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A PRELIMINARY NOTE ON THE TANAIIDACEA AND
ISOPODA OF TRAVANCORE

BY

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CARDED

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A PRELIMINARY NOTE ON THE TANAIIDACEA AND ISOPODA OF TRAVANCORE

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INTRODUCTION

Apart from the isolated reference to Indian Isopods in the works of the early authors like M. Edwards¹, Bleeker², Miers³ and Schioedte & Meinert⁴, the other notable contributions on Indian Isopods are those of Stebbing⁵, Barnard⁶ and Chopra⁷. Chopra's work is especially valuable since he has made an exhaustive study of the Bopyrid parasites of Indian *Macrura*.

The present work is based on collections from the littoral and estuarine waters of the Travancore coast and if the richness and variety of the species in this zone can be taken as an indication of the general abundance of species in this region as a whole, it may be presumed that the Arabian sea and the Indian ocean offer great scope for the study of this group.

The present paper is intended only as a preliminary note, giving the list of species so far recorded, together with the important diagnostic features of each species. A detailed report is under preparation and will be published in due course.

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1. *Hist. Nat. Crust.*, III, 1840
 2. *Verhandl. Naturk. Ver. Neederlandsch Indie*, II, 1857, pp. 20-40.
 3. Crustacea in: *Report Zool. Coll. H. M. S. "Alert."* 1884,
pp. 178-322.
 4. *Naturk. Tidsskr.*, (3) XII, 1879-1880, pp. 279-302 and 321-414.
" (3) XIII, 1881-1883, pp. 1-166 and 281-375.
" (3) XIV, 1884, pp. 221-454.
 5. *Rec. Ind. Mus.*, VI, 1911, pp. 171-191.
 6. *Rec. Ind. Mus.*, XXXVII, 1935, pp. 279-319.
" XXXVIII, 1936, pp. 147-191.
 7. *Rec. Ind. Mus.*, XXV, 1923, pp. 411-550.

Genus *Leptochelia* Dana*Leptochelia lifuensis* Stebbing

1900. *L. lifuensis*, Stebbing *Willey's Zool. Results*, pt 5, p. 616, pl. 64 C, D & pl 65 B
 1905. „ Stebbing, *loc. cit.* p. 7, pl. I.

In the size of the body, in the superior antennae, first peraeopod and the uropods this species shows considerable sexual dimorphism. Even among males there are two types. The present specimens closely agree with the Ceylon examples.

A comparatively rare species.

Family APSEUDIDAE.

Genus *Synapseudes* (Vanhoffen).*Synapseudes comorinensis* sp. nov.

Of the four species in this genus, *heterocheles* (Vanhoffen), *minutus* Miller, *intumescens* Menzies and *setoensis* Shiino, the present species resembles *heterocheles* and *setoensis*. Shiino distinguishes *setoensis* from *heterocheles* by its larger chela without spines. The other differences enumerated by him hold good in the case of the present new species also, but as in Vanhoffen's species there are spines on the carpus and merus of the gnathopod in *S. comorinensis* sp. nov.

S. comorinensis differs from *S. setoensis* in its differently shaped antennae and the distinctly five jointed pleon. Minor variations are noticed in the first and second maxillae also. The rami of the uropods are subequal and three segmented. The peraeopods are as usual spiny, but the spines are smaller, pointed and not stout as in *setoensis*.

The collection includes four specimens from Cape Comorin; the specific name refers to the place of capture.

ISOPODA

Family ANTHURIDAE.

Genus *Xenanthura* Barnard.*Xenanthura orientalis* Barnard.

1931. *X. orientalis*, Barnard, *Rec. Ind. Mus.*, XXXVII, p. 307.

To the description given by Barnard the following additional points may be added. The secondary flagellum of the second antenna is four to five segmented, the flagellum of the first antenna is five to six jointed and that of the second, seven jointed. The palm of the sixth joint of the second peraeopod is distinctly concave. The dactylus of peraeopods four to seven are not externally serrate. Exopod of uropod overlaps in the middle over the telson. Endopod is internally constricted in the middle, and carries four dagger like setae at the constriction.

Xenanthura linearis sp. nov.

A comparatively slender species greatly resembling *X. brevitelson* Barnard, from which it can be distinguished by the following characters. The fifth segment of the first and second peraeopods are not apically acute, inferior border is not spiny, but cut into rounded lobes, seventh segment of first peraeopod is long, reaching beyond the fifth, when closed. Fourth segment of third peraeopod is internally produced, almost as in the fifth segment. Peraeopods four to seven with the sixth segment bearing three prominent spines. Maxillipeds are four or five segmented, separated from each other. Endopod of uropod is basally bulged, with the median internal constriction, and the four dagger shaped setae as in the above described species.

Genus *Cyathura* Norman & Stebbing.

Cyathura carinata (Kroyer).

1886. *C. carinata*, Norman & Stebbing, *Trans. Zool. Soc. London*, XII, pt. 4, no. 1, p. 124.

1925. „ Barnard, *Journ. Linn. Soc. London*, XXXVI, p. 140

Except in minor details the present specimens agree with those described by Norman & Stebbing. The only noteworthy difference is that in the present specimens the eyes are totally absent.

Cyathura pusilla Stebbing.

1904 *C. pusilla*, Stebbing, *Spol. Zeylan.*, II, p. 9, pl. 6 B

1925 „ Barnard, *loc. cit.*, p. 140.

The present specimens differ from previous descriptions only in the presence of eyes.

Cyathura indica Barnard.

1925. *C. indica*, Barnard, *loc. cit.*, p. 140, pl. 4, fig. 7.

Differs from Barnard's account in that the first antenna does not appear to be brush like. The mandibular palp is well developed with the apical segment very small.

Genus Mesanthura Barnard.**Mesanthura maculata** (Haswell).

1925. *M. maculata*, Barnard, *loc. cit.*, p. 144.

The present collection differs from the previous descriptions in that the third segment of the mandibular palp is smaller than the first.

A very common littoral form of this region.

Genus Accalathura Barnard**Accalathura borradalei** (Stebbing).

1925. *A. borradalei*, Barnard, *loc. cit.*, p. 149.

Very closely agrees with Stebbing's description. Very rare on this coast.

Family GNATHIDÆ.**Genus Elaphognathia** Monod.**Elaphognathia insolita** (Stebbing).

1905. *Gnathia insolita*, Stebbing, *loc. cit.*, p. 9, pl. 12 B.

A single praniza larva obtained, is assigned to *E. insolita* with some reservation. The telson, uropods and the antennæ show resemblance to those of the adult male described by Stebbing.

Family EURYDICIDÆ.**Genus Cirolana** Leach.**Cirolana willeyi** Stebbing.

1904. *C. willeyi*, Stebbing, *loc. cit.*, p. 2, pl. 3.

Very abundant in all the major backwaters of Travancore.

Cirolana bovina Barnard.

1940. *C. bovina*, Barnard, *Ann. S. Afric. Mus.* XXXII, pt. 5, p. 400, fig. 9c-d.

The following differences from the description given by Barnard were noticed :—

The frontal lamina is differently shaped in the adult male. The posterior peræon segments are considerably arched, fourth pleon segment is laterally produced, overreaching the peduncle of the uropod. The second antenna does not reach beyond the third peræon segment.

Cirolana bicarinata sp. nov.

This species is distinguished by the presence of one to three transverse rows of spines along the posterior margin of the posterior peræon segments and two sub-median roughly parallel carinæ formed by a series of pairs of tubercles or spines on the telson. In this character *C. bicarinata* comes in the group formed by *C. pleonastica*, *sulcata*, *sulcaticauda* and *pustulosa*. Among these it closely resembles *pustulosa*, but the latter has only a single row of spines on the peræon segments.

Cirolana fluviatilis Stebbing.

1902. *C. fluviatilis*, Stebbing, *S. Afric. Crust.*, pt. 2, p. 52.

1935. „ Barnard, *loc. cit.*, p. 395.

Barnard's observation that Chilton's *pleonastica* is synonymous with *fluviatilis* is confirmed. A very rare typically estuarine species.

Family CORALLANIDÆ

Genus *Corallana* Dana

Corallana nodosa Schicødte & Meinert.

1879. *C. nodosa*, Sch. and Mein., *Natuur., Tijdskr.*, (3) XII, p. 294, pl. 5, figs. 8 & 9.

1904. *C. nodosa*, Stebbing, *loc. cit.*, p. 14, pl. 1 b.

This species is well distinguished by the basal prolongation of the first antennae, the sub-median cephalic horns and the sub-marginal teeth on the posterior peraeon segments. In these characters there is well marked sexual dimorphism.

Genus *Lanocira* Hansen

Lanocira gardineri Stebbing

1904 *L. gardineri*, Stebbing, *loc. cit.*, p. 706, pl. 51 a

1905 „ Stebbing, *loc. cit.*, p. 19

The description given by Stebbing applies very well to the present specimens, but the curved rostrum is totally absent in the female.

Lanocira rotundicauda Stebbing

1904 *L. rotundicauda*, Stebbing, *loc. cit.*, p. 708

This species is certainly distinct from *L. gardineri*, though Stebbing was rather doubtful about it. It can be clearly distinguished by its more elongated form, sparsely setose telson, broader frontal lamina and the absence of secondary lobes on the mandible. The conspicuously developed coxal plates distinguish it from all the other species.

Lanocira zeylanica Stebbing

1905 *L. zeylanica*, Stebbing, *loc. cit.*, p. 20, pl. Vb

1910 „ Stebbing, *Journ. Linn. Soc. London*, XXXI, p. 219

L. zeylanica is distinguished from *gardineri* and *rotundicauda* by the sub-marginal line on the head, comparatively small coxal plates, more setose surface of the body and the very short fifth segment of the anterior peraeopods.

Genus *Argathona* Stebbing

Argathona normani Stebbing

1905 *A. normani*, Stebbing, *loc. cit.*, p. 17, pl III a-

Closely agrees with Stebbing's description. However the coxal plates in the present specimens are more prominent and the full compliment of tubercles described by Stebbing is not observed.

Argathona rhinoceros (Bleeker)

1934 *A. rhinoceros*, Monod, *Notes. Inst. Oceano. Indochine*, XXIII, p. 9

This species has been recorded by several authors. The present collection from the nostrils of *Epinepheles chlorostigma* may probably be the first record of it as a parasite.

Family AEGIDAE**Genus Barybrotos Schioedte & Meinert****Barybrotos indus Schioedte & Meinert**

1934 *B. indus*, Monod, *loc. cit.*, p. 10, pls. XI-XVII.

This well known species has been till now known only as a free living animal. The present collection from the gills and the spiracles of *Dicerobates regoodoo* is probably the first record of this species as a parasite.

Genus Rocinela Leach**Rocinela orientalis Schioedte & Meinert**

1879 *R. orientalis*, Sch. & Mein., *loc. cit.*, p. 395.

This species is represented by a single specimen very much similar to the Ceylon examples described by Stebbing.

Genus Alitropus M. Edwards**Alitropus dimorphus sp. nov.**

Closely resembles *A. typus* M. Edw. and *Rocinela simplex* Chilton. The latter species should be transferred to this genus from *Rocinela*. As the specific name indicates this new species shows extreme sexual dimorphism. The female is broad, almost two and a half times as long as broad. The male on the other hand has a slender body about four times as long as broad. This is mainly due to an abrupt elongation of the peraeon segments four to seven.

In general structure it is similar to *R. simplex* Chilton.

The genus *Alitropus* was instituted by M. Edwards and till now it contained only the genotype *A. typus*. Most of the subsequent workers seem

to have disregarded it as a genus distinct from *Rocinela*. The present study however shows that such a view is unjustifiable. *Alitropus* should be considered distinct from *Rocinela* and I have no doubt that Chilton's *R. simplex* is really an *Alitropus*.

An extremely common free living species found even in isolated fresh water tanks.

Family SPHAEROMIDAE

Group HEMIBRANCHIATAE

Genus *Sphaeroma* Bosc

Sphaeroma terebrans Bate

1866 *S. terebrans*, S. Bate, *Ann. Mag. Nat. Hist.*, (3) XVII, p. 28, pl. 2, fig. 5

1940 „ Barnard, *loc. cit.*, p. 404.

The present specimens conform to the description given by S. Bate, whose specimens were obtained from the west coast of India, probably from this region itself. All the tubercles figured by him are found in the present collection also, but in addition there are four small tubercles on the fifth peraeon segment. All the larger tubercles invariably carry a tuft of long stiff setae.

Sphaeroma walkeri Stebbing.

1905 *S. walkeri*, Stebbing, *loc. cit.*, p. 31, pl. VII.

1940 „ Barnard, *loc. cit.*, p. 405.

This species is quite unique in the tuberculation of the dorsal surface of the body. One of the large specimens in the present collection shows still more conspicuous tuberculation than in the specimens previously described. This is evidently due to the larger size of the specimen in the present collection.

Sphaeroma annandalei Stebbing.

1911. *S. annandalei*, Stebbing, *Rec. Ind. Mus.*, VI, p. 181, pl. X.

1940. „ Barnard, *loc. cit.*, p. 405.

Erlanson* quotes Monod as expressing doubt regarding the distinctness of *S. annandalei* from *S. terebrans*. *S. terebrans* has a far more hairy body and a more or less triangular telson. Further *S. annandalei* differs in the transverse impressed lines of the peraeon segments, the posterior of which are broken up into tubercles. A careful study of the mouth parts also reveals certain slight but constant differences.

***Sphaeroma annandalei* Stebbing, var. *travancorensis* var. nov.**

Distinguished from *S. annandalei* by the differently shaped epistome, simple ridges of the peraeon segments and the comparatively narrow apex of the telson, which is also slightly different in its dorsal tuberculation.

Genus *Cymodoce* Leach

***Cymodoce longistylis* Miers.**

1884. *C. longistylis*, Miers, *Zool. Res. H.M.S. "Alert"*, p. 306, pl. XXXIIIc

In the tuberculation of the telson of the males there is slight difference from the previous descriptions. The female has two sub-median bosses on the telson, each surmounted by a conical tooth. The median telsonic lobe is not longer than the lateral ones.

In the granulation of the dorsal side the present specimens resemble the Indochina examples described by Monod more than the Australian specimens of Baker. The double sub-marginal rows of tubercles on the peraeon is quite characteristic.

***Cymodoce mammifera* Haswell.**

1880. *C. mammifera*, Haswell, *Proc. Linn. Soc. N. S. Wales*, V, p. 474, pl. XVIII, fig. I, IX.

1931. " Tattersall, *Journ. Linn. Soc. London*, XXX, p. 14, pl. 3, fig. 35.

The female differs from the male in the absence of the sub-median tubercles on the composite pleon, absence of tubercles on the mammiform bosses of the telson and the truncate nature of the mesial lobe of the telson. In addition to this the endopod of the uropod is not truncate in the female.

* *Curr. Sci.*, 1936, p. 877.

Genus *Dynoides* Barnard.*Dynoides amblysinus* sp. nov.

The males of the present species can be easily distinguished from all the known species of the genus by the absence of the median spine-like prolongation of the pleon and the transversely widening telsonic foramen. The median prolongation of the pleon is a generic character shown by all the species so far described. On this basis one may doubt the validity of the inclusion of this species in the genus *Dynoides*. But the typically Hemi-branchiate nature of the pleopods dispel that doubt. Moreover the appendix masculina on the 7th sternite and the male stylet on the second pleopod is exactly as in *D. serratisinus* and *D. barnardi* Shen. If however the abdominal prolongation is of significant generic value, the present species will have to be accommodated in a new genus.

Group *EUBRANCHIATAE*.Genus *Dynamenella* Hansen.*Dynamenella quilonensis* sp. nov.

The present species falls under the group in which the telsonic slit widens anteriorly into a transverse foramen. Of the several Indo-Pacific species comprising this group, *D. quilonensis* resembles *D. scabriuscula* in the nature of the telsonic slit, but differs from it in the absence of tubercles on the peraeon segments. It also resembles *D. perforata* Moore, but in the latter species the tubercles on the telson are only four in number and the telsonic slit is similar in both sexes. Of all the known species *D. quilonensis* sp. nov. resembles *D. platura* Nobili. But the latter can easily be separated by its differently shaped telsonic slit and the absence of tubercles on the pleon segments.

Very abundant in the estuarine regions of the Ashtamudi lake, Quilon.

Genus *Cerceis* M. Edwards.*Cerceis granulata* sp. nov.

The females resemble *C. orientalis* (Dana), but the extremely brief description given by him is not sufficient for purposes of detailed comparison. *C. tridentata* M. Edwards agrees with *C. granulata* sp. nov. but in the former

the telson does not show any tuberculation and the exopod of the uropod is longer than the endopod. The reverse is the case in *C. granulata* sp. nov. *C. bicarinata* Barnard is easily distinguished by the prominent carinae on the dorsal side of the telson. But for the conspicuous granulation of the telson this species closely resembles *C. tridentata* M. Edwards.

Genus *Cassidinidea* Hansen

Cassidinidea quadricarinata sp. nov.

In general appearance and in the structure of the oral appendages this species strongly resembles *Cassidina pulchra* Chilton but differs in being extremely small and in possessing four distinct longitudinal rows of tubercles giving the animal a quadricarinate appearance. Moreover in this species the exopod of the uropod is less than one fourth the length of the endopod and the telsonic apex is truncate while narrowly rounded in *C. pulchra*.

It is with some hesitation that this species is included under *Cassidinidea*. According to Hansen the genus *Cassidina* has the two proximal joints of the antennules exceedingly expanded and the endopod of pleopod one slightly longer than broad. It could easily go into *Cassidinidea* but for the clearly two jointed exopod of pleopod three. Hansen clearly says that it is unjointed.

Family CYMOTHOIDAE

Genus *Nerocila* Leach

Nerocila serra Schioedte & Meinert

1881 *N. serra*, Schioedte & Meinert, *Natur. Tidsskr.*, XIV, p. 17, pl. I, figs. 12—14

N. serra can be easily distinguished by the highly produced posterolateral angles of the peraeon segments and the coxal plates. The endopod of the uropod is apically forked and prominently serrated on its outer border.

Parasitic on several species of shoal fishes.

Nerocila exocoeti sp. nov.

The chief distinguishing character of this species is the comparative size of the coxal plates. The second coxal plate is small, not extending beyond the posterior border of the segment. The seventh reaches the tip of

the first pleon segment. The dorsal surface is minutely pitted and the entire body is steel blue in colour.

N. exocoeti which is parasitic on *Exocoetus brachypterus* is represented in the present collection by a very large number of specimens in all stages of development. The males, as is usual in the genus are elongate and the sides of the body are roughly parallel. The uropods are highly flattened and lamellar, fringed with plumose setae. The "hermaphrodite" specimens have the cephalon and the first four peraeon segments as in the male. The last three peraeon segments are abruptly broader, thus making the posterior half of the animal resemble that of the adult female. The uropods also are narrower and devoid of setae.

Genus *Amblycephalon* gen. nov.

This new genus comes very close to *Anilocra*, especially in the structure of the peraeon, pleon and telson. But the cephalon is highly flattened and considerably expanded, almost squarish. In this character it remotely resembles *Olencira* Leach. But in the latter genus the seventh pair of legs is abruptly elongated while it is subequal to the seventh in *Amblycephalon*. The uropods are very characteristic. The peduncle of the uropod is massive, produced internally. Exopod is long and uniformly broad throughout, apically rounded and curved slightly inwards, one and a half times as long as the endopod. Endopod is broad, apically bifid, inner limb of the fork is short and pointed, outer long and apically rounded. The uropods considerably overreach the tip of the telson.

Amblycephalon indicus gen. et sp. nov.

The body generally resembles that of *Anilocra leptosoma*. Peraeon segments are relaxed. Cephalon large, almost squarish with the antero-median part slightly bulged. Posterior border trilobed. Postero-lateral corners of the peraeon segments, except that of the seventh are not produced. None of the coxal plates are produced. Pleon is slightly narrower than the peraeon, not immersed.

Oral appendages are roughly as in *Anilocra*, except that the molar portion of the mandibles has a movable membranous lamina. All the legs are prehensile with long falcate dactyli.

Uropods (see definition of the genus)

Colour is opaque white with a broad dark median longitudinal band.

Found attached to the caudal fin of *Sphyraena obtusata* Day.

Genus *Anilocra* Leach*Anilocra leptosoma* Bleeker.

1856. *A. leptosoma*, Bleeker, *Verhandl. Natur. Ver. Nederlandsch Indie*, p. 30, pl. 1, figs. 6, 6 a-b.
1934. *A. leptosoma* Monod, *loc. cit.*, p. 11, pls. XIX, XXII, A-B, XXIII, XXIV B.

Compared to earlier descriptions the specimens in the present collection have the fifth pleon segment slightly projecting over the telson laterally, first pleon segment is not concealed by the seventh peraeon segment and the telson is slightly more rounded apically with a prominent median ridge.

Parasitic on *Pellona brachysoma*.

Anilocra dimidiata Bleeker.

1934. *A. dimidiata*, Monod, *loc. cit.*, p. 10, pls. XVIII, XXII c-d, XXIV a XXV d-f.

Parasitic on *Lactarius lactarius*.

Genus *Codonophilus* Haswell.*Codonophilus imbricatus* Fabr.

1926. *C. imbricatus*, Hale, *Trans. Roy. Soc. S. Austr.*, XLIX, p. 223, figs. 15-16.

Compared with Hale's description, in the local specimens the lateral corners of the first peraeon segment do not overreach the eyes. The uropods do not exceed the tip of the telson. This species slightly resembles *C. impressa* (Richardson) which is also a parasite of *Exocoetus*.

Inhabits the buccal cavity of *Exocoetus brachypterus*.

Codonophilus hemiramphi sp. nov.

Generally resembles *C. imbricatus* but is more elongated. The antero-lateral corners of the first peraeon segment are produced into very prominent prolongations which overreach the eyes. First peraeon segment is the longest and the seventh the shortest. The uropods slightly overreach the tip of the telson.

The structure of the antero-lateral corners of the first peraeon segment distinguishes this species from all the species hitherto described.

The anterior half of the lateral border is very prominently ridge like and a little internal to this is another equally prominent dorsal ridge. The space in between these two ridges is flat or even slightly concave giving it the appearance of an independant facet.

Inhabits the buccal cavity of *Hemiramphus far*.

Genus *Cymothoa* Fabricius.

Cymothoa stromatei Schioedte and Meinert.

1884. *C. stromatei*, Schioedte & Meinert, *loc. cit.*, p. 251

This is a species which appears to vary according to age. The large ovigerous females have a cephalon almost like that of *C. stromatei* as figured by the Danish authors. A closer examination however shows that this truncate appearance is due to a downward bending of the anterior margin.

Practically every specimen of *Parastromateus niger* caught along this coast was found to harbour in its mouth one female, and in some cases a male was also present.

Cymothoa asymmetrica sp. nov.

This new species approximately resembles *C. indica* Sch. & Mein. especially in the poorly developed condition of the antero lateral corners of the first peraeon segment. Because of this the head is not at all immersed in the peraeon segment. The body is slenderer and widens regularly from the first to the last peraeon segment. It differs from all the known species in the slightly asymmetrical nature of the body.

Inhabits the buccal cavity of *Sphyræna jello*.

Genus *Indusa* Schioedte & Meinert.

Indusa ophueseni sp. nov.

The body is highly asymmetrical due to the extreme enlargement of the posterior peraeon segments of one side. The head is very small triangular with a blunt acute apex. Antero lateral corners of first peraeon segment are produced into apically rounded lobes. Segments two to seven successively increase in length backwards; segments three to seven are considerably arched on the right side; coxal plates large, roughly triangular; pleon very short, but broad. The anterior pleon segments are slightly overlapped; by the lateral corners of the seventh peraeon segment.

The telson is roughly triangular, posterior border subtruncate with a faint median longitudinal carina. Rami of the uropods slightly exceed the tip of the telson.

The body of the male is elongate ovate and symmetrical; first peræon segment is anteriorly trisinuous and all the segments subequal; coxal plates are as long as the segments and the pleon is narrower than the peræon.

Parasitic in the gills of *Mugil ophueseri*.

Indusa carinata Richardson, obtained from the gills of *Mugil hospes* differs in the shape of the body and the pleon.

Indusa pustulosa sp. nov.

Almost similar to the previous species, but slightly larger. The most important character is the large number of bold pustules scattered on the highly flattened telson.

Parasitic in the gills of *Dorosoma chakunda*.

Genus *Agarna* Schioedte & Meinert.

Agarna tartoor sp. nov.

The body is highly asymmetrical, three times as long as broad; cephalon is minute, hidden under the highly expanded first peræon segment. Anterior border of first peræon segment concave and the antero-lateral corners form large lobes; coxal plates visible from above; first and the seventh segments devoid of them. The pleon is a little immersed in the peræon. Telson is longer than broad, with the apex acuminate.

Males are somewhat asymmetrical and the body widest at the seventh peræon segment.

Parasitic on *Opisthopterus tartoor*.

A. tartoor can be distinguished from *A. carinata* Sch. & Mein. by the structure of the head and the first peræon segment.

Genus *Livoneca* Leach.

Livoneca raynaudi Bleeker.

1926. *L. raynaudi*, Hale, *loc. cit.* p. 215, f. 10.

Closely agrees with the description given by Hale. As in *Nerocila*, this genus also shows distinct male, hermaphrodite and female stages in its development.

L. raynaudi is parasitic on a number of species of fish, primarily *Pellona brachysoma* and *Stolephorus commersonii*.

Livoneca circularis sp. nov.

The body is almost circular, somewhat convex, slightly asymmetrical; head semicircular, anterior border perfectly rounded. First peraeon segment arched, laterally produced into broad, blunt prolongations reaching half the length of the eye. Pleon is considerably immersed in the peraeon and overlapped by the seventh peraeon segment. Telson is broader than long, distorted. Rami of the uropods oblong in shape and subequal in length.

All the developmental stages are represented in the present collection.

This species closely approaches *L. ovalis* (Say), from which it can however be distinguished by the general shape of the body. Moreover the pleon in the latter is not immersed in the peraeon.

Parasitic in the gills of *Clupea leiogaster*.

Genus *Irona* Schioedte & Meinert.

Irona far Nair.

1950. *I. far*, Nair, *Journ Madras Univ*, XX, P. 70, pl. 2, figs. 13-23.

This species can be readily distinguished from all the known species by the characteristic dark transverse band on the posterior border of the peraeon segments, and the perfectly semicircular pleon. The uropods do not reach the tip of the telson.

The present study however shows that certain defects, though minor, are present in Nair's description. He figures the antennae as nine segmented and describes them as eight segmented, the mandible is said to have an inner two jointed ramus and the telson is described as semicircular, but figured as more or less oval. The antennae are really nine segmented and the telson is perfectly semicircular.

Parasitic in the gills of *Hemiramphus far*.

VALVIFERA.

Family IDOTEIDÆ.

Genus *Synidotea* Harger.

Synidotea variegata Collinge.

1917, *S. variegata*, Collinge, *Rec. Ind. Mus*, XIII, p. 2, pl. 1.

1940, " Barnard, *loc. cit.*, p. 428.

This is a well known species showing considerable variation. The females are comparatively broad, almost elongate ovate, whereas the adult males are slender. The outer lobe of the second maxilla is greatly elongated. This fact does not seem to have been observed by previous workers.

The specimen described by Chilton from the Chilka lake is different from *S. variegata* Collinge. For this a new name is proposed.

***Synidotea fluviatilis* sp. nov.**

This species resembles *S. variegata* to a great extent, but can be easily distinguished from the latter by the roughly parallel condition of the sides of the body, the greater breadth of the apical emargination of the metasome, the apical truncation of the endopod of the uropod and the comparative shortness of the outer lobe of the second maxilla. Moreover the anterior peraeon segments are laterally drawn out into roughly triangular, apically blunt processes.

The specific name refers to the estuarine and brackish water habitat of the species.

Family ASTACILLIDÆ

Genus *Neastacilla* Tattersall.

***Neastacilla amblyura* (Stebbing)**

1905. *Astacilla amblyura*, Stebbing, *loc. cit.*, p. 46, pl. XIB

The presence of the basal tooth on the fourth segment of the second antenna is quite characteristic of this species.

Genus *Astacilla* Cordiner.

***Astacilla gibbossa* sp. nov.**

Resembles *Astacilla sheardi* Hale to a very great extent, especially in the structure of the second antenna and the sculpturing of the body. Never the less it can be distinguished from the latter by the presence of a large spine like seta on the apical segment of the first peraeopod and the absence of a distinct dactylus on the second. The large dorsal hump on the fourth peraeon segment, to which the species owes its name distinguishes *A. gibbossa* from all the other known species.

ASELLOTA

Family JANIRIDAE.

Genus *Iais* Bovallius.*Iais pubescens* Dana.

1900. *I. pubescens*, Stebbing, *Proc Zool. Soc. London*, p. 549, pl. 38

1951. „ Menzies and Barnard *Bull. S. Calif. Acad. Sci.*, L, pt. 3,
p. 138, pl. 42-43.

Found along with *Sphaeroma annandalei* and *S. terebrans*. Agrees with the previous descriptions.

Family JÆRIDÆ.

Genus *Bagatus* Nobili.*Bagatus longimanus* sp. nov.

Very closely resembles *Janira crosslandi* Stebbing, *J. nana* Stebbing and *J. algicola* Miller, from all which this species can be distinguished by the nature of the first peræopod. In *J. crosslandi* the fifth joint of the first peræopod is scarcely twice as long as broad; in *J. nana* it is slightly shorter, but in the present species it is almost four times as long as broad. The sixth joint is longer than the fifth, has a basal swelling and narrows to a subacute apex with long apical and subapical setæ. *J. algicola* does not appear to be distinct from *J. crosslandi*.

On the basis of the diagnostic character of the genus *Bagatus*, the above mentioned three species should be transferred to it from the genus *Janira*.

EPICARIDEA.

Genus *Tylocepon* Stebbing.*Tylocepon bonnieri* Stebbing.

1904 *T. bonnieri*, Stebbing, *loc. cit.*, p. 717

Stebbing's description of this species may be supplemented by the following additional information:—The head consists of two perfectly oval lobes, the boss on the sixth peræon segment is formed of three independent lobes and the lateral plates of the pleon are decidedly dorsally situated

Branchial parasite of *Menaethius monoceros*. Stebbing's specimen was obtained from *Tylocarcinus*.

Genus *Paracepon* Nierstrasz & B. a Brandis*Paracepon nierstraszi* sp. nov.

In the general shape of the animal and the slightly wavy margin of the lateral plates of the pleon the present specimen differs markedly from *P. stebbingi* Nier. & B. a Brandis. In *P. stebbingi* the head consists of two more or less circular lobes and the lateral plates do not overlap the peræon. The dorsal bosses are narrow and apically acute and directed backwards. In the present specimen the head is transversely expanded and consists of two oval lobes placed roughly at right angles to each other; the lateral plates of the pleon are situated on the dorsal side of the body and the bosses on the peræon segments are apically rounded and directed forwards.

Genus *Stegoalpheon* Chopra.*Stegoalpheon choprai* sp. nov.

The female of *S. choprai* is hardly distinguishable from *S. kempi* Chopra. However the antennae and the antennules possess one more segment each; the "dorsal ramus" of the pleopods is more lamellar and the ovarian bosses are very prominent

The male is fundamentally different from that of *S. kempi*, as described by Chopra as well as Shūno. The thoracic segments are laterally drawn out and triangular whereas they are perfectly rounded in *S. kempi*.

Parasitic on *Alpheus palludicolla*. The species is named after Dr Chopra.

Genus *Palaegyge* Giard & Bonnier.*Palaegyge bengalensis* Chopra.

1923. *P. bengalensis*, Chopra, *Rec. Ind. Mus*, XXV, p. 501, pl. XVIII, figs. 1-4.

The present specimens differ only in the colouration which is more like that of *P. abhoyai* and *P. pica*. The points of difference between *P. bengalensis* and *P. buitendijki* given by Chopra are very clearly visible.

Branchial parasite of *Palaemon carcinus*.

Genus *Epipenaeon* Nobili.*Epipenaeon ovalis* sp. nov.

The present species can be distinguished from all the known species of *Epipenaeon* by the absence of pleural lamellae on the fifth abdominal

segment. *E. elegans* Chopra differs from it in the shape of the body, the length and breadth being almost equal in the former. It differs from *E. ingens* Nobili in possessing a considerably larger frontal lamina. More over the pleural lamellae are poorly developed in Nobili's species whereas they are well developed in *E. ovalis*

The genus *Epipenaeon* originally included a number of species characterised by five or six pleon segments. But Nier. & B. a Brandis separated all those with six pleon segments into a new genus *Apopenaeon*. Consequently the original genus *Epipenaeon* now contains only three species including the present one, in which there are only five pleon segments.

Branchial parasite of *Parapenaeopsis stylifera*

Genus *Apopenaeon* Nierstrasz & Brender a Brandis.

Apopenaeon sp.

In the detailed structure of the animal this species approaches *A. takii* Shiino. But it can be distinguished by its considerably larger coxal plates and pleural lamellae and the closer and more prominent arrangement of the tuberculation on the pleural lamellae, pleopods and uropods.

Branchial parasite of *Parapenaeopsis sculptilis*.

Genus *Parapenaeon* Richardson.

Parapenaeon sp.

The present species resembles *P. consolidatum* var. *richardsonae* Shiino, from which it can be easily distinguished by the more well developed, rounded lateral plates of the pleon and the conspicuously corrugated abdomen. The uropods also are not pointed apically. The male has an antero median emargination on the border of the head. In *P. consolidatum* var. *richardsonae* the antero median border of the head is perfectly rounded. From *P. secundum* Nier. & B. a Brandis it differs in the structure and shape of the coxal plates and the head. In the latter the coxal plates are elongated, with the margin lobed or tubercular and the head is almost squarish. But in the present species the margin of the coxal plates is entire and the head is decidedly broader than long.

Branchial parasite of *Metapenaeus dobsoni*.

