

spinate: the third to the sixth inclusive all have on either side, near the antero-lateral angle, a sharp recurrent declivous spine (rudimentary pleura P): the third fourth and fifth are broad, the sixth is long and narrow: the telson is as long as the sixth tergum, and is larger than either of the uropods.

The eyestalks are of the usual petaloid shape, and, as already mentioned, are devoid of any trace of a cornea.

The external maxillipeds are broadly pediform—the ischium being produced at its postero-internal angle to form an operculum: the dactylus forms a large, almost circular, plate, thickly beset with hairs. Of the first pair of trunk-legs the right is many times larger than the left, and has the following peculiarities of structure:—the ischium is spinate along its lower edge: the merus has a single small uncinat spine, placed infero-externally, at its proximal end: the carpus is considerably less than half the length of the palm of the hand, and has two small spines at its lower angle: the hand is longer and broader than the carapace, the palm is carinated along both the upper and the lower edge, the lower edge being also finely serrated: the dactylus, which is longer than the 'pollex,' is equal in length to the palm; is broadly phalanged, both outside and inside, above; and has, on its cutting surface, at the proximal end, two short rows of coarse crenulations, the outer of which is continued into a sharp edged ridge: the 'pollex' has at its base, close to the dactylar articulation, a strong sharp tooth.

The smaller cheliped of the first pair resembles its fellow as to the ischium and merus; but the carpus is more than  $\frac{1}{2}$  the length, and the fingers nearly twice the length, of the palm: the fingers, besides being relatively much longer, are also much straighter, and, except for a single tooth at the base of the pollex, are unarmed.

The second to fourth pairs of trunk-legs much resemble those of *C. gigas*: the fifth pair ends in a brush, which owing to the minuteness of the dactylus is only minutely and obscurely sub-chelate.

The first pair of abdominal legs (in the female) are short filiform and forked, the outer fork being filiform, the inner being very short, truncate, and ending in a tuft of hairs. The second to fifth pairs inclusive are very broadly lamellar, the exopodites and endopodites being nearly equal in size: in every case the inner edge of the endopodite carries, near the middle, a small styliform appendage.

Colours in life, ivory white with some scattered yellow-ochre flecks.

A single female, 65 millim. long from tip of rostrum to end of telson, was dredged in the Bay of Bengal, at Station 172; 200 to 350 fms.

Tribe *ERYONTIDEA.*Family *Eryontidae.**PENTACHELES*, Spence Bate.58. *Pentacheles phosphorus*, Alcock.

Alcock, Ann. Mag. Nat. Hist., March, 1894, p. 241; and Ill. Zool. 'Investigator', Crustacea, pt. II., pl. viii., fig. 2.

Bay of Bengal, Station 172; 200 to 350 fms., and Laccadive Sea, Station 145; 696 fms., and Station 177; 686 fms.

The male is much smaller than the female.

59. *Pentacheles heattii*, Alcock.

Alcock, Ann. Mag. Nat. Hist., March, 1894, p. 237.

Laccadive Sea, Station 150; 719 fms.

Tribe *SOYLLARIDEA.*Family *Soyllaridae.**ARCTUS*, Dana.60. *Arctus orientalis*, Sp. Bte.

Spence Bate, 'Challenger' Monura, p. 68, Pl. ix., fig. 4.

Bay of Bengal, Station 169; 91 fms.

New to the Indian fauna.

61. *Arctus rubens*, n. sp.

Close to *A. vittensis*, Dana.

Carapace slightly longer than broad: its surface, as in *A. tuberculatus*, Sp. Bte., is ornamented with squamiform granules which are especially numerous on the prominent median carina, and are especially large and numerous on the branchial regions laterally. The lateral dorsal carinae are very prominent anteriorly, where they overhang the orbit as large spines: the antero-lateral spines of the carapace are also very prominent.

The posterior border of the carapace, like that of each of the first three abdominal terga, is deeply excised in the middle line.

The sternum is traversed, fore and aft, by a row of sharp tubercles—one on each somite—which together form a regularly interrupted carina.

The second to fifth abdominal terga are sharply carinated, the carina in the case of the second and third bifurcating behind, and in the

case of the fourth and fifth being produced over the succeeding tergum to form a blunt spine. The sides and lateral margins of the terga, like the posterior borders of the pleuræ, are irregularly lobulate or crenulate. The second joint of the antennæ is deeply sculptured above, being traversed obliquely by *two* equally strong and salient ribs: its free margins are sharply serrate. The fourth joint of the antennæ has its antero-lateral margin 7-digitate.

The external maxillipeds, and the trunk-legs, are much stouter than in any other Indian species.

A single female from the Gulf of Manar, Station 151; 142 to 400 fms.

Colour in life, light rose madder above, white below.

### Family **Palinuridæ**.

#### PANULIBUS, Gray.

#### 62. *Panulirus angulatus*, Sp. Bte.

Spence Bate, 'Challenger' *Macrura*, p. 81, pl. xi, figs. 2, 3, 4.

Numerous fine specimens from the Gulf of Manar, Station 150; 142 to 400 fms.

New to the Indian fauna.

#### Tribe **ANOMALA**.

#### Families **Paguridæ** and **Parapaguridæ**.

Our collections in these families are the largest ever made by the 'Investigator' in a single season, and we have been fortunate enough to secure the co-operation of Professor J. R. Henderson in working them out. Professor Henderson's Report will be published separately.

### Family **Galatheidæ**.

#### MUNIDA, Leach.

#### 63. *Munida squamosa*, Hndrsn., var. *prolixa*, Alcock.

Alcock, *Ann. Mag. Nat. Hist.*, April, 1894, p. 322.

A number of fine specimens, of both sexes, from the Gulf of Manar, Station 151; 142 to 400 fms.

#### MUNIDOPSIS, Whiteaves.

#### 64. *Munidopsis stylirostris*, Wood-Mason.

Wood-Mason, *Ann. Mag. Nat. Hist.*, Feb., 1891, p. 201; and Alcock, *op. cit.* April, 1894, p. 328.

Laccadive Sea, Station 177; 636 fms.

65. *Munidopsis dasypus*, Alcock.

Alcock, Ann. Mag. Nat. Hist., April, 1894, p. 329.

Laccadive Sea, Station 177; 636 fms.

66. *Munidopsis scobina*, Alcock.

Alcock, Ann. Mag. Nat. Hist., April, 1894, p. 330.

Bay of Bengal, Station 162; 145 to 250 fms.

Colours in life, white with orange-red markings.

67. *Munidopsis poseidonia*, n. sp.

The dorsal integument of body and appendages finely scabrous beneath the usual pubescence.

The rostrum, which is about one-third the length of the carapace proper, is convexly laminar, carinated, and trifid at tip.

The carapace is elliptical, convex, and traversed fore-and-aft by a median multispinate ridge,—many of the spines being bifid and trifid: the frontal margin is convex and bears two spines, one above the base of either antenna, while just below the frontal margin, between the antenna and the eye, is a spine nearly as long as the eye: the lateral margins in front of the cervical groove are sharply quadridentate—the anterior of the four spines having a second spine to its inner side, while behind the cervical groove they are multispinate: the posterior margin, like the front edge of the second and third abdominal terga, is multispinate: in addition to the spines already noticed there is a pair of large spines on the gastric region, and there are some small spinules on the after margin of the cervical groove.

The eye-stalks are not prolonged beyond the cornea, and are movable. The meropodite of the external maxillipeds has, on its inner edge near the proximal end, two large unciform spines, and, at the distal end of its outer edge, another large spine. The chelipeds slightly exceed the fully extended body in length, and are slender: the ischiopodite has two distal spinelets, one above, the other below: the meropodite has three series of thornlike spines along its upper and inner surface: the carpopodite has a distal ring of spines, and a row of spinules along its inner edge: the hand is smooth, the fingers being about three-fourths the length of the palm. The second to the fourth thoracic legs have the meropodite and carpopodite spiny along the front edge, and the dactyli, which are about half the length of the propodites, of the usual form.



Length of fully extended body 53·5 millim., of chelipeds 58 millim. Bay of Bengal, Station 163; 210 fms.

This species is nearest related to *Munidopsis scobina*.

68. *Munidopsis trifida*, Hndrsn.

Henderson, 'Challenger' Anomura, p. 156, pl. xvi., fig. 2.

We identify with this species a single female specimen from the Laccadive Sea, Station 177; 636 fms.

New to the Indian fauna.

[69. *Munidopsis trisana*, n. sp.

Closely resembles *M. trifida*, Henderson, from which it differs in the following particulars:—The middle tooth of the trifid rostrum is relatively longer: there is a large spine on the cardiac region: the front edges of the second to fourth abdominal terga are armed in the middle line, the second with a large hook-shaped spine, the third and fourth with a pair of spines: the chelipeds are much less spiny, the hand being quite smooth, and the carpus having only a pair of distal spines: the carpopodites of the second to fourth legs have only a single spine, terminal in position, on the front border.

Length of fully extended body 23 millim; of chelipeds 19·5 millim. Andaman Sea, 240 to 375 fms.

This small species was dredged several years ago, but was never described or named. We introduce it here as we wish to complete our account with a 'key' to the Indian species of the genus.]

70. *Munidopsis regia*, n. sp.

The entire dorsal surface both of body and of appendages is covered with a remarkably thick velvety down.

The rostrum, which is half the length of the carapace proper, is moderately broad, convex, carinated, and armed in its anterior half with a single pair of strong divergent spines.

The carapace is strongly semi-elliptical, and strongly convex, and is traversed fore and aft in the middle line by a raised row of coarse spines—of which three are in the gastric region, one in the procardium and one in the postcardium—in addition to a pair of large spines, disposed transversely, in the front part of the gastric region: the frontal margin is convex, and is armed with two spines, one above the antenna on each side, while below the frontal margin a large spine is interposed

between the eye and the antenna: the lateral margins are deeply trilobed in front of the cervical groove, each lobe culminating in a spine, while behind the cervical groove is a row of three smaller and successively decreasing spines: the posterior border is broadly raised and multispinate.

Of the abdominal terga the second has, in the middle line, on the front edge, one strong tooth, while the third and fourth have in the same situation a pair.

The eye-stalks are freely movable, and are not prolonged beyond their cornea. The thoracic appendages have many long setæ in addition to the general investment of down. The external maxillipeds have the meropodite armed, on the inner border, near the proximal end, with two very large unciform spines, and, on the outer border, distally, with a strong spine. The chelipeds are considerably longer than the fully-extended body, but are stout: the ischiopodite has two distal spines, one above, the other below: the meropodite has three series of strong spines along its inner and upper surface: the carpopodite has a distal ring of teeth, and a few sharp tubercles on its upper and outer surface: the hand is unarmed, the fingers being about two-thirds the length of the palm. The second to fourth thoracic legs have the meropodite and carpopodite spiny: in all the dactylus is remarkably long (about two-thirds the length of the propodite) and remarkably hairy on both edges, the posterior edge also being multispinate. The telson, which, as is usual in this genus, appears quite plainly to consist of a somite and incompletely fused appendages, has its postero-lateral angles remarkably thickened and recurved, and its lateral borders thickly clothed with setæ of a peculiarly firm consistence and of a dark colour.

Colour in life, chalky pink.

Gulf of Manár, Station 151; 142 to 400 fms.

This is a large species, the measurements of the single specimen being as follows:—

Length of fully extended body from tip of rostrum to end of telson 111 millim. Length, from tip of chelipeds to end of telson 205 millim.

#### 71. *Munidepsis trachypus*, n. sp.

Near *M. scabra*, Faxon.

Carapace and appendages everywhere closely, sharply, and evenly spinate.

The rostrum, which is about one-third the length of the carapace, is broadly lamellar and trilid, is finely serrated at the sides, and is

traversed by a finely serrated carina that extends uninterruptedly to the cervical groove.

The carapace is markedly convex and semi-elliptical: the frontal margin is strongly convex and is armed with two spines, one above the base of the antenna on each side: the lateral margins are multiserrate: the posterior margin is raised, and, like the rest of the carapace, is sharply and evenly granular: all the regions of the carapace are well delimited.

The abdominal terga are smooth, the telson alone, like the outer halves of the caudal swimmerets, being finely granular.

The eyes are movable, and the eye-stalks are not prolonged beyond their cornea: there is a considerable interval between them and the antenna, but no spine.

The antennal peduncles are remarkably slender, and are not longer than the eyes (which are not half the length of the rostrum): the flagella appear to have been not longer than the carapace. The external maxillipeds are small and slender: the meropodite has two large unci-form spines (the proximal one slightly bicuspid) on the inner edge near the base, and a large terminal spine on the outer edge.

The chelipeds are remarkably long and slender, being, even in the female, nearly twice the length of the fully extended body: they are closely thorny, on every surface, up to the base of the fingers: the palm is more than three times the length of the fingers. The longest of the second to fourth thoracic legs is not much more than half the length of the chelipeds: all are densely spiny up to the remarkably short dactyli, which are hardly one-fourth the length of the propodites: a spine at the distal end of the meropodite is pre-eminent in all.

Length of fully extended body 54 millim., of chelipeds 100 millim. Colours in life, pale salmon.

Laccadive Sea, Station 177; 636 fms.

[72. *Munidopsis centrina*, n. sp.

Belongs to the group *Munidopsis abbreviata*, A. M.-E., *M. brevimana*, Hudsrsn., *M. ciliata*, W.-M., and *M. vicina*, Faxon.

The carapace and appendages are remarkably acutely spinose, besides bearing many long coarse stiff setæ.

The carapace is strongly semi-elliptical, and is about three times the length of the depressed, acute, simple, carinated, rostrum. The strongly convex frontal margin bears four spines, a large one above the antenna on each side, and a smaller one between and behind this and the

antero-lateral spine: the lateral margins are broken by 5 large spines, 3 of which are in the hepatic, and 2 in the branchial region: the posterior margin is raised but smooth: on the gastric region are two transverse rows of spines, four in each row, those of the middle pair of the front row being about two-thirds the length of the rostrum.

The abdominal terga are unarmed, but deeply cross-grooved.

The eye-stalks are short and immobile: their lower, their outer, and their inner border are all prolonged as spines beyond the cornea, the inner spine being more than half the length of the rostrum. The spires of the antennulary and antennary peduncles are of remarkable size. The meropodite of the external maxillipeds is faintly three-toothed along the inner edge. The chelipeds are rather shorter than the ambulatory legs: they are acutely spiny up to the hand, which has only the inner edge of the inflated palm slightly spinate: the fingers are very short and very broad. The 2nd to 4th legs are acutely spinate in every joint except the dactylus, which however has the usual dentations on its posterior margin.

Length of fully extended body 39 millim., of chelipeds 26.5 millim. Bay of Bengal, 1520 fathoms.

This species was obtained several years ago, but has never been described or named: we introduce it here to complete our survey of the genus in Indian waters.]

[73. *Munidopsis pilosa*, Hndrsn.

Henderson, 'Challenger' Anomura, p. 187; pl. xvii., fig. 5.

This species was dredged in the Andaman Sea, 480 fms., some years ago, and is now recorded as new to the Indian fauna.]

[74. *Munidopsis aristina*, n. sp.

Belongs to the *Munidopsis abbreviata* and *brevimana* group, but is distinguished from all its congeners by its enormous up-curved spiny *Heterocarpus*-like rostrum.

Carapace semi-elliptical. The rostrum, which is acutely styliform and strongly up-curved, is equal in length to the carapace, its tip reaching almost to the end of the fully extended chelipeds: its sides are acutely but unsymmetrically spinate.

The convex frontal margin is unarmed, except for the antero-lateral spine: the lateral margins besides this spine are armed with a second spine in the hepatic region, and a third in the branchial: the posterior margin is strongly spinate: on the gastric region are two pairs of

spines—a large pair in front, and a small inconspicuous pair behind: on the cardiac region also is a pair of small spines.

The abdominal terga are unarmed.

The eye-stalks, which are slightly mobile, are prolonged internally beyond the cornea to form a spine. The meropodite of the external maxillipeds has its inner edge faintly serrated. The chelipeds are rather shorter than the ambulatory legs, and have short broad hands. The 2nd–4th legs have dactyli of the usual form.

Length of fully extended body 27.5 millim., of chelipeds 15 millim. Bay of Bengal, 1,520 fms.]

75. *Munidopsis unguifera*, n. sp.

Distinguished from all its Indian congeners by the form of the dactyli of the 2nd–4th legs, which are long and talon-like, having the posterior edge sharp and entire.

The carapace is quadrangular, its surface is coarsely granular, and it is traversed fore and aft by a median carina which is surmounted by a few coarse spines: the frontal margin is hardly convex and is quite unarmed, although below it, and between the eye and the antenna, is a spine: the parallel lateral margins are acutely bilobed in front of the cervical groove, while behind it they are denticulated: the posterior margin is multi-spinate: there is a pair of coarse spines on the gastric region.

The rostrum, which is about one-third the length of the carapace proper, is depressed, acute, carinated, and simple.

The abdominal terga are unarmed.

The eye-stalks are movable: the inner margin forms a small papilla upon the summit of the cornea. The meropodite of the external maxillipeds has three small teeth on its inner edge. The chelipeds in both sexes are equal to the fully extended body, and are longer and stouter than the other legs: they are unarmed, except for a pair of small spines at the distal end of the meropodite: the fingers are not much shorter than the palm, and have the cutting edges dentate only near the distal end. The 2nd–4th legs have the posterior border of the meropodite serrated: in all the dactyli are remarkable for their great length—two-thirds that of the propodites, or more—for their long acute points, and for the sharp blade-like posterior edges.

This is a small species, ovigerous females measuring not more than 25 millim.

Colour, salmon-red to chestnut-brown.

Bay of Bengal, Station 162: 145 to 250 fms.

Key to the Indian Species of the genus *MUNIDOPSIS*.

A. Dactylopedites of the second, third, and fourth pairs of thoracic legs remarkably long, two-thirds the length of the propodites, or more—with the posterior edge sharp and entire ..... *M. unguifera*.

I. Chelipeds in both sexes always much longer than the other legs, with long slender hands; eye-stalks freely movable, and without any spiniform prolongation beyond the cornea; meropodite of the external maxilliped with two large unciniform spines on the inner edge.

[Species found between 200 and 750 fms.]

B. Dactylopedites of the 2nd, 3rd and 4th pairs of thoracic legs not remarkably long, not nearly two-thirds the length of their propodites, and having their posterior edge strongly serrated and multi-spinate.

II. Chelipeds shorter than the other legs, with short squat hands; eye-stalks fixed, or hardly mobile, and forming spiniform prolongations beyond the cornea; meropodite of the external maxilliped with only faint serrations along the inner edge.

[Species, with the single exception of *M. pilosa*, found between 1,200 and 1,800 fms.]

i. Rostrum trifid, carinated; carapace more or less elliptical, convex.

ii. Rostrum simple and styliform; carapace usually quadrangular and flat.

i. Rostrum styliform, as long as the carapace, and spiny; posterior border of the carapace armed with several large spines ..... *M. arctica*.

1. Posterior border of carapace not armed with large spines; carapace not, or incompletely, carinated.

a. Chelipeds even in the female nearly twice the length of the fully extended body; dactylopedites of the 1st—4th thoracic legs hardly one-fourth the length of their propodites.....*M. trachypus*.

b. Chelipeds about equal to the body in length; dactylopedites of the 1st—4th thoracic legs about half the length of their propodites.

2. Posterior border of carapace armed with large spines; carapace traversed from end to end by a median longitudinal spiny carina.

a. Postero-external angles of telson greatly thickened and recurved, forming on each side a stout hook.....*M. regia*.

b. Telson of typical form; carapace very distinctly carinated.....*M. poseidonica*.

1. Carapace rather broader behind than in front, laterally multispinate, traversed from end to end by a median longitudinal spiny carina ..... *M. scobina*.

2. Carapace quadrangular, non-carinate, non-spinate, quite flat; lateral margins with only one or two spines.

a. A single (antero-lateral) spine on the side of the carapace; posterior border of carapace unarmed.....*M. styliretris*.

b. Two or three spines near the antero-external angles of the carapace; posterior border of carapace armed with strong teeth..... *M. dasyops*.

1. Surface of carapace non-spiniferous; lateral margins of carapace with only one or two spines .....*M. pilosa*.

2. Gastric region at the least spiniferous; lateral margins of carapace multispinate.

a. Eye-stalks with only the inner border prolonged beyond the cornea to form a spine; fingers of chelipeds longer than the palm.....*M. subequanota*.

b. Eye-stalks with inner, outer, and lower borders all three forming spines; fingers of chelipeds shorter than the palm.

1b. Only a pair of gastric spines; four spines on lateral border of carapace; propodite of thoracic legs non-spiniferous; only the internal ocular spine conspicuous, *M. ciliata*.

2b. Two transverse rows of gastric spines; six or seven spines on lateral border of carapace; propodites of thoracic legs acutely spiniferous; cornea hidden by three large ocular spines. *M. centriscia*.

## GALACANTHA, A. Milne-Edwards.

76. *Galacantha areolata*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., Feb., 1891, p. 200.

The free end of the horizontal portion of the rostrum is not always minutely bifid, being sometimes minutely multidentate.

Laccadive Sea, Station 176; 1,070 fms.

The Indian Museum now possesses perfect specimens of both sexes.

77. *Galacantha investigatoris*, n. sp.

Closely allied to *G. bella*, Henderson, from which it differs in the following particulars:—

The carapace and appendages are very much more closely scabrous, being everywhere covered with small sharp granulations in close contact, and the spines at the antero-lateral angles are much longer and more acute: the horizontal portion of the rostrum is so strongly bifid, that, when viewed from above, the rostrum appears trifid: all the abdominal terga and pleuræ, with the sole exception of the concealed first tergum, are closely and sharply granular: the fingers, though longer than the palm, are relatively shorter than in the Challenger species, and have the cutting edges quite straight: the dactyli of the 2nd—4th thoracic legs have the posterior edge 15 to 17-dentate.

Colours in life, body and corneæ milky orange: in spirit, white with an uniform dull blue-black suffusion.

Length of fully extended body 56 millim; of chelipeds, 36 millim.

Laccadive Sea, Station 127; 1,200 fms.

78. *UROPTYCHUS* (A. Milne-Edw.), Henderson.*Uroptychus nitidus*, A. Milne-Edwards.

A. Milne-Edwards, Bull. Mus. Comp. Zool., Vol. viii., 1880, p. 62; and Henderson, 'Challenger' Anomura, p. 174, pl. xxi., fig. 6.

Laccadive Sea, Station 177; 636 fms.

Colours in life, uniform bright pink.

New to the Indian fauna.

## [BATHYANKYRISTES, n. g.

As *Munidopsis*, but with the trunk-legs, from the 2nd to the 4th, increasingly subcheliform in order of succession, the 4th pair being almost perfect subchelæ; and with the true third joint (the apparent second) of the antennal peduncle furnished at the antero-external angle with an unusually large spine.

79. *Bathyankestrytes spinosus*, n. sp. Pl. IX. fig. 2.

Carapace broad, depressed, rather broader behind than in front, but not at all elliptical in shape: its surface pilose, and transversely rugose, especially on the branchial regions, but not spinate. The rostrum, which is more than half the length of the carapace, is stoutly styliform, upturned, and very acute. The frontal margin of the carapace is slightly excavated above the eye (somewhat as in *Aeglea*), and almost transverse; it is unarmed, but a little ventrad of it, between the eye and the antenna, is a stout spine: the lateral margins of the carapace are deeply bilobed in front of the cervical groove, each lobe ending in an acute spine, and a third smaller spine occurs immediately behind the cervical groove: the posterior border is broadly moulded, and unarmed. The abdominal terga are perfectly smooth beneath a close fine pubescence, and ungrooved.

The eyes are unpigmented: the eyestalks are not prolonged beyond the cornea. The antennules are exactly as in *Munidopsis*, the basal joint being inflated and strongly spinate. All the joints of the antennal peduncle are strongly spinate, the spine at the antero-external angle of the true third joint being of significantly large size. The mouth-parts resemble closely those of *Munidopsis*, the exopodite of the 1st or anterior maxillipeds being without a flagellum. The external maxillipeds also are much as in *Munidopsis*: the antero-external angles both of ischiopodite and of meropodite are strongly spiniform, as is also the antero-inferior angle of the ischiopodite: near the middle of the inner border of the meropodite is a single strong spine. The trunk-legs are stout and densely hairy. The chelipeds are longer than the other legs, but shorter than the fully extended body: the ischiopodite has the inner border serrulate up to a distal terminal spine, and has also a distal tooth superiorly: the meropodite is strongly and acutely spiny along its upper and inner, and the carpopodite along its inner side, both of these joints having a distal ring of spines: the hand, which is a little longer than the fingers, has a few spinules along the inner border: the fingers are finely and evenly toothed, and excavated ventrally, just as in *Munidopsis*. The 2nd—4th legs have the meropodite and carpopodite strongly spiniferous anteriorly: in all, but especially in the fourth, the propodite is enlarged at its distal end and there has its posterior border produced to form a compressed dentigerous tubercle, against which the basal portion of the dactylus can be flexed to form a sub-chela: in the second pair of legs the tubercle carries two or three teeth, in the third pair five or six, and in the fourth pair, which are almost typical sub-chelae, six or



seven: the dactyli are stout, and are minutely serrated only in that part of their posterior border which is opposed to the tubercle on the propodite. The fifth pair of trunk-legs is of the ordinary Galatheid form.

In the female the 2nd—5th pairs of (uniramous) abdominal appendages are present, increasing in size from before backwards. The telson and caudal swimmerets resemble those of *Munidopsis*, etc.

Length of fully-extended body 70 millim., of chelipeds 59 millim.  
Andaman Sea, off Ross Island, 265 fms.]

80. *Bathyanhyristes levis*, n. sp.

Closely resembles the preceding species, from which it differs only in the following particulars:—The rostrum is broader and more depressed, and is only half the length of the carapace: the cornua is relatively much larger—no part of the eye-stalk being visible from above: the chelipeds are much less spiny: the 2nd—4th pairs of trunk-legs have the meropodite and carpopodite quite unarmed, except for a distal spine above and below: the abdominal terga are in closer contact.

In the male the 1st and 2nd pairs of abdominal appendages resemble those of *Munidopsis*, and the 3rd—5th pairs, as in *Munidopsis*, are minute rudiments.

Length 29 millim: of chelipeds 27 millim.  
Laccadive Sea, Station 177; 636 fms.

Sub-Order BRACHYURA.

Tribe ANOMOLA.

Family Raninidæ.

LYREIDUS, de Haan.

81. *Lyreidus gracilis*, Wood-Mason.

Wood-Mason, J. A. S. B., Vol. LVI., pt. ii, 1887, p. 376.

Gulf of Manár, Station 151, 142–400 fms.

Family Dromidæ.

DROMIDIA, Stimpson.

82. *Dromidia Kendallii*, n. sp.

Carapace globular, covered, like the appendages, with a dense fine short yellowish fur.

The rostrum is deeply bifid, and is without any trace of a median tooth: the margins of the two teeth are strongly deflexed, and pass backwards to traverse obliquely the roof of the orbits as a prominent ridge, the point where they meet the upper margin of the orbit being

marked by a distinct notch: the orbit is thus imperfectly sub-divided into two chambers, an inner lodging the root of the eye-stalks, and an outer into which the eye can be reflexed, much recalling the mode of formation of the orbit in *Homola*. The inferior orbital tooth is small and inconspicuous.

The convex antero-lateral margin of the carapace bears a few small distant granules, arranged in two sets separated by a slight indentation which probably corresponds to the anterior division of the cervical groove, but only the last granule of the front set is at all conspicuous: the equally convex postero-lateral margin is, like the branchiostegal region, very finely granular. The cervical groove, though not deep, is conspicuous: it traverses the lateral wall of the carapace to end at the antennal fossa, enclosing between itself and the antero-lateral border of the carapace two oval bosses: the pterygostemian region internal to the groove is the most coarsely granular portion of the carapace.

The sternal sulci unite opposite the base of the chelipeds.

The convexity of the cornea is markedly deficient in pigment. The antennal flagellum is unusually long. The efferent branchial opening is remarkably patulous. The trunk-legs, in form and proportion, much resemble those of *D. rumphii*. In the chelipeds the meropodite has the edges finely and sharply granular, the granules encroaching slightly on the neighbouring surfaces; the carpus has the upper and outer surfaces finely granular, the granules being disposed in longitudinal lines; the hand is finely and distantly granular; and the fingers are very indistinctly dentate except at the tips.

Length of carapace 18 millim., breadth 19 millim.

Bay of Bengal, Station 159; 112 fms.

#### Family **Homolidae**.

##### *HOMOLA*, Leach.

#### 83. *Homola megalops*, Alcock.

Alcock, Ann. Mag. Nat. Hist., May, 1894, p. 408.

Gulf of Manár, Station 151; 142-400 fms.; and Bay of Bengal, Station 162; 145-250 fms.

#### Tribe **OXYSTOMATA**.

#### Family **Dorippidae**.

##### *ETHUSA*, Roux.

#### 84. *Ethusa indica*, Alcock.

Alcock, Ann. Mag. Nat. Hist., May, 1894, p. 405.

This species, first dredged in the Bay of Bengal, at 240 fms., now appears in the Laccadive Sea, Station 145; 600 fms., and in the Gulf of Manár, Station 151; 142-400 fms.

## ETHUSINA, Smith.

85. *Ethusina gracilipes*, Miers.

Miers, 'Challenger' Brachyura, p. 832, pl. xviii., fig. 3.

This species, dredged by the 'Challenger' in the Arafura Sea and neighbouring basins of the Eastern Archipelago at 700–1,425 fms., is now found in the Laccadive Sea, Station 127; 1,200 fms.

Its colour in life was milk-white, with the tips of the legs faint pink.

## Family Leucosidae.

## RANDALLIA, Stimpson.

86. *Randallia coronata*, n. sp.

Carapace globular, finely and closely granular beneath a dense pubescence. Besides granules there are numerous conical tubercles of nearly uniform, rather large, size,—one bordering upon the hepatic and pterygostomian regions, five on the branchial region, two rather larger than the others on the posterior border, one near the after limit of the gastric region, and two close together in the centre of the extremely well-defined cardiac region: a majority of these tubercles is disposed with such regularity and symmetry as to form a crown round the gastric region.

For the rest, the species very closely resembles Stimpson's type (Boston Journal of Natural History, Vol. VI., 1850–1857, p. 471, pl. xx., fig. 3), except that the front is much less produced, and that the chelipeds are much more finely granular.

Length of carapace 16 millim., breadth 17 millim.; length of cheliped 23 millim.

Bay of Bengal, Station 159; 112 fms.

## PARILIA, Wood-Mason.

87. *Parilia Alcocki*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., March, 1891, p. 264; and Ill. Zool., 'Investigator,' pl. v., figs. 3, 3a.

This species was taken at almost every haul in the Bay between 91 and 250 fms.

The figure (fig. 3) in the 'Illustrations,' gives a very inadequate idea of this fine species.

## Family Calappidae.

## CALAPPA, Fabr.

88. *Culappa exanthematos*, n. sp.

Carapace oval, remarkably inflated, especially in the branchial regions which are marked off from the gastro-cardiac regions by a par-

ticularly deep furrow: its length is about two-thirds its greatest breadth immediately in front of the lateral shields: its surface in the posterior half, except for a few marginal granules, is smooth, but in the anterior half is covered with numerous large smooth isolated mammillary tubercles, which by their colouration (red base and shining yellow apex) exactly resemble ripe small-pox pustules. In the posterior half of the carapace the place of these well-defined "pustules" is taken by equally well-defined round or oval slightly-raised red patches, which exactly resemble the "papules" of the earlier stage of small-pox.

The front is rather broad for *Galappa*, and is excavated, as usual, so as to appear bilobed. The arch of the antero-lateral margin is anteriorly faintly and irregularly orenulate, but posteriorly is bluntly dentate. The clypeiform expansions of the postero-lateral margins are little developed—hardly breaking the general curve—and are armed each with seven or eight teeth, all of which have a bluntly serrated edge. The posterior margin proper—that part, namely, which is co-extensive with the first abdominal segment—is finely beaded.

The abdomen resembles that of other species of the genus, being narrow in both sexes, and the 3rd—5th segments in the male being fused, though distinctly recognizable.

The eyes and orbits, the antennules, and the antennæ, conform to type; but the external maxillipeds are even less operculiform than usual in the male sex. The chelipeds have the usual form: the transverse crest of the merus, which meets the lateral shield of the carapace at an angle very much wider than a right angle, is well marked, and is quadricuspid: the carpus and the palm, on their outer aspect, are marked with "pustules" similar to those on the anterior part of the carapace: the whole antero-inferior surface of the hand is closely covered with bead-like granules: the crest of the palm is sexcuspid: the fingers have the usual dissimilarity, those of the right side being coarser, and less mobile; those of the left side being slenderer, more finely and evenly toothed, and more mobile.

The second pair of abdominal appendages, in the male, are long and vermiform, and are enclosed each in a tube formed by the inrolling of the parts of the first pair.

Two males—the largest measuring 116 millim. across the carapace proper, and 126 millim. across the arch formed by the adducted chelipeds—from Stations 159 and 170; 112 and 107 fms. respectively: and three small females from Station 169; 91 fms.

This species is remarkable among its congeners, not only from the unusual depth of its habitat, but also for its great size and remarkable colouration.

**MURZIA, Desm.****89. *Murzia bicristimana*, n. sp.**

This species bears a general resemblance to *Murzia armata*, de Haan, but differs in the following particulars:—

The carapace is relatively wider, the lateral spines shorter and slenderer: the granular prominences on the upper surface form seven distinct rows, the most external row losing itself on the antero-superior surface of the lateral spine, the other rows occupying the same position as in *M. armata*. The rostrum ends in three teeth, the middle one of which is sharp and prominent, the lateral ones being more obtuse than in *M. armata*. The antero-lateral margins are armed with eleven denticles, the last of which is very small. The postero-lateral margins are slightly cristiform and microscopically granular. The posterior margin is faintly trilobed, the median lobe being hardly distinct, and the lateral lobes being mere papillæ, and not spines as in *M. armata*. The hands, in addition to the high dentate crest of the upper margin, are longitudinally traversed at the lower limit of their outer surface by a sharp crest, the edge of which is unevenly trilobed, the proximal lobe being short acute and spiniform, the middle lobe being broad and obtuse, and the distal lobe being narrow and obtuse: the lower edge of the hand is finely, closely, and sharply serrate: the meropodite of the chelipeds bears two spines at its distal end, the outer of which is about three times the length of the inner.

Colour in life, salmon pink.

Length of carapace 21 millim., breadth, from tip to tip of lateral spines, 41 millim.

Gulf of Manâr, Station 151; 142–400 fms.

Tribe **CATOMETOPA.**

Family **Gonoplacidæ.**

The crab that we have now to describe is the most singular and interesting form in the whole collection.

At first sight, from its general shape, from its elongate third pair of trunk-legs and its almost rudimentary notopodal fifth pair, from its extremely incomplete orbits, from the absence of antennular fossæ, and from the curiously small and slender external maxillipeds, Homolid affinities are suggested; but that our species has nothing to do with the *Homolidae* is shown: (1) by the position of the openings of the oviducts, which is typically canceroid; (2) by the form and position of the openings of the efferent ducts of the male, which are typically Catometopan; and (3) by the number and disposition of the branchiæ, of which there are only six on each side.

In the number and arrangement of the branchia, as well as in the position and degenerate form of the fifth pair of legs, it might be supposed, from a verbal acquaintance with the animal, that it had affinities with the *Dorippidae* (*Dorippe* and *Ethusa* more especially). That this is not the case is shown (1) by the position, above indicated, of the genital openings of the male; (2) by the great broad buccal orifice, which is only very partially covered by the maxillipeds; (3) by the form of the carapace, which is broad, and completely covers the thorax; (4) by the form of the antennules, which are not obliquely or almost vertically folded in distinct fossæ as they are in *Ethusa* and *Dorippe*; and (5) by the form of the sternal plastron, which in our new form is a broad pentagonal plate as in many Ocyrodoids.

Although not nearly related, then, to the typical Dorippid, it certainly has considerable affinities with one of the forms generally ranked with *Dorippe*, namely, with *Cymopolia*.

It resembles *Cymopolia* (1) somewhat in general form, and (2) in the fact that the maxillipeds are small and do not nearly cover the orifice of the large squarish buccal cavity; but it differs from *Cymopolia* (1) in the incompleteness of the orbits and antennular fossæ, and (2) in having the front narrow and deflexed.

Its resemblance to *Cymopolia*, however, is chiefly of interest as indicating the proper position of *Cymopolia* itself; for this new *Cymopolia*-like form of ours, for which we propose the name of *Archaeoplax*, is quite clearly related to the "*Gonoplaciens*" among the Catometopa, in which section its nearer affinities are, perhaps, with the *Macrophthalmines*, as we hope the following description will show.

#### ARCHAEOPLAX, n. gen.

Carapace transverse, greatly depressed, with the front very narrow, and declivous, yet forming a distinct rostrum (*i.e.*, its front border is not fused with the epistome, but is free). Abdomen in both sexes narrow, not nearly co-extensive in breadth with the sternum between the penultimate pair of trunk-legs. Orbits and antennular fossæ very imperfect (hardly more perfect than in *Homola*). Eye-stalks long, slender, tapering: eyes small. Antennules well developed, transversely folded on the inflated basal joint, which is free and exposed from its origin. Antennal peduncles arising below the orbit, and external to, and in the same plane with, the antennules: the flagella long. Buccal opening much wider in front than behind, not nearly covered by the short slender external maxillipeds: efferent branchial channels produced and patulous: epistome linear: the carpopodite of the external maxillipeds articulates with the apex of the narrow meropodite.

Chelipeds unequal in the male, sub-equal in the female: second, third, and fourth pairs of trunk-legs long and slender (the third pair the longest), with long sabre-shaped dactyli. *Fifth pair of trunk-legs reduced to feather-like rudiments, arising close together, high up, almost on the back.* Genital ducts of the male opening at a distinct tubercle on the base of the fifth pair of legs, the tubercle being embedded in a notch in the posterior border of the sternum.

90. *Archaeoplax notopus*, n. sp., Pl. IX., figs. 3, 3a, 3b.

Carapace extremely flat and depressed, transversely oval, with the anterior and antero-lateral margins broadly excised; its surface punctate beneath a shaggy reddish fur.

The front proper is extremely narrow—about one-fourteenth the greatest breadth of the carapace—and is deflexed with the tip free and horizontal, the tip also being slightly expanded and bilobed just as in *Macrophthalmus*.

The anterior border of the carapace, which is half the greatest width of the carapace, is concave on either side of the front, each concavity being interrupted near the middle by a small projection: the antero-lateral borders are very short, are broadly excised or concave, and are rather acutely produced at their junction with the anterior margin: the postero-lateral borders, which constitute four-fifths or more of the lateral extent of the carapace, are convex, and form a small lateral spine at their much-advanced junction with the antero-lateral borders: the posterior border is raised and gently convex. The inflated branchial regions are fairly well delimited from the gastro-cardiac regions.

Two remarkable almost straight sutures, unlike anything known to us, cross the carapace from side to side: the anterior at the level of the junction of the antero-lateral with the postero-lateral borders, the posterior at the middle of the cardiac region. These sutures are remarkably distinct, equally from the exterior and from the interior of the carapace: their exact relations will be described presently.

The branchiostegal and pterygostomial regions form nearly a right angle with the dorsal surface of the carapace, and the pterygostomial region has a wide oblique fold or groove leading to the afferent branchial orifice. The sternum is widely pentagonal.

The orbits are remarkably incomplete, their inferior border being formed only by a large acute lamelliform spine and by the basal joint of the antennule.

The eye-stalks are long (their length being contained 6 or 7 times in the greatest breadth of the carapace), slender, tapering, and slightly bent: the eyes are small and hemispherical.

The antennules have the basal joint hugely inflated, globular, quite free and exposed from its origin, and freely mobile: the second and third joints, which are long and slender, fold transversely on the base of the first.

The antennæ arise just below the infra-orbital spine, and outside and in the same line with, the antennules: their flagellum is half the length of the carapace.

The buccal cavity is considerably wider in front than behind: the external maxillipeds are so small and slender as to leave completely exposed the mandibles, the wide endostome, and a part of the wide and produced efferent branchial channels.

The epistome is linear. The fourth joint of the external maxillipeds arises from the apex of the small oval third joint.

All the trunk legs are thickly fringed with a shaggy reddish hair.

The chelipeds are subequal in the female, but are unsymmetrical in the male: their length, half of which is formed by the hand, slightly exceeds the breadth of the carapace: both hands in the female, and the smaller hand in the male, are elongate compressed and sharp-edged; and have the fingers curved compressed acute, slightly excavated on the inside, and indistinctly dentate along the opposed edges: the larger hand of the male has the palm inflated.

Of the 2nd-4th trunk legs the 3rd pair is the longest, measuring rather more than twice the greatest breadth of the carapace: all are slender compressed and quite smooth, and all end in long sharp sabre-shaped dactyli.

The 5th pair of trunk legs is quite unique in form and disposition: they arise quite close to the middle line of the body and high up, almost on the back; they are short, being considerably less than the breadth of the carapace in length, and are very slender and flexible; and they are so thickly fringed with shaggy hairs as to appear like feathers.

The abdomen in the male consists of 5 separate pieces—the 3rd-5th segments being coalescent: its breadth opposite the penultimate pair of trunk-legs is about one-third that of the sternum at the same point. In the female the abdomen consists of 7 separate segments, and its breadth opposite the penultimate pair of trunk-legs is half that of the sternum at the same level. The genital openings in the female have the usual position on the sternum: in the male they are placed at the summit of a prominent tubercle situated at the antero-internal angle of the basal joint of the 5th pair of legs, the tubercle being embedded in a notch in the posterior border of the sternum.

The figure represents a life-size male, so that we do not give a



table of measurements. Colours, chestnut-brown, carapace lighter: eggs scarlet.

Bay of Bengal, at almost all stations off the Coromandel Coast, from 14° southwards, between 190 and 250 fms.

*The sutures on the carapace of Archæopliax notopus—*

The anterior of the two sutures above-mentioned crosses the carapace from side to side at the level of the junction of the antero-lateral and postero-lateral borders. In front of it the carapace is declivous. Upon the sides of the carapace this suture is continued downwards and forwards to meet the epimeral suture—here somewhat creased and indefinite—in which it is lost.

The posterior of the two sutures crosses the carapace from side to side, parallel with the first, passing through the middle of the cardiac region. It is lost in a dimple high up on the branchiostegal region.

What these sutures mean we hardly venture to surmise. They are far too conspicuous—being as plainly visible on the interior of the carapace as they are on the exterior—to be mere adventitious markings. If, as is possible, they indicate lines of fusion of segments, then they do not support the classical explanation of the formation of the entire Brachyuran carapace out of the antennary and mandibular segments, since the epimeral suture is also present, as well as a double posterior border.

**Family Ocypodidae.**

**PROPHETICUS, Wood-Mason.**

91. *Psopheticus stridulans*, Wood-Mason.

Wood-Mason, Illustrations of the Zoology of H. M. I. M. S. 'Investigator,' Crustacea, part i. pl. v. fig. 1., and Alcock, Annals and Magazine of Natural History Ser. 6, Vol. xiii, May, 1894, p. 402.

Gulf of Manár, Station 151; 142–400 fms.

**Tribe CYCLOMETOPA.**

**Family Cancridae.**

**NECTOPANOPE, Wood-Mason.**

92. *Nectopanops longipes*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., March, 1892, p. 262.

Laccadive Sea, Station 177; 636 fms.

**XANTHODES, Dana.**

93. *Xanthodes microps*, n. sp.

Very closely allied to *Xanthodes pachyductylus*, A. Milne-Edwards (Nouv. Archiv. du Mus., 1873, p. 201, pl. vi., fig. 4), from which it ap-