The merus of the external maxillipeds is not twice as large as the ischium, and the sculpturing consists of a single loop parallel with the outer border of the merus, the inner half of that joint being quite smooth.

Fingers more than twice as long as the palm. In the last pair of legs the dactylus is about twice as long as the propodite: in all the other legs the dactyli are very little longer than the propodites.

In other respects this species agrees with *D. affinis*.

In the Indian Museum are 15 specimens from Mergui. The carapace is 4 millim. long and a little over 4 millim. broad.

60. *Dotilla Blanfordi*, n. sp.

The whole of the dorsal surface of the carapace is areolated and grooved (the areolæ being finely granular and the grooves smooth) as follows:—

A very distinct groove runs parallel with either lateral border, and a scarcely less distinct one runs parallel with the posterior border, and in the space bounded by these grooves a six-rayed star of grooves of nearly equal length can be made out. This "star" is formed by a groove running fore and aft down the middle of the carapace and having, on either side of it, a semicircular chord joining the outer angle of the orbit with a point near the postero-lateral angle of the carapace. The intersection of these grooves cuts the post-gastric subregion into 4 symmetrical tubercles.

The whole side-wall of the carapace is finely granular, and the subhepatic and pterygostomian regions have the characteristic convoluted sculpture. The orbits are shallow but are perfect.

The external maxillipeds are finely granular; the merus is twice as big as the ischium, and its sculpture consists of a single loop parallel with the outer border and a single groove parallel with the inner border.

Chelipeds as in *D. affinis*, except that the fingers are a little longer than the palm.

Legs as in *D. affinis*, the meropodites being slender and all having a "tympanum," but in the last pair the dactylus is about twice as long as the propodite, and in the other pairs the dactyli are very slightly longer than the propodites. No sternal tympana.

In the Indian Museum are 4 specimens from the coast of Sind and Baluchistan. The carapace of the type is a little over 5 millim. long and not quite 7 millim. broad. Collected by Mr. W. T. Blanford, F.R.S.

61. *Dotilla elepsydrodactylus*, n. sp.

Near *D. Wichmanni*, de Man.

The sculpture of the dorsum of the carapace is like that of *D. Blanfordi*, only the grooves are much deeper cut and the groove between the post-gastric region and the postero-lateral angle of the carapace is double: the sculpture of the sidewall of the carapace is like that of *D. Blanfordi*.

In the external maxillipeds the merus is not twice as big as the ischium, and its sculpture consists of a single simple convolution parallel with the outer border, the inner half of its surface being quite smooth—as is *D. intermedia*.

The orbits are shallow but are quite perfect.

The chelipeds, measured all round their curve, are not twice the length of the carapace and have no spine on the arm. The fingers are much longer than the palm: *in the adult male they are extremely slender, and each has a large tooth arranged so that when the tips of the fingers are closely apposed these two teeth meet and leave an hour-glass-shaped space between the closed fingers.*

Legs a little longer than the chelipeds; their meropodites are slightly but distinctly dilated and all have a *tympanum*: their dactyli are all longer than their propodites, and in the last pair the dactylus is very long, slender, straight, and fluted. No sternal tympana.

Colours, speckled like the sand in which they live.

In the Indian Museum are eight specimens from False Point on the sea face of the Mahanaddi Delta. The carapace of the largest is 5 millim. long and 6 millim. broad.

62. *Dotilla brevitarsis*, de Man.

Dotilla brevitarsis, de Man, Journ. Linn. Soc., Zool., XXII. 1887–88, p. 130, pl. ix. figs. 1–3 (1888).

The whole carapace is grooved and areolated (but the sculpture is not very deep) as follows:—

A strong groove runs fore and aft down the middle of the carapace, another runs parallel with the posterior border, and on each side another takes a sinuous course along each lateral border: other short and rather indefinite grooves join the median and lateral grooves.

The subhepatic and pterygostomian regions have the usual convolated sculpture. Orbits shallow, but distinct.

The merus of the external maxillipeds is much larger than the ischium: its whole surface is sculptured, the sculpture taking the form of a W-shaped convolution.

Chelipeds short, without any spine on the arm: palm short, high, and compressed, with sharp edges, traversed by a fine raised line near and parallel with the lower border: fingers thin and compressed, about as long as the palm, the upper edge of the dactylus—like that of the palm—fringed with hair.

Legs a little longer than the chelipeds, the meropodites—especially of the first 3 pairs—*much broadened and compressed*, all having a tympanum. *The dactyli, even of the last pair of legs, are shorter than the propodites.*

No tympana on the sternum.

In the Indian Museum are fragments of 3 specimens from Mergui: de Man states that the breadth of the cephalothorax of the largest specimen is nearly 10 millim.

63. *Dotilla myctiroides*, Edw.

Doto myctiroides, Milne Edwards, Ann. Sci. Nat. Zool. (3) XVIII. 1852, pl. iv. fig. 24.

Dotilla myctiroides, Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 98: A. O. Walker, Journ. Linn. Soc. Zool. XX. p. 111: Aurivillius, Zur Biologie amphibischer Dekapoden, p. 5, pl. i. figs. 1–13, pl. iii. fig. 13, (Mitg. Ges. Wiss. Upsala, 1893).

Scopimera myctiroides, Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 390.

Carapace about as long as, or slightly longer than, broad, little sculptured dorsally, though its antero-lateral parts are studded with vesiculous granules. Front grooved: a groove runs parallel with either lateral border, and a faint groove crosses either postero-lateral angle. The side-walls anteriorly have the usual "brain-convolution" sculpture.

Orbits very oblique and very shallow, almost obsolete.

The merus of the external maxillipeds is nearly twice as big as the ischium and is finely granular; a single faint groove, most distinct anteriorly, runs parallel with its outer border.

Chelipeds between three and four times the length of the carapace, all the joints long, slender, and unarmed: fingers longer than the palm, without any conspicuous teeth.

Legs long, but much shorter than the chelipeds: the meropodites strongly dilated, and with a large "tympanum": the dactylus of the last pair is longer than the propodite, but in the other three pairs it is a little shorter than the propodite.

On either side of each of the last four thoracic sterna is a large tympanum.

In the Indian Museum are 19 specimens from the Andamans and 11 from the Coromandel coast. The carapace is 10 millim. long.

Scopimera, De Haan.

Scopimera, De Haan, Faun. Japon. Crust., p. 24 (1835): Milne Edwards, Ann. Sci. Nat., Zool., (3) XVIII. 1852, p. 153.

Scopimera has the same deep "cubical" carapace and the same general facies as *Dotilla*, but differs in the following characters:—

The carapace is much broader than long and has none of the curious sculpture, resembling brain convolutions, that is found, at any rate on the sidewalls, in *Dotilla*: the external maxillipeds are unsculptured and their merus, though large, is smaller than their ischium: the abdomen of the male has a curious wasp-like form owing to the length and narrowness of its fifth segment, which segment may even become elongate-linear by constriction; it has no bristles either on the 4th tergum or elsewhere: in the female the abdomen consists of 7 separate segments.

Distribution: Indo-Pacific shores, from Karachi to Japan.

Key to the Indian species of Scopimera.

I. Chelipeds and legs with a reticulate or subsquamiform granulation, the chelipeds in the male about twice the length of the carapace: most of the tympana on the legs are traversed by a longitudinal ridge: fifth abdominal tergum of male long and narrow, but not linear..... *S. investigatoris.*

II. Chelipeds and legs finely and uniformly granular, the chelipeds in the male nearer 3 times than twice the length of the carapace: the tympana not subdivided by a ridge: the fifth abdominal tergum of the male is long and linear..... *S. crabricauda.*

According to F. Müller, *S. globosa*, De Haan, is found in Indian waters. The form of the abdomen in this species is similar to that of *S. investigatoris*, but the carapace is smooth, and the tympana of the legs are different.

64. *Scopimera investigatoris*, n. sp.

Carapace much broader than long, decidedly pentagonal, without distinction of regions, smooth except anteriorly and laterally where there are numerous irregularly-scattered granules: the sidewalls and pterygostomian regions finely granular.

Orbits broad as in *Ocypoda*, shallow, the upper border very oblique, the lower border finely denticulated and very prominent as in *Gelasimus*.

External maxillipeds with some obsolescent granulation. Chelipeds and legs finely granular in a somewhat reticulate or subsquamiform way.

Chelipeds about twice as long as the carapace: tympanum on the inner surface of the arm large, that on the outer surface of the arm small: fingers about as long as the palm, without any enlarged teeth.

First 3 pairs of legs about the same length as the chelipeds, the 4th pair shorter: the merus of all much dilated and with large well-defined tympana, all of which, except only the one on the dorsal surface of the last pair, are longitudinally subdivided by a fine ridge: the dactylus in the first 3 pairs is about the same length as the propodite, but in the last pair is considerably longer.

In the male abdomen the first 2 segments are horizontal-linear, the 3rd and 4th, though distinct, form a "butterfly" plate, the 5th is long and narrow and longitudinally grooved and gradually expands to meet the 6th, which is long and broad, while the 7th is transversely oval.

In the female the abdomen is of the usual shape, but in its broadest part is little more than half the breadth of the sternum.

In the Indian Museum are 11 specimens, from Diamond Island off C. Negrais in Burma. The carapace of the largest male is 4·5 millim. long and 7 millim. broad.

65. *Scopimera crabricauda*, n. sp.

Carapace subpentagonal, the regions indistinctly indicated, the surface of the mid-dorsal region is symmetrically puckered or vesiculous; the sidewalls and pterygostomian regions granular.

Orbits moderately broad and deep, the upper border oblique, the lower border prominent and finely denticulate.

External maxillipeds smooth: chelipeds and legs "frosted" under the lens.

In the male the chelipeds are more than $2\frac{1}{2}$ times the length of the carapace and are longer and much stouter than the legs: there is a large tympanum on the inner surface of the arm, and a very small one on the outer surface: the dactylus is a little shorter than the palm and has one large tooth. In the female the chelipeds are shorter and not much stouter than the legs: the fingers are shorter than the palm, and the dactylus has no large tooth.

The meropodites of the legs are much dilated: all have tympana but these are not subdivided by any ridge: in the first 3 pairs of legs the dactyli are a little longer, in the fourth pair considerably longer, than the propodites.

In the male abdomen the first 2 segments are linear-horizontal and concealed, the 3rd and 4th form a triangular plate deeply grooved down

the middle line, the 5th is long linear and grooved, the 6th and 7th, though separate, together form a racket-head.

In the female the abdomen is of normal shape.

In the Indian Museum are a male and female from Karachi. The carapace of the male is 6·5 millim. long and barely 10 millim. broad.

Tympanomerus, de Man, Rathbun.

Dioxippe, de Man, Journ. Linn. Soc., Zool., XXII. 1887–88, p. 137 (1888); *nom. præocc.*

Tympanomerus, Rathbun, Proc. Biol. Soc., Washington, XI. 1897, p. 164.

Carapace deep, quadrilateral, broader than long, the regions not defined. Front narrow, deflexed: the orbits are trenches occupying the whole anterior border of the carapace between the front and the antero-lateral angles.

Eyes, antennules, antennæ and epistome as in *Dotilla*. Buccal cavern large, a little narrowed and rounded anteriorly: the external maxillipeds completely close the buccal cavern, the anterior outer corner of the ischium is marked off as a distinct facet as in *Dotilla* and *Scopimera*, the merus is much larger than the ischium, the palp arises near the antero-external angle of the merus, and the exognath is small and linear.

Chelipeds in both sexes stouter, and in the male longer, than the legs: fingers a little deflexed.

Legs rather compressed, the two middle pairs a little longer than the first and last pair: there are ill-defined tympana on the meropodites.

The abdomen in both sexes consists of separate segments, and in the male is narrow.

Distribution: Japanese and Andaman Seas.

The name *Tympanomerus* is a most unfortunate one, since the "tympana," compared with those of *Dotilla* and *Scopimera*, are ill-defined and inconspicuous.

66. *Tympanomerus orientalis* (de Man).

Dioxippe orientalis, de Man, Journ. Linn. Soc. Zool. XXII. 1887–88, p. 138, pl. ix. figs. 8–10.

Carapace square-cut, the length about four-fifths of the greatest breadth, dorsally nearly flat with the lateral borders well defined especially anteriorly, the surface a little lumpy in places: a perfectly straight fine transverse ridge runs close to and parallel with the posterior border.

Front grooved dorsally, hardly a fourth the breadth of the carapace. The outer angle of the lower border of the orbit forms a

prominent tooth. The merus of the external maxillipeds is grooved along the outer border.

Chelipeds in the male nearly three times the length of the carapace: wrist elongate, somewhat cuboid, with a strong laterally-compressed lobe or tooth at its inner angle: palm rather high, both borders marginate and a second fine ridge runs close to and parallel with the lower border: fingers a little shorter than the palm, finely denticulate.

In the female the chelipeds are not twice the length of the carapace, the wrist is not elongate, though the tooth at its inner angle is present, and the fingers are a little longer than the palm.

The meropodites of the legs are slightly dilated, the dactyli are shorter than the propodites, and the carpopodites and propodites of the first two pairs are densely tomentose.

The fifth abdominal tergum of the male, though not particularly elongate, is a little constricted at base.

In the Indian Museum are 6 specimens from Mergui. The carapace of the largest is 4 millim. long and 5 millim. broad.

Subfamily MACROPHTHALMINÆ, Dana.

CLISTOSTOMA, De Haan restr.

Cleistostoma (= *dilata* nec *pusilla*) De Haan, Faun. Japon. Crust. p. 26: Milne Edwards, Ann. Sci. Nat., Zool., (3) XVIII. 1852, p. 160.

Carapace of no great depth, broader than long, its sides slightly arched, its regions ill-defined.

Front of moderate breadth, more than a fourth the greatest breadth of the carapace, declivous: orbits well defined, of good depth, occupying all the rest of the anterior border of the carapace: eyestalks stout, eyes terminal. The antennules fold obliquely: the antennæ are small and stand in the inner orbital hiatus.

Epistome well defined, very short fore and aft, with a prominent lobe or tooth in the middle line projecting between the external maxillipeds.

Buccal cavern squarish, but with the sides a little arched, completely closed by the external maxillipeds. These are large, and have the inner angle of the ischium strongly produced, the merus as large as or larger than the ischium, and the palp articulating at the antero-external angle of the merus: the carpus is ovate, but the two terminal joints are very short and slender: the exognath is in great part concealed.

Chelipeds in the female shorter and slenderer than any of the legs, in form exactly like those of the female of *Gelasimus*.

Of the legs the first two pairs are the shortest and slenderest, while the middle two pairs are much the largest and have very broad meropodites. There are no "tympana."

The abdomen of the female consists of 7 separate segments, and is very broad.

67. *Clistostoma dotilliforme*, n. sp.

Carapace rather depressed, slightly convex, smooth, with the regions ill-defined; its lateral borders are slightly arched and are finely serrated anteriorly behind the acute, almost dentiform, antero-lateral angles. Front between a third and a fourth the greatest breadth of the carapace, concave in the middle line. Upper border of the orbit sinuous, lower border prominent and finely serrated.

Merus of the external maxillipeds larger than the ischium, sculptured (somewhat as in the *Dotillæ*) with a sort of Y-shaped sulcus starting from the antero-external angle. The pterygostomian regions also are sculptured with branching or convoluted grooves much as in the *Dotillæ*.

The second and third pair of legs, which are much longer than the other two pair, are a little over $1\frac{1}{3}$ times the length of the carapace and have an almost foliaceous meropodite with the anterior border finely serrulate and the posterior border elegantly spinate: the anterior border of the carpus and propodite of the second and third pair of legs is tomentose.

A single egg-laden female is in the Indian Museum: it was found at Karachi, and its carapace is 7 millim. long and 9 millim. broad.

TYLODIPLAX, de Man.

Tylodiplax, de Man, Zool. Jahrb., Syst. VIII. 1894–95, p. 598 (1895).

Carapace deepish, quite flat dorsally, broader than long and broader behind than in front, the lateral borders being posteriorly divergent and having a distinctly convex curve, the regions more or less defined.

Front between a third and a fourth the greatest breadth of the carapace, not deflexed, grooved longitudinally. The orbits occupy the rest of the anterior border of the carapace, but as the extent of this border is a good deal less than the greatest breadth of the carapace, and as the front is broad, the orbits have not the same elongate form as they have in most species of *Macrophthalmus*, though otherwise similar. Antennules and antennæ as in *Macrophthalmus*. *Eyes small, not terminal on the eyestalks,*

The epistome would be linear, were it not for a septum-like fold or lobe that projects strongly between the meropodites of the external maxillipeds: owing to this fold the anterior edge of the buccal cavern has a bilobed appearance. The external maxillipeds completely close the buccal cavern: their merus is at least as long as and decidedly broader than their ischium: the flagellum, which is slender, is articulated near, but not at, the antero-external angle of the merus: the exognath is not much concealed, though not completely exposed.

The chelipeds in the adult male are unknown: in the young male they are equal and are shorter and slenderer than the legs, except perhaps the very small 4th pair.

The legs have somewhat the same relations as in *Macrophthalmus*—*i.e.*, the first and last pairs are much the shorter and the two middle pairs are much the longer and stouter.

The abdomen in the female is unknown: in the male it is narrow, and consists of 5 separate joints, the 3rd 4th and 5th segments being fused, but without obliteration of sutures.

It seems to me of very doubtful utility to separate this form from *Paraclistostoma*, de Man, or either of them from *Clistostoma*, De Haan (as restricted by de Man).

68. *Tylodiplax indica*, n. sp.

Two young males from Karachi are in the Indian Museum: their chelipeds are still of the female *Macrophthalmus* type, so that it is impossible to give a complete diagnosis of the species.

Carapace more or less hairy, finely punctate, its length less than two-thirds its greatest breadth which, owing to the strong divergence, from before backwards, of the lateral borders, is posterior; its antero-lateral angle is an obtuse angle. The gastric region is defined by a perfectly circular line.

Front square-cut, laminar, but not projecting beyond the inner angles of the orbits, from which it is separated by a groove: the front is concave in the middle line.

The pigment of the eyes is small in amount, and is placed some distance behind the end of the eyestalks.

The merus of the external maxillipeds is longer and much broader than the ischium, and has its antero-external angle considerably dilated, and its surface somewhat granular.

The chelipeds of the immature male, and the legs, are hairy, much as in *Macrophthalmus depressus*, the hairs on the posterior border of the merus of the 2nd pair of legs and on the dorsal surface of carpus and propodite of the 2nd and 3rd pair of legs being particularly

thickset. The length of the longest (second) pair of legs is 2⅓ times that of the carapace, that of the last pair of legs is very little more than that of the carapace.

Two young males from Karachi: the carapace 6·5 millim. long and 11 millim. broad.

MACROPHTHALMUS, Latreille.

Macrophthalmus, Latreille, in Cuvier Règne An. (ed. 2) Vol. IV. p. 44 (1829): De Haan, Faun. Japon. Crust. p. 26: Milne Edwards, Hist. Nat. Crust. II. 63, and Ann. Sci. Nat., Zool. (3) XVIII. 1852, p. 155: Dana, U. S. Expl. Exp., Crust. pt. I. p. 312: Miers, Challenger Brachyura, p. 248.

Carapace depressed, quadrilateral, broader than (sometimes more than twice as broad as) long: the regions are well defined, the cervical and branchial grooves being characteristically conspicuous both on the dorsum of the carapace, and on the lateral border where they cut out two prominent teeth or lobes.

Front deflexed, narrow, often a narrow lobe as in *Gelasimus*: its free edge never approaches the epistome. The orbits are narrow trenches occupying the whole anterior border of the carapace between the front and the antero-lateral angles: eyestalks usually very long and slender, as in *Gelasimus*. The antennular flagella, which are rather small, fold transversely beneath, but are not concealed by, the front. The antennæ stand at the inner angle of the orbit: the basal joint is short, and the flagellum is of good length.

Epistome very short fore and aft, almost linear, but well delimited from the palate. Buccal cavern somewhat arched anteriorly. The external maxillipeds have a broad foliaceous ischium and merus (the latter about half the length of the former) and a coarse flagellum articulating with the antero-external angle of the merus: though the ischium and merus may not quite meet across the middle of the buccal cavern, the narrow interval that may exist between them is largely filled by the flagella, so that the underlying parts are concealed.

The chelipeds differ greatly in the sexes: in the female they are equal, and are shorter and slenderer than any of the legs except, perhaps, the short and weak last pair: in the *adult* male they are equal or subequal, and are longer and stouter than any of the legs except, perhaps, the particularly large and stout penultimate pair: in both sexes the fingers are curiously deflexed and bent or curved inwards distally.

Of the legs, the first and last pairs are usually singularly short and slender compared with the second and third pairs: the third pair are the longest and stoutest, being nearly or quite as large as the chelipeds,

and the fourth (last) pair much the shortest and weakest of all. The dactylus in all is broad, stout, and laterally compressed.

The abdomen in both sexes consists of 7 separate segments, and in the male is narrower at base than the breadth of the sternum.

Key to the Indian species of Macrophthalmus.

I. Carapace much broader than long, its sides are distinctly convergent posteriorly and the antero-lateral angles are acute and spiniform: front narrow :—
   1. The eyestalks project *nearly half their length* beyond the antero-lateral angles of the carapace ..... *M. Verreauxi.*
   2. The eyestalks project slightly beyond the antero-lateral angles of the carapace: the true first tooth of the lateral border of the carapace belongs to the upper border of the orbit, and the antero-lateral angle of the carapace is formed by the true second tooth..... ..... *M. sulcatus.*
   3. The eyestalks do not project beyond the antero-lateral angles of the carapace :—
      i. Some of the borders of some of the leg joints are denticulate or spiny..... ..... *M. pectinipes.*
      ii. Legs smooth, except for a small subterminal denticle on the anterior border of the meropodites .... *M. convexus.*

II. Carapace broader than long, its sides are parallel :—
   1. The tooth at the antero-lateral angle of the carapace is truncate and square-cut: front about an eighth the greatest breadth of the carapace: inner surface of the palm of the male smooth..... ..... *M. depressus.*
   2. Front about a fourth the greatest breadth of the carapace: inner surface of the palm of the male armed with a spine..... ..... *M. erato.*

III. Carapace broader than long, its sides divergent posteriorly: two nearly parallel, obliquely longitudinal, finely beaded lines on the posterior part of each epibranchial region ..... *M. tomentosus.*

Besides the fore-named, the four following species, of which I have not seen specimens, are said to occur in Indian Seas :—

(1) *M. simplicipes*, Guérin, Mag. de Zool. II. 1838, pl. xxiv. fig. 1: it appears to differ from *M. pectinipes* in having no spines or denticles on the leg-joints.

(2) *M. carinimanus*, Milne Edwards, Hist. Nat. Crust. II. 65, and Ann. Sci. Nat. Zool. (3) XVIII. 1852, p. 156: it appears to differ from *M. convexus* only in having a spine on the inner surface of the palm of the male cheliped.

(3) *M. pacificus*, Dana, U. S. Expl. Exp., Crust. pt. I. p. 314, pl. xix. fig. 4: it appears to differ from *M. erato* only in not having a spine on the inner surface of the palm of the male cheliped.

M. bicarinatus, Heller, Novara Crust. p. 36, pl. iv. fig. 2, which I am unable from the descriptions to distinguish from *M. pacificus*.

69. *Macrophthalmus Verreauxi*, Edw.

Macrophthalmus Verreauxi, Milne Edwards, Ann. Sci. Nat., Zool., (3) IX. 1848, p. 358, and XVIII. 1852, p. 155, pl. iv. fig. 25: Hess, Archiv f. Nat. XXXI. 1865, i. pp. 142, 171: de Man, Notes Leyden Mus. II. 1880, p. 184: Haswell, Cat. Austral. Crust. p. 89.

Carapace finely granular on the branchial regions, its length about two-thirds its greatest breadth, its sides slightly convergent posteriorly and cut anteriorly into 3 teeth, the first of which is the antero-lateral angle.

Front only very moderately deflexed, its least breadth (between the eyestalks) is about a fifth the greatest breadth of the carapace, very obscurely bilobed.

Orbits oblique, sinuous, their borders microscopically beaded. *The eyestalks project nearly half their length beyond the antero-lateral angles of the carapace.*

The external maxillipeds, when the flagella are folded, completely occlude the buccal cavern: the suture between the merus and ischium is oblique.

The legs are darkly variegated or incompletely banded, and are unarmed except for a subterminal spine on the anterior border of the meropodites of the first 3 pairs.

The chelipeds in the young male are not as long as, though more massive than, the 2nd and 3rd pairs of legs.

In the Indian Museum are 4 specimens, more or less damaged, from the Andamans and Mergui ("Investigator" collection). The largest male (which wants the chelipeds) has a carapace 9 millim. long and 14 millim. broad.

70. *Macrophthalmus pectinipes*, Guérin.

Macrophthalmus pectinipes, Guérin, Voy. Favorite, p. 167, pl. 49 (1839), and Mag. de Zool. II. 1839, Crust. (Cl. VII.) pl. xxiii (1838): Milne Edwards, Ann. Sci. Nat., Zool., (3) XVIII. 1852, p. 158: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 389: Ortmann, Zool. Jahrb., Syst., X. 1897–98, p. 340.

Carapace studded with large conspicuous pearly granules, its length in the adult male is about six-elevenths of its greatest breadth at the level of the second tooth of the lateral border: the lateral borders are slightly but distinctly convergent posteriorly where they are beaded or denticulate, anteriorly they are cut into three acute teeth the last of which is minute, the first being the outer orbital angle.

The front, measured at its narrowest part between the eyestalks, is barely a sixteenth the greatest breadth of the carapace: its free edge is distinctly bilobed. Orbits sinuous, a little oblique; their upper border

elegantly denticulate, the lower border unevenly crenulate. Eyestalks slender and curved: the eye does not reach to the end of the orbital trench.

When their flagella are folded the external maxillipeds completely occlude the buccal cavern: the suture between the ischium and merus is hardly at all oblique.

In the adult male the chelipeds are from $2\frac{1}{2}$ to 3 times the length of the carapace and longer than any of the legs except the 3rd (penultimate) pair: except the hand, their joints are not more massive than those of the 2nd and 3rd pair of legs. The arm is trigonal, its inner border being prominent and rising into a crest, on the most convex part of which is a short horny plate, called by de Man the "musical ridge": this border of the arm, as also the inner border and angle of the wrist and the extreme proximal end of the upper border of the palm, is serrated. The palm is nearly as long as the arm and is perfectly smooth and unsculptured, it has a tuft of hair at its extreme distal end, continuous with a thick fringe of hair along the upper border of the dactylus: the dactylus is about two-thirds the greatest length of the palm and has a molariform tooth at its basal end, but there is no such tooth on the immobile finger: the fingers meet only at the distal inbent end.

In the female and young male the chelipeds are short and slender, a good deal fringed with hair, but unsculptured, and the fingers are longer than the palm.

In both sexes the legs are alike, the 2nd and 3rd pairs being remarkably long and strong and the 1st and 4th (last) pairs being short and comparatively slender. The 3rd pair, which are the longest of all, are from $2\frac{1}{2}$ to nearly 3 times the length of the carapace, the 4th pair are only about $1\frac{1}{2}$ times the length of the carapace. In all but the last pair the meropodites carpopodites and propodites are scabrous, the anterior border of all these joints and the distal end of the posterior border of the meropodites being serrated: in the third pair only the posterior border of the propodite is very strongly serrated.

In the Indian Museum are 7 specimens from Karachi and one from Orissa. In a large male specimen the carapace is 35 millim. long and 62 millim. broad.

The great changes that occur in the chelipeds during the growth of the male indicate that caution is necessary in basing specific distinctions on the form of these organs in this genus.

71. *Macrophthalmus convexus*, Stimpson.

Macrophthalmus convexus, Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 97: Miers, Ann. Mag. Nat. Hist. (5) V. 1880, p. 307: Haswell, Cat. Austral. Crust. p. 89:

de Man, Archiv f. Naturges. LIII. 1887, i. p. 354, pl. xv. fig. 4: Ortmann, Zool. Jahrb., Syst., VII. 1893–94, p. 745 and X. 1897–98, pp. 342, 344.

Macrophthalmus inermis, A. Milne Edwards, Ann. Soc. Ent. France, (4) VII. 1867, p. 286, and Nouv. Archiv. du Mus. IX. 1873, p. 277, pl. xii. fig. 5 (*apud* de Man).

Carapace smooth, becoming finely granular near the lateral margins, its length in the male is half, in the female decidedly more than half, its greatest breadth: on either branchial region, behind the branchial groove, are two granular eminences, one behind the other: 3 teeth arranged as in *M. pectinipes* at the anterior end of the posteriorly-convergent lateral borders, the first (outer orbital angle) being the most prominent and much the largest, the third minute.

Front, in its narrowest part between the eyestalks, about one-eleventh the greatest breadth of the carapace, its free edge obscurely bilobed. Orbits considerably oblique, the upper border microscopically beaded, the lower border finely and elegantly serrate. The eyestalks are slender and curved, and the eyes reach to the end of the orbital trench.

The suture between the ischium and merus of the external maxillipeds is decidedly oblique, and there is a distinct gap between these appendages even when their flagellum is folded.

The chelipeds have the same general proportions as in *M. pectinipes*: all the borders of the arm are granular or denticulate, but there is no "musical ridge" on the inner border: a bunch of spinules at the inner angle of the wrist: both borders of the palm, but particularly the lower border, are finely granular, and a fine raised granular line runs along the outer surface of the palm parallel with the lower border: the inner surface of the palm, like that of the fingers, is hairy, but quite smooth and unarmed beneath the hair: there is a small molariform tooth at the base of the dactylus, and a larger one having a forward slant on the immobile finger.

The legs have the same general proportions as in *M. pectinipes*, but they are quite smooth and unarmed, except for a small subterminal spine on the anterior border of the meropodites of the 2nd and 3rd pair.

In the Indian Museum are 5 specimens from the Andamans. The carapace of the largest specimen is 10·5 millim. long and 21·5 millim. broad.

72. *Macrophthalmus sulcatus*, Edw.

Macrophthalmus sulcatus, Milne Edwards, Ann. Sci. Nat. Zool. (3) XVIII. 1852, p. 156: Ortmann, Zool. Jahrb. Syst. X. 1897–98, pp. 344, 345 (*nec synon.*).

Carapace free of granules in the female, studded with minute granules in the male, its length in the male only about three-eighths, in the female nearly half, its greatest breadth. On the branchial region,

behind the branchial groove, are, in both sexes, three granular eminences, one behind the other, the last being on the posterior border. The lateral borders are convergent: their true *first* tooth, which in other species is at once the antero-lateral angle of the carapace and the outer angle of the orbit, appears in this species to belong to the *upper border* of the orbit, so that the antero-lateral angle of the carapace is formed by the much larger *second* tooth which also is the *apparent* outer orbital angle.

The least breadth of the front, between the eyestalks, is about an eighth the greatest breadth of the carapace: its free edge is very obscurely bilobed.

Orbits sinuous and oblique: the upper border microscopically beaded and furnished near its outer end with a sharp recurved tooth, which is really the outer orbital angle, though the apparent angle is the much larger tooth of the lateral border of the carapace: the lower orbital border is finely denticulated in its inner two-thirds, but is broken and indistinct beyond this. Eyestalks long, slender, curved: the eyes reach nôt only beyond the true limits of the orbit, but also beyond the antero-lateral angle of the carapace.

The external maxillipeds do not quite meet across the buccal cavern: the suture between the ischium and merus is decidedly oblique.

The legs and chelipeds have the same general proportions as in *M. pectinipes*, but the legs are unarmed.

In the male chelipeds the anterior border of the arm is hairy and strongly denticulated, but there is no "musical ridge:" the inner angle of the wrist and the proximal part of the upper border of the palm are also denticulated. On the outer surface of the palm there is a crest running close to, and parallel with, the lower border; and on the inner surface of the palm, near the middle line, is a longitudinal row of denticles the first one of which is considerably enlarged: the surface above this ridge, as also the inner surface of the fingers, is densely hairy. The dactylus is not nearly two-thirds the length of the palm: the immobile finger, but not the dactylus, has a strong molariform tooth at its basal end.

In the female the chelipeds are short and weak as usual, and the hand is quite smooth and has the borders — but specially the lower border — thin and sharp.

In the Indian Museum are a male and a female from the Andamans: the carapace of the male is 9 millim. long and 24 millim. broad.

73. *Macrophthalmus depressus*, Rüpp.

Macrophthalmus depressus, Rüppell, 24 Krabben Roth. Meer. p. 19, pl. iv. fig. 6, pl. vi. fig. 13: Milne Edwards, Hist. Nat. Crust. II. 66, and Ann. Sci. Nat. Zool. (3) 722

XVIII. 1852, p. 159: Heller, SB. Ak. Wien, XLIII. 1861, i. p. 362: de Man, Notes Leyden Mus. III. 1881, p. 255, and Archiv f. Naturges. LIII. 1887, i. pl. xv. fig. 3, and Journ. Linn. Soc., Zool., XXII. 1887-88, p. 124, and Zool. Jahrb., Syst. VIII. 1894-95, p. 578: J. R. Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 389: Ortmann, Zool. Jahrb., Syst. VII. 1893-94, p. 745 (?) and X. 1897-98, pp. 341, 342.

Macrophthalmus affinis, Guérin, Mag. de Zool. II. 1838, pl. xxiv. fig. 2: Milne Edwards, Ann. Sci. Nat. (3) XVIII. 1852, p. 158: Haswell, Cat. Austral. Crust. p. 88 (*apud* Ortmann).

Carapace studded with minute granules not always plainly visible to the naked eye, its length in the male about two-thirds of its breadth. The lateral borders are parallel and the antero-lateral angle is rather a square-cut lobe than a tooth. On the epibranchial regions, behind the branchial groove, are two nearly parallel obliquely-longitudinal finely-granular lines, the inner of which is faint.

Front, at its narrowest part, about an eighth the breadth of the carapace, longitudinally grooved, but its free edge is straight and not bilobed.

Orbits little sinuous and little oblique, their upper border microscopically, their lower border finely and evenly denticulate. Eyestalks slender, hardly curved, the eyes reach almost to the end of the orbital trenches.

When the flagella are folded there is not much space between the external maxillipeds: the suture between the ischium and merus of these appendages is hardly oblique.

In the male the chelipeds and legs have much the same general proportions as in *M. pectinipes*, but they are unarmed, except for a small subterminal denticle on the anterior border of the meropodites of the first three pairs of legs: on the other hand the inner surface of the joints of the chelipeds, and the upper surface of the leg-joints (especially of the meropodites) are densely hairy. The dactylus is more than two-thirds the length of the palm, which is smooth and unsculptured: there is a molariform tooth near the basal end of the dactylus, and a similar, but less distinct and more oblique, tooth on the immobile finger.

In the Indian Museum are 2 males from Mergui, besides several specimens from Aden. The carapace of the largest specimen is 14 millim. long and 22 millim. broad.

74. *Macrophthalmus erato*, de Man.

Macrophthalmus erato, de Man, Journ. Linn. Soc., Zool., XXII. 1887-88, p. 125, pl. viii. figs. 12-14, and Zool. Jahrb. Syst., VIII. 1894-95, p. 579.

Carapace quadrilateral, not granular to the naked eye, its length about two-thirds of its breadth, the cervical groove plain, but the

branchial groove faint: the second tooth of the lateral border is a little more prominent than the first. *Front about two-ninths the breadth of the carapace,* square cut, longitudinally grooved, but not bilobed. Orbits slightly sinuous, hardly oblique: eyestalks little curved, stoutish, not quite reaching end of orbit. In the male the lower border of the orbit is peculiar: it is finely denticulate at its internal extremity and has a small lobule at its outer angle, and in between these it has the form of a prominent deflexed somewhat triangular lobe. In the female the lower border of the orbit is finely crenulate throughout. The external maxillipeds do not quite meet across the buccal cavern, and the suture between their ischium and merus is a little oblique.

All three borders of the arm are serrated, and the inner angle of the wrist and upper border of the arm are very finely denticulated. There is a strong "musical crest" obliquely parallel with the inner border of the arm and in the middle third of that border. Palm longer than the arm, its inner surface is hairy and carries a spine near the carpal end about midway between the upper and lower borders. The fingers are considerably less than two-thirds the length of the palm: there is a molariform tooth at the base of the dactylus and a larger slanting one on the immobile finger.

The upper surface of the legs, especially in the case of the third pair, is hairy.

In the Indian Museum are 4 specimens from Mergui and Akyab: the carapace of the largest specimen is 10 millim. long and 14 millim. broad.

75. *Macrophthalmus tomentosus*, Eyd. and Soul.

Macrophthalmus tomentosus, Eydoux and Souleyet, Zool. Voy. Bonite, I. p. 243, pl. iii. fig. 8, (1841): Milne Edwards, Ann. Sci. Nat., Zool., (3) XVIII. 1852, p. 159: A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 279: de Man, Journ. Linn. Soc., Zool., XXII. 1887-88, p. 122.

Carapace studded with very fine granules: its length is about two-thirds its greatest breadth, *which is behind the middle of the lateral border, the lateral borders being decidedly divergent posteriorly.* On either epibranchial region, behind the branchial groove, are two finely beaded obliquely-longitudinal lines. The first two teeth of the lateral borders are square-cut.

Front, in its narrowest part, about one-eleventh the greatest breadth of the carapace; though longitudinally grooved it is not bilobed.

Orbits hardly sinuous, not oblique; their upper border microscopically beaded, their lower border finely crenulate. The eyestalks are hardly curved, and the eyes do not reach to the end of the orbits.

The chelipeds and legs have the same general proportions as in *M. pectinipes*, but are shorter. Chelipeds unarmed and unsculptured, except for some spinules along the inner angle of the wrist and some denticles along the proximal part of the upper border of the palm: in the distal half of the inner border of the arm is a short upstanding horny "musical crest": the borders of the arm and the inner border of the fingers are hairy. The dactylus has a small molariform tooth near the base, and the immobile finger has a much larger one.

The legs are unarmed, except for a small subterminal denticle on the anterior border of the meropodites of the first 3 pairs: the upper surfaces of their joints are more or less hairy.

In the Indian Museum is a single specimen from Mergui: its carapace is 23 millim. long and 34 millim. broad.

Family MICTYRIDÆ, Dana.

Mictyris, Latreille.

Mictyris, Latreille, Gen. Crust. et Ins. p. 40 (1806), and in Cuvier Règne Animal, III. p. 21: Desmarest, Consid. Gen. Crust. p. 115, and Dict. Sci. Nat. XXVIII. 1823, p. 235: De Haan, Faun. Japon. Crust. p. 24: Milne Edwards, Hist. Nat. Crust. II. 36, and in Cuvier Règne An., Crust. p. 67, and Ann. Sci. Nat., Zool., (3) XVIII. 1852, p. 154: Miers, Challenger Brachyura, p. 278.

Carapace elongate globose, oval but truncated posteriorly by the short and perfectly straight posterior border, the cervical and cardio-branchial grooves well developed and making the regions very distinct and convex, the posterior border fringed with bristles, as is also the apposed very prominent edge of the first abdominal tergum.

The afferent branchial orifice is a singular valvular recess, formed dorsally by a semicircular notch in the margin of the carapace, and ventrally by a curious cup-shaped dilatation of the base of the epipodite of the external maxillipeds.

Front a narrow deflexed lobe as in *Ocypoda*. Orbits represented by a small post-ocular spine, the eyes, which are borne on shortish stalks, being quite unconcealed.

Antennules as in *Ocypoda*, the basal joint being large and exposed, while the flagellum is rudimentary and concealed beneath the front. Antennæ small but well formed, standing in the usual position.

Epistome short lozenge-shaped. Buccal cavity enormous, somewhat oval in outline. External maxillipeds very large and foliaceous, with a hemispherical bulge causing them to face as much laterally as ventrally: their greater part is formed by the ischium, the inner margin of which is hairy, especially at base: the merus is very much smaller

than the ischium and carries the coarse hairy flagellum at its antero-external angle: the exognath is small, slender, and very inconspicuous.

Chelipeds moderately long and rather slender, stouter and a little shorter than the legs; their freest motion is in a vertical plane: the wrist is a rather elongate trigonal obconical joint.

Legs somewhat compressed: the first pair are the longest and the others decrease slightly in length in posterior succession.

The abdomen in both sexes is of a broad truncate-oval shape, the segments from the 2nd to the 6th gradually increasing in length but the 7th being narrow: in both sexes the abdomen is fringed with hairs.

Distribution: Indo-Pacific from China and Australia to the Andamans.

In habits the species of *Mictyris* resemble the Ocypodes, Gelasimi and Dotillæ.

76. *Mictyris longicarpus*, Latreille.

Mictyris longicarpus, Latreille, Gen. Crust. et Ins. p. 41 (1806): Desmarest, Consid. Gen. Crust. p. 115, pl. xi. fig. 2, and Dict. Sci. Nat. XXVIII. p. 236: Guérin, Icon. Règne An. Crust. pl. iv. fig. 4: Milne Edwards, Hist. Nat. Crust. II. 37, and in Cuvier Règne An. Crust. pl. xviii. fig. 2, and Ann. Sci. Nat., Zool., (3) XVIII. 1852, p. 154: Dana, U. S. Expl. Exp. Crust. pt. I. p. 389: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 99: Hess. Archiv f. Nat. XXXI. 1865, p. 142: Heller, Novara Crust. p. 40: A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 276: Tozzetti, Magenta Crust. p. 185, pl. xi. figs. 5, 5*a-c*: Nauck, Zeits. Wiss. Zool. XXXIV. 1880, p. 22, pl. i. figs 5-7 (gastric teeth): Haswell, Cat. Austral. Crust. p. 116: Miers, Zool. H. M. S. Alert, pp. 184, 248, and Challenger Brachyura, p. 278: de Man, Archiv f. Naturges. LIII. 1887, i. p. 358, and Notes Leyden Mus. XII. 1890, p. 83: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 390: Aurivillius, Zur Biol. Amphib. Dekap. p. 38, pl. iii. figs. 10-11 (Mitg. K. Ges. Wiss. Upsala, 1893): Ortmann, Zool. Jahrb. Syst. VII. 1893-94, p. 748, and in Semon's Forschungr. Crust. p. 58 (Jena. Denks. VIII): Stead, Zoologist, (4) II. 1898, p. 307: Nobili, Ann. Mus. Genov. (2) XX. 1890, p. 272.

Carapace smooth, the regions moderately convex and dividing the dorsal surface into four lobes: edge of front broadly triangular: *linea anomurica* very distinct.

Chelipeds a little over $1\frac{1}{2}$ times the length of the carapace: a strong spine at the inner angle of the ischium (sometimes absent in the female): usually some spinules along the distal part of the lower border of the arm: wrist with the upper border of the outer surface marginate, and with a tooth near the middle of the distal border of the inner surface: palm much shorter than the wrist and not much more than half the length of the fingers; the upper and lower borders of its outer surface are marginate, and the middle of its outer surface is traversed by two divergent ridges which are continued along the

fingers: fingers slender and tapering, in the male there is an enlarged tooth near the base of the dactylus.

The legs, like the chelipeds, are rough under the lens: the edges of their propodites and dactyli are finely plumed: none of their joints are dilated: the first pair, which are slightly the longest, are about $1\frac{3}{4}$ times the length of the carapace.

In the Indian Museum are 5 specimens from the Andamans and 2 from the Nicobars.

Family HYMENOSOMIDÆ, Ortm.

Key to the Indian Genera or Sub-genera.

I. Front conspicuously tridentate: the external maxillipeds do not quite meet across the buccal cavern and their exognath is not hidden in its proximal portion: chelipeds much more massive than the legs ... ... HYMENICUS.

II. Front broadly triangular, or truncated: the external maxillipeds completely close the buccal cavern and their exognath is completely hidden:—

1. The interantennular septum is a prominent plate: chelipeds in the male much more massive than the legs ... ... ELAMENA.
2. The interantennular septum is a mere ridge; chelipeds in both sexes slender, not stouter than the legs ... ... TRIGONOPLAX.

ELAMENA, Edw.

Elamena, Milne Edwards, Hist. Nat. Crust. II. 33, and Ann. Sci. Nat., Zool., (3) XX. 1853, p. 223: Dana U. S. Expl. Exp. Crust. pt. I. p. 879: A Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 321.

Carapace flat dorsally, thin and almost lamellar, triangular or subcircular, its edges are usually turned up to form a thin circumscribing ridge and are without any teeth. Front broadly triangular, or sometimes truncated. There are no orbits and the eyes, though they may be hidden beneath the front, are exposed and non-retractile: a small post-ocular tooth may be present or not. The antennules fold beneath the front and are not visible from above when folded: the interantennular septum is a prominent plate. Antennal peduncle slender, the flagellum of no great length.

Epistome well defined and remarkably long fore and aft. Buccal cavern square; the external maxillipeds, which completely close it, have the merus about as large as the ischium, the palp articulating not far from the antero-external angle of the merus, and the exognath slender and concealed.

Chelipeds in the male subequal, massive, especially as to the palm. Legs long and slender.

The abdomen of the male does not quite fill all the space between the last pair of ambulatory legs.

77. *Elamena sindensis*, n. sp.

Carapace broadly piriform, smooth, flat, with no distinction of regions: its edge, which is slightly turned up, is entire and unarmed. Front a prominent broad triangular lamina, somewhat rounded at tip. No post-ocular tooth. Interantennular septum very prominent. Eyes not quite concealed beneath the front.

Male chelipeds about $1\frac{2}{3}$ times as long as the carapace, palm massive and somewhat swollen, fingers stout and pointed and meeting throughout their length. Female chelipeds little longer than carapace, slender, with a slender palm and longish fingers spooned at tip.

Legs slender, the 1st pair not three times as long as the carapace: in all, there is a distinct tooth at the end of the anterior border of both the merus and carpus, and the dactylus is long compressed and falcate with two or three teeth at the end of its posterior border.

In the Indian Museum are 7 specimens from Karachi: the carapace of a male is 5 millim. long and 6 in greatest breadth.

78. *Elamena truncata* (Stimpson ?).

? Trigonoplax truncata, Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 109.

Elamena truncata, A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 323: J. R. Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 395.

Carapace orbiculate-ovate, smooth, flat, with no distinction of regions, its edge, which is slightly turned up and entire and unarmed, shows the faintest traces of angulation in 2 or 3 places. No post-ocular tooth; eyes quite concealed beneath the front. The front, though it projects slightly beyond the carapace is *broadly truncated*, having its free margin cut quite straight. Interantennular septum very prominent. The female chelipeds and the legs are as in the preceding species, the anterior border of the merus and carpus of all the legs ending in a strong tooth.

In the Indian Museum is a female from the Nicobars.

TRIGONOPLAX, Edw.

Trigonoplax, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 224.

This is best regarded as a subgenus of *Elamena*, from which it differs only in the following unimportant particulars:—(1) the edge of the carapace is not turned up, (2) the interantennular septum is a mere ridge, (3) the chelipeds in the male, as in the female, are very slender.

79. *Elamena* (*Trigonoplax*) *unguiformis*, De Haan.

Elamene unguiformis, De Haan, Faun. Japon. Crust. p. 75, pl. xxix. fig. 1 and pl. H: J. R. Henderson, Trans. Linn. Soc. Zool., (2) V. 1893, p. 394.

Trigonoplax unguiformis, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 224: Ortmann, Zool. Jahrb., Syst., VII. 1893-94, p. 31.

Carapace smooth, flat, lamellar, broadly pentagonal with the postero-lateral sides about a third as long as any of the others, the regions not defined, the sides entire, unarmed. Front a broad, horizontal, triangular lamina. No post-ocular tooth: eyes not concealed by the front, though the eyestalks are. Interantennular septum a mere ridge.

Epistome as long as broad. Chelipeds and legs smooth and slender.

Chelipeds not stouter than the legs, about 1½ times as long as the carapace: fingers slender, as long as the slender sub-cylindrical palm, their tips spooned.

The anterior border of the meropodite of all the legs ends in an inconspicuous denticle, the dactylus of all is long, subfalciform, and strongly compressed, and has two or three denticles at the tip of the posterior border. The 2nd and 3rd pair of legs, which are the longest, are more than three times the length of the carapace.

In the Indian Museum are 5 specimens from the Andamans. The carapace of one is 12 millim. long and 14 in greatest breadth.

Hymenicus, Dana.

Hymenicus, Dana, Amer. Journ. Sci. (2) XII. 1851, p. 290, and U. S. Expl. Exp. Crust. pt. I. p. 387: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 224.

Differs from *Elamena* only in the following particulars:—

(1) the front is tridentate and the ridge that defines the edge of the carapace dorsally is continued across its base between the eyes: (2) the interantennular septum, as in *Trigonoplax*, is a mere ridge: (3) on either lateral border of the carapace teeth are sometimes present: (4) the external maxillipeds do not quite meet across the buccal cavern and their exognath is not hidden in its proximal portion.

Rhynchoplax of Stimpson (Proc. Ac. Nat. Sci. Philad. 1858, p. 109) is probably synonymous.

Key to the Indian species of Hymenicus.

I. Median spine of the rostrum of moderate length: 3 teeth on either lateral border of the carapace ... *H. Wood-Masoni.*

II. Median spine of the rostrum very long: no teeth on the lateral borders of the carapace ... ... *H. inachoides.*

80. *Hymenicus Wood-Masoni*, n. sp.

Body and chelipeds tomentose. Carapace dorsally flat or sunken, longer than broad, circular without the rostrum, the regions demarcated by fine grooves.

The front, which is delimited from the rest of the carapace by a fine raised line running across its base between the eyes, is cut into 3 prominent teeth, the middle one of which is somewhat the largest. The antennules fold beneath the front.

A small post-ocular denticle: a large tooth on the lateral border of the carapace above the base of the 1st pair of legs, another, hardly smaller, midway between this and the front, a third, much smaller, midway between this and the post-ocular denticle.

Chelipeds in the adult male more than twice the length of the carapace, very much stouter than the legs, the palm being specially massive. When denuded, the upper border of the arm is dentate and there is a stout spine near the far end of the outer border of this joint: there are several sharp tubercles on the upper surface of the wrist, the outer surface of the palm is reticulate in places, and the fingers which are stout and as long as the palm, have elegantly interlocking teeth.

In the female the chelipeds are considerably shorter and, though stouter than the legs and formed on the male pattern, are not nearly so stout as in the male.

The legs have long, curved dactyli, which are armed with small recurved teeth at the distal end of the posterior border: the 2nd pair, which are a little the longest, are over $2\frac{1}{2}$ times the length of the carapace

Carapace of male (including rostrum) 7·5 millim. long and 6 broad.

Specimens were collected by the late Professor Wood-Mason at Port Blair in the Andamans, and at Port Canning near Calcutta.

81. *Hymenicus inachoides*, n. sp.

Carapace somewhat tomentose, flat, elongate-triangular, ending in a rostrum of three long teeth of which the middle one is about a third the length of the rest of the carapace, the other two being more than half the length of the middle one. The regions are all well defined by grooves. No spines on the lateral borders of the carapace. Post-ocular denticle hardly distinguishable. The antennules fold beneath the front.

Chelipeds of the adult male somewhat tomentose, not $1\frac{1}{2}$ times the length of the carapace: arm slender, with a tooth near the distal end of the outer border; palm short, high, produced and somewhat swollen below; the fingers a little longer than the palm, stout, and finely toothed.

Legs long and slender, with long dactyli furnished with hook-like teeth at the end of the posterior border: the 2nd pair of legs are nearly three times the length of the carapace.

A single male from Port Canning near Calcutta: its carapace is 8·5 millim. long and 6 millim. in its greatest breadth.

Family GRAPSIDÆ Dana.

Key to the Indian Genera.

I. The antennules fold beneath the front in the ordinary way:—

1. No oblique hairy ridge on the exposed surface of the external maxillipeds:—

i. A very wide gap between the external maxillipeds, the exopodites of which appendages are narrow, and the palp of which appendages articulates at or near the antero-external angle of the merus: the abdomen of the male fills all the space between the last pair of ambulatory legs (*Grapsinæ*):—

A. Front less than half the greatest breadth of the carapace: merus of the external maxillipeds longer than broad:—

a. Fingers with broad spooned tips: flagellum of exopodite of external maxillipeds well developed. GRAPSUS.

b. Fingers acute, not spooned: flagellum of exopodite of external maxillipeds absent..... GEOGRAPSUS.

B. Front more than half the greatest breadth of the carapace: merus of the external maxillipeds broader than long:—

a. Antennæ completely excluded from the orbit..... ..... METOPOGRAPSUS.

b. Antennæ in the orbital hiatus... PACHYGRAPSUS.

ii. A moderate gap between the external maxillipeds, the exopodites of which appendages are broad, and the palp of which appendages articulates near the middle of the anterior border of the broad merus: the abdomen of the male does not quite fill all the space between the last pair of legs (*Varuninæ*):—

A. Exognath of the external maxillipeds not as broad as the ischiognath: terminal joints of legs thin broad and compressed..... .... VARUNA.

B. Exognath of the external maxillipeds as broad as or broader than the ischiognath: dactyli of the legs compressed but not broadened:—

a. Carapace flat and depressed.... PTYCHOGNATHUS.

b. Carapace deepish, strongly convex in both directions..... PYXIDOGNATHUS.

2. An oblique hairy ridge on the exposed surface of the external maxillipeds (*Sesarminæ*):—

i. Carapace little, sometimes not at all, broader than long, the pterygostomian regions and sidewalls with a sieve-like reticulation: lower border of orbit not abnormally prominent:—

A. Antennæ lodged in the orbital hiatus:—

a. Carapace nearly square: front abruptly and vertically deflexed..... SESARMA.

b. Antero-lateral borders of carapace arched: front obliquely deflexed..... SARMATIUM.

B. The tooth at the inner angle of the lower border of the orbit meets the front, so as to exclude the antennæ from the orbit:—

a. Carapace dorsally smooth and nude..... METASESARMA.

b. Carapace dorsally verrucose and densely tomentose..... CLISTOCŒLOMA.

ii. Carapace much broader than long, the pterygostomian regions, etc., not reticulated: lower border of orbit prominent beyond the front. Front gradually declivous. General appearance much like *Macrophthalmus*..... METAPLAX.

II. The antennules fold nearly longitudinally in deep notches in the front visible in a dorsal view (*Plagusiinæ*):—

1. Merus of the external maxillipeds of good size and as broad as the ischium..... PLAGUSIA.

2. Merus of the external maxillipeds small and much narrower than the ischium..... LIOLOPHUS.

Sub-family GRAPSINÆ, Dana (pt.).

GRAPSUS, Lamk., Kingsley.

Grapsus (part) Lamark, Syst. Anim. Sans Vertebr.: Latreille, Hist. Nat. Crust. et Ins. VI. p. 56, and Gen. Crust. p. 32.

Grapsus, Leach, Trans. Linn. Soc. XI. 1815, pp. 309, 323.

Grapsus (part) Desmarest, Consid. Gen. Crust., p. 129, and Dict. Sci. Nat. XXVIII. p. 247: Milne Edwards, Hist. Nat. Crust. II. 83, and Ann. Sci. Nat., Zool., (3) XX. 1853, p. 166: Dana, U. S. Expl. Exp. Crust. pt. I. p. 336.

Grapsus, Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, pp. 188 and 192: Miers, Challenger Brachyura, p. 254.

Goniopsis, De Haan, Faun. Japon. Crust. p. 33.

Carapace little broader than long, much depressed, the regions fairly well defined, the branchial groove particularly clear, the branchial regions with regular obliquely transverse ridges, the gastric region with a transverse squamiform sculpture. The lateral borders are arched and are armed with a tooth, placed immediately behind the acute outer orbital angle.

Front about half the breadth of the anterior border of the carapace, strongly deflexed: along the line of flexion are 4 tubercles, the outer of which on either side correspond with the supra orbital angles.

Orbits of moderate size, deep, distinctly divided into two fossæ: their lower border is deeply notched near the outer angle: the wide inner orbital hiatus is filled partly by the antennal peduncle and partly by a strong isolated tooth that belongs to the inner of the two fossæ into which the orbit is divided.

The antennules fold nearly transversely in rather narrow fossæ: the interantennulary septum is very broad. The antennal flagellum is short, and lies practically in the orbital cavity: the excretory tubercle of the basal antenna-joint is singularly prominent.

Epistome of good length fore and aft, well defined; its wings run up towards the orbital hiatus. Buccal cavity square with the antero-lateral corners rounded off. The external maxillipeds are widely distant, leaving between them a rhomboidal gap in which the mandibles are exposed: the ischium and merus are both narrow, the merus being slightly shorter than the ischium, and the palp, which is coarse—especially as to its carpus—articulates at the antero-external angle of the merus.

Chelipeds subequal in both sexes and much shorter than the legs, though, in the male, of a somewhat stouter make: hands and fingers short and stout, the tips of the fingers broad and hollowed *en cuillère*.

Legs broad and compressed, especially as to the merus: the dorsal surface of some of the joints has a sort of reticulate or squamiform sculpture, and the dactyli are thorny.

The abdomen in both sexes consists of 7 segments, and in the male its base is as broad as the sternum between the last pair of legs.

Distribution: rocks and reefs of all the tropical and subtropical seas.

The *Grapsi* of Indian seas are found in considerable number wherever there are rocks. They live out of water and are very cunning and active; if they cannot succeed in dodging their pursuer they

fling themselves into the sea and in that way escape capture. Their colour in life is a dark bottle-green.

82. *Grapsus grapsus* (Linn.).

Seba, Thesaurus, III, p. 43, pl. xviii. figs. 5, 6.

Cancer grapsus, Linnæus, Syst. Nat. (ed. xii.) p. 1048: Fabricius, Ent. Syst. II. p. 438 and Suppl. p. 342.

Grapsus maculatus (Catesby, 1743), Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 167, pl. vi. fig. 1: Hoffmann, in Pollen and Van Dam, Faun. Madagasc., Crust., p. 21: Brocchi, Ann. Sci. Nat., Zool., (6) II. 1875, Art. 2, p. 78 (male appendages): Kingsley, Proc. Ac. Nat. Sci. Philad. 1879, p. 401, and 1880, p. 192: de Man, Notes Leyden Mus. V. 1883, p. 159: Miers, Zool. H. M. S. Alert, pp. 518, 544, and Challenger Brachyura, p. 255: Cano, Boll. Soc. Nat. Napol. III. 1889, p. 236: R. I. Pocock, Journ. Linn. Soc., Zool., XX. 1890, p. 512: de Man, Notes Leyden Mus. XIII. 1891, p. 49: Koelbel, Ann. Nat. Hofmus. Wien, VII. 1892, p. 114: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 391: A. Milne Edwards and Bouvier, Hirondelle Crust. (Monaco, 1894) p. 47: de Man, Zool. Jahrb. Syst. IX. 1895-97, p. 79: Whitelegge, Mem. Austral. Mus. III. 1897, p. 139: Nobili, Boll. Mus. Torino, XII. 1897, p. 3. *Grapsus maculatus* var. *pharaonis*, A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 285.

Grapsus pictus, Latreille, Hist. Nat. Crust. et Ins. VI. p. 69, pl. xlvii. fig. 2, and Genera Crust. p. 33: Lamarck, Hist. Nat. Anim. Sans Vert. V. p. 248: Dumeril, Dict. Sci. Nat. XIX. p. 322: Desmarest, Consid. Gen. Crust. p. 130, pl. xvi. fig. 1: Milne Edwards, in Cuvier Règne An. pl. xxii. fig. 1, and Hist. Nat. Crust. II. 86: Milne Edwards and Lucas, Voy. Amer. Merid., Crust. p. 28: Gay, Hist. Fisica Chili, pt. III. Zool. p. 166: Dana, U. S. Expl. Exp. Crust. pt. I. p. 336: ?Desbonne and Schramm, Crust. Guadal. p. 49: Martens, Archiv f. Nat. XXXVIII. 1872, p. 106: Miers, Cat. Crust. New Zeal. p. 36, and P. Z. S. 1877, p. 73, and Phil. Trans. 1879, p. 489, and Ann. Mag. Nat. Hist. (5) V. 1880, p. 310: Smith, Trans. Connect. Acad. IV. 1880, p. 256: Tenison Woods, Proc. Linn. Soc. N. S. W. V. 1880-81, p. 117: Ozorio, Journ. Sc. Nat. Lisb. XI. 1885-87, p. 227. *Grapsus pictus* var. *ocellatus*, Studer, Abh. Ak. Berlin, 1882, Gazelle Crust. p. 14: *Grapsus pictus* var. *Webbi*, Hilgendorf, SB. Nat. Freunde Ges. 1882, p. 24.

Grapsus ornatus, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 168.

Grapsus pharaonis, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 168: Heller, SB. Ak. Wien. XLIII. 1861, i. p. 362: Hoffmann in Pollen and Van Dam, Faun. Madagasc. Crust. p. 20, pl. v. figs. 32-35: Richters, in Mobius, Meeresf. Maurit. Crust. p. 156.

Grapsus Webbi, Milne Edwards, Ann. Sci. Nat. (3) XX. 1853, p. 167: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 102.

Grapsus altifrons, Stimpson, Ann. Lyc. Nat. Hist. N. Y. VII. 1862, p. 230.

Grapsus grapsus, Ives, Proc. Ac. Nat. Sci. Philad. 1891, p. 190: Ortmann, Zool. Jahrb. Syst. VII. 1893-94, p. 703: Faxon, Mem. Mus. Comp. Zool., XVIII. 1895, p. 30: Rathbun, Proc. U. S. Nat. Mus. XXI. 1898, p. 604.

Goniopsis picta, De Haan, Faun. Japon. Crust. p. 33, and Krauss Sudafr. Crust. p. 46.

Carapace somewhat discoidal in shape, owing to the curvature of

the sides: its regions well defined: the transverse and oblique ridges are salient, and the surface between the latter is coarsely reticulate.

Front deep and almost vertically deflexed, overhanging the epistome and much concealing the antennules, its free edge crenate.

Length of the epistome one-third or more of its greatest breadth. The tooth at the inner angle of the orbit is blunt.

Chelipeds in the male hardly longer than the carapace, shorter in the female: inner border of ischium and arm strongly spinate, and there are one or two less acute spines at the far end of the outer border of the arm: wrist with fine scattered tubercles on its upper surface, and with its inner angle produced to form a talon-shaped spine: palm nearly as high as long, its outer surface sculptured, its upper border culminating in a tooth: the fingers have very broad rounded tips, and the length of the dactylus in the male is nearly twice the length of the upper border of the palm.

Of the legs the 1st pair are very decidedly the shortest and the 3rd pair the longest, the latter being about twice the length of the carapace: the 4th pair are longer than the first by a dactylus, and shorter than the 2nd by about two-thirds of a dactylus. Only in the last pair of legs does the breadth of the merus approach half the length of the same joint: the far end of the upper border of the merus is spine-like and there are usually 2 or 3 spines at the far end of the lower border.

In the Indian Museum are 18 specimens from the Laccadives, the Andamans, the Coromandel coast, and Ceylon. The carapace of a large specimen is 64 millim. long and 68 millim. broad.

83. *Grapsus strigosus* (Herbst).

Cancer strigosus, Herbst, Krabben, III. i. p. 55, pl. xlvii. fig. 7. *Grapsus strigosus*, Bosc, Hist. Nat. Crust. I. p. 203: Latreille, Hist. Nat. Crust. et Ins., VI. p. 70, *etc.*: Milne Edwards, Hist. Nat. Crust. II. 87: Gay, Hist. Fis. Chili, III. Zool. p. 168: Dana, U. S. Expl. Exp. Crust. pt. I. p. 338: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 169: Stimpson, Journ. Bost. Soc. Nat. Hist. VI. 1857. p. 466: Kinahan, Journ. Roy. Soc. Dubl. I. 1858, p. 340: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 102: Hess, Archiv f. Nat. XXXI. 1865, i. pp. 147, 171: Heller, Novara Crust. p. 47: A. Milne Edwards, Nouv. Archiv. du Mus. IV. 1868, p. 71 and IX. 1873, p. 286 (*ubi synon.*): Hilgendorf in v. d. Decken's Reis. Ost-Afr. III. i. p. 87: Hoffmann, in Pollen & Van Dam, Faun. Madag. Crust. p. 20, pl. v. fig. 31: Lockington, Proc. Calif. Acad. VII. 1876, p. 151: Kossmann, Reise roth. Meer., Crust. p. 60: Miers, P. Z. S. 1877, p. 136, and Ann. Mag. Nat. Hist. (5) II. 1878, p. 410: Hilgendorf, MB. Ak. Berl. 1878, p. 808: E. Nauck, Zeits. Wiss., Zool. XXXIV. 1880, p. 32 (*gastric teeth*): Kingsley, Proc. Ac. Nat. Sci. Philad. XXXII. 1880, p. 194: Haswell, Cat. Austral. Crust. p. 97: Miers, Zool. H. M. S. Alert, pp. 518, 544, and Challenger Brachyura, p. 256: Müller, Verh. Nat. Ges. Basel, VIII. p 475: de Man,

Archiv f. Nat. LIII. 1887, i. p. 365, and Journ. Linn. Soc. Zool. XXII. 1888, p. 148: Cano, Boll. Soc. Nap. III. 1889, p. 236: Walker, Journ. Linn. Soc., Zool., XX. 1886–1890, p. 110: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 390: de Man, Zool. Jahrb. Syst. IX. 1895–97, p. 80: Ortmann, Zool. Jahrb., Syst., 1893–94, p. 705: Wedenissow, Bull. Soc. Ent. Ital. 1894, p. 415.

Grapsus albo-lineatus, Lamarck, Hist. Nat. Anim. Sans Vert. V. p. 249 (*fide* Edw.).

Gonioposis flavipes, Macleay, Ill. Ann. S. Africa, p. 66, and Krauss, Sudafr. Crust. p. 46 (*apud* Miers).

Goniopsis strigosa, De Haan, Faun. Jap. Crust. p. 33: Macleay, *loc. cit.*: Krauss, *loc. cit.*

Grapsus granulosus, *pelagicus*, and *Peroni*, Milne Edwards, Ann. Sci. Nat. (3) XX. 1853, p. 169 (*fide* A. M. E.).

The chief differences between this species and *G. grapsus* are the following:—

The branchial grooves of the carapace are not so well cut, the transverse and oblique ridges are low and smooth, and the surface between the oblique ridges is quite smooth.

The front is not so deep and is obliquely deflexed, hardly overhanging the epistome and not concealing the antennules, and its free edge is not so distinctly crenulate. The tooth at the inner angle of the orbit is subacute. The length of the epistome is not nearly a third its greatest breadth.

In the chelipeds, the tooth at the inner angle of the wrist is nearly straight, not talon-like, the length of the upper border of the palm is nearly two-thirds the length of the dactylus, and the tips of the fingers are not so broad and blunt.

In the legs the meropodite is broader, its greatest breadth being half its length. Moreover the difference in size between the 1st and 4th pairs of legs is much less marked.

In the Indian Museum are 76 specimens, from the Baluchistan and Sind coast, the Malabar coast, Ceylon, the Coromandel coast, the Arakan and Tenasserim coast, Mergui, the Andamans, and the Nicobars.

The carapace of the largest specimen (a female) is 59 millim. long and 63 millim. broad.

Geograpsus, Stimpson.

Geograpsus, Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 101; Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, pp. 188, 195: Miers, Challenger Brachyura, p. 260.

Orthograpsus, Kingsley, *l. c.* pp. 188, 194.

Closely resembles *Grapsus*, but differs in the following important particulars:—

The carapace is more quadrate, the sides being very little arched, it is also broader and less depressed. The lobe at the inner inferior

angle of the orbit is not so completely isolated. The antennal peduncle is not so massive, nor is its "urinary tubercle" conspicuous. The epistome is shorter fore and aft, and is much less well defined.

The chelipeds are altogether of a different type, being vastly more massive than the legs, and in the adult male at least as long as the longest legs: the fingers are pointed. Though the dactyli of the legs are thorny, they are not so closely covered with thorns, nor are the thorns so coarse, as in *Grapsus*. Between the coxæ of the 2nd and 3rd pair of legs is a narrow fossa fringed with hair leading to the branchial cavity.

The two Indian species of the genus are land-crabs and are found in the jungles of the Andaman and Nicobar islands and in the villages of the Laccadive islands. They are extremely vigilant and active.

84. *Geograpsus Grayi* (Edw.).

Grapsus Grayi, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 170.

Geograpsus rubidus, Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 103.

Geograpsus Grayi, A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 288: Miers, Phil. Trans. 1879, p. 489, and Zool. H. M. S. Alert, pp. 518, 545, and Challenger Brachyura, p. 261: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 196: Richters, in Mobius, Meeresf. Maurit. p. 156: Haswell, Cat. Austral. Crust. p. 98: Ortmann, Zool. Jahrb., Syst., VII. 1893-94, p. 707: de Man, Zool. Jahrb., Syst. IX. 1895-96, p. 80: Nobili, Ann. Mus. Genov. (2) XX. 1899, p. 266.

Carapace subquadrilateral, a little convex, the lateral borders well defined anteriorly, ill defined and slightly convergent posteriorly: transverse markings fine, curved or oblique on the branchial regions, almost invisible on the gastric region.

The four tubercles along the line of flexion of the front are not salient; the edge of the front in a dorsal view is concave. The notch near the outer end of the lower border of the orbit is small and narrow. The epistome is rather ill defined.

Chelipeds in both sexes a little unequal: squamiform markings are present but, except on the arm, are indistinct, as also are the scattered granules on the upper surface of the palm. The larger cheliped may be a little under or a little over twice the length of the carapace. The inner border of the ischium is denticulate, the inner border of the arm is expanded to form a dentate lobe, and the inner angle of the wrist is spiniform.

The greatest breadth of the meropodites of the legs is less than half their length. The first pair of legs are slightly shorter than the 4th: the 2nd pair are the longest of all, being about twice the length of the carapace. The last 3 joints of all the legs are bristly.

Colours in life yellow-ochre, the greater part of the dorsum of the carapace livid bluish or purplish.

In the Indian Museum are 24 specimens from the Andamans, Nicobars, and Laccadives.

The carapace of a large male is 40 millim. long and 49 broad.

85. *Geograpsus crinipes* (Dana).

Grapsus crinipes, Dana, Proc. Ac. Nat. Sci. Philad. 1851, p. 249, and U. S. Expl. Exp. Crust., pt. I. p. 341, pl. xxi. fig. 6.

Geograpsus crinipes, Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 101: Heller, Novara Crust. p. 48: Streets, Bull. U. S. Nat. Mus. VII. 1877, p. 115: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 196: Ortmann, Zool. Jahrb., Syst. VII. 1893–94, p. 706: de Man, Zool. Jahrb., Syst. IX. 1895–97, p. 83: Whitelegge, Mem. Austral. Mus. III. 1897, p. 139.

Grapsus rubidus, Hilgendorf, in v. d. Decken's Reisen Ost-Afr. Crust., p. 87, pl. v.: Hoffmann, in Pollen & Van Dam, Faun. Madagasc. Crust. p. 22.

Differs from *G. Grayi* in the following particulars: –

The carapace is quite flat, and the lateral borders, which are thin and well defined throughout their extent, are slightly *divergent* posteriorly: the transverse markings are distinct and *nearly straight*.

The four tubercles along the line of flexion of the front are salient, and the free edge of the front is quite straight. The notch near the outer end of the lower border of the orbit is large, and the lobule external to the notch is denticulate. The epistome is well defined from the palate by a granular or pectinate ridge.

The chelipeds in the male are nearly equal, but in the *female* they are unequal. The squamiform markings on the arm, wrist, and lower portion of the hand are distinct, as also are the vesiculous granules on the upper surface of the palm and dactylus.

The greatest breadth—near the far end—of the meropodites of the last 3 pairs of legs is *more than half* their length.

Colour in life bright red.

In the Indian Museum are 2 males and a female from the Andamans, a male from the Nicobars, and a female from the Laccadives. The carapace of a female is 40 millim. long and 45 broad.

Metopograpsus, Edw.

Metopograpsus, Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 164: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, pp. 188, 190: Miers, Challenger Brachyura, p. 257.

Carapace quadrate, little broader than long, somewhat depressed, the regions not well defined, the branchial groove distinct, fine oblique

grooves are present on the lateral parts of the branchial regions: the antero-lateral, or outer orbital angle, is acute, but there are no teeth on the lateral border behind it.

Front very broad, more than half the extreme width of the carapace, deflexed: along the line of flexion are four depressed lobes, the outer one of which on either side sometimes shows a tendency to split into two.

Orbits of moderate size, occupying the corners of the carapace: the lower border is notched near its outer end: the orbital hiatus is filled by a special lobe which belongs to the inner of the two fossæ into which the orbit is divided and this lobe completely excludes the antennæ from the orbit. The antennules fold nearly transversely in fossæ of good size. The antennæ have a short and slender flagellum: the basal joint of the peduncle is not very massive.

Epistome well defined, but short fore and aft. Buccal cavity square with the anterior corners rounded off. The external maxillipeds leave between them a rhomboidal gap in which the mandibles are exposed: the merus is shorter than the ischium, and carries the coarse palp at or near the antero-external angle.

Chelipeds either subequal or unequal, the larger one much more massive than the legs but shorter than the 2nd and 3rd pairs of these: fingers rather short and stout, with the tip spooned.

Legs broad and compressed, especially as to the merus, which joint—like the arm of the chelipeds—usually has some squamiform markings: the last three joints have bristly edges and the dactylus is thorny.

The abdomen in both sexes consists of 7 separate segments, and in the male its base is as broad as the sternum between the last pair of legs.

An Indo-Pacific genus.

86. *Metopograpsus messor* (Forskal) Edw.

Cancer messor, Forskal, Descrip. Anim. in itin. orient. p. 88. *Grapsus messor*, Milne Edwards, Hist. Nat. Crust. II. 88: Krauss, Sudafr. Crust. p. 43: Hoffmann in Pollen & Van Dam, Faun. Madag. Crust. p. 23: Sluiter, Tijds. Nederl. Ind. XL. 1881, p. 164. *Metopograpsus messor*, Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 165: Heller, SB. Ak. Wien, XLIII. 1861, p. 362, and Novara Crust. p. 44: A. Milne Edwards, Nouv. Archiv. du Mus. IV. 1868, p. 71: Kossmann, Reise roth. Meer., Crust. p. 57: Hilgendorf, MB. Ak. Berl. 1878, p. 808: Miers, Phil. Trans. 1879, p. 489, and Zool. H. M. S. Alert, pp. 184, 245, 518, 545, and Challenger Brachyura, p. 258: de Man, Notes Leyden Mus. II. 1880, p. 183, and Journ. Linn. Soc. Zool. XXII. 1887–1888, p. 144, pl. ix. fig. 11, and Archiv f. Naturges. LIII. 1888, i. p. 361, pl. xv. fig. 6, and in Weber's Zool. Ergebn. Niederl. Ost. Ind. II. p. 314:

Richters, in Mobius, Meeresf. Maurit. p. 156: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 190: Lenz & Richters, Abh. Senck. Nat. Ges. XII. 1881, p. 425: Müller, Verh. Nat. Ges. Basel, VIII. p. 475: Ozorio, Journ. Sci. Nat. Lisb. XI. p. 227: Henderson, Trans. Linn. Soc., Zool., (2) V, 1893, p. 390: Ortmann, Zool. Jahrb., Syst., VII. 1893-94, p. 701: Whitelegge, Mem. Austral. Mus. III. 1897, p. 139: Nobili, Ann. Mus. Genov. (2) XX. 1899, p. 265.

Grapsus Gaimardi, Savigny, Descr. Egypt. Crust. pl. ii. fig. 3.

Metopograpsus Eydouxi and *intermedius*, Milne Edwards, Ann. Sci. Nat., Zool., (2) XX. 1853, p. 165 (*sec.* Kingsley, *l.c.*).

Pachygrapsus æthiopicus, Hilgendorf, in v. d. Decken, Reisen Ost-Afr., Crust. p. 88, pl. iv. fig. 2 (*fide* Kossmann, *l.c.*, and Hilgendorf, *l.c.*).

Carapace about four-fifths as long as broad, the sides distinctly convergent posteriorly; besides the oblique markings on the lateral parts of the epibranchial regions, there are some fine transverse markings on the post-frontal region.

Front about three-fifths the greatest breadth of the carapace, its free edge beaded, thin and prominent but hardly laminar, and slightly sinuous. Orbits little oblique, their major diameter is a little more than a third the width of the front: the inner angle of the lower border is denticulate.

Chelipeds unequal, the length of the larger one about $1\frac{1}{2}$ times that of the carapace: there are wrinkles or squamiform markings on the upper surface of the arm and wrist and—along with some vesiculous granules—on the upper and lower borders of the hand. The inner border of the ischium is denticulate, the inner border of the arm is spinate and is expanded distally to form a laciniate lobe, and there is a spine, which may be double, at the inner angle of the wrist: the fingers have blunt tips, and the dactylus is not very much longer than the upper border of the palm.

Of the legs the 1st pair is the smallest and the 3rd pair the longest —about twice the length of the carapace: in all, the upper border of the merus ends in a spine and the lobe at the far end of the lower border is spinate: in the last three pairs the greatest breadth of the merus is half its length.

The terminal segment of the male abdomen is simply triangular.

In the Indian Museum are 56 specimens, from Karachi, Bombay, the Orissa coast, the Ganges Delta, the Arakan coast, and the Andamans. The carapace of the largest specimen is $23\frac{1}{2}$ millim. long and 30 millim. broad.

87. *Metopograpsus maculatus*, Edw.

Metopograpsus maculatus, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 165: de Man, Journ. Linn. Soc., Zool., XXII. 1887-88, p. 145, pl. x. figs. 1-3.

Distinguished from the only other Indian species by the following characters:—

The carapace is much more elongate, its length being seven-eighths of its breadth, its sides are very markedly convergent posteriorly, and there are no transverse markings on the post-frontal region.

The front is nearly three-fourths the greatest breadth of the carapace, and its free edge is decidedly laminar and nearly straight.

The orbits are oblique: their major diameter is less than a third the breadth of the front and the inner angle of their lower border is not denticulate.

The fingers of the chelæ, though their tips are spooned, are not very blunt: the dactylus is much longer than the upper border of the palm.

Except perhaps in the last pair of legs, the meropodites are narrower, their greatest breadth being decidedly less than half their length.

In the male abdomen the terminal segment has a somewhat three-lobed appearance.

In the Indian Museum are two specimens from Mergui. It seems to me very doubtful whether they are distinct from *M. latifrons*, White (Jukes, Voy "Fly," II. 337, pl. ii. fig. 2).

Pachygrapsus, Randall, Stimpson.

Pachygrapsus, Randall, Proc. Ac. Nat. Sci. Philad. 1839, p. 126: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 166: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 101: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, pp. 188, 198: Miers, Challenger Brachyura, p. 259.

Differs from *Metopograpsus* only in the following particulars:—

(1) the tooth or lobe at the inner angle of the lower border of the orbit is small and does not fill the orbital hiatus, so that the antennæ are not excluded from the orbit; (2) there may be a tooth or two on the lateral border of the carapace immediately behind the outer orbital angle.

Distribution: West Indies eastwards, through the Mediterranean, to the American Pacific coast.

88. *Pachygrapsus minutus*, A. M. Edw.

Pachygrapsus minutus, A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 292, pl. xiv. fig. 2: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 201: de Man, Notes Leyden Mus. V. 1883, p. 158, and Archiv f. Naturges. LIII. 1887. i. p. 368, and Journ. Linn. Soc., Zool., XXII. 1888, p. 148: Cano, Boll. Soc. Nat. Napol. III. 1889, p. 240.

Carapace a good deal broader than long, its whole dorsal surface marked with fine transverse and oblique lines: the lateral borders are

strongly convergent posteriorly, and have no spine behind the acute outer orbital angle.

Front about three-fifths the greatest breadth of the carapace, moderately deflexed, its free edge slightly sinuous. Orbits little oblique, their major diameter more than a third the breadth of the front, their lower border not denticulate.

The chelipeds in the male are subequal and vastly more massive than the legs, and are about twice the length of the carapace, and, except for some squamiform markings on the arm, are smooth: the inner border of the ischium and both borders of the arm are crenulate, and the distal end of the inner border of the arm is expanded to form a denticulate lobe: the inner angle of the wrist is dentiform: the fingers are stout and blunt.

Of the legs the two middle pairs are the longest, being not twice the length of the carapace. In all the last three joints are bristly, and the merus has a spine at the far end of the anterior border and two largish spines at the far end of the posterior border.

The terminal joint of the male abdomen is simply triangular.

A small species: the carapace of the single specimen (from Mergui) in the Indian Museum is 6·5 millim. long and 10 millim. broad.

Subfamily VARUNINÆ.

VARUNA, Edw.

Varuna, Milne Edwards, Dict. Hist. Nat. XVI. p. 511 (1830), and Hist. Nat. Crust. II. 94, and Ann. Sci. Nat. Zool., (3) XX. 1853, p. 176: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, pp. 188, 205: Miers, Challenger Brachyura, p. 265.

Trichopus, De Haan, Faun. Japon. Crust. p. 32.

Carapace very little broader than long, depressed, with thin sharp edges, the regions fairly well indicated. Front a little more than half the breadth of the anterior border and a little more than a third the greatest breadth of the carapace, straight, prominent, sublaminar, little deflexed. Antero-lateral borders of the carapace arched, cut into 3 teeth including the outer orbital angle.

Orbits small, of good depth, their lower border broken and incomplete. The antennules fold obliquely and the interantennulary septum is broad. Antennæ of fair size, standing in the orbital hiatus.

Epistome of good length, well defined. Buccal cavern square. The external maxillipeds gape, but not very widely: their exognath is not nearly as broad as the ischium: their merus is shorter, but anteriorly much broader, than the ischium, its antero-external angle being considerably produced, so that the palp articulates near the middle of the anterior border.

Chelipeds equal, but variable in size. In old males they are considerably longer, and vastly more massive, than the legs: in the female they are shorter, and though stouter are not vastly stouter than the legs. The fingers, though sharp pointed, are a little hollow-tipped.

The legs have the three terminal joints compressed, dilated, and plumed, for swimming: the 2 middle pairs are the longest, the last pair is the shortest.

The abdomen in both sexes consists of 7 separate segments: in the male it does not completely cover the sternum between the last pair of legs.

Distributed throughout the Indo-Pacific, ascending estuaries even into freshwater. Commonly found at sea on drift logs.

89. *Varuna litterata* (Fabr.) Edw.

Cancer litteratus, Fabricius, Ent. Syst. Suppl. p. 342: Herbst, Krabben, III. i. 58, pl. xlviii. fig. 4.

Grapsus litteratus, Bosc, Hist. Nat. Crust. I. p. 203, and Latreille, Hist. Nat. Crust. et Ins. VI. p. 71.

Varuna litterata, Milne Edwards, Dict. d'Hist. Nat. XVI. p. 511.

Trichopus litteratus, De Haan, Faun. Japon. Crust. p. 32: Dana, U. S. Expl. Exp. Crust. pt. I. p. 336, pl. xx. fig. 8.

Varuna litterata, Milne Edwards, Hist. Nat. Crust. II. p. 95, and Ann. Sci. Nat. Zool., (3) XX. 1853, p. 176: Lucas, Hist. Nat. Anim. Artic., Crust., p. 72, pl. iii. fig. 4: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 103: Heller, Novara Crust. p. 51, A. Milne Edwards, Nouv. Archiv. du Mus. IV. 1868, p. 71, and IX. 1873, p. 295: Brocchi, Ann. Sci. Nat. (6) II. 1875, (*male appendages*): Miers, Cat. Crust. New Zealand, p. 40, and Ann. Mag. Nat. Hist. (5) V. 1880, p. 310, and Challenger Brachyura, p. 265: Tozzetti, Magenta Crust. p. 122, pl. viii. figs. 2 *a–g*: Hilgendorf, MB. Ak. Berl. 1878, p. 808: Neumann, Crust. Heidelb. Mus., p. 27: Nauck, Zeits. Wiss. Zool. XXXIV. 1880, p. 29 (*gastric teeth*): Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 205: Sluiter, Tijds. Nederl. Ind. XL. 1881, p. 164: Haswell, Cat. Austral. Crust. p. 103: Filhol, Crust. Nouv. Zel. in Miss. l'ile Campbell, p. 390: de Man, Archiv fur Nat. LIII. 1887, i. p. 371, and in Weber's Zool. Ergebn. Niederl. Ost-Ind. II. 1892, p. 315, and Zool. Jahrb., Syst. IX. 1895, p. 112: Henderson, Trans. Zool. Soc. (2) V. 1893, p. 391: Ortmann, Zool. Jahrb. Syst., VII. 1893–94, p. 718: Max Weber, Zool. Jahrb. Syst. X. 1898, p. 157: Nobili, Ann. Mus. Genov. (2) XX. 1899, p. 267.

Carapace curiously pitted and frosted above, the regions well enough defined by grooves, which in places are broad shallow and uneven; the disposition of these grooves in the middle of the carapace makes a letter H. The borders of the carapace are thin and are sharply defined and finely beaded or milled: the antero-lateral borders are arched and are cut into three teeth, including the outer orbital angle: the postero-lateral boundary of the carapace, on each side, is a distinct facet.

The chelipeds vary, according to sex and age, from a little over once (in the female) to a little over twice (in old males) the length of the carapace. The borders of the arm are denticulated, especially the inner border; the inner angle of the wrist forms a large sharp spine with some spinules at its base; the inner surface of the palm is more or less granular, the outer surface has some fine reticulate markings and —running parallel with the lower border, on to the fixed finger— a raised line: the fingers are stout and strongly toothed, the dactylus being longer than the upper border of the palm.

The 2nd and 3rd pair of legs, which are about equal, are over $1\frac{1}{2}$ times the length of the carapace: the 1st pair are a little more than a dactyl-length, the 4th pair a little less than a dactyl-length longer than the carapace. The only armature of the legs, which are typical swimming paddles, is a subterminal spine on the anterior border of the meropodite.

In the Indian Museum are 63 specimens from the seas of India. The carapace of the largest male is 50 millim. long and 56 millim. broad.

Ptychognathus, Stimpson.

Ptychognathus, Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 104: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, pp. 188, 203: de Man, Zool. Jahrb., Syst., IX. 1895, p. 90.
Gnathograpsus, A. Milne Edwards, Nouv. Archiv. du Mus. IV. 1868, p. 180.
Cœlochirus, Nauck, Zeits. Wiss. Zool. XXXIV. 1880, pp. 30, 66 (*teste* de Man).

Very closely resembles *Varuna*, from which it differs only in the following particulars:—

(1) the exopodite of the external maxillipeds is of remarkable breadth, being at least as broad as, and usually much broader than, the ischium of those appendages:

(2) the regions of the carapace are not always so well defined.

(3) the dactyli of the legs, though compressed, are not so broad.

Distribution: Islands of the Indo-Pacific, entering fresh water above any tidal influence.

Key to the Indian species of Ptychoynathus.

I. Carapace hardly broader than long: front prominent, straight or hardly sinuous: the antennules fold very obliquely:—
  1. Teeth of the antero-lateral border sharp and salient: regions of the carapace fairly well defined: fingers of the female chelæ nude:—
    i. Inner angle of the wrist dentiform, but not produced: a large shaggy patch of hairs on the inner surface of the hand of the male... *P. dentata.*

ii. Inner angle of the wrist produced to form a long spine: a patch of hair on the outer surface of the hand of the male, near the finger cleft ..... *P. onyx.*

2. Teeth of the antero-lateral border not salient, inconspicuous: regions of the carapace not, or hardly, indicated:—

i. A subterminal patch of bristles on the outer surface of the fixed finger of the female..... *P. andamanica.*

ii. Fingers of female nude ..... *P. pusilla.*

II. Carapace decidedly broader than long: front little prominent and decidedly sinuous: the antennules fold nearly transversely ..... *P. barbata.*

90. *Ptychognathus dentata*, de Man.

Ptychognathus dentatus, de Man, in Weber's Zool. Ergebn. Niederl. Ost-Ind. II. 1892, p. 318, pl. xviii. fig. 9.

Carapace inappreciably broader than long, flat but not particularly depressed, its regions quite distinct, as also are the cervical and branchial groves and a pair of post-frontal tubercles: on the posterior part of each epibranchial region, obliquely parallel with the postero-lateral borders, is a fine ridge.

Front prominent, laminar, nearly straight, its extent is two-fifths the greatest breadth of the carapace.

Antero-lateral borders of the carapace cut into three sharp salient teeth, of which the first is much the largest, and the third much the smallest.

Upper border of the orbit very sinuous. The antennules fold very obliquely. Anterior border of the buccal cavern not granular, but having a median horizontal tooth.

Exognath oval, with a smooth and strongly convex surface: its greatest breadth in the male is more than twice that of the ischiognath, but in the female is only a little more than that of the ischiognath.

Chelipeds of the male more than $1\frac{1}{2}$ times the length of the carapace, smooth: inner angle of the wrist acute, but not spiniform: palm higher than long, inflated at the postero-inferior angle, and having a tussock of hairs in the middle of its inner surface: dactylus more than twice the length of the upper border of the palm, longer slenderer and less strongly toothed than the fixed finger: both fingers though hollowed at the tip are sharp-pointed. In the female the chelipeds are about as long as the carapace; the inner angle of the wrist is spiniform; the palm is not swollen and is nude, and its outer surface is traversed, near the lower border, by a fine raised line which extends nearly to the tip of the fixed finger.

The 2nd and 3rd pairs of legs are about $1\frac{4}{5}$ times, the 1st pair are not quite $1\frac{1}{2}$ times, and the 4th pair are are not $1\frac{1}{3}$ times, the length of the carapace: on the anterior border of the merus of the first three pairs is a subterminal spine.

The sidewall of the carapace and the basal joints of the legs have little tomentum.

In the Indian Museum are 2 males and an egg-laden female from "the Bay of Bengal" and 2 young females from Upper Tenasserim.

The carapace of the largest male is 19 millim. long and not quite 20 millim. in its greatest breadth.

91. *Ptychognathus onyx*, n. sp.

Very closely related to *P. spinicarpus*, Ortm., and to *P. Polleni* and *affinis*, de M., if these species are distinct.

This species very nearly resembles *P. dentata*, from which it differs, young males being compared with females of the same size, only in the following particulars:—

(1) the carapace though otherwise similar is much thinner and more depressed and its markings are not quite so distinct:

(2) in the middle of the anterior border of the buccal cavern is a slight prominence, but no distinct tooth:

(3) the exognath (*in the young male*) is, as in the female of *P. dentata*, but little broader than the ischiognath:

(4) in the chelipeds of the young male the inner angle of the wrist is produced to form a long spine; there is no hair on the inner surface of the palm, but on the outer surface, in the finger-cleft and extending along the fixed finger, there is a tuft of hair; the outer surface of the palm also, as in the female of *P. dentata*, is traversed, close to the lower border, by a raised line, which runs to the tip of the fixed finger; finally the fingers are blunter, and the dactylus is only about twice as long as the upper border of the palm.

Practically the chief distinction between this species and *P. dentata* is that in the male of this species the inner angle of the wrist forms a long spine, and the hair is on the outside instead of on the inside of the hand.

In the Indian Museum are two young males probably from Tavoy. The carapace is a little over 12 millim. long and 13 millim. broad.

92. *Ptychognathus andamanica*, n. sp.

Closely related to *P. pusilla*, of which it may be an Andaman variety.

Carapace not much broader than long, quite flat, much depressed, the regions are hardly indicated, even when the carapace is quite dry,

but the H-shaped mark in the middle is always plainly visible, the whole surface is closely and finely punctate: there are no post-frontal tubercles, but on the posterior part of either epibranchial region there is a fine line running obliquely-parallel with the postero-lateral borders.

Front prominent, laminar, slightly sinuous, its extent is two-fifths the greatest breadth of the carapace.

The antero-lateral borders are cut into 3 not very acute or distinct lobes (including the outer orbital angle), of which the first is much the largest, and the last much the smallest.

Upper border of the orbit slightly sinuous: the antennules fold very obliquely. The anterior border of the buccal cavern is granular and a little concave.

The exognath is long and elliptical; its breadth in the female, is nearly twice that of the ischiognath.

The chelipeds in the female (male unknown) are about as long as the carapace, and their outer surface is very finely reticulate-granular: inner angle of wrist pronounced, but not spiniform: palm without hair, but there is a characteristic brush of stiffish hair at the tip of the fixed finger on its outer surface. The fingers have broad tips, especially the fixed finger, which is stouter and more strongly toothed than the dactylus: the dactylus is about twice as long as the upper border of the palm: the outer surface of the palm and fixed finger is traversed, near the lower border, by a fine raised granular line.

The legs have not much tomentum on the basal joints, but the anterior border of the meropodites is rather thickly fringed: the subterminal denticle on the anterior border of the meropodites is small, blunt, inconspicuous, or obsolescent. The 2nd and 3rd pair of legs, which are the longest, are about $1\frac{1}{2}$ times, the 1st pair are not $1\frac{1}{4}$ times, and the 4th pair are little more than once, the length of the carapace.

In the Indian Museum are two young females from a freshwater stream at the base of Saddle Hill in North Andaman Island. Their colour is dark mottled green. The carapace is a little over 13 millim. long and about 14 millim. broad.

93. *Ptychognathus pusilla*, Heller.

Ptychognathus pusillus, Heller, Novara Crust. p. 60: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880. p. 204: de Man, Notes Leyden Mus. V. 1883, p. 161, and Zool. Jahrb. Syst. IV. 1888–89, p. 440, and in Weber's, Zool. Ergebn Niederl. Ost-Ind. II. p. 325, and Zool. Jahrb. Syst. IX. 1895, p. 99, and X. 1898, pl. xxviii. fig. 22: Ortmann, Zool. Jahrb., Syst. VII. 1893–94, p. 712.

This species, which was first found in the Nicobar Islands, is not represented in the Museum collection and I have never seen it.

94. *Ptychognathus barbata* (A. M. Edw.).

Gnathograpsus barbatus, A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 316, pl. xvii. fig. 4.

Ptychognathus barbatus, Ortmann, Zool. Jahrb. Syst. VII, 1893-94, p. 712: de Man, Zool. Jahrb., Syst., IX. 1895, p. 105.

Carapace decidedly broader than long, flat, depressed, the regions indistinct: the two postfrontal tubercles are fairly distinct, but there is no distinct raised line on the posterior part of the epibranchial regions, running obliquely parallel with the posterior borders, such as is present in all the other Indian species. There is a good deal of tomentum on the sides of the carapace.

Front decidedly sinuous, not prominent, its extent is a little more than two-fifths the greatest breadth of the carapace.

The antero-lateral borders of the carapace are cut into 3 not very conspicuous teeth (including the outer orbital angle) of which the first is much the largest and the third much the smallest, as usual.

Upper border of the orbit little sinuous: the antennules fold nearly transversely. Anterior border of the buccal cavern finely granular.

The exognath is elliptical, with a slightly convex surface: in the male its greatest breadth is more than that of the ischiognath, in the female it is slightly narrower than in the male.

Chelipeds in the male about $1\frac{2}{3}$ times the length of the carapace, the inner angle of the wrist little pronounced; the hand massive, with a tuft of hair in the finger-cleft and running some little distance along the outer surface of both fingers; the fingers are rather blunt, the dactylus, which is about twice the length of the upper border of the palm is longer slenderer and less strongly toothed than the fixed finger, against which it closes rather obliquely. In the female the chelipeds are about as long as the carapace and are not very massive, the inner angle of the wrist is dentiform, there is no hair on the hand or fingers, and the outer surface of the hand and fixed finger is traversed near the lower border by a raised line.

The leg-joints are less expanded and less abundantly plumed than in the other Indian species, and there is no subterminal spine on the anterior border of the meropodites. The 2nd and 3rd pairs of legs are about $1\frac{2}{3}$ times, the 1st pair about $1\frac{1}{2}$ times, and the last pair a little over once, the length of the carapace.

In the Indian Museum are 3 specimens from Diamond Island off the Pegu coast and from Akyab, (besides numerous specimens from Samoa). The carapace of an apparently adult male is 11 millim. long and 14 millim. broad.

Pyxidognathus, A. M. Edw.

Pyxidognathus, A. Milne Edwards, Bull. Soc. Philom. Paris (7) III. 1878, p. 109: de Man, Notes Leyden Mus. V. 1883, p. 160, and Journ. Linn. Soc., Zool., XXII. 1888, p. 148.

Hypsilograpsus, de Man, Notes Leyden Mus. I. 1879, p. 72 (*ipso teste*).

This genus is closely related to *Varuna* and *Ptychognathus*. It differs from *Varuna* in the same particulars that *Ptychognathus* does, that is to say, the exognath of the external maxillipeds is much broader than the ischiognath, and the dactyli of the legs though compressed are not dilated. It further differs, both from *Varuna* and *Ptychognathus* in the following characters:—

(1) the carapace is decidedly transverse, is deep, and is dorsally strongly convex in both directions: it is also anteriorly declivous with the front deflexed, and its antero-lateral borders are hardly arched:

(2) the antennules fold transversely:

(3) the lower border of the orbit is complete, except of course at the orbital hiatus:

(4) the carpopodites and propodites of the legs are not particularly broad.

Distribution: Indo-Pacific in fresh or brackish water.

Key to the Indian species of Pyxidognathus.

I. A single spine on the posterior border of the meropodites of the legs ..... *P. fluviatilis.*

II. More than one spine on the posterior border of the meropodites of the legs ..... *P. deianira.*

95. *Pyxidognathus deianira*, de Man.

Pyxidognathus deianira, de Man, Journ. Linn. Soc., Zool., XXII. 1888, p. 148, pl. x. figs. 4-6.

Carapace about $\frac{3}{4}$ as long as broad, convex, smooth, without distinction of regions excepting a faintish H-shaped mark in the middle. Free edge of front sinuous or four-lobed, as in the next species.

Antero-lateral borders of the carapace cut into three prominent acute teeth (including the outer orbital angle), the first of which is the largest, and the last of which is spine-like.

Upper border of orbit slightly sinuous, lower border finely denticulate.

Exognath of the external maxillipeds, in the male, very much broader than the ischiognath, and having a smooth convex surface.

Chelipeds in the young male about $1\frac{1}{2}$ times the length of the carapace: inner border of ischium, arm, and wrist denticulate; inner angle of

wrist spiniform; the upper border of the palm is granulate, a finely beaded raised line traverses the lower part of the outer surface of the palm and fixed finger, and there is a very short series of granules near the middle of the inner surface of the palm: the palm is nearly as high as long, and the dactylus is much longer than the upper border of the palm and closes against the fixed finger by the tip only.

The 2nd pair of legs, which are the longest, are not much short of twice the length of the carapace; the 4th pair, which are the shortest, are but little longer than the carapace. In all the legs, the meropodite has some fine rugosities on its upper surface, a spine near the far end of the anterior border, and some spines on the posterior border—these being most numerous in the case of the 4th pair of legs: and in all, the edges of the 3 terminal joints are hairy but not plumose, nor are these joints broadened or compressed.

In the Indian Museum are two very small male specimens from Mergui.

96. *Pyxidognathus fluviatilis*, n. sp.

Carapace transverse, markedly convex, finely punctate, the regions indicated only by an H-shaped mark in its centre.

Front between two-fifths and a third the greatest breadth of the carapace, deflexed, sinuous or four-lobed, the two middle lobes broad, the outer lobes (= inner orbital angles) subacute.

Antero-lateral borders of the carapace slightly arched, cut into three prominent acute teeth (including the outer orbital angle) of which the first is the largest and least acute, and the third is spine-like.

Orbits of good depth, the upper border slightly sinuous, the lower border defined by a granular ridge running close behind the prominent denticulated ridge that bounds the infra-orbital region of the carapace.

Anterior border of buccal cavern prominent, finely crenulate. Exognath in the female broader than the ischiognath, and having a smooth convex surface.

Chelipeds in the female about as long as the carapace, more massive than the legs: inner angle of wrist acuminate: a raised line runs along the outer surface of the palm and fixed finger, close to the lower border: fingers rather sharp though spooned at tip, dactylus hardly twice the length of the upper border of the palm, longer and rather less strongly toothed than the fixed finger.

All the leg-joints are plumed, and all the dactyli are long compressed and recurved. In all the legs there is a very strong spine in the distal

half of the posterior border of the meropodite, and in the first 3 pairs there is a smaller subterminal spine on the anterior border of the same joint. The 2nd and 3rd pairs of legs are about $1\frac{3}{4}$ times, the 1st pair are not quite $1\frac{1}{2}$ times, and the 4th pair are about $1\frac{1}{4}$ times the length of the carapace.

Colour mottled dark green. A single female was found clinging to the floats of a fisherman's net in the R. Ichamutty above Bongong in the Jessore District: its carapace is 15 millim. long and 19 millim. broad.

The legs are obviously adapted for swimming, and the recurved dactyli and spiny meropodites appear to be adaptations to a swift current.

The chief difference between this species and *P. deianira*—the female of the former being compared with the male of the latter—is that in this species the three terminal joints of the legs are more compressed and the posterior border of the meropodites is armed with a single spine.

Sub-family Sesarminæ, Dana.

Sesarma, Say.

Sesarma, Say, Journ. Acad. Nat. Sci. Philad. I. 1817, p. 76: Milne Edwards, Hist. Nat. Crust. II. 71, and Ann. Sci. Nat. Zool. (3) XX. 1853, p. 181: A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 301: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 213: Miers, Challenger Brachyura, p. 269: de Man, Zool. Jahrb., Syst., II. 1886–87, p. 641 and IX. 1895–97, p. 128: Bürger, Zool. Jahrb., Syst., VII, 1893–94, p. 613.

Pachysoma, De Haan, Faun. Japon. Crust., p. 33.

Holometopus, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 187.

Carapace squarish or actually square (the sides being straight and usually nearly parallel), usually deep (though occasionally shallow and much depressed), seldom very convex: the gastric region is almost always very well delimited, and is commonly divided into 5 subregions, and in most cases the 4 antero-lateral subregions project as 4 prominent post-frontal tubercles.

The side-walls of the carapace have everywhere a characteristic fine-meshed reticulate texture as regular as that of a sieve. This appearance is due to a multitude of small uniform granules arranged in pairs in close-set parallel rows: between each pair of granules is a little row of bristles, one of which in each row is long and points diagonally forwards.

The front occupies half, or more, of the anterior border of the carapace, and is obliquely or vertically deflexed.

The orbits, which occupy the rest of the anterior border of the carapace, are oval and of good depth: below their outer angle is a deepish gap leading into a system of grooves which open into a notch at the antero-lateral angle of the buccal cavern. At the inner angle of the orbit is the usual tooth, belonging to the inner of the two fossæ into which (as in all the crabs of this subfamily) the orbit is so plainly divided. The eyes are of no great length.

The antennules fold nearly transversely into rather narrow fossæ: the inter-antennular septum is very broad.

The antero-external angle of the 2nd joint of the antennal peduncle is a good deal produced: the antennal flagellum, which is slender and rather short, lies in the orbital hiatus.

Epistome well defined, prominent, rather short fore and aft. Buccal cavern square. The external maxillipeds leave between them a large rhomboidal gap, which is a good deal filled up by a hairy fringe: they are obliquely traversed, from a point behind the antero-external angle of the ischium to the antero-internal angle of the merus, by a conspicuous line or crest of hairs: the palp, which is rather coarse, is attached to the rounded summit of the obliquely-directed merus.

Chelipeds massive—not always so in the female—usually subequal, of no great length: palm high and short, the fingers though subacute, are hollowed at the tip.

The legs do not usually differ very markedly in length, though the third pair are the longest and the first and last (4th) pairs the shortest: the meropodites are thin, and are usually, but not always, broad.

The abdomen in both sexes consists of 7 separate segments: in the male it occupies the whole breadth of the sternum between the bases of the last pair of legs. In both sexes the second segment, as well as the exposed portion of the first, are narrow fore and aft. In the female the last segment is small and narrow from side to side, and is more or less impacted in the broad 6th segment: in the male also the last segment is much narrower than the one that precedes it.

Distribution: all tropical and subtropical seas: not found in the Mediterranean.

I am not inclined to adopt the subgenera proposed by Dr. de Man, although I must admit that his system is convenient in practice, for identifying species.

I may also mention here that specific distinctions based merely on the sculpture of the dactylus of the male chelæ are inadmissible, as the sculpturing frequently differs in the two fingers of the same individual.

Key to the Indian species of Sesarma.

I. Carapace deepish, its length decidedly less than its breadth between the antero-lateral angles, its sides nearly parallel—never markedly divergent posteriorly :—

1. The inner border of the arm bears, near its far end, a large acute tooth: on the upper surface of the palm of the male are at least two characteristic *oblique* comb-like ridges: the upper surface of the movable finger of the male is milled :—

i. Posterior border of the meropodites of the legs entire :—

a. No tooth on the lateral border of the carapace behind the orbital angle :—

α. Front more than half the extent of the anterior border of the carapace..... *S. quadratum.*

β. Front exactly half the extent of the anterior border of the carapace..... *S. pictum.*

b. A tooth on the lateral border of the carapace, behind the orbital angle ..... *S. bidens.*

ii. Distal end of the posterior border of the meropodites of the legs acutely serrate (no tooth behind the outer orbital angle)... ..... *S. Andersoni.*

2. The inner border of the arm does not end in a large spine or acute lobe, though it may be a little dilated distally: there are no oblique pectinated ridges on the upper surface of the palm, and the upper surface of the movable finger of the male though it may be granular is not milled :—

i. A tooth at the inner angle of the wrist (a tooth on the lateral border of the carapace behind the orbital angle) :—

a. The breadth of the carapace between the antero-lateral angles is equal to, or more than, the breadth between the epibranchial teeth..... *S. Edwardsi.*

b. The breadth of the carapace between the antero-lateral angles is decidedly less than the breadth between the epibranchial teeth, the sides of the carapace being markedly sinuous..... *S. Meinerti.*

ii. No spine at the inner angle of the wrist :—

a. Carapace and appendages not uniformly tomentose: two acute teeth—the second of which is hardly visible—on the lateral border, behind the acute orbital angle..... *S. intermedium.*

b. Carapace and appendages covered with a short but very dense fur, amid which are prominent tubercle-like tufts of hair: lateral borders cut into three blunt lobes (including the orbital angle) of equal size..... *S. lanatum.*

II. Carapace nearly square, its length being little less than its breadth between the antero-lateral angles: the inner border of the arm ends in an acute serrated lobe: a very finely pectinated ridge traverses the upper surface of the palm, fore and aft, close to the upper border: (a tooth on the lateral border of the carapace behind the orbital angle):—

1. Carapace deep, its sides nearly parallel: a transverse granular ridge on the inner surface of the palm: dactyli of the legs of good length:—
   i. Upper border of movable finger of male with an elegantly milled crest of 40 to 60 fine lamellæ..... *S. tæniolatum.*
   ii. Upper border of movable finger of male with a coarsely crenulate crest..... *S. tetragonum.*
2. Carapace shallow and depressed, its sides divergent posteriorly: no transverse granular crest on the inner surface of the palm: dactyli of the legs short: (a milled crest of about 25 very fine lamellæ on the upper border of the movable finger of the male)..... *S. Brockii.*

III. Carapace somewhat elongate (its length being decidedly more than its breadth at the antero-lateral angles), shallow and depressed:—

1. No tooth on the lateral border of the carapace behind the orbital angle: legs with remarkably broad meropodite and remarkably short propodite: upper border of movable finger of male with an elegantly milled crest of about 40 fine lamellæ..... *S. latifemur.*
2. Two teeth on the lateral border behind the orbital angle: movable finger without any milling:—
   i. Post-frontal tubercles of the gastric region serrated: legs with meropodites of good breadth and dactyli of good length..... *S. politum.*
   ii. Post-frontal tubercles smooth: legs with rather narrow meropodites and short dactyli..... *S. oceanicum.*

IV. The length of the carapace is just equal to its breadth at the antero-lateral angles: legs long and slender, with elongate dactyli:—

1. Carapace shallow, depressed, perfectly square, its sides quite parallel: two little teeth on the lateral border behind the orbital angle..... *S. Finni.*
2. Carapace deepish, its sides strongly divergent posteriorly where its breadth is much greater than its length: two teeth (not including the orbital angle)

on the lateral border, the posterior one being very small :—

i. Third pair of legs not three times the length of the carapace..... *S. longipes.*

ii. Third pair of legs more than three-and-a-half times the length of the carapace..... *S. kraussi.*

97. *Sesarma quadratum* (Fabr.).

Cancer quadratus, Fabricius, Ent. Syst. Suppl. p. 341.

Ocypoda quadrata, Bosc, Hist. Nat. Crust. I. p. 198.

Ocypoda plicata, Latreille, Hist. Nat. Crust. &c. VI. p. 47.

Sesarma quadrata, Milne Edwards, Hist. Nat. Crust. II. 75, and Ann. Sci. Nat., Zool., (3) XX. 1853, p. 183.

Sesarma quadratum, A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 302 : Miers, Phil. Trans. Vol. 168, 1879, p. 490.

Sesarma quadrata, Richters, in Mobius' Meeresf. Maurit. p. 157 : Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 217 : Lenz and Richters, Abh. Senck. Nat. Ges. XII. 188, p. 425 : de Man, Zool. Jahrb. Syst. II. 1887, p. 655, pl. xvii. fig. 2 and p. 683, and IV. 1889, p. 434, and IX. 1895–97, pp. 181, 182, and Notes Leyden Mus. XII. 1890, p. 99, and in Weber's Zool. Ergebn. Niederl. Ost-Ind. II. p. 328 : Thallwitz, Abh. Mus. Dresden, 1890–91, No. 3, p. 37 : Henderson, Trans. Linn. Soc. Zool., (2) V. 1893, p. 392 : Ortmann, Zool. Jahrb. Syst. VII. 1893–94, p. 724.

Grapsus (*Pachysoma*) *affinis*, De Haan, Faun. Jap. p. 66, pl. xviii. fig. 5.

Sesarma affinis, Krauss, Sudafr. Crust. p. 45 : Milne Edwards, Ann. Sci. Nat. Zool. (3) XX., 1853, p. 183 : Heller, Novara Crust. p. 62 : de Man, Notes Leyden Mus. II. 1880, p. 22 : Miers, Ann. Nag. Nat. Hist. (5) V. 1880, p. 312 : Kingsley, *l.c. supra*, p. 213 : Ortmann, *l.c. supra*, p. 724.

Sesarma ungulata : Milne Edwards, Ann. Sci. Nat., Zool. (3) XX. 1853, p. 184 : Kingsley, *l.c. supra*, p. 218.

Sesarma aspera, Heller, Novara Crust. p. 63, pl. vi. fig. 1 : Kingsley, *l.c. supra*, p. 214 : Müller, Verh. Nat. Ges. Basel, 1886, p. 476 : de Man, Zool. Jahrb. II. 1887, p. 656 and Journ. Linn. Soc. Zool. XXII. 1887–88, p. 169.

Sesarma melissa, de Man, Zool. Jahrb. Syst., II. 1887, p. 656, and Journ. Linn. Soc., Zool., XXII. 1888, p. 170, pl. xii. figs. 5–7, and Zool. Jahrb. Syst., IV. 1889, p. 434.

Carapace hardly convex, decidedly broader than long, its length being about four-fifths its breadth between the antero-lateral angles, deep ; the 4 post-frontal lobes prominent equal and a little rugose transversely, the rugæ being sparsely tufted with hair ; the cardiac and intestinal regions very much less distinct than the gastric : some oblique striations on the epibranchial regions.

Front decidedly more than half the greatest breadth of the carapace, not very deep, its free margin usually but slightly sinuous. Lateral borders of carapace nearly parallel, a little divergent anteriorly, without any tooth behind the acute orbital angle.

The chelipeds differ in the sexes, being about $1\frac{3}{4}$ times the length

of the carapace in the male and much more massive than the legs, but in the female hardly $1\frac{1}{3}$ times the length of the carapace and not more massive than the legs. In both sexes the outer surface of the arm wrist and palm are granular, the granules on the arm and wrist having a squamiform arrangement, the inner border of the arm bears a subterminal spine of large size, the upper border of the arm ending in a much smaller spine, the inner angle of the wrist is not dentiform, and the inner surface of the palm is more or less granular. In the male the palm is a little swollen below and has, on its upper surface, some short oblique crests, of which two are most elegantly pectinated: in the female the palm is not swollen and the crests are simply granular. The dactylus is less than twice the length of the upper border of the hand (palm) and its dorsal surface is elegantly milled with from 11 to 19 blunt, rather coarse, transverse lamellæ: in the female this milling is incomplete and very indistinct. In neither sex is there any great gap between the closed fingers.

The meropodites of the legs are foliaceous, their greatest breadth in the 2nd and 3rd pairs being more than half their length, their anterior border ends at an acute subterminal spine, and their dorsal surface has some fine transverse squamiform sculpture. The anterior border of the last three joints of the legs, and part of the posterior border of the last two, is fringed with tufts of bristles. The 3rd pair of legs, which are slightly the longest, are about twice the length of the carapace, and their dactylus is about three-fourths the length of their propodite.

In the Indian Museum are 42 specimens from both coasts of the Peninsula, Ceylon, the Andamans and the Nicobars.

In a male of good size the carapace is 16 millim. long and 20 millim. broad.

98. *Sesarma pictum*, De Haan.

Grapsus (*Pachysoma*) *pictus*, De Haan, Faun. Japon. Crust. p. 61, pl. xvi. fig. 6.

Sesarma picta, Krauss, Sudafr. Crust. p. 45: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 184: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 106: de Man, Notes Leyden Mus. II. 1880, p. 22, and Zool. Jahrb., Syst., II. 1887, p. 657, and IX. 1895–97, pp. 181, 182, and Journ. Linn. Soc., Zool., XXII. 1888, p. 171: Bürger, Zool. Jahrb., Syst., VII. 1893–94, p. 626: Ortmann, Zool. Jahrb., Syst., VII. 1893–94, p. 725.

Agrees with *S. quadratum* in everything but the following particulars:—

(1) the carapace is not so broad, its length being about five-sixths of its breadth between the antero-lateral angles:

(2) the front is not so broad, its extent being only half the breadth of the carapace:

(3) the meropodites of the legs are not so broadly foliaceous, their greatest breadth, in the middle two pairs, being less than half their length.

The Indian Museum possesses a single specimen from Mergui.

99. *Sesarma bidens* (De Haan).

Grapsus (Pachysoma) bidens, De Haan, Faun. Japon. Crust. p. 60, pl. xvi. fig. 4, and pl. xl. fig. 4.

Sesarma bidens, Dana, U. S. Expl. Exp. Crust. pt. I. p. 353: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 185: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 105: Heller, Novara Crust. p. 64: Hilgendorf, in v. d. Decken's Reisen Ost-Afr., Crust., p. 91, pl. iii. fig. 3*a*: Hoffmann, in Pollen & Van Dam, Faun. Madag. Crust. p. 24: Miers, Ann. Mag. Nat. Hist. (5) V. 1880, p. 313, and Zool. H. M. S. Alert, pp. 184, 246: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 214: de Man, Notes Leyden Mus. II. 1880, p. 28, and Zool. Jahrb., Syst., II. 1887, p. 658, and in Weber's Zool. Ergebn. Niederl. Ost-Ind. II. p. 330: Lenz & Richters, Abh. Senck. Nat. Ges. XII. 1881, p. 425: Bürger, Zool. Jahrb., Syst., VII. 1893–94, p. 628: Ortmann, *ibid.* p. 726: Nobili, Ann. Mus. Genova (2) XX. 1899, p. 269.

Sesarma Dussumieri, Milne Edwards, *l. c. supra*: Tozzetti "Magenta" Crust. p. 145, pl. ix. figs. 3 *a-f*: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 215: de Man, Zool. Jahrb. Syst. II. 1887, p. 659, and IX. 1895-97, p. 208, and Journ. Linn. Soc., Zool., XXII. 1888, p. 177, pl. xii. figs. 8–12: Ortmann, Zool. Jahrb., Syst., VII. 1893–94, p. 726.

Sesarma lividum, A. Milne Edwards, Nouv. Archiv. du Mus., V. 1869, Bull. p. 25, and IX. 1873, p. 303, pl. xvi. fig. 2: Brocchi, Ann. Sci. Nat., Zool., (6) II. 1875, Art. 2, p. 83 (*male appendages*): Kingsley, *tom. cit. supra*, p. 216: de Man, Archiv. f. Naturges. LIII. 1887, i. p. 381, pl. xvii. fig. 1, and Zool. Jahrb. Syst. II. 1887, p. 659, and Journ. Linn. Soc., Zool., XXII. 1888, p. 180.

Sesarma Haswelli, de Man, Zool. Jahrb., Syst., II. 1887, p. 658, and Journ. Linn. Soc., Zool., XXII. 1888, p. 175.

This species very closely resembles *S. quadratum*, from which it differs in the following characters:—

(1) there is a small sharp tooth on the lateral border of the carapace, immediately behind the outer orbital angle:

(2) the carapace is slightly less transverse (though decidedly broader than long):

(3) the transverse ridges on the upper surface of the dactylus of the male chelæ are coarser and shorter and more tubercle-like.

In the Indian Museum are 52 specimens from the coasts of the Bay of Bengal, Andamans, Nicobars and Ceylon.

100. *Sesarma Edwardsi*, de Man.

Sesarma Edwardsi, de Man, Zool. Jahrb., Syst., II. 1887, p. 649, and Journ. Linn. Soc., Zool., XXII. 1888, p. 185, pl. xiii. figs. 1–4: Ortmann, Zool. Jahrb., Syst., VII. 1893-94, p. 721.

Differs from *S. quadratum* in the following particulars:—

(1) the carapace is squarer and less transverse, and the four post-frontal lobes of the gastric region are more prominent; the front also is slightly, but distinctly, broader:

(3) there is a sharp tooth on the lateral border of the carapace immediately behind the antero-lateral angle:

(3) the upper border of the arm does not end in a spine, and though there may be a slight subterminal dilatation of the crenulated inner border of the arm there is *no large spine:*

(4) there is a *sharp tooth or spine just below the inner angle of the wrist:*

(5) the upper surface of the wrist and outer surface of the palm are covered—usually very closely covered—with vesiculous tubercles; and there are smaller and sharper tubercles on the upper surface of the dactylus and the lower surface of the fixed finger of the chelæ:

(6) there are no oblique pectinated crests on the palm:

(7) *the male abdomen is singularly broad.*

In the Indian Museum are 126 specimens, most of which came from the Burma coast from Arakan to Tavoy, the rest from the Gangetic delta, the Andamans and Ceylon.

In the variety separated by de Man as *crassimana* the abdomen is not quite so broad as it is in the typical form, and the palm of the male is larger and more swollen.

101. *Sesarma intermedium* (De Haan).

Grapsus (*Pachysoma*) *intermedius*, De Haan, Faun. Japon. Crust. p. 61, pl. xvi. fig. 5.

Sesarma intermedia, Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 186: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 105: Heller, Novara Crust. p. 64: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 216: Miers, Ann. Mag. Nat. Hist. (5) V. 1880, p. 314: de Man, Notes Leyden Mus. II. 1880, p. 25, and Zool. Jahrb., Syst., II, 1887, p. 649, and Journ. Linn. Soc., Zool., XXII. 1888, p. 182: Ortmann, Zool. Jahrb. Syst. VII. 1893–94, p. 721.

Differs from *S. quadratum* in the following particulars:—

(1) the carapace is more quadrate and less transverse, the post-frontal lobes are less prominent and much smoother, and the front is broader:

(2) there is a tooth—and sometimes also a second rudimentary tooth—on the lateral border immediately behind the orbital angle:

(3) there is no large subterminal spine on the inner border of the arm, nor does the upper border end in a spine:

(4) in the corner of the upper surface of the palm there are in the male some oblique granular lines, but no pectinated crests; and on the inner surface of the palm there is a conspicuous transverse granular crest:

(5) the upper surface of the dactylus of the male chelæ is granular in its proximal half, but is not milled with transverse lamellæ.

From *S. Edwardsi* it is distinguished by numerous characters, but the absence of a spine at the inner angle of the wrist is sufficiently characteristic.

In the Indian Museum are 5 specimens from Mergui.

102. *Sesarma Meinerti*, de Man.

Sesarma Meinerti, de Man, Zool. Jahrb., Syst., II. 1887, pp. 648, 668, and IX. 1895-97, p. 166: Bürger, Zool. Jahrb. Syst. VII. 1893-94, p. 617, and Ortmann, *ibid.* p. 720.

Sesarma tetragona, Edw. (*nec* Fabr.), Milne Edwards, Hist. Nat. Crust. II. 73, and Ann. Sci. Nat., Zool., (3) XX. 1853, p. 184: A. Milne Edwards, Nouv. Archiv. du Mus. IV. 1868, p. 71, and IX. 1873, p. 304, pl. xvi. fig. 4: Hilgendorf, in v. d. Decken's Reisen Ost-Afr., Crust. p. 90: Hoffmann, in Pollen & Van Dam, Faun. Madag. Crust. p. 23: Hilgendorf, MB. Ak. Berl. 1878, p. 809: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 218.

Carapace convex, especially fore and aft, a little broader than long, deep: the 4 post-frontal lobes prominent, unequal—the outer ones being much narrower than the middle pair; the cardiac and intestinal regions are quite distinct, and the usual oblique striations are found on the epibranchial regions: the whole dorsal surface of the carapace is rather profusely covered with tufts of hair.

Front decidedly more than half the greatest breadth of the carapace, which is just behind the orbital angles, not very deep, its free edge sinuous. Lateral borders of the carapace somewhat sinuous, armed with a large tooth behind the orbital angle: there may even be a trace of a second epibranchial tooth.

Chelipeds subequal, almost equally massive in both sexes, about twice as long as the carapace. The outer surface of the arm and wrist is finely rugose, that of the palm is only pitted: neither the upper nor the inner border of the arm end in a tooth: inner angle of wrist pronounced but not dentiform: no pectinated crests of any kind on the palm: the fingers are a good deal arched and meet only at tip, the upper surface of the dactylus in the male has a row of inconspicuous denticles: on the inner surface of the palm there is an oblique granular crest.

The meropodites of the legs are foliaceous, but their breadth is not twice their length; but otherwise the legs are as in *S. quadratum*.

The abdomen of the male is decidedly narrow.

In the Indian Museum are 26 specimens from the Andamans and one from Madras. The carapace of a large one is 33 millim. long and 38 millim. broad: in the female the carapace is not so broad.

103. *Sesarma Andersoni*, de Man.

Sesarma Andersoni, de Man, Zool. Jahrb., Syst., II. 1887, p. 657, and Journ. Linn. Soc. Zool. XXII. 1888, p. 172, pl. xii. figs. 1–4.

Carapace moderately deep, hardly convex, considerably broader than long, the four post-frontal lobes of the gastric region only moderately prominent, nearly equal, pitted; the cardiac and intestinal regions faintly indicated; the oblique striations of the epibranchial regions very sharp and distinct, one of them almost projects beyond the lateral border as a tooth behind the orbital angle.

Front more than half the greatest breadth of the carapace, not very deep, its free margin a little convex but nearly straight. The lateral borders of the carapace are slightly convergent posteriorly: except for the afore-mentioned projection of the first branchial ridge there is no tooth behind the orbital angle.

Chelipeds much larger in the male than in the female, but the difference is not so marked as in *S. quadratum*. The inner border of the arm ends in a very acute denticulated lobe: the palm is traversed on the outer surface, near the lower border, by a fine raised line, and on the upper surface in the male are numerous short parallel oblique striæ one of which at least is most elegantly pectinate: in the female these crests are less numerous and less distinct: the upper surface of the dactylus of the male is milled, the lamellæ increasing in size and coarseness from behind forwards.

At the distal end of the posterior border of the meropodites of the legs are three or four strong spines, decreasing in size from behind forwards, but there is no subterminal spine on the anterior border: in other respects, except that the dactyli are slightly shorter, the legs are very similar to those of *S. quadratum*. The male abdomen is broad.

In the Indian Museum are 8 specimens from Mergui: the carapace of the largest is 7 millim. long and 9 millim. broad.

104. *Sesarma lanatum*, n. sp.

Carapace deepish, dorsally flat, everywhere covered, as also are the appendages, with a dense fur amid which are freely scattered little dense

adherent tufts of hair resembling tubercles. When this covering is removed the surface of the carapace is smooth and polished, with the gastric region and its four post-frontal tubercles distinct.

The length of the carapace is considerably less than its breadth between the antero-lateral angles.

Front a little more than half the breadth of the carapace, obliquely deflexed, its free margin nearly straight. The lateral borders of the carapace are nearly parallel and anteriorly are cut into three blunt lobes of nearly equal size—including the outer orbital angle.

The chelipeds when denuded have a smooth surface and sharp borders: they are similar in the two sexes, except that they are much more massive in the male. There is a blunt angular projection at the far end of the inner border of the arm, the inner angle of the wrist is pronounced but not dentiform, and the upper border of the palm is traversed fore and aft by a fine sharp crest: in the male the palm is at least as high as long: the upper border of the dactylus is faintly crenulate in its proximal two-thirds.

The meropodites of the legs are foliaceous, but their breadth is less than half their length: their borders are entire. The dactyli of the legs are claw-like, their length being about three-fourths that of the propodites.

The abdomen of the male is narrow.

In the Indian Museum are 4 specimens from Bombay and Karachi: the carapace of the largest is 8½ millim. long and 10 millim. broad.

105. *Sesarma tæniolatum*, White.

Sesarma tæniolatum, White, List Crust. Brit. Mus. p. 38 (1847): Miers, P. Z. S. 1877, p. 137, and Ann. Mag. Nat. Hist. (5) V. 1880, p. 313: de Man, Notes Leyden Mus. II. 1880, p. 26: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 218: de Man, Zool. Jahrb., Syst., II. 1887, pp. 647, 666, and IX. 1895-97, p. 166, and Journ. Linn. Soc., Zool., XXII. 1888, p. 181, and in Weber's Zool. Ergebn. Niederl. Ost-Ind. II. p. 330: Bürger, Zool. Jahrb., Syst., VII. 1893-94, p. 615, and Ortmann, *ibid.* p. 720.

Sesarma Mederi, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 185: Tozzetti, "Magenta" Crust. p. 136, pl. ix. figs. 1 *a–i*.

Carapace deep, nearly flat dorsally, square, its length being slightly less than its breadth between the antero-lateral angles. All the regions are quite well defined, and the 4 post-frontal tubercles—the middle two of which are not very much broader than the outer ones—are very prominent. The whole dorsum of the carapace is covered with tufts of hair, which are largest and longest anteriorly. There are some oblique striæ on the sides of the epibranchial regions.

Front half, or a little more than half, the breadth of the carapace,

not very deep, its free margin strongly sinuous. Lateral borders of the carapace nearly parallel, armed with one acute tooth behind the acute outer orbital angle.

The chelipeds are similar in the two sexes, except that they are a good deal more massive and more sharply sculptured in the male. They are not quite twice the length of the carapace: the outer surface of the arm and wrist are granular-rugose, the outer surface of the palm is granular, and there is a transverse granular ridge on the inner surface of the palm: the upper border of the arm is crest-like and ends in a sharp tooth, and the distal end of the inner border forms an acute angular serrate lobe: the inner angle of the wrist is dentiform: close to and nearly parallel with the upper border of the palm runs a fine and very finely and evenly pectinate crest: along the upper border of the dactylus runs a very elegantly milled crest of from 40 to 60 fine teeth. In the male the palm is at least as high as long, the fingers meet only at tip, and the dactylus is about twice the length of the upper border of the palm.

The meropodites of the legs are foliaceous, but their greatest breadth is not quite half their length: there is a sharp subterminal spine on their anterior border only. The dactyli of the legs are two-thirds, or more, the length of the propodites. The 3rd pair of legs, which are the longest, are a little more than twice the length of the carapace.

In the Indian Museum are 9 specimens, from Mergui, the Andamans, and Penang. The carapace of a large specimen is nearly 38 millim. long and nearly 40 broad.

106. *Sesarma tetragonum* (Fabr.).

Cancer tetragonus, Fabricius, Ent. Syst., Suppl. p. 341.

Cancer fascicularis, Herbst, Krabben etc. III. i. 49, pl. xlvii. fig. 5.

Sesarma tetragona, de Man, Zool. Jahrb., Syst., II. 1887, p. 646: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 392.

This species closely resembles *S. tæniolatum*, from which it differs in the following characters:—

(1) the carapace is slightly broader:

(2) the subterminal lobe of the inner border of the arm is smaller, while the tooth at the inner angle of the wrist is more pronounced:

(3) the fine striated crest along the upper border of the palm is shorter:

(4) the crest of the upper surface of the movable finger of the chelæ is coarsely crenulate.

In the Indian Museum are 8 specimens from Ceylon, Madras, the Mahanaddi Delta, and the Ganges Delta. The carapace of a large one is 40 millim. long and 43 millim. broad.

107. *Sesarma Brockii*, de Man.

Sesarma Brockii, de Man, Zool. Jahrb., Syst., 1887, p. 651, and IX. 1895-97, p. 171, and Archiv f. Naturges. LIII. 1887, i. p. 373, pl. xvi. fig. 3: Thallwitz, Abhand. Zool. Mus. Dresden, 1890-91, No. 3, p. 39: Ortmann, Zool. Jahrb., Syst., VII. 1893-94, p. 721.

Resembles *S. tæniolatum*, but differs in the following characters:—

(1) the carapace is *shallow* and much depressed, its length is just equal to its breadth between the antero-lateral angles, its dorsal surface is not so hairy, and its sculpture though similar is not so deeply cut: the front is not so sinuous.

(2) the lateral borders of the carapace are *slightly divergent* posteriorly, and there are *two* teeth—the posterior of which is, however, extremely small—behind the outer orbital angle:

(3) no subterminal spine on the upper border of the arm: no transverse granular crest on the inner surface of the palm:

(4) the milled crest along the upper border of the dactylus of the chelæ is lower and has only about 25 teeth:

(5) the legs are longer, their meropodites are narrower and their dactyli—except in the case of the 1st pair of legs—are *barely half the length of their propodites.*

In the Indian Museum there is a young male from the Andamans. In this specimen the chelipeds are not massive and are very little longer than the carapace.

108. *Sesarma latifemur*, n. sp.

Closely related to *S. elongatum*, A. M. Edw.

This species belongs to the same natural group as *S. tæniolatum*, from which it differs only in the following characters:—

(1) the carapace is *shallow* and much depressed, and its length is decidedly *more* than its breadth between the antero-lateral angles, its dorsal surface is not quite so hairy and its post-frontal lobes are deeper cut:

(2) the lateral borders of the carapace are decidedly *divergent* posteriorly and have no tooth behind the orbital angle:

(3) the male chelipeds are little longer than the carapace: the crest-like upper border of the arm does not end in a spine: the inner

angle of the wrist, though well pronounced, is not spiniform: the transverse beaded ridge on the inner surface of the palm is very short:

(4) the dactylus of the chelæ is not nearly twice the length of the upper border of the palm, and the milled crest on its upper surface consists of not more than 40 teeth:

(5) the meropodites of the legs are remarkably foliaceous, their greatest breadth, in the case of the 2nd and 3rd pairs, being more than half their length: all the leg joints are thinner and flatter:

(6) the dactyli of the legs are remarkably short, their length, in the case of the 2nd and 3rd pairs, being *less than half* the length of their propodites.

In the Indian Museum is a single male from the Andamans: its carapace is nearly 35 millim. long, and a little over 30 millim. broad across the antero-lateral angles.

109. *Sesarma politum*, de Man.

Sesarma polita, de Man, Zool. Jahrb. Syst. II. 1887, p. 654: Journ. Linn. Soc., Zool., XXII. 1888, p. 189, pl. xiii. figs. 7–9.

Carapace shallow and much depressed, a good deal longer than broad, all the regions well defined: the four post-frontal lobes of the gastric subregions are deep-cut and very prominent, their anterior overhanging edges are serrated and their surface bears some transversely arranged sharpish tubercles: the two middle lobes are decidedly larger than the outer ones. There are no oblique striæ on the epibranchial regions.

Front more than half the breadth of the carapace, its free margin markedly sinuous. The lateral borders of the carapace are nearly parallel though slightly sinuous: there are two well cut teeth behind the outer orbital angle.

Chelipeds equal, and not so very much longer than the carapace: the outer surface of the arm wrist and hand are closely beset with small tubercles, which in places have a squamiform look, and the inner surface of the palm is granular but has no transverse ridge: the inner and outer borders of the arm, the inner border of the wrist, and the upper border of the palm and movable finger are conspicuously serrulate, and there is also a noticeable dilatation near the far end of the inner border of the arm. There are no pectinated crests of any sort on the palm, and the fingers—both surfaces of which are smooth and polished—have no large gap between them when closed.

The legs are shortish, the 3rd pair being hardly $1\frac{2}{3}$ times the length

of the carapace, and rather slender. The meropodites are nearly three times as long as broad, they have a subterminal spine on the anterior border and in the case of the 1st pair their posterior border is distinctly serrulate. The dactyli are rather short, their length, in the third pair, being less than two-thirds the length of the propodite: they are remarkably tomentose.

In the Indian Museum there is a single specimen from Mergui: its carapace is 38 millim. long and 35 millim. broad.

110. *Sesarma oceanicum*, de Man.

Sesarma oceanica, de Man, Zool. Jahrb., Syst., IV. 1889, p. 429, pl. x. fig. 9, and Notes Leyden Mus. XIII. 1891, p. 52.

Carapace shallow, depressed, its length greater than its breadth between the antero-lateral angles; all the regions are fairly well defined and the 4 post-frontal lobes of the gastric subregions are prominent, the middle pair being more than twice as broad as the two outer ones: the surface of the carapace is granular anteriorly and punctate posteriorly, and near the sides are numerous short oblique striæ.

Front half the breadth of the carapace, deepish, its free margin a a little sinuous: orbits not at all oblique: the lateral borders of the carapace have a slight, but distinct, convex curve, and there are two teeth—the posterior of which is extremely small—behind the outer orbital angle.

Chelipeds equal, not much longer than the carapace: the outer surface of the arm and wrist are rugose and both surfaces of the palm are studded with sharpish granules: there is a small angular lobe near the far end of the inner border of the arm, and the inner angle of the wrist is dentiform: the palm is not quite as high as long, close to and nearly parallel with its upper border is a fine and finely granular ridge: the dactylus is about half as long again as the upper border of the palm, and there are some sharpish granules along its upper surface.

The legs are slender: their meropodites are more than three times as long as broad and are not foliaceous, they have a subterminal spine on the anterior border only: their dactyli are shortish, those of the 3rd pair being less than two-thirds the length of their propodites, and are densely plumed: the 3rd pair of legs are about $2\frac{1}{3}$ times the length of the carapace.

In the Indian Museum is a single specimen from the Nicobars: its carapace is 20 millim. long, and 16·5 millim. across the antero-lateral angles.

111. *Sesarma Finni*, n. sp.

Near *S. maculata*, de Man.

Carapace shallow, depressed, flat, perfectly square, its length being equal to its breadth at the antero-lateral angles and its sides being parallel: the regions are indicated, but not emphasized, and the 4 post-frontal lobes are sharply prominent, the middle pair being much broader than the outer ones.

Front half the breadth of the carapace, deepish, its free edge nearly straight: two little teeth on the lateral border of the carapace, behind the outer orbital angle.

In the chelipeds of the female the outer surface of the arm wrist and hand are granular; the upper border of the arm ends acutely, and the inner border ends in a spine; the inner angle of the wrist is pronounced, but is not dentiform; and the upper surface of the palm is traversed, fore and aft, close to the upper border, by a fine and finely milled ridge.

Legs long and slender, the 3rd pair being more than $2\frac{1}{2}$ times the length of the carapace: their meropodites are not foliaceous, being about three times as long as broad, and they have a subterminal spinule on the anterior border only: their dactyli are long and slender, those of the 3rd pair being more than three-fourths the length of the propodite: the propodites and dactyli of all the legs are fringed with short stiff sharp bristles.

The species is represented by a small female from the Andamans: its carapace is not quite 11 millim. in either diameter.

112. *Sesarma longipes*, Krauss.

Sesarma longipes, Krauss, Sudafr. Crust. p. 44, pl. iii. fig. 2: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 199: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 216: de Man, Zool. Jahrb., Syst., II. 1887, p. 651.

The length of the carapace is equal to its breadth at the antero-lateral angles, but as the lateral borders of the carapace diverge considerably, from before backwards, the *greatest* breadth of the carapace (at the level of the 2nd pair of legs) is considerably more than the length.

Carapace deepish, very slightly convex; its regions are not very well defined, but the median longitudinal groove of the gastric region is deep, and the 4 post-frontal lobes are sharply prominent, the middle pair being much broader than the outer ones.

Front half the extent of the anterior border of the carapace, the free margin slightly sinuous: the divergent lateral borders of the carapace have a tooth of good size behind the outer orbital angles.

Chelipeds in the female not half as long again as the carapace: the outer surface of the arm and wrist are rugulose, and both surfaces of the palm are studded with sharpish granules: the upper border of the arm ends acutely, but there is no spine at the end of the inner border; the inner angle of the wrist is pronounced, almost dentiform; there are no granular or pectinated crests of any kind on the palm: the fingers are little bent and leave no large gap between them when closed, there are some sharpish granules along the upper border of the dactylus, and along the lower border of the fixed finger.

The legs are remarkably uneven in length, the third pair being more than $2\frac{1}{2}$ times the length of the carapace; the meropodites are not exactly foliaceous, their greatest breadth being hardly two-fifths of their length, and they have a subterminal spine on the anterior border only; the dactyli are remarkably long, those of the third pair being as long as their propodites.

In the Indian Museum are 2 females from the Andamans: the carapace of the larger one is 18 millim. long and 20 millim. in its greatest breadth posteriorly.

113. *Sesarma Kraussi*, de Man.

Sesarma Kraussi, de Man, Zool. Jahrb., Syst., II. 1887, p. 652, and Journ. Linn. Soc., Zool., XXII. 1888, p. 193, pl. xiv. figs. 1–3.

Differs from *S. longipes*, which it closely resembles, in the following characters:—

(1) the four post-frontal lobes are not so prominent, the outer ones, indeed, being very inconspicuous:

(2) the free edge of the front is more sinuous, owing to the depth of the median notch:

(3) there are two distinct teeth on the lateral border of the carapace, behind the outer orbital angle:

(4) the outer surface of the wrist and both surfaces of the palm are nearly smooth, and there is a row of sharp granules along the *outer* surface of the fixed finger: the upper border of the arm does not end acutely:

(5) the legs are even longer and slenderer, the 3rd pair being more than $3\frac{1}{2}$ times the length of the carapace: the meropodites of the legs are at least 3 times as long as broad.

In the Indian Museum is a single male from the Nicobars: its carapace is 9 millim. long and 11 millim. in greatest breadth.

Heller ("Novara" Crust. pp. 64, 65) includes the following species in the Indian fauna:—

S. Eydouxi, Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. p. 184 (Madras).

S. indica, Milne Edwards, *tom. cit.* p. 186 (Ceylon, Nicobars).
S. gracilipes, Milne Edwards, *tom. cit.* p. 182 (Nicobars).

Sarmatium, Dana.

Sarmatium, Dana, Silliman's Amer. Journ. Sci. (2) XII. 1851, p. 288, and Proc. Ac. Nat. Sci. Philad. 1851, p. 251, and U. S. Expl. Exp. Crust. pt. I. p. 357: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 212: de Man, Zool. Jahrb., Syst, II, 1887, p. 659.
Metagrapsus, Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 188.

This genus, which I almost agree with Dr. de Man in regarding as only a subgenus of *Sesarma*, differs from *Sesarma* in the following particulars:—

(1) the front, instead of being abruptly and vertically deflexed, is gradually declivous and obliquely deflexed:

(2) the antero-lateral borders of the carapace are usually a little arched, instead of being in the same straight line with the postero-lateral borders:

(3) the abdomen of the male does not completely coincide with the breadth of the sternum at the level of the 5th pair of legs; and in the female the terminal segment is not deeply impacted in the penultimate segment.

Distribution: West Indies, West coast of Africa, Indo-Pacific.

114. *Sarmatium crassum*, Dana.

Sarmatium crassum, Dana, Proc. Ac. Nat. Sci. Philad. 1851, p. 251; U. S. Expl. Exp. Crust. pt. I. p. 358, pl. xxiii. figs. 1 *a–d*: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 189: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 212: de Man, Zool. Jahrb. Syst. II. 1887, p. 660.

Carapace deep, broader than long, broader behind than in front, smooth, with very faint indications of regions and no oblique striæ on the epibranchial regions: of the post-frontal lobes the two middle ones alone are distinct, and they are not prominent, they occupy almost all the space between the orbits.

The front is half the extent of the anterior border of the carapace, its free edge is very little concave in the middle line. The antero-lateral borders of the carapace are distinctly arched and are cut into 2 broad blunt lobes (one of which is the orbital angle) followed by a small tooth.

Chelipeds "of male short, hand above transversely four to five-plicate, externally nearly smooth, moveable finger with four short rudiments of spines, carpus mostly smooth, a few seriate granules above." In the female the transverse plications of the upper surface of the hand are very indistinct and the dactylus is smooth.

Legs not much compressed: the meropodites are not broadened, there is a spinule at the distal end of their anterior border: the dactyli are slender but are shorter than the propodites.

In the Indian Museum is a young female from the Nicobars: its carapace is 8 millim. long and 9 broad.

Henderson (Trans. Linn. Soc., Zool., (2) V. 1893, p. 393) describes a variety of *Sarmatium indicum* (Milne Edwards, Nouv. Archiv. du Mus. IV. 1868, p. 174, pl. xxvi. figs. 1–5) from Cochin.

Metasesarma, Edw.

Metasesarma, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 188: Kingsley, Proc. Acad. Nat. Sci. Philad. 1880, p. 211: de Man, Zool. Jahrb., Syst. IX. 1895–97, p. 128.

The most marked difference between this genus and *Sesarma*, which it closely resembles, is that the tooth at the inner angle of the orbit meets the thickened angle of the front, so as to completely exclude the antennæ from the orbit.

The regions of the carapace are not defined, and the post-frontal tubercles are inconspicuous: the front is vertically deflexed as in *Sesarma*, but is deeper and overhangs the epistome: the reticulate appearance of the pterygostomian and neighbouring regions is finer, closer, and more confused: the orbits are more open below: the antennæ are much smaller: the legs are not so broad and compressed.

The *Metasesarmata* are land and fresh-water crabs of the Indo-Pacific region.

115. *Metasesarma Rousseauxii*, Edw.

Metasesarma Rousseauxii, Milne Edwards, Ann. Sci. Nat., Zool. (3) XX. 1853, p. 188, and Archiv. du Mus. VII. 1855, p. 158, pl. x. figs. 1 *a-c*: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 211: de Man, Zool. Jahrb., Syst., IV. 1889, p. 439, and IX. 1895–97, p. 138, and X. 1898, pl. xxix. fig. 28, and in Weber's Zool. Ergebn. Niederl. Ost-Ind. II. p. 350: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 392: Ortmann, Zool. Jahrb., Syst., VII. 1893–94, p. 717.

Sesarma Aubryi, de Man (*nec* A. M. Edw.), Journ. Linn. Soc., Zool., XXII. 1888, p. 168.

Carapace deepish, a little broader than long, smooth to the naked eye, slightly convex fore and aft: a short semilunar groove separates the gastric from the cardiac region, and there is a median longitudinal post-frontal groove of some depth: the middle pair of post-frontal tubercles are distinct, though not prominent, but the outer ones are hardly distinguishable.

Front a little more than half the breadth of the carapace, vertical, deep, somewhat spathulate, the free edge convex and very slightly sinuous.

Sides of the carapace slightly curved and convergent posteriorly, no tooth behind the outer orbital angle.

The chelipeds are longer and more massive in the male, but are otherwise similar in both sexes: in the male they are less than $1\frac{1}{2}$ times the length of the carapace. To the naked eye they are smooth, except for a patch of vesiculous granules in the middle of the inner surface of the palm. The inner angle of the wrist is sharply pronounced, and the upper border of the palm and of the base of the dactylus have a few small blunt serrulations. The palm is as high as long, the dactylus is about $1\frac{1}{2}$ times the length of the upper border of the palm, the fingers, though a little hollowed at tip, are subacute and have no gap between them when closed.

Legs rather slender, smooth and unarmed to the naked eye: the meropodites are not broadened: the dactyli are as long as their propodites and like them are fringed with dark spine-like bristles. The 3rd pair of legs, which are the longest, are less than twice the length of the carapace.

In the Indian Museum are 61 specimens from the Andamans and Nicobars, Mergui, Ganges Delta, Madras, and Minnikoy (Laccadives). Many of the specimens were taken on land, hiding under timber, in which situation their curious mottled coloration must be protective. The largest specimen has a carapace 14 millim. long by nearly 17 broad.

Clistocœloma, A. M. Edw.

Clistocœloma, A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 310: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 219.

Differs from *Sesarma* only in the following characters:—

(1) the tooth at the inner angle of the lower border of the orbit meets the front, as in *Metasesarma*, so as to completely exclude the antennæ from the orbit:

(2) the reticulation of the sidewalls of the carapace resembles that of *Sesarma*, but, on denudation, the lines of granules are found to be absent, so that the meshwork is made up of hairs entirely:

(3) the merus of the external maxillipeds is shorter.

From *Metasesarma* this genus is distinguished by the lobulation of the dorsum of the carapace and the dentate lateral borders.

If *Metasesarma* is to be classed as a subgenus of *Sesarma* as it has been, and with undoubted reason, by Dr. de Man, the same course might be taken with *Clistocœloma*.

116. *Clistocœloma balansæ*, Edw.

Clistocœloma balansæ, A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 311, pl. xvii. fig. 1.

The whole body and the appendages, except the tips of the dactyli of the legs, are everywhere covered with a dark dense adherent fur, amid which, on the dorsal aspect, are numerous clumps of tomentum that look like tubercles: the legs, in addition, have a shaggy fringe of coarse hair.

Carapace square, as long as broad, somewhat depressed: when denuded it is smooth and polished, with all the regions well defined and boldly and symmetrically lobulated, and the post-frontal lobes prominent, the outer ones being again subdivided into two tubercles.

Front much more than half the breadth of the carapace, nearly vertically deflexed, deepish, its free margin sinuous and turned up to form a trenchant horizontal edge.

The lateral borders of the carapace are cut, anteriorly, into three lobes including the outer orbital angle.

Chelipeds subequal, nearly similar in size in both sexes, not more massive than the legs, shorter even than the 1st pair of legs, which are little longer than the carapace. When denuded they are smooth, except that the upper surface of the wrist is a little lumpy: the inner border of the arm is a little convex distally, but does not expand into an undoubted lobe: the palm is higher than long, but is by no means swollen or massive, and in the male only its upper surface is traversed, obliquely fore and aft, as close as possible to the upper border, by a fine microscopically-pectinate crest: the fingers are subacute, though slightly hollowed at tip, and have no wide gap between them when closed, and the fixed finger is shorter and deeper than the dactylus, the dactylus is nearly twice as long as the upper border of the palm, and in the male its upper border is milled with about 14 or 15 lamellæ.

Legs markedly unequal: the third pair, which are the longest, are not quite twice as long as the carapace. In all, the meropodites are thin and broad, and the dactyli are not two-thirds as long as their propodites.

In the Indian Museum are a male and two females from the Nicobars. The carapace of the largest is 19 millim. in either diameter.

117. *Clistocœloma merguiense*, de Man.

Clistocœloma merguiensis, de Man, Journ. Linn. Soc., Zool., XXII. 1888, p. 195, pl. xiii. fig. 10, and Notes Leyden Mus. XII. 1890, p. 92: and Zool. Jahrb., Syst., IX. 1895-97, p. 339, and X. 1898, pl. xxxi. fig. 40.

This species differs from *C. balansæ* in the following particulars:—

(1) the carapace is decidedly broader than long, its lobulations are not nearly so bold and convex, and the outer post-frontal lobules may be entire:

(2) the free edge of the front is not turned up to form a trenchant horizontal crest, although it is well defined:

(3) the chelipeds of the male are far more massive than any of the legs; the inner border of the arm is dilated distally; the palm is a good deal swollen, the pectinate crest that traverses its upper surface is longer, and its inner surface is more granular; the fingers are more widely separated when closed, and the lamellar tubercles along the upper border of the dactylus are more numerous:

(4) it is a smaller species.

In the Indian Museum are 10 specimens from the Nicobars: the carapace of the largest egg-laden female is 10 millim. long and 12 broad.

Metaplax, Edw.

Metaplax, Milne Edwards, Ann. Sci. Nat. Zool. (3) XVIII. 1852, p. 161.

Rhaconotus, Gerstaecker, Archiv f. Naturges. XXII. 1856, i. p. 140, and Kingsley, Proc. Ac. Nat. Sci. Philad., 1880, p. 213.

Metaplax, de Man, Journ. Linn. Soc., Zool., XXII. 1888, pp. 153–155.

Carapace quadrilateral, somewhat depressed, a good deal broader than long, the regions well or fairly defined and the cervical and branchial grooves distinct.

Front declivous, its breadth about a third or a fourth that of the carapace, the convexity of its free edge impinges on the epistome to help in forming the broad interantennulary septum.

Lateral borders of the carapace straight, or a little arched anteriorly, nearly parallel, cut into 4 or 5 teeth of which the last one or two are very inconspicuous. The posterior part of the sidewalls of the carapace with some hairs curving towards the incurrent branchial opening.

Orbits of good depth: their outer wall incomplete, their lower border crenulate: the eyes do not fill the orbits and the eyestalks are not prolonged.

The antennules fold nearly transversely: the septum between them is broad. The antennæ lie in the orbital hiatus, their basal joint is extremely short, their flagellum is of fair length.

Epistome short, but well defined and prominent: buccal cavern squarish: the external maxillipeds leave between them a large rhomb-

oidal gap, in which the mandibles are exposed: a broad oblique groove, bounded internally by a line of hairs, runs from a point behind the antero-external angle of the ischium to the anterior edge of the merus: the merus is truncated, and the foliaceous propodite articulates near its antero-external angle.

The chelipeds differ very markedly in the sexes: in the female they are shorter and slenderer than the legs, but in the male they are longer and much more massive than the legs. In the male there is always a short oblique horny crest, either on or close to and parallel with, the inner border of the arm, as in many species of *Macrophthalmus*: it probably, as Dr. de Man suggests, is scraped against the lower border of the orbit to produce a musical sound.

Legs slender, the first and last pairs much shorter than the 2nd and 3rd pairs—the 3rd pair the longest.

The abdomen in the male does not quite cover the sternum between the bases of the last pair of legs: it may have all 7 segments distinct, or, rarely, the 3rd 4th and 5th segments may be fused together: in the female all 7 segments are separate and the 7th is small and deeply impacted in the 6th, as in *Sesarma*.

Distribution: Estuaries and mudflats of the Oriental littoral.

The species of *Metaplax* have many points of resemblance with the Ocypodoid genus *Macrophthalmus*, and this is all the more likely to lead to confusion as the two genera share the same habitat and have the same manner of life; but there is no doubt of the true position of *Metaplax* among the *Sesarminæ*.

Key to the Indian species of Metaplax.

I. Anterior border of carpi and propodites of legs spiny: chelipeds in the male 3 times the length of the carapace..... *M. crenulata.*

II. Anterior border of carpopodites and propodites of legs smooth: male chelipeds less than 3 times the length of the carapace:—

1. Dactylus of chelæ of male without any prominent lobe on its dentary edge: chelipeds of male equal:—

i. 3rd 4th and 5th abdominal segments fused together in the male..... *M. indica.*

ii. All the abdominal segments separate:—

a. Length of the carapace about three-fourths the breadth: orbital portion of lower border of orbit with 4 or 5 teeth... *M. dentipes.*

b. Length of the carapace less than three-fourths the breadth: orbital portion of lower border of orbit with 9 or 10 teeth... *M. distincta.*

Dactylus of chelæ of male with a prominent lobe projecting on the dentary edge: chelipeds of male markedly unequal :—

i. Palm of larger cheliped of male longer than high. *M. elegans.*

ii. Palm of larger cheliped of male higher than long. *M. intermedia.*

118. *Metaplax indica*, Edw.

Metaplax indicus, Milne Edwards, Ann. Sci. Nat., Zool., (3) XVIII. 1852, p. 161, and Archiv. du Mus. VII. 1855, p. 165, pl. xi. figs. 2–2c.

Carapace about two-thirds as long as broad, deepish, a little convex, its surface smooth, the regions and the cervical and epibranchial grooves faint.

Front about a third the greatest breadth of the carapace. Lateral borders of the carapace nearly straight, cut into 4 teeth, of which the first 2 are large, the 3rd very small, and the 4th very inconspicuous.

Lower border of the orbit of the male continued to the level of the first notch in the lateral border of the carapace, unevenly crenulate.

Chelipeds of the male equal, more than $2\frac{1}{2}$ times the length of the carapace, smooth and unarmed, to the naked eye: arm long and slender, projecting far beyond the carapace, its musical crest is almost on the inner border, close to its proximal end: palm nearly twice as long as high, increasing in height from its proximal to its distal end: fingers slender, acute, not noticeably channelled and only moderately incurved, neither of them have any large lobes on their dentary edge, the dactylus is hardly shorter than the upper border of the palm, and though it is deflexed is not hooked.

Legs quite unarmed, the carpopodites and propodites of the two middle pairs remarkably tomentose: the third pair of legs are a little more than twice as long as the carapace.

The 3rd 4th and 5th abdominal segments of the male are fused together—though the sutures are not obliterated on either side, but only in the middle—to form a single piece.

In the female the chelipeds are very slender, quite smooth, a little longer than the carapace, and the lower border of the orbit is finely and evenly serrulate.

In the Indian Museum are a male and a female from Karachi: the carapace of the male is 10 millim. long and 14·5 millim. broad.

119. *Metaplax distincta*, Edw.

Metaplax distinctus, Milne Edwards, Ann. Sci. Nat., Zool., (3) XVIII. 1852, p. 162, pl. iv. fig. 27: de Man, Journ. Linn. Soc., Zool., XXII. 1888, p. 158, pl. x. figs. 7–9: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 391.

Differs from *M. indica* in the following characters:—

(1) the carapace is more than two-thirds—nearly three-quarters—as long as broad:

(2) the lower border of the orbit of the male is prolonged to the level of the second notch in the lateral border of the carapace, and its orbital portion is cut into 9 or 10 little, blunt, obscurely-bilobulate teeth, which decrease very regularly in size from within outwards:

(3) the chelipeds of the male are hardly $2\frac{1}{2}$ times the length of the carapace; the arm has denticulate borders—the inner border being a little dilated distally—and is not elongate and slender, its musical crest runs obliquely away from the inner border and is nearer to the middle of that border: the palm is only about half again as long as high: the fingers are obliquely-truncated and channelled at tip, the fixed finger has a lobe (though not a very large one) on its dentary edge, the dactylus is hardly shorter than the upper border of the palm and has a strong hook-like curve:

(4) the anterior border of the meropodites of the legs is armed, in the first and last pairs with a single subterminal spine, in the middle two pairs with several spines; the tomentum on the carpopodites and propodites of the middle two pairs of legs is not so thick:

(5) the abdomen of the male consists of 7 separate segments.

In the Indian Museum are 8 specimens from Madras, Coconada, Mergui, and the Nicobars: the carapace of the largest male is 15 millim. long and 21 broad.

120. *Metaplax dentipes* (Heller).

Helice dentipes, Heller, Novara Crust. p. 62, pl. v. fig. 5: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 220.

Metaplax dentipes, de Man, Journ. Linn. Soc., Zool., XXII, 1888, p. 162, pl. xi. figs. 1–3.

This is little more than a large variety of *M. distincta*, from which it differs in the following particulars:—

(1) the carapace is less transverse, its length being slightly more than three-fourths of its breadth:

(2) the lower border of the orbit of the male is divided, in its orbital portion, into 4 or 5 blunt, broad, compressed teeth decreasing in size from within outwards, and each tooth has a little cusp at its outer end:

(3) in the chelipeds, the inner border of the arm is more dilated distally; the lobe on the dentary edge of the fixed finger is not so convex, and the dactylus is as long as the upper border of the palm

and is not so strongly hooked; the dactylus also sometimes has an enlarged tooth—not a distinct lobe—near the middle of its dentary border:

(4) the anterior border of the meropodites of the legs is very often quite free from spines, but sometimes there are inconspicuous spinules where spines exist in *M. distincta*.

In the Indian Museum are 23 specimens from the banks of the Hooghly, the mud-flats of Arakan and Tenasserim, and Mergui. The carapace of a large male is a little over 21 millim. long and 29 millim. broad.

121. *Metaplax elegans*, de Man.

Metaplax elegans, de Man, Journ. Linn. Soc., Zool., XXII. 1888, p. 164, pl. xi. figs. 4–6, and Zool. Jahrb., Syst., VIII. 1894–95, p. 596.

Metaplax crassipes, de Man, in Weber's Zool. Ergebn. Niederl. Ost-Ind. II. 1892, p. 325, pl. xix. fig. 12 (*ipso teste*).

Resembles *M. indica* in the form of the carapace, but can be recognized by the following characters:—

(1) the groves of the carapace are fainter:

(2) the lower border of the orbit instead of being irregularly cut into dentiform lobules is very finely and regularly pectinate:

(3) the chelipeds in the male are not $2\frac{1}{2}$ times as long as the carapace and are distinctly unequal, the hand of one being decidedly larger than its fellow: the arm is not elongate, its edges are granular, and its musical crest, which is very fine, stands at the middle of the inner border, running obliquely parallel with that border: the larger palm is only a little longer than high and its inner surface is granular, its fingers are obliquely truncate and strongly channelled, and both of them have a lobe near the middle of their dentary border, the dactylus also is strongly curved, at any rate in the larger hand:

(4) in the first pair of legs the meropodites have a single subterminal spine on the anterior border, in the 2nd pair there are from three to six spines, and in the 3rd and 4th pairs from seven to ten: moreover at the extreme distal end of the *posterior* border of the meropodites of the two middle pairs of legs there may be two or three spinules:

(5) the abdomen of the male is broader, and has all 7 segments separate.

In the Indian Museum are 32 specimens from the Godavari Delta and from Mergui: the carapace of the largest male is 10·5 millim. long and 16 broad.

122. *Metaplax intermedia*, de Man.

Metaplax intermedius, de Man, Journ. Linn. Soc., Zool., XXII. 1888, p. 166, pl. xi. figs. 7-9.

Differs from *M. indica* in the following characters:—

(1) In the male the lower border of the orbit is continued a little beyond the first notch in the antero-lateral border of the carapace, and at its inner end it is cut into a series of 5 or 6 little even teeth that decrease in size from within outwards, and then it gradually becomes minutely and regularly pectinate:

(2) the chelipeds of the male are markedly unequal, the difference in size being in the hand: their length is about $2\frac{1}{3}$ times that of the carapace: the arm is of no great length and is somewhat broadened across the middle, its edges are granular, and its musical crest lies in the middle of the inner border, close to and nearly parallel with that border: the palm has granular edges and is much compressed at its antero-inferior corner; in the larger cheliped *the hand is at least as high as long:* the fingers are obliquely truncated and strongly channelled; in the larger hand the dactylus is hooked and has a lobe on its cutting edge near the proximal end, while the fixed finger is broad, is thin and compressed at its basal end, and presents on its cutting edge a notch (corresponding with the lobe on the dactylus) followed by a high lobe that descends obliquely to the tip of the finger:

(3) near the far end of the anterior border of the meropodites of the legs is a spine:

(4) the abdomen of the male has all 7 segments distinct, and is rather broadly triangular.

In the Indian Museum are 11 specimens from the Godavari Delta, the Gangetic Delta and Mergui. The carapace of the largest male is $9\frac{1}{2}$ millim. long and 15 broad.

123. *Metaplax crenulata*, Gerstaecker.

Rhaconotus crenulatus, Gerstaecker, Arch. f. Naturges. XXII. i. 1856, p. 142, pl. v. fig. 5: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 213.

Metaplax crenulatus, de Man, Journ. Linn. Soc., Zool., XXII. 1888, p. 156, and Zool. Jahrb., Syst., IV. 1889, p. 439.

Carapace about three-fourths as long as broad, convex, with the regions well defined and the cervical and epibranchial furrows deep and coarse, its surface pitted.

Front about a fourth the greatest breadth of the carapace. Lateral borders of the carapace cut into five teeth, the edges of which are serrated; the anterior part of the lateral borders is distinctly arched.

The lower border of the orbit, in the male, extends beyond the first notch of the lateral border of the carapace, its inner end is sharp entire and sinuous, but all the rest of its extent is elegantly beaded.

Chelipeds of the male three times the length of the carapace, the borders of the wrist and hand, and the inner border of the wrist, sharply granular or serrulate: arm long and slender, somewhat dilated at its proximal end, the musical crest close to the proximal end and almost on the inner border: the palm gradually increases in height from behind forwards, its greatest height is about half its length, along the middle of its inner surface is a row of granules ending in a granular patch: fingers slender, acute, incurved, not channelled, the extreme length of the dactylus is only about three-fourths that of the upper border of the palm: there are no prominent lobes on the dentary edges of the fingers.

Both borders of the meropodites of the legs, as well as the anterior border of the carpopodites and propodites, are spinulate. The third pair of legs are nearly as long as the male chelipeds.

In the abdomen of the male, which is narrow, all 7 segments are distinct, the penultimate segment being square.

In the female the chelipeds are very slender and are about $1\frac{1}{2}$ times the length of the carapace, and the lower border of the orbit is elegantly pectinate.

In the Indian Museum are 11 specimens from the Sunderbunds and Mergui. The carapace of the largest male is 30 millim. long and 40 broad.

Sub-family PLAGUSIINÆ, Dana.

PLAGUSIA, Latreille.

Plagusia (part), Latreille, Gen. Crust. et Ins. p. 33 (1806): Desmarest, Consid. Gen. Crust. p. 126 (part): De Haan, Faun. Japon. Crust. p. 31: Milne Edwards (part), Hist. Nat. Crust. II. 90, and Ann. Sci. Nat. Zool., (3) XX. 1853, p. 178: Miers, Ann. Mag. Nat Hist. (5) I. 1878, p. 148, and Challenger Brachyura, p. 271: Kingsley, Proc. Ac. Nat. Sci. Philad., 1880, pp. 189, 223.

Philyra, De Haan, *l.c. supra.*

Carapace subcircular, depressed, the antero-lateral borders toothed. The interorbital space is broad, being nearly a third the greatest breadth of the carapace; but there is no true front, so that the antennular fossæ, into which the antennules fold nearly vertically, are visible in a dorsal view as deep clefts in the anterior border of the carapace. The interantennular septum is broad. Orbits deep: the antennæ stand in the wide orbital hiatus, their flagellum is short.

Epistome short: buccal cavern squarish, its anterior border is crenate and projects strongly in a horizontal direction. The external maxillipeds do not meet across the buccal cavern, but the space between them, which is not very broad, is occluded by bristles: their merus is as broad as the ischium and carries the palp at its summit: *their exognath has no flagellum.*

Chelipeds and legs dorsally rugose. Chelipeds subequal: in the male they are more massive than the legs, and longer than those of the first and last pairs, in the female they are shorter and slenderer than any of the legs: the fingers are stout and have rounded hollowed-out tips.

Legs very stout, with broad massive meri and short stout serrated dactyli.

The abdomen of the male is triangular and rather broad: it covers all the sternum between the last pair of legs, and it may have all 7 segments distinct or the 3rd 4th and 5th fused. In the female the abdomen is broad and consists of 7 segments, but the 3rd 4th and 5th do not move independently of one another.

Distribution: all warm seas, and extending into the Mediterranean.

In habit the *Plagusiæ* to a certain extent resemble the *Grapsi*, dodging about rocks that are awash at high tide, and hiding in crannies when pursued. They also resemble *Varuna* in being able to make themselves at home on drift timber in the open sea. This will account for the very wide range of some of the species.

The presence of two species in the Mediterranean implies nothing, of itself, for they may very probably have been carried there by ships. On the "Investigator" one could always see a *Plagusia* adhering to the ship's side near the water-line.

124. *Plagusia depressa* var. *squamosa* (Hbst.).

? Cancer depressus, Herbst (*nec* Fabr.), Krabben &c. I. ii. 117, pl. iii. figs. 35 *a-b*.

Cancer squamosus, Herbst, I. ii. 260, pl. xx. fig. 113 (*v.* Hilgendorf, SB. Ges. Nat. Freunde, 1882, p. 24).

Plagusia squamosa, Latreille, Gen. Crust. p. 34, and Nouv. Dict. Hist. Nat. XXVI. p. 533, and (?) Encycl. Méthod. X. 1825, p. 145: Lamarck, Hist. Nat. Anim. Sans Verh. p. 246: Milne Edwards, Hist. Nat. Crust. II. 94: Krauss, Sudafr. Crust. p. 42: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 178: Heller, SB. Akad. Wien, XLIII. 1861, p. 363, and Novara Crust. p. 51: A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 298: Richters, in Möbius, Meeresf. Maurit. p. 157: Hilgendorf, SB. Ges. Nat. Freunde, Berlin, 1882, p. 24.

Plagusia tuberculata, Lamarck, *l. c.* p. 247: Latreille, Encycl. Méthod. X. p. 146: Milne Edwards, *l. c.* p. 94: Miers, Ann. Mag. Nat. Hist. (5) I. 1878, p. 148: Haswell, Cat. Austral. Crust. p. 110: Müller, Verh. Ges. Basal, VIII. 1886, p. 476: de Man, Notes Leyden Mus. V. 1888, p. 168, and Zool. Jahrb., Syst., IX. 1895–97,

p. 358 : Ortmann, Zool. Jahrb., Syst., VII. 1893–94, p. 730 : M. J. Rathbun, P. U. S. Nat. Mus. XXI. 1898, p. 605.

Plagusia immaculata, Lamarck, *l. c.* p. 247 : Miers, *l. c.*, p. 150, and Challenger Brachyura, p. 273, pl. xxii. fig. 1 : Haswell, *l. c.* : de Man, Archiv für Naturges. LIII. 1887, i. p. 371 : Cano, Boll. Soc. Nat. Napol. III. 1889, p. 246 : Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 391 : Ortmann, *l. c.* : Nobili, Ann. Mus. Genov. (2) XX. 1899, p. 271.

Plagusia depressa, Latreille (*nec* Fabr.), Encycl. Méth. X. 145 : Milne Edwards, Hist. Nat. Crust. II. 93, and Ann. Sci. Nat., Zool., (3) XX. 1853, p. 179 : Heller, Novara Crust. p. 51.

Plagusia orientalis, Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 103, and Ann. Lyc. Nat. Hist. New York, VII. 1860, p. 231.

All the regions of the carapace are distinct, and the surface is covered with flat pearly or squamiform tubercles which are fringed anteriorly with little close-set bristles of uniform length.

The tubercles vary: sometimes they are prominent, sometimes depressed, and sometimes they are almost obsolete on the most convex portions of the carapace. The little fringes of bristles also vary: sometimes they fill all the space between the tubercles, somtimes they can only be made out with a lens, sometimes they are absent.

The antero-lateral border of the carapace is armed with four teeth (including the orbital angle) which decrease in size from before backwards. The epistome is prominent beyond the anterior border of the carapace and is usually cut into seven lobes.

The chelipeds of the adult male are massive and are about half again as long as the carapace, but in the female they are slender and only about as long as the carapace. The inner angle of the wrist is coarsely dentiform : the tubercles on the upper surface of the palm and dactylus are arranged in high relief in longitudinal rows, those on the outer surface of the palm—especially at the upper part of it—have a tendency to fall into transverse rows.

On the posterior edge of the dorsal surface of the basipodites of the legs is a subacute tooth or blunt lobe with entire edges, this tooth being most conspicuous in the 2nd and 3rd pair of legs: on the anterior border of the meropodites there is a single strong spine, subterminal in position : the upper surface of the carpopodites propodites and dactyli is traversed longitudinally by a dense strip of long bristles. The 3rd pair of legs, which are the longest, are not quite twice the length of the carapace.

In the Indian Museum are 31 specimens from the Bay of Bengal and Arabian Sea: many of them were taken from drift timber in the open sea. Old specimens are commonly encrusted with barnacles and acorn-shells. The largest specimen in the collection has a carapace 54 millim. long and 56 broad.

LIOLOPHUS, Miers.

Leiolophus, Miers, Cat. Crust. New Zealand, p. 46 (1876), and Ann. Mag. Nat. Hist. (5) I. 1878, p. 153.

Acanthopus, De Haan, Faun. Japon. Crust. p. 29: Dana, U.S. Expl. Exp. Crust. pt. I. p. 372: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 180 (*nom. præocc.*).

As in *Plagusia*, the antennæ fold nearly vertically in deep slits—visible in a dorsal view—cut in the anterior border of the carapace, the slits dividing the interorbital space into three deep lobes; and the exognath of the external maxillipeds has no flagellum.

The difference from *Plagusia* is as follows:—

The carapace is extremely flat and depressed—being quite disk-like—and is longer than broad: the interantennular septum is of no great breadth: the epistome is almost linear: the merus of the external maxillipeds is very small, being much narrower than the ischium, and is disposed obliquely in repose: the chelipeds and legs, though in places spiny, are not rugose: the legs are much slenderer, and though the meropodites are broad they are very thin: the copulatory organ of the male ends in a claw: finally, the exognath of the external maxillipeds is extremely short and slender.

As in the Indian species of *Plagusia*, the abdomen of the male consists of 5 segments, the 3rd 4th and 5th being fused. The abdomen of the female is similar in this respect to that of the male.

Distribution: as *Plagusia*, but not in the Mediterranean.

125. *Liolophus planissimus* (Hbst.).

Cancer planipes, Seba, Thesaurus III. p. 49, pl. xix. fig. 21 (1758).

Cancer planissimus, Herbst, Krabben &c. III. iv. 3, pl. lix. fig. 3 (1804).

Plagusia clavimana, Latreille, Gen. Crust. p. 34: Lamarck, Hist. Nat. Anim. Sans Vert., Crust., p. 247: Desmarest, Dict. Sci. Nat. XXVIII. p. 246: Latreille, Encycl. Méthod. X. p. 146: Desmarest, Consid. Gen. Crust. p. 127, pl. xiv. fig. 2: Milne Edwards, Hist. Nat. Crust. II. 92, and in Cuvier, Règne Animal, Crust. pl. xxiii. fig. 3: Hess, Archiv f. Nat. XXXI. 1865, i. p. 154: Desbonne et Schramm, Crust. Guadaloupe, p. 50: Richters in Möbius' Meeresf. Maurit. p. 157.

Plagusia serripes, Lamarck, *loc. cit.*: Latreille, Encycl. Méthod. *loc. cit.*

Acanthopus planissimus, De Haan, Faun. Japon. Crust. p. 30: Dana, U. S. Expl. Exp. Crust. pt. I. p. 372: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. p. 180: Heller, SB. Ak. Wien, XLIII. 1861, p. 364: Stimpson, Ann. Lyc. Nat. Hist. New York, VII. 1862, p. 232: Heller, Novara Crust. p. 51: A. Milne Edwards, Nouv. Archiv. du Mus. IX. 1873, p. 299: Brocchi, Ann. Sci. Nat., Zool., (6) II. 1875, Art. 2 (*male appendages*): Nauck, Zeits. Wiss. Zool. XXXIV. 1880, p. 31 (*gastric teeth*).

Acanthopus clavimanus, Krauss, Sudafr. Crust., p. 42.

Acanthopus Gibbesi, Milne Edwards, Ann. Sci. Nat. Zool. *loc. cit.*

Leiolophus planissimus, Miers, Cat. Crust. N. Z. p. 46, and Ann. Mag. Nat. Hist. (5) I. 1878, p. 153, and P. Z. S. 1879, p. 38, and Zool. H. M. S. Alert, pp. 518, 545:

Filhol, Crust. N. Z., Miss. l'ile Campbell, p. 394: Haswell, Cat. Austral. Crust. p. 112: Müller, Verh. Ges. Nat. Basel, 1886, p. 476: de Man, Arch. f. Nat. LIII. 1887, i. p. 372, and Notes Leyden Mus. XV. 1893, p. 287, and Zool. Jahrb., Syst., IX. 1895–97, p. 358: Pocock, Journ. Linn. Soc., Zool., XX. 1890, p. 513: Henderson, Trans. Linn. Soc. Zool. (2) V. 1893, p. 391: Ortmann, Zool. Jahrb., Syst., VII. 1893–94, p. 731: Whitelegge, Mem. Austral. Mus. III. 1897, p. 139: M. J. Rathbun, Ann. Inst. Jamaica, I. 1897, p. 36.

Carapace thin, disk-like, covered with little short bristles which, however, leave certain symmetrical raised linear patches bare: the meropodites of the legs are clad in the same way, and have two long bare stripes.

The front, the antennular and supra-orbital angles, and the epistome are all acutely spinous: the antero-lateral border of the carapace is armed with 4 acute spines: the middle of the upper border of the orbit is more or less serrate. The eyes are large and reniform.

The chelipeds vary according to age and sex, but the arm and wrist are always armed with spines; the palm is smooth, nude, oval, and somewhat compressed; and the fingers are short, blunt, and hollowed at tip. In the adult male the palms, or one of them, are remarkably deep.

The anterior border of the meropodites of all the legs is armed along its whole length with remarkably large and even spines, the posterior border ends in a spine: in the case of the first two meropodites there is a second row of spinules parallel with the anterior border, but this is very indistinct in the meropodites of the 3rd pair, and quite absent in those of the 4th.

The colour in life is dark green, the nude streaks being bright green. In the Indian Museum are 36 specimens from the Andamans, Ceylon, and Laccadives: the carapace of the largest is 23 millim. long and 21 broad.

Family GEOCARCINIDÆ, Dana.

Key to the Indian Genera.

I. Fronto-orbital border more than half the maximum breadth of the carapace: interantennular septum broad: epistome well defined and prominent: dactyli of legs with 4 rows of spines:—

1. Buccal cavern not elongate: exognath of external maxillipeds without a flagellum: opposed edges of the basal joints of the 2nd and 3rd pairs of legs heavily fringed with hair much as in *Ocypoda*:—

i. Antero-lateral borders of carapace dentate..... GRAPSODES.

ii. Antero-lateral borders of carapace entire..... EPIGRAPSUS.

2. Buccal cavern elongate: exognath of external maxillipeds with a flagellum: no hairy fringe on the basal joints of the 2nd and 3rd pairs of legs..... CARDIOSOMA.

II. Fronto-orbital border less than half the greatest breadth of the carapace: interantennular septum narrow: epistome ill-defined and sunken: dactyli of legs with 6 rows of spines: exognath of external maxillipeds without a flagellum..... PELOCARCINUS.

GRAPSODES, Heller.

Grapsodes, Heller, Novara Crust. p. 58: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, pp. 188, 197.

Carapace depressed, little broader than long, declivous anteriorly, the regions faintly indicated, the dorsal surface without ridges or wrinkles, the lateral borders well arched and irregularly dentate.

Front about half the width of the anterior border, or about a third the greatest breadth of the carapace, strongly deflexed, its free edge nearly straight.

Orbits small, shallow, the lower border is wanting except for the tooth at the inner angle. The antennules fold nearly transversely in fossæ which are widely open externally: interantennular septum very broad. Antennal flagella slender and very short, standing in the orbital hiatus.

Epistome of moderate length fore and aft. External maxillipeds having a rhomboidal gap between them, in which the mandibles are visible: the merus is narrower than, but about the same length as, the ischium, and is a little oblique: the palp, which though coarse is small, articulates at the antero-external angle of the merus.

Chelipeds in both sexes subequal: in the male they are very much more massive than the legs and longer than the first and last pairs: in the female they are relatively shorter and much less massive than in the male. The tips of the fingers are acute.

Legs stout, their joints are not particularly broad or compressed but have their edges armed with stout bristles: the dactyli are long, acute, and thorny. The 2nd and 3rd pair of legs are the longest, and between their bases is a recess fringed with hairs resembling that found in *Ocypoda* and *Gelasimus*, and probably indicating terrestrial or amphibious habits.

The abdomen in both sexes consists of seven segments, and in the male its base covers all the breadth of the sternum between the last pair of legs.

Distribution: Islands of East Indian Archipelago.

This genus is really identical with *Epigrapsus* (=*Nectograpsus*), from which it only differs in having the regions of the carapace even more indistinct, the lateral borders of the carapace entire, the male chelipeds remarkably unequal, and the dactylus of the legs alone hirsute.

126. *Grapsodes notatus*, Heller.

Grapsodes notatus, Heller, Novara Crust. p. 58, pl. v. fig. 2: Miers, P. Z. S. 1877, p. 136: J. S. Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 197: de Man, Notes Leyden Mus. V. 1883, p. 160.

Carapace five-sixths as long as broad, the regions defined, though faintly, the surface smooth except sometimes for some granules near the lateral borders. The antero-lateral borders are cut into three shallow teeth or lobes behind which are some inconspicuous crenulations. On the line of flexion of the front are two eminences separated by a notch. Epistome and pterygostomian regions tomentose.

The chelipeds differ considerably in the sexes, though always smooth. In the adult male they are nearly twice the length of the carapace, the inner angle of the wrist is pronounced but not spiniform, the palm (which is as high as long) has a strong bulge at the infero-posterior angle, the dactylus (which is twice as long as the upper border of the palm) is much longer than the immobile finger and closes very obliquely, and there are two molariform teeth, one near the base of the dactylus, the other nearer the tip of the immobile finger.

In the female the chelipeds are hardly $1\frac{1}{2}$ times the length of the carapace, the inner angle of the wrist is dentiform or spiniform, the palm is not enlarged or inflated, and the fingers are of nearly equal length, meet in the greater part of their extent, and are finely denticulated except near the tips.

The second pair of legs, which are the longest, are about twice the length of the carapace, the third pair are a little shorter than the second, and the first and last pair are about $1\frac{1}{2}$ times the length of the carapace.

In the Indian Museum are 8 specimens from the Nicobars. The carapace of the largest male is 25 millim. long and 30 millim. broad, but a female is somewhat larger than this.

That this species is probably terrestrial is evidenced by the vaulted branchial cavities, and also by the folding of the membrane that lines them, which is practically the same as that of *Ocypoda*, *Cardiosoma*, and *Pelocarcinus*.

EPIGRAPSUS, Heller.

Epigrapsus, Heller, Verh. zool.-bot. Ges. Wien, XII. 1862, p. 522: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, pp. 188, 192: Miers "Challenger" Brachyura, p. 265.

Nectograpsus, Heller, Novara Crust. p. 56.

This genus is really identical with *Grapsodes*, from which it differs in no single point of importance.

The trivial characters that separate it from *Grapsodes* are the following:—

The regions of the carapace are hardly distinguishable, and the lateral margins are entire: the chelipeds in the male are markedly unequal, one of them being longer and vastly more massive than the legs, the other being hardly larger than those of the female (which resemble those of *Grapsodes*): though the legs resemble those of *Grapsodes* in proportions and in the singular length of the dactyli, they differ in having only the terminal joint hirsute.

Distribution: Islands of the East Indian Archipelago and Polynesia.

127. *Epigrapsus politus*, Heller.

Epigrapsus politus, Heller, Verh. zool.-bot. Ges. Wien, XII. 1862, p. 522: Kingsley, Proc. Ac. Nat. Sci. Philad. 1880, p. 192: Miers, Challenger Brachyura, p. 266: Ortmann, Zool. Jahrb., Syst., VII. 1893-94, p. 703: de Man, Zool. Jahrb. Syst. IX. 1895-97, p. 79.

Nectograpsus politus, Heller, Novara Crust. p. 57, pl. v. fig. 3.

Carapace about seven-eighths as long as broad, perfectly smooth, the outer orbital angle not pronounced and the lateral margins entire in the adult. The line of flexion of the front is a little concave in the middle. Epistome and pterygostomian regions tomentose.

Chelipeds smooth, equal in the female, markedly unequal in the male. In the male the larger cheliped is more than twice the length of the carapace, the inner angle of the wrist is not pronounced, the palm is about as high as long and has a strong bulge at its postero-inferior angle, the dactylus is much longer than the immobile finger, and the dactylus has 2 or 3 small molariform teeth while the immobile finger has a single one.

In the female the chelipeds are little longer than the carapace, have the inner angle of the wrist pronounced, the palm not enlarged or inflated, and the fingers finely and inconspicuously toothed and nearly equal in length.

The smaller cheliped of the male is but little larger than those of the female.

Of the legs the 2nd pair are the longest, being twice the length of the carapace, and the 3rd pair are slightly shorter: the 1st pair are nearly $1\frac{1}{2}$ times, the 4th pair about $1\frac{1}{3}$ times the length of the carapace.

In the Indian Museum are 4 specimens, from the Andamans and Nicobars: the carapace of the largest male is 14 millim. long and 16 millim. broad.

Cardiosoma, Latreille.

Cardisoma, Latreille, Encycl. Méthod. X. p. 685 (1825): De Haan, Fann. Japon. Crust. p. 27: Milne Edwards, Hist. Nat. Crust. II. 22, and Ann. Sci. Nat. Zool. (3) XX. 1853, p. 203: Smith, Trans. Connect. Acad. Sci. II. 1870, p. 142: Miers, Challenger Brachyura, p. 219: Ortmann, Zool. Jahrb., Syst., VII. 1893–94, p. 732.

? *Discoplax*, A. Milne Edwards, Ann. Soc. Entom. France, (4) VII. 1867, p, 248, and Nouv. Archiv. du Mus. IX. 1873, p. 293.

Carapace deep, convex fore and aft, transversely oval, with the lateral borders tumid and strongly arched owing to the vault-like expansion of the gill-chambers, the pterygostomian regions densely tomentose.

The fronto-orbital border is much more than half, and the deflexed and nearly straight front is about a fourth, the greatest breadth of the carapace. Orbits deep, with the outer angle defined by a denticle, and with the tooth at the inner angle well developed but distant from the front: the eyes are very loose in the orbits.

The antennules fold obliquely beneath the front, by which they are a good deal concealed: the inter-antennular septum is very broad. The antennæ lie in the orbital hiatus, which their broad basal joint nearly fills: their flagellum is very short.

Epistome short, prominent and well defined: buccal cavern elongate squarish, the external maxillipeds do not close it but leave between them a rhomboidal gap in which the mandibles are exposed. In the external maxillipeds the merus is a longish joint and carries the palp, which is large and not at all concealed, at its antero-external angle: the exognath, which carries a flagellum, is exposed in much the greater part of its extent. The exognaths of the other maxillipeds are heavily fringed with coarse hair.

The chelipeds, which are much more massive than the legs, may either be equal or markedly unequal, differing little in the sexes: they alter considerably with age—one or both—the arm and fingers becoming elongated, and the whole hand increasing in size until it becomes longer than the carapace is broad and more than half as high as the carapace is long.

The legs are stout: some of their joints are fringed with bristles, and

their long strong dactyli are square in section and have a series of spines along all four edges.

The abdomen in both sexes consists of 7 separate segments, and in the male its base covers the whole width of the sternum between the last pair of legs.

The branchiæ are eight in number on either side: the gill chambers are vaulted and remarkably capacious, and they are lined by a thick vascular membrane folded to form a sort of pocket, and as in several other crabs—such as *Gelasimus* and *Ocypoda*—that spend most of their time out of water, a sort of "choroid process" of this membrane, shaped like a gill-plume, projects laterally over the pleura of the penultimate pair of legs.

The species of this genus live on land. They are very common in the jungles of the Andamans where they may be found in the day time crouching under roots, fallen logs, &c., sometimes in burrows near the shore.

Distribution: West Indies and neighbouring coasts of America, Cape Verde Is. and West Coast of Africa, Indo-Pacific from Madagascar to Chili.

Key to the Indian species of Cardiosoma.

I.	Carapace very strongly convex fore and aft, the regions indistinct: breadth of the orbit not much more than half its length: merus of the legs with bristles only at its distal end.....	*C. carnifex.*
II.	Carapace very moderately convex fore and aft, the regions distinct: breadth of the orbit about two-thirds its length: merus of the legs with bristles along its whole length.....	*C. hirtipes.*

128. *Cardiosoma carnifex*, (Hbst.).

Cancer carnifex and *hydrarnus*, Herbst, Krabben etc. II. v. 163, 164, pl. xli. figs. 1, 2 (1794).

Cardisoma carnifex, Latreille, Encycl. Méthod. X. p. 685: Milne Edwards, Hist. Nat. Crust. II. 23: Guérin, Icon. Règne An., Crust. pl. v. fig. 2: Dana, U.S. Expl. Exp. Crust. pt. I. p. 377: Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 204 Heller, Novara Crust. p. 35: A. Milne Edwards, Nouv. Archiv. du Mus. IV. 1868, p. 71, and IX. 1873, p. 264: Hoffmann, in Pollen and van Dam, Faun. Madagasc., Crust. p. 12: Brocchi, Ann. Sci. Nat., Zool., (6) II. 1875, Art. 2, p. 85, pl. xvii. figs. 117, 118 (*male appendages*): Miers, P.Z.S. 1877, p. 137, and Phil. Trans. 1879, p. 490, and Challenger Brachyura, p. 220: Hilgendorf, MB. Ak. Berl. 1878, p. 801: de Man, Notes Leyden Mus. II. 1880, p. 31, and in Weber's Zool. Ergebn. Niederl. Ost.-Ind. II. p. 285: Richters, in Möbius, Meeresf. Maurit. p. 157: Lenz and Richters, Abh. Senck. Nat. Ges. XII. 1881, p. 422: Taschenberg, Zeitschr. f.

Naturwiss. LVI. 1883, p. 171: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 380: Nobili, Ann. Mus. Genov. (2) XX. 1899, p. 271.

Cardisoma Guanhumi var. *carnifex*, Ortmann, Zool. Jahrb., Syst., VII. 1893-94, p. 735.

Cardisoma obesum, Dana, Proc. Ac. Nat. Sci. Philad. V. 1851, p. 252, and U. S. Expl. Exp. Crust. pt. I. p. 375, pl. xxiv. fig. 1: Milne Edwards, Ann. Sci. Nat., *t.c.* p. 205: Stimpson, Proc. Ac. Nat. Sci. Philad. 1858, p. 100: Streets, Bull. U. S. Nat. Mus. VII. 1877, p. 114: ? de Man, Notes Leyden Mus. II. 1880, p. 35.

Cardisoma Urvillei, Milne Edwards, Ann. Sci. Nat. *t.c.* p. 204: de Man, Notes Leyden Mus. *t.c.*, p. 33.

Carapace strongly convex fore and aft, especially in the young, the regions are indicated by inequalities of level, but the posterior limit of the gastric region and the cardiaco-intestinal region are defined by grooves: the posterior areola of the gastric region is always tumid.

The antero-lateral border of the carapace is defined by a fine raised line, becoming indistinct with age, which is not continuous with the small tooth at the outer orbital angle, but starts at a little denticle of its own.

The sides of the front (inner boundaries of the orbit) are very oblique: the sinuous upper border of the orbit runs very slightly backward to the base of the outer orbital tooth: the greatest width (height) of the orbit is little more than half the length of that cavity. The basal antenna-joint is large, touching the front.

The breadth of the buccal cavern, measured across the middle of the external maxillipeds, is equal to its length in the middle line.

In both sexes the chelipeds are unequal: they are smooth, except for a few small tubercles or wrinkles or denticles or granules along the edges of some of the joints: the inner angle of the wrist is dentiform, the palm is higher than long, especially in the larger hand, the stout fingers meet only at tip, especially in the larger hand.

The size of the larger cheliped varies with age. In adults of moderate size it is about twice the length of the carapace, the ischium hardly projects beyond the carapace, and the length of the dactylus is about equal to the height of the palm. In old specimens, especially in the male sex, it is about $2\frac{3}{4}$ times the length of the carapace, the ischium projects far beyond the carapace, and the length of the dactylus is $1\frac{1}{2}$ times the height of the palm.

In the legs there are stiff bristles, not very thickly set, at the distal end of the merus, on the anterior border and surface of the carpus and on both borders of the propodite.

The 7th segment of the male abdomen is half or less than half the length of the 6th, measured in the middle line.

In the Indian Museum there are 13 specimens from the Andamans and the Coromandel coast (besides specimens from Tahiti and Madagascar).

Ortmann considers that this form is only a variety of the West Indian *C. Guanhumi*, with which he regards the West African *C. armatum* as synonymous. So far as I can judge from single specimens of these two supposed species, I should think that this view is correct.

129. *Cardiosoma hirtipes*, Dana.

Cardisoma hirtipes, Dana, Proc. Ac. Nat. Sci. Philad. 1851, p. 253, and U. S. Expl. Exp. Crust. pt. I. p. 376, pl. xxiv. figs. 2, *a-d*: Milne Edwards, Ann. Sci. Nat., Zool., (3) XX. 1853, p. 205: Hess, Archiv f. Naturges. XXXI. 1865, i. p. 140: Heller, Novara Crust. p. 35: Miers, Cat. Crust. New Zealand, p. 53: de Man, Notes Leyden Mus. II. 1880, p. 34, and Archiv f. Naturges. LIII. 1887, i. p. 349, pl. xiv. fig. 3: E. Nauck, Zeits. Wiss. Zool. XXXIV. 1880, p. 26 (*gastric teeth*): Filhol, Crust. N. Z. in Miss. l'ile Campbell, p. 460: Ortmann, Zool. Jahrb., Syst., VII. 1893-94, p. 787: Whitelegge, Mem. Austral. Mus. III. 1897, p. 138: Nobili, Ann. Mus. Genov. (2) XX. 1899, p. 271.

Discoplax longipes, A. Milne Edwards, Ann. Soc. Entomol. France, (4) VII. 1867, p. 284, and Nouv. Archiv. du Mus. IX. 1873, p. 294, pl. xv. (*sec* Ortmann, *l.c.*).

This species is easily distinguished from *C. carnifex* by the following characters:—

(1) the carapace is much less convex, the regions are much more distinctly defined, and the gastric region is distinctly subdivided, by grooves, into 3 areolæ: moreover there are some fine oblique striæ on the sides of the epibranchial regions:

(2) the sides of the front, or inner boundaries of the orbit, are not nearly so oblique: the upper border of the orbit is less sinuous and runs slightly forwards to the outer orbital angle: the greatest width of the orbit is nearly two-thirds the length of that cavity. The basal antenna joint does not touch the front:

(3) the breadth of the buccal cavern, measured across the middle of the meri of the external maxillipeds, falls considerably short of the length measured in the middle line:

(4) the chelipeds may be unequal but are far more commonly equal, even in old specimens in which the palms and fingers have grown long and the palm become enlarged:

(5) the bristles on the legs are more thickly set, and they occur along the whole of the anterior border of the merus:

(6) the 7th segment of the male abdomen is more than half the length of the 6th, measured in the middle line.

In the Indian Museum are 16 specimens from the Nicobars and Andamans (besides 4 from the "South Seas" and Madagascar).

In life the carapace is dark violet and the chelæ bright cinnabar red.

PELOCARCINUS, Edw.

Gecarcoidea, Milne Edwards, Hist. Nat. Crust. II. 25 (1837).

Pelocarcinus, Milne Edwards, Ann. Sci. Nat. Zool. (3) XX. 1853, p. 203, and Archiv. du Mus. VII. 1854–55, p. 183: A. Milne Edwards, Nouv. Archiv. du Mus. (3) II. 1890, p. 171 (*et synon.*).

Hylæocarcinus, Wood-Mason, J.A.S.B. XLII. 1873, pt. 2, p. 258, and Ann. Mag. Nat. Hist. (4) XIV. 1874, p. 189.

Limnocarcinus, de Man, Notes Leyden Mus. I. 1879, p. 65.

Gecarcoidea, Ortmann, Zool. Jahrb., Syst., VII. 1893–94, pp. 732, 736.

Carapace transversely oval, somewhat depressed, with the lateral borders tumid and strongly arched owing to the vault-like expansion of the gill-chambers: the gastric region particularly well defined.

The extent of the fronto-orbital border is less than half the greatest breadth of the carapace, that of the strongly deflexed and nearly straight front is from a sixth to a seventh the greatest breadth of the carapace.

Orbits deep, broadly oval, demarcated dorsally by a sharpish slightly raised border, their outer angle not defined, a wide gap in their lower border: at the inner angle there is a strong tooth which may or may not, even in the same species from the same jungle, meet the front: if it does so, the antennæ, which are much reduced in size, are excluded from the orbit.

The antennules fold obliquely beneath the front, and the inter-antennular septum is not very broad.

Epistome sunken, hairy posteriorly so as to appear ill defined from the palate. Buccal cavern rounded anteriorly, not nearly closed by the external maxillipeds, which leave between them a wide rhomboidal gap in which the mandibles are exposed.

The external maxillipeds are rather short: their merus lies obliquely, and its anterior edge is excavated for the insertion of the palp, which is short and coarse and is completely exposed: their exognath is very short and almost entirely concealed and is without a flagellum. The exognaths of the other maxillipeds are heavily fringed with hair.

Chelipeds much more massive than the legs, usually equal in both sexes, though larger and longer in the male than in the female.

Legs stout: in all, the anterior border of the carpus and all the borders of the propodite and dactylus are spiny, there being six rows of spines on the dactylus.

The abdomen in both sexes consists of 7 separate segments, and in the male its base covers all the breadth of the sternum between the last pair of legs.

The gill-chamber and its lining membrane, and the number of branchiæ, are as in *Cardiosoma*.

The *Pelocarcini* are land-crabs. The single Indian species is very common in the jungles of the Andamans, where, especially on the smaller islets, it grows to a large size.

Distribution: Brazil, Andamans and Nicobars, Celebes, Philippines, New Guinea, Loyalty Is.

Ortmann (*l.c.*) throws doubt on the locality Brazil, but, as it appears to me, without sufficient reason, seeing that the elder Milne Edwards states definitely that the type of the species was found in that country by a collector of the Paris Museum. *Pelocarcinus* is by no means the only form of animal life that has this very curious and suggestive distribution, which we also find, among Mammals in the Tapirs, among Birds, as Mr. Finn informs me, in the Piculets of the genus *Picumnus*, among Reptiles in the *Ilysiidæ*, and among fishes in the freshwater eels of the genus *Symbranchus*.

130. *Pelocarcinus Humei* (Wood-Mason).

Hylæocarcinus Humei, Wood-Mason, Journ. As. Soc. Bengal, Vol. XLII. 1873, pt. 2, p. 260, pls. xv, xvi, and Ann. Mag. Nat. Hist. (4) XIV. 1874, p. 190.

Carapace transversely oval, becoming broader with age, its lateral borders tumid and ill defined. The gastic region is particularly well delimited and is divided into three subregions—two antero-lateral and one postero-median—the anterior two of which are separated from one another by a deep groove: the cardiac-intestinal region is fairly well defined.

In adults the carapace is smooth, except for some oblique striæ on the lateral borders, which become squamiform markings on the pterygostomian regions, these regions being devoid of tomentum.

Front nearly vertically deflexed, somewhat spatulate but with the free edge straight. The tooth at the inner angle of the orbit does not usually touch the front, but sometimes it does and excludes the small antennæ from the orbit.

The chelipeds in the adult male are usually equal and are about $2\frac{1}{2}$ times the length of the carapace: the arm projects a long way beyond the carapace, and its upper and inner borders are rugose or irregularly tuberculate; the inner angle of the wrist is truncated; the palm is enlarged, its length is about $1\frac{1}{2}$ times its height and about as long as the

dactylus; the fingers, though they only meet at tip, are not widely separated.

In the adult female the chelipeds are about $1\frac{1}{2}$ times the length of the carapace: the arm projects but little, the hand is not much enlarged, and the fingers almost meet throughout their length.

In many young females the inner edge of the wrist is serrated and there are also a few denticles along the upper border of the palm.

The second pair of legs, which are the longest, are hardly twice the length of the carapace.

Colours in life: carapace violet with some dirty yellow markings: chelipeds and legs yellowish with a livid reddish tinge.

In the Indian Museum are specimens from the Nicobars and from numerous islands of the Andaman group. The largest one has a carapace 82 millim. long and 110 broad.

Family PALICIDÆ, Rathbun.

Palicus, Philippi.

Cymopolia, Roux, Crust. Médit. pl. xxi. 1828: Milne Edwards, Hist. Nat. Crust. II. 158: Miers, Challenger Brachyura, p. 333 (*nom præocc.*).

Palicus, Mary J. Rathbun, Proc. Biol. Soc., Washington, XI, 1897, pp. 93, 165 ["Philippi, Zweiter Jahresber. d. Vereins f. Naturk. in Cassel, 11, 1838."].

Carapace depressed, broader than long, covered with granules and with symmetrical tubercles or rugosities that have a tendency to fall into transverse series.

Front about a third the greatest breadth of the carapace, little or not at all deflexed, usually lobed or toothed. Lateral borders of the carapace hardly curved, serrated anteriorly.

Orbits deep, the upper border is cut into several teeth by deep clefts, and there are usually two clefts in the lower border.

The antennules fold nearly transversely beneath the front: the interantennular septum is a narrow plate. The antennæ commonly have the basal joint, which stands in the orbital hiatus, enlarged: the flagellum is well developed.

Epistome sunken, not defined. Buccal cavern square. The external maxillipeds do not close the buccal cavern anteriorly: their merus is very small and is much narrower than the ischium: the ischium has its antero-internal angle and the merus its antero-external angle much produced: the palp articulates near the middle of the concave summit of the obliquely-placed merus.

Chelipeds short and usually slender in the female: in the adult male one of them may be enlarged—rarely both.

The two middle pairs of legs are much the largest: the first pair, except that they are much shorter and slenderer, resemble the middle pairs, but the fourth pair are weak, sometimes filiform, and are elevated above the third pair as in *Dorippe*, etc.

The abdomen in both sexes consists of 7 separate segments, the basal segments being very narrow fore and aft and the 1st linear.

In the female the genital openings are on the 2nd segment of the sternum close to the suture between it and the first.

Distribution: Atlantic coasts of Central America and of the United States, Cape Verde and Mediterranean, Indo-Pacific from Scychelles to California.

The Indian species of *Palicus* live among coral shingle at a depth of from 10 to 40 fathoms, where their mottled coloration and granular rugose carapace afford a good concealment.

Key to the Indian species of Palicus.

I. Posterior border of the propodites and dactyli of the first 3 pairs of legs entire:—
   1. Front cut into two lobes:—
      i. Lobes of front broad: propodites and dactyli of the two middle pairs of legs sub-foliaceous ..... *P. Jukesii.*
      ii. Lobes of front subacute: propodites and dactyli of the two middle pairs of legs compressed but not broadened ..... *P. Whitei.*
   2. Front cut into four lobes, the middle two subacute, the outer ones broad ..... *P. Wood-Masoni.*

II. Posterior border of the propodites and dactyli of the first 3 pairs of legs elegantly serrate:—
   1. Front cut into four blunt teeth: propodites and dactyli of the two middle pairs of legs broadly foliaceous ..... *P. serripes.*
   2. Front cut into four acute teeth: propodites and dactyli of the two middle pairs of legs compressed but not foliaceous ..... *P. investigatoris.*

131. *Palicus Jukesii* (White).

Cymopolia Jukesii, White, in Jukes' Voy. H. M. S. "Fly," p. 338, pl. ii. fig. 1: Miers Zool. H. M. S. "Erebus" and "Terror," Crust. p. 3, pl. iii. figs. 4-4c, and Challenger Brachyura, p. 335: Haswell, Cat. Austral. Crust. p. 138: Henderson, Trans. Linn. Soc., Zool., (2) V. 1893, p. 405.

Carapace with the regions well defined, and with the surface thrown into four transverse wrinkles, the two middle ones of which are the most convex and best defined: the whole surface is also closely

covered with vesiculous and crystalline granules, which are largest on the convexities.

Front divided into two broad rounded lobes: antero-lateral border of the carapace cut into three teeth including the orbital angle: posterior border of the carapace raised, but not cut into well-spaced lobules.

Upper border of the orbit with two deep notches between the inner and outer orbital angles, both of these angles having a concave margin: lower border with two deep notches. There is a leaf-like lobule on the granular eye-stalk, another at the outer angle of the basal antenna-joint, and another in the gap between the antenna and the outer angle of the buccal cavern. The exposed surface of the ischium of the external maxillipeds is obliquely traversed by two ridges which meet at the produced antero-internal angle of the joint.

The chelipeds of the *adult* male are granular and downy and are usually markedly unequal. The larger one is stout, is more than $1\frac{1}{2}$ times the length of the carapace and has a swollen (subcylindrical) club-shaped palm of which the length is not twice the greatest height: the fingers are short and stumpy, the dactylus being little more than a third the length of the palm, and meet only at tip: the smaller cheliped of the male is short and slender, sometimes however it is almost as large as its fellow.

In the female the chelipeds are equal, are hardly longer than the carapace and hardly stouter than the last pair of legs: they have a palm which is as slender and nearly as long as the ischium, and incurved fingers which nearly meet throughout their length.

In the first 3 pairs of legs the merus is stout and broad with a granular dorsal surface and coarsely and unevenly serrulate edges, the anterior edge ending in a crest-like tooth; the carpus is dorsally carinate, and its anterior border has the form of a two-lobed carina; and the propodite and dactylus are subfoliaceous owing to the depth of the thin sharp carinæ of their edges—these carinæ being plumed. The 4th pair of legs are short weak and granular as far as the dactylus, which is much shorter than the propodite.

The 1st pair of legs are a little longer, the 4th pair a little shorter, than the carapace: the 2nd and 3rd pairs are about $1\frac{2}{3}$ times the length of the carapace.

In both sexes all the abdominal terga, except the last, are transversely carinate, the carinæ of the 2nd and 3rd terga being most conspicuous. Also on either side of the sternum there are two crests, one behind the base of the last pair of legs, the other almost in a line with the 3rd abdominal carina.