs anteriorly. Copulatory bursa with a chitinous lining. Penis stylet enclosed in a sheath at the posterior end. Gonads occur lateral to the gut.

**Measurements :** Length 1.6-1.8 mm and maximum width 0.25 mm.

**Remarks :** The material examined conforms well with the detailed description and figures of the species given by Meixner (1925).

**Habitat :** Coarse and medium coralline sand rich in organic detritus, intertidal zone.

**Distribution :** Cosmopolitan in fresh, brackish and salt-water habitats.

Phylum NEMATODA

Class APHASMIDEA

Order ENOPLIDA

Family ANTICOMIDAE

Genus *Anticoma* Bastian, 1865

7. *Anticoma arctica* Steiner

1916. *Anticoma arctica* Steiner, *Zool. Jahrb. Abt. Syst.*, 39 : 511.

*Material examined* : 2 ex., Hut Bay, 18.3.90 ; 1 ex. Butler Bay, 21.3.90.

*Diagnostic features* : Cuticle with faint striation. Prominent lateral fields. Labial papillae distinct. Cephalic setae short and 0.25 head diameter long. Four somatic setae located about 1.5 head diameters from anterior end. Stoma curved and slightly sclerotized. Amphids distinct, cup-shaped and 0.2 head diameter wide. Excretory ampulla prominent and the pore opens at the level of amphid. Tail conical-cylindrical. Caudal gland 3-celled. Spicule in male 0.8 anal diameter long.

*Measurements* : Length 1.6-1.8 mm. Tail 5.0-6.5 anal diameters long in male and female specimens respectively.

*Remarks* : The present specimens agree well with the original description of the species except for the variation of body size and the position of amphids in both the sexes.

*Habitat* : Fine and medium coralline sand with little detritus between low and high water levels, intertidal zone.

*Distribution* : Artic Sea, North Sea, Atlantic, Red Sea, Bay of Bengal.

8. *Anticoma acuminata* (Eberth)

1962. *Anticoma acuminata* (Eberth) Gerlach, *Kieler Meeresforsch.*, 18 : 84.

**Material examined :** 1 ex., Dugong Creek, 24.3.90.

**Diagnostic features :** Labial papillae distinct. Cephalic setae less than half the head diameter. Excretory ampulla prominent. Excretory pore one head diameter behind the anterior end. Amphid distinct, cup-shaped and lies at the level of excretory pore. Five somatic setae occur about 2.4 head diameters from anterior end. Tail conical-cylindrical, with 3-celled caudal gland. Spicule in male curved and 48  $\mu\text{m}$  or 1.6 anal diameters long.

**Measurements :** Length 1.6 mm. Tail 6.0 anal diameters long.

**Remarks :** The specimen examined conforms well with the description and figures of the species given by Gerlach (1962), but for the minor variation in relative measurements of the body.

**Habitat :** Fine coralline sand and algal thalli near low water level, intertidal zone.

**Distribution :** Cosmopolitan.

### 9. *Anticoma* sp.

**Material examined :** 2 ex., South Bay, 26.3.90 ; 1 ex., West Bay, 28.3.90.

**Description :** Cuticle with weak striation. Lateral fields and labial papillae distinct. Cephalic setae are less than half the head diameter long. Four somatic setae located about 4 head diameters from anterior end. Amphid distinct, cup-shaped, 0.25 head diameter long and located about 1.5 head diameters from anterior end. Excretory pore located about 100  $\mu\text{m}$  from anterior end. Nerve ring located 64% from anterior end. Spicule in male curved and 1.0 anal diameters long. Tail conical-cylindrical with 2-celled caudal gland. Spinnert present.

**Measurements :** Length 1.2-1.4 mm. Tail in male 6.0 anal diameters and in female 8.0 anal diameters long.

**Remarks :** The material needs further study for specific identification.

**Habitat :** Fine coralline sand from the thalli of littoral algae near low water level, intertidal zone.



Family OXYSTOMINIDAE

Genus *Oxystomina* Filipjev, 1921

10. *Oxystomina alpatovi* (Filipjev)

1927. *Oxystomina alpatovi* Filipjev, *Arch. Naturgesch.*, 91 : 87.

*Material examined* : 2 ex., West Bay, 28.3.90.

*Diagnostic features* : Cuticle smooth, thin and transparent. Lips short and distinct. Six cephalic setae just behind lips are 0.5 head diameter long. Four cervical setae occur 1.2 head diameters behind the cephalic setae. Amphid horse-shoe shaped and located 5.0 head diameters from anterior end. Excretory pore located about 200  $\mu\text{m}$  from anterior end. Tail conical-cylindrical and bluntly rounded at the tip with an inflated cuticle. Spicule in male is curved and 1.2 anal diameters long.

*Measurements* : Length 2.0-2.2 mm. Tail 6.0 anal diameters long.

*Remarks* : The specimens correspond well the description and figures of the species given by Gerlach (1962) from Maldives.

*Habitat* : Fine and medium sand with little detritus, sublittoral zone.

*Distribution* : Coasts of Atlantic and Indian Oceans.

Genus *Halalaimus* De Man, 1888

11. *Halalaimus setosus* Timm

1961. *Halalaimus setosus* Timm, *Proc. Pak. Acad. Sci.*, 1 : 36.

*Material examined* : 3 ex., Dugong Creek, 19.3.90.

*Diagnostic feature* : Cuticle thin, transparent and finely striated. Head diameter 5  $\mu\text{m}$ . Neck tapers gradually. Six cephalic setae and 6 cervical setae 8  $\mu\text{m}$  long. Amphid cylindrical, 45  $\mu\text{m}$  long and

situated 4 head diameters from anterior end. Nerve ring 56%. Excretory cell elongated. Tail 35% conical, 65% filiform and 18 anal diameters long. Spicule in male arcuate, cephalated and 20  $\mu\text{m}$  or 1.8 anal diameters long. Gubernaculum short, curved and sleeve-like. Female: 1.0-1.2 mm.  $a=58.4$ ,  $b=3.8$ ,  $c=6.0$ ,  $v=50\%$ . Male: 0.9 mm long,  $a=61.2$ ,  $b=3.8$ ,  $c=5.8$ .

**Measurements:** Length 1.0-1.2 mm. Tail 5.8 anal diameters long.

**Remarks:** The material examined conforms well with the original description of the species made from Bangladesh.

**Habitat:** Fine mud and littoral algae near low water level, intertidal zone.

**Distribution:** Bay of Bengal.

## 12. *Halalaimus filicollis* Timm

1961. *Halalaimus filicollis* Timm, *Proc. Pak. Acad. Sci.*, 1: 36.

**Material examined:** 1 ex., Bomila Creek, 19.3.90.

**Diagnostic features:** Cuticle thin and finely striated. Lateral alae lacking. Head diameter 5  $\mu\text{m}$ . Neck long and narrow, extending 2/3 of oesophageal length. Six labial setae 0.3 head diameter long. Six cephalic and cervical setae 0.7 head diameter long. Amphid cylindrical, 40  $\mu\text{m}$  long and located 5 head diameters from anterior end. Excretory cell narrow and elongated. Tail 10-12 anal diameters long and tapers gradually to the posterior end with 2 terminal setae. Nerve ring 68%. Spicule in male curved, cephalated and 26  $\mu\text{m}$  long. Gubernaculum a double enveloping plate 10  $\mu\text{m}$  long.

**Measurements:** Female: 1.4 mm long,  $a=58.6$ ,  $b=2.8$ ,  $c=8.4$ ,  $v=63.0\%$ .

**Remarks:** The specimen examined closely corresponds with *H. filicollis* Timm (1961) and *H. longicaudatus* Filipjev (1925) in all the essential features, But because of the longer oesophagus and geographical proximity, the local specimen makes its conformity with the former species,

**Habitat :** Fine muddy sand in mangrove swamp rich in organic detritus, intertidal zone

**Distribution :** Bay of Bengal.

**13. Halalaimus sp.**

**Material examined :** 2 ex., South Bay, 26.3.90.

**Description :** Body filiform. Cuticle thin, transparent and finely striated. Head diameter about 0.5 body diameter at the oesophageal base. Neck tapers gradually to the anterior end. Cephalic and cervical setae 1.8 head diameters long. Amphid cylindrical, 30  $\mu\text{m}$  long and situated about 4.8 head diameters from anterior end. Tail conical anteriorly and filiform posteriorly. Anal glands indistinct. Spinnert present.

**Measurements :** Length 1.2-1.4 mm. Female 22.0 anal diameters long.

**Remarks :** The specimens examined closely approach *H. setosus* Timm (1961) described from the Bay of Bengal. However, specific identification of the species requires further study.

**Habitat :** Fine sandy sediment on algal thalli near low water level, intertidal zone.

**Family ONCHOLAMIDAE**

**Genus Oncholaimus Dujardin, 1845**

**14. Oncholaimus brachycercus De Man**

**1889. *Oncholaimus brachycercus* De Man, Mem. Soc. Zool. France, 2 : 1.**

**Material examined :** 2 ex., Harmindar Bay, 25.3.90.

**Diagnostic features :** Cuticle smooth and transparent. Head diameter 52  $\mu\text{m}$ . Lips, labial palillae and buccal teeth prominent. Buccal cavity deep and wide, with heavily cuticularized walls. Ten cephalic setae 0.15 head diameter wide present, Amphid width about 1/3 of the corresponding body diameter. Few scattered cervical setae present.

Excretory pore about 3 head diameters from anterior end. Tail short and conical, with a spinnert. Cement glands well developed with long ducts. Spicule in male 120  $\mu\text{m}$  or 2.2 anal diameters long. Gubernaculum obscure. About ten preanal and postanal setae present.

*Measurements* : Length 3.0-3.2 mm. Tail 1.4 anal diameters long.

*Remarks* : The specimens examined agree with the original description of the species except for the longer spicules in male specimens.

*Habitat* : Coarse and medum sands with little detritus between low and half-tide levels, intertidal zone.

*Distribution* : Baltic Sea, North Sea, Arctic, Atlantic and Indian Oceans.

## Order CHROMADORIDA

### Family COMESOMATIDAE

#### Genus *Sabatieria* Re Rouville, 1903

#### 15. *Sabatieria hilarula* De Man

1922. *Sabatiera hilarula* De Man, *Tidschr. Nederl. Dierk. Varcen.*, 18 : 127.

*Material examined* : 3 ex., Bomila Creek, 19.3.90.

*Diagnostic features* : Cuticular punctation homogeneous. Labial papillae distinct. Labial setae minute. Four cephalic setae 0.8 head diameter long. Cervical setae in 4 groups of 5-10 each and 0.9 head diameter long. Amphid spiral with 4 turns and 0.5 head diameter wide. Oesophageal base swollen into a bulb. Tail conical-cylindrical with 3 terminal spines. Caudal glands well developed. Excretory pore 65%. Spicule in male 50  $\mu\text{m}$  or 1.5 anal diameters long. Gubernaculum with triangular apophysis. Preanal supplements obscure.

*Measurements* : Length 1.0-1.2 mm. Tail 4.0-4.2 anal diameters long.

**Remarks :** Compared to the original description of the species, the specimens from Andamans show minor variation in relation to the Demanian values. The material, however, corresponds well with the description and figures of the species given by Timm (1961) from Bangladesh.

**Habitat :** Weeds, algae and surface sand near low water level, intertidal zone.

**Distribution :** Eurytopic on the coasts of Mediterranean, Atlantic and Indian Oceans.

### 16. *Sabatieria abyssalis* (Filipjev)

1918. *Parasabatiera abyssalis* Filipjev, *Savastopol Biol. Stan. Ross Akad. Nauk*, 2 : 350.

**Material examined :** 1 ex., South Bay, 26.3.90.

**Diagnostic features :** Cuticle punctate with vertical and horizontal differentiation. Lateral fields with large irregular dots. Labial setae short. Four cephalic setae present attaining 1/2 the head diameter in length. Cervical setae very short. Amphid spiral type. Tail conical-cylindrical with 3-celled caudal gland. Spicule in male 62  $\mu$ m long or 2.0 anal diameters long. Gubernaculum with posterior apophysis. Fine preanal supplements present.

**Measurements :** Length 1.5-1.8 mm. Tail 4.6 anal diameters long.

**Remarks :** The material studied agrees well with the original description of the species.

**Habitat :** Fine coralline mud and medium sand with ditritus near low water level, intertidal zone.

**Distribution :** Mediterranean Sea, Black Sea, Atlantic, Bay of Bengal, Lakshadweep.

## Family CHROMADORIDAE

Genus *Chromadora* Bastian, 186517. *Chromadora vulgaris* Bastian

1865. *Chromadora vulgaris* Bastian, *Trans. Linn. Soc. Lond.*, 25 : 167.

*Material examined* : 2 ex., East Bay, 20.3.90.

*Diagnostic features* : Body slightly compressed with both ends tapering. Head diameter 30  $\mu\text{m}$ . Cuticle with distinct transverse striation about 5  $\mu\text{m}$  apart. A pair of reddish ocelli occur posterior to the base of the deep buccal cavity. Four cephalic setae 0.25 head diameter long. Amphid, cervical and somatic setae obscure. Lateral alae lacking. Oesophagus with well developed single cylindrical bulb. Intestine with numerous irregular oil globules. Tail conical-cylindrical. Caudal gland 5-celled. Spinnert present. Spicule in male cephalated and 30  $\mu\text{m}$  long. Gubernaculum short, simple and sleeve-like.

*Measurements* : Length. 1.8-2.0 mm. Tail 4.5 anal diameters long.

*Remarks* : The material from Andamans agrees well with the description of the type species except for the minor variations in the relative measurements of body.

*Habitat* : Algae and detritus sand in the littoral zone, rocky beach.

*Distribution* : Coasts of Atlantic and Indian Oceans.

## Family CHONIOLAIMIDAE

Genus *Latronema* Wieser, 195418. *Latronema orcinum* (Gerlach)

1952. *Synonchiella orcina* Gerlach, *Akad. Wiss. Abh. Mathem-Naturw. Kl.*, 6 : 317.

*Material examined* : 2 ex., South Bay, 26.3.90.

**Diagnostic features :** Ornamentation of cuticle on the head region consists of unipunctate rows interrupted by several longitudinal lines. Labial setae prominent and about 10  $\mu\text{m}$  long. Cephalic setae indistinct. About 15 setae occur in a circle representing cephalic and cervical setae. Three jaws present anteriorly at the apex of pharynx, each jaw bearing four bifid and three simple teeth. Amphid indistinct. Tail short and conical. Spicule in male about 1.5 anal diameters long. About 12 preanal papillae occur in male. Gubernaculum obscure.

**Measurements :** Length 1.0-1.5 mm. Tail 1.5-2.0 anal diameters long.

**Remarks :** This species recorded from different global regions showed little variation of the cuticular ornamentation characteristic of the species. The specimens collected from Andamans, however, agreed well with the description of the species made by Gerlach (1964) from Maldives.

**Habitat :** Coarse and medium coralline sand between low and half-tide levels, intertidal zone.

**Distribution :** Widely distributed on the coasts of Atlantic and Indian Oceans.

Family SELACHINEMATIDAE

Genus *Synonchium* Cobb, 1920

19. *Synonchium obtusum* Cobb

1920. *Synonchium obtusum* Cobb, *Contrib. Sci. Nemat.*, 9 : 290.

**Material examined :** 2 ex., West Bay, 28.3.90.

**Diagnostic features :** Cuticular punctation shows distinct horizontal differentiation. Labial papillae small and conical. Ten cephalic papillae are flat and button-like. Somatic setae are replaced by conical papillae. Circular pores present on body. Pharynx with 3 powerful jaws characteristic of the species. Amphid distinct and 2.5 spiral. Spicule in male is straight and 75  $\mu\text{m}$  long. Accessory part indistinct. Tail very short and ends in a blunt point. Preanal papillae absent.

Cuticular ridges occurring on either side of cloaca are supported by saccular papillae.

*Measurements* : Length 1.8 mm long. Tail about 0.5 anal diameter long.

*Remarks* : The material examined conforms with the original description and the more recent description of the species given by Gerlach (1964) from Maldives.

*Habitat* : Coarse coralline sand with fine silt and little detritus between low and half-tide levels, intertidal zone.

*Distribution* : Eurytopic on the coasts of tropical and temperate seas.

#### Family SPIRINIIDAE

#### Genus *Spirinia* Gerlach, 1963

#### 20. *Spirinia* sp.

*Material examined* : 3 ex., Butler Bay, 21.3.90.

*Description* : Cuticle finely ringed, the annulation starting from the anterior border of amphid. Head conical and 15  $\mu\text{m}$  in diameter. Labial setae minute. Four cephalic and sub-cephalic setae 0.6 head diameter long. Numerous somatic setae 0.8 head diameter long. Amphid distinct at the level of cephalic setae, circular and 0.6 head diameter wide. Stoma funnel-shaped and 8  $\mu\text{m}$  deep. Oesophagus with distinct posterior intestinal bulb. Nerve ring 50%. Tail conical-cylindrical and 3-4 anal diameters long. Spicule in male 50  $\mu\text{m}$  or 1.6 anal diameters long with distal part expanded. Gubernaculum simple and 15  $\mu\text{m}$  long. Preanal papillae obscure.

*Measurements* : Female : 1.4 mm long,  $a = 24.2$ ,  $b = 13.6$ ,  $c = 12.0$ ,  $v = 42\%$ . Male : 1.3 mm long,  $a = 28.0$ ,  $b = 12.8$ ,  $c = 7.4$ .

*Remarks* : The material examined has a close resemblance to *S. laevis* (Bastain, 1865) occurring on the European coasts, but a further detailed study is need for specific identification.



**Habitat :** Coarse and medium detritus sand near low water level, intertidal zone.

Order DESMADORIDA

Family DESMODORIDAE

Genus **Desmodora** De man, 1889

21. **Desmodora megalosoma** Steiner

1918. *Desmodora megalosoma* Steiner, *Zool, Anz.*, 50 : 13.

**Material examined :** Cuticular annulation faintly ringed, with longitudinal lines. Cephalic setae short, about 5-6  $\mu\text{m}$  or 0.4 head diameter long. The setae longer in female than in male. Amphid conspicuous with 3.5 spirals, 10  $\mu\text{m}$  or 0.5 head diameter wide in female and 15  $\mu\text{m}$  or 0.6 head diameter wide in male. Buccal cavity cylindrical and 40  $\mu\text{m}$  long, with cuticular plates in the anterior region. Oesophageal bulb bilobed posteriorly, the lobes being larger in size in males than in females. Tail short and conical. Spicule in male curved and 1.0-1.3 anal diameters long. A preanal papilla occurs on the ventral surface in front of anus.

**Measurements :** Length 1.5-1.8 mm. Tail 2.0-4.5 anal diameters long. The tail is longer in females than in males.

**Remarks :** The material examined agrees well with the description and figures of the species given by Gerlach (1963).

**Habitat :** Fine detritus coralline sand below low water level, sandy beach.

**Distribution :** Coasts of Atlantic and Indian Oceans.

22. **Desmodora brevicollis** (Cobb)

1920. *Bulbonema brevicolle* Cobb, *Contrib. Sci. Nemat.*, 9 : 264.

**Material examined :** 2 ex., Hut Bay, 18.3.90 ; Butler Bay, 21.3.90.

**Diagnostic features :** Cuticular annulation deeply ringed and about

1  $\mu\text{m}$  wide. Labial papillae very short. Cephalic setae longer than one head diameter. Numerous somatic setae longer than body diameter. Amphid distinct, 2.5 spiral and 0.5 head diameter wide. Tail conical-cylindrical. Buccal cavity cuticularised. Pharyngeal bulb distinct, 18  $\mu\text{m}$  wide. Spicule in male about 1.0 anal diameter long. Accessory plate present.

*Measurements* : Length 0.8-1.0 mm. Tail 4.0 anal diameters long.

*Remarks* : The specimens examined conform with the description of the species given by Gerlach (1963) from Maldives in the Indian Ocean.

*Habitat* : Surface layers of fine detritus sand between low and half-tide levels, intertidal zone.

*Distribution* : Widely distributed on the coasts of Atlantic and Indian Oceans.

### 23. *Desmodora* sp.

*Material examined* : 2 ex., Harmindar Bay, 25.3.90.

*Description* : Cuticle deeply ringed excepting the anterior head region. Lips indistinct. Longitudinal rows of cephalic and cervical setae 0.15-0.20 head diameter long. Amphid small, distinct, 1-spiral, located anteriorly on head and 0.12 head diameter wide. Oesophagus with a posterior bulb. Spicule in male curved and 1.0 anal diameter long. Gubernaculum is short and plate-like. Tail short and conical. Numerous subventral preanal pricks present. Two preanal papillae occur about 70 and 130  $\mu\text{m}$ , respectively from anus.

*Measurements* : Length 1.6-1.8 mm. Tail 1.6 anal diameters long.

*Remarks* : Specific identification of the material needs further detailed study.

*Habitat* : Fine detritus sand from algal thalli in the littoral zone.

Family MONOPOSTHIIDAE

Genus *Rhinema* Cobb, 1920

24. *Rhinema exquisita* Timm

1961. *Rhinema exquisita* Timm, *Proc. Pak. Acad. Sci.*, 1 : 60.

*Material examined* : 3 ex., South Bay, 26.3.90.

*Diagnostic features* : Cuticle with 12 rows of longitudinal plates connected by V-shaped markings. Head truncate anteriorly and 14 $\mu$ m wide. Lips distinct with short labial setae. Four cephalic setae 1.2 head diameters long. Lateral and cervical setae present. Amphid circular 2.5  $\mu$ m in diameter and situated 0.6 head diameter from anterior end. Stoma 15  $\mu$ m deep with a dorsal and a ventral tooth. Oesophageal bulb double and divided into 4 equal sections. Tail conical, 4.2 anal diameters long and ends in a finger-like tip. Two ovaries in female. Spicule in male curved, cephalated and 32  $\mu$ m long. Gubernaculum epsilon-like and 18  $\mu$ m long. Preanal supplements obscure.

*Measurements* : Female : 1.2 mm long, a=28.8, b=6.8, c=10.6, v=48%. Male : 1.0 mm long, a=26.4, b=6.5, c=11.2.

*Remarks* : The Andaman population conforms well with the original description of the species made from Bangladesh. The species, however, approaches very closely *R. retrosum* Cobb (1920), except for the presence of lateral setae on head.

*Habitat* : Fine littoral mud near low water, intertidal zone.

*Distribution* : Bay of Bengal.

Order MONHYSTERIDA

Family SPHAEROLAIMIDAE

Genus *Sphaerolaimus* Bastian 1865

25. *Sphaerolaimus pacificus* Allgen

1947. *Sphaerolaimus pacificus* Allgen, *Vidensk. Medd. dansk. Naturh.*, 110 : 212.

*Material examined* : 2 ex., Bomila Creek, 19.3.90.

*Diagnostic features* : Cuticle finely striated up to helmet region. Sexual dimorphism of head and setae lacking. Pigmented helmet 20  $\mu\text{m}$  long and 30  $\mu\text{m}$  wide with shallow anterior scallops. Stoma 30  $\mu\text{m}$  deep with heavily sclerotized walls and hemispherical projection posteriorly. Six labial setae present. Ten cephalic setae 4  $\mu\text{m}$  long. Eight groups of cephalic setae of 3 each 10-15  $\mu\text{m}$  long. Several scattered cervical setae 10-16  $\mu\text{m}$  long. Amphid oval, 0.25 head diameter wide and situated on lower part of stoma. Oesophagus cylindrical with heavily sclerotized lining and short intestinal valve. Nerve ring 46%. Excretory pore 64%. Tail conical-cylindrical and 3-4 anal diameters long with 3 terminal setae.

*Measurements* : Female : 1.4-1.6 mm long,  $a=16.2$ ,  $b=5.2$ ,  $c=8.6$ ,  $v=78\%$ .

*Remarks* : Specimens examined conform well with the detailed description of the species given by Wieser (1956), except for a variation in the structure of the posterior part of stoma.

*Habitat* : Littoral algae and soft mud, intertidal zone.

*Distribution* : Widely distributed in the Indo-Pacific region.

#### Family MONHYSTERIDAE

#### Genus *Theristus* Bastian, 1865

#### 26. *Theristus tortuosa* Timm

1961. *Theristus tortuosa* Timm, *Proc. Pak. Acad. Sci.*, 1 : 78.

*Material examined* : 1 ex., Bomila Creek, 19. 3. 90.

*Diagnostic features* : Cuticle moderately striated anteriorly and coarsely striated on the rest of body. Head diameter 20  $\mu\text{m}$ . Lips conspicuous with labial papillae. Stoma simple, 10  $\mu\text{m}$  deep and unsclerotized. Ten cephalic setae 10-15  $\mu\text{m}$  long. Cervical setae indistinct. Amphid conspicuous, spiral with 3 turns, 0.3 head diameter wide and situated 26  $\mu\text{m}$  from anterior end. Oesophagus without

distinct posterior bulb. Nerve ring 46%. Tail conical-cylindrical and 4.2 anal diameters long with 2 terminal spines. Spicule in male 46  $\mu\text{m}$  long, cephalated and bent at right angles. Gubernaculum a vertical piece 25  $\mu\text{m}$  long.

*Measurements* : Male : 1.2 mm long,  $a=32.2$ ,  $b=4.4$ ,  $c=6.2$ .

*Remarks* : The specimens conform well with the original description of the species except for a minor variation of the Demanian formula.

*Habitat* : Littoral mud and algae near low water, intertidal zone.

*Distribution* : Bay of Bengal.

### 27. *Theristus* sp.

*Material examined* : 1 ex., West Bay, 28.3.90.

*Description* : Cuticle finely striated. Lips prominent. Cephalic setae 1.0 head diameter long. Cervical and somatic setae are 2.5-3.0 head diameters long. Amphid distinct, circular, 0.3 head diameter wide and located just behind cervical setae. Spicule in male bent at right angle, with the proximal and distal part slightly expanded and reaches 1.0 anal diameter long. Gubernaculum short and sheath-like. Tail conical-cylindrical, with two long terminal setae. Caudal glands well developed. Spinnert present.

*Measurements* : Length 1.0 mm. Tail 6.0 anal diameters long.

*Remarks* : Specific identification of the material needs more specimens and further study.

*Habitat* : Coarse coralline sand with little detritus 10 cm below surface between low and half tide levels, intertidal zone.

### Genus *Rhynchonema* Cobb, 1920

### 28. *Rhynchonema cinctum* Cobb

1920. *Rhynchonema cinctum* Cobb, *Contrib. Sci. Nemat.*, 9 : 260.

*Material examined* : 1 ex., Hut Bay, 18.3.90 ; Butler Bay, 21.3.90.

**Diagnostic features :** Cuticle coarsely ringed. Head diameter 5  $\mu\text{m}$ . Body diameter at the end of oesophagus 30  $\mu\text{m}$ . Buccal cavity cylindrical, 60  $\mu\text{m}$  long, extending up to the anterior end of amphid. Ten cephalic and 4 cervical setae 1.0 head diameter long present. Amphid circular, 4  $\mu\text{m}$  wide and located 60  $\mu\text{m}$  from anterior end. Numerous somatic setae 10-15  $\mu\text{m}$  long in longitudinal rows. Tail conical and setose. Caudal gland 3-celled. Spicule in male curved and 30  $\mu\text{m}$  long. Gubernaculum short, triangular and 12  $\mu\text{m}$  long.

**Measurements :** Length 0.80-0.82 mm. Tail 4.0-4.5 anal diameters long.

**Remarks :** The specimens agree well with the original description of the type species, but for minor variations in the Demanian values.

**Habitat :** Coarse and medium coralline sand with little detritus 5-10 cm below surface between low and half-tide levels, intertidal zone.

**Distribution :** Eurytopic along the coasts of Pacific, Atlantic and Indian Oceans.

Phylum GASTROTRICHA

Order MACRODASYIDA

Family MACRODASYIDAE

Genus *Macrodasys* Remane, 1924

29. *Macrodasys andamanensis* n. sp.

(Fig. 3)

**Material examined :** 5 ex., Bomila Creek, 19.3.90 ; 2 ex., Butler Bay, 21.3.90.

**Description :** Adult specimens attain a maximum length of 800  $\mu\text{m}$  including the tail. Maximum width of body attains 90  $\mu\text{m}$  about the level of pharyngeal pores. Body transparent and dorsoventrally flattened. The anterior end is somewhat truncate without any projec-

tions on its anterior border, while the posterior end tapers into a pointed tail 150  $\mu\text{m}$  in length. Head is not demarcated from trunk and bears a pair of lateral pestle organs. Epidermis is finely granular with two rows of dorsolateral epidermal glands 3-5  $\mu\text{m}$  in diameter. Fine sensory bristles 15-20  $\mu\text{m}$  long occur along the lateral corners of head and lateral margins of trunk. Ciliation forms a continuous field on ventral surface.

Adhesive tubes occur in anterior, lateral and posterior series. The anterior tubes are about 10  $\mu\text{m}$  long and occur in two groups of 2+3 on either side in an arc on ventral surface of head just behind the mouth. Ten pairs of lateral tubes occur beginning at the level of pharyngeal pores. The tubes are almost even in disposition and attain about 12-15  $\mu\text{m}$  in length. Ten pairs of posterior tubes occur on lateral surface of tail and are distinctly separate from lateral tubes of the trunk. They reach about 5-10  $\mu\text{m}$  in length, their size decreasing steadily towards the posterior end.

The mouth is terminal, cup-shaped and the oral cavity has a velum characteristic of the genus. The pharynx is about 220  $\mu\text{m}$  long and occupies nearly one-third of the total gut length. Pharyngeal pores are distinct and lie about the middle of the pharynx. The gut following the pharynx is undifferentiated into a wide stomach and tapers to the posterior end. Anus is subterminal and opens on the ventral surface about 20  $\mu\text{m}$  from the base of tail.

The reproductive organs consist of a paired testes located laterally along the anterior region of the digestive tract. They are spindle-shaped starting from just behind the pharynx and the vasa deferentia terminating close to the penis. The penis is pitcher-shaped, about 55  $\mu\text{m}$  long and 35  $\mu\text{m}$  in maximum width. It is located posterior to the ovary and opens anteriorly on the ventral surface. Mature specimens were observed to carry 1-2 egg cells having a maximum diameter of 80  $\mu\text{m}$ . Bursa copulatrix is about 150  $\mu\text{m}$  long, with conspicuous muscular and vermiform portions. The bursa opens posteriorly into a distinct antrum feminum at the tail end.

*Remarks* : The species of *Macrodasys* are generally distinguished based on structure of genital organs. Among the known species of the genus, in the general organization of body and the structure of penis and bursa copulatrix, the new species *M. andamanensis* shows

close relationship with *M. africanus* Remane (1950) described from the south-west coast of Africa and *M. indica* Rao (1991) described from Minicoy at Lakshadweep in the Arabian Sea. But, the new species clearly differs from both the known species in the body size,

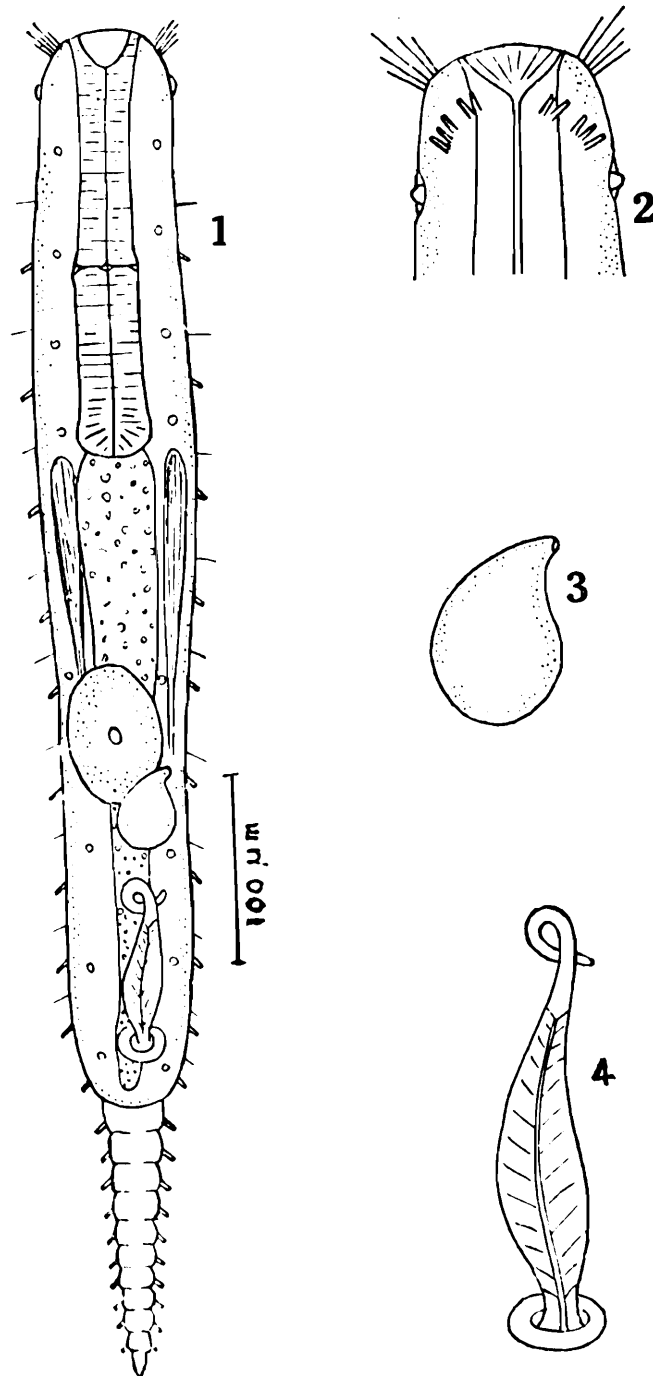


Fig. 3: *Macrodasys andamanensis* n. sp. 1. Adult, dorsal view; 2. Anterior end, ventral view; 3. Penis; 4. Bursa.

structure of buccal cavity and tail, number of epidermal glands and the anterior, lateral and posterior tubes.



**Diagnostic features :** Minute worms with body up to 0.8 mm long, 0.09 mm wide, transparent and dorsoventrally flattened. Anterior end truncate. Posterior end tapers into a distinct tail. Five pairs of anterior tubes occur in an arc of 2+3 just behind the buccal cavity. Ten pairs of lateral tubes and 10 pairs of posterior tubes present. Pharynx occupies about 1/3 of total gut length, with pores at the middle part. Penis pear-shaped. Bursa copulatrix and antrum feminum present.

**Holotype :** Adult specimen 0.78 mm long, with ova and sperm collected by the author on 19.3.90. Deposited in the National Zoological Collections, Z.S.I., Port Blair. Regd. No. 2393.

**Type locality :** Coarse and medium sand with little detritus 5-10 cm below surface between low and half-tide levels, intertidal zone, Bomila Creek, Little Andaman, India.

Family THAUMASTODERMATIDAE

Genus *Acanthodasyas* Remane, 1927

30. *Acanthodasyas aculeatus* Remane

1927. *Acanthodasyas aculeatus* Remane, *Zool. Jb. (Syst.)*, 54 : 203.

**Material examined :** 1 ex., West Bay, 28.3.90.

**Diagnostic features :** Body elongate, vermiform and dorsoventrally flattened, with both ends slightly tapering. Length and width ratio is around 10 : 1. Ventral ciliation uniform. Cuticular armature with nail-shaped unispined hooks excepting the anterior head region. Lateral epidermal glands present. Dorsolateral tubes 6-8 pairs. Caudal lobes with 2 adhesive tubes each. Pharynx forms 1/4 of the total length. Mouth terminal and inclined to the ventral surface. Pharyngeal pores inconspicuous at the posterior end of pharynx. Testes paired. Solitary dorsal ovary.

**Measurements :** Length 0.5 mm and width 0.05 mm.

**Remarks :** The specimens from Little Andaman conform well with the original description of the species except for minor variations in

the number and disposition of adhesive tubes, particularly the dorsolateral ones.

*Habitat* : Medium sand with little detritus between low and half-tide levels, intertidal zone.

*Distribution* : Eurytopic on the coasts of Atlantic and Indian Oceans.

### Genus *Thaumastoderma* Remane, 1926

#### 31. *Thaumastoderma heideri* Remane

1926. *Thaumastoderma heideri* Remane, *Z. Morph. Okol.*, 5 : 625.

*Material examined* : 2 ex., South Bay, 26.3. 90.

*Diagnostic features* : Body elongate and dorsoventrally flattened. Head with 2 pairs of laterally directed tentacles. Dermal hooks 4-pronged. Five pairs of anterior, 20 pairs of lateral and 6 pairs of posterior tubes present. Two pairs of reddish eye spots on head are characteristic of the species. Five pairs of long dorsolateral cirri present. Ventral ciliation uniform. Pharyngeal pores located at the posterior end of pharynx. Single testis lies on the right side lateral to the anterior part of intestine. Copulatory bursa and seminal receptacle present.

*Measurements* : Length 0.25 mm and maximum width 0.05 mm.

*Remarks* : Although the material examined corresponds well with the original description of the species from Baltic Sea, the disposition of tentacles and adhesive tubes resemble more the specimens of the species reported by Gerlach (1961) from Maldives.

*Habitat* : Medium and coarse sand with little detritus 5-10 cm below surface near half-tide level, intertidal zone.

*Distribution* : Eurytopic along the coasts of Atlantic and Indian Oceans.

Genus *Tetranchyroderma* Remane, 1926

32. *Tetranchyroderma indica* Rao and Ganapati

1968. *Tetranchyroderma indica* Rao and Ganapati, *Proc. Ind. Acad. Sci.*, 67 : 46.

*Material examined* : 1 ex., East Bay, 26.3. 90.

*Diagnostic features* : Body elongated and dorsoventrally flattened, with both the ends rounded. Cuticular armament of tetrancres in 10-12 longitudinal rows. A pair of cephalic tentacles and 4 pairs of dorso-lateral cirri present. Five pairs of anterior, 20-30 pairs of lateral and 16-20 posterior adhesive tubes present. Posterior pedicles absent. Five to 7 pairs of dorsolateral epidermal glands present. Ventral ciliation uniform and complete. Pharynx is 110  $\mu\text{m}$  long and occupies about 1/3 of the total gut length. A single tubular testis present on the right side.

*Measurements* : Length 0.3 mm and width 0.06 mm.

*Remarks* : The specimens examined agree well with the original description except for the larger number of lateral and posterior adhesive tubes in the local forms.

*Habitat* : Medium sand 10 cm below surface near half-tide level, intertidal zone.

*Distribution* : Andhra and Orissa coasts, Andaman Islands. Lakshadweep.

33. *Tetranchyroderma tentaculata* n. sp.

(Fig. 4)

*Material examined* : 7 ex., West Bay 28.3.90.

*Description* : The adult specimens attain a maximum length of 360  $\mu\text{m}$  and a width of 80  $\mu\text{m}$  at a middle part of the body in extended condition. Body dorsoventrally flattened and contractile. Head distinct, truncate anteriorly, with a narrow neck and a wide trunk tapering posteriorly. Pestle organs absent. Head bears a pair of

short and curved tentacles on the antero-lateral corners, attaining a length about  $12\ \mu\text{m}$  long. Posterior end of body bears two pedicles commonly seen in other species of the genus.

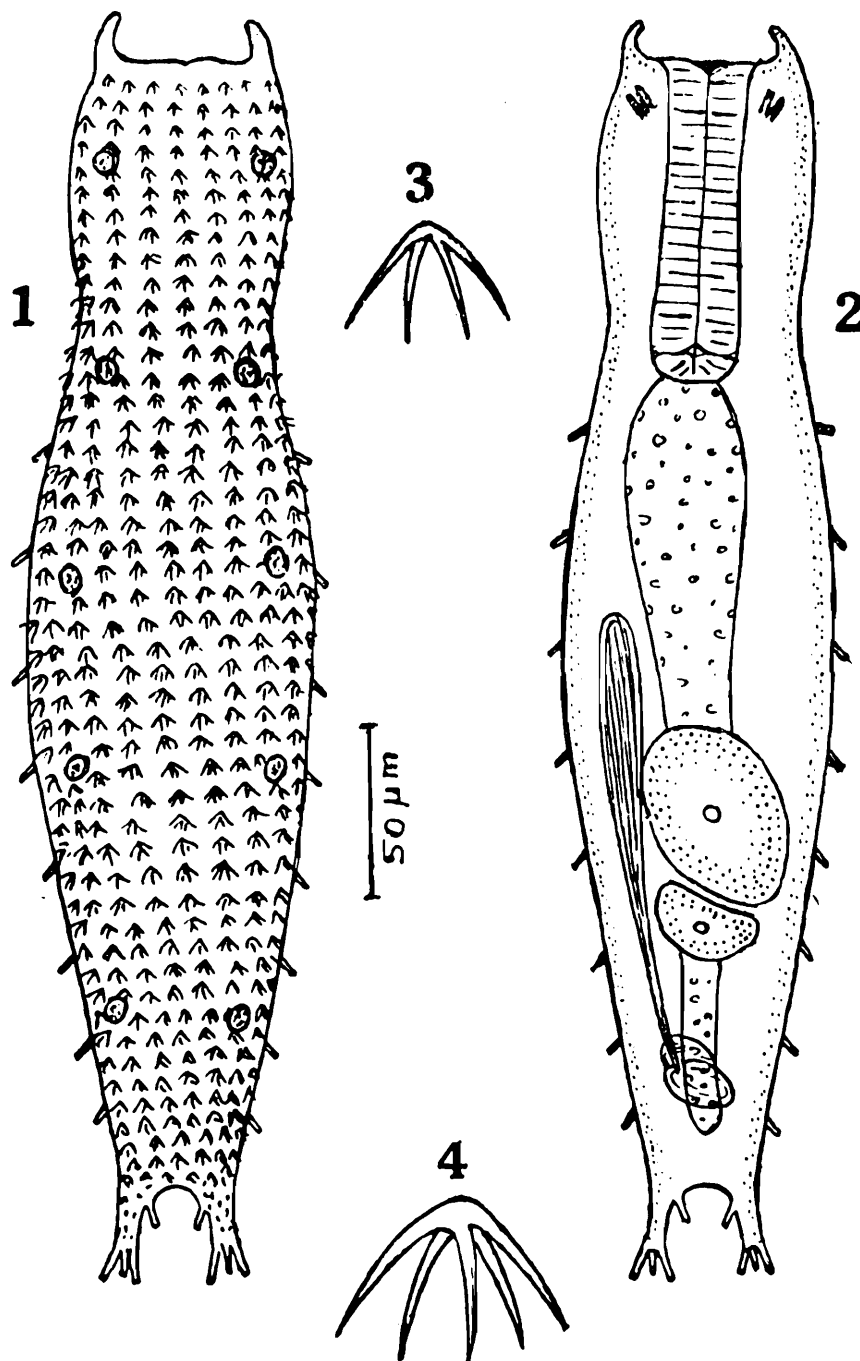


Fig. 4: *Tetranchyroderma tentaculata* n. sp. 1. Adult, dorsal view; 2. Same, ventral view; 3. Tetrancra; 4. Pentancra.

The body has a dorsal covering of cuticular hooks arranged in 46-50 transverse rows. Each row consists of 8-10 hooks. The head and neck region supports tetrancra or 4-pronged hooks, while the rest

of the posterior body has pentaneres or 5-pronged hooks. All the hooks have prongs of equal size and measure about 2-3  $\mu\text{m}$  in the anterior region and 3-5  $\mu\text{m}$  on the rest of the body. There are 5 pairs of oval epidermal glands 8-10  $\mu\text{m}$  in diameter on the dorsal surface with refringent granular material. Short sensory cilia 8-10  $\mu\text{m}$  long occur on cephalic tentacles and lateral margins of trunk. Ciliation on ventral surface is restricted to a median band extending from the anterior end to the posterior end.

Adhesive tubes occur in three groups. Anterior adhesive organ consists of two pairs of tubes about 8  $\mu\text{m}$  long on the ventral surface of head just behind the mouth. Eight pairs of evenly spaced ventrolateral tubes measuring 8-10  $\mu\text{m}$  long are present. The tubes start at the level just after the neck region and extend to the posterior region. The posterior adhesive pedicles are trifid with one dorsal and two ventral tubes. Between the two pedicles on the inner side occurs a pair of posteriorly directed tubes. All the posterior tubes are nearly equal in length and reach about 8-10  $\mu\text{m}$ .

The mouth is widely extensible, 30  $\mu\text{m}$  in width and inclined to the ventral surface. Pharynx is about 90  $\mu\text{m}$  long and occupies nearly 1/3 of the total gut length. Pharyngeal pores are distinct at the posterior end of pharynx. Anus subterminal. Reproductive system follows the usual pattern typical of the genus with a single testis and ovary. The linear testis lies on the right side of the gut. Two oocytes were observed in a mature specimen, attaining a maximum length of 50  $\mu\text{m}$ . Receptaculum seminis and bursa copulatrix are bladder-like and open on the ventral surface close to the male genital aperture and anus.

*Remarks* : Among the known species of the genus *Tetranchyroderma* having both the tetraneres and pentaneres, the new species *T. tentaculata* closely approaches *T. paralittoralis* Rao (1991) in the disposition of epidermal hooks, adhesive tubes and reproductive organs. But, the new species clearly differs from the two known species in the shape of body, presence of bent tentacles of head, number of dorsal epidermal glands, transverse rows of cuticular hooks and adhesive tubes and the structure of bursa copulatrix.

**Diagnostic features :** Body up to 360  $\mu\text{m}$  long and 80  $\mu\text{m}$  wide. Head tentacles present. Dorsal body surface covered with 46-50 transverse rows of hooks. Tetrancres occur anteriorly and pentancres on the rest of the body. Five pairs of dorsolateral epidermal glands present. Adhesive organs comprise 2 pairs of anterior tubes, 8 pairs of lateral tubes and 3 pairs of posterior tubes and a pair of inner tubes on pedicles. Testis unpaired on the right side. Seminal receptacle and bursa copulatrix bladder-like.

**Holotype :** Adult specimen 360  $\mu\text{m}$  long with gonads collected by the author on 28.3.90. Deposited in the National Zoological Collections, ZSI, Port Blair. Regd. No. 2394.

**Type locality :** Medium sand with little detritus 10 cm below surface near half-tide level, intertidal zone, West Bay, Little Andaman, India.

#### 34. *Tetranchyroderma* sp.

**Material examined :** 3 ex., West Bay, 28.3.90.

**Description :** The specimens attain a length of 280-320  $\mu\text{m}$  and a width of 50  $\mu\text{m}$  in extended condition. Body vermiform and dorsoventrally flattened. Head and neck indistinct. Anterior and posterior ends of body rounded, with two pedicles of the usual shape on the posterior border. Body has a dorsal covering of triancres or 3-pronged scales on anterior region and tetrancres or 4-pronged scales on the rest of the body. The scales occur in 12-14 longitudinal rows. Eight to 10 pairs of dorsolateral epidermal glands present. Adhesive organ consists of 2 pairs of anterior tubes, 10-12 pairs of ventrolateral tubes and 4 pairs of posterior tubes. Internal organization including the gonads could not be studied due to opaque body.

**Remarks :** Among the known species of the genus *Tetranchyroderma*, the present species approaches *T. paradoxa* Thane-Fenchel (1970) described from South Florida beaches in the structure of body and disposition of epidermal scales, glands and adhesive tubes. But, variations occur in the number of dermal scales and lateral adhesive tubes. However, the identification of the present species has been

deferred to later date in the absence of any information on internal anatomy.

*Habitat* : Medium sand rich in organic detritus 10 cm below surface near mid water level, intertidal zone.

Genus *Pseudostomella* Swedmark, 1956

35. *Pseudostomella malayica* Renaud-Mornant

1967. *Pseudostomella malayica*. Renaud-Mornant, *Bull. Mus. nat. Hist. Nat.*, 39 : 209.

*Material examined* : 2 ex., Butler Bay, 21.3.90.

*Diagnostic features* : Body uniformly elongated and dorsoventrally flattened, with a thick cuticular armament of tetrancres in 66-68 transverse rows. Each tetrancra attains about 2  $\mu$ m in size. The characteristic anterior cephalic net has 8 dorsal and 8 ventral papillae of varying size, the outermost ventral ones being the largest. Two pairs of anterior, 3 pairs of lateral and 3 pairs of ventral adhesive tubes present. Posterior pedicle has one ventral, one lateral and 2 dorsal tubes. Dorsal epidermal glands occur in 6-8 pairs. Testis and ovary unpaired.

*Measurements* : Length 0.21 mm and width 0.04 mm.

*Remarks* : The specimens conformed well with the original description of the species except for the smaller body size, lower number of tetrancres and higher number of ventral adhesive tubes. The local specimens bear 3 pairs of short ventral tubes, compared to the 2 pairs known for the type specimens. The dorsal epidermal glands are also higher in number in local specimens.

*Habitat* : Medium sand 10 cm below surface near mid-water level, intertidal zone.

*Distribution* : Malaysia, Andaman and Nicobar Islands.

36. *Pseudostomella andamanica* n. sp.

(Fig. 5)

*Material examined* : 6 ex., Dugong Creek, 24.3.90.

*Description* : Adult specimens of the species attain a length of 0.5 mm and a maximum width of 65  $\mu\text{m}$  in extended condition. The body is well elongated and dorsoventrally flattened, with almost uniform width all along the body. There is a dorsal covering of 4-pronged scales or tetrancres, excepting a little part on the anterior head region. The scales are quite small, 2-3  $\mu\text{m}$  in size and arranged in 10-12 longitudinal rows. No scales could be observed on the ventral surface. The organization of the cephalic net in the prebuccal region comprises 7 dorsal and 6 ventral papillae, each papilla supporting a vibratile bristle at the distal end. The dorsal papillae reach 10-12  $\mu\text{m}$  long, while the ventral papillae are 5-6  $\mu\text{m}$  long. The cephalic appendages attain a length of about 70  $\mu\text{m}$  and each bears 2 pairs of sensory cilia on elevated knobs on the outer side.

The adhesive tubes occur as usual in three paired series. Two pairs of anterior tubes occur on ventral surface of head just behind the mouth and are 6-8  $\mu\text{m}$  long. There are 8 pairs of lateral tubes 10  $\mu\text{m}$  long, disposed more or less at equal distance from each other. The lateral tubes start just behind the head and extend close to the posterior end. Two pedicles of the usual shape occur on the posterior border, each bearing 3 apical tubes 8-12  $\mu\text{m}$  long and an inner tube 8  $\mu\text{m}$  long situated close to the base. No adhesive tubes occur on the posterior border between the two pedicles.

Epidermis contains 6 pairs of well developed dorsolateral glands about 8  $\mu\text{m}$  in diameter. Ventral glands are not seen. Ventral surface of body has a uniform covering of cilia. Mouth is spacious, terminal and inclined to the ventral surface. The pharynx is about 120  $\mu\text{m}$  long and occupies nearly one-third of the total gut length. Pharyngeal pores occur close to the posterior end of pharynx. The gut following pharynx is undifferentiated and tapers to the posterior end. Anus is subterminal.

The reproductive system follows the usual pattern characteristic



of the genus. The unpaired testis is situated in the second half of body lying close to the digestive tract. Ovaries lie on the opposite side of testis. A oocyte of  $70 \times 36 \mu\text{m}$  in size situated on dorsal side was

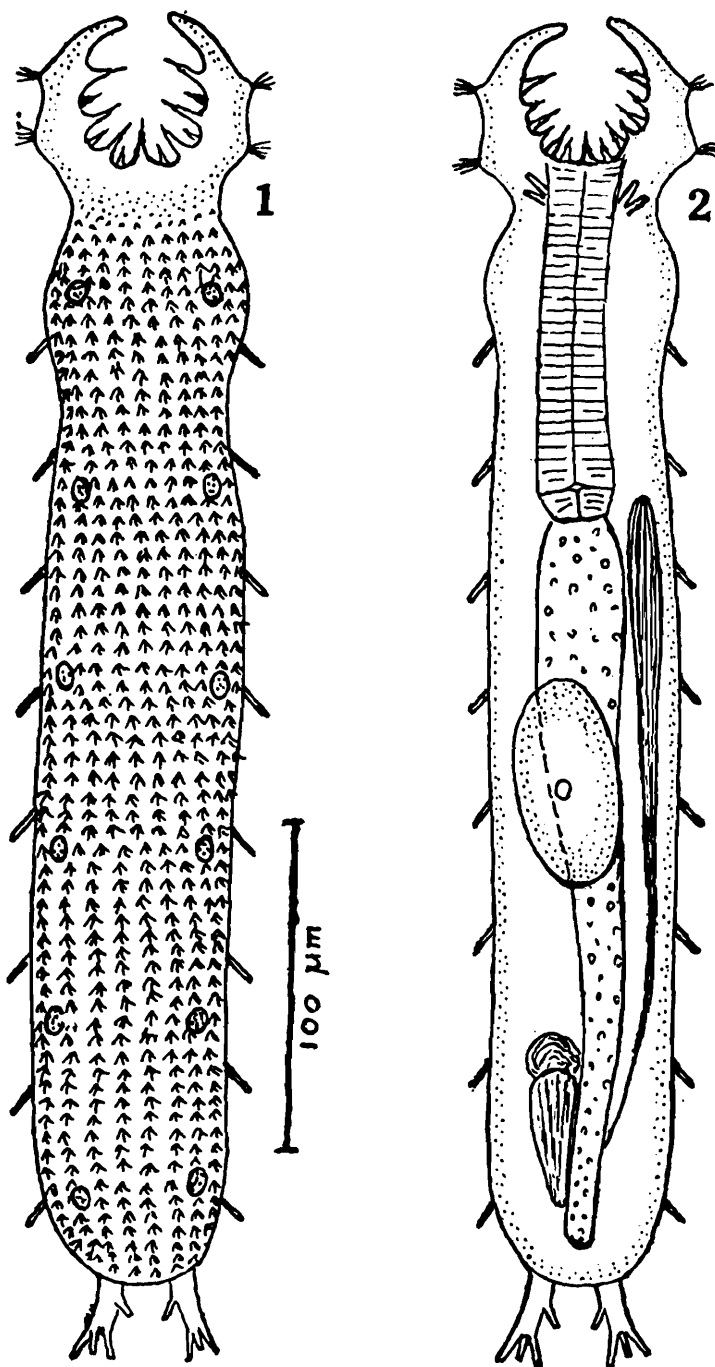


Fig. 5: *Pseudostomella andamanica* n. sp. 1. Adult, dorsal view; 2. Same, ventral view.

observed in a mature specimen. The seminal receptacle and bursa copulatrix lie close to the intestine in the last quarter of body. The male and female genital pores open on ventral surface close to the anus,

*Remarks* : Among the six known species of the genus *Pseudostomella*, the new species *P. andamanica* closely approaches *P. malayica* Renaud-Mornant (1967) described from the west coast of Malaysia in general organization of body, structure of cephalic net and the disposition of 4-pronged scales, dorsolateral epidermal glands, adhesive tubes and reproductive organs. But, the new species clearly differs from the known species in the larger body size, number and disposition of lateral adhesive tubes and the shape of bursa copulatrix.

*Diagnostic features* : Body elongated and dorsoventrally flattened, reaching up to 0.5 mm long. Width/length ratio is about 1/8. Dorsal covering of tetrancres of 2-3  $\mu\text{m}$  in size occur in 12 longitudinal rows. The buccal cephalic net supports 7 dorsal and 6 ventral sensory papillae. Two pairs of the anterior tubes, 8 pairs of lateral tubes and 3 pairs of posterior tubes on pedicles present, with a pair of short tubes on the inner side. Pharynx occupies about 1/3 of the total gut length. Testis unpaired. Bursa copulatrix elongate. Male and female genital pores open close to the anus on ventral surface.

*Holotype* : Adult specimen 0.5 mm long with gonads collected by the author on 24.3.90. Deposited in the National Zoological Collections, ZSI, Port Blair. Regd. No. 2395.

*Type locality* : Medium sand rich in organic detritus 10 cm below surface near mid-water level, intertidal zone, Dugong Creek, Little Andaman, India.

Family PLANODASYIDAE

Genus *Planodasys* Rao, 1970

37 *Planodasys littoralis* n. sp.

(Fig. 6)

*Material examined* : 5 ex., Harmindar Bay, 25.3.90 ; 2 ex., South Bay, 26.3.90.

*Description* : Adult specimens attain a length of 760-800  $\mu\text{m}$  and a maximum width of 85-90  $\mu\text{m}$  seen in the anterior one-third of body.

The whole-body is transparent, dorsoventrally flattened and ribbon-like. Anterior end is bluntly rounded, while the posterior end slightly tapers into a tail with two terminal symmetrical lobes. The tail lobes are distinct and triangular with broad bases and tapering tips. The lobes are 15-20  $\mu\text{m}$  long and highly retractable. The head is indistinct and merges with the posterior trunk. Dorsal surface of body is smooth without any cuticular ornamentation as hooks or scales. Epidermis contains 8 pairs of oval and dorsolateral glands measuring about 10  $\mu\text{m}$  in diameter. Head with two shallow lateral pits, each carrying a pestle organ sensory in function. Anterior and lateral margins of head and trunk bear sensory hairs 12-18  $\mu\text{m}$  long. Ventral ciliation occurs in two distinct longitudinal bands. Ventral glands indistinct.

Adhesive tubes occur in three paired groups, viz., anterior, lateral and posterior. Anterior tubes occur disposed in a diagonal row broken in the middle on ventral surface of head just behind buccal cavity. Each group consists of 6 tubes directed forwards and 8-10  $\mu\text{m}$  long. Lateral tubes extend from just behind anterior tubes close to the posterior end. There are about 30 lateral tubes on either side of the body attaining 12-15  $\mu\text{m}$  in length. Each tail lobe bears 8 posterior tubes, 4 tubes being disposed on either side. The tubes are directed backwards, progressively increase in size and attain a length of 6-10  $\mu\text{m}$ , the distal two tubes being always the longest. Adhesive tubes are absent on the posterior border of the animal between the two tail forks.

Mouth is 20  $\mu\text{m}$  wide, terminal and inclined to ventral surface. It lacks any accessory structures. Buccal cavity is shallow, cup-shaped, with thin cuticularised walls. Pharynx is about 260  $\mu\text{m}$  long with numerous refringent granules and occupies nearly one-third of the total gut length. Pharyngeal pores are well developed and occur close to the hind end of pharynx. The gut following the pharynx is almost straight and consists of a broad stomach and slender intestine. Anus is subterminal and opens on the ventral surface.

The species is a hermaphrodite with paired testes and ovaries situated lateral to the digestive tract. The testes run from just behind the pharyngeal knobs along the anterior part of stomach. Ovaries lie just behind testes. Position of male genital pore is indistinct, but the vasa deferentia converge posteriorly anterior to the egg cells. A cylind-

rical bursa copulatrix characteristic of the genus occurs posteriorly, running close to the intestine to the level of anus. The bursa is 150  $\mu\text{m}$  long, slightly bent and muscular, with a conspicuous internal ciliated

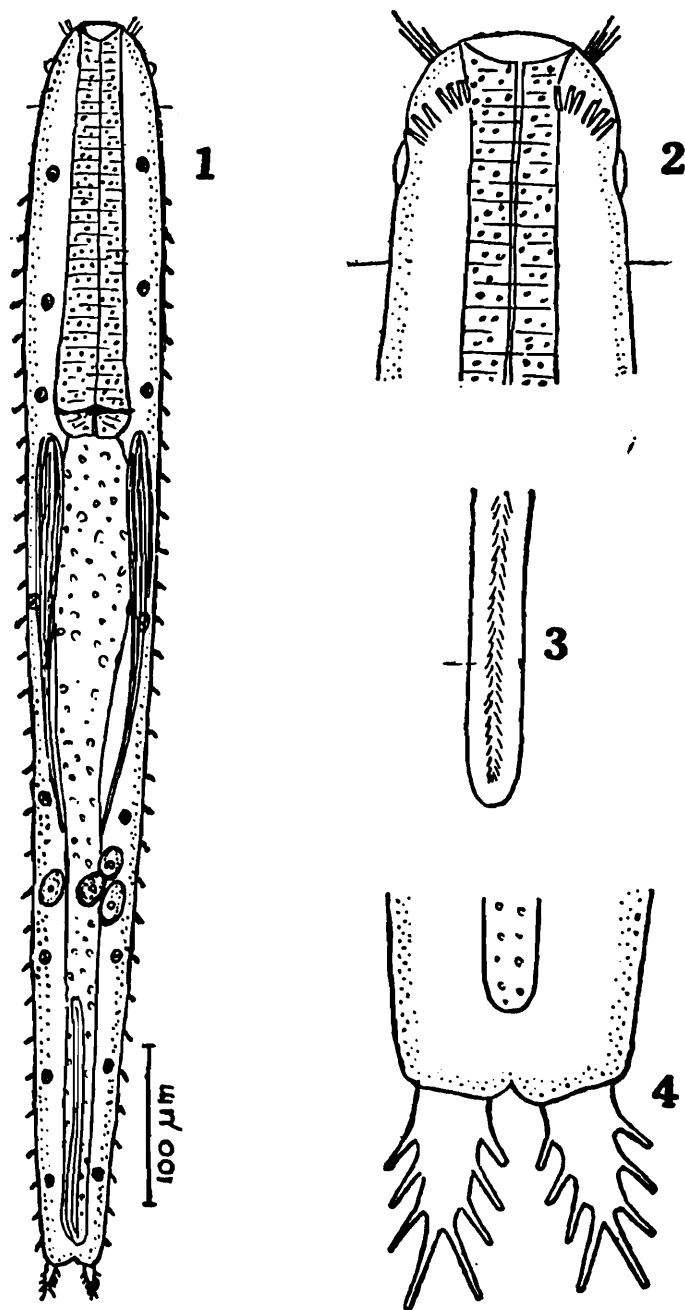


Fig. 6: *Planodasys littoralis* n. sp. 1. Adult, dorsal view; 2, Anterior end, ventral view; 3. Posterior part of bursa; 4. Posterior end, dorsal view.

canal opening ventral surface close to anus. No seminal receptacle or antrum feminum could be distinguished. Spermatozoa are thread-like and undifferentiated into head and tail.

**Remarks :** The genus *Planodasys* hitherto contains only one species *P. marginalis*. Rao (Rao and Clausen, 1970) described from the beach sands at Waltair on the east coast of India. Both these species resemble in several morphological and anatomical characters as the shape of body, head, tail lobes, adhesive tubes, cuticle, pestle organs, pharynx and reproductive organs. But, the new species clearly differs from the known species in body size, shape of tail lobes and buccal cavity, number of adhesive tube and epidermal glands and the position of ovaries. Until now, the distribution of this genus is confined to the Indian Ocean and *P. littoralis* n. sp. constitutes the second species of the genus described from this region.

**Diagnostic features :** Body dorsoventrally flattened, elongated and ribbon-like, reaching up to 800  $\mu\text{m}$  long and 90  $\mu\text{m}$  in maximum width. Head indistinct. Tail lobes triangular. A pair of pestle organs and 8 pairs of dorsolateral epidermal glands present. Six pairs of anterior tubes, 30 pairs of lateral and 8 pairs of posterior tubes present. Buccal cavity cup-shaped. Pharynx forms one-third of total gut length, with pores at the hind end. Gonads paired. Bursa copulatrix cylindrical and posterior in position.

**Holotype :** Adult specimen 780  $\mu\text{m}$  long with ova and sperm collected by the author on 25.3.90. Deposited in the National Zoological Collections, ZSI, Port Blair. Regd. No. 2396.

**Type locality :** Medium sand with little detritus 10 cm below surface between low and mid-water levels, intertidal zone, Harmindar Bay, Little Andaman, India.

Family TURBANELLIDAE

Genus *Paraturbanella* Remane, 1927

38. *Paraturbanella* sp.

**Material examined :** 1 ex., West Bay, 28.3.90.

**Description :** Body 480  $\mu\text{m}$  long from anterior end to tail end and 50  $\mu\text{m}$  in maximum width. Body elongated, dorsoventrally flattened and

ribbon-like, with maximum width at the middle part and tapering posteriorly into a tail. Head distinct with lateral cephalic lobes. Piston pits present laterally behind the cephalic lobes. Numerous dorsolateral epidermal glands present. Ventral ciliation occurs in two lateral longitudinal bands. Caudal lobes missing due to damage to tail end. Median anal cone could not be observed. Five pairs of anterior tubes and two pairs of long ventrolateral tubes of unequal length typical of the genus present. Posterior tubes could not be ascertained. Buccal cavity conical and thickly cuticularised. Pharynx forms one-third of the total gut length. Pharyngeal pores as usual occur at the posterior end. Gonads are indistinct and not well developed.

*Remarks* : The single specimen collected and examined was damaged at the posterior end. Among the known species of the genus *Paraturbanella*, the specimen approaches *P. mesoptera* Rao (1970) described from the east coast of India in the organization, shape and structure of body. But, in the absence of any information on the caudal lobes and the posterior adhesive tubes, it is not possible at the present to ascertain the exact status of the species.

*Habitat* : Medium sand rich in organic detritus 10 cm below surface between the low and half-tide levels, intertidal zone.

#### Order CHAETONOTIDA

#### Family XENOTRICHULIDAE

#### Genus *Xenotrichula* Remane, 1927

#### 39. *Xenotrichula velox* Remane

1927. *Xenotrichula velox* Remane, *Zool. Anz.*, 71 : 289.

*Material examined* : 2 ex., Bomila Creek, 19.3.90 ; East Bay, 28.3.90.

*Diagnostic features* : Body dorsoventrally flattened and covered with pedunculated scales in about 16 longitudinal rows. Head with two lateral tentacles 20  $\mu$ m long directed backwards and 2 pairs of long sensory bristles directed forwards. Two caudal furca with adhesive

tubes. Locomotory ventral cirri of one size occur in two longitudinal rows on either side of the digestive tract. Pharynx forms 1/3 of the total gut length. Pharyngeal pores inconspicuous. Hermaphroditic with testes and ovary.

*Measurements* : Length 0.25 mm and width 0.05 mm.

*Remarks* : The specimens examined agree well with the original description of the species except for minor variations in the length of the body parts and the number of the rows of dorsal dermal scales.

*Habitat* : Medium sand rich in organic detritus, 10 cm below surface between low and high water levels, intertidal zone.

*Distribution* : Baltic Sea, Mediterranean, Atlantic and Indian Oceans.

#### Genus *Chaetonotus* Ehrenberg, 1830

#### 40. *Chaetonotus atrox* Wilke

1954. *Chaetonotus atrox* Wilke, *Zool. Jb. (Syst.)*, 82 : 527.

*Material examined* ; 1 ex., Hut Bay, 18.3.90.

*Diagnostic features* : Body dorsoventrally flattened with distinct head, neck and trunk. Trunk widest in mid-body region. Paired tufts of sensory bristles occur on anterior margin of head. The species belongs to the *schultzei* group with 9-11 rows of scales with median and lateral spine 10-25  $\mu$ m long. Caudal furca curved to the interior. The scales are horse-shoe shaped on anterior region of trunk and triangular on posterior region. Spines on scales in the mid-body region are the longest. Pharynx forms 1/3 of the total body length. Oral tube rigged. Anus subterminal on dorsal surface. Ventral ciliation in regular transverse bands. A single dorsal ovum present.

*Measurements* : Length 0.16 mm and maximum width 0.04 mm. Caudal furca 24  $\mu$ m long.

*Remarks* : Although considerable variation has been reported in the disposition of dermal scales of this species from different geogra-

phical regions, the local specimens, however, closely approach the original description of the species given for the Mediterranean specimens.

*Habitat* : Medium sands 5 cm below surface between low and high water levels, intertidal zone.

*Distribution* : Eurytopic along the coasts of Atlantic and Indian Oceans.

#### 41. *Chaetonotus* sp.

*Material examined* : 2 ex., Butler Bay, 21.3.90 ; 3 ex., Dugong [Creek, 24.3.90.

*Description* : Body shape characteristic of the genus with distinct head, neck and trunk. Head unlobed and bears 2 pairs of long ciliary tufts. Neck is narrow. Posterior end of trunk is rounded ending in two caudal furca 20  $\mu$ m long. Dorsal body surface covered with triangular scales 5  $\mu$ m long in 14 longitudinal rows. The spines which project from central part of scales are 6-10  $\mu$ m long. This species belongs to the *hermaphroditic* group based on the structure of scales. Ventral cilia occur in 2 longitudinal bands lateral to the digestive tract. Pharynx non-bulbous at the posterior end. Gonads were not studied in detail, but the presence of paired testes and ovary shows that the species is hermaphroditic.

*Measurements* : Length 0.6 mm and maximum width 0.04 mm.

*Remarks* : Specific identification of the material needs further study in detail.

*Habitat* : Fine and medium sands rich in organic detritus, intertidal zone.



Phylum KINORHYNCHA

Class CYCLORHAGEA

Order NOMOSOMATIDA

Family ECHINODERIDAE

Genus *Echinoderes* Claparede, 1863

42. *Echinoderes andamanensis* Higgins and Rao

1979. *Echinoderes andamanensis* Higgins and Rao, *Zool. J. Linn. Soc.*, 67 : 77.

*Material examined* : 3 ex., Bomila Creek, 19.3.90 ; 1 ex., Dugong Creek, 24.3.90.

*Diagnostic features* : Minute spiny and segmented worms, with distinct head, neck and trunk comprising 11 segments. Body dorsoventrally compressed with lateral and terminal spines. Mid-dorsal spines absent. Lateral terminal accessory spines of females are quite short and robust, while they are absent in males. Pachycycli well developed with distinct pattern. Sub-dorsal sensory spots occur on segments 3, 6, 7, 8, 9, 10 and 11. Muscle scars barely evident.

*Measurements* : Total length 0.27 to 0.30 mm and width 66 to 70  $\mu$ m.

*Remarks* : The material examined agrees well with the original description of the species made from Havelock Island, South Andaman, except for minor variations in the measurements of body spines. But, unlike the type description, the female indicated a short sensory seta on the 12th segment.

*Habitat* : Surface layers of soft mud rich in organic detritus near mid-water level, intertidal zone.

*Distribution* : Hitherto, the species is known only from the Andaman and Nicobar Islands in the Bay of Bengal.

43. *Echinoderes* sp.

*Material examined* : 2 ex., Dugong Creek, 24.3.90.

**Description :** Body elongate and vermiform. Length-width ratio is about 5 : 1. Mid-dorsal spines present on zonites 6-10 with their length increasing posteriorly. Lateral spines occur on zonites 6-10. Paired lateral end spines are 90  $\mu$ m long. Posterior margins of the zonites 3-11 bear minute hair-like processes. Somatic ornamentation punctae. Eyes are not seen. Dorsolateral and ventrolateral muscle scars indistinct. Pachycycli well developed, with distinct pattern on ventromedian and posterolateral plates. Male unknown.

**Measurements :** Length 310  $\mu$ m.

**Remarks :** Further detailed examination of more material is required for confirming its specific identity.

**Habitat :** Fine muddy sand near water level, intertidal zone.

Phylum ANNELIDA

Class ARCHIANNELIDA

Family POLYGORDIIDAE

Genus **Polygordius** Schneider, 1868

44. **Polygordius madrasensis** Aiyar and Alikunhi

1944. *Polygordius madrasensis* Aiyar and Alikunhi, *Proc. nat. Inst. Sci. India*, 10 : 113.

**Material examined :** 2 ex., South Bay, 26.3.90 ; West Bay, 28.3.90.

**Diagnostic features :** Body white in colour with 40-60 segments externally indistinct. Hypodermal glands well developed. External ciliation absent. Head distinct with triangular anterior portion and broad posterior part. Two moderately long cephalic tentacles present. Eyes absent. Pygidium swollen with a pair of anal cirri shorter than cephalic tentacles. Anal lobes absent. Adhesive glands occur around pygidium in a band. Sexes separate. Gonads develop from fifteenth segment onwards. Highly thigmotactic.

**Measurements :** Length 5.0-6.0 mm and diameter 0.16 mm. Tentacles 0.15 mm long. Anal cirri 0.07 mm long.

*Remarks* : The specimens conform well with the original description of the species from Madras coast but for the slightly smaller body size and its grey colour.

*Habitat* : Coarse sand with fine shell gravel and little detritus near low water level in exposed areas, intertidal zone.

*Distribution* : Andaman Islands, Lakshadweep, Indian and South African coasts.

#### 45. *Polygordius* sp.

*Material examined* : 1 ex., West Bay, 28.3.90.

*Description* : Body pale-white with 25-35 segments. Hypodermal glands present. Body ciliation absent. Head distinct with 2 short cephalic tentacles and 2 dark irregular eyes. Pygidium missing due to some physical damage. Nuchal organs are in the form of ciliated depressions, situated behind the eyes. Minute palpcils in groups of 3-5 project from sides of body. Pharynx cylindrical with ciliated internal canal. Alimentary canal straight and filled with large nutrient globules. Reproductive organs were not studied in detail.

*Measurements* : Length 8.0 mm and diameter 0.15 mm. Tentacles 0.15 mm long.

*Remarks* : Although the single specimen examined conforms to a considerable extent with *P. uroviridis* Aiyar and Alikunhi (1944) described from beach sands of Madras coast, in the absence of pygidium, it is not possible to ascertain the exact position of the species.

*Habitat* : Coarse sand near low water level under exposed conditions, intertidal zone.

#### Family PROTODRILIDAE

#### Genus *Protodrilus* Hatschek, 1882

#### 46. *Protodrilus indicus* Aiyar & Alikunhi

1944. *Protodrilus indicus* Aiyar & Alikunhi, *Proc. nat. Inst. Sci. India*, 44 : 126.

*Material examined* : 1 ex., Butler Bay, 21.3.90 ; South Bay, 36.3.90 ; 2 ex., West Bay, 28.3.90.

*Diagnostic features* : Body transparent and attenuated posteriorly. Number of segments vary between 20 and 30. Cuticle thin and devoid of external ornamentation. Hypodermal glands few and spindle-shaped. Head not swollen, indistinct, with 2 long cephalic tentacles, 2 statocysts and 4 incomplete ciliary bands. Eyes absent. Nuchal organs conspicuous behind the tentacles as linear depressions with bunches of long cilia. Pygidium deeply bifurcated with 2 long adhesive anal lobes. Ventral groove is deep. Macrotype nephridia develop from second segment backwards. Sexes separate. Gonads develop from tenth segment backwards.

*Measurements* : Length 2.0-3.0 mm and width 0.06 mm. Tentacles 0.25 mm long.

*Remarks* : The material conforms well with the original description of the species from Madras coast in all the important features.

*Habitat* : Medium and coarse coralline sand with little detritus between low and mid-water levels, intertidal zone.

*Distribution* : India, Lakshadweep, Andaman Islands, Malaysia, New Caledonia, Galapagos Islands.

#### 47. *Protodrilus* sp.

*Material examined* : 4 ex., East Bay, 20.3.90 ; 2 ex., Butler Bay, 21.3.90.

*Diagnostic features* : Body short, vermiform, dorsoventrally flattened and slightly tapers posteriorly. Number of somatic segments vary between 20 and 26. No chaetae on body. Cuticle thin and devoid of any external ornamentation. Hypodermal glands poorly developed, scarce and oval-shaped. Head not swollen anteriorly and indistinct from the rest of body. Two long cephalic tentacles, 2 statocysts, 2 dark eye spots, 2 nuchal organs and 4 ciliary bands present on head. Two well developed and elongated caudal lobes occur on pygidium. Ventral groove indistinct. Ventral ciliation well developed extending between

mouth and anus. No observations were made relating to internal structures as salivary glands, nephridia and gonads.

*Measurements* : Length 3.0-4.0 mm and width 0.5 mm. Tentacles 0.24-0.26 mm long.

*Remarks* : In the structure of the external features, the present specimens closely approach *P. indicus* Aiyar and Alikunhi (1944), but for the presence of 2 dark eye spots on head and the shape of hypodermal glands. However, a further detailed study of the material is needed to clearly establish its specific identity.

*Habitat* : Medium and coarse sand with little detritus between low and mid-water levels, intertidal zone.

#### Family SACCOCIRRIDAE

#### Genus *Saccocirrus* Bobretzky, 1872

#### 48. *Saccocirrus minor* Aiyar and Alikunhi

1944. *Saccocirrus minor* Aiyar and Alikunhi, *Proc. nat. Inst. Sci. India*, 10 : 129.

*Material examined* : 2 ex., Harmindar Bay, 25.3.90, ; 1 ex., South Bay, 26.3.90.

*Diagnostic features* : Minute active worms with 80-100 setigerous segments. Head conical with a pair of long tentacles, 2 dark conspicuous eyes and 2 oblique nuchal organs located at the base of tentacles. Pygidium without bifurcation, anal cirri or anal lobes but with 2 glandular ventral adhesive pads. Parapodia occur from second segment backwards. Setae with expanded tips. Pharynx without ventral muscular pad. Body shows definite sculptured appearance on dorsal side. Sexes separate. Reproductive organs complicated. Gonads develop in middle and posterior segments. Sperm sacs occur in lateral chambers of body cavity. Penis swollen in the middle with supporting cuticular rods.

*Measurements* : Length 8-10 mm. Tentacles 0.8-1.0 mm long.

*Remarks* : The specimens examined agree with the original des-

cription of the species except for a minor variation with the number of body segments.

*Habitat* : Coarse and medium sands with little detritus near low water level, intertidal zone.

*Distribution* : India, Lakshadweep, Andaman Islands, Malayasia.

#### 49. *Saccocirrus krusadensis* Alikunhi

1948. *Saccocirrus krusadensis* Alikunhi, *Proc. nat. Inst. Sci. India*, 14: 373.

*Material examined* : 1 ex., West Bay, 28.3.90.

*Diagnostic features* : Minute worms, white in colour with 100-120 segments, the last 2 being achaetous. Head triangular with a pair of long tentacles, 2 conspicuous brown eyes and 2 ciliated nuchal organs. Pygidium deeply bifurcated into 2 long caudal lobes. Each caudal lobe bears 5-8 rows of ventral adhesive papillae. Anal cirri absent. Pharyngeal ventral muscular pad present. Parapodia with 3 types of setae *viz.*, long papillary setae with bifurcate tips, medium setae with broad tips and short setae with blunt tips. Bifid tip of long setae asymmetrical. Sexes separate. Gonads developed only on the left side of the digestive tract from twenty fourth segment backwards.

*Measurements* : Length 10.0 mm. Tentacles 1.0 mm long.

*Remarks* : The material examined conforms well with the original description of the species made from Krusadai Island in the Gulf of Manaar. Minor variations of the material, however, occurred in the size of the arms of the medium setae on parapodia.

*Habitat* : Coarse and clean sand near low water level, intertidal zone.

*Distribution* : India, Lakshadweep, South Africa, Andamans, Australia.

Family DINOPHILIDAE

Genus *Diurodrilus* Remane, 1925

50. *Diurodrilus benazzii* Gerlach

1952. *Diurodrilus benazzii* Gerlach, *Zool., Anz.*, 149 : 185.

*Material examined* : 1 ex., Hut Bay, 18.3.90.

*Diagnostic features* : Minute worms with distinct head and trunk with 8 segments. Head oblong, with several sensory bristles on anterior and lateral margins. Eyes absent. Dorsolateral epidermal glands well developed and numerous. Short bristles occur on lateral margins of trunk. Pygidium deeply cleft posteriorly ending in two adhesive anal lobes. Buccal cavity deep and ciliated. Digestive tract undifferentiated. Anus subterminal. Gonads develop lateral to the gut from fifth trunk segment backwards. Negatively phototactic and highly thigmotactic.

*Measurements* : Length 0.28 mm and width 0.04 mm.

*Remarks* : The specimens examined correspond well with the original description of the species made from the coasts of the Mediterranean Sea.

*Habitat* : Medium detritus sand 5 cm below surface between low and half-tide levels, intertidal zone.

*Distribution* : Mediterranean Sea, Lakshadweep, India, Andaman Islands.

Family NERILLIDAE

Genus *Nerilla* Schmidt, 1848

51. *Nerilla antennata* Schmidt

1927. *Nerilla antennata* Schmidt, *Fauna de France*, 16 : 482.

*Material examined* : 2 ex., Butler Bay, 21.3.90,

**Diagnostic features :** Minute segmented worms with transparent body. Head distinct with 3 several-segmented antennae, 2 palps, 2 pairs of dark eye-spots and a pair of lateral nuchal organs. Trunk with 7 parapodial segments. Parapodium with distinct dorsal cirrus and 2 bunches of simple capillary setae. Two lateral tufts of cilia occur between parapodia. Parapodia on pygidial segment without dorsal cirri. Pygidium with 2 long segmented anal cirri. Mouth ventral and occurs at the level of lateral nuchal organs. Digestive tract undifferentiated. Anus terminal on last segment. Gonads occur lateral to the intestine from fifth trunk segment backwards.

**Measurements :** Length 0.75 mm and width 0.1 mm. Tentacles and anal cirri are 0.2 mm long.

**Remarks :** Some geographical variation has been reported by earlier workers for the lateral tufts of cilia in this species occurring on different coasts. The Little Andaman specimens, however, consistently supported two tufts of the cilia between parapodia as those occurring on the coasts of India and Andaman Islands (Rao and Ganapati, 1968 ; Rao, 1980).

**Habitat :** Coarse and medium sands with fine shell gravel and little detritus between low and half-tide levels, intertidal zone.

**Distribution :** Widely distributed on the coasts of Atlantic, Pacific and Indian Oceans.

Class POLYCHAETA

Order ERRANTIA

Family PISIONIDAE

Genus *Pisione* Grube, 1856

## 52. *Pisione complexa* Alikunhi

1947. *Pisione complexa* Alikunhi, *Proc. nat. Inst. Sci. India*, 10 : 113.

**Material examined :** 2 ex., South Bay, 26.3.90 ; 1 ex., West Bay, 28.3.90.



**Diagnostic features :** Body vermiform, with 40-60 setigerous segments. Prostomium with 2 dark eyes. Buccal segment with a pair of denticulate jaws. Two pairs of cephalic tentacles are directed forwards. Two long anal cirri present on pygidial segment. Anal segment semi-circular without anal glands and adhesive pads. Parapodial segments carrying receptacular seminis are not modified. Upto six pairs of testes, genital funnels, sperm sacs and copulatory organs. Sperms large and non-motile. Ovaries upto 20 pairs.

**Measurements :** Length 8.0-10.0 mm and width 0.15-0.18 mm.

**Remarks :** The material conforms well with the original description of the species made from Madras beach on the east coast of India.

**Habitat :** Coarse sand with fine shell gravel and little detritus between low and half-tide levels, intertidal zone.

**Distribution :** India, Lakshadweep, Andaman Islands.

#### Family PISIONIDAE

#### Genus *Pisionidens* Aiyar and Alikunhi, 1942

#### 53. *Pisionidens indica* (Aiyar and Alikunhi)

1940. *Pisionella indica* Aiyar and Alikunhi, *Rec. Ind. Mus.*, 42 : 89.

**Material examined :** 3 ex., South Bay, 26.3.90.

**Diagnostic features :** White cylindrical worms with tapering ends. Reduced head and parapodia. Two pairs of cephalic cirri, one directed forwards and the other lateral. Eyes absent. Proboscis with 4 chitinous jaws. Two long anal cirri. Buccal and the 6 succeeding segments non-setigerous. Ventral cirrus of first segment and dorsal cirrus of second segment are elongate and function as tentacular cirri. Parapodia of the next 4 segments are minute and inconspicuous. Only one seta occurs as aciculum in each parapodium. Highly active and negatively phototactic.

**Measurements :** Length 15.0-16.0 mm and diameter 0.6 mm.

**Remarks :** The specimens agree well with the original description of the species from Madras sandy beach on the east coast of India.

*Habitat* : Coarse sand with fine shell gravel near low water level, intertidal zone.

*Distribution* : Cosmopolitan in tropical and subtropical sand beaches.

Family HESIONIDAE

Genus *Hesionides* Friedrich, 1937

54. *Hesionides arenaria* Friedrich

1937. *Hesionides arenarius* Friedrich, *Kieler Meeresforsch.*, 1 : 343.

*Material examined* : 2 ex., Harmindar Bay, 25.3.90.

*Diagnostic features* : Minute worms with 15-18 setigerous segments. Head with a median and 2 pairs of dorsal and ventral tentacles. Three pairs of tentacular cirri. Notopodia with elongated dorsal cirri. Two acicula occur in neuropodium. Pygidium with two distinctly separated and fan-shaped anal lamellae. Two long thread-like anal cirri present. Anal lamellae are thigmotactic giving firm hold on substratum. Body largely transparent and brown in colour.

*Measurements* : Length 1.2-1.4 mm and width 0.08 mm.

*Remarks* : Compared to the type specimens described from North Sea, the anal lamellae in the local forms are narrower and do not overlap. Otherwise, the specimens agree fairly well with the original description except for minor variations in the length of cephalic appendages. These features are seen to be common for the specimens from Indian Ocean.

*Habitat* : Coarse and medium sands between low and half-tide levels, intertidal zone, sheltered and exposed areas.

*Distribution* : Cosmopolitan.

55. *Hesionides gohari* Hartmann-Schroder

1960. *Hesionides gohari* Hartmann-Schroder, *Kieler Meeresforsch.*, 16 : 74.

*Material examined* : 1 ex., Hut Bay, 18.3.90 ; 1 ex., Butler Bay, 21.3.90.

**Diagnostic features :** Small worms with 12-15 setigerous segments. Dorsal and ventral tentacles nearly equal. First tentacular cirri the longest. Parapodia with 2 simple notosetae of unequal size. Pygidium with an anal plate undivided at the base, but divided distally into 2 lamellae. Two long anal cirri present. Anal lamellae are glandular and highly thigmotactic. Male genital pore located in front of median tentacle. Two vesiculae in fourth setigerous segment. Body transparent and brown in colour.

**Measurements :** Length 0.8-1.0 mm and width 0.06 mm.

**Remarks :** The specimens correspond well with the original description of the species made from Red Sea, except for slight variation in body colour.

**Habitat :** Medium sand between low and mid-water levels, intertidal zone.

**Distribution :** Tropical and temperate beaches on the coasts of Mediterranean Sea, Atlantic and Indian Oceans.

#### 56. *Hesionides indoceanica* Westheide and Rao

1977. *Hesionides indoceanica* Westheide and Rao, *Cah. Biol., Mar.*, 18 : 282.

**Material examined :** 2 ex., Harmindar Bay, 25.3.90 ; 1 ex., South Bay, 26.3.90.

**Diagnostic features :** Minute worms with 28-30 setigerous somatic segments. Body transparent with brown stripes. Head with 11 tentacular appendages. First two pairs of appendages are of the same length, while the third ones are the longest. Tentacular cirri are thread-like with broad bases. Cephalic tentacles lack distinct knot-shaped swellings. Parapodium with notopodium bearing 2 simple setae of different size. Notopodium with 5 compound setae of varying size. Pygidium with a well developed semi-circular and flat anal plate, which is highly thigmotactic. Anal cirri thread-like. Sexes separate.

**Measurements :** Length 2.2-2.8 mm and width 0.12 mm.

**Remarks :** The material examined conformed well with the original description of the species made from Indian subcontinent and

Andaman Islands. But, minor differences occurred in the structure of notosetae, with varying number of saw-shaped teeth. In the circumstances, until further detailed studies are made on the notosetae, these differences are to be considered as local variants of the present species.

*Habitat* : Coarse and medium sand with fine shell gravel and little detritus 10-20 cm below surface between low and half-tide levels, intertidal zone.

*Distribution* : East coast of India, Andaman Islands.

### 57. *Hesionides andamanensis* n. sp.

(Fig. 7)

*Material examined* : 1 ex., Bomila Creek, 19.3.90 ; 3 ex., Butler Bay, 21.3.90 ; 2 ex., Dugong Creek, 24.3.90.

*Description* : Small, active and colourless worms, with elongate and compact body light-green in colour. Total body length ranges from 0.8 to 1.0 mm with 12 to 16 setigers. Maximum width without parapodia varies between 50 to 70  $\mu\text{m}$ . Body tapers slightly posteriorly. Anterior head end with 11 appendages characteristic of the genus. Dorsal and ventral tentacles are directed forwards and reach about 40  $\mu\text{m}$  in length. Median tentacle at the level of second tentacular cirri attains 55 to 60  $\mu\text{m}$  long and projects slightly beyond the anterior extremity of head. Three pairs of tentacular cirri are laterally directed with progressive increase in length from anterior to posterior end reach 50 to 80  $\mu\text{m}$ . Tentacles and tentacular cirri with broad bases and tapering tips, but lack distinct knot-shaped swellings.

Setigerous segments are distinct, wider than long and slightly narrowed towards caudal region. Biramous parapodia stand erect slightly above the stem. Notopodia with dorsal cirri 20-25  $\mu\text{m}$  long, lacking knot-shaped swellings. Two simple notosetae of varying length occur with bent subdistal part, the longer one with 3 saw-shaped teeth and the shorter one with 2 similar teeth. Both the setae bear pointed ends bent distally. Notopodia with one fine tapering aciculum. Neuropodia look rectangular from above with slightly bent short cirri. Compound neurosetae 4-5 in number with slightly curved unidentate

blades of variable length, one of them being always the longest. One fine tapering aciculum present.

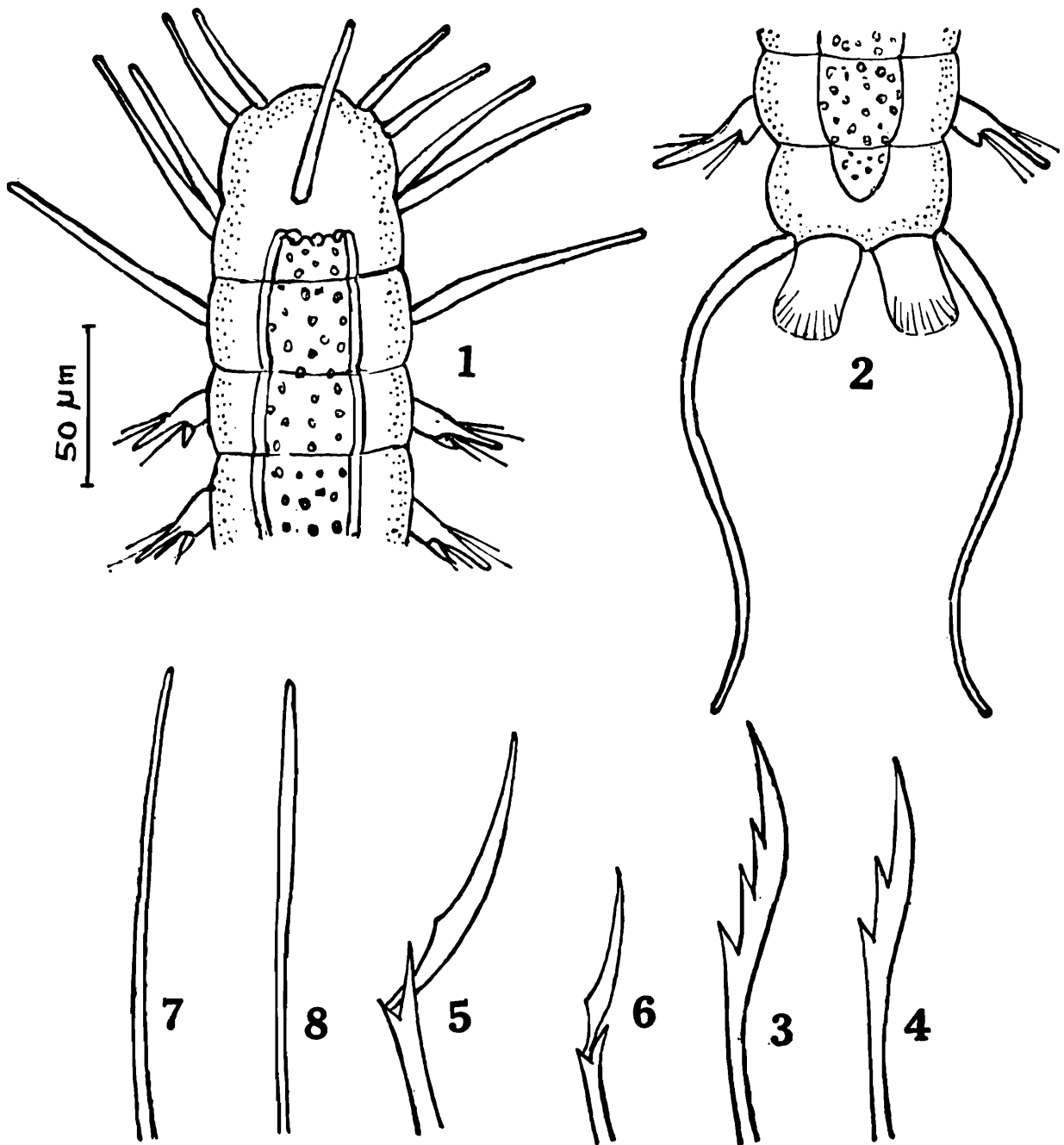


Fig. 7: *Hesionides andamanensis* n. sp. 1. Anterior end, dorsal view ; 2. Posterior end, dorsal view ; 3. Notoseta with three teeth ; 4. Notoseta with two teeth ; 5. Macroneuroseta ; 6. Microneuroseta ; 7. Aciculum of notopodium ; 8. Aciculum of neuropodium.

Pygidium with two distinctly separated rectangular anal lamellae, with circular openings of adhesive glands at the end. Two anal cirri are long and thread-like, swollen at the base and 120 µm long. The cirri are

generally severed after fixation and hence lost in preserved specimens. Pharynx with two folds and 8 tapering papillae at the oral end. It extends from the median tentacle back to the third setigerous segment. Sexes are separate. Females with oocytes extending from fourth setiger back to the last segments. Each oocyte measures about 30  $\mu\text{m}$  in maximum diameter. Males with long, thread-like sperms. Paired vesiculae occur in the third setigerous segment. Male openings occur close to the dorsal median tentacle.

**Remarks :** Among the ten species of the fascinating mesopsammic genus *Hesionides* Friedrich hitherto known from different parts the world, the new species *H. andamanensis* closely approach *H. minima* Westheide and Rao (1977) and *H. simiis* Rao (1978) described from the east coast of India in the general organisation of the cephalic cirri, setigerous segments, structure of parapodial setae, anal plate and gonads. But, the present species clearly differs from both the known species in the body size, nature of cephalic cirri, number and structure of notosetae and neurosetae and the position of gonads in body segments.

**Diagnostic features :** Minute worms 0.8 to 1.0 mm long with 12-16 setigerous segments. Anterior end with 11 cephalic appendages lacking knot-shaped swellings. Two simple notosetae of varying length with two and three saw-shaped teeth on terminal blades. Compound neurosetae 4-5 with unidentate blades of varying size. Pygidium with two thread-like anal cirri swollen at the base. Pharynx with two folds and 8 tapering papillae at the oral end. Female oocytes extend from fourth setiger backwards. Male openings occur close to the dorsal median tentacle.

**Holotype :** Adult specimen 0.9 mm long with ova and sperm collected by the author on 21.3.90. Deposited in the National Zoological Collections, Z.S.I., Port Blair. Regd. No. 2397.

**Type locality :** Medium sand with little detritus 5-10 below surface between low and half-tide levels, intertidal zone, Butler Bay, Little Andaman, India.

Family PHYLLODOCIDAE

Genus *Hesionura* Hartmann-Schroder, 1958

58. *Hesionura elongata* (Southern)

1914. *Eteone elongata* Southern, *Proc. Roy. Irish. Acad.*, 31 : 18.

*Material examined* : 1 ex., South Bay, 26.3.90.

*Diagnostic features* : Head triangular with four anteriorly directed tentacles at the narrow anterior end and 2 dark eyes at the wider base. Long tentacular cirri occur on first body segment lacking parapodia. Uniramous parapodia typical of the genus, with a dorsal and a ventral cirrus. Four compound setae with expanded blades and one simple supporting seta with blunt end present. Two long anal cirri occur on pygidium. Body transparent and white in colour. Highly active and weakly thigmotactic.

*Remarks* : The specimen conformed well with the original description of the species but for the longer tentacular and anal cirri characteristic of Indian Ocean forms.

*Habitat* : Coarse sand with fine shell gravel near low water level, intertidal zone.

*Distribution* : Tropical and subtropical beaches on the coasts of Atlantic and Indian Oceans.

Family SYLLIDAE

Genus *Eusyllis* Malmgren, 1876

59. *Eusyllis homocirrata* Hartmann-Schroder

1958. *Eusyllis homocirrata* Hartmann-Schroder, *Kieler Meeresforsch.*, 14 : 235.

*Material examined* : 3 ex., West Bay, 28.3.90.

*Diagnostic features* : Small transparent worms with 16-18 setigerous body segments. Prostomium with 2 long triangular palps, 3

tentacles and 2 pairs of tentacular cirri. Eyes absent. All tentacles and cirri are jointed at the base. Dorsal cirri long, but absent on second setigerous segment. Ventral cirri finger-like. Parapodia uniramous with 2 simple supporting setae and 4 compound setae with expanded blades. Pygidium with 2 long anal cirri. Proboscis with an anterior tooth and undulated lamella. Gizzard with 22 rings occupying third to fifth setigerous segments. Weakly thigmotactic.

*Measurements* : Length 1.2-1.4 mm and width 0.1 mm.

*Remarks* : The tentacular cirri are slightly longer in the Little Andaman specimens compared to the original description of the species.

*Habitat* : Coarse and medium sands with fine shell gravel between low and half-tide levels, intertidal zone.

*Distribution* : Circumtropical.

### Genus *Typosyllis* Langerhans, 1879

#### 60. *Typosyllis variegata* (Grube)

1860. *Syllis variegata* Grube, *Arch. Naturgesch.*, 26 : 85.

*Material examined* : 4 ex., South Bay, 26.3.90 ; 1 ex., West Bay, 28.3.90.

*Diagnostic features* : Long and thin worms with 90-120 setigerous segments. Head with 2 pairs of eyes, 2 long palps, one median and 2 lateral tentacles. Tentacles and cirri are ringed. Pygidium with 2 long anal cirri and a finger-like papilla in between. Pharynx long, lies between 3 and 12 segments, with an anterior conical tooth. Parapodia are short, dorsal cirrus long and moniliform ; ventral cirrus finger-like. Each parapodium with 10 short setae bearing serrated terminal blades. Gizzard with 36 rings extending between twelfth and eighteenth setigerous segments.

*Measurements* : Length 1.6-1.8 cm and width 0.2 mm.

*Remarks* : The specimens examined are slightly smaller in size compared to the original description of the species. This is probably related to the interstitial mode of existence,



*Habitat* : Coarse and clean sand with fine shell gravel near low water level, intertidal zone.

*Distribution* : Cosmopolitan.

### 61. *Typosyllis* sp.

*Material examined* : 2 ex., Bomila Creek, 19.3.90.

*Description* : Long slender worms with 80-90 setigerous segments. Head with 2 pairs of circular eyes, 2 oblong palps, one median and 2 tentacles. Tentacles and dorsal cirri moniliform. Pharynx with conical tooth at the anterior end. Falcate setae are conspicuously bidentate. Pygidium with 2 long anal cirri and a conical papilla in between. Parapodia short, dorsal cirrus long and moniliform ; ventral cirrus short and conical. Each parapodium 8-10 setae bearing serrated terminal blades. Acicular seta stout and pointed at the end. Gizzard with 28 rings extending between sixth and eighth setigerous segments. Body transparent and weakly thigmotactic.

*Measurements* : Length 1.4 mm and width 0.16 mm.

*Remarks* : Specific identification of the material needs further study.

*Habitat* : Coarse and clean sand with fine shell gravel near low water level, intertidal zone.

### Genus *Sphaerosyllis* Claparede, 1863

### 62. *Sphaerosyllis bengalensis* Rao and Ganapati

1966. *Sphaerosyllis bengalensis* Rao and Ganapati, *Proc. Ind. Acad. Sci.* 58 : 309.

*Material examined* : 1 ex., East Bay, 20.3.90.

*Diagnostic features* : Minute worms with 13-15 setigerous segments, with body tapering towards both the extremities. Prostomium with a pair of brown eyes, 2 conical palps fused dorsally by a papillated skin, 3 tentacles and a pair of tentacular cirri. Dorsal cirri absent on second

pair of parapodia. Parapodia with one simple and 5 compound setae. Pygidium with 2 club-shaped anal cirri. Proboscis with conical tooth. Males smaller than females. Embryos develop attached to genital segments until juveniles are released. Eggs are borne in eighth to tenth setigerous segments.

*Measurements* : Length 1.1 mm and width 0.08 mm.

*Remarks* : The material conforms well with original description of the species from Waltair on the east coast of India.

*Habitat* : Coarse and medium sand with little detritus 5-10 cm below surface between low and mid-water levels, intertidal zone.

*Distribution* : India, Andaman Islands, Lakshadweep, Sri Lanka.

#### Genus *Brania* Quatrefages, 1865

#### 63. *Brania subterranea* (Hartmann-Schroder)

1956. *Pionosyllis subterranea* Hartmann-Schroder, *Zool. Anz.*, 157 : 89.

*Material examined* : 2 ex., Bomila Creek, 19.3.90.

*Diagnostic features* : Minute worms with 25-30 setigerous segments. Prostomium with 2 long palps, 3 tentacles and 2 pairs of tentacular cirri. Palps are partly covered with a dorsal membrane. Parapodia with long dorsal cirri. Each parapodium with 12 short setae bearing serrated terminal blades. Two pairs of eyes present, the anterior ones being larger in size. Pharynx with anterior conical tooth. Gizzard cylindrical with 20-22 rings. All tentacles and cirri are club-shaped. Pygidium with 2 long, club-shaped anal cirri. Sexes separate. Gravid female with 10-12 lateral egg sacs on 12-22 setigerous segments. Body transparent and contractile.

*Measurements* : Length 1.8 mm and width 0.12 mm.

*Remarks* : The specimens agree well with original description and figures given for the type material from the Atlantic coast of Brazil.

*Habitat* : Coarse sand 5-10 cm below surface between low and mid-water levels, intertidal zone.

*Distribution* : Eurytopic in tropical and subtropical beaches.

Genus **Ehlersia** Quatrefages 1865

64. **Ehlersia cornuta** (Rathke)

1932. *Syllis (Ehlersia) cornuta* Rathke, *Fauna de France*, 5 : 267.

*Material examined* : 1 ex., Hut Bay, 18.3.90.

*Diagnostic features* : Slender worms with 90-120 setigerous segments. Anterior tentacles thin and subequal, palps long and distinct. Two pairs of eyes present. Pharynx very long with an anterior tooth. Parapodia with compound setae of two kinds : (i) with a long, slender, slightly pectinate and bidentate piece, and (ii) falcigerous setae with a short spinous bidentate end piece. Both types present in the same feet. Last parapodia with a dorsal and simple seta. Two anal cirri present. Tentacles and cirri are moniliform. Body transparent and weakly thigmotactic.

*Measurements* : Length 4.0 mm and width 0.2 mm.

*Remarks* : The specimen corresponds well with the original description of the species but for the smaller body size and the number of setigerous segments probably related with interstitial mode of existence.

*Habitat* : Coarse and clean sand with fine shell gravel near low water level, intertidal zone.

*Distribution* : Mediterranean Sea, Atlantic and Indian Oceans.

Family GLYCERIDAE

Genus **Goniadides** Hartmann-Schorder, 1960

65. **Goniadides aciculata** Hartmann-Schorder

1960. *Goniadides aciculata* Hartmann-Schorder, *Kieler Meeresforsch.*, 16 : 116.

*Material examined* : 2 ex., South Bay, 26.3.90 ; 1 ex., West Bay, 28.3.90.

**Diagnostic features :** Slender worms with 40-50 setigerous segments. Prostomium conical, 8-ringed, the basal ring being the largest, while the distal one bears four 4-ringed tentacles directed anteriorly. Eyes absent. Two anal cirri occur on pygidial segment lacking parapodia. Pharynx with dark chitinous micro and macro jaws. Parapodia elongate with conical dorsal, ventral and median cirri having finger-like tips. One simple internal seta bifid at the tip and 4 compound setae bearing terminal blades. Proboscis short and ventral in disposition.

**Measurements :** Length 4.0-5.0 mm and width 0.25-0.30 mm.

**Remarks :** The specimens examined correspond well with the original description of the species from Red Sea except for some minor variations in body size, segmentation of the cephalic tentacles and number of acicular setae.

**Habitat :** Coarse and clean sand with fine shell gravel near low water level, intertidal zone.

**Distribution** Red Sea, Lakshadweep, India, Andaman Islands.

Phylum ARTHROPODA

Class CRUSTACEA

Order COPEPODA

Suborder HARPACITICOIDA

Family LONGIPEDIIDAE

Genus *Longipedia* Claus, 1863

66. *Longipedia weberi* Scott

1909. *Longipedia weberi* Scott, *Siboga Exped.*, 29 : 196.

**Material examined :** 4 ex., Bomila Creek, 19.3.90 ; 2 ex., Dugong Creek, 24.3.90 ; 1 ex., Butler Bay, 21.3.90.

**Diagnostic features :** Body fusiform. Rostrum large. Anal operculum well developed. Antennule 6-segmented, with 4 aesthetes. Exopod of antenna 8-segmented. Exopod of mandible 3-segmented.

Maxilliped not prehensile. P. 1-P. 4 with both rami 3-segmented. Setae highly plumose. Second exopod segment of P. 1 with a modified seta. Second segment of endopod of P. 2 with one minute seta on posterior surface. Third endopod segment of P. 2 extremely elongate and 4 times longer than the first two segments. P. 5 distinctly biramous with 2 plumose setae on basendopod and 6 naked setae on exopod. P. 5 in male with one plumose seta on basendopod. Caudal ramus as long as broad with 2 developed terminal setae. Abdomen spinules extremely elongate. Intercoxal plates of P. 1-P. 4 highly ornamented.

*Measurements* : Length 0.6-0.8 mm.

*Remarks* : The material corresponds well with the original description. The species is clearly distinguished from other members of the genus in the extreme length of abdominal spinules.

*Habitat* : Fine detritus sand and littoral algae near low water level, intertidal zone.

*Distribution* : Widely distributed on warm tropical and temperate beaches in the Indo-Pacific region.

#### 67. *Longipedia kikuchii* Ito

1980. *Longipedia kikuchii*, Ito, *J. Nat. Hist.*, 14 : 18.

*Material examined* : 2 ex., Harmindar Bay, 25.3.90.

*Diagnostic features* : Fusiform body with large triangular rostrum and spiny anal operculum. Caudal ramus as long as wide. Inner ventral and inner terminal setae of caudal ramus elongate. Epidermal lappets of genital segment small. Abdomen ornamented with small spinules. Antennule 7-segmented, copiously setose and with 4 aesthetes, 2 of them situated on terminal segment. Antenna with 3-segmented endopod and 8-segmented exopod. Mandible exopod 3-segmented. Maxilliped not prehensile, with 12 terminal setae, 4 being extremely elongate. P.1-P. 4 with both rami 3-segmented. Second exopod segment of P. 1 with a modified seta, while the third endopod segment of P. 2 is quite elongate. P. 5 is distinctly biramous, with exopod bearing 6 setae in female and 7 setae in male.

*Measurements* : Length 0.7 mm.

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**Remarks :** The specimens from Little Andaman conform well with the original description of the species, but their morphology is closely related to *L. coronata* Claus. However, the recent revision of the genus by Wells (1980) clearly differentiated both these species, setting aside all doubts at rest.

**Habitat :** Fine detritus sediment and algal thalli near low water level, intertidal zone.

**Distribution :** Japan, Indonesia, Singapore, Andaman Islands, India, Lakshadweep.

### 68. *Longipedia andamanica* Wells

1980. *Longipedia andamanica* Wells, *Zool. J. Linn. Soc.*, 70 : 142.

**Material examined :** 3 ex., Harmindar Bay, 25.3.90 ; 6 ex., South Bay, 26.3.90 ; 11 ex., West Bay, 28.3.90.

**Diagnostic features :** Body fusiform, with rostrum having rounded apex. Anal operculum with a long median spine, two sensilla and two lateral spines. Antennule 6-segmented with 4 aesthetes. Antennule in male chirocerate. Exopod of antenna 5-segmented. Exopod of mandible 3-segmented. Maxilliped non-prehensile. P. 1-P. 4 with both rami 3-segmented. Setae highly plumose. Origin of outer spine on P. 2 is quite variable. Endopod on P. 4 slightly shorter than exopod. Accessory seta of P. 5 very long. Exopod of P. 5 in male with 6 setae. Caudal ramus with 2 short lateral and 2 long terminal setae.

**Measurements :** Length 0.8 to 1.0 mm.

**Remarks :** The specimens examined agreed fairly well with the original description of the species made from Havelock Island in South Andaman. However, close resemblance of the species exists with *L. scotti* Sars, except for the distinct variation in the disposition of spinules and the ornamentation on anal operculum.

**Habitat :** Detritus sand near low water level, intertidal zone.

**Distribution :** Hitherto, the species is known only from Andaman and Nicobar Islands in the Bay of Bengal.

Family CANUELLIDAE

Genus *Canuellina* T. and A. Scott, 1892

69. *Canuellina nicobaris* Wells and Rao

1987. *Canuellina nicobaris* Wells and Rao, *Mem. Zool. Surv. India*, 16 (4) : 7.

*Material examined* : 3 ex., Hut Bay, 18.3.90 ; 1 ex., Bomila Creek, 19.3.90 ; 2 ex., Butler Bay, 21.3.90.

*Diagnostic features* : Body linear without demarcation between metasome and urosome. Rostrum large with truncate tip. Anal operculum is simple and asetose. Caudal ramus with 5 setae, the inner terminal one being the largest and bulbous. Antennule 4-segmented, with profuse setation. Antenna with 7-segmented exopod and 3-segmented endopod. P. 1-P. 3 with both rami 3-segmented. Endopod of P. 4 two-segmented. P. 5 is a lappet with 4 setae. Antennule in male strongly chirocerate.

*Measurements* : Length 1.0-1.2 mm.

*Remarks* : The material examined agrees well with the original description of the species and is readily identified by the presence of only two segments in the endopod of P. 4.

*Habitat* : Coarse detritus sand near low water level, intertidal zone.

*Distribution* : Andaman and Nicobar Islands.

Genus *Scottolana* Por, 1967

70. *Scottolana longipes* (Thompson and Scott)

1903. *Sunaristes longipes* Thompson and Scott, *Rep. Govt. Ceylon Pearl Fish. Gulf. Manaar*, 1 : 256.

*Material examined* : 2 ex., Harmindar Bay, 25.3.90 ; 1 ex., South Bay, 26.3.90.

**Diagnostic features :** Body linear, slightly fusiform and minutely punctate, without any demarcation between metasome and urosome. Last abdominal segment much reduced. Caudal ramus elongate, with 2 well developed terminal setae. Rostrum very large. Antennule segmentation indistinct, possibly of several segments. Exopod of antenna with 8 segments. Exopod of mandible 3-segmented. Exopod of maxilliped with 10 setae. Both rami of P. 1-P. 4 are 3-segmented. Last endopod segment of P. 2-P. 3 with very stout spines having blunt teeth along their edges. P. 4 is very slender. P. 5 is reduced to a narrow lappet with 4 setae.

**Measurements :** Length 1.2 mm.

**Remarks :** The original description of the species was confined to the female without full details of the body appendages. The very slender P. 4 was the chief character of the species until Wells (1967) described further species of the genus. The present specimens, however, conform well with the original description of the species except for some minor variations in the structure of antennae and mouth parts. These differences could possibly be due to evolution of new geographic races.

**Habitat :** Detritus sand and algal thalli near low water level, intertidal zone.

**Distribution :** Sri Lanka, Andamans, Lakshadweep, Mozambique, Israel.

### 71. *Scottolana rostrata* Wells and Rao

1987. *Scottolana rostrata* Wells and Rao, *Mem. Zool. Surv. India*. 16 (4) : 14.

**Material examined :** 1 ex., South Bay, 26.3.90 ; 1 ex., West Bay, 28.3.90.

**Diagnostic features :** Body minutely punctate, linear and without a taper. Rostrum triangular with rounded tip. Caudal ramus longer than broad with 2 long terminal setae. Antennule short and 5-segmented. Antenna with the last two exopod segments fused together. P. 1-P. 4 with both rami 3-segmented. P. 5 with 4 elongate innermost and outermost setae. Genital apparatus with a pair of pointed laminated processes. Antennule in male chirocerate with truncated terminal segment. Caudal



ramus less broad in male than in female with a single seta at the distal corner.

*Measurements* : Length 0·8-0·9 mm.

*Remarks* : The specimens examined agreed fairly well with the original description of the species. The female genital field is unique in the species, which positively helps its identification from the closely allied species of the genus.

*Habitat* : Detritus sand 10 cm below surface near low water level, intertidal zone.

*Distribution* : Hitherto, the species is endemic to the Andaman Islands.

Family ECTINOSOMATIDAE

Genus *Ectinosoma* Boeck, 1864

72. *Ectinosoma melaniceps* Boeck

1864. *Ectinosoma melaniceps* Boeck, *Forh. Vidensk. Krist.*, 1864 : 254.

*Material examined* : 2 ex., Bomila Creek, 19.3.90.

*Diagnostic features* : Body linear and fusiform, with distinct demarcation between metasome and urosome ; widest at the posterior end of cephalothorax. Anal operculum lacking. Abdomen with bands of pustules. Caudal ramus as long as wide with 2 developed apical setae. Rostrum distinct and pointed anteriorly. Antennule 6-segmented with an aesthete on fourth segment. Exopod of antenna 3-segmented, the middle segment being very short. P. 1-P. 4 with both rami 3-segmented. Outer edges of all leg segments spinulose. P. 5 in female quite variable. Basendopod of P. 5 with 2 inner setae and exopod with 4 outer setae. Male antennule haplocerate. P. 6 in male fused to segment, with a lateral seta.

*Measurements* : Length 0·45 mm.

*Remarks* : This widely distributed species is known to exhibit considerable geographical variation, particularly in the structure of P. 5

in female. The present material, however, agrees well with the detailed description of the species given by Lang (1965), except for the presence of several bands of pustules on abdomen.

*Habitat* : Littoral algae and detritus sands near low water level, intertidal zone.

*Distribution* : Cosmopolitan.

### 73. *Ectinosoma dentatum* Steuer

1940. *Ectinosoma dentatum* Steuer, *Zool. Anz.*, 132 : 124.

*Material examined* : 2 ex., East Bay, 20.3.90.

*Diagnostic features* : Body linear and fusiform, with distinct demarcation between metasome and urosome. Anal operculum poorly developed and lacks spinules on posterior border. Abdomen with minute rows of pustules and lacks minute setules. Caudal ramus as long as wide with two well developed apical setae. Rostrum distinct, well developed and pointed anteriorly. Antennule 6-segmented, with an aesthete on third and terminal segments. Exopod of antenna 3-segmented, the middle segment being shortest. Maxilliped non-prehensile. P. 1-P. 4 with both rami 3-segmented. Outer segments and setae spinulose. Exopod of P. 3-P. 4 with setae on outer edge. P. 5 in female with 4 setae on exopod, while basendoped has one outer and two inner setae. P. 6 in male is a short lappet with two setae of unequal length.

*Remarks* : The specimens from Little Andaman agree well with the original description of the species, which was not, however, made in detail.

*Habitat* : Coarse detritus sand 5-10 below surface between low and mid-water levels, intertidal zone.

*Distribution* : The species is widely distributed on the coasts of Indian and Pacific Oceans.

### 74. *Ectinosoma andamanica* n. sp.

(Figs. 8-9)

*Material examined* : 3 ex., West Bay, 28.3.90.

**Description :** Female specimens attain a length of 510-530  $\mu\text{m}$ . Body elongated and cylindrical, with a taper towards both the ends. Cephalothorax widest at the posterior end. Rostrum short with broad base and pointed tip directed ventrally. Genital somite slightly narrow, with the suture represented by a few small patches of chitin. Body ornamented and minutely punctate. Abdominal segments excepting the last segment have a hyaline frill. Caudal ramus slightly longer than wide with a short unguiform projection and three well developed terminal setae, the median seta being the longest.

Antennule elongate and 5-segmented with the fifth segment being the longest and the third segment bearing an aesthete. Antenna with a basis, 2-segmented endopod and 3-segmented exopod. The second endopod segment bears one lateral and 5 terminal setae, the second exopod segment being the shortest with one seta and the third one being the longest with 3 terminal setae. Mandible palp well developed. The two endopod segments carry 3 and 6 setae respectively, while the single exopod segment is quite small bearing 3 setae. Maxillule and maxilla are typical of the genus in their structure. Maxilliped with a short and broad basis bearing a slender seta. First endopod segment elongate with lateral setules, while the second one is short with 4 setae.

P. 1-P. 4 with a coxa bearing spinules at the distal outer corner. Basis with the outer edge bearing one seta. Both rami are 3-segmented, the endopod being longer than the exopod. Outer edges of all segments are spinulose. Setal formula of the appendages is as follows. P. 1 exopod 0.1.222 and endopod 1.1.230. P. 2-P. 3 with exopod 1.1.232 and endopod 1.1.230. P. 4 with exopod 1.1.231 and endopod 1.1.230. P. 5 with distinct rami. The basendopod has one outer and 2 inner setae of varying length. Exopod small and oval with 4 setae of varying length and shape. The male specimens of the species could not be collected, studied and reported here.

**Remarks :** Among the known species of the genus *Ectinosoma*, the new species *E. andamanica* closely approaches *E. dentatum* Steuer (1940) in the general organization of the body and the armature of its appendages. But, the new species clearly differs from the known species in the shape of rostrum, somatic ornamentation, structure of caudal ramus, antennule and antenna and the setal formula of appendages P. 1-P. 4.

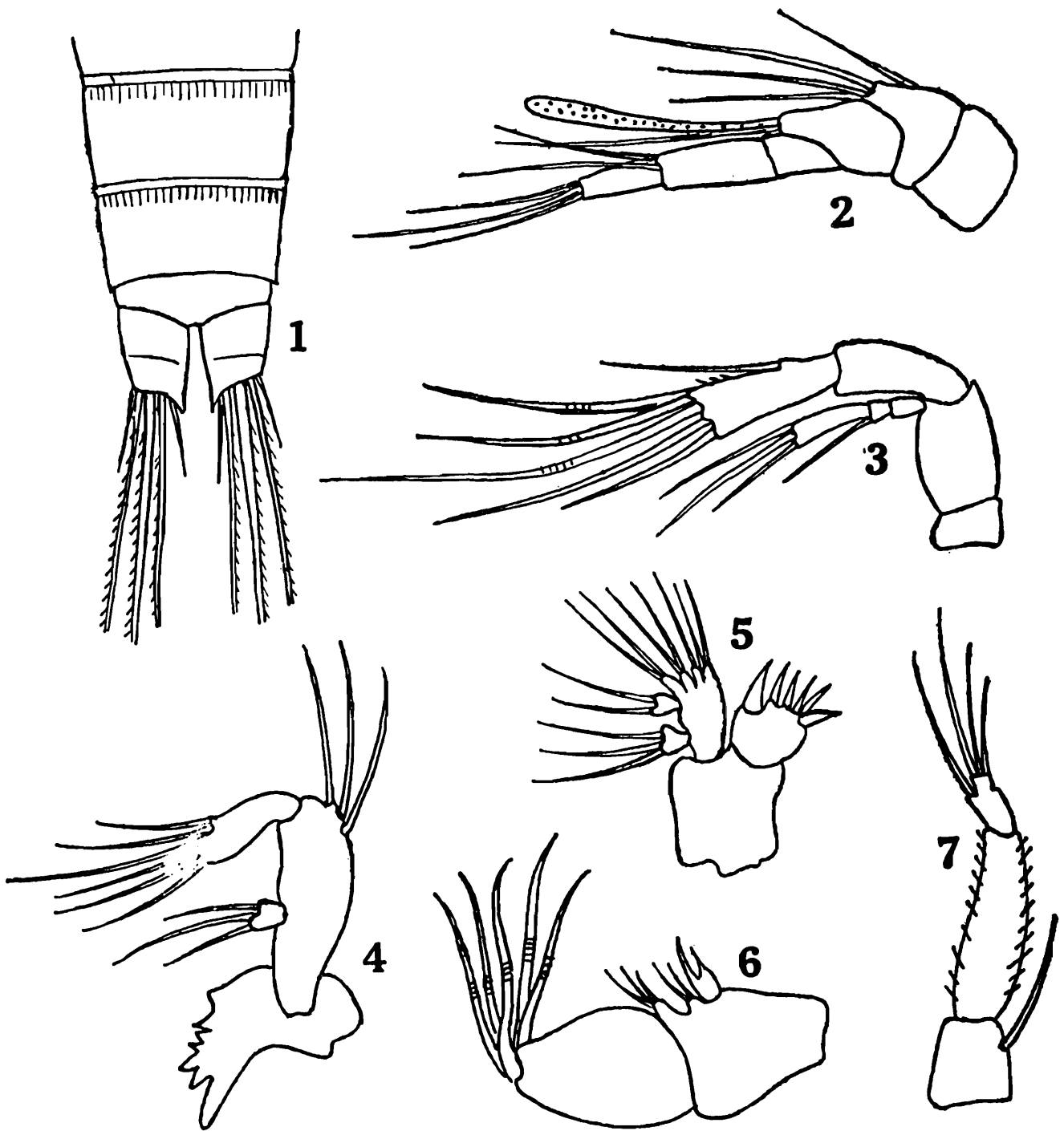


Fig. 8 : *Ectinosoma andamanica* n. sp. Female. 1. Posterior end, ventral view ; 2. Antennule ; 3. Antenna ; 4. Mandible ; 5. Maxillule ; 6. Maxilla ; 7. Maxilliped.

**Holotype** : Female specimen 520  $\mu\text{m}$  long collected by the author on 28.3.90. Deposited in the National Zoological collections, ZSI, Port Blair, Regd. No. 2398.

**Type locality** : Coarse detritus sand 5-10 cm below surface between low and mid-water levels, intertidal zone, West Bay, Little Andaman, India.

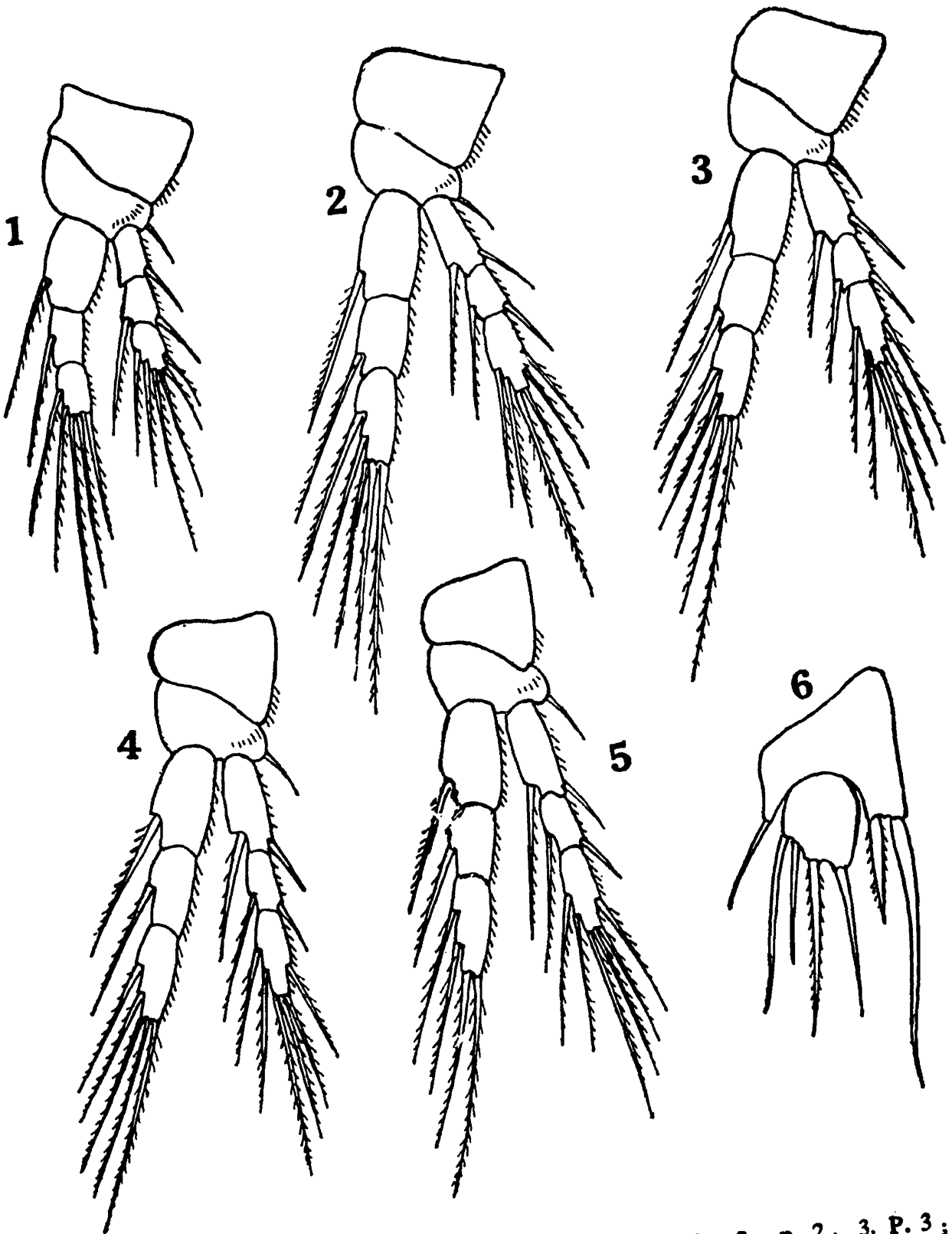


Fig. 9: *Ectinosoma andamanica* n. sp. Female. 1. p. 1; 2. p. 2; 3. P. 3; 4. p. 4; 5. p. 4 alternate setation; 6. p. 5.

Genus **Halectinosoma** Lang, 194875. **Halectinosoma tenuirema** (T. and A. Scott)

1896. *Ectinosoma tenuireme* T. and A. Scott, *Trans. Linn. Soc. London*, 2 (6) : 439.

*Material examined* : 1 ex., South Bay, 26.3.90.

*Diagnostic features* : Body linear and cylindrical. Cephalothorax tapers from posterior to anterior region. Rostrum small and conical. Anal operculum indistinct. Abdominal segments spinulose on posterior border. Caudal ramus as long as wide with two long terminal setae and a short spine. Antennule 7-segmented with an aesthete on third segment. Male antennule chirocerate. Exopod of antenna 3-segmented. Maxilliped with second endopod segment bearing 3 setae. P. 1-P. 4 with both rami 3-segmented and with spinulose outer edges. Distal segment of exopod and endopod of P. 1 with 5 and 4 setae, respectively. P. 5 with confluent rami bearing 3 setae on basendopod and 4 setae on exopod.

*Measurements* : Length 0.52 mm.

*Remarks* : The single specimen examined agreed fairly well with the original description of the species, except for the female antennule and P. 5, in which the segments are distinctly fused.

*Habitat* : Coarse detritus sand between low and mid-water levels, intertidal zone.

*Distribution* : Widely distributed on the coast of Pacific and Indian Oceans.

Genus **Halophytophilus** Brian, 192776. **Halophytophilus simplex** Wells and Rao

1987. *Halophytophilus simplex* Wells and Rao, *Mem. Zool. Surv. India*, 16 (4) : 19.

*Material examined* : 1 ex., Butler Bay, 21.3.90 : 1 ex., Harmandar Bay, 25.3.90.

*Diagnostic features* : Body linear with slight taper towards both ends. Rostrum short, with broad base. Cephalothorax with a few

dorsal sensilla. Caudal ramus broader than long with 3 terminal setae, the median one being the longest. Antennule short and 6-segmented, with an aesthete on third segment. Antenna with basis and 3-segmented exopod. Maxilliped not prehensile. P. 1 with 2-segmented prehensile endopod. P. 2-P. 3 with 3-segmented rami subequal in length. P. 5 with exopod longer than broad with 3 long, one accessory and two terminal setae.

*Measurements* : Length 0.3-0.4 mm.

*Remarks* : The specimens examined conform well with the original description of the species. The characteristic reduced setation on P. 2-P. 4 clearly differentiates the species from other members of the genus.

*Habitat* : Algal and detritus sand near mid-water level, intertidal zone.

*Distribution* : Andaman Islands.

Genus *Arenosetella* Wilson, 1932

77. *Arenosetella germanica* Kunz

1937. *Arenosetella germanica* Kunz, *Kieler Meeresforsch.*, 2 : 95.

*Material examined* : 2 ex., Butler Bay, 21.3.90.

*Diagnostic features* : Body fusiform without demarcation between metasome and urosome. Cephalothorax rectangular anteriorly. Antennule 6-segmented with an aesthete on the fourth segment. Exopod of antenna 3-segmented, the last segment with 2 apical setae. Exopod of mandible single-segmented with 2 apical setae. P. 1-P. 4 are biramous, with both rami 3-segmented. Distal segment of P. 3 of exopod with 2 internal setae. P. 5 is a biramous and triangular lamina with exopod bearing 3 apical setae and endopod with 2 inner setae. Anal segment with 2 pairs of curved dorsal claws. Caudal ramus slightly longer than broad, with 2 well developed apical setae.

*Measurements* : Length 0.6 mm.

*Remarks* : The specimens conform well with the original

description of the species from Kiel Bay, despite the minor geographical variations reported from different global areas.

*Habitat* : Coarse coralline sand with fine shell gravel and little detritus near low water level, intertidal zone.

*Distribution* : Widely distributed in the beaches of Atlantic, Pacific and Indian Oceans.

Genus **Lineosoma** Wells, 1965

78. **Lineosoma intermedia** (Wells)

1967. *Noodtiella intermedia* Wells, *Trans. R. Soc. Edinb.*, 67 : 245.

*Material examined* : 2 ex., East Bay, 20.3.90.

*Diagnostic features* : Body linear and cylindrical. Cephalothorax rectangular. Last segment partially cleft and without anal operculum. Antennule 6-segmented with a terminal aesthete. Exopod of antenna is minute and 2-segmented with 1 and 2 setae, respectively. Both rami of P. 2 to P. 4 are 3-segmented. Second endopod segment of P 1 with 4 terminal setae. P. 5 with distinct rami, exopod with 3 setae. Accessory seta absent. Antennule haplocerate in male and geniculate between second and third segments. P. 6 in male is confluent, with a long seta on either side.

*Measurements* : Length 0.3-0.4 mm.

*Remarks* : The specimens from Little Andaman agree well with the type specimens with a minor variation. The endopod segment of P. 1 bears 4 terminal setae, while it was described 3 setae only for the type material.

*Habitat* : Medium sand 5 cm below surface near mid-water level, intertidal zone.

*Distribution* : Mozambique, Lakshadweep, India, Andaman Islands.



Genus *Hastigerella* Nicholls, 1935

79. *Hastigerella leptoderma* (Klie)

1929. *Ectinosoma leptoderma* Klie, *Zool. Jb. (Syst.)*, 57 : 335.

*Material examined* : 4 ex., East Bay, 20.3.90.

*Diagnostic features* : Body linear and cylindrical without taper to posterior. Cephalothorax rectangular. Last abdominal segment cleft without anal operculum. Caudal ramus longer than broad with 2 developed setae. Antennule 5-segmented, the last one being the longest with an aesthete. Exopod of antenna 3-segmented. Exopod of mandible short with 3 setae. Maxilliped long and thin. Both rami P. 1-P. 4 with 3 segments. P. 5 with confluent rami, basendopod with 2 inner setae and exopod with 3 outer setae. P. 6 in male is a small plate with 2 setae.

*Measurements* : Length 0.4 mm.

*Remarks* : The specimens agree fairly well with the original description of the species except for a minor variation in the setal formula. Second segment of endopod of P. 2-P 4 bears two inner setae, instead of one reported for the type material.

*Habitat* : Median sand with fine shell gravel and little detritus near low water level, intertidal zone.

*Distribution* : North Atlantic, Mediterranean, South Carolina, Mozambique, Lakshadweep, India, Andaman Islands.

Family HARPACTICIDAE

Genus *Harpacticus* Milne-Edwards, 1840

80. *Harpacticus gracilis* Claus

1863. *Harpacticus gracilis* Claus, *Die Freilebenden Copepoden der Fauna Deutschlands*, 1 : 67.

*Material examined* : 2 ex., Bomila Creek, 19.3.90 ; Butler Bay, 21.3.90.

**Diagnostic features :** Body linear and cephalosome longer than broad. Caudal ramus wider than long with two well developed setae. Antennule 9-segmented, with an aesthete on fourth segment. Antenna with exopod 2-segmented. Maxilliped prehensile with a terminal claw and the endopod bearing spinules on inner margin. P 1 biramous with 3-segmented exopod and 2-segmented endopod, both the terminal segments of the rami bearing 2 terminal claws. Endopod of P. 1 twice longer than exopod. P. 2-P. 4 with both rami 3-segmented. P. 5 biramous, with short endopod bearing 4 setae and elongated exopod bearing 5 setae of unequal length.

**Measurements :** Length 0.54-0.56 mm.

**Remarks :** This is a cosmopolitan species widely distributed on the world beaches with minor morphological variation. The species is, however, readily distinguished from other members of the genus by the special structure of P. 1 and P. 5.

**Habitat :** Common inhabitant of algae and grasses in tide pools in the intertidal zone.

**Distribution :** Cosmopolitan.

#### Family PORCELLIDIIDAE

#### Genus *Porcellidium* Claus, 1860

#### 81. *Porcellidium ravanae* Thompson and Scott

1903. *Porcellidium ravanae* Thompson and Scott, *Rep. Govt. Ceylon Pearl Oyster Fish. Gulf Manaar*, 1 : 275.

**Material examined :** 1 ex., Harmindar Bay, 21.3.90.

**Diagnostic features :** Body ovate. Caudal ramus elongate, with 2 dorsal and 4 apical setae. Body ornamentation with circular markings. Rostrum broadly truncate. Antennule 6-segmented and highly setose. Exopod of antenna is of one segment with 3 lateral and 3 apical spinulose setae. Endopod of mandible with curiously shaped plumose spines. Endopod of maxilliped with 4 short claws. Endopod of P. 1

is 2-segmented, first segment being lamelliform. Rami of P. 2-P. 4 are 3-segmented. Exopod of P. 5 is a triangular lamella with 2 plumose setae in female and 5 plumose setae in male on the outer edge.

*Measurements* : Length 0.56 mm and width 0.4 mm.

*Remarks* : Despite the incomplete original description of the species made by Thompson and Scott, the present specimens closely agree with it in the structure caudal ramus and fifth leg. Thus, the material examined is very close to *P. ravanae* more than any other species of the genus hitherto known.

*Habitat* : Fine coralline sediment from algal thalli near low water level, intertidal zone.

*Distribution* : Sri Lanka, India, Lakshadweep, Andamans.

#### Family PELTIDIIDAE

#### Genus *Peltidium* Philippi, 1839

#### 82. *Peltidium ovale* Thompson and Scott

1903. *Peltidium ovale* Thompson and Scott, *Rep. Govt. Ceylon pearl Oyster Fish. Gulf Manaar*, 1 : 275.

*Material examined* : 2 ex., South Bay, 26.3.90.

*Diagnostic features* : Body ovate. Caudal ramus longer than broad with 4 setae. Antennule 7-segmented, with an aesthete on third segment. Antennule is not modified in male, an unusual feature among copepods. Exopod of antenna 2-segmented, the second segment bearing 2 setae. Exopod of mandible single-segmented. Maxilliped prehensile, with a terminal claw. P. 1 with exopod 3-segmented and endopod 2-segmented. Last segment of exopod of P. 1 is short with 3 terminal claws in male and 2 in female. Endopod of P. 1 with a spoon-like modified seta on both the segments. P. 2-P. 4 with both rami 3-segmented, with long plumose setae. Exopod of P. 5 is an elongate lamina with 5 setae.

*Measurements* : Length 1.4-1.6 mm and maximum width 0.8 mm.

*Remarks* : The species is readily distinguished from all other members of the genus in the body shape, skeleton pattern and the structure of P. 1 in both the sexes. The male and female specimens are, however, identical in their organisation except for the structure of P. 1 and the absence of P. 6 in the female.

*Habitat* : Coarse detritus sand and littoral algae near low water level, intertidal zone.

*Distribution* : Widely distributed along the coasts of Indian, Pacific and Atlantic Oceans.

### 83. *Peltidium angulatum* Thompson and Scott

1903. *Peltidium angulatum* Thompson and Scott, *Rep. Govt. Ceylon Pearl Oyster Fish. Gulf Manaar*, 1 : 273.

*Material examined* : 1 ex., Hut Bay, 18.3.90.

*Diagnosotic features* : Body ovate with greatest width at the posterior end of cephalothorax. All segments with acutely pointed epimera. Caudal ramus twice longer than broad with one articulated dorsal seta. Antennule 7-segmented, with an aesthete on third and fourth segments. Exopod of antenna 2-segmented. Endopod of mandible single-segmented with 6 setae. Maxilliped well developed and prehensile with a curved claw. Endopod of P. 1 is 2-segmented. Rami of P. 2-P. 3 are 3-segmented. P. 5 with an elongate exopod, bearing 5 setae.

*Measurements* : Length 0.8 mm and maximum width 0.5 mm.

*Remarks* : The material examined conformed well with the original description of the species in all the essential features.

*Habitat* : Coarse and detritus sand between low and mid water levels, intertidal zone.

*Distribution* : Sri Lanka, Gulf of Mannar, Lakshadweep, Andamans.

## Family THALESTRIDAE

Genus *Phyllothalestris* Sars, 190584. *Phyllothalestris mysis* (Claus)

1863. *Thalestris mysis* Claus, *Die freilebenden Copepoden*, 1 : 130.

*Material examined* : 3 ex., Harmindar Bay, 25.3.90.

*Diagnostic features* : Body linear and slender. Rostrum prominent. Caudal ramus as long as wide with 2 developed apical setae, the inner one being the longest. Antennule 8-segmented, with an aesthete on fourth segment. Antenna robust, with 2-segmented exopod. Maxilliped prehensile with a terminal claw and a row of spinules on the inner margin of endopod. P. 1 with 3-segmented exopod and 2-segmented endopod, the second segment of exopod and first segment of endopod being quite long, while the terminal segment bears a pair of apical claws on both the rami. P. 2-P. 4 with both rami 3-segmented. P. 5 is represented by two enlarged foliaceous plates with 4 short inner setae on basendopod and 6 short outer setae on exopod.

*Measurements* : Length 0.76-0.80 mm.

*Remarks* : The three known species of the genus *Phyllothalestris*, viz., *P. mysis* (Claus), *P. harringtoni* Willey and *P. sarsi* Sewell closely resemble each other in all the major details of the body armature except for the structure of setae on the female P. 5. However, the seta on the basal segment of the exopod of antenna is very well developed in *P. mysis*. Due to considerable morphological variation of the species occurring on different geographical regions, five other species were recently absorbed as its synonyms.

*Habitat* : Littoral algae and weeds near low water level, intertidal zone.

*Distribution* : Cosmopolitan on the coasts of the Mediterranean Sea, Atlantic, Pacific and Indian Oceans.

Genus **Rhynchothalestris** Sars, 190585. **Rhynchothalestris rufocincta** (Brady)

1880. *Thalestris rufocincta* Brady, *A monograph of British Copepoda*, 2 : 125.

*Material examined* : 1 ex., Hut Bay, 18.3.90.

*Diagnostic features* : Body linear and widest at the posterior margin of cephalothorax. Rostrum large and acutely pointed anteriorly. Abdominal segments 3-4 fringed with minute spinules. Antennule 9-segmented with an aesthete on fourth segment. Exopod of antenna 3-segmented, the median one being quite short with a dorsal seta. Maxilliped prehensile with a terminal claw and a short spine on inner margin of endopod. P. 1 with 2-segmented endopod and 3-segmented exopod, the first exopod segment and second endopod segment being the longest. P. 2-P. 4 with both rami 3-segmented. P. 5 with expanded flaps, the basendopod bearing 4 internal setae and the oval exopod bearing 6 outer setae. Endopod of P. 2-P. 3 modified in male.

*Measurements* : Length 0.86 mm.

*Remarks* : This species closely resembles with *R. similis* Scott (1909) in all the major details of the body appendages, for which reason the latter species has been synonymised recently with the former species.

*Habitat* : Littoral algae and weeds near low water level, intertidal zone.

*Distribution* : The species is almost cosmopolitan along the coasts of Atlantic, Pacific and Indian Oceans.

## Family THALESTRIDAE

Genus **Diarthrodes** Thompson, 188286. **Diarthrodes cystoecus** Fahrenbach

1954. *Diarthrodes cystoecus* Fahrenbach, *J. Wash. Acad. Sci.*, 44 : 326.

*Material examined* : 2 ex., South Bay, 26.3.90.

**Diagnostic features :** Body fusiform. Rostrum distinct and rounded anteriorly. Caudal ramus broader than long, with spinulose posterior edge and 2 developed setae. Anal operculum lacking. Antennule 6-segmented, with an aesthete on fourth segment, exopod of antenna 3-segmented. Second endopod segment of antenna with geniculate setae. Maxilliped prehensile with a terminal claw. P. 1 with both rami 2-segmented. Rami P. 2-P. 4 with 3 segments, exopod being longer than endopod. P. 5 with distinct rami ; with both basendopod and exopod with 5 terminal setae. Antennule in male haplocerate. P. 6 is a small reduced plate with a pair of lappets.

**Measurements :** Length 0.6 mm.

**Remarks :** The species has been described earlier by several workers with considerable morphological variation. The present specimens, however, approach well the description and figures of the species made by Sewell (1940).

**Habitat :** Algae and detritus sand between low and mid-water levels, intertidal zone.

**Distribution :** Atlantic coast of America Maldives, Lakshadweep, India, Andaman Islands.

### Genus *Eudactylopus* Scott, 1909

#### 87. *Eudactylopus andrewi* Sewell

1940. *Eudactylopus andrewi* Sewell, *Scient. Rep. John Murray Exped.*, 7 : 202.

**Material examined :** 3 ex., West Bay, 28.3.90.

**Diagnostic features :** Body linear, with clear demarcation between metasome and urosome. Rostrum distinct and pointed anteriorly. Caudal furca longer than broad with 2 developed apical setae. Antennule 7-segmented, with an aesthete on fourth segment. Exopod of antenna 2-segmented, the distal one being quite short. Mandible with stout biting ramus and powerful teeth. Maxilliped prehensile, with a terminal claw and a row of spinules on inner margin of endopod. P. 1 with 2-segmented endopod and 3-segmented exopod. First endopod segment very long and the second one very short. P. 2-P. 4 with both rami

3-segmented. P. 5 with two wide flaps reaching the middle of the fourth abdominal segment. P. 6 in male is a short lamina with 4 setae.

*Measurements* : Length 1.0-1.2 mm.

*Remarks* : This species having a wide geographical distribution in the Indo-Pacific region showed considerable morphological variation, leading to the formation of some sub-species. But, the excellent description of this species made by Ito (1974) put an end to this controversy. The present material conforms well with the description of the species given by Ito, particularly in the absence of the dense cover of spinules on abdominal segments.

*Habitat* : Littoral algae and weeds near low water level, intertidal zone.

*Distribution* : Maldives, Lakshadweep, India, Sri Lanka, Andaman and Nicobar Islands, Aru Islands, Caroline Islands, Xisha Islands, China and Japan.

### Genus *Idomene* Lang, 1948

#### 88. *Idomene maldivae* (Sewell)

1940. *Xouthous maldivae* Sewell, *Scient. Rep. John. Murray Exped.*, 7 : 198.

*Material examined* : 1 ex., Bomila Creek, 24.3.90.

*Diagnostic features* : Body dorsoventrally flattened and densely punctate. Rostrum absent. Genital field simple and strongly chitinized. Caudal ramus as long as broad with 2 developed terminal setae. Antennule short and 6-segmented with an aesthete on fourth segment. Exopod of antenna with 2 segments, the first and second segments bearing 2 and 4 setae, respectively. Endopod of mandible with 9 setae. Maxilliped prehensile with a terminal claw. Second endopod segment of P. 1 with 2 setae and 2 terminal claws. Rami of P. 2-P. 4 are 3-segmented and equal in length. All setae and outer spines of the legs are densely plumose. P. 5 massive, exopod being longer than broad with 6 setae and endopod with 5 setae.

*Measurements* : Length 0.56 mm,



**Remarks :** Sewell (1940) described the species based on a single female specimen. The single specimen examined from the present collection agreed well with the original description of the species in the all the essential features of the body appendages, particularly the structure of P. 5.

**Habitat :** Detritus sand and littoral algae near low water level, intertidal zone.

**Distribution :** Maldives, Lakshadweep, Gulf of Mannar, Andamans.

Family PARASTENHELIIDAE

Genus **Parastenhelia** Thompson and Scott

89. **Parastenhelia hornelli** Thompson and Scott

1903. *Parastenhelia hornelli* Thompson and Scott, *Rep. Govt. Ceylon Pearl Oyster Fish.*, 1 : 263.

**Material examined :** 2 ex., Harmindar Bay, 25.3.90 ; 1 ex., Butler Bay, 26.3.90.

**Diagnostic features :** Body elongated. Rostrum pointed apically. Anal operculum simple and naked. Caudal ramus broader than long with 2 developed apical setae. Antennule 9-segmented with an aesthete on fourth segment. Exopod of antenna 2-segmented. Maxilliped prehensile with a terminal claw. Endopod of P. 1 with 2 segments, the second one being quite small with 2 long terminal claws. Exopod short and 3-segmented. P. 2-P. 4 with both rami 3-segmented. P. 5 in male with outer segment composed of 3 joints.

**Measurements :** Length 0.6 mm.

**Remarks :** The material collected from Little Andaman exhibits some minor variations compared to the original description of the species, particularly in the setal formula. Examination of the material from type locality may throw some light on the validity of these variations.

**Habitat :** Detritus sand between low and mid-water levels, intertidal zone.

**Distribution :** Eurytopic on the coasts of warm temperate and tropical seas.

Family DIOSACCIDAE

Genus *Stenhelia* Boeck, 1864

90. *Stenhelia* (*Delavalia*) *polluta* Monard

1928. *Stenhelia polluta* Monard, *Arch. Zool. exp. gen.*, 67 : 399.

**Material examined :** 1 ex., Hut Bay, 18.3.90.

**Diagnostic features :** Body elongate. Anterior region robust and posterior region narrow. Rows of spinules occur on female abdomen. Antennule 8-segmented. Exopod of antenna 3-segmented. Caudal ramus twice longer than wide. Exopod of P. 1 with 3 segments and endopod with 2 segments. Endopod of P. 1 as long as exopod. Basal segment of P. 5 with 3 setae, while the distal exopod has 5 setae. Caudal ramus thrice longer than wide with 2 developed apical setae, the inner one being the longest. Caudal ramus and P. 5 in female are quite variable in this species.

**Measurements :** Length 0.50-0.52 mm.

**Remarks :** The present specimens agree fairly well with the original description of the species, particularly in possessing rows of spinules on the female abdomen and the shape of caudal ramus, which showed considerable variation in the material reported from different geographical regions.

**Habitat :** Algae and fine detritus sand near low water level, intertidal zone.

**Distribution :** Widely distributed along the coasts of warm temperate and tropical seas.

91. *Stenhelia (Delavalia) madrasensis* Wells

1971. *Stenhelia madrasensis* Wells, *J. nat. Hist.*, 5 : 508.

**Material examined :** 3 ex., West Bay, 28.3.90.

**Diagnostic features :** Body elongate and pyriform. Rostrum large and triangular with bifid apex. Antennule 8-segmented and highly setose, with an aesthete on the fourth segment. Exopod of antenna 3-segmented. Maxilliped non-prehensile, with endopod with 2 segments. Endopod of P. 1 is 2-segmented and P. 2-P. 4 is 3-segmented. Endopod of P. 2 with 2-segments in male and 3 segments in female. Exopod P. 5 elongate and oval, with 6 terminal setae. Basendopod not expanded, with 5 setae and spines. Genital segment wider in the anterior part than the posterior. Caudal rami 4 times longer than broad, with 2 developed terminal setae.

**Measurements :** 0.42 mm.

**Remarks :** The specimens agree well with the original description of the species except for a variation in the structure of antennule and maxilliped. The antennule in the local forms has 8 segments compared to the 7 segments described for the type material. The endopod of maxilliped in the Andaman specimens has 2 segments, while it was reported as one for the type specimens.

**Habitat :** Fine beach sand and algae near low water level, intertidal zone.

**Distribution :** East coast of India, Andaman Islands, Lakshadweep.

92. *Stenhelia (Delavalia) breviseta* Wells and Rao

1987. *Stenhelia breviseta* Wells and Rao, *Mem. Zool. Surv. India*, 16 (4) : 71.

**Material examined :** 2 ex., Hut Bay, 18.3.90 ; 1 ex., Butler Bay, 21.3.90.

**Diagnostic features :** Body pear-shaped. Cephalothorax large. Rostrum not bifid. Abdomen not tapering. Structure of anal operculum typical of the genus. Caudal ramus longer than broad with 2 well developed terminal setae, the inner one being twice longer than the outer.

Antennule 8-segmented, with an aesthete on fourth segment. Exopod of antenna long, slender and 3-segmented. Maxilliped not prehensile. P. 1 with 3-segmented exopod and 2-segmented endopod. P. 2-P. 4 with both rami 3-segmented. Exopod of P. 5 elliptical with 5 setae. Antennule in male sub-chirocerate. P. 6 in male is a lappet with 3 small setae.

*Measurements* : Length 0.38-0.40 mm.

*Remarks* : The material examined conforms well with the original description of the species made from middle Andaman Islands. The species is readily distinguished from closely allied species of the genus by the short and stout inner setae on P. 2-P. 4 and the structure of P. 5 in both the sexes.

*Habitat* : The species is an inhabitant of algae and detritus sand near low water level, intertidal zone.

*Distribution* : Hitherto, the species is endemic to the Andaman and Nicobar Islands in the Bay of Bengal.

### 93. *Stenhelia* (*Delavalia*) *ovalis* Wells and Rao

1987. *Stenhelia ovalis* Wells and Rao, *Mem. Zool. Surv. India*. 16 (4) : 89.

*Material examined* : 2 ex., Bomila Creek, 19.3.90 ; 1 ex., Butler Bay, 21.3.90.

*Diagnostic features* : Body elongate. Metasome wider than urosome. Somatic ornamentation lacking. Rostrum pronounced with rounded apex. Caudal ramus twice longer than wide with 2 well developed terminal setae. Antennule 8-segmented, with an aesthete on fourth segment. Exopod of antenna 3-segmented the third segment being the longest with one lateral and 3 terminal setae. Maxilliped prehensile. Endopod of P. 1 is 2-segmented, the first segment being oval, while the second one being elongate with a curious spine. P. 2-P. 4 with 3-segmented rami, the outer spines on exopod being stout and pectinate. Exopod of P. 5 with 5 setae.

*Measurements* : Length 0.40-0.42 mm.

*Remarks* : The specimens conform well with the original description of the species, which is readily distinguished from other

species of the genus by the striking oval shape of first endopod segment of P. 1.

*Habitat* : Fine detritus sand between low and mid-water levels, intertidal zone.

*Distribution* : Andaman Islands.

94. *Stenhelia* (*Delavalia*) *andamanica* n. sp.

(Figs. 10-11)

*Material examined* : 5 ex., East Bay, 20.3.90.

*Description* : Female specimens attain 480-510  $\mu\text{m}$  long. Body tapers from anterior to posterior end. Rostrum much reduced to a short conical plate bent to the ventral surface. Genital suture strongly chitinized dorsolaterally. Genital field simple, in the form of a transverse ridge with a lateral seta. Anal operculum well developed, with distinct processes at the posterior end. Caudal ramus two and half times longer than wide, tapers distally, with two well developed apical setae. Somatic ornamentation lacks punctation. Small sensilla, however, occur at the posterior edge of cephalothorax and abdominal segments.

Antennule 8-segmented, with distinct annulation and an aesthete on fourth segment. Antenna with distinct coxa and 3-segmented exopod, the second segment being the shortest and the third one being the longest bearing one, one and three setae, respectively. Mandible resembles the other species of the genus. Exopod and endopod of maxillule fused to the basis with 2-5 setae, respectively. Maxilla with syncoxa bearing 3 endites, basis with a terminal claw and endopod composed of one segment. Maxilliped non-prehensile, basis and endopod bearing 3 setae each, one of the terminal setae being considerably robust and short.

P. 1 with coxa bearing a row of spinules at distal corner. Basis with an inner and outer spine and spinules at distal edge. Exopod slightly shorter than endopod and 3-segmented, the first segment being the longest, while the last one bearing 2 outer and 2 terminal setae. Endopod 2-segmented of equal size, the second segment bearing 2 inner and 2 terminal setae. P. 2-P. 4 with both rami 3-segmented. Coxa with

a row of spinules at the distal corner. Basis bears an outer seta. Exopod and endopod are nearly of equal length with rows of spinules on their outer edges. Setation on last exopod segment 1.2.3 and endopod segment 1.2.1. P. 5 with basendopod bearing one lateral and 4 terminal

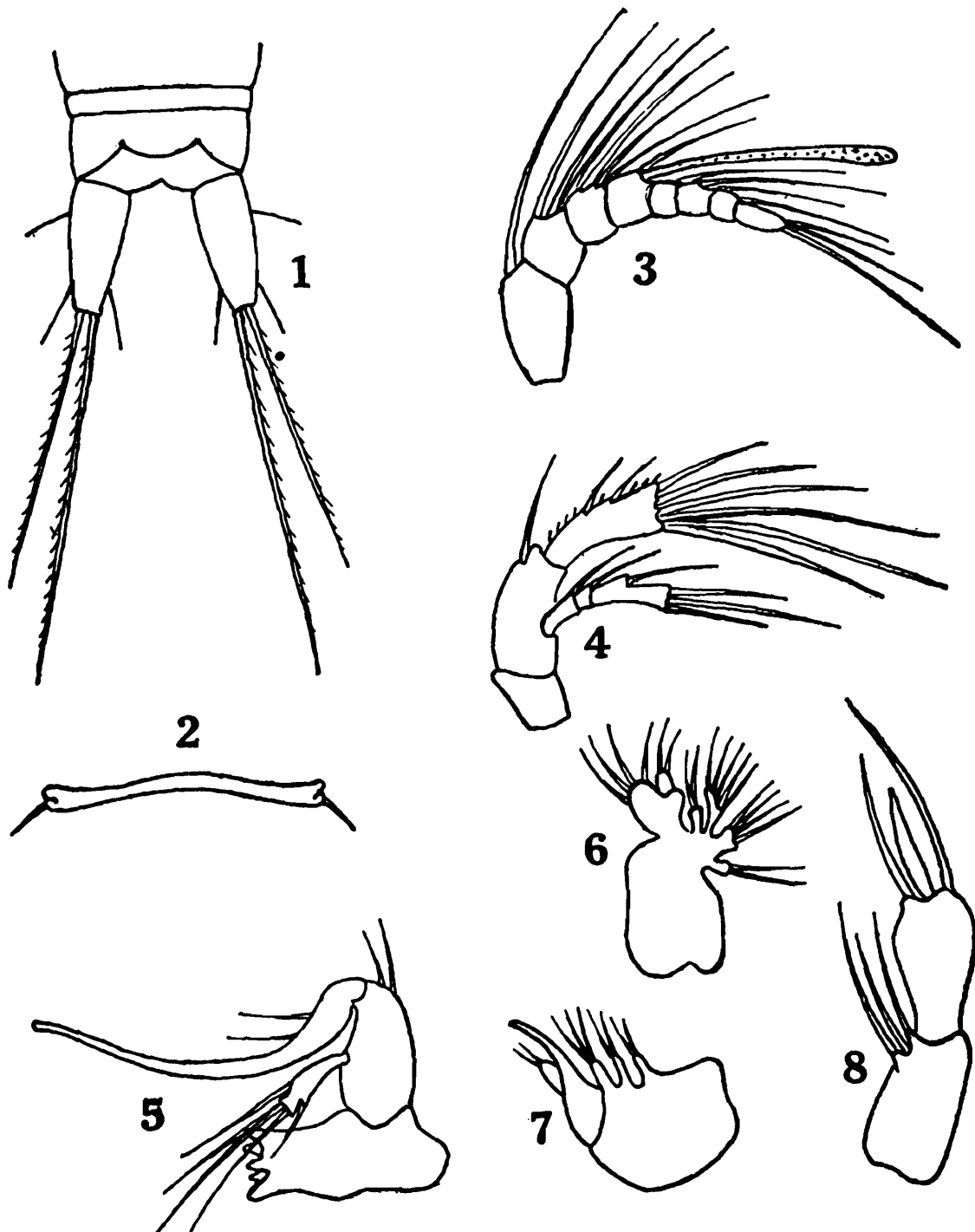


Fig. 10: *Stenhelia (Delavalia) andamanica* n. sp. Female. 1. Posterior end, dorsal view; 2. Genital ridge; 3. Antennule; 4. Antenna; 5. Mandible; 6. Maxillule; 7. Maxilla; 8. Maxilliped,

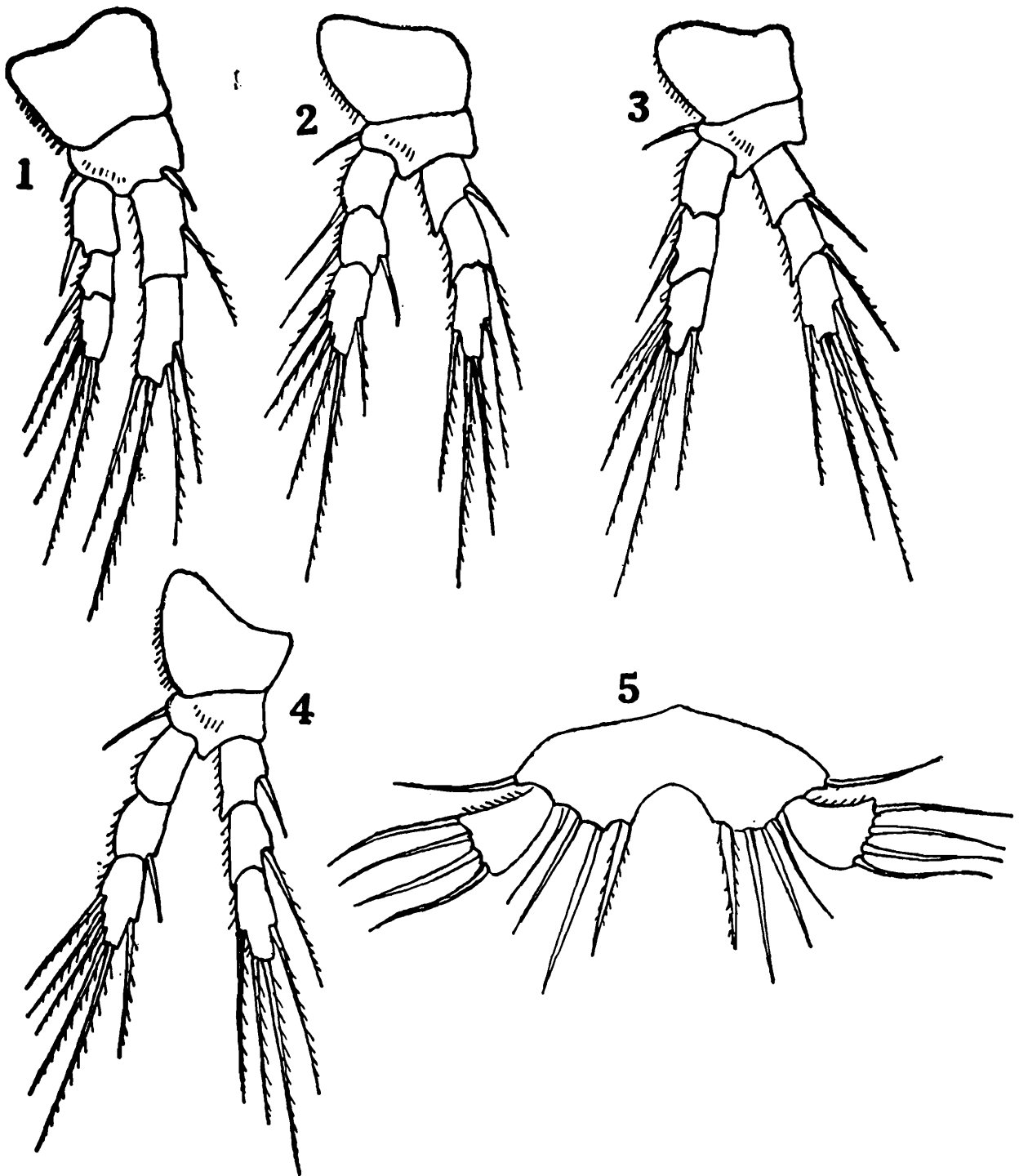


Fig. 11 : *Stenhelia (Delavalia) andamanica* n. sp. Female. 1. p. 1 ; 2. p. 2 ; 3. p. 3 ; 4. p. 4 ; 5. p. 5.

setae, while the exopod is a triangular lamina with 4 terminal setae and lateral spinules. Male specimens were not collected.

*Remarks* : Among the known species of the genus *Stenhelia*, the new species *S. (D.) andamanica* closely approaches *S. (D.) valens* Wells

and Rao (1987) described from Havelock Island, South Andaman, in the general organization of the body and the armature of its appendages, particularly the antennule, antenna, maxilliped and P. 1-P. 5. But, the new species clearly differs from *S. (D.) valens* and other allied species in the structure of maxilliped and the setal formula of the appendages P. 1-P. 4.

**Holotype** : Female specimen 490  $\mu\text{m}$  long collected by the author 20.3.90. Deposited in the National Zoological Collections, ZSI, Port Blair, Regd. No. 2399.

**Type locality** : Medium detritus sand 5-10 cm below surface between low and mid-water levels, intertidal zone, East Bay, Little Andaman, India.

### Genus *Diosaccus* Boeck, 1872

#### 95. *Diosaccus monardi* Sewell

1940. *Diosaccus monardi* Sewell, *Scient. Rep. John Murray Exped.*, 7 : 244.

**Material examined** : 2 ex., West Bay, 28.3.90.

**Diagnostic features** : Body linear. Marginal spinules occur on ventral surface of three abdominal segments. Rostrum short and broad. Caudal ramus as long as broad, with 1-jointed dorsal seta, a lateral spine and a well developed terminal seta. Antennule 8-segmented, with an aesthete on fourth segment. Exopod of antenna 3-segmented. Exopod of mandible with one lateral and 3 terminal setae ; endopod absent. Maxilliped prehensile, with a terminal claw. P. 2 in male with 3-segmented exopod and 2-segmented endopod bearing modified setae. Setae on rami P. 1-P. 4 are highly plumose. P. 5 with fused laminae, the endopod bearing 3 setae and exopod 4 setae. P. 6 in male is a single plate with 2 setae and a long spine. Principal apical seta of caudal ramus in male is not modified at its base.

**Measurements** : Length 0.81-0.82 mm.

**Remarks** : The original description of the species was made based on a single female specimen. The material examined agreed well with



the original description, particularly in the short endopod of P. 1, which is a unique feature of the species in the genus.

*Habitat* : Coarse detritus sand 5 cm below surface near low water level, intertidal zone.

*Distribution* : Nicobar Islands, Gulf of Mannar, Lakshadweep.

Genus **Robertsonia** Brady, 1880

96. **Robertsonia adduensis** (Sewell)

1940. *Laophonte adduensis* Sewell, *Scient. Rep. John Murray Exped.*, 7 : 314.

*Material examined* : 4 ex., West Bay, 28.3.90.

*Diagnostic features* : Body linear with distinct demarcation between metasome and urosome. Caudal ramus twice as broad as long with the principal apical seta short and expanded at the base. Antennule 6-segmented. Exopod of antenna 3-segmented. Mandible with 1-segmented exopod bearing 2 lateral and 2 terminal setae. Maxilliped prehensile ; endopod with a terminal claw. First endopod of P. 1 is longer than the entire exopod. Both rami of P. 2 in female are 3-segmented, bearing highly plumose setae. P. 2 in male with 3-segmented exopod and 2-segmented endopod, bearing highly modified setae. Inner seta absent on the first endopod segment of P. 2-P. 4. P. 5 with endopod bearing 2 stout terminal setae and exopod with 6 setae and spines. P. 6 in male bears a long seta flanked by a short plumose spine.

*Measurements* : Length 0.7-0.8 mm.

*Remarks* : The specimens examined agreed well with the original description of the species in all the essential features of the body appendages except for the principal apical seta of the caudal ramus, which was reported as normal for the type specimens.

*Habitat* : Coarse and detritus sand near low water level. intertidal zone.

*Distribution* : Maldives, Lakshadweep, Gulf of Manaar, Andamans.

Genus *Amphiascoides* Nicholls, 194197. *Amphiascoides subdebilis* (Willey)1935. *Amphiascus subdebilis* Willey, *Ann. Mag. Nat. Hist.*, 10 : 64.*Material examined* : 1 ex., South Bay, 26.3.90.

*Diagnostic features* : Body linear and tapers from anterior to posterior, with distinct demarcation between metasome and urosome. Rostrum distinct and elongated. Abdominal ornamentation lacking. Anal operculum present and bare. Caudal ramus thrice as wide as long, with 2 developed terminal setae, the inner one being the longest. Antennule 8-segmented, the fourth segment being quite elongated and bearing an aesthete. Exopod of antenna 3-segmented, the middle segment being very short and the terminal segment bearing 2 apical setae of unequal length. Maxilliped prehensile with a terminal claw. P. 1-P. 4 biramous, with 3-segmented exopod and endopod. Endopod of P. 1 quite stout, first segment being very long and second segment very short. Middle exopod segment without an inner seta. Distal endopod segment of P. 3 and distal exopod segment of P. 4 with 2 inner setae. P. 5 distinctly biramous, with the triangular basendopod and the elongated exopod bearing 5 setae each.

*Measurements* : Length 0.8 mm.

*Remarks* : The specimen collected from Andamans conforms well with the original description of the species, with a minor variation of setation of the body appendages. This species reported from different geographical regions is, however, known to exhibit considerable morphological variability.

*Habitat* : Algae and detritus sand near low water level, intertidal zone.

*Distribution* : Cosmopolitan.Genus *Amphiascopsis* Lang, 194098. *Amphiascopsis cinctus* (Claus)1868. *Amphiascus cinctus* Claus, *Schr. ges. Befr. Ges. Naturw. Marburg*, 1 : 27.

*Material examined* : 3 ex., West Bay, 28.3.90.

*Diagnostic features* : Body linear and slightly tapers posteriorly. Rostrum prominent and pointed anteriorly. Caudal ramus as long as broad with 2 developed setae. Antennule 8-segmented with an aesthete on fourth segment. Exopod of antenna 3-segmented, the middle one being very short. Maxilliped prehensile with a terminal claw and a seta on inner border of the endopod. P. 1-P. 4 with both rami 3-segmented. Basal segment of P. 1 in male with a long spine. Endopod of P. 2 in male modified. P. 5 in female biramous with 5 inner setae on basendopod and 6 outer setae on exopod. P. 5 in male with 2 inner setae on basendopod and 6 outer setae on exopod. P. 6 in male is represented by 3 setae.

*Measurements* : Length 0.8-0.9 mm.

*Remarks* : This eurytopic species reported from different geographical regions is known to exhibit minor morphological variation of ornamentation and the setae on abdominal appendages. All these varieties ultimately proved to belong to the same species.

*Habitat* : Littoral algae and weeds in tide pools near low water level, intertidal zone.

*Distribution* : Cosmopolitan, occurring on the coasts of Indian, Pacific and Atlantic Oceans.

#### Genus *Metamphiascopsis* Lang, 1949

##### 99. *Metamphiascopsis nicobaricus* (Sewell)

1940. *Amphiascus nicobaricus* Sewell, *Scient. Rep. John Murray Exped.*, 7 : 252.

*Material examined* : 2 ex., Bomila Creek, 19.3.90.

*Diagnostic features* : Body linear, with distinct demarcation between metasome and urosome. Rostrum distinct, triangular and pointed anteriorly. Caudal ramus broader than long with 2 developed setae. Antennule 9-segmented, with an aesthete on fourth segment. Exopod of antenna 3-segmented, the middle one being quite short. Maxilliped with a terminal claw and a row of needle-like setae on inner margin of endo-

pod. P. 1 with 3-segmented exopod and 2-segmented endopod, the first segment being very long, while the second segment being very short, with 2 terminal claws. P. 2-P. 4 with both rami 3-segmented. P. 5 with basendopod bearing 5-setae and the oval distal segment with 6 setae. Endopod of P. 2 in male modified. P. 6 in male with one spine and 2 setae.

*Measurements* : The material examined conforms well with the original description of species, particularly in the presence of only 2 inner setae on the third exopod segment of P. 4, which is an important diagnostic character of the species.

*Habitat* : Littoral algae and weeds in tide pools, intertidal zone.

*Distribution* : Widely distributed on the coasts of Indian Ocean as Maldives, Lakshadweep, India, Andaman and Nicobar Islands.

### Genus *Balucopsylla* Rao, 1972

#### 100. *Balucopsylla triarticulata* Wells and Rao

1987. *Balucopsylla triarticulata*, Wells and Rao, *Mem. Zool. Surv. India*, 16 (4) : 120.

*Material examined* : 2 ex., West Bay, 28.3.90.

*Diagnostic features* : Body linear and cylindrical. Cephalothorax elongate and rounded anteriorly. Thoracic segments short and abdominal segments elongate. Rostrum elongate and pointed. Anal operculum absent. Somatic ornamentation limited to sensilla. Antennule 8-segmented, with second segment being the longest and an aesthete on fourth segment. Exopod of antenna 3-segmented, the second one being quite small without a seta. Maxilliped well developed and prehensile. P. 1-P. 4 with both rami 3-segmented, with elongate exopod segments bearing spinules on outer edges. P. 5 with basendopod bearing 2 setae and a massive spine on inner side, while the exopod bears 5 setae.

*Measurements* : Length 0.48-0.50 mm.

*Remarks* : The specimens conform well with the original description of the species. The three-segmented nature of the exopod of antenna

is significant of the species reflecting on the primitive nature of the appendage.

*Habitat* : Medium detritus sand with fine shell gravel 5-10 cm below surface between low and mid-water levels, intertidal zone.

*Distribution* : Andaman and Nicobar Islands.

Family AMEIRIDAE

Genus *Ameira* Boeck, 1864

101. *Ameira parvula* (Claus)

1866. *Canthocamptus parvula* Claus, *Schr. Ges. Beford, ges. Naturw. Marburg*, 1 : 30.

*Material examined* : 2 ex., Bomila Creek, 19.3.90.

*Diagnostic features* : Body linear and cylindrical. Rostrum distinct and pointed anteriorly. Antennule 8-segmented, with an aesthete on fourth segment. Exopod of antenna 2-segmented. Maxilliped prehensile upon first segment. Basis of endopod of P. 1 longer than second and third segments put together. P. 1-P. 4 with both rami 3-segmented. Middle segment of exopod of P. 2 with one inner seta. Third exopod segment of P. 4 with 3 inner setae. P. 5 distinctly biramous, basal segment with 4 setae and distal segment with 5 setae. Caudal rami rectangular and as wide as long, with 2 developed setae. P. 1 in male with a modified inner spine on basipod. P. 6 in male represented by 3 setae.

*Measurements* : Length 0.52-0.54 mm.

*Remarks* : Great morphological variation has been reported for this widely distributed species. The present material, however, approaches well in all the morphological details with the original description of the species.

*Habitat* : Algae and detritus coralline sand near low water level, intertidal zone.

*Distribution* : Cosmopolitan.

Genus **Sicameira** Klie, 1950102. **Sicameira langi** Rao

1972. *Sicameira langi* Rao, *Cah. Biol. Mar.*, 13 : 316.

*Material examined* : 1 ex., South Bay, 26.3.90.

*Diagnostic features* : Body cylindrical without demarcation between metasome and urosome and slightly tapers posteriorly. Distinct somatic ornamentation lacking. Anal operculum bare. Caudal ramus twice longer than broad, with 3 setae, the middle one being very long. Rostrum small and pointed. Cephalothorax rectangular. Antennule 7-segmented with an aesthete on fourth segment. Exopod of antenna 2-segmented, the distal one being quite small with 2 long setae. Mandible lacks exopod. Maxilliped prehensile with a terminal claw. Both the rami of P. 1-P. 4 are 3-segmented. P. 5 biramous with distinct rami, the basendopod bearing 2 inner setae and oval exopod bearing 5 setae, the second innermost one being the longest and plumose.

*Measurements* : Length 0.50 mm.

*Remarks* : The Little Andaman specimens agree well with the original description of the species which was based on female specimens. The male specimens, however, still remain unknown.

*Habitat* : Coarse sands with fine shell gravel and little detritus between low and half-tide levels, intertidal zone.

*Distribution* : Indian coast, Lakshadweep, Andaman Islands.

Genus **Paraleptomesochra** Wells, 1967103. **Paraleptomesochra minima** Wells

1967. *Paraleptomesochra minima* Wells, *Trans. Roy. Soc. Edinb.*, 67 : 297.

*Material examined* : 2 ex., Harmindar Bay, 25.3.90 ; 1 ex., South Bay, 26.3.90.

*Diagnostic features* : Body linear and cylindrical, without a taper from anterior to posterior. Rostrum confluent with cephalothorax and sharply pointed anteriorly. Anal operculum present without setules.

Somatic ornamentation lacking. Caudal ramus longer than broad with 2 developed terminal setae. Antennule 8-segmented, second segment longest and with an aesthete on fourth and terminal segments. Exopod of antenna 2-segmented, with a modified bifid terminal seta. Mandible exopod absent. Maxilliped prehensile, with a terminal claw. P. 1 with both rami 2-segmented, first endopod segment being as long as exopod. Basis in male with a modified inner spine. P. 2-P. 4 with both rami 3-segmented with reduced setation. P. 5 with distinct rami, exopod being longer than broad with 6 setae in female and 4 setae in male. P. 6 in male confluent both sides with 2 setae on either side.

*Measurements* : Length 0.28-0.30 mm.

*Remarks* : Rao (1972) described *P. wellsi*, the only other species of the genus from the beach sands on Waltair coast. Although *P. minima* and *P. wellsi* are closely related, the Andaman specimens agree fairly well with the former species described from Mozambique, which is in fact geographically more distant than the adjacent Indian coast.

*Habitat* : Clean and medium sands 5 cm below surface between low and mid-water levels, intertidal zone.

*Distribution* : Inhaca Island (Mozambique) ; Lakshadweep, Andaman Islands.

#### Family PARAMESOCHRIDAE

#### Genus *Kliopsyllus* Kunz, 1962

#### 104. *Kliopsyllus* sp.

*Material examined* : 1 ex., Hut Bay, 18.3.90.

*Description* : Body elongated, dorsoventrally depressed and progressively tapers from anterior to posterior. Rostrum small and pointed anteriorly. Thoracic segments distinct. Anal operculum present. Caudal ramus thrice longer than wide, with 4 terminal setae, the innermost one being well developed. Antennule 7-segmented, with an aesthete on fourth segment. Exopod of antenna 1-segmented, with 3 apical setae. Maxilliped elongated and prehensile. P. 1 with both rami 2-segmented,

second segment of exopod and endopod bearing 4 and 2 setae, respectively. P. 2-P. 4 with 1-segmented endopod and 3-segmented exopod, both rami ending in 1 and 3 setae, respectively. P. 5 with oval exopod bearing 1 lateral and 3 apical setae. P. 6 in male a small plate with 2 apical setae.

**Measurements :** Length 0.30 mm.

**Remarks :** Among the known species of the genus *Kliopsyllus*, in the structure of the body appendages and their setation, the material examined closely approaches *K. idiotes* Wells (1967) described from the sandy beaches of the Inhaca Island, Mozambique. But, considerable variation of the setation of P. 1-P. 5 occurs in the local specimens, making their identity with the South African species difficult. Specific identification of the species needs further detailed study.

**Habitat :** Clean and medium sand 5 cm below surface between low and mid-water levels, intertidal zone.

### Genus *Apodopsyllus* Kunz, 1962

#### 105. *Apodopsyllus camptus* Wells

1971. *Apodopsyllus camptus* Wells, *J. nat. Hist.*, 5 : 512.

**Material examined :** 3 ex., West Bay. 28.3.90.

**Diagnostic features :** Body elongate, cylindrical, about 7 times as long as broad. Thoracic segments 3-5 without distinct demarcation. Caudal rami subpyriform. Antennule 7-segmented with an aesthete on the fourth segment. Exopod of antenna 1-segmented with 2 lateral setae and a modified terminal seta. Exopod of P. 1 is 1-segmented with one lateral and 4 terminal setae. Endopod of P. 1 is 2-segmented, the second segment being small with 2 terminal setae. P. 2-P. 4 with 3-segmented exopod ; endopod lacking. Exopod of P. 5 with 4 setae. P. 6 on either side fused, with 2 setae on each side.

**Measurements :** Length 0.30-0.32 mm.

**Remarks :** This species described from Porto Novo is very close to *A. depressus* Krishnaswamy (1957) described from Madras, except



for a minor variation in the setation of the exopod of P. 5. The present specimens otherwise agree well with both these species. Hence, the validity of *A. depressus* needs to be ascertained due to the non-availability of its type material (Wells, 1971).

**Habitat :** Medium sand with little detritus near mid-water level, intertidal zone.

**Distribution :** India, Andamans Islands, Lakshadweep.

Family TETRAGONICIPITIDAE

Genus *Phyllopodopsyllus* Scott, 1906

106. *Phyllopodopsyllus aegypticus* Nicholls

1944. *Phyllopodopsyllus aegypticus* Nicholls, *Ann. Mag. nat. Hist.*, 11 : 493.

**Material examined :** 4 ex., South Bay, 26.3.90.

**Diagnostic features :** Body linear about 5 times as long as broad and densely covered with fine hairs. Anal operculum setose. Genital suture complete dorsally. Caudal ramus longer than wide, with the principal terminal seta being not bulbous. Antennule 7-segmented in female and 6-segmented in male, with an aesthete on fourth segment. Exopod of antenna 1-segmented and bears 3 setae. Exopod of mandible small and 1-segmented. Maxilliped with a terminal claw. Rami of P. 1-P. 4 with 3-segmented exopod and 2-segmented endopod. First endopod segment of P. 1 is elongate, slender, 7 times as long as broad and 7 times as long as the second segment. Exopod of P. 5 with 5 setae, 2 of them being stout and plumose. P. 6 in male with 2 setae and an outer spine.

**Measurements :** Length 0.70 mm.

**Remarks :** The specimens examined agreed well with the original description of the species, except for the presence of an extra seta on the distal segment of P. 4. The peculiar rostrum, mouth parts, exopod of P. 3 and female P. 5 are important characteristic features of the species.

*Habitat* : Coarse sand with little detritus 5 cm below surface between low and mid-tide levels, intertidal zone.

*Distribution* : Red Sea, Lakshadweep, Andamans.

### 107. *Phyllopodopsyllus gracilipes* Wells and Rao

1987. *Phyllopodopsyllus gracilipes* Wells and Rao, *Mem. Zool. Surv. India*, 16 (4) : 151.

*Material examined* : 6 ex., Harmindar Bay, 25.3.90 ; 2 ex., South Bay, 26.3.90 ; 1 ex., West Bay, 28.3.90.

*Diagnostic features* : Body linear, five times as long as broad. Rostrum short with truncate apex. Anal operculum spinulose. Caudal ramus longer than broad, with principal terminal seta being bulbous. Entire body and appendages minutely pubescent, with broad setules. Antennule 9-segmented, lacking an unguiform projection on second segment. Exopod of antenna 1-segmented. Maxilliped prehensile. P. 1-P. 4 with 3-segmented exopods and 2-segmented endopods. Endopod of P. 1 prehensile. P. 5 is of usual generic type. Antennule in male strongly haplocerate. Exopod of P. 5 in male with 5 setae.

*Measurements* : Length 0.6-0.7 mm.

*Remarks* : The material examined agrees with the original description of the species made from these islands.

*Habitat* : Algal weeds and coarse detritus sand near low water level, intertidal zone.

*Distribution* : Andaman and Nicobar Islands.

Family CANTHOCAMPTIDAE

Genus *Mesochra* Boeck, 1864

### 108. *Mesochra pygmaea* (Claus)

1863. *Dactylopus pygmaea* Claus, *Die freilebenden Copepoden der Fauna Deutschlands*, 127.

*Material examined* : 2 ex., South Bay, 26.3.90.

*Diagnostic features* : Body linear without distinct demarcation between metasome and urosome. Antennule 6-segmented. Exopod of antenna 1-segmented. Rostrum distinct, long and slender. Maxilliped prehensile with a terminal claw and spinules on inner margin of endopod. P.1 biramous with endopod 3-segmented, basis being longer than whole exopod. P. 2-P. 4 biramous with 2-segmented endopod and 3-segmented exopod. P. 5 with 2 segments, the basal and distal segments bearing 5 setae each. Anal operculum covered with fine setules. Caudal ramus not longer than wide, a developed terminal seta present. Abdominal ornamentation lacking.

*Measurements* : Length 0.40 mm.

*Remarks* : The specimens examined correspond well with the original description of the species, but for the minor variation of setules on anal operculum and setation on P 1.

*Habitat* : Algae and detritus sand near low water level, intertidal zone.

*Distribution* : Cosmopolitan.

#### Genus *Psammastacus* Nicholls, 1935

#### 109. *Psammastacus spinicaudatus* Rao and Ganapati

1969. *Psammastacus spinicaudatus* Rao and Ganapati, *Proc. Ind. Acad. Sci.*, 69 : 7.

*Material examined* : 2 ex., Bomila Creek 19.3.90. 1 ex., Butler Bay, 21.3.90.

*Diagnostic features* : Body cylindrical and vermiform without demarcation between metasome and urosome. Rostrum small and triangular. Anal operculum with two spinous outgrowths. Caudal rami conical, with a lateral row of spinules, 4 setae and a terminal claw. Antennule 7-segmented, with an aesthete on the fourth segment. Exopod of antenna one-segmented with a terminal seta. Maxilliped with elongated second endopod segment and a claw. P. 1 with 1-segmented exopod and 2-segmented endopod. P. 2-P. 4 with 3-segmented exopods and 2-segmented endopods. Third exopod segment of P. 3 and second and third exopod

segments of P. 4 bear modified setae. P. 5 reduced to narrow plate with 4 setae in female and 3 setae in male. P. 6 in male is a narrow lappet with one lateral and one apical seta.

*Measurements* : Length 0.58-0.60 mm.

*Remarks* : The specimens agree well with the original description of the species made from Waltair coast on Indian mainland with a minor variation of the spinules on caudal rami.

*Habitat* : Coarse and medium sand with fine shell gravel and little detritus between low and half-tide levels, intertidal zone.

*Distribution* : India, Lakshadweep, Andaman Islands.

#### Genus *Arenopontia* Kunz, 1937

#### 110. *Arenopontia indica* Rao

1967. *Arenopontia indica* Rao, *Crustaceana*, 13 : 9.

*Material examined* : 4 ex., Harmindar Bay, 25.3.90 ; 2 ex., South Bay, 26.3.90.

*Diagnostic features* : Body cylindrical without demarcation between metasome and urosome and worm-like. Anal operculum prominent without setae. Antennule 6-segmented, the fourth with an aesthete. Exopod of antenna one-segmented with two terminal setae. Maxillule and maxilla much reduced. Maxilliped short with a terminal claw. P 1-P. 4 are biramous with 3-segmented exopod and 2-segmented endopod. Second endopod segment short with 2 terminal setae. Second endopod segment of P. 2 and P. 4 and third exopod segment of P. 4 with modified setae. P. 5 is a triangular plate with 4 setae. Egg sac single, with 5-9 eggs arranged in 1 or 2 rows. Sixth leg in male is a semicircular lamina with an inner spine and an outer seta. Considerable variability occurs in this species in the structure of caudal ramus and its terminal claw.

*Measurements* : Length 0.52-0.54 mm.

*Remarks* : The specimens examined correspond well with the original description of the species made from Andhra coast, except for

the presence of the spur on the inner side of ramus. The spur was reported on the outer side of ramus for the type specimens occurring on the Waltair coast.

*Habitat* : Medium and coarse sand with little detritus near mid-water level, intertidal zone.

*Distribution* : India, Lakshadweep, Andaman Islands.

Genus *Psammopsyllus* Nicholls, 1945

111. *Psammopsyllus operculatus* Nicholls

1945. *Psammopsyllus operculatus* Nicholls, *Jour. Roy. Soc. West Australia*, 29 : 17.

*Material examined* : 1 ex., West Bay, 28.3.90.

*Diagnostic features* : Body linear and cylindrical, without demarcation between metasome and urosome. Anal operculum present. Caudal ramus conical and twice longer than wide. Each ramus bears 2 short terminal spines, 3 lateral and 3 terminal setae. Antennule 6-segmented, with an aesthete on fourth segment. Exopod of antenna lacking. Maxilliped single-segmented, with a terminal claw. P. 1 is uniramous with 2-segmented endopod, the second segment being 1/3 of the first with 2 apical setae. P.2-P.4 are biramous with 3-segmented exopod and 1-segmented endopod ; last exopod segment with 3 terminal setae. P. 5 is a short semicircular lamina with a spine and a seta.

*Measurements* : Length 0.35 mm.

*Remarks* : The species has a wide geographical distribution occurring on the Pacific, Atlantic and Indian Oceans, exhibiting minor morphological variation compared to the original description, particularly the setation of the body appendages. The material examined, however, was very close to the specimens described from the Australian coast, except for the presence of a modified seta with branched tip on the endopod segment of second leg of the local specimen.

*Habitat* : Medium sand 10 cm below surface near mid-water level, intertidal zone.

*Distribution* : Australia, Andamans, India, Lakshadweep, Senegal, Ghana, Brazil.

Family LAOPHONTIDAE

Genus *Laophonte* Philippi, 1840

112. *Laophonte cornuta* Philippi

1840. *Laophonte cornuta* Philippi, *Arch. Naturgesch.*, 5 : 195.

*Material examined* : 2 ex., Harmindar Bay, 25.3.90 ; 1 ex., South Bay, 26.3.90.

*Diagnostic features* : Body linear with maximum width behind cephalothorax. No distinct demarcation between metasome and urosome. Rostrum depressed and bluntly pointed anteriorly. Thoracic and abdominal segments with ornamentation of hemispherical knobs on posterior margin. Antennule 4-segmented with an aesthete on the third segment. Exopod of antenna 1-segmented with two setae. Maxilliped prehensile with a terminal claw. P.2-P.4 biramous, with 2-segmented endopod and 3-segmented exopod. P.5 biramous with endopod bearing 5 setae and exopod 6 setae.

*Measurements* : Length 0.62 mm.

*Remarks* : The species has been described from different geographical regions with considerable morphological variation (Lang, 1965), particularly in the anal operculum and the somatic ornamentation. Although the present specimens conform well with the important characters of the species, variation is, however, observed with the ornamentation, antennule and caudal ramus. Because of the ubiquitous nature of the species, these variations are to be considered local.

*Habitat* : Algae and detritus sand, between the low and mid-water levels, intertidal zone.

*Distribution* : Cosmopolitan.

Genus **Quinquelaophonte** Wells, Hicks and Coull, 1982

113. **Quinquelaophonte quinquespinosa** (Sewell)

1924. *Laophonte quinquespinosa* Sewell, *Mem. Indian Mus.*, 5 : 832.

*Material examined* : 2 ex., Hut Bay, 18.3.90.

*Diagnostic features* : Body linear and slightly compressed dorso-ventrally. Anal operculum with a row of small spinules. Caudal rami twice as long as broad with 2 developed terminal setae. Antennule 6-segmented, with an aesthete on the fourth segment. Exopod of antenna is of one small segment with 2 setae. Maxilliped robust, with a stout terminal claw. Endopod of P. 1 with 2 segments, prehensile and ends in a terminal claw. P. 2-P. 4 biramous, with 2-segmented endopod and 3-segmented exopod. Exopod of P.5 with 5-6 setae. P.6 in male is a small lappet with 2 lateral setae.

*Measurements* : Length 0.62-0.64 mm.

*Remarks* : The specimens conform well with the original description of the species except for minor variations in abdominal ornamentation and setation of the body appendages.

*Habitat* : Fine sand and algae near low water level, intertidal zone.

*Distribution* : Widely distributed along the coasts of Mediterranean Sea, Atlantic, Pacific and Indian Oceans.

Genus **Langia** Wells and Rao, 1987

114. **Langia maculata** Wells and Rao

1987. *Langia maculata* Wells and Rao, *Mem. Zool. Surv. India*, 16 (4) : 182.

*Material examined* : 1 ex., Butler Bay, 21.3.90 ; 2 ex., Dugong Creek, 24.3.90.

*Diagnostic features* : Body linear and dorsoventrally depressed. Cephalothorax rounded anteriorly with minute rostrum. Genital field simple, P.6 being represented by a seta. Anal operculum prominent and strongly dentate. Caudal ramus longer than broad, terminating

in an unguiform projection. Body largely punctate. Antennule 5-segmented, with an aesthete on fourth segment. Exopod of antenna one-segmented, with 3 well developed plumose setae. Maxilliped small and prehensile. P. 1 with both rami 2-segmented. Endopod absent in P 2. Endopod of P. 3 very small with 2 long setae. Exopod of P. 5 with 5 setae. Antennule in male sub-chirocerate. P. 6 is a lappet with 2 setae.

*Measurements* : Length 0.35-0.36 mm.

*Remarks* : These specimens conform well with the original description of the species, which is readily identified by the spotted appearance of body ornamentation.

*Habitat* : Coarse detritus sand and crustose algae near mid-water level, intertidal zone.

*Distribution* : Andaman and Nicobar Islands.

### Genus **Laophontina** Norman and Scott, 1905

#### 115. **Laophontina sensillata** Wells and Rao

1987. *Laophontina sensillata* Wells and Rao, *Mem. Zool. Surv. India*, 16 (4) : 184.

*Material examined* : 1 ex., South Bay, 26.3.90 ; 2 ex., West Bay, 28.3.90.

*Diagnostic features* : Body cylindrical and minutely pubescent. Rostrum minute and fused with cephalothorax. Anal operculum prominent and dentate. Caudal ramus with 3 unguiform processes and weak setae. Cephalothorax with many rows of dense sensilla. Anal operculum strongly dentate. Antennule 6-segmented, with an unguiform projection on second segment. Exopod of antenna one-segmented with 4 plumose setae. Maxilliped prehensile on first segment. P. 1 with 1-segmented exopod and 2-segmented prehensile endopod. P.2-P.4 with reduced rami, lacking endopods. Exopod of P. 5 with 3 setae. Antennule in male chirocerate.

*Measurements* : Length 0.48-0.50 mm.

*Remarks* : The specimens examined correspond well with original description. The species is distinguished from other members of the



genus by the extremely dense distribution of sensilla on the cephalothorax.

*Habitat* : Coarse and medium sand rich in organic detritus 5-10 cm below surface between low and half-tide levels of the intertidal zone.

*Distribution* : The species is apparently endemic to the Andaman and Nicobar Islands.

## Order ISOPODA

### Family MICROPARASELLIDAE

#### Genus *Angeliara* Chappuis and Delamare, 1954

#### 116. *Angeliara cosettae* Coineau and Rao

1972. *Angeliara cosettae* Coineau and Rao, *Vie et Milieu*, 23: 67.

*Material examined* : 3 ex., Butler Bay, 21.3.90 ; 2 ex., Hut Bay, 20.3.90 ; 3 ex., Harmindar Bay, 25.3.90 ; 1 ex., South Bay, 26.3.90 ; 2 ex., West Bay 28.3.90.

*Diagnostic features* : Body long and vermiform, Thorax 7-segmented and abdomen 2-segmented. Uropod long and biramous with 4 terminal setae on endopod. Eyes absent. Antennule 7-segmented, with an aesthete on sixth and seventh segments. Antenna longer than antennule, composed of 6 long and 8 short segments. Endopodite of maxilliped long and bract-like. Pereiopods all alike, 6-segmented and carry a pair of terminal claws. Second pleopod of male 2-jointed and modified into an odd apparatus for copulation. Viviparous and brood-pouch external.

*Measurements* : Length 0.8 to 1.0 mm.

*Remarks* : The specimens correspond well in all the essential features with the original description of the species made from north and south Andaman Islands. The second pleopod in male specimens is highly modified, forming a characteristic feature of the species, by which it can easily be distinguished from other species of the genus,

*Habitat* : Coarse detritus sand 5-20 cm below surface between low and mid-water levels of the intertidal zone.

*Distribution* : The species is endemic to the Andaman and Nicobar Islands.

Family ANTHURIDAE

Genus *Microcerberus* Karaman, 1933

117. *Microcerberus andamanensis* Coineau and Rao

1972. *Microcerberus andamanensis* Coineau and Rao, *Vie et Milieu*, 23 : 73.

*Material examined* : 3 ex., East Bay, 20.3.90 ; 1 ex., Harmindar Bay, 25.3.90 ; 2 ex., South Bay, 26.3.90 ; 2 ex., West Bay, 28.3.90.

*Diagnostic features* : Body long, vermiform and transparent. Eyes absent. Antennule 10-segmented with an aesthete on fifth segment. Antenna 6-segmented with an aesthete on last segment. Mandible palp much reduced. Pereiopods 6-segmented, all alike, excepting the first with robust fifth segment prehensile on sixth segment. Modified sensory setae occur on first, fourth and fifth segments of pereiopods 2-7. Second pleopod of male 2-segmented, with terminal segment modified into an unguiform structure for copulation. Uropod 2-segmented, with two terminal setae and lateral sensory bristles on endopod. Exopod much reduced.

*Measurements* : Length 0.9-1.0 mm.

*Remarks* : The material examined agreed fairly well with the original description of the species from Andamans Islands. Despite the close resemblance to some other species of the genus, *M. andamanensis* can easily be distinguished by the characteristic structure of second pleopod in male, which is slightly longer in the Little Andaman specimens compared to the type specimens.

*Habitat* : Coarse and medium sand with little detritus between low and mid-water levels, intertidal zone.

*Distribution* : Andaman and Nicobar Islands,

Phylum TARDIGRADA

Order HETEROTARDIGRADA

Suborder ARTHROTARDIGRADA

Family BATILLIPEDIDAE

Genus *Batillipes* Richters, 1909

118. *Batillipes mirus* Richters

1909. *Batillipes mirus* Richters, *Verh. disch. Zool. Ges.*, 19 : 85.

*Material examined* : 1 ex., West Bay, 28.3.90.

*Diagnostic features* : Body minute, unsegmented, dorsoventrally flattened and nearly rectangular in shape. Head and trunk not clearly demarcated. The head appendages disposed on the anterior border consist of a median cirrus, internal buccal cirrus, external buccal cirrus, clava and lateral cirrus, the last one being the longest. Eyes absent. Cuticle is smooth and transparent. Four pairs of lateral legs are present, each with a slender dorsal spine at the base and 6 digits of different size ending in spoon-shaped adhesive discs. Postero-lateral corners of the body bear a long seta characteristic of the genus. A median caudal spine present. Highly thigmotactic and negatively phototactic in habits.

*Measurements* : Length 180  $\mu\text{m}$  and width 60  $\mu\text{m}$ .

*Remarks* : The specimen examined agreed well with the original description of the species except for some minor variation in the body size and the length of the cephalic appendages.

*Habitat* : Medium coralline sand 10 cm below surface near mid-water level, intertidal zone.

*Distribution* : Cosmopolitan.

Phylum MOLLUSCA  
Class GASTROPODA  
Subclass PROSOBRANCHIA  
Order CAENOGASTROPODA  
Family CAECIDAE  
Genus *Caecum* Fleming, 1813

119. *Caecum glabrum* (Montagu)

1803. *Philine glabrum* Montagu, *Zool. Jb. (Abt. Syst.)*, 71 : 55.

*Material examined* : 1 ex., Butler Bay, 21.3.90.

*Diagnostic features* : Body small with curved tubular shell having well developed external annulation. Small coiled portion of the shell decollated. Animal lies in the distal uncoiled portion of the shell. Shell is closed by a calcareous septum at the proximal end and by a horny multispiral operculum at the distal end. Head distinct with a pair of dark eyes and a pair of ciliated tentacles. Foot with small operculum attached on the dorsal surface. Body anatomy much reduced to suit interstitial life. Feeds mainly on diatoms and detritus of the sediment.

*Measurements* : Length 0.98 mm.

*Remarks* : The much reduced morphology and anatomy of *C. glabrum* were studied in detail by Gotze (1938). The present specimen examined conformed well with the description and figures of the species except for the superficial ridges on the shell, which might be a result of the geographical isolation of the species.

*Habitat* : Coarse sand between low and mid-water levels of the intertidal zone.

*Distribution* : Widely distributed along the coasts of the North Atlantic and the Indian Ocean.

Order NUDIBRANCHIATA

Family PSEUDOVERMIDAE

Genus *Pseudovermis* Pariaslavzewa, 1891

120. *Pseudovermis soleatus* Salvini-Plawen and Rao

1973. *Pseudovermis soleatus* Salvini-Plawen and Rao, *Z. Morph. Tiere*, 74 : 235.

*Material examined* : 2 ex., Bomila Creek, 19.3.90.

*Diagnostic features* : Body elongated with distinct head and tapering tail. White and vermiform in appearance. Distinct foot-sole present. About 8-10 asymmetrally arranged lateral serata occur on body, each containing a cnidosac with duct. Eyes absent. Radula with 35-40 transverse rows of plates, each row containing 3 teeth. Lateral teeth long, slender and pointed. Middle teeth with 13-17 denticules. Anterior border of mandible with 20 distinct denticles. Inner border of jaw thickened. Epidermis highly contractile and thigmotactic.

*Measurements* : Length 2.2 mm and maximum body diameter 0.11 mm.

*Remarks* : Material examined conforms well with the original description of the species made from Sound Island, North Andaman. The Little Andaman specimens, however, exhibited wider distance between the first and the second cerata compared to the type specimens.

*Habitat* : Coarse sand mixed with fine shell gravel and little detritus 10 cm below surface between low and mid-water levels, intertidal zone.

*Distribution* : The species is endemic to the Andaman and Nicobar Islands.

REMARKS ON DISTRIBUTION

The coast around Little Andaman Island is mostly sandy, with patches of rocky and muddy beaches in between. Algal weeds largely

occur in tide pools on rocky shores in the littoral region. Except for the areas in the proximity of estuarine creeks, tropical oceanic conditions of temperature and salinity of sea water prevail all along the coast. Bulk of these beach sands are silicious and fall under the category of medium sands in their texture. The sediments are rich in organic-detritus, particularly in sheltered areas. Compactness of these beaches is considerably high due to the fine nature of the sediments. Coarse sands with fine shell gravel and little detritus occur largely near low water level on beaches at exposed areas. Limited patches of dark and fine mud flats occur on the coast along estuaries, bays and other sheltered areas. The beach sands are mostly silicious and rarely coralline in their composition.

The majority of meiofaunal groups characteristic of littoral habitats are encountered on this island. But, their faunal composition and quantitative abundance varied considerably at different tidal levels, habitats and localities on the island, depending on the nature of the substratum. The medium detritus sands in sheltered situations with greater beach stability supported remarkably rich populations of the meiofauna, while the areas exposed to severe surf action yielded considerably poor collections. The total population densities of meiofauna recorded in the littoral sediments varied from 220 individuals/10 cm<sup>2</sup> to 1860 individuals/10 cm<sup>2</sup>. Maximum concentrations of the meiofauna, however, occurred between the low and mid-water levels of the intertidal zone upto 20 cm below surface in sandy sediments and the top 1 cm in muddy sediments. The algal thalli and fronds supporting rich detritus in the lower levels yielded more number of individuals than those occurring in the higher tidal levels.

As characteristic of littoral habitats, the free-living Nematoda and Copepoda constituted the major groups of the meiofauna, comprising about 70-90% of the total fauna, depending on nature of the habitat. The finer sediments of sand and mud generally supported larger populations of the nematodes, while the coarser sandy sediments exhibited a predominance of the copepods. The Hydrozoa, Turbellaria, Gastrotricha, Kinorhyncha, Archiannelida, Polychaeta, Isopoda, Amphipoda, Halacarida and Gastropoda comprised the minor groups. The results of a quantitative estimation of the diverse groups of meiofauna inhabiting the sand, mud and algae are presented in Table 1. Of

**Table 1**

Percentage Composition of diverse groups of meiofauna recorded from the three littoral habitats on Little Andaman.

Group	Sand	Mud	Algae
Hydrozoa	0.2	—	—
Turbellaria	3.1	1.1	1.4
Nematoda	36.1	58.4	38.2
Nemertina	0.1	—	0.2
Gastrotricha	5.4	1.0	0.1
Kinorhyncha	—	0.3	—
Rotifera	0.2	0.2	0.4
Archannelida	4.2	—	0.1
Polychaeta	6.2	2.4	1.8
Oligochaeta	1.4	0.5	—
Ostracoda	1.2	1.8	1.4
Copepoda	34.0	28.4	32.5
Isopoda	2.0	—	1.2
Amphipoda	1.6	0.6	15.0
Cumacea	0.4	0.2	—
Halacarida	1.2	0.5	2.2
Gastropoda	0.2	1.2	1.7
Holothuroidea	0.4	—	—
Insect larvae	0.8	1.2	1.8
Others	1.3	2.2	2.0

these three habitats, as elsewhere, the sandy sediments generally supported a greater variety of meiofauna on the Little Andaman Island. The accumulation of pollutants on the littoral zone at Hut Bay due to continuous harbour activities in the area has, however, resulted in the depletion or eradication of many meiofauna species which are quite sensitive to ecological stress in the environment. This is evident based on the studies carried out earlier at this region (Rao, 1987).

The composition and abundance of genera and species of meiofauna recorded on Little Andaman are more or less in close conformity with

those known from other parts of the world. The faunal element is thus dominated by the eurytopic species which are widely distributed in the Indian Ocean as well as those of the warm temperate and tropical

**Table 2**

**Zoogeographical relationship of the littoral meiofauna of Little Andaman**

Group	Cosmopolitan species	Eurytopic species	Indian Ocean species	Endemic to A. & N. Islands	Endemic to Little Andaman.	Total no. of species
Hydrozoa	—	—	—	1	2	3
Turbellaria	1	—	1	1	—	3
Nematoda	6	8	8	—	—	22
Gastrotricha	—	4	2	3	4	13
Kinorhyncha	—	—	—	1	1	2
Archiannelida	2	2	4	—	—	8
Polychaeta	2	7	2	2	1	14
Copepoda	8	14	16	10	2	50
Isopoda	—	—	—	2	—	2
Tardigrada	1	—	—	—	—	1
Gastropoda	—	1	—	1	—	2
<b>Total</b>	<b>20</b>	<b>36</b>	<b>33</b>	<b>21</b>	<b>10</b>	<b>120</b>

regions. There are only a few species recorded as endemic for the Little Andaman, while only one genus *Anthohydra* (Hydrozoa) hitherto proved endemic to this region. Of the total 120 species dealt in this paper, 20 (16.7%) are cosmopolites, 36 (30.0%) are eurytopics with wide geographical distribution, 33 (27.5%) are Indian Ocean forms and 21 (17.5%) are endemic to Andaman and Nicobar Islands, while 10 (8.3%) are endemic to the Little Andaman Island (Table 2). It is well known that a majority of marine species in general are widely distributed on different parts of the world, but the marine meiofauna because of their peculiar mode of existence and bionomics, showed a remarkably higher percentage of endemism in the insular ecosystems,



## SUMMARY

The diverse groups of marine meiofauna of Little Andaman Island inhabiting the sand, mud and algae in the littoral region were investigated. Based on the results, the present paper gives a systematic account of 120 species of the following groups : Hydrozoa (3), Turbellaria (3), Nematoda (22), Gastrotricha (13), Kinorhyncha (2), Archiannelida (8), Polychaeta (14), Copepoda (50), Isopoda (2), Tardigrada (1) and Gastropoda (2). Eight species of the following groups are described as new to science : Hydrozoa (1), Gastrotricha (4), Polychaeta (1) and Copepoda (2). Sixty-eight species of the meiofauna proved new records to the fauna of the island. Part of the material belonging to various groups remains to be studied, identified and reported.

The meiofauna of Little Andaman Island proved to be sufficiently rich, both in their density and diversity. A majority of the faunal groups characteristic of littoral habitats are encountered around the island. But, their abundance varied considerably at different tidal levels, depths, habitats and localities, depending on the nature of the substratum. Their total population densities varied from 220 to 1860 individuals per 10 cm<sup>2</sup> of the sediment. The free-living Nematoda and Copepoda constituted the major groups comprising 70 to 90% of the total meiofauna, while the rest of the groups are reduced to a minor status. The composition of genera and species of the fauna are in close conformity with those known from other parts of the world. The faunal element exhibited a limited percentage of endemism and is largely dominated by eurytopic species, which are widely distributed in Indian Ocean as well as those of the warm temperate and tropical regions.

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