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NATURAL HISTORY SECRETARY.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease." SIR WM. JONES.

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Natural History Notes from the R. I. M. Survey Steamer 'Investigator,' *Commander C. F. Oldham, R. N.*, commanding. Series II, No. 21.

An Account of the Deep Sea Crustacea collected during the season 1894-95,—*By* A. R. S. Anderson, B. A., M. B., *Surgeon Naturalist to the Survey.*

[Received 28th April—Read 6th May.]

The following paper gives a description of the 56 species of Crustacea, excluding Cirripeds, Amphipods and Pagurids collected by the R. I. M. S. 'Investigator' during the working season 1894-95.

From the middle of October 1894 to the beginning of January 1895, while at work in the Arabian Sea between Cape Monza—some 20 miles to the west of Karachi and Bombay—four hauls of the trawl were made between 100 and 200 fms.; but, with the exception of large numbers of *Selenocera hextii*, no crustaceans were obtained.

In the same area, two hauls were effected at 890 and 947 fms. and resulted in the capture of respectively 8 and 11 different species of crustaceans; of these only four are new to the Indian fauna, *viz. Acanthephyra cristata*, Faxon, *Nephropsis Suhmi*, Bate, *Calastacus investigatoris* and *Galacantha trachynotus*, the two last being hitherto undescribed species. One Isopod, *Aega* sp., was also obtained at 947 fms., and is new to our record and apparently new to science.

On the passages between Bombay and Trincomali and *vice versâ* 6 trawls, varying in depth from 637 to 931 fms. were made and resulted in the capture of 0, 4, 6, 5, 7 and 8 species of crustaceans. Four of these species were new to the Indian fauna, but of these two, *Nephropsis Suhmi* and *Galacantha trachynotus*, were also obtained this season between Karachi and Bombay: the remaining two species were *Eucopia sculpticauda* and *Benthouphausia amblyops*.

In four trawls between 180 and 406 fms. 5, 7, 3 and 21 species of crustaceans were obtained, of which 5 only are new to the Indian record, and of these one had also been captured at 951 fms. this season; 3 of the remainder, *Pandalus alcocki* and *Munidopsis wardeni*, both from 406 fms., and *Trichopeltarion ovale* from 180 fms. prove to be new species. The fifth, *Lithodes agasizii* from 406 fms., is the first recorded specimen of a *Lithodes* from Indian waters.

List of the stations, over 200 fms. from which crustaceans were obtained.

Station No.	Lat. N.	Long. E.	Depth in fathoms.	Corrected bottom temp. F.	Surface temp. F.	Nature of bottom.
183	23°08′22″	65°40′45″	890	40°.5	72°	Soft gray mud.
184	22°14′25″	67°08′55″	947	40°.5	75°.5	Soft gray mud.
192	15°11′	72°28′	912–931	39°.5	81°	Soft gray mud.
193	15°11′	72°28′	931	39°.5	81°	Soft gray mud.
194	13°47′	72°3′45″	891	41°	81°	Soft gray mud.
197	9°34′57″	75°36′30″	406	48°	81°.8	Green mud.
198	8°55′	81°17′30″	764	42°.25	81°	Green mud.
199	8°40′	81°27′35″	800–637	41° 42°.25	83°.5	Green mud.
201	8°29′05″	81°31′35″	320–296	49° 49°.8	84°.5 85°	Green mud.
203	5°50′30″	80°25′30″	364	48°	85°.5	Green mud.
204	6°50′20″	79°36′	180–217	53°	84°.8	Broken coral.

MALCOSTRACA.

Order SCHIZOPODA.

Family **Lophogastridæ.**

GNATHOPHAUSIA, W.-Suhm.

1. *Gnathophausia brevispinis*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., (6) VII., 1891, p. 188, and Oct. 1891, pp. 269, 270; Faxon, Mem. Mus. Comp. Zool., Vol. XVIII., pp. 216–218, pl. J.

Arabian sea; Station 184; 947 fms.

2. *Gnathophausia zoëa*, Suhm, G. O. Sars.

G. O. Sars, Challenger Schizopoda, p. 44, pl. vi., figs. 6–10; A. Milne Edwards Rec. Fig. Crust., pl. 7; Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 143; Faxon, Mem. Mus. Comp. Zool., Vol. XVIII., p. 215.

? *G. Sarsii*, Wood-Mason, Ann. Mag. Nat. Hist., Feb. 1891, p. 187.

Colour in life, bright scarlet.

Arabian sea, Station 183, 890 fms.

Family **Eucopiidæ**.

EUCOPIA, Dana, G. O. Sars.

3. *Eucopia australis*, Dana, Sars.

Dana, U. S. Explor. Exped., Crustacea, pt. i., p. 609, pl. 40, fig. 10 a–m; G. O. Sars, 'Challenger' Schizopoda, p. 55, pls. ix. and x.; Wood-Mason Ann. Mag. Nat. Hist., Oct. 1891, p. 270; Faxon, Mem. Mus. Comp. Zool., Vol. XVIII., pp. 218, 219.

Six specimens were obtained, 5 of these being captured in the same haul with an equal number of *Eucopia sculpticauda*.

Stations 183 and 198; 890 and 764 fms.

4. *Eucopia sculpticauda*, Faxon.

W. Faxon, Bull. Mus. Comp. Zool., Vol. XXIV., No. 7, 1893, p. 218; *Id.*, Mem. Mus. Comp. Zool., Vol. XVIII., pp. 219–221, pl. k., fig. 2, 2*d*, pl. liii., fig. 1–1*d*.

Eight specimens, varying in length from 21 to 75 millim., were captured at depths ranging from 406 down to 931 fms. Unfortunately all the specimens, owing to the great delicacy of their tissues and the tenuity of their legs, are more or less imperfect, although in some the deficiency merely amounts to an abbreviation of the antennal flagella.

This species differs from *Eucopia australis* and from Sars' definition of the genus in the presence of small branchiæ at the base of the last pair of legs.

Colour in life, dark crimson lake. Eyes brown in spirit.

New to the Indian fauna.

Stations 193, 197, 198 and 199; 931, 406, 764 and 800—637 fms. respectively.

Family **Euphausiidæ**.

BENTHEUPHAUSIA, G. O. Sars.

5. *Bentheuphausia amblyops*, G. O. Sars.

G. O. Sars, 'Challenger' Schizopoda, pp. 109–114, pl. xix.

New to the Indian fauna.

Station 198; 764 fms.

Order DECAPODA.

Sub-order MACRURA.

Tribe *PENÆIDEA*.

Family **Penæidæ**.

Sub-family *Parapenæina*.

PARAPENÆUS, S. I. Smith.

6. *Parapenæus fissurus*, (Sp. Bate.)

Penæus fissurus, Sp. Bte., 'Challenger.' Macrura, p. 263, pl. xxxvi. fig. 1; *Para-*

penæus fissurus, Alcock and Anderson, J. A. S. B., Vol. LXIII., Pt. ii., 1894 p. 144.

Colours in life, white mottled with red.

Off west coast of Ceylon, Station 204; 180–217 fms.

Sub-family *Solenocerina.*

SOLENOCERA Lucas.

7. *Solenocera hextii*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., Feb. 1891, p. 188, and Oct. 1891, p. 275 Alcock and Anderson, J. A. S. B., Vol. LXIII. Pt. ii., 1894, p. 145; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, Pt. iv., pl. xxvi. fig. 5 (to be published in 1896).

Hitherto this species has only been recorded from the Bay of Bengal ranging as far east as Chittagong. This season it was obtained in large numbers in the Arabian Sea off the mouths of the Indus at depths varying from 35 to 170 fms. on a muddy bottom.

HALIPORUS, Spence Bate.

8. *Haliporus æqualis*, Sp. Bate.

Spence Bate, 'Challenger' Macrura, p. 285, pl. xli., fig. 1; and Alcock and Anderson, J. A. S. B., Vol. LXIII, pt. ii., 1894, p. 140.

Off Cochin coast, Station 197, 406 fms.

Sub-family *Aristæina.*

ARISTÆUS, Duvernoy, Wood-Mason.

9. *Aristæus crassipes*, Wood-Mason.

Wood-Mason Ann. Mag. Nat. Hist., Oct. 1891, pp. 281, 282. fig. 7; Alcock and Anderson, J. A. S. B., Vol. LXIII, pt. ii., 1894, p. 147.

Many specimens, exhibiting the marked sexual differences previously described, were trawled off the Cochin coast at Station 197, 406 fms.

10. *Aristæus semidentatus*, Sp. Bate.

Hemipenæus semidentatus, Spence Bate, 'Challenger' Macrura, p. 305, pl. xlix. fig. 1; *Aristæus semidentatus*, Wood-Mason, Ann. Mag. Nat. Hist., Oct. 1891, p. 280 and Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 146.

Colour in life, red.

Station 201; 320–296 fms.

Sub-family **Benthesicymina.**

GENNADAS, Spence Bate.

11. *Gennadas parvus*, Spence Bate.

Spence Bate, Ann. Mag. Nat. Hist. (5) viii., p. 191, and 'Challenger' Macrura,

p. 340, pl. lix.; Wood-Mason and Alcock, Ann. Mag. Nat. Hist., Feb. 1891, p. 169 and Oct. 1891, p. 286.

Stations 193, 194 and 198; 931, 891 and 764 fms. respectively.

Family **Sergestidæ.**

SERGESTES, Edw.

12. *Sergestes rubroguttatus*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., Nov. 1891, pp. 354, 355, fig. 10.

South of Ceylon, Station 198, 764 fms.

13. *Sergestes robustus*, Smith.

S. I. Smith, Rep. U. S. Fish. Comm., 1892, (1894), p. 416, pl. viii., figs. 3–6, and 1885 (1886), p. [93], pl. xx., fig. 6; and Bull. Mus. Comp. Zool., X., p. 97, pl. xvi., figs. 5–8; Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 148.

Colour in life, crimson dots on a colourless background, the intestinal tract showing through the transparent body-wall as a crimson tube.

Stations 194, 197 and 203; 891, 406 and 364 fms.

Tribe *CARIDEA.*

Family **Glyphocrangonidæ.**

GLYPHOCRANGON, A. Milne-Edwards.

14. *Glyphocrangon unguiculata*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., Feb. 1891, pp. 193, 194; and Ill. Zool. 'Investigator,' Crustacea, Pt. ii., pl. vii., fig. 2.

Five females from the Arabian sea, Station 184; 947 fms.

15. *Glyphocrangon prionota*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., Feb. 1891, p. 192; Alcock and Anderson, J. A. S. B., Vol. LXIII., Pt. ii., 1894, p. 151; and Ill. Zool. 'Investigator,' Crustacea, Pt. ii., pl. vi., fig. 1.

Many male and female specimens, both young and adult, were taken in the Arabian sea at Stations 183, 184 and 193; 890, 947 and 931 fms. respectively.

Family **Pandalidæ.**

PANDALUS, Leach.

16. *Pandalus alcocki*, n. sp.

This species bears a considerable resemblance to *Nothocaris binoculus*, Sp. Bte., but differs from it in the following particulars. The

dorsal carina begins near the middle of the carapace and in the gastric region supports four movable spines which gradually increase in length from behind forwards. The rostrum, about $1\frac{2}{3}$ as long as the carapace, is armed dorsally with 2 fixed teeth, the posterior situated midway between its fellow and the anterior movable spine and above the centre of the cornea. In front of these teeth the rostrum slopes downwards as far as the extremity of the first antennal base; thence it becomes straight and ascends slightly to near its tip where it again assumes a gentle downward curve. Except for the two teeth near the base it is dorsally unarmed, while its lower margin is 4–7 toothed, the number of teeth increasing with the size of the specimen.

The eye bears no ocellus distinct from the large cornea.

The meri of the last three thoracic legs are armed on their lower margins with a few teeth, that of the 5th leg bears the fewest or none, that of the 3rd the largest number of teeth, while the 4th bears an intermediate number.

The telson is shorter than the caudal plates.

Colour in life red. Eggs very minute and numerous.

Many specimens, both males and ovigerous females, from Station 197; 406 fms.

PLESIONIKA, Spence Bate.

17. *Plesionika bifurca*, Alcock and Anderson.

Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, pp. 155 and 156.

Station 197; 406 fms.

Family **Acanthephyridæ.**

ACANTHEPHYRA, A. Milne-Edwards.

18. *Acanthephyra brachytelsonis*, Sp. Bate.

Spence Bate, 'Challenger' Macrura, p. 753, pl. cxxvi., fig. 7; Wood-Mason, Ann. Mag. Nat. Hist., May 1892, pp. 362, 363, fig. 4; Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 156; and Ill. Zool. R. I. M. S., 'Investigator,' Crustacea, pl. iii., fig. 2.

The largest specimen obtained this year measured 157 millim. from tip of rostrum to the end of telson.

Stations 183, 184, 192, 193, 194 and 199; 890, 947, 912-931, 931. 891 and 800–637 fms. respectively.

19. *Acanthephyra armata*, A. M. E., var. *fimbriata*, W.-M.

Wood-Mason, Ann. Mag. Nat. Hist., May 1892, p. 359, fig. 2; Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 156; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. i., pl. iii., fig. 1.

Station 197; 406 fms.

20. *Acanthephyra curtirostris*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist. (6) VII., p. 195, and Ann. Mag. Nat. Hist., May 1892, pp. 364, 365 and fig. 5; Ill. Zool. R. I. M. S. 'Investigator,' pl. iii., fig. 4: Faxon, Mem. Mus. Comp. Zool., Vol. XVIII, pp. 164–167, pl. xliii., figs. 2–5.

In four small specimens obtained this year, the largest of which is an ovigerous female 36 millims. in length, the tooth on the antero-inferior margin of the laminar part of the rostrum is absent.

At the distal end of the dorsal surface of the carpus of the 1st pereiopods is a small blunt recurved tubercle, and, leading to it, an oblique line of short stout hairs on the inner surface of the palms of the same pair of legs.

Both margins of the inner, and the inner margin of the outer, plate of the swimmeret are minutely serrate.

Stations 198 and 203; 764 and 364 fms.

21. *Acanthephyra cristata*, Faxon.

Faxon, Bull. Mus. Comp. Zool., XXIV., 206, 1893; Memoirs Mus. Comp. Zool., Vol. XVIII., pp. 162–164, pl. xliii., fig. 1, 1*a*, 1*b*: Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. iv., pl. xxv., figs. 2, 2*a*.

The end of the telson, which was wanting in both Faxon's specimens, is prolonged into a sharp spine armed on both sides with movable teeth, of which one on each side at a little distance from the tip is specially large and strong. Both margins of the inner and the inner margin of the outer plate of the swimmeret are minutely serrate and clothed with long silky hairs.

Colour in life, dark crimson.

Length from tip of rostrum to end of telson 67·5 millims.

Station 183; 890 fms.

Hoplophorus, Edw.

22. *Hoplophorus gracilirostris*, A. Milne-Edwards.

A. Milne-Edwards, Ann. Sci. Nat. Zool., (6) XI. 4, p. 6; and Rec. Fig. Crust.; Wood-Mason and Alcock, Ann. Mag. Nat. Hist., May 1892, p. 365; and Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 157.

Several specimens from stations 201 and 203; 320–296 and 364 fms. When placed in a tub of water they swam about with great vigour, but were unable to maintain an upright position, always turning over on one side. They would appear, as previously mentioned, to live at no great depth, as the specimens of *Lyreidus*, *Ethusa*, *Uroptychus* and *Nephropsis*, all bottom dwellers, which were captured at the same stations as the *Hoplophorus*, were quite dead on reaching the surface.

Colour in life bright transparent red with golden coloured glisten-

ing patches on merus of last three thoracic legs, on carpus and coxa of 5th pair of legs and on the abdominal pleuræ. Telson and uropods colourless. Eggs purplish red.

EPHYRINA, S. I. Smith.

23. *Ephyrina hoskynii*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., February 1891, p. 194.

Stations 183 and 199; 890 and 800-637 fms. respectively.

Family **Palæmonidæ.**

PALÆMONELLA, Dana.

24. *Palæmonella laccadivensis*, Alcock and Anderson.

Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 157; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. iv., pl. xxvi., fig. 4 (1896).

The rostrum, in the larger specimen obtained this year, is deeper, more horizontal and bears only nine spines on its upper margin, a rather wide interval separating the 1st from the 2nd and the 8th from the 9th spines.

The fingers of the larger of the 2nd pair of legs are flattened so as to form two broad opposing surfaces, end in recurved hooks, and are furnished each in its proximal half with two small sharp interlocking tubercles in addition to the blunt tubercle which the movable finger carries close to its articular end.

A female, bearing very numerous small eggs, and measuring 50 millims. from tip of rostrum to end of telson was trawled at Station 197, 406 fms.

Family **Pasiphæidæ.**

PHYE, Wood-Mason.

25. *Phye alcocki*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., Feb. 1893, p. 164; and Ill. Zool. 'Investigator,' Crustacea, pt. i., pl. iii., fig. 5.

Stations 184 and 197; 947 and 406 fms.

Family **Nematocarcinidæ.**

NEMATOCARCINUS, A. Milne-Edwards.

26. *Nematocarcinus gracilis*, Sp. Bte.

Spence Bate, 'Challenger' Macrura, p. 815, pl. cxxxii., fig. 8; and Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 160.

Station 197; 406 fms.

Tribe *ASTACIDEA*.

Family **Homaridæ**.

PHOBERUS, A. Milne-Edwards.

27. *Phoberus cæcus*, A. Milne-Edw., var. *sublevis*, W.-M.

Wood-Mason, Ann. Mag. Nat. Hist., Feb. 1891, p. 197; Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 21.

The female, captured this year at Station 192, 912–931 fms., differs both from the female taken last year and from the male previously caught in possessing 2 spines on the upper margin of the rostrum.

Length, from tip of rostrum to end of telson, 122 millims.

NEPHROPSIS, Wood-Mason.

28. *Nephropsis Stewarti*, Wood-Mason.

Wood-Mason, J. A. S. B., 1873, Vol. LXIII., pt. 2, p. 39, pl. iv.; and Ann. Mag. Nat. Hist., (4) XII., 1873, p. 59; A. Milne-Edwards, Ann. Sci. Nat. Zool., (5) XIX., pl. xx., figs. 1–3; and Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 161; Illustrations of the Zoology of the R. I. M. S. 'Investigator,' Crustacea, pt. iv., pl. xxvii., figs. 1, 1*a*.

A male, measuring 141 millim. from tip of rostrum to end of telson, was captured at Station 197; 406 fms.

29. *Nephropsis atlantica*, Norman.

Norman, P. R. S., Edin., 1881-82, Vol. XI., p. 684; Wood-Mason and Alcock, Ann. Mag. Nat. Hist., Feb. 1891, p. 198, fig. 4; and Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 162.

Station 201; 320–296 fms.

30. *Nephropsis suhmi*, Sp. Bate.

Spence Bate, 'Challenger' Macrura, pp. 181–183, pl. xxiii., fig. 3, and pl. xxiv. fig. 2.

Seven specimens of this species, which is new to the Indian fauna, varying from a male of 83 millims. and a female of 82·6 millims., to 32 millims. in length, were captured at 5 stations at depths between 890 and 947 fms. The teeth on the anterior margins of the pleura of the first four abdominal somites vary both in size and numbers; in some case none in others one large and two smaller teeth are present.

In a specimen 83 millims. in length the flagellum of the 1st antenna measures 25 millims., that of the 2nd antenna 186 millims.

The absence of a joint in the outer plate of the caudal swimmeret was both noted and figured by Spence Bate; but, owing to the smallness and immaturity of his single specimen, he seems to have been doubtful of the permanence of this character. In none of these

specimens is there any vestige of a joint in these plates. This character at once serves to distinguish *Nephropsis suhmi* from the other three Indian species of this genus, *atlantica*, *stewarti* and *carpenteri*, in all of which the joint is very apparent. Indeed it isolates this species from all other Homarids and forms a connecting link with the nearly allied *Eryonidæ*.

Colour in life pale orange with a broad whitish stripe on the dorsum of the abdomen and posterior part of the carapace. Antennal bases colourless. Hairs on dactyli of last 4 pereiopods crimson. Cornea opalescent.

Stations 183, 184, 192, 193, 194; 890, 947, 912–931, and 891 fms. respectively.

Family **Callianassidæ.**

Calocaris, Bell.

31. *Calocaris macandreæ*, Bell.

Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 163, where a list of references is given.

Three very small specimens, the largest only 24 millims. in length, were captured off the east coast of Ceylon at Station 199, 800–637 fms.

Family **Axiidæ.**

Calastacus, Faxon.

32. *Calastacus investigatoris*, n. sp.

Female. This species very closely resembles *Calastacus stilirostris*, Faxon, only differing in the following points. The carapace is covered with small granules, and dorsally markedly carinate. The carina extends from the base of the rostrum to within a short distance of the posterior border of the carapace, where it ends in a small denticle. A similar denticle is found on the carina in the centre of the gastric area. The rostrum is triangular and dorsally flattened, its lateral margins extending a short distance back on the sides of the carapace as a pair of elevated ridges each bearing a couple of acute anteriorly directed teeth, the posterior of which is considerably larger than the anterior.

The eyestalks are short and conical without any trace of a cornea.

Both the fixed and movable spines of the second joint of the second antennæ are very short, only reaching about one-quarter the length of the third joint.

The upper border of the merus of the great chelipeds is armed

with one large distal and 3 or 4 small spines; those on the lower margin of this joint are subequal. On the infero-external margin of the hand is a row of spinules.

The borders of the suture in the outer plate of the swimmeret are destitute of spinules; the outer margin of this plate is armed with 3 small spines, the smallest near the centre, the largest on the margin of the suture, and the third midway between these two. The external border of the inner plate of the swimmeret is not furnished with a spine.

Length of carapace exclusive of rostrum 18·5 millim., rostrum 3·75 millim., abdomen 32·4 millim., cheliped 27 millim., merus of cheliped 9·75 millim., dactylus of cheliped 11 millim. Colour in life; abdomen light brown, carapace very pale pink dorsally fading into slate colour on the sides.

Station 184; 947 fms., 2 females.

Tribe *ERYONTIDEA.*

Family **Eryontidæ.**

PENTACHELES, Spence-Bate.

33. *Pentacheles gibba*, Alcock.

Alcock, Ann. Mag. Nat. Hist., Vol. XIII., March 1894, p. 234; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. ii., pl. viii., fig 4.

A male, measuring 135 millims., from tip of rostral spine to end of telson, only differs from the description of the female in having the first abdominal appendages well developed; the fifth pair of thoracic legs are chelate.

Arabian sea, Stations 192 and 193; 912–931 and 931 fms.

34. *Pentacheles phosphorus*, Alcock.

Alcock, Ann. Mag. Nat. Hist., Vol. XIII., March 1894, p. 240; Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 165; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. ii., pl. viii., fig. 2.

Off the Cochin coast, Station 197; 406 fms.

Tribe *SCYLLARIDEA.*

Family **Scyllaridæ.**

ARCTUS, Dana.

35. *Arctus rubens*, Alcock and Anderson.

Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, pp. 25 and 26.

Indian Ocean, Station 204; 180–217 fms.

Tribe *ANOMOLA.*

Family Lithodidæ.

Lithodes, Latreille.

36. *Lithodes agassizii*, S. I. Smith.

S. I. Smith, Bull. Mus. Comp. Zool., Vol. X. No. 1, 1882, pp. 8–11, pl. i.

A single small specimen, measuring only 9 millim. in length, exclusive of the rostral and posterior spines, was trawled off the Cochin coast at Station 197, 406 fms. The colour in life was pale pink, similar to the colour of the American examples as described in the 'Three voyages of the Blake.'

New to the Indian fauna.

Family Galatheidæ.

Munida, Leach.

37. *Munida microps*, Alcock.

Alcock, Ann. Mag. Nat. Hist., April 1894, p. 326.

One small immature specimen was trawled at Station 197; 406 fms.

Munidopsis, Whiteaves.

38. *Munidopsis trifida*, Henderson.

Henderson, 'Challenger' Anomura, p. 156, pl. xvi., fig. 2; and Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 168.

One small specimen from Station 201, 296–320 fms.

39. *Munidopsis stylirostris*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., February 1891, p. 201; Alcock, Ann. Mag. Nat. Hist., April 1894, p. 328; Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 166; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. iii., pl. xiii., fig. 6.

Three ovigerous females and two males from the Arabian Sea, Station 184; 947 fms.

40. *Munidopsis wardeni*, n. sp.

This species is very closely related to *M. stylirostris*, W. M., but differs in the following particulars. 1. The carapace is hairier, flatter and broader. 2. The rostrum is relatively shorter and slopes gently downwards, its curve being nearly continuous with that of the anterior part of the carapace; its extreme tip is upturned. 3. The cornea are cylindrical and slightly curved. 4. The spine at the antero-lateral

angle of the carapace is much smaller and directed forwards and not obliquely outwards at an angle of about 45°. 5. The cervical groove is bounded posteriorly by a small spine; in *M. stylirostris* both groove and spine are very inconspicuous. 6. The merus of the cheliped has two rows of spines on its upper surface, one on the inner the other on the outer margin. 7. All the joints of the 2nd, 3rd and 4th thoracic legs are hairy. 8. The ridges bounding the transverse furrows of the 2nd–4th abdominal terga are spinulous not ctenate.

Colours in life were the same as those of *M. stylirostris;* milky orange dorsally, white ventrally, corneæ yellow.

The length of the largest specimen, an egg-laden female, from tip of rostrum to end of telson is 50 millims.

Station 197; 406 fms., 2 egg-laden females and one male. There is also in the Indian Museum an ovigerous female from 30 miles W. of Middle Andaman Island, depth 480–500 fms.

41. *Munidopsis*, sp.

One small specimen, 9 millim. in total length, resembling *M. margarita*, Faxon, more closely than any other described species was obtained at Station 201; 320–296.

ELASMONOTUS, A. Milne-Edwards.

42. *Elasmonotus cylindrophthalmus*, Alcock.

Alcock, Ann. Mag. Nat. Hist., Vol. XIII., April 1894, p. 333; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. iii., pl. xiii., fig. 4.

The single specimen obtained this year is a male. The chelipeds are unequal, the larger measuring 56 while the smaller measures 49 millims. The palm of the larger cheliped is 16·75 millims. and the fingers 6 millims. in length. From tip of rostrum to end of telson is 25·5 millims.

Station 197; 806 fms.

GALACANTHA, A. Milne-Edwards.

43. *Galacantha trachynotus*, n. sp.

This species is closely allied to *G. investigatoris*, Alc. and And., *bella*, Hend., and *rostrata*, A. M. E.

From the first it differs in the following points: 1. The carapace is covered with short sharp spiniform tubercles the tips of which are bent forwards. Anteriorly these tubercles are somewhat sparsely scattered but posteriorly they are more densely crowded together. 2. Slightly in front of the pair of gastric spinules is a small median

gastric spinule. 3. Immediately posterior to the cardiac is a small median spine resembling it in shape but only about one-quarter its length. 4. The posterior margin of the carapace is armed with a row of spiniform tubercles as also are both carinae of the 2nd, 3rd and 4th and the anterior margin of the 5th abdominal segments; the terga of the 5th and 6th abdominal segments are irregularly covered with small sharp granules while their pleura are almost smooth. 5. The upper surface of the meri and carpi of the 2nd–4th thoracic legs are covered with tubercles similar to those on the carapace. 6. The posterior margin of the dactyli of the 2nd–4th thoracic legs are 10–12 dentate. 7. The 1st, 2nd and 3rd antennal joints terminate in short sharp spinules.

From *G. bella* it differs: 1. In the distribution of tubercles on the abdominal segments and on the upper surfaces of the meri and carpi of the 2nd–4th thoracic appendages. 2. In the presence of spinules on the antennal joints. 3. In the presence of two median gastric and two median cardiac spines. 4. In the number of dentations in the posterior margin of the dactyli of the 2nd–4th thoracic legs. 5. In the cutting edges of the fingers of the chelipeds being quite straight.

From *G. rostrata* it differs: 1. In the presence of two gastric and two cardiac median spines. 2. In the two spines on the lateral margins of the carapace being subequal. 3. In the spinature of the ambulatory legs.

Colour in life milky orange.

A female specimen was obtained from each of the three Stations 184, 192 and 193 at depths of 947, 912–931 and 931 fms. respectively.

Will be figured in the Illustrations of the Zoology of the R. I. M. S. 'Investigator,' Crustacea, Pt. iv., pl. xxv., figs. 3, 3*a*. (to be issued in 1896).

Uroptychus (A. Milne-Edwards), Henderson.

44. *Uroptychus nitidus*, A. Milne-Edwards.

A. Milne-Edwards, Bull. Mus. Comp. Zool., Vol. VIII., 1880, p. 62; Henderson, Challenger,' Anomura, p. 174, pl. xxi., fig. 6; and Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 173.

An ovigerous female, coloured in life bright pink and with milk-white eggs was obtained from Station 201; 320–296 fms.

Sub-Order, BRACHYURA.

Tribe *ANOMOLA.*

Family **Raninidæ.**

LYREIDUS, de Haan.

45. *Lyreidus gracilis*, Wood-Mason.

Wood-Mason, J. A. S. B., Vol. LVI., pt. ii., 1887, p. 376; Alcock and Anderson J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 175.

Twelve specimens from Station 197, 406 fms.; and four specimens from Station 201, 320–296 fms.

Family **Homolidæ.**

PAROMOLOPSIS, Wood-Mason.

46. *Paromolopsis boasi*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., March 1891, p. 268, fig. 5.

The largest specimen obtained this season measures from tip to tip of 4th thoracic legs (the longest) 314 millims.; breadth of carapace 50, length 52 millims.

The type of this species was dredged in the Andaman Sea in 480 fms. The present specimens were obtained off the Cochin coast at Station 197; 406 fms.

HYPSOPHRYS, Wood-Mason.

47. *Hypsophrys superciliosa*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., March 1891, p. 269; Alcock, J. A. S. B., Vol. LXII., pt. 2, 1893, p. 177; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. 3, pl. xiv., figs. 4, 4*a*.

Numerous specimens in all stages of growth and of both sexes were obtained from the Arabian Sea at Stations 183, 184, 192, 193, and 194 at depths of 890, 947, 912–931, 931 and 891 fms. respectively.

Tribe *OXYSTOMATA.*

Family **Dorippidæ.**

ETHUSA, Roux.

48. *Ethusa indica*, Alcock.

Alcock, Ann. Mag. Nat. Hist., Ser. 6, Vol. XIII., May 1894, pp. 405, 406; Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 176; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. iii., pl. xiv., fig. 2.

In the males the chelæ are very unequal, one being very much stouter although not much longer than the other.

Colours in life—body French gray, legs pink.
Station 197; 406 fms.; 6 males, 8 females.
Station 201; 320–296 fms.; 1 male.

ETHUSINA, Smith.

49. *Ethusina gracilipes*, Miers.

Miers, 'Challenger' Brachyura, p. 332, pl. xxviii., fig. 3; and Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii., 1894, p. 177.

Station 192; 912–931 fms.

Family **Leucosidæ.**

RANDALLIA, Stimpson.

50. *Randallia pustulosa*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., March 1891, p. 266.

The specimens captured this year are two immature females and a small male. The abdominal segments of the former resemble those of the male both in width and in forming a concavity. They differ much from the abdominal segments of the adult female which form a marked convex protuberance and extend nearly to the bases of the legs.

Station 197; 406 fms.

Family **Calappidæ.**

MURSIA, Desmarest.

51. *Mursia bicristimana*, Alcock and Anderson.

Alcock and Anderson, J. A. S. B., Vol. LXIII., pt. ii.,, 1894, p. 197; and Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. iv., pl. xxiv., fig. 5, (to be issued in 1896).

The colours of this crab in life were: upper surface of leg and carapace pale bluish-white studded with orange red granules, lower surface white; fingers of chelipeds white, inner surface of merus of chelipeds deep orange.

A large male, measuring 88 millim. from tip to tip of lateral spines and 47·8 millim. antero-posteriorly, was trawled at Station 204, off Colombo, 180–217 fms.

Tribe *CYCLOMETOPA.*

Family **Corystoidæ.**

TRICHOPELTARION, A. Milne-Edwards.

52. *Trichopeltarion ovale*, n. sp.

As unfortunately no male of this species has hitherto been obtained,

it is with some doubt that I assign it a place in the genus *Trichopeltarion*. The enlargement of the first joint of the antennal base, the production of the antero-internal angle of the ischium of the external maxillipeds, the absence of spines from the extremity of the merus, and the obliquity of the antero-internal angle of the same joint of the external maxilliped serve to separate it from *Hypopeltarion* at the same time showing its affinity to *Trichopeltarion*.

The carapace is egg-shaped, truncated posteriorly and slightly flattened dorsally, where it is covered with short stiff hairs and short tubercles the free extremities of which split into from 2–6 small teeth; in places the bases of two or more of these tubercles are confluent. Towards the margin of the carapace these multidentate tubercles are gradually replaced by conical, short, sharp spines. On the under surface of the carapace these diminish greatly in size and on the antero-internal part of the pterygostomian region become mere granules. The regions are defined by sulci.

A diamond-shaped sulcus, with its anterior extremity prolonged to the base of the rostrum and its posterior extremity ending in the sulci separating the median from the lateral regions, encloses about the middle two-thirds of the dorsum. The rostrum is similar to that of *T. nobile*, but the tip of the central spine is broken off. It appears to have been not shorter than the lateral spines. External to these three spines a deep notch, in which the base of the external antenna is visible from above, separates the three central from another large spine carrying a small spinule on its outer side.

From between this spine and the basal joint of the antenna protrudes the eye peduncle. The external maxillipeds resemble those of *T. nobile* except that the antero-internal border of the merus is not concave, but straight although oblique. The basal joints of the 2nd antennæ are relatively longer than those of *T. nobile*. The 2nd joint nearly reaches the tip of the 3 rostral spines and the 3rd joint much surpasses it. The ocular peduncle is long slender and slightly curved. Both corneæ have been accidentally destroyed. The orbit is bounded above by a large multicuspidate tubercle, separated by wide notches both from the tubercle from beneath which the eye emerges and from another multicuspidate tubercle which limits the orbit externally.

A very broad notch again separates this latter tubercle from the large spine-bearing tubercle which forms the floor of the orbit. The inner margin of this tubercle is straight and almost parallel with the outer margin of the first basal joint of the external antenna from which it is separated by a deep notch.

All the legs are covered with long coarse hairs.

The chelipeds (in the female) are sub-equal. The merus and ischium are curved to correspond with the much inflated branchiostomial region. The former is triangular in section and bears sharp spines on its upper and a few small spines on its lower external margins. The outer and upper surfaces of the carpus are covered with short sharp tubercles, of which one at the distal extremity is pre-eminent in size. The hand is vertically elongated and studded with four rows of small tubercles on its outer side and some scattered larger sharp tubercles on its upper margin. The fingers are placed somewhat obliquely, leave a slight hiatus at the base when closed, are 5- or 6-dentate on the cutting edges and the movable one bears a few small tubercles on its upper margin near its base.

The upper margin of the meri of the 2nd, 3rd, 4th and the upper margin and posterior surface of the merus of the 5th thoracic legs are armed with sharp spines some 2 millims. in length. The carpi and propodi also carry a few acuminate tubercles. The dactyli are long and styliform.

The abdomen is covered with coarse yellow hairs and is seven jointed; a median ridge on all the segments except the last bears a few tubercles; those on the 1st and 2nd segments resemble the tubercles on the posterior part of the carapace, but on the other segments they gradually diminish in size to mere granules on the 6th, and on the 7th they are absent.

Length of carapace including rostrum	64·0	millim.
Breadth „ „	55·5	„
Depth „ „ including thickness of abdominal segments	35·0	„
Greatest span tip to tip of 3rd legs	210·0	„
Length of chelipeds (along chord from tip of dactylus to basis)	55·0	„

Colour in life pale bluish yellow.

Station 204; 180–217 fms.

This species will be figured in the Illustrations of the Zoology of the R. I. M. S. 'Investigator,' Crustacea, pt. iv., pl. xxv., figs. 4, 4*a*.

Tribe *OXYRHYNCHA.*

Family **Maiidæ.**

Scyramathia, A. Milne-Edwards.

53. *Scyramathia rivers-andersoni*, Alcock.

Alcock, Carcinological Fauna of India, J. A. S. B., Vol. LXIV., pt. ii., 1895, p. 203
Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. iv., pl. xxii., figs. 2 and 4.

Colour in life pale pink, deeper on chelipeds.

Station 197; 406 fms.

OXYPLEURODON, Miers.

54. *Oxypleurodon stimpsoni*, Miers.

Miers, 'Challenger,' Brachyura, pp. 38, 39, pl. vi., fig. 1.

A small male, only 4 millim. in total length, was trawled near Colombo, Station 204; 180–217 fms.

Colour in life orange.

New to the Indian fauna.

PHYSACHÆUS, Alcock.

55. *Physachæus ctenurus*, Alcock.

Alcock, Carcinological Fauna of India, J. A. S. B., Vol. LXIV., pt. ii., 1894, p. 175, pl. iii., figs. 2, 2a. and b., Ill. Zool. R. I. M. S. 'Investigator,' Crustacea, pt. iv., pl. xviii., fig. 1.

Colour in life pale salmon.

Off the Cochin coast. Station 197; 406 fms.

Order ISOPODA.

Family Ægidæ.

56. *Ægа*, Leach.

A single specimen of an *Ægа*, closely allied to *Ægа ventrosa*, Sars, and measuring 32 millim. in total length, was obtained at Station 184, 947 fms. When caught it was not adherent to any host. Colours in life, white and brown in patches.

Noviciæ Indicæ XII.—*Description of a new genus of* Orchidaceæ.—*By* D. PRAIN.

[Recd. 28th April, Read 6th May.]

Among the Orchids of Sikkim sent to Calcutta by Mr. Pantling during 1895, one of the most interesting was a singular little member of the tribe *Neottieæ*,—and within that tribe apparently most satisfactorily referable to the subtribe *Limodoreæ*—that did not seem to fit into any hitherto described genus. Mr. Pantling's specimens, with a figure made from a fresh plant, were sent to Dr. King, then absent in Europe, for comparison with the material preserved in the national herbarium at Kew. The result of this comparison was to confirm the writer's conclusion. A definition of the new genus that it is necessary to propose in order to accommodate the plant, with a description of the plant itself, are now given. The genus is named in honour of Mr. R. Pantling whose devotion to the study of this natural order is so well-known, and whose exertions have so largely extended our knowledge of the Sikkim Orchid-flora.