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REPORT ON A COLLECTION OF CRUSTACEA FROM PORTUGUESE
EAST AFRICA.

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(With Plates X-XI.)

The collection herein reported upon was made during the course of the Marine Survey of Portuguese East Africa undertaken for the Mozambique Government by Dr. J. D. F. Gilchrist, to whom I am indebted for the opportunity of examining the collection.

Although not very large, the collection contains some interesting forms, and much credit is due to the Portuguese officers—Lieut.-Comm. Bello, Chief of the Marine Staff, and Lieut. Amaral, Port Captain, Delagoa Bay—who were concerned with the operations of the Survey; and to Mr. W. J. Copenhagen, who acted as biologist on board the Survey ship.

The Crustacea of Portuguese East Africa are comparatively little known, especially in the region around Delagoa Bay. From the works of Bianconi, Hilgendorf, Lenz, Miers, and Kemp a list of about 140 species can be obtained. My own collections, made on behalf of the South African Museum, at Delagoa Bay, Inhambane, and Mozambique in 1912, yielded 29 species not before recorded. Of these 8 were described by Stebbing,* 9 by myself.† The remaining 12 have been incorporated in the present report for the sake of making the fauna-list of Portuguese East Africa as complete as possible.

The present collection contains 57 species, of which 14 have been previously recorded, bringing the total number of species on the fauna-list up to 211. This number is only about one quarter of the number of species recorded from South Africa south of 27° S. lat., and evidently represents but a small part of the real fauna-list.

* Stebbing, Ann. S.A. Mus., xv, pt. 1, 1914; *ibid.*, pt. 2, 1915; *ibid.*, xviii, pt. 4, 1921; *ibid.*, xix, pt. 1, 1924.

† It should be noted that the specimens recorded under the name "*Actaea parvulus* Krss." do not belong to that species, but comprise specimens of *Actaea rüppelli* Krss., *Xanthodes lamarchi* M. Edw., and *Carpilodes bellus* Dana, according to the more recent identifications of Dr. Th. Odhner.

† Barnard, Ann. S.A. Mus., x, pt. 7, 1914; *ibid.*, pt. 11, 1914; *ibid.*, xv, pt. 3, 1916; *ibid.*, xx, pt. 1, 1924.

The results of the Survey are valuable in showing that there is still much to be done, especially in the deeper waters, in this region. The capture of a crayfish of the genus *Palinustus*, hitherto known only from the West Indies, and of three Indo-Pacific forms not reported since their capture by the "Challenger," are striking results, considering the comparatively short period during which the trawling vessel had been in commission. They indicate that a continuance of the Survey would yield still more interesting results.

The 43 new records are listed below, together with those in the South African Museum collection, the latter being indicated by an asterisk.

BRACHYURA.

* <i>Huena proteus</i> (de Haan)	. . .	Delagoa Bay.
<i>Hyastenus diacanthus</i> (de Haan)		
var. <i>spinus</i>	. . .	"
* <i>Macropodia formosa</i> Rath	. . .	"
* <i>Dehaanius macleaii</i> (Krss.)	. . .	"
<i>Cyrtomaia murrayi</i> Miers	. . .	Label lost.
<i>Platynaia wyville-thomsoni</i> Miers	. . .	26° 3' S. 33° 4' E. 290 m.
<i>Actaea savignyi</i> (M. Edw.)	. . .	Delagoa Bay.
* <i>Xantho hydrophilus</i> (Hbst.)	. . .	"
* <i>Neptunus argentatus</i> (White)	. . .	"
* <i>Thalamita prymna</i> (Hbst.)	. . .	"
<i>Charybdis merguensis</i> (de Man)	. . .	"
<i>Carcinoplax longimanus</i> (de Haan)	. . .	25° 17' S. 33° 29' E. 117 m.
* <i>Typhlocarcinus rubidus</i> Alck.	. . .	Delagoa Bay.
<i>Plagusia squamosa</i> (Hbst.)	. . .	"
* <i>Uca vocans</i> (M. Edw.)	. . .	"
<i>Elamena mathaei</i> (Desm.)	. . .	"
<i>Calappa flammea</i> Hbst.	. . .	25° 45' S. 33° 3' E. 58 m.
<i>Mursia bicristimana</i> Alck. & And.	. . .	26° 3' S. 33° 4' E. 290 m.
<i>Leucosia marmorea</i> Bell	. . .	26° 17' S. 33° 10' E. 415 m.
* <i>Philyra punctata</i> Bell	. . .	Chinde.
<i>Dorippe lanata</i> (Linn.)	. . .	26° 17' S. 33° 10' E. 415 m.
<i>Homola andamanica</i> Alck.	. . .	26° 3' S. 33° 4' E. 290 m.
<i>Latreillopsis alcocki</i> Stebb.	. . .	25° 59' S. 33° 6' E. 312 m.
<i>Latreillia elegans</i> Roux	. . .	25° 55' S. 33° 4' E. 37 m.
* <i>Clibanarius padavensis</i> de Man	. . .	Delagoa Bay.
* <i>Porcellana dehaani</i> Krss.	. . .	"
<i>Munida incerta</i> Hend.	. . .	See below.
<i>Emerita emeritus</i> (Linn.)	. . .	Delagoa Bay. Inhambane.

MACRURA.

	* <i>Calliadne savignyi</i> (Strahl)	.	.	Delagoa Bay.
	<i>Scyllarus sordidus</i> (Stmps.)	.	.	See below.
	„ <i>tuberculatus</i> (Bate)	.	.	„
13	<i>Ibacus peroni</i> (Leach)	.	.	„
	<i>Thenus orientalis</i> (Lund)	.	.	Delagoa Bay.
	<i>Palinurus gilchristi</i> Stebb.	var.		
	<i>delagoae</i> nov.	.	.	See below.
var. natalensis nov.	<i>Palinustus mossambicus</i> n.sp.	.	.	„
	<i>Nephrops andamanica</i> Wood-Mason	.	.	„
	<i>Penaeus japonicus</i> Bate	.	.	Delagoa Bay.
	„ <i>monodon</i> Fabr.	.	.	„
	<i>Pontophilus megalochair</i> (Stebb.)	.	.	See below.
	<i>Eupalaemon sundaicus</i> (Heller)	.	.	Delagoa Bay.
	<i>Glyphocrangon gilesi</i> Wood-Mas.			
	var. <i>dentatus</i> nov.	.	.	See below.
	<i>Anchistus inermis</i> (Miers)	.	.	Delagoa Bay.
	<i>Alpheus crassimanus</i> Heller.	.	.	„
	„ <i>rapax</i> de Haan.	.	.	„

STOMATOPODA.

	<i>Squilla latreillei</i> (Eyd. & Soul.)	.	.	Delagoa Bay.
	„ <i>nepa</i> (Latr.)	.	.	Exact locality lost.
	<i>Pseudosquilla ciliata</i> (Latr.)	.	.	Delagoa Bay.
	<i>Gonodactylus glabrous</i> Brks.	.	.	„

ISOPODA.

	<i>Meinertia imbricata</i> (Fabr.)	.	.	Delagoa Bay.
	<i>Cymothoa borbonica</i> Sch. & Mein.	.	.	„
	<i>Epipenacon japonicum</i> Th.	.	.	„

AMPHIPODA.

	<i>Leucothoe spinicarpa</i> (Abilg.)	.	.	Delagoa Bay.
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OSTRACODA.

	<i>Crossophorus africanus</i> Stebb.	.	25° 59' S. 33° 31' E.	540 m.
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CIRRIPEDIA.

	<i>Octolasmis warwicki</i> Gray	.	.	On various crabs.
	<i>Balanus astacophilus</i> n. sp.	.	.	See below.

FAMILY GALATHEIDAE.

Munida incerta Hend.

1888. Henderson, *Challeng. Rep.*, xxvii, p. 130, pl. xiii, fig. 4.

The specimens agree with Henderson's description, but are considerably larger and have a relatively shorter rostrum.

The rostrum is just over one-third the length of carapace. The inner apex of the 2nd peduncular joint of the antenna ends in a slender spine with 1-2 spinules at its base; the outer apex also has a spine, but smaller than the inner one.

In the single "Challenger" specimen both chelipeds were lost. In these specimens they are elongate, subcylindrical, and squamose. The 4th joint is spinose along both upper margins and along the inner margin; the 5th likewise but more feebly spinose; the 6th has only a few short spines differentiated from the squamae. The 6th joint, including the immobile finger, about 3 times as long as 5th. Both fingers elongate, straight, slender, slightly longer than the palm, their inner margins in contact throughout; close to the base there are 2 teeth interlocking with those on the opposite finger, the rest of the inner margins being finely denticulate, with a few slightly larger denticles on the immobile finger. One specimen, which has only one cheliped, lacks the basal teeth on the fingers, the whole inner margin being straight.

Length and breadth of carapace 28 mm., length of rostrum 10 mm., of cheliped 104 mm.

Colour.—Pale salmon red.

Locality.—25° 56' S., 32° 52' E., 17 metres, sand and shell.

Distribution.—Philippine Islands, 250 fathoms.

FAMILY SCYLLARIDAE.

Scyllarus sordidus (Stimpson).

(Plate X.)

1888. Bate, *Challeng. Rep.*, xxiv, p. 66, pl. ix, fig. 3.

A ♂ specimen, total length 65 mm., length of carapace 25 mm., agrees with Bate's figure and description. The colour is rusty-red, paler towards end of abdomen, eyes dark maroon.

Locality.—26° 3' S., 33° 4' E., 290 metres, fine sand.

Distribution.—Hong Kong (Stimpson), Arafura Sea, 140 fathoms (Bate).

Scyllarus tuberculatus (Bate).

(Plate X.)

1888. Bate, Challeng. Rep., xxiv, p. 70, pl. x, figs. 1, 2.

1920. Stebbing, Ann. S. Afr. Mus., xvii, pt. 4, p. 267 (*Thenus orientalis* non Lund).

An ovigerous ♀ specimen, total length 58 mm., length of carapace 21 mm., agrees with Bate's figures and description. The peduncle of the antennule, however, only reaches to the end of the last joint of the antenna, its basal joint is distinctly the longest, the 3rd shorter than the 2nd.

Colour.—General colour red, paler towards end of abdomen, mottled with paler red and white, most of the tubercles have white tips, outer margin of 2nd joint of antennae and the smooth dorsum of 1st abdominal segment violet.

Locality.—26° 17' S., 33° 10' E., 415 metres, sand and shell.

Distribution.—Between New Guinea and Australia, 49 fathoms (Bate).

I have also examined a young specimen, 18 mm. total length, which was recorded by Stebbing (*loc. cit., supra*) as *Thenus orientalis* from off the Zululand coast. It is obviously a young *S. tuberculatus*, though it is less prominently rugose and tuberculate; the distinctive knob on the 3rd abdominal segment is merely indicated. On the ventral surface there is a tubercle on the 5th thoracic sternite only.

Ibacus peronii (Leach).

Locality.—25° 24' S., 33° 25' E., 310 metres, sand and mud; 26° 3' S., 33° 4' E., 290 metres, fine sand.

FAMILY PALINURIDAE.

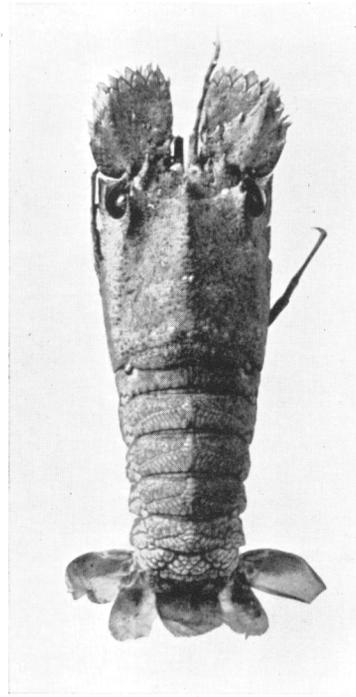
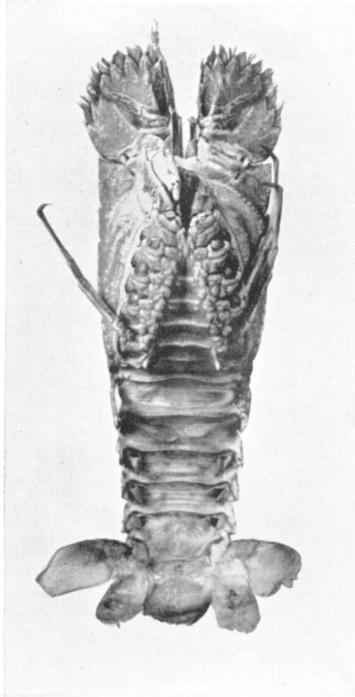
Palinurus gilchristi Stebb.

var. *delagoae* n.

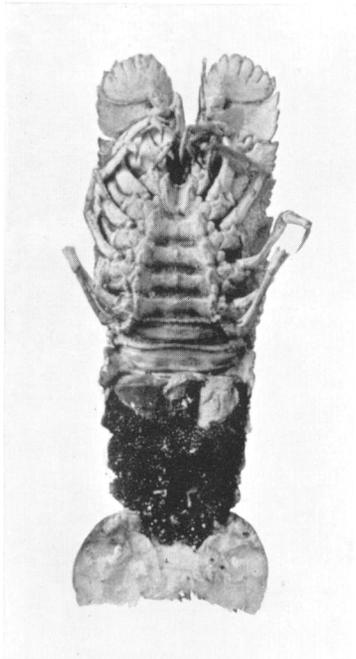
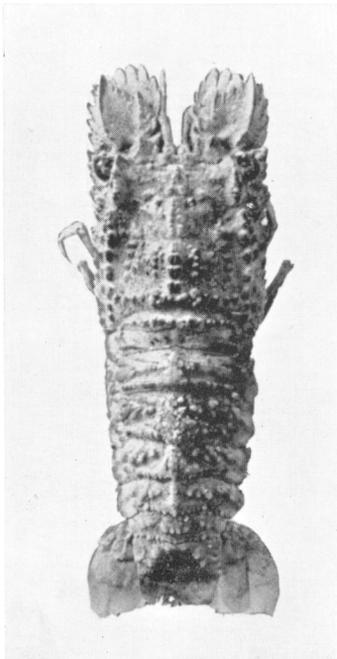
(Plate XI.)

This form is so closely allied to *gilchristi* that I have hesitated to give it specific rank. After an examination of numerous examples of typical *gilchristi* I have failed to find any hint of variation in regard to the two characters which differentiate the two forms, and therefore I had almost decided to give the present one specific rank.

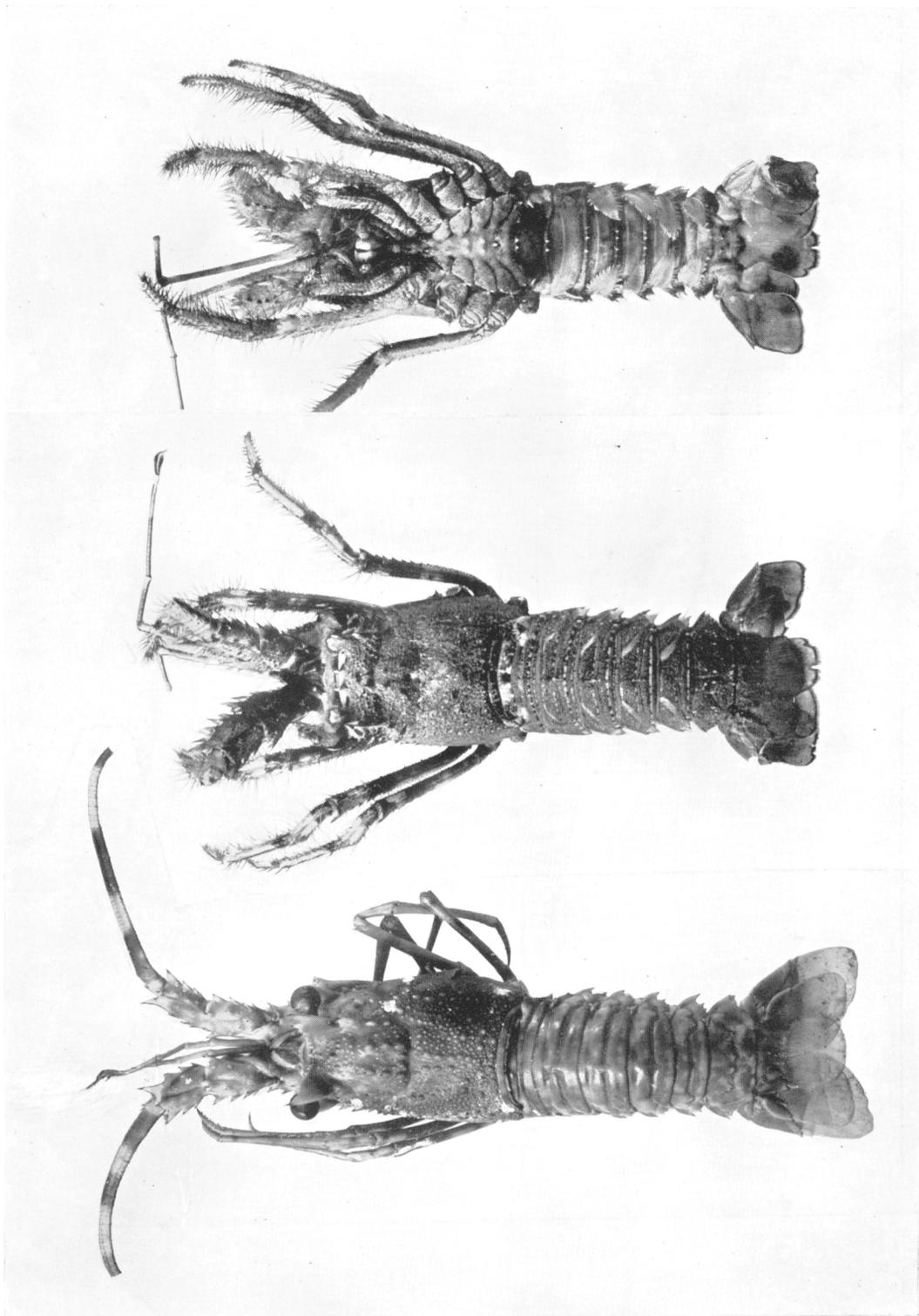
Later, however, I was able to examine through Dr. Gilchrist's kindness two examples of the crayfish found on the Natal coast. These examples,



Scyllarus sordidus (Stmps.).



Scyllarus tuberculatus (Bate).



Palinurus mossambicus n. sp.

Palinurus gilchristi Stebb.
var. *delagoae* n.

though distinctive in themselves, formed a transition between typical *gilchristi* and the Delagoa form.

It therefore seems advisable to treat the Natal and Delagoa forms as local races and rank them as varieties of *gilchristi*.

The Delagoa Bay variety resembles *gilchristi* in nearly all particulars; the two most important exceptions being the following:—

In *gilchristi* the 2nd–5th abdominal segments have the transverse furrow interrupted in the centre by a low, but distinct, median keel. This keel is marked on either side by a shallow groove. Both these grooves and the transverse grooves are filled up with a thick, short pilosity which gives a distinctive H-shaped marking on the 2nd–5th segments.

In *delagoae* the transverse grooves are very shallow, with a few setae only in the one specimen and none at all in the other. In particular the grooves on either side of the median keel are non-existent.

The second character forms an even more sharply defined difference between the two forms. In *gilchristi* the legs are more or less triquetral in cross-section, especially the 4th and 5th joints. The flattened outer or posterior sides of these joints are also very slightly grooved, and the grooves are occupied by a strip of short, close pilosity. In *delagoae* the legs are subcylindrical and there is no trace of the pilose strips.

These two features seem sufficiently clear-cut and distinctive to justify at least varietal rank for the Portuguese East African form.

It will be noticed that *delagoae* resembles *vulgaris* in the first feature, but differs from it in the second feature.

As regards other characters, *delagoae* very closely resembles *gilchristi*. It has the 3 close-set pairs of spines in the middle line of the carapace in front of the cervical groove, and the 4 distinct lines of spines behind the cervical groove which differentiate it from *vulgaris*. But the whole ornamentation of the body is much less prominent than in *gilchristi*, and the little groups of setae around the bases of the spines which give a squamose appearance to *gilchristi* are almost or quite obsolete in *delagoae*.

The same remarks apply to the under surface, the sternal plate being much smoother and the patch of spines on the 6th abdominal segment in ♂ reduced to 2 very small and blunt points.

The eyes in *delagoae* are slightly larger proportionately than in *gilchristi*.

The ♂ is larger than any specimens of *gilchristi* that I have seen.

Colour (as preserved).—Pinkish or mauve, the legs and antennae banded with white or cream as in *gilchristi*, the abdomen with white marbling and oblique stripes on each segment very much as in *gilchristi* and *vulgaris*.

Length of carapace 94 mm.; total length from front of carapace to end of telson 244 mm.

Locality.—25° 58' S., 33° 5' E., 228 metres, sand and shell.

var. *natalensis* n.

1921. Gilchrist, Fish. Mar. Surv. Rep., No. 1 (1920), pp. 5, 16, pl. vii (localities).

1922. *Ibid.*, No. 2 (1921), p. 1 (localities).

1925. Calman, *ibid.*, No. 3 (1925), p. 21.

This variety resembles var. *delagoae* in size, in the smooth subcylindrical legs, the smooth sternum, and the 2 small points on the under surface of the 6th abdominal segment.

The dorsal ornamentation of the abdomen, however, is intermediate between typical *gilchristi* and var. *delagoae*. The grooves are better developed than in the latter, but are very feebly pilose, or quite glabrous. The carapace also is more squamose than in *delagoae*.

Locality.—Natal coast, from off Umkomaas River in the south as far north as off Tugela River (as far as yet ascertained); and off Delagoa Bay, 100–260 fathoms.

The three forms thus constitute a series, but with the varieties *natalensis* and *delagoae* more closely related to one another than either of them is to *gilchristi*. Size and the character of the legs are distinctive features.

The examination of a large amount of material might show that *natalensis* should be merged into *delagoae*, and the latter raised to specific rank. For the present I think that the conferring of varietal names will sufficiently meet the case.

Typical *gilchristi* has been found from False Bay to Algoa Bay in comparatively shallow water of 30–60 fathoms. In the deeper water to the north a distinctive race seems to be in process of differentiation.

Gen. PALINUSTUS M. Edw.

1880. A. Milne-Edwards, Bull. Mus. Comp. Zool. Harv., viii, p. 66.

Ophthalmic segment completely uncovered. Frontal spines in the form of small flattened horizontal plates projecting over the ocular peduncles. Antennules elongate, with short flagella.

This genus was proposed for a West Indian crayfish captured by the "Blake." It has apparently not been met with in other parts of the world. Its occurrence off the coast of Portuguese East Africa is therefore exceedingly interesting, and forms a parallel to the distribution of *Palinurus longimanus*, which was originally described from the West Indies and afterwards (as var. *mauritanus* Miers.) from Mauritius.

The present specimen, however, is the representative of a species quite distinct from *P. truncatus* M. Edw.

Palinustus mossambicus n. sp.

(Plate XI.)

Carapace with fine granules and tubercles, and covered with a short fine pilosity. Frontal margin truncate, with a pair of spines (no median rostral point). Between these and the cervical groove 4 pairs of spines, diverging posteriorly. Frontal spines projecting over the free portion of the ocular peduncle, front margin denticulate, outer lateral margin with 2-3 spinules. Behind these 2 smaller spines. Outer margin of orbit with 3 long slender curved spines. A median and dorso-lateral irregular line of tubercles somewhat larger than the surrounding ones. A deep submarginal groove on posterior margin.

Abdomen shallowly and closely pitted, with sparse short pilosity. 2nd-5th segments with a low rounded median longitudinal keel. 1st-5th segments each with a transverse groove near the base and another near the posterior margin, the latter interrupted by the median keel, except on the 1st segment, where it is continuous. Both grooves and also the posterior margin of each segment with thick fringe of setae. 6th segment with a median longitudinal groove flanked on either side by a submedian groove which curves round outwards and laterally. A few small tubercles on the 6th segment and on basal half of telson.

Pleura of segments 2-4 ending in 2 subequal points.

Ophthalmic segment with 4 little spinules on its anterior margin.

Antennal segment narrow, smooth, except for a few setae.

Thoracic sterna each with a pair of small blunt tubercles near the median line, except the 4th, which has a single median tubercle. Abdominal sterna of segments 1-5 with a few (4-6) small sharp spines on posterior margins, sternum of 6th segment with about 8 on either side of the median line. Telson with a pair of spines at base in front of anus.

Antennule, 1st joint longer than carapace, almost equal to rest of antennule including the flagella; 2nd joint about $\frac{1}{3}$ the 1st and $\frac{1}{2}$ the 3rd joint; flagella short, equal to 2nd peduncular joint. The whole peduncle covered with short stiff setae.

Antenna, peduncle spinose and setose, lower margin with a fringe of long plumose setae; flagellum on both sides missing, the few remaining basal joints, however, with short, stout spine-setae and a fringe of plumose setae on lower margin.

Third maxilliped and all the legs with long, stiff, outstanding hairs. 4th-7th joints grooved on outer side, the groove on 4th joint filled with a close, short pilosity. Third maxilliped reaching to end of 2nd peduncular joint of antenna and to 4th joint of 2nd leg. 1st leg a little longer than length of abdomen plus telson; 4th leg a little longer than 1st, 3rd leg longer still

and equal to distance from front of carapace to end of indurated portion of telson. 2nd and 5th legs on both sides missing.

Genital opening on 5th leg forming a prominent papilla, with a flap closing the opening and a little brush of stiff setae on inner margin.

Pleopods with well-marked fringe of setae.

Indurated portions of uropods with inner margins spinulose.

Length of carapace 30 mm., total length from front of carapace to end of telson 95 mm.

Colour.—Salmon-red, a deeper red (crimson) band across front of carapace; abdominal segments with white spots on posterior margins, an oblique white lateral line on segments 2-5, and lateral points of segments 2-5 white; 1st joint of peduncle of antennule with basal, median, and apical white bands, 2nd and 3rd joints with apical white bands only, flagella crimson; legs spotted and banded with white, the greater part of the 5th-7th joints being white; telson and uropods with a thin red marginal line.

Locality.—25° S., 33° 10' E., 406 metres, mud.

FAMILY NEPHROPSIDAE.

Nephrops andamanica W. Mas.

1894. Wood Mason, Ann. Mag. Nat. Hist., p. 226, and Illustr. Zool. Investigator, pl. iv, fig. 1 (1892), and pl. viii, fig. 5 (1894).

1916. de Man, Siboga Exped. Monogr., xxxix, a2, p. 99, pl. iii, fig. 15.

1921. Gilchrist, Fish. Mar. Surv. Rep., No. 1, p. 16, and Annexure A (recorded).

1922. *Ibid.*, No. 2 (1921), Annexure A, p. 7, etc. (localities).

Locality.—25° 28' S., 33° 31' E., 420 metres, sand, shell, and mud.

Also taken by the s.s. "Pickle" off Delagoa Bay, 275 fathoms, and in several localities in the neighbourhood of Durban and Tongaat River in 102-460 fathoms.

Distribution.—Andaman Sea ("Investigator"), Bali Sea ("Siboga").

FAMILY CRANGONIDAE.

Pontophilus megalochair (Stebb.).

1915. Stebbing, Ann. S. Afr. Mus., vol. xv, pt. 2, p. 71, pl. lxxix.

A single specimen, 23 mm. long, from Delagoa Bay, has led me to examine the type of *Philoceras megalochair*, especially in reference to the remarks of Kemp (Rec. Ind. Mus., xii, 8, p. 372, 1916).

In the first place it may be remarked that the specimens from 33° 13' S., 27° 39' E. (S.A.M., No. A1316) should be assigned to *P. hendersoni* Kemp. They are quite typical examples, except that I find the apex of the antennal

scale is variable, and, therefore, cannot be used to differentiate *megalocheir* from *hendersoni*.

The type of *megalocheir* (S.A.M., No. A1317) consists of the dried abdominal segments and microscope preparations of the carapace and appendages.

No indication of the projection on the 3rd abdominal segment can be seen in the type, nor in the Delagoa Bay specimen. In the latter the sternal spine between the chelipeds is present but there are no carinae ending in spines on the last four sterna.

The apex of the antennal scale in the Delagoa Bay example resembles that of *hendersoni* as figured by Kemp.

The telson of the type, contrary to Stebbing's description and figure, resembles that of *hendersoni*. And the Delagoa Bay specimen also agrees in this respect.

There are, therefore, apparently only two characters by which to separate *hendersoni* and *megalocheir*: the greater size and the absence of the abdominal tubercle in the latter.

FAMILY GLYPHOCRANGONIDAE.

Glyphocrangon gilesii W. Mas.

1891. Wood Mason, Ann. Mag. Nat. Hist., p. 193.

1894. *Ibid.*, Illustr. Zool. Investigator, pl. vii, fig. 4.

1899. Alcock, Cat. Ind. Deep-sea Crust., p. 132.

var. *dentata* n.

Distinguished from the typical form by the posterior half of the 2nd or subdorsal crest being distinctly and sharply tridentate.

Length of rostrum 24 mm., of carapace 22 mm., of abdomen 52 mm.

Locality.—25° 59' S., 33° 31' E., 540 metres, mud and sand.

CIRRIPEDIA.

FAMILY BALANIDAE.

Balanus (Solidobalanus) astacophilus n. sp.

Shell moderately solid, conical, smooth, orifice only slightly notched. Base calcareous, thin, radiately ribbed. Parietes smooth, very finely striate, growth lines fine but distinct, internally with several ribs, basal edges crenulate. Raddi broad, transversely grooved, summits straight and nearly parallel with base, edges crenulate. Alae broad, summits slightly oblique.

Scutum not very thin, growth lines forming rather widely spaced deep

grooves, with finer intervening lines (cf. *B. hawaiiensis* Pils.), the ocludent margin consequently strongly toothed, a prominent articular ridge extending nearly $\frac{3}{4}$ of the length of the tergal margin, no adductor ridge, scar of adductor muscle faint.

Tergum with growth lines, faint but more distinct on the band leading to the spur and especially on the scutal margin, groove very shallow, spur short but broad, well defined from basal margin, articular ridge and crests for depressor muscles well marked.

Labrum with 4-5 teeth on the straight margin on either side of the median notch. Maxilla and mandible as in *hawaiiensis*, but the mandible with 5 teeth besides the trispinose lower angle.

Cirri: 1st with unequal branches of 8 and 11 joints, 2nd with slightly unequal branches of 8 and 9 joints, 3rd with somewhat unequal branches of 9 and 10 joints, 4th-6th with ca. 20 joints, each joint with 3 large pairs and one small pair of spines on inner margins; no recurved teeth on any of the cirri. Penis extremely long, almost glabrous.

Length of base 5 mm., of orifice 3.5 mm.; *height*, 4 mm.

Colour.—Chalky white.

Locality.—25° 28' S., 33° 31' E., 420 metres, on legs of *Nephrops andamanica*, several specimens.

This species is closely related to *B. hawaiiensis* Pilsbry, 1916, but differs in the form of the parietes and tergum.