

5. On a Collection of Crustaceans made at Singapore and Malacca.—Part I. Crustacea Brachyura. By W. F. LANCHESTER, M.A., King's College, Cambridge<sup>1</sup>.

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(Plates XLIV.—XLVII.)

This collection is part of a more general collection of marine animals made by Mr. F. P. Bedford and myself during a period of about seven months, of which six were spent in and around the island of Singapore, and one in the town of Malacca. The difference in the length of our stay in these neighbourhoods will, in part, explain the greater diversity and number of the forms which come from Singapore—out of 120 forms (116 distinct species), 91 are from Singapore, 14 from Malacca, 12 are common to both localities, and in 3 there is no record of locality. At the same time, something must be allowed, in this connection, for the more suitable nature of the collecting-ground at Singapore: the sea round which is broken by numerous islets, many of these bordered with coral-reef, leaving, at low water, a large expanse of rough ground (sandy mud, stones, and dead coral), very productive of the littoral forms. On the east of the town is a shore bordered with great patches of sand or mud, grown over in parts by a *Zostera*-like weed; while, for deeper forms, the bottom is no less varied, ranging from thick mud, through sand and gravel, to patches of stone and coral débris. From Singapore, then, came by far the greater number of the Oxyrhyncha and Cyclometopa (Actæids and all the Eriphiidæ); several of the Grapsoid Crabs (*Gelasini*, *Metopograpsus*, *Scopimera*); two species of *Dorippe* and several *Leucosiidæ*, the latter being almost invariably obtained from a bottom of dense mud, in contradistinction to the experience of Adams and White ('Samarang' Crust., pref. p. v), who found that they preferred a bottom of sand to one of mud.

In Malacca, on the other hand, the conditions are far more uniform: the coast consists mostly of mud swamps, and, with the exception of one partly exposed island near by, offers no very great scope for the collecting of littoral forms: the Grapsoidea—*Sesarmini*, *Gelasini*, *Ocypodidæ*, and *Macrophthalmini*—were, however, fairly well represented. As far as concerns work with the dredge, the bottom is too uniformly covered with thick mud to offer much variety of forms: here the *Leucosiids* and *Dorippids* were most representative and fairly abundant. At a spot, however, about 7 to 8 miles north of the town, where a strong current set round a promontory, we found a fairly productive piece of rough bottom, which supplied, amongst others, a few *Maioidæ* (*Chlorinoides*, *Hyastenus*). And, still farther north, at

<sup>1</sup> Communicated by Prof. BELL, F.Z.S.

Cape Rachado, where Mr. Bedford spent some time after my return home, he obtained several examples of *Matuta*, a genus of which, out of the three species in the collection, only one comes from Singapore.

As regards the systematic part, I have described as new 5 varieties and 7 species, and 2 of the species have had to be referred to new genera: one, a Leucosiid of the *Oreophorus* type, which is interesting because of the great lateral expansion of its carapace; the other, a small form with a very general resemblance to an *Actæu*, especially in the front and orbits, but with well-marked palatal ridges and other differences. As regards the common genus *Thalamita*, of which there are 3 species, I had hoped to be able to set at rest the question of the value of their specific characters, but was unfortunately unable to obtain sufficient specimens for comparison; but from what I have myself seen, and taking Kossmann's (Zoolog. Ergebn. p. 48), and other scattered, evidence into consideration, I think it strongly probable that some at least of the species should be united—as, for example, the three in the collection, *T. crenata*, *T. spinimana*, and *T. danae*. Dr. de Man (Mergui Crust. p. 78) has laid some stress on the form of the lobes of the internal angle of the eye; but these are certainly variable in the specimens I have examined.

I have taken measurements of the breadth and length of the carapace of nearly all the individual examples of each species, and, but for the lack of space, would have given the length of the rostrum, lateral margins, &c., in order to make the list more complete. It is, of course, very difficult to find any constant lines of measurement, owing to the variability, in the same species, of the form of the carapace; spines, whether rostral or lateral, are notoriously variable, and there is no necessary constancy in the straightness, or amount of convexity or concavity, of the frontal and posterior marginal lines. Under these circumstances, I have taken the following bases of measurement:—In the Oxyrhyncha, Cyclometopa, and Oxystomata, the length from the middle of the posterior margin to the middle of a line drawn from the one base to the other of the præocular or internal supraocular (as the case may be) spines: such a line approximately defines the base of the rostrum. I have never found the præ- or supraocular spine so ill-developed that this line cannot be traced. The breadth, in these groups, has been taken from the anterior base of the last lateral (Cyclometopa) or epibranchial (Oxyrhyncha) spine, or from the epibranchial angles. In the Catometopa, however, I have found myself obliged to include the rostrum in the measurement of length, and to take the breadth from the point of one external ocular spine to that of the other. None of these measurements, however, can be considered as other than approximate; I give them, as I have taken them, for what they are worth. They certainly do show a variability in proportions, which, though slight in a great many species, is in others rather striking.

As regards the references that are given, under each species, I

should like to say that they have been chosen, in nearly every instance, for one of two reasons, apart from those of synonymy: 1st, that the reference given contains a good description, or figure, or useful additional remarks; 2nd, that the reference points to the occurrence of the species in India or Australia, with the neighbouring seas, or that its existence has been previously noted at Singapore or Malacca.

Before proceeding to the account of the species, I should like to take this opportunity of expressing my personal thanks to the following gentlemen, who received us most kindly, and gave us valuable facilities in the pursuit of our object: Sir Alexander Swettenham, C.B., at the time of our visit Acting Governor at Singapore; Dr. R. Hanitsch, Curator of the Raffles Museum, who gave us the free use of a room in the Museum, and also useful advice as to collecting-grounds; Mr. H. N. Ridley, Curator of the Botanical Gardens, to whom I am particularly indebted for the new variety of *Potamon tridentatum* described below, and for the brief account of its burrowing habits (which I reproduce from memory); and also to the Hon. W. Egerton, Resident Councillor at Malacca. At home, I have to thank Prof. Jeffrey Bell for the very kind way in which he has placed a room at my disposal in the Natural History Museum, and for kindly communicating this paper to the Society; and Mr. G. A. Boulenger, for very useful advice given in connection with this paper.

NOTE.—In the measurements given, the first figures invariably represent the breadth: *e. g.*  $10 \times 7$  = breadth 10, length 7. All measurements in millimetres.

## I. Genus *ACHÆUS* Leach.

### 1. *ACHÆUS LACERTOSUS* Stimpson.

*Achæus lacertosus*, Stimpson, Proc. Acad. Nat. Sci. Philad. p. 218 (1857).

*Achæus breviceps*, Haswell, Proc. Linu. Soc. N. S. W. vol. iv. p. 433 (1879).

*Achæus lacertosus*, Miers, 'Alert' Crust. p. 188 (1884); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 341 (1893).

*Hab.* Singapore; 6 fms. One male.

*Dim.*  $3.5 \times 4$ .

### 2. *ACHÆUS LORINA* Ad. & White.

*Inachus lorina*, Ad. & White, 'Samarang' Crust. p. 3, pl. ii. f. 2 (1848).

*Hab.* Singapore; 6 fms. Sandy mud. One male.

*Dim.*  $5.75 \times 7.5$ .

## II. Genus *CAMPOSCIA* Latr.

### 3. *CAMPOSCIA RETUSA* Latr.

*Camposcia retusa*, Latr. Règne Animal, 2<sup>e</sup> éd. t. iv. p. 60 (1829);

M.-Edw. Hist. Nat. Crust. t. i. p. 283 (1834); Haswell, Cat. Austr. Crust. p. 4 (1882); Miers, 'Alert' Crust. p. 189 (1884).

*Hab.* Singapore; littoral. Two females, one with ova; and a male with a parasite under the abdomen. All are thickly clothed with small globular pieces of sponge.

Dim. ♂ 23 × 31.5. ♀ 27.5 × 37. ♀ 26 × 34.5.

### III. Genus ONCINOPUS de Haan.

#### 4. ONCINOPUS ARANEA de Haan.

*Oncinopus aranea*, de Haan, Crust. Japon. p. 100, pl. xxix. f. 2 (1839).

*Oncinopus neptunus*, Ad. & White, 'Samarang' Crust. p. 1, pl. ii. f. 1 (1848).

*Oncinopus subpellucidus*, Stimpson, Proc. Acad. Nat. Sci. Philad. p. 221 (1857).

*Oncinopus angulatus*, Hasw. Proc. Linn. Soc. N. S. W. vol. iv. p. 433 (1879).

*Oncinopus subpellucidus*, Hasw. Cat. Austr. Crust. p. 5 (1882).

*Oncinopus neptunus*, Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Hab.* Singapore; 5 fms. One male.

Dim. 2.5 × 3.25.

### IV. Genus MENÆTHIUS M.-Edw.

#### 5. MENÆTHIUS MONOCEROS Latr.

*Pisa monoceros*, Latr. Encycl. t. x. p. 139 (1825).

*Menæthius monoceros*, M.-Edw. Hist. Nat. Crust. t. i. p. 339 (1834).

*Menæthius subserratus*, Ad. & White, 'Samarang' Crust. p. 18, pl. iv. ff. 1-2 (1848).

*Menæthius monoceros*, A. M.-Edw. Nouv. Arch. Mus. Hist. Nat. t. viii. p. 252 (1872).

*Hab.* Singapore. Littoral: from off seaweed, with Caprellids, Amphipods, &c. 5 males, 1 female. Malacca; 1 fm. Sandy mud. A larger, damaged female.

Dim. ♂ 6 × 8. ♂ 6.75 × 8.5. ♂ 5.5 × 7.5. ♂ 4 × 5.5. ♀ 7 × 9.5. ♀ 10.75 × 13.5. ♂ 16.5 × 13.5.

### V. Genus DOCLEA Leach.

#### 6. DOCLEA MURICATA Herbst.

*Cancer muricatus*, Herbst, Naturgesch. der Krabben, t. i. p. 211, pl. xiv. f. 83 (1788).

*Inachus muricatus*, Fabr. Suppl. Ent. Syst. p. 355 (1798).

*Doclea muricata*, M.-Edw. Hist. Nat. Crust. t. i. p. 295 (1834); Walker, Journ. Linn. Soc., Zool. xx. p. 109 (1887).

*Hab.* Malacca; 1-2 fms., mud. A male and two females.

Dim. ♂ 8 × 9. ♀ 15.5 × 17. ♀ 12 × 13.

VI. Genus *EGERIA* Latr.7. *EGERIA ARACHNOIDES* Rumph.

*Cancer arachnoides*, Rumph. D'Amboin. Rarit-kammer, pl. viii. f. 4 (1741).

*Inachus longipes*, Fabr. Suppl. p. 358 (1798).

*Egeria arachnoides*, Latr. Encycl. pl. cclxxxi. f. 1 (1825); M.-Edw. Hist. Nat. Crust. t. i. p. 291 (1834); Hasw. Cat. Austr. Crust. p. 11 (1882); Miers, 'Alert' Crust. p. 191 (1884).

*Egeria longipes*, Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Egeria arachnoides*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 343 (1893).

*Hab.* Singapore; 2-4 fms. Muddy bottom. One male, rather damaged, and another larger.

*Dim.* ♂ 6 × 7. ♂ 16 × 16.

VII. Genus *MAIA* Lam.8. *MAIA MIERSII* Walker.

*Maia miersii*, Walker, Journ. Linn. Soc., Zool. vol. xx. p. 113 pl. vi. ff. 1-3 (1887).

*Hab.* Singapore; 6 fms. Bottom of sandy mud. One female example, entirely agreeing with Mr. Walker's description. The carapace is thickly covered with matted weed, in which are entangled tiny shells, gravel particles, &c., as well as mud, when first caught.

*Dim.* 16.5 × 21.5.

VIII. Genus *HYASTENUS* White.9. *HYASTENUS DIACANTHUS* de Haan.

*Pisa (Naxia) diacantha*, de Haan, Crust. Jap. p. 86, pl. xxiv. f. 1 (1839).

*Hyastenus diacanthus*, A. M.-Edw. Nouv. Arch. Mus. t. viii. p. 250 (1872); Hasw. Cat. Austr. Crust. p. 20 (1882); Miers, 'Alert' Crust. p. 194 (1884).

*Hab.* Malacca; 6 fms. Rough bottom. 3 small females.

*Dim.* ♀ 5 × 7.5. ♀ 4 × 5.5. ♀ 2.5 × 3.5.

9 a. *HYASTENUS DIACANTHUS BITUBERCULATUS*, var. nov.

There are, in addition to the above, three large specimens, in which the gastric prominence, besides being much elevated, bears two pointed tubercles, one in front of the other, the anterior being the more prominent; a small tubercle on the middle of the posterior border. In other respects they resemble *H. diacanthus*. There are three examples, a male and a female from 15 fms. at Singapore, and another female from 10-15 fms. at Malacca. In the female from Singapore there is a biggish round brown spot on the posterior declivity of the gastric eminence.

*Dim.* ♂ 15 × 21. ♀ 18.5 × 25. ♀ 12.5 × 18.

10. *HYASTENUS ORYX* A. M.-Edw.

*Hyastenus oryx*, A. M.-Edw. Nouv. Arch. Mus. t. viii. p. 250, pl. xiv. f. 1 (1872); Hasw. Cat. Austr. Crust. p. 20 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Hab.* Singapore; littoral. Two males and two females, one with ova.

Dim. ♂ 5.75 × 9. ♂ 4.5 × 7. ♀ 6.5 × 10.5. ♀ 5.25 × 8.

11. *HYASTENUS PLANASIUS* Ad. & White.

*Pisa planasia*, Ad. & White, 'Samarang' Crust. p. 9, pl. ii. ff. 4, 5 (1848).

*Hyastenus planasius*, A. M.-Edw. Nouv. Arch. Mus. t. viii. p. 250 (1872); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Hab.* Singapore; 2-3 fms. A female and two males.

On two of these is found a species of *Tubularia*, fixed to the upper and outer margins of the ambulatory legs.

Dim. ♂ 8.75 × 12.5. ♂ 6 × 9. ♀ 12.5 × 17.5.

IX. Genus *CHLORINOIDES* Haswell.12. *CHLORINOIDES ACULEATUS* M.-Edw.

*Chorina aculeata*, M.-Edw. Hist. Nat. Crust. t. i. p. 316 (1834).

*Paramithrax (Chlorinoides) aculeatus*, var. *armatus*, Miers, 'Alert' Crust. p. 193, pl. xviii. f. A (1884).

*Chlorinoides aculeatus*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 345 (1893).

*Hab.* Singapore and Malacca; 10-18 fms. Rough bottom.

One large and one small male from Singapore; and two smaller males from Malacca, in which the spines of the carapace and meropodites are relatively less developed.

Mr. Miers's variety *armatus* is founded on—(a) a small tooth-like expansion on the posterior margin of the postocular spine, and (b) the "existence (usually) of two spines at the distal ends of the merus-joints of the ambulatory legs" (*t. c.*). As regards (b), M.-Edwards describes the ambulatory legs as "garnies d'une forte épine à l'extrémité des troisième et quatrième articles"; and Mr. Miers's two spines are not invariably found. In my specimens, the larger male from Singapore has the second spine well developed, the smaller male very much less so. In the two still smaller males from Malacca the second spine is absent, though the postocular tooth still bears a small tooth on its posterior margin. I hardly think the slight difference in the postocular tooth is sufficient to admit of accepting a distinct variety.

Prof. Henderson points out the similarity between the postocular tooth of var. *armatus* and that of a form figured by de Haan as *Maia (Chorinus) aculeata*; but the arrangement of the dorsal spines in this figure show that it is wrongly referred to

*C. aculeata*, and a reference to the text confirms this; for it is there named *Maia (Chorinus) longispina*, and said to be "*Ch. aculeato* Edw. proximus."

Dim. ♂ 23.5 × 28. ♂ 13 × 17.5. ♂ 8.5 × 11.5. ♂ 6.75 × 10.5.

#### X. Genus SCHIZOPHRYS White.

##### 13. SCHIZOPHRYS ASPERA M.-Edw.

*Mithrax aspera*, M.-Edw. Hist. Nat. Crust. t. i. p. 320 (1834).

*Dione affinis*, de Haan, Crust. Japon. p. 94, pl. xxii. f. 4 (1839).

*Schizophrys serratus*, Ad. & White, 'Samarang' Crust. p. 16 (1848).

*Schizophrys aspera*, A. M.-Edw. Nouv. Arch. Mus. t. viii. p. 231, pl. x. f. 1 (1872); Hasw. Cat. Austr. Crust. p. 22 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Hab.* Singapore and Malacca. A male and two females from Malacca, all of the typical form; a young male from Singapore, also typical. Littoral.

Dim. ♂ 15.5 × 19. ♂ 6.5 × 8.5. ♀ 24.5 × 31. ♀ 16.5 × 20.5.

#### XI. Genus MICIPPA Leach.

##### 14. MICIPPA MASCARENICA Kossmann.

*Micippa philyra*, Leach, Zool. Misc. iii. p. 16 (1817) (nec *M. philyra* Herbst); M.-Edw. Hist. Nat. Crust. t. i. p. 330 (1834).

*Micippa philyra*, var. *mascarenica*, Kossm. Zool. Ergebn. Reise roth. Meeres, p. 7, pl. iii. fig. 2 (1877).

*Micippa mascarenica*, Miers, Ann. Mag. Nat. Hist. ser. 5, vol. xv. p. 7 (1885); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Hab.* Singapore; littoral. Two males and two females.

There are five tuberculiform teeth behind the postorbital tooth in the males, of which the 3rd and 4th are absent in the females.

Dim. ♂ 7.5 × 10. ♂ 10 × 12.5. ♀ 10 × 13. ♀ 7.25 × 9.

##### 15. MICIPPA CURTISPINA Haswell.

*Micippa curtispina*, Hasw. Proc. Linn. Soc. N. S. W. vol. iv. p. 446, pl. xxv. f. 1 (1879); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Hab.* Singapore; littoral. One female with ova.

As in *M. mascarenica*, the lateral spines of the female are irregular: the five that Prof. Haswell mentions as bordering the postero-lateral and posterior margins are only represented in this specimen by two well-developed teeth on the postero-lateral angle. The subapical rostral lobes are well-developed.

Dim. 8.5 × 10.

##### 16. MICIPPA EXCAVATA, sp. nov. (Plate XLIV. fig. 1.)

*Hab.* Singapore; 5-6 fms. A male and an ova-bearing female. This form comes nearest to the *M. curtispina* of Prof. Haswell.

The carapace is closely granulated, a few of the granules being larger than the others, more especially one on each branchial region, and one on the cardiac. The sides are irregularly tuberculate, two fairly prominent tubercles may be seen close behind the eye, and two more farther back, one on the branchial angle, the other on the postero-lateral margin. The middle line of the carapace is somewhat elevated; the hepatic regions are, as usual, very depressed. As regards the rostrum, the upper *half* is obliquely deflexed, the lower *half* vertically; its surface is granular and obtusely bicarinate, so as to form a median and two lateral grooves, the median terminating in the wide notch which separates the *two* lobes of the distal margin. The chelipedes are small and quite smooth; the distal half of the upper margin of the arm is strongly keeled, but the carina is not dentate. Ambulatory legs densely hairy, otherwise smooth: the meri are rather broad, but not so much as those of *M. curtispina*. The orbital margins are prominent; a single closed fissure above, and two below; pterygostomial regions smooth, and profoundly excavate. Basal joint of antennæ smooth, and the next two joints fairly narrow. The fingers of the chelipedes do not meet in their proximal half. Colour of carapace brick-red, touched with light yellow; chelipedes light yellow, distal two-thirds of fingers brown.

Dim. ♂ 9 × 11. ♀ 9·5 × 11·5.

## XII. Genus LAMBRUS Leach.

### 17. LAMBRUS HOPLONOTUS Ad. & White.

*Lambrus hoplonotus*, Ad. & White, 'Samarang' Crust. p. 35, pl. vii. f. 3 (1848); Hasw. Cat. Austr. Crust. p. 33 (1882); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 351 (1893).

*Hab.* Singapore; 10 fms. Two females, of the var. *planifrons*.

Dim. ♀ 9·25 × 8. ♀ 9·25 × 8.

### 18. LAMBRUS VALIDUS de Haan.

*Parthenope (Lambrus) valida*, de Haan, Crust. Japon. p. 90, pl. xxi. f. 1, & pl. xxii. f. 1 (1839).

*Lambrus validus*, Ad. & White, 'Samarang' Crust. p. 29 (1848).

*Hab.* Singapore; 15 fms. One male.

Dim. 30·25 × 26·5.

### 19. LAMBRUS LONGISPINUS Miers.

*Lambrus longispinus*, Miers, Ann. Mag. Nat. Hist. ser. 5, vol. iv. p. 18 (1879).

*Lambrus spinifer*, Hasw. Proc. Linn. Soc. N. S. W. vol. iv. p. 451, pl. xxvii. f. 4 (1880).

*Lambrus longispinus*, Miers, 'Alert' Crust. p. 199 (1884); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Hab.* Singapore; 6-8 fms. Two males.

Dim. ♂ 10·25 × 10·5. ♂ 16 × 16.

20. *LAMBRUS PELAGICUS* Rüpp.

*Lambrus pelagicus*, Rüpp. Beschreib. 24 Krabben, p. 15, pl. iv. f. 1 (1830); M.-Edw. Hist. Nat. Crust. t. i. p. 355 (1834).

? *Lambrus rumphii*, Bleeker, Rech. sur Crust. de l'Inde Archipel, Batavia, p. 18 (1856).

*Lambrus affinis*, A. M.-Edw. Nouv. Arch. Mus. t. viii. p. 261, pl. xiv. f. 4 (1872); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 350 (1893).

*Lambrus pelagicus*, de Man, Decap. u. Stom. von Malakka, Borneo, etc., Zoolog. Jahrb. Bd. viii. p. 494 (1895).

*Hab.* Singapore; from sandy shore at low-water. One male.

Dr. de Man, by a comparison with Rüppell's original specimens, has shown that the *Lambrus affinis* of A. M.-Edw. is identical with Rüppell's *L. pelagicus*; and possibly also with *L. rumphii* Bleeker.

Dim. 17 × 16.

21. *LAMBRUS TUMIDUS*, sp. nov. (Plate XLIV. fig. 2.)

*Hab.* Malacca; 2-6 fms.; muddy bottom. A male and a female.

Carapace a very little broader than long, general surface smooth; gastro-cardiac and branchial regions strongly tumid, separated by two wide and deep depressions. A median carina, branched anteriorly towards the base of the rostrum and enclosing there a concave triangular space; a low tubercle at the point of bifurcation, a second stronger tubercle in the centre of the cardiac region, and a third, as strong, half-way between the second and the first. Behind the second the carina shelves rapidly to a slightly upturned median spine on the posterior margin; the shelving portion bears a minute tubercle. Antero-lateral margins, behind the narrow hepatic notch, with eight flattened, obscurely lacinated, triangular spines, which increase in size from before backwards to the 7th, while the eighth becomes suddenly twice as large as the 7th, quite thin and laminate. Between this and the median posterior tooth are three teeth: first, an outwardly directed tooth, as strong as the eighth antero-lateral, carinate above, the carina granular and extending on to the tumid branchial region, where it becomes tubercular; from the base of this tooth, on the postero-lateral margin springs a shorter flattened tooth, not carinate, and bearing in turn at its base a minute tooth; and at a little distance on the external angle of the posterior margin, a tooth equal in size to the median posterior. The bed of the furrow separating the gastro-cardiac and branchial regions has in it four or five relatively deep holes, having the appearance of pin-pricks. Rostrum conical, acute, with a single, obscure tooth on either side of the base, just above the eye. The suborbital tooth is very strong and carinated below; a low granulated carina extends from the base of this tooth to the base of the chelipedes: pterygostomian regions otherwise smooth, under a covering of rather dense hair which

extends under the antero-lateral margins. Chelipedes three times as long as the body, and generally quite smooth above and below, except for—(a) a longitudinal line of granules on the upper surface of the arm, not quite reaching its distal extremity; the most proximal of these is produced into a very strong tooth; (b) a similar, more obscure line on the under surfaces of the wrist and hand; the distal third of this surface in the hand is rather swollen, and the linear arrangement of the granules is here rather broken up. The whole of the inferior margin of the arm and hand is set with evenly disposed sharp tubercles, which in the wrist are granular (in the male they are less sharp than in the smaller female); on the posterior margin of the arm five strong teeth, with smaller ones between them; on the anterior margin a similar arrangement, the teeth being, however, less strong and more numerous; two strong teeth on the hind margin of the wrist; both upper margins of hand dentate, the teeth being much stronger in its distal third. Dactyl with upper margin dentate; both fingers with strong tubercular teeth on the inner margins; these margins do not meet, except at the tips. Ambulatory legs with mero- carpo- and pro-podites strongly carinated above; and with meri spinulose below, strongly on the 1st and 4th pairs, very obscurely on the 2nd and 3rd.

Length (base of posterior spine to tip of rostrum) . . . . .	♂ .	♀ .
	25·5 mm.	20 mm.
Breadth (between 7th and 8th antero- lateral spines) . . . . .	28	22·5
	”	”
Length of chelipedes . . . . .	76	59·5
	”	”

This species is most nearly related to *L. validus* and *L. laciniatus*, from both of which it is distinguishable by its relative smoothness, and the fact that it is not so very much broader than long.

### XIII. Genus CRYPTOPODIA M.-Edw.

#### 22. CRYPTOPODIA FORNICATA Fabr.

*Cancer fornicatus*, Fabr. Ent. Syst. t. ii. p. 453 (1781); Herbst, Naturgesch. d. Krab. Bd. i. Hft. 6, p. 204, pl. xiii. ff. 79–80 (1785).

*Cryptopodia fornicata*, M.-Edw. Hist. Nat. Crust. t. i. p. 362 (1834); de Haan, Crust. Japon. p. 90, pl. xx. f. 2 (1839); Hasw. Cat. Austr. Crust. p. 37 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887); Hend. Trans. Linn. Soc., Zool. vol. v. p. 351 (1893).

*Hab.* Singapore. A male.

*Dim.* 22×13.

### XIV. Genus HARROVIA White.

#### 23. HARROVIA ALBOLINEATA Ad. & White.

*Harrovia albolineata*, Ad. & White, ‘Samarang’ Crust. pp. 55–56, pl. xii. f. 5 (1848).

*Hab.* Singapore; dredged from 10–15 fms. Two males. One of these shows the typical markings on the carapace and chelipedes; in the other, the red stripes on the carapace are fainter and less broad, and the crimson colour of the chelipedes is absent.

Dim. ♂ 5·5 × 5. ♂ 5·5 × 5.

23 a. *HARROVIA ALBOLINEATA LONGIPES*, var. nov. (Plate XLIV. fig. 3.)

*Hab.* Singapore. From a shoal of scattered stones and coral, with sand in places, partially exposed at low-water. One male.

In this specimen, the most striking feature is the length of the chelipedes, which are three times as long as the carapace, and not only twice as in *H. albolineata*. Further, the tubercles on the arm and wrist are very minute; and the two antero-lateral teeth are as low and as broad as the post-ocular tooth; the fourth is narrow and pointed.

Carapace raised but not tuberculate; minutely punctate, when seen through a lens, and of a diffuse dark red colour. Chelipedes rough, or even slightly granular, and generally as in *H. albolineata*. No tubercles on the ambulatory legs.

Dim. 7·5 × 7.

24. *HARROVIA TUBERCVLATA* Haswell.

*Harrovia tuberculata*, Hasw. Proc. Linn. Soc. N. S. W. vol. iv. p. 455, pl. xxvii. f. 1 (1880).

*Hab.* Singapore. One female, taken from off the arms of a Crinoid (*Actinometra multiradiata*) dredged from 6 fms.

This species is very near *H. albolineata*, of which it is possibly only a variety. I can discern the same arrangement of tubercles on the carapace in one of my examples of *H. albolineata*, in which the colouring is altogether fainter than usual. In the other, strongly coloured, individual the arrangement is not so obvious; but in no instance is it very distinct.

The tubercles on the meri of the ambulatory legs seem to be the only distinctive feature; for, as regards the absence of colour-markings, the two examples of *H. albolineata* show that a certain variation occurs in this respect. Variation is also evident in the tubercles of the arm: thus in the above examples of *H. albolineata* I find:—

A. A spine at the base of the posterior margin just where it appears from beneath the carapace. In both arms of the one male this is relatively strong and spiniform, and in the right arm of the other male; in the left arm of the other male it is small, tubercular.

B. A spine in a corresponding position on the anterior margin. In the right arm of the one male this is single tuberculate, in the left arm bifid tuberculate.

In the right arm of the other male this is bifid and spinous, in the left it is only represented by a roughening of a granulous nature.

In addition, the right arm of the other male has a small tubercle on the middle of the posterior margin.

I have, however, two larger individuals, both females, whose presence in the collection I had at first overlooked, in which the tubercles of the carapace and the antero-lateral teeth are very strongly developed: the two anterior tubercles being quite tooth-like, and as big as the penultimate lateral teeth. It may be, then, that the species is a good one, although I am still inclined to suspect that the differences are only varietal.

The larger of these females bears ova, and was taken off another specimen of *A. multiradiata*.

Dim. ♀ 6 × 5.5. ♀ 10.5 × 8.5. ♀ 8.5 × 6.5.

## XV. Genus ATERGATIS de Haan.

### 25. ATERGATIS INTEGERRIMUS Lamarek.

*Cancer integerrimus*, Lam. Hist. des Anim. sans Vert. t. p. 272 (1818); M.-Edw. Hist. Nat. Crust. t. i. p. 374 (1834).

*Cancer (Atergatis) integerrimus*, de Haan, Crust. Japon. p. 45, pl. xiv. f. 1 (1839).

*Atergatis integerrimus*, de Man, Mergui Crust. p. 24 (1888); id. Zoolog. Jahrb. Bd. viii. p. 496 (1895).

*Hab.* Singapore. Littoral: under stones or dead coral. 6 males and 2 females.

Dim. ♂ 81 × 51. ♂ 67 × 41.5. ♂ 44 × 27.5. ♂ 36.5 × 23. ♂ 24 × 15. ♂ 23 × 14.75. ♀ 62 × 39.5. ♀ 48.5 × 30.5.

Breadth taken is the *greatest* breadth.

### 26. ATERGATIS FLORIDUS Rumph.

*Cancer floridus*, Rumph. D'Amboin. Rariteit-kammer, p. 16, pl. viii. f. 5 (1741).

*Cancer ocyroë*, Herbst, Krab. u. Krebse, pl. liv. f. 2 (1801); M.-Edw. Hist. Nat. Crust. t. i. p. 375 (1834).

*Cancer (Atergatis) floridus*, de Haan, Crust. Japon. p. 46 (1839).

*Atergatis floridus*, Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887); de Man, Mergui Crust. p. 24 (1888); id. Zoolog. Jahrb. Bd. viii. p. 498 (1895).

*Hab.* Singapore. 5 males and 3 females, one with ova. From same localities as *A. integerrimus*.

Dim. ♂ 51 × 35.5. ♂ 48 × 33.5. ♂ 43.5 × 30. ♂ 38.5 × 27. ♂ 24 × 17.25. ♀ 45.5 × 32.5. ♀ 41.5 × 29. ♀ 31 × 22.

Breadth taken is the *greatest* breadth.

### 27. ATERGATIS ROSEUS Rüpp.

*Carpilius roseus, marginatus*, Rüpp. Beschreib. 24 Krabben, p. 13, pl. iii. f. 3 (1830).

*Cancer roseus*, M.-Edw. Hist. Nat. Crust. t. i. p. 374 (1834).

*Atergatis marginatus*, Dana, U.S. Expl. Exped., Crust. pt. i. p. 158 (1852).

*Atergatis nitidus, roseus, scrobiculatus, laevigatus*, A. M.-Edw. *Nouv. Arch. Mus. t. i. pp. 239 seq.* (1865).

*Atergatis roseus*, Kossmann, *Zoolog. Ergebn.* pp. 19-21 (1877).

*Atergatis laevigatus*, Henderson, *Trans. Linn. Soc., Zool. vol. v. p. 352* (1893).

*Hab.* Singapore and Malacca; littoral. Five males.

Kossmann has shown that probably all the above-named species are varieties of *A. roseus*. Of these specimens one is the var. *scrobiculatus*, with a slightly punctated carapace, generally red but with a very distinct white border. Two others belong to the var. *alba* (Kossm.), although not perfect examples of it, for a whiter margin may still be distinguished from the white carapace, and the latter is still slightly punctated. The fourth and fifth are respectively more and more intermediate between var. *alba* and var. *scrobiculata*, one of them more resembling the former, the other the latter.

The Singapore specimens are the two examples of var. *alba*.

Dim. ♂ 10.5 × 6.5. ♂ 10.25 × 6.25. ♂ var. *scrobic.* 11.75 × 7. ♂ var. *alba*, 11.5 × 6.5. ♂ var. *alba*, 6.5 × 4.5.

Breadth taken is *greatest* breadth.

## XVI. Genus CARPILODES Dana.

### 28. CARPILODES MARGARITATUS, A. M.-Edw.

*Carpilodes margaritatus*, A. M.-Edw. *Nouv. Arch. Mus. t. ix. p. 182, pl. v. f. 2* (1873); Henderson, *Trans. Linn. Soc., Zool. vol. v. p. 353* (1893).

*Hab.* Malacca; 15 fms. One female. Agrees with the descriptions of M.-Edwards and Henderson: like those of the latter, it is without the brilliant colours figured by M.-Edwards although still of a general red hue.

Dim. 24 × 17.

### 29. CARPILODES SOCIUS, sp. nov. (Plate XLIV. fig. 4.)

*Hab.* Singapore; 8-10 fms. Two males and a female.

Carapace much broader than long, everywhere smooth to the eye, but minutely punctate viewed under the lens, posteriorly nearly flat, but very declivous anteriorly towards the front and anterolateral margins. Progastric lobe divided by a groove which does not quite reach the branchio-hepatic groove. Epigastric lobes clearly defined, having a well-marked transverse groove behind as well as in front of them. Mesogastric lobe prolonged a little way between them; the two grooves enclosing this lobe are not prolonged backwards very far. Groove between cardiac and gastric regions less pronounced than the others.

Front notched in the middle, and sinuous, so as to form four lobes, the two median being large and broad, and the external, forming also the internal angle of the eye, small and conical. Upper margin of the orbit very much thickened in its internal half.

Antero-lateral margins curved, about as long as the postero-lateral, divided into four lobe-like teeth, and tending anteriorly to be continued below the orbits.

Chelipedes short; arm trigonous, externally punctated like the carapace, upper margin sharp, lower rounded; wrist punctate, armed internally with two approximate blunt teeth, externally with a line of three flat tubercles; hand compressed, grooved externally and above, just below the blunt crest formed by the upper margin; this groove is very wide and shallow, and not so conspicuous in small examples. Fingers brown, with white, strongly excavate tips; inner margins dentate; longitudinally bisulcate externally, uni-sulcate internally.

Ambulatory legs with meri smooth, or slightly punctate; compressed, and lightly keeled above. Upper borders of next two joints each with two tubercular prominences, one near the proximal, the other near the distal joint. Sixth joint rounded; dactyl very small and pointed. Abdomen of male five-, of female seven-jointed.

The two males are of a very deep crimson colour; the female is of a much lighter shade, more like terra-cotta.

This species comes between *C. rugipes* and *C. rugatus*. The carapace is broader than that of *C. rugipes*, but less broad than that of *C. rugatus*; there is a transverse groove behind the epigastric lobes as in the latter, but the protogastric groove, as in the former, is not prolonged backwards to meet the branchio-hepatic.

Dim. ♂ 18.5 × 11. ♂ 12.75 × 8. ♀ 24.5 × 15.

#### XVII. Genus LOPHACTEA A. M.-Edw.

##### 30. LOPHACTEA GRANULOSA Rüppell.

*Xantho granulatus*, Rüpp. Beschreib. 24 Krabben, p. 24, pl. v. f. 3 (1830).

*Ægle granulatus*, de Haan, Crust. Japon. p. 17 (1839).

*Cancer limbatus*, M.-Edw. Hist. Nat. Crust. t. i. p. 377, pl. xvi. f. 1 (1834).

*Lophactea granulosa*, A. M.-Edw. Nouv. Arch. Mus. t. i. p. 247 (1865); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 354 (1893).

*Hab.* Singapore; from dead coral exposed at low water. Two females, one bearing ova.

The upper margins of the hands are *slightly* cristate.

Dim. ♀ 37 × 25. ♀ 31.5 × 21.

#### XVIII. Genus ACTEA de Haan.

##### 31. ACTEA GRANULATA Audouin.

*Cancer granulatus*, Aud. Explic. d. Planches d'Égypte, Crust. pl. vi. f. 2 (1819).

*Cancer savignyi*, M.-Edw. Hist. Nat. Crust. t. i. p. 378 (1834).

*Cancer (Actea) granulatus*, de Haan, Crust. Japon. p. 47 (1839).

*Actea granulata*, A. M.-Edw. Nouv. Arch. Mus. t. i. p. 275

(1865); Hasw. Cat. Austr. Crust. p. 44 (1882); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 356 (1893).

*Hab.* Singapore. From the New Harbour, in 6 fms. Two females; the larger a deep red, the smaller a lighter red.

Dim. ♀ 13·5 × 10·5. ♀ 10 × 7·5.

### 32. *ACTÆA NODULOSA* Adams & White.

*Actæa nodulosa*, Ad. & White, 'Samarang' Crust. p. 39, pl. viii. f. 4 (1848); A. M.-Edw. Nouv. Arch. Mus. t. i. p. 277 (1865); Miers, 'Challenger' Brachyura, p. 120 (1886); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 356 (1893).

*Hab.* Singapore; reef. A female and two males. The female is a dull grey-white, the males white flecked with orange.

Dim. ♂ 7 × 5·25. ♂ 6 × 4·5. ♀ 8 × 6·5.

### 33. *ACTÆA RÜPPELLII* Krauss.

*Ægle rüppellii*, Krauss, Südafrik. Crust. p. 28, pl. i. f. 1 (1843).

*Ægle rugata*, Ad. & White, 'Samarang' Crust. p. 43, pl. viii. f. 5 (1848).

*Actæa rüppellii*, A. M.-Edw. Nouv. Arch. Mus. t. i. p. 270 (1865).

*Actæa rugata*, id. tom. cit. p. 269.

*Actæa rüppellii*, Miers, Ann. Mag. Nat. Hist. ser. 5, vol. v. p. 232 (1880); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Actæa rufopunctata*, de Man, Mergui Crust. p. 26 (1888).

*Actæa rüppellii*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 358 (1893); de Man, Zoolog. Jahrb. Bd. viii. p. 499 (1895).

*Hab.* Singapore; shore, and up to 12 fms. Three males and three females. These were generally found curled far down in the cavities of pieces of eroded stone, which had to be broken in order to find them. In all, the whole of the mesogastric and part of the protogastric lobes are red; the ground-colour a faint yellow, with scattered red spots both on the carapace, legs, and under surface.

Dim. ♂ 27 × 21. ♂ 25·5 × 19·5. ♂ 23 × 18. ♀ 27 × 20. ♀ 26·5 × 20. ♀ 20·5 × 15·5.

### 34. *ACTÆA AREOLATA* Dana.

*Actæa areolata*, Dana, U.S. Expl. Exped., Crust. pt. i. p. 162, pl. viii. f. 1 a (1852); A. M.-Edw. Nouv. Arch. Mus. t. i. p. 264 (1865); Miers, 'Alert' Crust. p. 209 (1884); de Man, Mergui Crust. p. 25 (1888); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887).

*Hab.* Singapore; under stones between tide-marks. Three females and a young male.

As in the 'Alert' specimens, so in these, the inter-regional grooves are much more clearly defined than in Dana's figure. But their general resemblance with the figure, and their close

agreement with the description make it almost certain that they are Dana's species. Dr. de Man has noticed (*t. c.*) that whereas the internal protogastric division is represented in Dana's figure as being much broader than the portion of the mesogastric next it, in his examples the former is scarcely broader than the latter. This I find to be also the case both in the Singapore and the 'Alert' individuals.

Dim. ♂ 9 × 5. ♀ 20 × 12.5. ♀ 19 × 12. ♀ 16 × 10.

35. *ACTÆA PULCHELLA* A. M.-Edw.

*Actœa pulchella*, A. M.-Edw. Nouv. Arch. Mus. t. i. p. 273, pl. xviii. f. 5 (1865).

*Hab.* Singapore; between tide-marks. Two males and a female.

These specimens agree entirely with the description and figures given, except that the granules on the hand tend, here, to form in definite rows.

I may also notice that the granules tend to disappear on the posterior part of the carapace. M.-Edwards's figure gives something of their appearance, but in his description he only says "surface couverte de granulations."<sup>1</sup>

Dim. ♂ 12 × 9. ♂ 9.25 × 7. ♀ 10.5 × 7.5.

XIX. Genus *ACTÆODES* Dana.

36. *ACTÆODES TOMENTOSUS* Dana.

*Zozymus tomentosus*, M.-Edw. Hist. Nat. Crust. t. i. p. 385 (1834), and Atlas du Règne Anim. de Cuvier, Crust. pl. xi bis. f. 2.

*Actœodes tomentosus*, Dana, U.S. Expl. Exped., Crust. pt. i. p. 197 (1852).

*Actœodes affinis*, Dana, t. c. p. 197, pl. xi. f. 3 (1852).

*Actœa tomentosa et affinis*, A. M.-Edw. Nouv. Arch. Mus. t. i. pp. 262-3 (1865).

*Actœodes tomentosus*, Miers, 'Challenger' Brachyura, p. 135 (1886).

*Hab.* Singapore; littoral. Three males and two females.

Of these, one male and one female agree entirely with Dana's *A. tomentosus*; the others agree with his *A. affinis* in having the cardiac areolet nearly completely bisected, the granules smaller and more numerous, and the outer maxillipedes relatively smoother, but not in the smoothness of the under surface of the hands, nor the fewer and larger spinules on the fingers; the hands are quite similar in all. Furthermore, all have a ratio of length to breadth of approximately 1 : 1.6; in Dana's *A. affinis* this ratio is 1 : 1.37 (*t. c.* p. 198). These specimens were all obtained from the same exposed reef. The internal surface of the hands of two of the males is encrusted with a Polyzoön.

In Milne-Edwards's description of *Zozymus tomentosus* (*t. c.*) he

<sup>1</sup> I have recently examined a larger individual from the Museum collection at Sarawak, which I am at present describing, and find that the granules on the posterior region are quite distinct, though smaller than those in front.

says that the pterygostomian regions are not granulous ; in all these specimens they are distinctly granulated.

Dim. ♂ 30.5 × 19.5. ♂ 29.5 × 19. ♂ 26.5 × 17. ♀ 28.5 × 18.5.  
♀ 27.75 × 17.5.

## XX. Genus CYCLOXANTHUS A. M.-Edw.

### 37. CYCLOXANTHUS LINEATUS A. M.-Edw. (?)

Cf. *Cycloxanthus lineatus*, A. M.-Edw. Nouv. Arch. Mus. t. ix. p. 209, pl. vi. f. 5 (1873); Miers, 'Alert' Crust. p. 212 (1884).

*Hab.* Uncertain. A small male.

I cannot definitely refer this specimen to M.-Edwards's species. The carapace is not at all smooth; there is a distinct low carina on each side over the branchial regions, extending from the last tooth nearly to the middle line; two low swellings on the mesogastric, and one on the cardiac regions. The whole surface, moreover, is finely and closely granulated. Colour a dull grey; legs yellow; fingers of chelipedes brown. This individual is identical with the two specimens obtained by the 'Alert.'

Dim. 7.5 × 5.5.

## XXI. Genus EUXANTHUS Dana.

### 38. EUXANTHUS HUONII Jacq. et Lucas.

*Cancer huonii*, Jacq. et Lucas, Voyage au Pôle du Sud, Crust. p. 16, pl. iv. f. 1 (Hombbron et Jacquinot, tome iii. 1853).

*Euxanthus huonii*, A. M.-Edw. Nouv. Arch. Mus. t. i. p. 290 (1865); Miers 'Alert' Crust. p. 204 (1884).

*Hab.* Singapore; littoral, from among stones and dead coral. One male.

A. M.-Edwards thinks it possible that *E. huonii* and *E. sculptilis* Dana may be identical. Mr. Miers, commenting on this, points out that the black coloration of the fingers extends on to the hand in M.-Edwards's figure, and also in his ('Alert') specimen. This, he adds, is not figured by Dana, nor does it occur in two Museum specimens one of which has been designated *E. huonii* by A. M.-Edwards, but which Mr. Miers refers provisionally to *E. sculptilis*. Now, in this example from Singapore, the colour is limited to the fingers also; yet there can be no doubt it is identical with *E. huonii*, and not with *E. sculptilis*, for two reasons—firstly, the fingers are not denticulate above: and secondly, the posterolateral margins are deeply concave, while in Dana's figure they are represented as nearly straight. For these reasons, also, I should still regard *E. huonii* and *E. sculptilis* as distinct. I was unfortunately unable to obtain the specimens referred to by Mr. Miers for purposes of comparison (*vide* footnote<sup>1</sup>).

Dim. 18.5 × 13.

<sup>1</sup> The two specimens of *Euxanthus sculptilis* to which Mr. Miers refers (*op. cit.* p. 204) were not in the collection when I made a MS. catalogue of the Brachyura in 1895.—F. J. B., Nat. Hist. Mus. 16 April, 1900.

## XXII. Genus LOPHOZOYMYUS A. M.-Edw.

## 39. LOPHOZOYMYUS EPHELITICUS Linn.

*Cancer epheleticus*, Linn. (fide auctor.).

*Xantho octodentatus*, M.-Edw. Hist. Nat. Crust. t. i. p. 398 (1834); Jacq. et Lucas, Voyage au Pôle du Sud, Crust. p. 23, pl. ix. f. 1 (Hombroun et Jacq. tome iii. 1853).

*Lophozozymus octodentatus*, Hasw. Cat. Austr. Crust. p. 58 (1882).

*Lophozozymus epheleticus*, Walker, Journ. Linn. Soc., Zool. vol. xx. p. 109 (1887); de Man, Zoolog. Jahrb. Bd. viii. p. 518 (1895).

*Hab.* Singapore; littoral. One male and three females: and one younger male.

In these specimens I note the following variations:—In the adult male, the fissure in the dorsal crest of the merus of the chelipedes opens widely at the top in the left arm, being broader above than below, whereas in the right arm it is nearly closed above; and in the right arm of one of the females it is completely closed above. Further, in the females the two tubercles on the inner edge of the carpus show a tendency to unite and form a ridge with concave edge. In the right carpus of one it forms a tri-tuberculate ridge, in the left the posterior tubercle is rudimentary, lying at the base of the other: while on the right carpus of another the two are nearly obsolete, being only represented by a very small excrescence.

Dim. ♂  $56 \times 36.5$ . ♂  $32.5 \times 20$ . ♀  $64 \times 41.5$ . ♀  $58.5 \times 37.5$ . ♀  $56.5 \times 37$ .

## 40. LOPHOZOYMYUS (LOPHOXANTHUS) LEUCOMANUS Lockington.

*Xanthodes leucomanus*, Lockington, Proc. Calif. Ac. Nat. Sci. pp. 32, 100 (1876).

*Lophozozymus (Lophoxanthus) bellus*, var. *leucomanus*, Miers, 'Challenger' Brachyura, p. 115, pl. xi. f. 1 (1886).

*Hab.* Singapore. I have no record of the depth. A male and a female.

Colour of carapace grey-black, of legs white-yellow. I cannot but regard this as specifically distinct from *L. bellus* Stm., after comparing it with two examples of the latter that are in the Museum collection. Superficially, the carapace of *L. leucomanus* appears, and is actually, broader in proportion to the length than that of *L. bellus*, and the front projects much farther forward beyond the orbits. The result of this is that the crab has a definitely six-sided appearance, which is not seen in *L. bellus*. The antero-lateral margins also differ very considerably, for in *L. leucomanus* they are continued in front to a point below the orbits, making the hepatic regions somewhat concave; whereas in *L. bellus* the margin is continued, at the same level, to the external orbital angle, and the hepatic regions are slightly convex. The rugosities of the carapace are also very distinctive in *L. leucomanus*,

and these occur but little in *L. bellus*. Further, the carinæ of the upper margins of the ambulatory legs are very well developed in *L. leucomanus*; whereas in *L. bellus* the upper margins are only sharp, or even slightly rounded, as in the last pair. The chelipedes of *L. leucomanus* are very pitted and rugose, those of *L. bellus* are smooth.

In the two Museum specimens of *L. bellus*, the proportions are:—

Breadth of carapace . . . .	9 mm.	19 mm.
Length of carapace . . . . .	7 mm.	14 mm.

Dim. ♂ 12 × 9. ♀ 10 × 7·25.

### XXIII. Genus PARAPANOPE de Man.

#### 41. PARAPANOPE EUAGORA de Man.

*Parapanope euagora*, de Man, Zoolog. Jahrb. Bd. viii. pp. 513–518, Bd. ix. pl. xii. f. 4 (1895).

*Hab.* Malacca. One male, entirely agreeing with Dr. de Man's excellent description.

Dim. 8 × 5·5.

### XXIV. Genus CHLORODIUS Rüpp.

#### 42. CHLORODIUS NIGER Forskål.

*Cancer niger*, Forskål, Descr. Anim. p. 89 (1775).

*Chlorodius niger*, Rüpp. Beschreib. 24 Krabben, p. 20, pl. iv. f. 7 (1830); A. M.-Edw. Nouv. Arch. Mus. t. ix. p. 214 (1873); de Man, Mergui Crust. p. 32 (1888), and Zoolog. Jahrb. Bd. viii. p. 519 (1895).

*Hab.* Singapore. One male.

Dim. 12·5 × 9.

### XXV. Genus CHLORODOPSIS A. M.-Edw.

#### 43. CHLORODOPSIS PILUMNOIDES Ad. & White.

*Chlorodius pilumnoides*, Ad. & White, 'Samarang' Crust. p. 41 pl. ix. f. 3 (1848).

*Chlorodopsis pilumnoides*, de Man, Mergui Crust. p. 35 (1888).

*Hab.* Malacca.

An adult female. Spines on anterior margin of arm well-developed; interspace between the fingers very wide as far as the tips, which are sharply curved to meet each other and strongly excavate. Mr. Miers states ('Alert' Crustacea, p. 531) that in an adult male specimen from Singapore in the Museum collection the black coloration of the fingers extends over the inner and outer surfaces of the hand: in this individual the fingers are deep brown with white tips, and the brown colour does not extend beyond their base. Dr. de Man also (*t. c.*) has found this to be the

case in his females from the Mergui Archipelago, so perhaps it is a sexual distinction.

In three females and a male from the Mergui collection, which I have examined, the actual colour varies from a deep black to a very pale brown.

Dim.  $22 \times 16$ .

#### XXVI. Genus LEPTODIUS A. M.-Edw.

##### 44. LEPTODIUS EXARATUS M.-Edw.

*Chlorodius exaratus*, M.-Edw. Hist. Nat. Crust. t. i. p. 402 (1834).

*Xantho affinis*, de Haan, Crust. Japon. p. 48, pl. xiii. f. 8 (1839).

*Leptodius exaratus*, A. M.-Edw. Nouv. Arch. Mus. t. ix. p. 222 (1873); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 362 (1893); de Man, Zoolog. Jahrb. Bd. viii. p. 521 (1895).

*Hab.* Singapore; littoral. Several young examples.

Dim. ♂  $10 \times 7$ . ♂  $9.5 \times 7$ . ♂  $10.5 \times 7.25$ . ♂  $7.25 \times 5.25$ .  
 ♂  $7.25 \times 5.5$ . ♀  $12 \times 8$ . ♀  $9 \times 6.5$ . ♀  $8 \times 6$ . ♀  $9 \times 6.5$ .  
 ♀  $6.75 \times 5$ . ♀  $7.5 \times 5.5$ . ♀  $7 \times 5$ . ♀  $8.5 \times 6$ .

##### 44a. LEPTODIUS EXARATUS GRACILIS.

*Chlorodius gracilis*, Dana, U.S. Expl. Exped. p. 210, pl. xi. f. 13 (1852).

*Leptodius exaratus*, var. *gracilis*, Miers, 'Alert' Crust. p. 530 (1884).

*Hab.* Singapore; littoral, together with the species. A male and a female.

Dim. ♂  $14.5 \times 9.5$ . ♀  $17 \times 12$ .

#### XXVII. Genus ETISUS M.-Edw.

##### 45. ETISUS LEVIMANUS Randall.

*Etisus levimanus*, Randall, Journ. Ac. Nat. Sci. Philad. vol. viii. p. 115 (1839); Dana, U.S. Expl. Exped., Crust. pt. i. p. 185, pl. x. f. 1 (1852).

*Etisus macrodactylus*, Jacq. et Lucas, Voyage au Pôle du Sud, Crust. p. 30, pl. ix. f. 2 (Hombron et Jacquinet, tome iii. 1853).

*Etisus levimanus*, A. M.-Edw. Nouv. Arch. Mus. t. ix. p. 234 (1873).

*Hab.* Singapore; littoral. Two males. One of these is ornamented with a large, oval, brown spot on the gastric region, and other brown spots dotted more or less regularly over the carapace generally.

Dim. ♂  $63.5 \times 40$ . ♂  $68.5 \times 41.5$ .

##### 46. ETISUS UTILIS Jacq. et Lucas.

*Etisus utilis*, Jacq. et Lucas, Voyage au Pôle du Sud, Crust.

p. 27, pl. ii. f. 6 (Hombron et Jacq. tome iii. 1853); A. M.-Edw. *Nouv. Arch. Mus.* t. ix. p. 233 (1873).

*Hab.* Singapore; obtained at lowest tides. Five males.

Dim. ♂ 90 × 59. ♂ 78 × 52.5. ♂ 100 × 66. ♂ 104 × 66.  
♂ 102 × 68.

Breadth taken from between *penultimate* lateral teeth.

## XXVIII. Genus ETISODES Dana.

47. ETISODES ANAGLYPTUS M.-Edw. (Plate XLV. fig. 5.)

*Etisus anaglyptus*, M.-Edw. *Hist. Nat. Crust.* t. i. p. 411 (1834).

*Etisodes anaglyptus*, Miers, 'Alert' *Crust.* p. 218 (1884); Hasw. *Cat. Austr. Crust.* p. 55 (1882).

*Hab.* Singapore; littoral. Three males and a female.

These are all fine specimens, and, as I have not seen any description of the species since that of Milne-Edwards in 1834, and a few additional remarks by Mr. Miers (*t. c.*), I give a further one now.

Carapace somewhat lobulated, more particularly in front and on the sides, and rather depressed; under the lens everywhere minutely punctated; furrows between the lobules broad and rather deep. Front relatively narrow, consisting of two projecting lobes, separated by a deep median notch, closed posteriorly; each lobe with a short, thick, granulated and concave anterior margin, the external half of which is lower than the interior, so that the line of the front is curved dorso-ventrally; a deep wide notch between this and the internal orbital angle, below which, when viewed from above, appear the antennæ. This angle forms a salient tubercle. Upper orbital margin thick, its external half divided, by two conspicuous closed fissures, into two low tubercles, the outer of which forms the external angle of the orbit. Lower margin formed of two tubercles; one, more prominent, below and external to the internal orbital angle, the other below and internal to the external angle. A curved line of granules, set in a shallow furrow, separates the subhepatic and pterygostomial regions; merus of external maxillipedes granulated, as also are the anterior half of the first sternal segment and the internal edge of the others where they abut on the abdomen; the first sternal segment also presents a deep median groove.

Chelipedes fairly long; merus and carpus internally granulate, hand internally smooth and slightly punctate. External surface of merus smooth, its upper margin with a line of long hairs; external surface of carpus tuberculate and punctate, its internal angle with a strong forwardly curved spine, which has a low tubercle at its base posteriorly; external surface of hand punctate, and with three longitudinal rows of low tubercles; upper margin with two rows of tubercles, irregularly disposed. Fingers black, this colour extending a little way on to the under, lower external, and lower internal surfaces of the hand; externally

and internally more or less sulcate; mobile finger with two rows of 3 or 4 tubercles above, enclosing between them a furrow; tips strongly excavate and white; inner margins dentate and not quite meeting. Ambulatory legs with upper and under margins densely clothed with hair; upper margins tuberculate, the tubercles becoming stronger from the merus to the dactyl, under margins granulate.

Colour variable; smallest male greenish yellow with a few red-brown patches, the next in size with a much greater amount of red-brown, the largest completely brown; the female has a somewhat mottled appearance of brown and yellow.

The tubercles of the chelipedes tend to obsolescence in the largest male. Mr. Miers's statement (*t. c.*) that the distal ends of the frontal lobes are *convex* seems to be either a mistake or a misprint; for I have examined the 'Alert' specimen, and find them, like these, slightly *concave* when viewed from above; briefly, they are convex in a vertical, and concave in a horizontal plane.

Dim. ♂ 57·5 × 38. ♂ 45·5 × 30·5. ♂ 36 × 25. ♀ 42 × 28.

#### XXIX. Genus CYMO de Haan.

##### 48. CYMO ANDROSSYI MELANODACTYLA.

*Cymo melanodactylus*, de Haan, Crust. Japon. p. 22 (1839).

*Cymo andreossi*, Miers, 'Alert' Crust. p. 532 (1884); de Man, Mergui Crust. p. 35 (1888); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 363 (1893).

*Hab.* Singapore: from the reef at low water. A male. Fingers black: black colour extending on to under and lower external surface of hand; granules on this part small above, absent below; tips of fingers light brown, not white.

Dim. 11·5 × 9·5. Breadth taken is *greatest* breadth.

#### XXX. Genus MYOMENIPPE Hilgendorf.

##### 49. MYOMENIPPE GRANULOSA A. M.-Edw.

*Menippe granulosa*, A. M.-Edw. Ann. Soc. Entom. de France, t. vii. p. 275 (1867).

*Myomenippe duplicitens*, Hilgendorf, Monatsber. k. Akad. Wiss. Berlin, p. 796 (footnote) (Nov. 1878).

*Myomenippe granulosa*, de Man, Mergui Crust. p. 40, pl. ii. f. 1 (1888), and Zoolog. Jahrb. Bd. viii. p. 525 (1895).

*Hab.* Malacca; littoral. One male example.

This agrees almost entirely with Dr. de Man's excellent description (*t. c.*); the only notable difference is the presence of numerous, rather thickly-set hairs on the ambulatory legs, especially on the upper margin of the meri; these would appear, from Dr. de Man's figure, to be much less numerous in his examples.

Dim. 38 × 27·5.

Distance between ext. orbital angles, 22 mm.

Length of larger hand, 29·25 mm.

XXXI. Genus *ACTÆOPSIS*, gen. nov.

This genus bears a very general resemblance to *Actæa*, both in the shape of the carapace, and arrangement of the front, orbits and antennæ. But it differs in having well-marked ridges on the endostome, and very distinct carinæ on the ambulatory legs; furthermore, the fingers are strongly excavate. The antero-lateral margins, too, are much straighter, and the carapace relatively more flat.

The characters of the genus, as exemplified in the present specimens (2 males and 2 females), are as follows:—

Carapace six-sided, broader than long, generally depressed, but a little declivous towards the front and sides; front broad, and a little advanced, its anterior margin sinuous; basal joint of the antennæ barely entering the internal orbital hiatus, reaching the base of the infero-lateral process of the front by the anterior half of its internal margin, but not quite reaching the apex of the internal subocular lobe externally<sup>1</sup>; flagellum short. Endostome with well-marked ridges; merus of the exterior maxillipedes truncate, broader than long, the next joint being articulated at its emarginate antero-internal angle. Chelipedes short with excavate fingers; ambulatory legs of moderate length, meri unicarinate, next three joints bicarinate. Antero-lateral margins very thick, with four blunt and rounded teeth, the depressions between which are continued on to the subhepatic regions at well marked grooves. Abdomen, in the male five-, in the female seven-jointed.

50. *ACTÆOPSIS PALLIDA* (Borradaile). (Plate XLV. fig. 6.)

*Carpiliodes pallidus*, Borradaile, P. Z. S. 1900, p. 586, pl. xl. fig. 3.

*Hab.* Singapore; from interstices in coral from off the shore at low water, and up to 6 fms. Two males and two females.

Carapace nearly flat behind, slightly declivous towards the anterior and antero-lateral margins; under the lens it is seen to be everywhere closely punctate, with a tendency to a spongy appearance; breadth one and a half times the length. Proto-gastric grooves prolonged posteriorly to meet the branchio-hepatic; epigastric lobes limited by a transverse groove behind as well as before; mesogastric lobe projecting very slightly between them, and the grooves which bound it prolonged posteriorly and outwardly so as nearly to meet the proto-gastric grooves at their junction with the branchio-hepatic; hepatic and branchial regions lobulated. Front with a distinct median notch, and sinuous; median lobes broad and rounded and rather prominent, lateral lobes small and only faintly prominent. Superior orbital margin rather thickened internally, and externally to this two closed fissures. Antero-lateral teeth four in number, broad, low and very rounded, except the last which is conical and obtuse. The depressions between them are continued as grooves on to the subhepatic regions which, together with the exterior maxillipedes, the pterygostomian and sternal regions, are everywhere strongly punctate.

<sup>1</sup> Note.—This is not very clearly shown in the figure, Pl. XLV. fig. 6.

Chelipedes short, everywhere punctated, on the outside strongly so as to appear almost rugose, on the inside faintly so as to appear smooth in comparison. Merus trigonous, with a small double blunt tooth, subdistal, on its upper margin; carpus rounded, with a small double tooth internally; hand rather compressed, the punctæ, externally, tending to a linear arrangement; fingers brown, rather short, dentate on the inner margin and externally unisulcate; tips white and strongly excavate.

The ambulatory legs are all carinated, in the following manner, on their upper margins: the merus has a simple carina with a slight groove on its outer aspect; in the carpal joint this carina is faintly sinuous, the groove is very distinct, and outside it may be seen a second low carina; this carina is even more distinct in the fifth joint, until in the next it equals in size the first carina, and the two enclose the original groove between them. Thus the merus is unicarinate, the carpus obscurely bicarinate, and the remaining two joints distinctly bicarinate.

The carapace and limbs in one female are of a deep red hue; in the males and the other female the limbs and under-surface only are red or pinkish, the carapace being white or yellow-white.

This form is identical with one which Mr. Borradaile has referred to the genus *Carpilodes* in a recent paper (*supra*, page 586) and I too was at first inclined to refer it to that genus. But the differences it exhibits are very striking, namely, the depression of the carapace, the grooves on the subhepatic regions, the ridges of the endostome, and the carination of the ambulatory legs, while the lateral margins are much less curved than in *Carpilodes*. This combination of characters is also sufficient to separate it from *Actæa*; though I am inclined now to regard it as more nearly related to that genus than to *Carpilodes*.

Dim. ♂ 8.5 × 5.75. ♂ 8.5 × 5.75. ♀ 7.75 × 5.5 ♀ 9.25 × 6.

### XXXII. Genus ACTUMNUS Dana.

#### 51. ACTUMNUS SETIFER de Haan.

*Cancer (Pilumnus) setifer*, de Haan, Crust. Japon. p. 50, pl. iii. f. 3 (1839).

*Actumnus setifer*, A. M.-Edw. Nouv. Arch. Mus. t. i. p. 287, pl. xviii. f. 5 (1865).

*Actumnus tomentosus*, Dana, U.S. Expl. Exped., Crust. pt. i. p. 243, pl. xiv. f. 2 (1852).

*Actumnus setifer*, Miers, 'Alert' Crust. pp. 225-6 (1884); de Man, Mergui Crust. p. 47 (1888); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887).

*Hab.* Singapore; 5-10 fms. Five adult males and a smaller female, and two young males. These were found in holes made in soft stones, which were brought up by the dredge.

Dim. ♂ 20.5 × 16. ♂ 16 × 13. ♂ 13.25 × 10.5. ♂ 13.25 × 10.5. ♂ 13.75 × 10.5. ♀ 12.75 × 10.

## XXXIII. Genus PILUMNUS Leach.

## 52. PILUMNUS VESPERTILIO Fabr.

*Cancer vespertilio*, Fabr. Suppl. Ent. Syst. p. 338 (1798).

*Pilumnus vespertilio*, M.-Edw. Hist. Nat. Crust. t. i. p. 418 (1834).

*Pilumnus ursulus*, Ad. & White, 'Samarang' Crust. p. 45, pl. ix. f. 6 (1848).

*Pilumnus mus*, Dana, U.S. Expl. Exped., Crust. pt. i. p. 240 (1852).

*Pilumnus vespertilio*, de Man, Mergui Crust. p. 58 (1888); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887).

*Hab.* Singapore; littoral. One large male, four smaller; a small female, and a very young male. The granulations of the under surface of the larger hand tend to disappear in the largest male (*cf.* de Man, *t. c.*).

Dim. ♂ 24.5 × 19. ♂ 13 × 10. ♂ 10 × 7. ♂ 10 × 7.  
♂ 8.5 × 6.5. ♀ 10 × 7.5

## 53. PILUMNUS LABYRINTHICUS Miers.

*Pilumnus labyrinthicus*, Miers, 'Alert' Crust. p. 224, pl. xxii. f. C (1884); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 365 (1893).

*Hab.* Singapore; 5-15 fms., rough bottom. Two adult females and three very young males.

Dim. ♀ 12.5 × 10. ♀ 9 × 7.25. ♂ 5 × 6.

## 54. PILUMNUS MINUTUS HIRsutUS.

? *Pilumnus minutus*, de Haan, Crust. Japon. p. 50, pl. iii. f. 2 (1839).

*Pilumnus hirsutus*, Stimpson, Proc. Ac. Nat. Sci. Philad. p. 37 (1858); Hasw. Cat. Austr. Crust. p. 69 (1882).

*Pilumnus minutus?*, var. *hirsutus*, Miers, 'Challenger' Brachyura, p. 154 (1886).

*Hab.* Singapore; littoral, from broken stones and coral. One larger male, damaged, and two smaller.

I agree with Mr. Miers in thinking it very probable that de Haan's *P. minutus* is nearly identical with *P. hirsutus* of Stimpson.

Dim. ♂ 9 × 7. ♂ 6 × 4.5. ♂ 4.5 × 3.5.

## 55. PILUMNUS LEVIS Dana.

*Pilumnus levis*, Dana, Conspectus Crust., Proc. Ac. Nat. Sci. Philad. vol. vi. p. 82 (1852); de Man, Mergui Crust. p. 66, pl. iv. ff. 1-2 (1888); id. Zoolog. Jahrb. Bd. viii. p. 553 (1895).

*Hab.* Singapore; ? depth. A small male.

The infra-orbital margins may be seen to be finely granulous under the lens, but there is no hiatus just under the outer orbital angle on the right side; as in Dr. de Man's somewhat larger

specimens (Zoolog. Jahrb. loc. cit.) the margin is continuous on both sides.

From a shoal near Raffler lighthouse, a female with ova. Colour a deep pink, extending on to the legs.

Dim. ♂  $5 \times 3.75$ . ♀  $4.25 \times 6$ .

#### XXXIV. Genus EURYCARCINUS A. M.-Edw.

##### 56. EURYCARCINUS MACULATUS A. M.-Edw.

*Pilumnopus maculatus*, A. M.-Edw. Annal. Soc. Entom. France, t. vii. p. 277 (1867); id. Nouv. Arch. Mus. t. iv. p. 82, pl. xix. ff. 17-19 (1868).

*Eurycarcinus maculatus*, de Man, Mergui Crust. p. 44, pl. ii. ff. 4-5 (1888).

*Hab.* Singapore; littoral, sandy shore. One male, slightly damaged.

Dim.  $12.75 \times 9$ .

#### XXXV. Genus ERIPHIA Latr.

##### 57. ERIPHIA LÆVIMANA SMITHII.

*Eriphia smithii*, McLeay, Annulosa in Smith's Illustr. Zool. S. Africa, p. 60 (1838); Krauss, Südl. Afrik. Crust. p. 36, pl. ii. f. 3 (1843).

*Eriphia levimana*, var. *smithii*, Hilgendorf, Monatsber. Akad. Berlin, p. 797 (1878); Miers, Ann. Mag. Nat. Hist. ser. 5, vol. v. p. 237 (1880); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887).

*Hab.* Singapore; littoral. Three males and four females. These crabs run actively among rocks on the shore; they will also defend themselves well against attack, with their formidable chelipedes.

Dim. ♂  $39.5 \times 29$ . ♂  $45.5 \times 34.25$ . ♂  $57 \times 42.5$ . ♀  $38 \times 27.5$ . ♀  $37 \times 28$ . ♀  $43 \times 31.5$ . ♀  $47.5 \times 34$ .

Breadth taken is *greatest* breadth.

#### XXXVI. Genus TETRALIA Dana.

##### 58. TETRALIA GLABERRIMA Herbst.

*Cancer glaberrimus*, Herbst, Naturgesch. d. Krabben, i. p. 262, pl. xx. f. 115 (1799).

*Trapezia serratifrons*, Luc. et Jacq. Voyage au Pôle du Sud, Crust. pl. iv. ff. 20-23 (Hombron et Jacq. tome iii. 1853).

*Tetralia glaberrima* et *nigrifrons*, Dana, U.S. Expl. Exped., Crust. pt. i. p. 261, pl. xvi. ff. 2 & 3 (1852).

*Hab.* Singapore; littoral. A male and a female, the latter slightly damaged. Front and antero-lateral margins edged with a black band. Pit at base of hand in larger chelipede very distinct in the male; the female has lost its larger chelipede.

Dim. ♂  $8.25 \times 7.25$ . ♀  $9.25 \times 8.25$ .

## XXXVII. Genus NEPTUNUS de Haan.

## 59. NEPTUNUS PELAGICUS Linn.

*Cancer pelagicus*, Linn. Syst. Nat. (ed. xii.) p. 1042 (1766).

*Lupea pelagica*, M.-Edw. Hist. Nat. Crust. t. i. p. 450 (1834).

*Portunus (Neptunus) pelagicus*, de Haan, Crust. Japon. p. 37, pl. ix. & x. (1839).

*Neptunus pelagicus*, A. M.-Edw. Arch. Mus. t. x. p. 320 (1861); Hasw. Cat. Austr. Crust. p. 77 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887); de Man, Mergui Crust. p. 69 (1888); id. Zoolog. Jahrb. Bd. viii. p. 556 (1895); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 367 (1893).

*Hab.* Singapore. Six males and six females; all from pools at low water.

Dim. ♂ 84 × 45·25. ♂ 81 × 44. ♂ 68 × 37. ♂ 51·5 × 28.  
♂ 51·5 × 27·5. ♂ 42·25 × 22. ♀ 58 × 31. ♀ 55·5 × 30·5.  
♀ 44 × 24·5. ♀ 39 × 22. ♀ 37 × 21. ♀ 33 × 19.

## 60. NEPTUNUS SANGUINOLENTUS Herbst.

*Cancer sanguinolentus*, Herbst, Naturgesch. d. Krab. i. p. 161, pl. viii. ff. 56-57 (1796).

*Portunus sanguinolentus*, Fabr. Suppl. Ent. Syst. p. 367 (1798).

*Lupea sanguinolenta*, M.-Edw. Hist. Nat. Crust. t. i. p. 451 (1834).

*Neptunus sanguinolentus*, A. M.-Edw. Arch. Mus. t. x. p. 319 (1861); Hasw. Cat. Austr. Crust. p. 77 (1882); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 368 (1893).

*Hab.* Singapore; sandy shore. Two males and a female.

Dim. ♂ 52 × 28. ♂ 40·5 × 22. ♀ 37·5 × 20.

## 61. NEPTUNUS (AMPHITRITE) HASTATOIDES Fabr. (Plate XLV. fig. 7.)

*Portunus hastatoides*, Fabr. Suppl. Ent. Syst. p. 368 (1798).

*Cancer hastatus*, Herbst, Naturgesch. d. Krabben, iii. p. 3, pl. lv. f. i. (1803).

*Lupea hastata*, M.-Edw. Hist. Nat. Crust. t. i. p. 455 (1834).

*Portunus (Amphitrite) hastatoides*, de Haan, Crust. Japon. p. 39, pl. i. f. 3 (1839).

*Neptunus hastatoides*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 368 (1893).

*Neptunus (Amphitrite) hastatoides*, de Man, Zoolog. Jahrb. Bd. viii. p. 557 (1895).

*Hab.* Singapore; 5 fms., mud. Five small males and one female.

In two of these the dark spot, on the end of the dactyls of the last pair, is absent. Like Dr. de Man's Malacca examples (*t. c.*) the middle teeth of the front project only as far as the middle portion of the upper orbital margin. The teeth mentioned by Dr. de Man as occurring on the distal end of the hind border of the meri of the last pair of legs are not readily distinguished in these small examples, but they seem to be variable and not constant.

I note the following sexual differences in this species:—

*Males.* The hind margin of the abdomen as seen from below (*i. e.* hind margin of 3rd segment) is medianly emarginate, and curved forward at the sides. The first and second sternal segments are crossed by transverse rows of granules, which are prominent in the larger examples.

*Females.* The hind margin of the abdomen not, or very faintly, emarginate, and almost transverse; first and second sternal segments smooth.

Dim. ♂ 15.5 × 9.5.    ♂ 15 × 9.    ♂ 15.5 × 9.    ♂ 10.5 × 6.  
 ♂ 12 × 19.    ♀ 4.75 × 8.

### XXXVIII. Genus ACHELOUS de Haan.

#### 62. ACHELOUS WHITEI A. M.-Edw.

*Achelous whitei*, A. M.-Edw. Arch. Mus. t. x. p. 343, pl. xxxi. f. 6 (1861); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 371 (1893).

*Hab.* Singapore; up to 12 fms. An adult male and adult female; a spurious male, with the whole of the under surface covered with parasitic organisms, and a spurious female, less densely beset with the same parasite (= a *Sacculina*). In the adult female the last (epibranchial) spine is but little bigger than those in front, and the breadth of the carapace is relatively less than in the male.

Dim. ♂ 18 × 11.5.    ♀ 16 × 12.

#### 63. ACHELOUS RUBRO-MARGINATUS, sp. nov. (Plate XLVI. fig. 8.)

*Hab.* Singapore; taken from off a floating piece of wood. A single specimen, a female.

Carapace only moderately broad, and somewhat convex, covered with numerous, evenly disposed, and granulated prominences, between which is an exceedingly dense, short pubescence; this extends on to the prominences, but not so as to conceal the granules on them, which are quite smooth and rounded. Frontal lobes six: two median, short and conical, separated by a wide fissure from the submedian, which are broader and directed more obliquely outwards than the median, but do not project farther forwards; a deeper, wider, fissure separates these from the laterals, which are broad and less prominent, and form the internal orbital angle. All these lobes are granulated. Superior orbital margin granulated, with two fissures; tooth of external angle broad and salient; tooth next behind this about half the size, and the six antero-lateral teeth following equal, and still smaller than the second, all directed forwards; last tooth strong, a very little larger than the external tooth of the orbit, and with its point curved forwards. Lower orbital border granulous, with a deep fissure in its external half; internal angle of this lower border forming a strong and prominent tooth. Basal joint of antennæ broad, and reaching the infero-lateral process of the front, next joint moderately dilated; flagellum smooth and not very long. Ischium

of external maxillipedes with a longitudinal groove near its inner margin; merus with its external angle much dilated, this dilatation separated off by a broad groove. All the under surface, maxillipedes, abdomen, &c., clothed with pubescence, with longer hairs in places. The antero-lateral teeth are partially hidden by a line of long, thickly placed hairs, arising just below the margin of the carapace.

Merus of chelipedes with its anterior half visible from beneath the carapace; upper surface concave and faintly pubescent where it is applied to the carapace, somewhat rounded and more densely pubescent in front. Anterior margin with long hairs, and five teeth; one of these is placed about the centre of the margin; behind it are three placed very close together, closer to each other than the first of them is to the spine in the centre of the margin, the first being the same size as that in front, the two behind it being equal and half the size. Posterior margin convex, with long hairs, and a single small tooth at the distal end. Carpus externally pubescent, and costate; with a strong spine at its inner angle, and a smaller one on its lower outer surface. Hand rather thick, everywhere pubescent, externally with three strong costæ, and above with two, less strong costæ, none of them pubescent; the internal costa of the upper surface bears a single, forwardly directed spine at its distal extremity, between the two next costæ there is a similar spine at the angle of the joint, and the lowermost costa is continued on to the immobile finger. Each of the fingers presents five costæ, all perfectly smooth, except the uppermost one on the dactyl, which is evenly granulate at the base. Inner margins dentate, teeth strong and lacinate; tips decussate. Ambulatory legs much compressed, dactyls styliform; under margins of all the joints lined with hairs.

Colour dull yellow, granules lighter than pubescence; teeth of meri and antero-lateral margins with their bases red and their tips white.

Dim.  $50 \times 34.5$ .

Base of chelipede to tips of fingers . . . . .	about 75 mm.
Length of hand . . . . .	about 16 mm.
Length of dactyl of hand . . . . .	about 16 mm.

### XXXIX. Genus GONIOSOMA A. M.-Edw.

#### 64. GONIOSOMA AFFINE Dana.

*Charybdis affinis*, Dana, U.S. Expl. Exped., Crust. pt. i. p. 286, pl. xvii. f. 12 (1852).

*Goniosoma affine*, A. M.-Edw. Arch. Mus. t. x. p. 384 (1861); de Man, Mergui Crust. p. 80, pl. v. f. 2 (1888); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 374 (1893); de Man, Zoolog. Jahrb. Bd. viii. p. 559 (1895).

*Hab.* Singapore; sandy shore. One male example.

In this individual the merus of the left chelipede has the typical three spines on its anterior border, the most posterior being smaller than the two in front; on the right side, however,

there is another small tooth between the first two spines, and an even smaller one between the second and third. Dr. de Man (Mergui, Crust. l. c.) says: "The outer and upper surfaces of the hands of *G. affine* are covered with short hairs, whereas in the specimen of *G. cruciferum*" (*i. e.* the only one obtained from the Mergui Archipelago) "their surfaces are perfectly glabrous and smooth." In this example of *G. affine*, their surfaces are nearly smooth in the case of the left chelipede, which is smaller than the right: the carpi are in both cases externally hairy.

Dim.  $35 \times 24$ .

#### XL. Genus SCYLLA de Haan.

##### 65. SCYLLA SERRATA Forskål.

*Cancer serratus*, Forskål, Descr. Anim. p. 90 (1775).

*Cancer olivaceus*, Herbst, Naturgesch. d. Krab. ii. p. 157, pl. xxxviii. f. 3 (1794).

*Portunus tranquebaricus*, Fabr. Suppl. Ent. Syst. p. 366 (1798).

*Lupea tranquebarica*, M.-Edw. Hist. Nat. Crust. t. i. p. 448 (1834).

*Portunus (Scylla) serratus*, de Haan, Crust. Japon. p. 44 (1839).

*Scylla serrata*, A. M.-Edw. Arch. Mus. t. x. p. 349 (1861); Hasw. Cat. Austr. Crust. p. 79 (1882); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 372 (1893).

*Hab.* Singapore; one large male, caught in the fishing-stakes used by the natives, about 3-6 fms.

Dim.  $152 \times 102$ .

#### XLI. Genus THALAMITA Latr.

##### 66. THALAMITA CRENATA Latr.

*Portunus crenatus*, Latr. Coll. du Muséum.

*Thalamita crenata*, Rüpp. Krab. d. rothen Meeres, pl. 6, pl. i. f. 2 (1830); M.-Edw. Hist. Nat. Crust. t. i. p. 461 (1834).

*Thalamita prymna*, var. *crenata*, Kossmann, Zoolog. Ergebn., Malacostraca, p. 48 (1877).

*Thalamita crenata*, de Man, Mergui Crust. p. 79 (1888).

*Hab.* Singapore; from the nets of native fishermen. Three females. I note the following variations:—

Specimen A. The 4th antero-lateral tooth on the left side is only represented by a prolongation of the posterior edge of the tooth in front; thus forming one enormous tooth, completely filling the normal positions of the 3rd and 4th teeth. Right side normal. Posterior border of penultimate joint of last legs dentate.

Specimen B. Normal, except for denticulation of the posterior border of the penultimate joint of the last legs.

Specimen C. Penultimate joint of last legs denticulate; carapace, chelipedes, and posterior surface of last legs thickly covered with short hairs.

Dim. ♀  $67 \times 44$ . ♀  $60 \times 39.5$ . ♀  $53 \times 35.5$ .

## 67. THALAMITA SPINIMANA Dana.

*Thalamita spinimana*, Dana, U.S. Expl. Exped., Crust. p. 283, pl. xvii. f. 8 (1852); A. M.-Edw. Nouv. Arch. Mus. t. ix. p. 165, pl. iv. f. 5 (1873).

*Thalamita prymna*, var. *spinimana*, Kossmann, Zoolog. Ergebn., Malacostr. pp. 47-49 (1877).

*Thalamita spinimana*, de Man, Mergui Crust. p. 76, pl. iv. f. 7 (1888).

*Hab.* Singapore; from a shoal exposed at low water. Four males and two females. The approximation of the median lobes of the front varies, from a state of almost complete fusion in the smallest to a separation of quite a millimetre in the largest. In one female the median and submedian frontal lobes are partially fused.

Dim. ♂ 70 × 43. ♂ 59·5 × 37. ♂ 48 × 30·5. ♂ 59·5 × 37.  
♀ 56 × 35. ♀ 54 × 33·5.

## 68. THALAMITA DANÆ Stimpson.

*Thalamita crenata*, Dana, U.S. Expl. Exped. pt. i. p. 282, pl. xvii. f. 7 (1852).

*Thalamita danæ*, Stimpson, Proc. Ac. Nat. Sci. Philad. p. 37 (1858); A. M.-Edw. Arch. Mus. t. x. p. 366, pl. xxx. f. 1 (1861).

*Thalamita stimpsoni*, A. M.-Edw. t. c. p. 362, pl. xxxv. f. 4.

*Thalamita danæ*, de Man, Mergui Crust. p. 78 (1888).

*Hab.* Singapore; littoral. Five adult females, three with ova, and four young males. These are all of the variety *stimpsoni*, with rudimentary fourth antero-lateral tooth.

Dim. ♀ 42 × 26. ♀ 27 × 17·5. ♀ 25·5 × 16·5. ♀ 21 × 12·5.  
♀ 20 × 13.

## XLII. Genus POTAMON Sav.

69. POTAMON (PARATHELPHUSA) TRIDENTATUM INCERTUM, var. nov. (Plate XLVI. fig. 10.)

For species cf. M.-Edw. Arch. Mus. t. vii. p. 171, pl. xiii. f. 1. (1854-55); Heller, 'Novara' Reise, Crust. p. 34 (1867); von Martens, Archiv für Naturgeschichte, pp. 18-22 (1868); Targioni-Tozzetti, Zoologia del viaggio della Magenta, Crostacei, p. 93, pl. vi. f. 4 (1877); de Man, Notes Leyd. Mus. vol. xxi. nos. i.-iii. pp. 67-70 (1899).

*Hab.* Singapore; from a lake in the Botanical Gardens. Three males and two females, ranging from 17 mm. to 39·5 mm. in the length of the carapace.

The most notable point in this well-marked variety is the structure of the inner and under angle of the eyes. The lower of the two teeth described by M.-Edw. as occurring in this position is well developed, and agrees entirely with his description and figure, but the upper tooth is not all prominent, though still represented by a very small lobe, occupying the same position and abutting on

the basal joint of the antenna, but leaving the orbit widely open at this point.

The postfrontal ridge is sinuous and not straight: and the extra-orbital tooth is lobular and not pointed, though its anterior angle is rather sharp. In this latter respect it agrees with a description by von Martens of seven Borneo examples (tom. cit.). As it has the same shape in all these individuals irrespective of size or sex, I do not think it is a peculiarity of age, as he at first suggests, but rather one of local race: the possibility of which von Martens admits a few lines further on.

In none of these specimens can I find any traces of the longitudinal groove of the median crest of the palate. As with Heller's examples of the species (t. c.), the meri of all five legs bear a sub-terminal spine on their anterior margins: in all other respects they agree with M.-Edwards's description. In colour they are uniformly dark brown above, with a tendency to yellow below.

These crabs form burrows with two mouths, one of which would open on the bank of the lake, just above the level of the water, the other opening at a distance of at least 10 feet over a stream which carries off the surplus water of the lake: the burrow, between its mouths, being straight and horizontal, more or less.

Tozzetti gives a figure of the internal angle of the orbit, but I cannot determine from it whether the upper tooth is well- or ill-developed, and he makes no mention of it in the text. He also describes the sub-apical teeth of the meropodites as being much less acute than in the *Thelphusæ* generally, and figures that on the 2nd pair, showing it to be more of a rounded lobe than a tooth: in all five legs in this variety they are, on the contrary, very acute indeed. External maxillipedes, male abdomen, and hands of chelipedes, however, entirely agree with his description and figures.

Dim. ♂  $52 \times 38.5$ . ♂  $42 \times 33$ . ♂  $37 \times 28$ . ♀  $38 \times 30.75$ . ♀  $19.75 \times 16$ .

Length taken from base of rostrum to middle of posterior border.

#### XLIII. Genus *CARCINOPLAX* M.-Edw.

70. *CARCINOPLAX SUBINTEGER*, nom. nov. (Plate XLVI. fig. 9.)

*Carcinoplax integra*, Miers, 'Alert' Crust. p. 543, pl. xlviii. fig. C (1884).

*Carcinoplax integra*, de Man, Mergui Crust. p. 93 (1888).

*Hab.* I am uncertain as to whether this was obtained at Singapore or Malacca, or at what depth it occurs.

3 males, and 1 female with ova.

I propose to alter Mr. Miers's specific name in view of the fact that the antero-lateral margins are not entire but dentated. This I find to be the case in all my specimens (3 ♂ and 1 ♀), and also in two examples in the Museum from the Mergui collection. There are 4 teeth, small but distinct: the first two are low, broad, and truncate, the 2nd about as broad as the first; the 3rd, about

half the breadth of those in front, is also slightly more prominent; the 4th, very small and tuberculiform, lies close behind the 3rd: all are granulated.

In the larger individuals, the pubescence that covers both palms externally in the smaller tends to disappear from below upwards in the *right* palm; leaving the upper margin, in the largest example, and the base of the palm still thickly covered, while the rest of the surface is naked, smooth, and of a white colour. In the last mentioned example, also, the space between the bases of the finger of the *left* chela has lost its hairy covering.

Dim. ♂ 10·5 × 7·5. ♂ 7·75 × 6·25. ♂ 7·5 × 6. ♀ 6·25 × 5.

Length taken from base of rostrum to middle of posterior border.

70 a. *CARCINOPLAX SUBINTEGER* HIRSUTIOR, var. nov.

*Hab.* Singapore; littoral. A male, which has lost its right chelipede.

This variety shows a much greater development of hair than the preceding species. The front has a fringe of long silky hairs, which spring from a line connecting the external angles of the front; and similar hairs are seen thickly placed on the chelipede and legs, more especially on the anterior and superior faces of the carpo- pro- and dactylopodites: the meri are relatively smooth. In the left chelipede the hairs extend to the tips of the fingers but not on them: these tips are brown, the rest of the fingers white, as seen through the less dense covering of hair. I may add that the 2nd of the four antero-lateral teeth (orbital angle included) is less flattened and more prominent than in *C. subinteger*.

This variety is well-marked and the differences may be specific — *e. g.*, the denser hairiness, the somewhat different 2nd antero-lateral tooth, and the different coloration of the fingers; but it is difficult to form a certain opinion from a single individual, in which, moreover, a chelipede is wanting.

Dim. 10·75 × 8. Length taken from base of rostrum to middle of posterior border.

#### XLIV. Genus *CERATOPLAX* Stimpson.

##### 71. *CERATOPLAX LÆVIS* Miers.

*Ceratoplax* ? *levis*, Miers, 'Alert' Crust. p. 244, pl. xxv. fig. C (1884).

*Hab.* Singapore; 2½ fms. One male specimen.

Dim. 6·5 × 4·75. Length taken from base of rostrum to middle of posterior border.

#### XLV. Genus *OCYPODE* Fabr.

##### 72. *OCYPODE CERATOPHTHALMA* Pallas.

*Cancer ceratophthalmus*, Pallas, Spicil. Zool. fasc. ix. p. 83, pl. v. f. 17 (1772).

*Ocypode ceratophthalma*, Fabr. Suppl. Ent. Syst. p. 347 (1798).

*Ocypoda ceratophthalma*, M.-Edw. Hist. Nat. Crust. t. ii. p. 48 (1837); Hasw. Cat. Austr. Crust. p. 94 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887); de Man, Mergui Crust. p. 107 (1888); Hend. Trans. Linn. Soc., Zool. vol. v. p. 387 (1893).

*Ocypode ceratophthalma*, de Man, Zoolog. Jahrb. Bd. viii. p. 570 (1895).

*Hab.* Singapore and Malacca: in holes in the dry sand, above the mean high-water mark. These holes are not more than a foot to a foot and a half in depth, with at least one more or less sharp turn in them: they are only covered at the highest spring tides, at least in the great majority of cases. Five males and two females, all adult, about 35–40 mm. in length: seven males and a female, ranging from 5–20 mm.

The individual 20 mm. long shows the first trace of ocular styles in the shape of tubercles barely a millimetre in length (*cf.* de Man, Zoolog. Jahrb. l. c.); that next in size, 13 mm. long, shows no trace of them.

Close to the distal extremity of the eyestalk, in the young specimens, may be seen a small hair: and a little farther back a similar hair, just where the stalk is left uncovered by the cornea. In the adult this second hair retains its position, but the first is carried farther and farther away, as the ocular style increases in length. These two hairs may equally be seen in *O. cordimana*, but with numerous smaller hairs interspersed between and around them. In four of the smallest specimens the epibranchial angles attain the same level as the external orbital angle, the margin between being straight or concave: in the other two it projects farther than the orbital angle, the margin between being concave just behind the latter angle, but becoming convex towards the epibranchial. In the individual of 13 mm. length it is much more prominent than the orbital, and forms a sharp angle: the antero-lateral margin is straight. In the adults the two angles are approximately on the same level, with the margin between slightly concave.

Dim. ♂ 41.5 × 36.5. ♂ 41 × 37. ♂ 40.5 × 36.5. ♂ 35 × 31.75  
♂ 32.5 × 29. ♂ 23 × 20. ♀ 40.75 × 36.5. ♀ 37.5 × 34.5  
♀ 35 × 31.

Breadth taken from epibranchial angles.

### 73. OCYPODE CORDIMANA Latr.

*Ocypoda cordimana* (Latr.) M.-Edw. Hist. Nat. Crust. t. ii. p. 45 (1837); de Man, Notes Leyden Mus. vol. iii. p. 248 (1881); *id.* Mergui Crust. p. 108 (1888); *id.* Zoolog. Jahrb. Bd. viii. p. 572 (1895); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 387 (1893).

*Hab.* Singapore: holes like those of *O. ceratophthalma*. Two males and a female. Prof. Henderson (*t. c.*) states that it is "terrestrial, and lives in burrows at some distance from the sea." These specimens came from holes which would sometimes be liable to be covered by the sea, though the strip of beach was not an open

one like that which supplied specimens of *O. ceratophthalma*, but part of a small bay, and further protected by an expanse of the mangroves which grow out into the sea on many of the islets round Singapore.

Dim. ♂ 33·25 × 30·25. ♂ 32·75 × 31. ♀ 35·5 × 30·5.  
Breadth taken from epibranchial angles.

#### XLVI. Genus *UCA* Leach.

##### 74. *UCA ACUTA* Stimpson.

*Gelasimus acutus*, Stimpson, Proc. Ac. Nat. Sci. Philad. p. 99 (1858); de Man, Mergui Crust. p. 113, pl. vii. ff. 8-9, pl. viii. ff. 1-4 (1888); id. Zoolog. Jahrb. Bd. viii. p. 573 (1895).

*Hab.* Singapore: Malacca, from mangrove-swamps near the edge of the sea. From Malacca there are five males; from Singapore three males, six females and two young examples. The difference in coloration between these two sets is interesting. The Malacca specimens have their carapace of a light blue-green colour, and the external surface of the hand rose-coloured: in those from Singapore the carapace is a fine purple, with, in most cases, two light blue spots on each side of the gastric region, and the hands externally are of a deep plum-colour. In one or two of the females the purple of the carapace becomes mottled in front with green, this colour tending to replace the former.

The Singapore specimens were obtained from the same place as the next-described species; which is interesting, in view of their close relationship to each other.

Dim. (a) Singapore forms:—♂ 13·75 × 9·5. ♂ 28 × 18. ♂ 16·5 × 11. ♀ 23·5 × 16. ♀ 19·5 × 13·5. ♀ 17·5 × 12. ♀ 17 × 12. ♀ 16·5 × 11·5.

(b) Malacca forms:—♂ 20·5 × 12. ♂ 20 × 12. ♂ 19 × 11·75. ♂ 18 × 11. ♂ 17·25 × 10·75.

##### 75. *UCA DUSSUMIERI* M.-Edw.

*Gelasimus dussumieri*, M.-Edw. Ann. Sci. Nat. ser. 3, t. xviii. p. 148, pl. iv. f. 12 (1852); Kingsley, Proc. Ac. Nat. Sci. Philad. p. 145 (1880); de Man, Mergui Crust. p. 108, pl. vii. ff. 2-7 (1888); id. Zoolog. Jahrb. Bd. viii. p. 576 (1895).

*Hab.* Singapore: from the shore on the mouth of a small river. Seven males and thirteen females. Colour of females, when alive, a rich blue over the carapace, a light sky-blue on the legs; the males a more sombre brown or bronze; lower half of hand, and index, orange; upper half, and dactyl, nearly white.

In some cases the females were ornamented with one median, or one median and two lateral, fair-sized white spots in the gastric region. The interest of the colour-marking here lies in the fact that the gay colours appear in the females; and not in the males, as is generally the case (*cf.* Darwin's 'Descent of Man,' 2nd ed. 1894, p. 271).

Dim. ♂ 23 × 17·5. ♂ 23 × 17·5. ♂ 27 × 17·5. ♂ 22 × 14·5.

♂ 18·5 × 12·75. ♂ 18·5 × 12·5. ♂ 14·5 × 9·5. ♀ 23·5 × 16·5.  
 ♀ 21·5 × 14·75. ♀ 23 × 15. ♀ 22 × 14·5. ♀ 20·5 × 14.

76. *UCA VOCANS* M.-Edw.

*Gelasimus vocans*, M.-Edw. Ann. Sci. Nat. sér. 3, t. xviii. p. 145, pl. iii. f. 4 (1852).

? *Gelasimus cultrimanus*, Ad. & White, 'Samarang' Crust. p. 49 (1848).

*Gelasimus nitidus* Dana, U.S. Expl. Exped., Crust. pt. i. p. 316, pl. x. f. 5 (1852).

*Gelasimus vocans* Miers, Ann. Mag. Nat. Hist. ser. 5, vol. v. p. 308 (1880); id. 'Challenger' Brachyura, p. 242 (1886); Hasw. Cat. Austr. Crust. p. 92 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887).

*Hab.* Singapore and Malacca: burrowing in the beach, holes covered at high water. Six males and three females.

In one male the tooth between the base of the index and the subdistal tooth is absent.

Dim. ♂ 20 × 13·5. ♂ 18 × 12·5. ♂ 17 × 11·5. ♂ 15 × 10·25  
 ♂ 13·75 × 9·5. ♂ 12·75 × 8·75. ♀ 16·75 × 12·25. ♀ 16·25 × 11·5. ♀ 14·75 × 10·25.

77. *UCA TETRAGONON* Herbst.

*Cancer tetragonon*, Herbst, Naturgesch. d. Krab. i. p. 257, pl. xx. f. 110 (1790).

*Gelasimus tetragonon*, Rüpp. Besch. 24 Krab. p. 25, pl. v. f. 5 (1830); M.-Edw. Hist. Nat. Crust. t. ii. p. 42 (1837); id. Ann. Sci. Nat. sér. 3, t. xviii. p. 147, pl. iii. f. 9 (1852); Kingsley, Proc. Ac. Nat. Sci. Phil. p. 143, pl. ix. f. 11 (1880).

*Hab.* Singapore: a male from the shore at the west entrance to the New Harbour.

Dim. 24·5 × 17.

78. *UCA ANNULIPES* M.-Edw.

*Gelasimus annulipes*, M.-Edw. Hist. Nat. Crust. t. ii. p. 55, pl. xviii. ff. 10-13 (1837); id. Ann. Sci. Nat. sér. 3, t. xviii. p. 149, pl. iv. f. 15 (1852).

*Gelasimus perplexus*, M.-Edw. t. c. p. 150, pl. iv. f. 18.

*Gelasimus annulipes*, Kingsley, Proc. Ac. Nat. Sci. Philad. p. 148 (1880); de Man, Mergui Crust. p. 118, pl. viii. ff. 6-7 (1888); id. Zoolog. Jahrb. Bd. viii. p. 577 (1895); Heuderson, Trans. Linn. Soc., Zool. vol. v. p. 388 (1893).

*Hab.* Singapore: very common in holes on the shore, or a short distance inland, near brackish and tidal water.

Out of 63 males 34 have the big claw on the right side, and 29 have it on the left; 13 females. There are also a male and a female from Malacca. General colour of the carapace, alternate transverse, rather irregular, bands of light blue and black.

Dim. ♂ 14·5 × 9. ♂ 15 × 8·75. ♂ 13·5 × 7·75. ♂ 13 × 7·5.

♂ 13·5 × 8. ♂ 12·5 × 7·5. ♀ 11 × 6·75. ♀ 12·5 × 8. ♀ 11·5 × 6·5.  
 ♀ 10·5 × 6·25. ♀ 10·5 × 6.

#### XLVII. Genus GRAPSUS Lam.

##### 79. GRAPSUS STRIGOSUS Herbst.

*Cancer strigosus*, Herbst, Naturgesch. d. Krab. iii. p. 55, pl. xlvi. f. 7 (1799).

*Grapsus (Goniopsis) strigosus*, de Haan, Crust. Japon. p. 33 (1839).

*Grapsus strigosus*, A. M.-Edw. Nouv. Arch. Mus. t. ix. p. 286 (1873); Hasw. Cat. Austr. Crust. p. 97 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 390 (1893).

*Hab.* Singapore; rocks along the shore. Two males and a female.

General colour of carapace and legs a light yellow with maroon markings, the latter having a somewhat linear arrangement on the sides of the carapace.

Dim. ♂ 52 × 49·5. ♂ 38·5 × 36. ♀ 47·5 × 43.

#### XLVIII. Genus METOPOGRAPSUS M.-Edw.

##### 80. METOPOGRAPSUS OCEANICUS Jacq. & Lucas.

*Grapsus oceanicus*, Jacq. et Lucas, Voyage au Pôle du Sud, Crust. p. 73, pl. vi. f. 9 (Hombron et Jacq. tome iii. 1853).

*Metopograpsus quadridentatus*, Stimpson, Proc. Ac. Nat. Sci. Philad. p. 102 (1858).

*Metopograpsus oceanicus*, Kingsley, Proc. Ac. Nat. Sci. Philad. p. 191 (1880).

? *Pachygrapsus transversus*, Gibbes, et syn. vide Kingsley, t. c. p. 199; Walker, Journ. Linn. Soc., Zool. vol. xx. p. 110 (1887).

*Hab.* Singapore: from rocks or piles of landing-stages. Twelve males and sixteen females, five having ova. Carapace generally has a mottled appearance of green and purple; but the colour of these crabs is exceedingly variable.

I have also from Malacca six specimens, three male and three female, of a form which seems to be identical with *Pachygrapsus transversus* Gibbes; the internal subocular lobe being reduced so that the antennæ just enter the orbit. They also agree with descriptions given of that species. But, excepting that the antennæ are more in contact with the orbit, these individuals agree so entirely with those of *Metopograpsus oceanicus*, that I am inclined to agree with Mr. Walker (t. c. p. 113) that *P. transversus* is a variety of a *Metopograpsus*—but of *M. oceanicus*; not *M. messor*, as he suggests, seeing that this latter species has no teeth on the antero-lateral margin.

Dim. ♂ 28·5 × 24. ♂ 28·5 × 23·5. ♂ 27 × 22·5. ♂ 25·25 × 22.  
 ♂ 24 × 20·5. ♂ 22·25 × 19. ♀ 34 × 28. ♀ 33·5 × 27. ♀ 29 × 24.  
 ♀ 26 × 21·5. ♀ 27 × 22·5. ♀ 24 × 19.

## XLIX. Genus VARUNA M.-Edw.

## 81. VARUNA LITTERATA Fabr.

*Cancer litteratus*, Fabr. Suppl. Ent. Syst. p. 342 (1798); Herbst, Naturgesch. d. Krab. iii. p. 53, pl. xlviii. f. 4 (1799).

*Varuna litterata*, M.-Edw. Hist. Nat. Crust. t. ii. p. 95 (1837).

*Grapsus (Trichopus) litteratus*, de Haan, Crust. Japon. p. 32 (1839).

*Varuna litterata*, Hasw. Cat. Austr. Crust. p. 103 (1882) Henderson, Trans. Linn. Soc., Zool. vol. v. p. 391 (1893).

*Hab.* Singapore; from off a floating log of wood. Two males and four females.

The shape of the frontal margin is slightly variable. According to Herbst, it is "in der Mitte ein wenig aufgeschnitten": and his figure shows it to be very distinctly concave. Of these specimens it is very slightly, yet distinctly concave in three; in the other three it is straight.

Dim. (a) With straight front.

♂ 31.5 × 30. ♀ 26.5 × 25.75. ♀ 21 × 20.

(b) With concave front.

♂ 29 × 26.5. ♀ 30.5 × 23.5. ♀ 25.75 × 25.

## L. Genus SESARMA Say.

## 82. SESARMA QUADRATA Fabr.

*Cancer quadratus*, Fabr. Suppl. Ent. Syst. p. 341 (1798).

*Sesarma quadrata*, M.-Edw. Hist. Nat. Crust. t. ii. p. 75 (1837); Hilgendorf, von d. Decken Reise, p. 90, pl. iii. f. 3c (1869).

*Sesarma quadratum*, A. M.-Edw. Nouv. Arch. Mus. t. ix. p. 302 (1873).

*Grapsus (Pachysoma) quadratus*, de Haan, Crust. Japon. p. 62, pl. viii. f. 3 (1839).

*Grapsus (Sesarma) affinis*, de Haan, t. c. p. xxx.

*Sesarma aspera*, Heller, Crust. der Novara Reise, p. 63, pl. vi. f. 1 (1867); de Man, Mergui Crust. p. 169 (1888).

*Sesarma quadrata*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 392 (1893).

*Hab.* Singapore; taken from under decayed logs of wood on marshy ground a short distance from the sea. Two males: typical specimens of *S. quadrata*, with eleven tubercles on the dactyl.

*Sesarma aspera* Heller I judge to be a variety of *S. quadrata*, and not distinct.

Dim. ♂ 19.5 × 16. ♂ 14 × 11.5.

## 83. SESARMA TENIOLATA White.

*Sesarma tenuolata*, White, List Crust. Brit. Mus. p. 38 (1847).

*Sesarma mederi*, M.-Edw. Ann. Sci. Nat. t. xx. p. 185 (1853).

*Sesarma tenuolata*, de Man, Mergui Crust. p. 181 (1888); id. Zoolog. Jahrb. Bd. ix. p. 166 (1897); Bürger, Zoolog. Jahrb. Bd. vii. p. 615 (1894).

*Hab.* Malacca; mangrove swamp on the edge of the sea. Two males (one young) and two females. These are all covered, on the back of the carapace, with dense tufts of hair.

Dim. ♂  $34 \times 32.5$ . ♂  $19 \times 16$ . ♀  $36.5 \times 33$ . ♀  $32 \times 29$ .

84. *SESARMA CALYPSO* de Man.

*Sesarma* (*Parasesarma*) *calypso*, de Man, Zoolog. Jahrb. Bd. ix. pp. 185–189 (1897), & Bd. x. pl. xxx. f. 34 (1898).

*Hab.* Malacca; littoral. Two males.

I am inclined to refer these to the above species, because in the general form of the carapace and chelipedes they agree with Dr. de Man's description, and more especially in the cross-markings on the tubercles of the dactyl, which are very distinctive: they give them an appearance which Dr. de Man describes as "treppenformig," for which I can find no English equivalent. There are, however, two points in which these individuals differ from the type: (a) in the number of the tubercles; these are fewer, being 8–9 instead of 12–13: (b) in the number of pectinated ridges (= Kammleisten, de Man) of the hand. Of these, in the larger male there are four, all well-marked, the proximal one being a little shorter than the distal three, which are equal in length. In the smaller, however, there are only three on the left hand, *i. e.* counting distoproximally 1, 2, and 4: 3 being merely represented by a short line of granules projecting only a little way between the external terminations of 2 and 4. In the right hand, 3 is more developed as a pectinated ridge extending half-way to the internal upper margin, and 4 is correspondingly reduced to a granular line, becoming externally fainter. Allowing, then, for this variability, and also for the fact that the actual number of tubercles on the dactyl is also slightly variable in the species of *Sesarma*, I have not thought it advisable to separate these two individuals from *S. calypso*. Colour of hands orange-red.

Dim. ♂  $17 \times 13$ . ♂  $16.5 \times 12.5$ .

85. *SESARMA ONYCHOPHORA* de Man.

*Sesarma* (*Perisesarma*) *onychophora*, de Man, Zoolog. Jahrb. Bd. ix. pp. 214–18 (1897), & Bd. x. pl. xxxi. f. 39 (1898).

*Hab.* Singapore: off wooden piles. Two males, and a female with ova. Colour of hands deep red.

Dim. ♂  $16.75 \times 13.25$ . ♂  $15 \times 12$ . ♀  $17.75 \times 14$ .

86. *SESARMA EDWARDSI* de Man.

*Sesarma edwardsi*, de Man, Mergui Crust. pp. 185–188, pl. xiii. ff. 1–4 (1888); *cf.* also *Sesarma edwardsi*, var. *levimana*, Zehntner, Rev. Suisse Zool., tom. ii. fasc. i. p. 181 (1894).

*Sesarma edwardsi*, var. *crassimana*, de Man, Mergui Crust. p. 188; Zehntner, t. c. p. 180.

*Hab.* Malacca. These specimens were taken from the stomach of a species of *Varanus*, the monitor lizard. A male and female

are representative of the species: and two males and two females (although with some doubt) of *M. Zehntner's* variety. I also find two males answering to Dr. de Man's var. *crassimana*; these were obtained on the shore.

Dim. ♂ 14 × 13. ♀ 17 × 15.

Var. *crassimana*. ♂ 11.5 × 10.25. ♂ 7.75 × 7.25.

Var. *levimana*? ♂ 12 × 10.5. ♂ 12.75 × 11. ♀ 10 × 9.  
♀ 9 × 7.75.

87. *SESARMA FASCIATA*, sp. nov. (Plate XLVII. fig. 12.)

*Hab.* Singapore: marshy ground near sea. One male and three females.

This species belongs to Dr. de Man's subgenus *Parasesarma*, in which the sides have no tooth behind the orbital angle, and in which there are two or more pectinated ridges on the palms. Carapace smooth to the eye, but under the lens seen to be closely punctated everywhere: sides nearly parallel (but broken up in one of the females just behind the eyes so as to give indications of a tooth behind the orbital angle). Tooth at distal end of the upper border of the merus very small and obtuse, and the anterior border only slightly expanded, the long proximal edge of the expansion being dented. External surfaces of merus and carpus rugose, inner angle of carpus with a large triangular tooth; outer surface of palm and fingers quite smooth to the eyes, but minutely punctate under the lens; whole inner surface of chelipedes smooth. Inner upper border of hand thick and prominent: external to this there are three pectinated ridges, which lie more nearly longitudinal than transverse. The middle one consists of:—*a*, a short distal portion, practically one with the distal part of the inner upper border; *b*, a longer middle portion running obliquely from near the upper border to the upper part of the posterior border, and cutting off a small semicircular piece of the upper surface in which lies another very small pectinated ridge; and *c*, a proximal portion, curving sharply from the middle portion to run parallel to the posterior border as far as the joint of hand and carpus. The third pectinated ridge starts from the inner and upper base of the dactyl, to run in front of, and parallel with the middle portion of the middle ridge, and to stop abruptly half-way between its starting point and the joint of hand and carpus. Only 5 or 6 obscure, low tubercles can be distinguished on the upper margin of the dactyl, which stop some distance from the tip: inner margins of both fingers with 4 or 5 broad triangular denticulations. Meri of ambulatory legs with a subdistal low and blunt spine; remaining joints with hairs, rather diffuse, but tending to be arranged on the anterior and posterior margins. Male abdomen seven-jointed, broad, regularly tapering from the middle of the 3rd segment to the middle of the 6th where it suddenly narrows; the 7th has a rounded extremity, parallel sides, and is only a little longer than broad. Colour a deep crimson red, with regular mottlings of a light yellow, and a light yellow band, or fascia, placed transversely on the frontal

eminences between the bases of the eyestalks, and extending along the latter as far as the corneæ; but the degree of this mottling varies, and is less conspicuous in some individuals. Hands and fingers bright yellow.

Dim. ♂ 8·75 × 8. ♀ 9·5 × 8·5. ♀ 9·25 × 8·25. ♀ 8·75 × 7·5.

## LI. Genus MACROPHthalmus Latr.

88. *MACROPHthalmus dilatatus carens*, var. nov. (Plate XLVII. fig. 11.)

Cf. *Ocypode (Macrophthalmus) dilatata*, de Haan, Crust. Japon. p. 55, pl. xv. f. 3 (1839).

*Macrophthalmus dilatatus*, M.-Edw. Ann. Sci. Nat. sér. 3, Zool. t. xviii. p. 157 (1852); de Man, Notes Leyd. Mus. vol. xii. pl. iv. f. 9 (1890); Ortmann, Carcinol. Stud., Zool. Jahrb. Bd. x. p. 345 (1898).

*Hab.* Singapore and Malacca; littoral. Five males and six females, four of the latter carrying ova.

There is a specimen in the Museum from Singapore, from the 'Alert' collection, referred to "*M. dilatatus*, young?," presumably by Mr. Miers; of which, however, I can find no mention in the descriptive account of the 'Alert' Crustacea. It is identical with the present specimens; and on an examination of these, I find them sufficiently distinct from the type to be considered as a well-marked variety.

The average size of these specimens is 15 mm. breadth to 7·5 mm. length: two of the females with ova are considerably larger, but the other three (two having ova) are of these dimensions, so that they may all be regarded as adult. I find the following departures from the type:—

a. The chelipedes are shorter, being only just longer than the breadth of the carapace, whereas in de Haan's species they are not quite half as long again.

b. The spinules on the upper margin of the hand are wanting, and the granules on the outer surface very small, though numerous.

c. A well-marked dentated tubercle exists at the base of the dactyl; and there is a flattened dentated prominence extending from the base to the middle of the thumb, which is less evident in *M. dilatatus*. The thumb is only slightly deflexed, and the carina near the lower margin is rather strong and obscurely granulous.

Dim. ♂ 15 × 8. ♂ 15·5 × 8·25. ♂ 13·75 × 7·5. ♂ 12 × 6·5. ♂ 11·5 × 6·5. ♀ 19·25 × 10. ♀ 18 × 9·5. ♀ 13·5 × 7·5. ♀ 13 × 7. ♀ 12·5 × 7. ♀ 11·5 × 6·5.

89. *MACROPHthalmus crassipes* M.-Edw.

*Macrophthalmus crassipes*, M.-Edw. Ann. Sci. Nat. sér. 3, Zool. t. xviii. p. 157 (1852); de Man, Notes Leyd. Mus. vol. xii. p. 76, pl. iv. f. 7 (1890); Ortmann, Carcinol. Stud., Zool. Jahrb. Bd. x. p. 345 (1898).

*Hab.* Singapore; littoral. Four males and three females, one of

the latter with ova: two of the males, however, only represented by exuvia.

The tubercle on the inner margin of the thumb is, in these, rather more flattened than in the type (*v. de Man, t. c.*), leaving a larger interspace between itself and the finger.

Dim. ♂ 17 × 9.5. ♂ 17 × 9.25. ♂ 15.25 × 9. ♂ 12.5 × 7.5.  
♀ 14.5 × 8.5. ♀ 15 × 8.5. ♀ 12 × 6.5.

#### 90. MACROPHTHALMUS PODOPHTHALMUS Eydoux & Souleyet.

*Macrophthalmus podophthalmus*, Eyd. & Souleyet, Voy. 'Bonité', Zool. Crust. vol. i. pl. iii. f. 6 (1841); M.-Edw. Ann. Sci. Nat. sér. 3, Zool. t. xviii. p. 155 (1852); Hasw. Cat. Austr. Crust. p. 88 (1882); Miers, 'Challenger' Brachyura, p. 249 (1886).

*Hab.* Singapore; littoral. A male.

In this specimen the eye-peduncles do not project by much more than a quarter of their length.

Dim. 14 × 8.5. Length of eyes 8.25. Length of projecting portion of eyes 2.5.

#### 91. MACROPHTHALMUS JAPONICUS de Haan.

*Ocypode (Macrophthalmus) japonica*, de Haan, Crust. Japon. p. 54, pl. vii. f. 1, & pl. xv. f. 2 (1839).

*Macrophthalmus japonicus*, Ad. & White, 'Samarang' Crust. p. 51 (1848); M.-Edw. Ann. Sci. Nat. sér. 3, Zool. t. xviii. p. 158 (1852).

*Hab.* Singapore; littoral. A female with ova.

Dim. 10.5 × 8.

### LIII. Genus SCOPIMERA de Haan.

#### 92. SCOPIMERA MYCTIROIDES M.-Edw. (Plate XLVII. fig. 14.)

*Doto myctiroides*, M.-Edw. Ann. Sci. Nat. sér. 3, Zool. t. xviii. p. 152, pl. iv. f. 24 (1852).

*Dotilla myctiroides*, Walker, Journ. Linn. Soc., Zool. vol. xx. p. 111 (1887).

*Scopimera myctiroides*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 390 (1893).

*Hab.* Singapore. In great numbers on the sand between tide-marks, burrowing in holes.

Out of 81 specimens, I find 7 females, one bearing ova. I think it has hitherto escaped notice that the shape of the female abdomen is almost exactly similar to that of the male. Prof. Henderson (tom. cit.) states that out of a very large series he had only met with males. But on examining a bottle in the Museum collection, labelled "*Sc. myctiroides*, Rameswarana, J. R. Henderson, 92.7.15," I find, out of about 30 examples, at least as many females as males. The female abdomen, however, may still be distinguished externally from that of the male by a generally broader aspect. Taking measurements from the base of the 5th segment to the tip of the

7th, and across the base of the 6th, I find these to be, approximately, for most examples :—

	Length.	Breadth.
♂ . . . . .	4·5 mm.	2 mm.
♀ . . . . .	4 mm.	2·5 mm.

giving a ratio for the female of 1 : 1·6, for the male 1 : 2·25.

Dim. ♂ 7 × 9. ♂ 7·75 × 9·5. ♂ 7·25 × 9. ♂ 8·25 × 10·5.  
 ♂ 7 × 8·5. ♂ 6·5 × 8. ♀ 7 × 8·5. ♀ 7 × 8·5. ♀ 7·25 × 8·75.  
 ♀ 6·75 × 8. ♀ 6·5 × 8. ♀ 6 × 7·25. ♀ 5·5 × 6·5.

Breadth taken across posterior margin, just above the last legs.

## LII. Genus ELAMENE M.-Edw.

### 93. ELAMENE UNGUIFORMIS de Haan.

*Inachus (Elamene) unguiformis*, de Haan, Crust. Japon. p. 75, pl. xxix. f. 1 (1839).

*Elamene unguiformis*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 394 (1893).

*Hab.* Singapore. A female.

Dim. 6·25 × 6·5.

## LIV. Genus PINNOTHERES Latr.

### 94. PINNOTHERES SEMPERI Bürger.

*Pinnotheres semperi*, Bürger, Zoolog. Jahrb. Bd. viii. p. 382, pl. ix. f. 28, & pl. x. f. 27 (1895).

*Hab.* Singapore; right respiratory tree of *Holothuria scabra*. A male, and a female with ova.

The specimens which Dr. Bürger has described came from the cloaca of *Hol. fusco-cinerea*; whereas the specimens we obtained from that *Holothurian* are, I find, referable to *P. ortmanni*. The host, from which came Dr. Bürger's example of the latter species, was, I suppose, not known, as he makes no reference to it. In both these species, the animal was found high up the respiratory tree, forming an enormous gall; whether it would be able to extricate itself from this, and move, at will, up or down the respiratory tree, I do not know, but it has the appearance of being a fixture, *nolens volens*.

Dim. ♀ 10·5 × 11. ♂ 7·75 × 8.

### 95. PINNOTHERES ORTMANNI Bürger.

*Pinnotheres ortmanni*, Bürger, Zoolog. Jahrb. Bd. viii. p. 384, pl. ix. f. 30, pl. x. f. 28 (1895).

*Hab.* Singapore; right respiratory tree of *Holothuria fusco-cinerea*. Two females, both with ova.

Dim. ♀ 12 × 11·5. ♀ 12·25 × 11·75.

### 96. PINNOTHERES MODIOLICOLA Bürger.

*Pinnotheres modiolicola*, Bürger, Zoolog. Jahrb. Bd. viii. p. 370, pl. ix. f. 9, & pl. x. f. 9 (1895).

*Hab.* Singapore; from Lamellibranch shells. Seven females, six with ova.

These were collected by natives, and as I never saw the shells from which the *Pinnotheres* were taken, I am unable to state their genus.

Dim. ♀ 9·5 × 8. ♀ 7 × 5·5. ♀ 6·5 × 5·25. ♀ 10 × 8·25.  
♀ 9 × 8. ♀ 9 × 7·5. ♀ 8 × 7·5.

97. PINNOTHERES ARCOPHILUS Bürger.

*Pinnotheres arcophilus*, Bürger, Zoolog. Jahrb. Bd. viii. p. 371, pl. ix. f. 10, & pl. x. f. 10 (1895).

*Hab.* Singapore: from Lamellibranch shells. Four females, all with ova. For the same reason as with *P. modiolicola*, I am unable to give the genus of the mollusc they inhabited.

Dim. ♀ 9 × 7. ♀ 10 × 8·5. ♀ 8·5 × 7. ♀ 9 × 7·5.

LV. GENUS MATUTA Fabr.

98. MATUTA VICTRIX Fabr.

*Matuta victor*, Fabr. Suppl. Ent. Syst. p. 369 (1798).

*Matuta peronii*, Leach, Zool. Misc. iii. p. 13, pl. cxxvii. ff. 1-2 (1817).

*Matuta lesuerii*, Leach, tom. cit. p. 14.

*Matuta victrix*, Miers, Trans. Linn. Soc. 2nd ser. Zool. vol. i. p. 243, pl. xxxix. ff. 1-3 (1877); Hasw. Cat. Austr. Crust. p. 134 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 111 (1887); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 306 (1893).

*Matuta victor*, Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 160 (1896).

*Hab.* Singapore; sandy shore. Three adult males, three young males, and three small females. Also from Malacca two adult and one young female.

Dim. ♂ 46·25 × 42. ♂ 40·5 × 37. ♂ 34·25 × 32. ♂ 24·75 × 23·25. ♂ 24 × 22·5. ♂ 20·25 × 19·25. ♀ 25 × 23. ♀ 22 × 21·75. ♀ 15·25 × 15. ♀ 32 × 30. ♀ 33 × 31·5. ♀ 17 × 16.

99. MATUTA BANKSII Leach.

*Matuta banksii*, Leach, Zool. Misc. iii. p. 14 (1817); Miers, Trans. Linn. Soc. 2nd ser. Zool. vol. i. p. 245, pl. xl. ff. 1-2 (1877); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 111 (1887); de Man, Archiv f. Naturgesch. p. 389 (1887); Zehntner, Rev. Suisse Zool. t. ii. p. 183 (1894); Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 158 (1896); de Man, Zoolog. Jahrb. Bd. ix. p. 363 (1896).

*Hab.* Malacca; littoral. Five males, and two smaller females. In the males, besides some rather big crimson spots on the meri of the legs, there is a very large crimson patch on the penultimate joint of each of the 1st, 2nd, and 4th pairs. The latter is not seen

on the females ; but only a few small spots on the meri. In one of the males the spots on the carapace are arranged in pairs, or even in groups of three, giving it a more densely spotted appearance. I may add that I should describe the rostrum, in these individuals, as being *distinctly* emarginate (*vide* Alcock, t. c., "rostrum entire or faintly emarginate"; and Miers, t. c., "front obtuse and rounded or obscurely emarginate"), the emargination taking the form of a wide, triangular notch, quite as distinct as in *M. lunaris*. Otherwise they entirely agree with Mr. Alcock's description.

Dim. ♂ 35 × 34. ♂ 32 × 30.5. ♂ 31.75 × 31. ♂ 29 × 23.75.  
♂ 25.5 × 24.25. ♀ 22 × 21.25. ♀ 21.5 × 20.5.

#### 100. MATUTA LUNARIS Herbst.

? *Cancer lunaris*, Herbst, Krab. u. Krebse, i. p. 140, pl. vi. f. 44 (1790).

*Matuta planipes*, Fabr. Suppl. Ent. Syst. p. 369 (1798).

*Cancer lunaris*, Herbst, op. cit. iii. p. 43, pl. xlviii. f. 6 (1799).

*Matuta lunaris*, Miers, Trans. Linn. Soc. 2nd ser. Zool. vol. i. p. 247, pl. xl. f. 10 (1877); Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, pp. 161-2 (1896).

*Hab.* Malacca ; littoral. Two young males and a female.

Dim. ♂ 22.5 × 21.25. ♂ 16.25 × 15. ♀ 20 × 19.

### LVI. Genus LEUCOSIA Fabr.

#### 101. LEUCOSIA CRANIOLARIS Herbst.

? *Cancer craniolaris*, Linn. Syst. Nat. 12th ed. p. 1041 (1766); Herbst, Naturgesch. d. Krab. Bd. i. Hft. ii. p. 90, pl. ii. f. 17 (1783); Fabr. Ent. Syst. ii. p. 441 (1792).

*Leucosia craniolaris*, Fabr. Suppl. Ent. Syst. p. 350 (1798); Bell, Trans. Linn. Soc. vol. xxi. p. 283 (1855).

*Leucosia craniolaris*, var. *laevimana*, Miers, 'Alert' Crust. p. 250, pl. xxvi. f. A (1884).

*Leucosia craniolaris*, Walker, Journ. Linn. Soc., Zool. vol. xx. p. 111 (1887); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 397 (1893); Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 231 (1896).

*Hab.* Singapore and Malacca ; 5 fms.; muddy bottom. Two females, of which the larger is from Malacca.

Dim. ♀ 19 × 21.75. ♀ 14.5 × 16.

#### 102. LEUCOSIA RHOMBOIDALIS de Haan.

*Leucosia rhomboidalis* de Haan, Crust. Japon. p. 134, pl. xxxiii. f. 5 (1839); Bell, Trans. Linn. Soc. vol. xxi. p. 284 (1855).

*Leucosia maculata*, Stm. Proc. Ac. Nat. Sci. Philad. p. 159 (1858).

*Leucosia rhomboidalis*, Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 234 (1896).

*Hab.* Singapore : 5 fms. ; muddy bottom. A male and a female. Both these individuals have a row of three yellow spots arranged

creescent-wise on each side of the gastric region, and the female has, in addition, a reticulated yellow patch on the cardiac and uro-cardiac regions.

Dim. ♂ 10·5 × 12. ♀ 12 × 13·5.

### 103. LEUCOSIA BRUNNEA Miers.

*Leucosia brunnea*, Miers, Trans. Linn. Soc. 2nd ser. Zool. vol. i. p. 237, pl. xxxviii. ff. 10-12 (1877).

*Hab.* Singapore: 7 fms.; muddy bottom. A female.

A very deep yellow patch on the uro-cardiac declivity, extending forward laterally nearly to the epibranchial angle; the same yellow colour on all the legs, but less deep on the abdomen.

Dim. 25·5 × 29·75.

## LVII. Genus PHILYRA Leach.

### 104. PHILYRA GLOBOSA Fabr.

*Cancer globosus*, Fabr. Ent. Syst. ii. p. 441 (1792).

*Leucosia globosa*, Fabr. Suppl. Ent. Syst. p. 349 (1798).

*Philyra globosa*, M.-Edw. Hist. Nat. Crust. t. ii. p. 132 (1837).

*Philyra porcellana*, M.-Edw. t. c. p. 133.

*Philyra globosa*, de Man, Mergui Crust. p. 203 (1888).

*Philyra globosa et globulosa et syn.*, Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, pp. 243-246 (1896).

*Philyra polita*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 401, pl. xxxviii. ff. 1-3 (1893).

*Hab.* Malacca: 5 fms.; muddy bottom. Eight males, seven females: one of the latter carrying ova.

In none of these does the epistome project farther than the front; the inner angles do, but in a greater or less degree in the different individuals. Five of the males have the small tubercle on the abdomen (*P. globulosa*); in the other three it is absent (*P. globosa*)—yet in one of the males with a tuberculated abdomen the whole of the upper surface of the arm is granulated except near the tip (*P. globosa*), while in the three with no tubercle only the proximal half is granular (*P. globulosa*); in all the females it is entirely granulous except at the tip. The internal edge of the exopodite of the external maxillipedes seems to show a gradation from a nearly straight line to a slightly curved one; but, curiously, the nearly straight edge (*P. globosa*) is found in the males with abdominal tubercle (*P. globulosa*), the slightly curved (*P. globulosa*) on a male with no tubercle (*P. globosa*). In all cases the under surface of the meri of the legs is smooth (*P. globosa*); equally in all cases, the size of the granules on the edge of the carapace varies (*P. globulosa*). The males with abdominal tubercles have a low dentiform eminence at the base of the thumb, in those with no abdominal tubercle it is absent; this is the normal correlation in *P. globulosa* and *P. globosa* respectively. The amount of definition of the regions of the carapace varies from one to

another; but the cardiac region is always more or less distinct, and the hepatic regions always project slightly in a lateral and obliquely downward direction, so as to break the plane of the antero-lateral margins.

Dim. ♂ 14.5 × 15. ♂ 13.75 × 13.5. ♂ 12.5 × 13. ♂ 13 × 13.  
 ♂ 10.5 × 10.5. ♂ 9.75 × 10. ♂ 12.5 × 12.75. ♂ 13 × 12.75.  
 ♀ 15.25 × 15. ♀ 11.5 × 11.5. ♀ 11.5 × 11. ♀ 9 × 9. ♀ 13 × 13.  
 ♀ 11.5 × 11.25.

#### 105. PHILYRA SEXANGULA Alcock.

*Philyra sexangula*, Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 241, & pt. ii. No. 3, pl. vii. f. 2 (1896).

*Hab.* Singapore: from mud, at low water. A female with ova.

Mr. Alcock's description is from a male; in this female I note the following differences:—The median carina is raised into four low tubercles over the cardiac and mesogastric regions; the teeth at the outer edge of the posterior margin are not very strong; the black colour of the carapace shades off to a dull yellow-green in the anterior half, commencing at the anterior termination of the branchial carinæ; the finger-tips are white, and the four posterior pairs deep yellow.

As regards the abdomen, it is composed of three distinct pieces: a narrow basal segment; a long, broad, dome-shaped median piece, composed of segments 2 to 6, segment 2 being still clearly marked off by a transverse groove; and the 7th segment, very small and rounded triangular. Segments 1 and 2 are obtusely carinated transversely; the whole abdomen is honeycombed and pubescent like the carapace, and uniformly black, except the 7th segment and the anterior and lateral margins of the middle piece, which are nearly white.

Dim. 9.75 × 9.5.

Length of middle piece of abdomen . . . . .	7.0 mm.
Breadth " " " " . . . . .	6.0 "
Length of chelipede . . . . .	20.5 "

### LVIII. Genus PSEUDOPHILYRA Miers.

#### 106. PSEUDOPHILYRA MELITA de Man.

*Pseudophilyra melita*, de Man, Mergui Crust. p. 199 (1888); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 397 (1893); Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 253 (1896).

*Hab.* Uncertain. One female.

I have no doubt that this specimen belongs to *P. melita*; but the following—possibly sexual—differences may be noted. The surface of the carapace is nowhere granular, but everywhere fairly closely punctate, the punctæ being distinct, and quite visible to the naked eye. The distal third of the upper and under surfaces of the arm, and the wrist, both above and below, are also punctate,

the under surfaces less so than the upper; and there is no sign of any granules on the inner (anterior or lower) margin of the hand. The inner edges of both fingers have a line of 5 or 6, widely separate hairs, very distinct under the lens.

Dim.  $7.25 \times 8$ .

#### LIX. Genus MYRA Leach.

##### 107. MYRA AUSTRALIS Hasw. (?).

*Myra australis*, Hasw. Proc. Linn. Soc. N. S. W. vol. iv. p. 50, pl. v. f. 3 (1879), & Cat. Austr. Crust. p. 122 (1882); Miers, 'Alert' Crust. p. 251 (1884), & 'Challenger' Brachyura, p. 315 (1886); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 111 (1887); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 402 (1893).

*Hab.* Singapore: 4-5 fms.; bottom of broken shells and sand. A small male, which I refer rather doubtfully to this species with which it seems to agree, excepting that there is an additional minute spine over the base of each of the posterior legs, and there is no denticle on the penultimate joint of the abdomen.

Dim.  $8 \times 8$ .

#### LX. Genus ARCANIA Leach.

##### 108. ARCANIA ERINACEUS Fabr.

*Cancer erinaceus*, Fabr. Ent. Syst. ii. p. 460 (1792); Herbst, Naturgesch. d. Krab. Bd. ii. Hft. 2, p. 258, pl. xx. f. 111 (1790).

*Lewosia erinaceus*, Fabr. Suppl. Ent. Syst. p. 352 (1798).

*Arcania erinaceus*, Bell, Trans. Linn. Soc. vol. xxi. p. 309 (1855); Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 268 (1896).

*Hab.* Singapore: 4 fms.; sandy bottom. A damaged male.

Dim.  $11 \times 11$ .

#### LXI. Genus IPHICULUS Ad. & White.

##### 109. IPHICULUS SPONGIOSUS Ad. & White.

*Iphiculus spongiosus*, Ad. & White, 'Samarang' Crust. p. 57, pl. xiii. f. 5 (1848); Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 256 (1896).

*Hab.* Singapore: 5 fms.; muddy bottom. A male.

Dim.  $10.5 \times 8$ .

#### LXII. Genus NURSIA Leach.

##### 110. NURSIA PLICATA Herbst.

*Cancer plicatus*, Herbst, Naturgesch. d. Krab. Bd. iii. Hft. 4, p. 2, pl. lix. f. 2 (1804).

*Nursia plicata*, Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 180 (1896).

*Hab.* Singapore: 12 fms., rough bottom; south of Blakang Mati island. One male.

I quite concur with Mr. Alcock in the separation of this species from the next, and its identification with Herbst's form. This specimen lacks the red colouring of his Indian examples, being only of a rather dark, yellow-brown hue.

Dim.  $9.5 \times 7.75$ .

#### 111. *NURSIA HARDWICKII* Leach.

*Nursia hardwickii*, Leach, Zool. Misc. iii. p. 20 (1817); M.-Edw. Hist. Nat. Crust. t. ii. p. 137 (1837).

*Nursia plicata*, Bell, Trans. Linn. Soc. vol. xxi. p. 307, pl. xxxiv. f. 4 (1855).

*Nursia plicata*?, Miers, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 240, pl. xxxviii. f. 28 (1877).

*Nursia plicata*, Hasw. Cat. Austr. Crust. p. 127 (1882); ? Walker, Journ. Linn. Soc., Zool. vol. xx. p. 111 (1887); Henderson (*vide* Alcock), Trans. Linn. Soc., Zool. vol. v. p. 404 (1893).

*Nursia hardwickii*, Alcock, Journ. As. Soc. Bengal, vol. lxv. pt. ii. No. 2, p. 181 (1896).

*Hab.* Singapore: 6-10 fms., rough bottom; from both north and south side of Blakang Mati island. A male and a female.

Rather yellow than, like Mr. Alcock's examples, flesh-coloured.

It is interesting to find this species living together with the closely-related *N. plicata*.

Dim. ♂  $10.5 \times 9.5$ . ♀  $9.75 \times 8.75$ .

### LXIII. Genus *OREOPHORUS* Rüpp.

#### 112. *OREOPHORUS RUGOSUS* Stimpson.

*Oreophorus rugosus*, Stimpson, Proc. Ac. Nat. Sci. Philad. p. 259 (1858); A. M.-Edw. Ann. Soc. Entom. Fr. t. v. p. 152, pl. vi. f. 3 (1865); id. Nouv. Arch. Mus. t. x. p. 49 (1874); Hasw. Cat. Austr. Crust. p. 130 (1882).

*Hab.* Singapore: a male from 2-3 fms., muddy bottom, and a female from the reef.

Dim. ♂  $13 \times 9$ . ♀  $18.5 \times 14$ .

### LXIV. Genus *FAVUS*<sup>1</sup>, gen. nov.

Carapace twice as broad as long, extended laterally so as quite to conceal the 2nd, 3rd, and 4th pairs of legs in flexion, but suddenly narrowed behind so as to leave the whole of the posterior pair exposed; front small and upturned; antennules obliquely folded; antennæ with flagellum either very rudimentary or completely absent, and basal portion imbedded in the inner orbital angle and fused with the orbital margin; orbits, in consequence,

<sup>1</sup> *Favus* = a honeycomb.

circular and complete, small; eyes very small, but not fixed; endostome deeply excavate in the middle line; exopodite of exterior maxillipedes broad, and not reaching beyond the middle of the merus; chelipedes and legs short and rugose. Abdomen (of female) composed of only two pieces, of which one is the narrow basal segment.

113. *FAVUS GRANULATUS*, sp. nov. (Plate XLVII. fig. 13.)

*Hab.* Singapore; littoral. One female.

Carapace convex in both directions, regularly honeycombed, the pits being more distinct on the branchial regions or lateral expansions, the elevated parts covered with relatively large rounded granules; a rather strong prominence—granulated, and with two deep sulci on either side—on the narrowed uro-cardiac region. The marginal line is regularly curved, and defined as a non-pitted, but granulated border; edges thick, and under side of lateral expansions honeycombed, transversely concave, longitudinally convex. Front very small, appearing as a slightly upturned prominence in the anterior margin; epistome and tip of exterior maxillipedes just visible from above. Chelipedes very rugose, with carpus just appearing from under the carapace; hand as high as it is long, and as thick also, in its posterior portion; fingers shorter than hand, curved, with short decussating tips. Legs rugose and granulous, with carpo- and propodites obtusely carinate. Maxillipedes and abdomen also granulate; the latter (in a female) with four distinct grooves, marking the segmental sutures. The rather long and narrow 7th segment, which nearly reaches the base of the maxillipedes, is partially fused on to the large, only slightly rounded, middle piece. The sternum is deeply hollowed.

Dim.  $15 \times 7.5$ .

LXV. Genus *DORIPPE* Latr.

114. *DORIPPE FACCHINO* Herbst.

*Cancer facchino*, Herbst, Naturgesch. d. Krab. Bd. i. Hft. 6, p. 190, pl. xi. f. 68 (1785).

*Dorippe sima*, M.-Edw. Hist. Nat. Crust. t. ii. p. 157, pl. xx. f. 11 (1837).

*Dorippe facchino*, de Haan, Crust. Japon. p. 123 (1839).

*Dorippe sima*, Miers, Ann. Mag. Nat. Hist. 5th ser. vol. v. p. 317 (1880); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 111 (1887).

*Dorippe facchino*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 405 (1893); Alcock, Journ. As. Soc. Bengal, vol. lxxv. pt. ii. No. 2, p. 278 (1896).

*Hab.* Singapore and Malacca; 2-6 fms., muddy bottom.

A large male from Malacca, and a smaller one from Singapore; also, from Singapore, a much smaller female which had just

moulted, and which carries on its dorsum a small anemone, with a bivalve shell interposed (*vide* Alcock, t. c. p. 279). The right hand is much swollen in the two males. Mr. Alcock describes both edges of the merus of 1st and 2nd legs as being densely pubescent in the male; in these only the posterior edge is so, as with the pro- and carpopodite.

The base of the anemone rests directly on the shell; but, the latter being only half the size of the anemone's base, it follows that the outer edge of the base projects beyond the shell on every side. Between this part of the base and the dorsum of the *Dorippe* is found a circular flattened ring, with a wrinkled surface; with the appearance and consistency of mud supported by a few scattered fibres.

There is also another female from Malacca, which carries an anemone. There is no shell interposed between the base of the anemone and the crab, but only what appears to be the operculum of a large Gastropod. The circular flattened ring mentioned above is evidently the remains of a similar structure.

Dim. ♂ 28·75 × 22. ♂ 25 × 19·5. ♀ 16·5 × 13. ♀ 13·5 × 19·25.

#### 115. DORIPPE DORSIPES Linn.

*Cancer dorsipes*, Linn. Mus. Lud. Ulr. p. 452, & Syst. Nat. ed. xii. i. 2, p. 1053 (1766).

*Cancer frascone*, Herbst, Naturgesch. d. Krab. Bd. i. Hft. 6, p. 192, pl. xi. f. 70 (1785).

*Dorippe quadridens*, Fabr. Suppl. Ent. Syst. p. 361 (1798).

*Dorippe quadridentata*, M.-Edw. Hist. Nat. Crust. t. ii. p. 156 (1837).

*Dorippe quadridens*, de Haan, Crust. Japon. p. 121, pl. xxxi. f. 3 (1839).

*Dorippe quadridentata*, Hasw. Cat. Austr. Crust. p. 137 (1882).

*Dorippe dorsipes*, Henderson, Trans. Linn. Soc., Zool. vol. v. p. 404 (1893); Alcock, Journ. As. Soc. Bengal, vol. lxv. pt. ii. No. 2, p. 277 (1896).

*Hab.* Singapore: 10 fms.; muddy bottom. Three males.

Dim. ♂ 15 × 14·5. ♂ 12·5 × 12. ♂ 11 × 10·5.

#### 116. DORIPPE ASTUTA Fabr.

*Dorippe astuta*, Fabr. Suppl. Ent. Syst. p. 361 (1798).

? *Dorippe callida*, Fabr. t. c. p. 362.

*Cancer astutus*, Herbst, Naturgesch. d. Krab. Bd. iii. Hft. 3, p. 45, pl. lv. f. 6 (1803).

*Dorippe astuta*, M.-Edw. Hist. Nat. Crust. t. ii. p. 157 (1837); Hasw. Cat. Austr. Crust. p. 136 (1882); Walker, Journ. Linn. Soc., Zool. vol. xx. p. 111 (1887); Henderson, Trans. Linn. Soc., Zool. vol. v. p. 405 (1893); Alcock, Journ. As. Soc. Bengal, vol. lxv. pt. ii. No. 2, p. 280 (1896).

*Hab.* Malacca: 2 fms.; muddy bottom.

Seven adult males and five young ones. There is also another

male, still carrying a comparatively large leaf, beneath which it is entirely concealed when the legs are flexed. In three of the males the right hand is swollen.

Judging from Fabricius' description of his *D. callida*, it seems to me very probable that it is really identical with his *D. astuta*.

Dim. ♂ 13.25 × 12.5. ♂ 13.5 × 12.5. ♂ 13.5 × 13. ♂ 12.75 × 12. ♂ 9.75 × 9.5. ♂ 7.5 × 7. ♂ 8.25 × 7.5. ♂ 6 × 5.75. ♂ 6 × 5.5. ♂ 5.75 × 5. ♂ 5.5 × 4.75. ♂ 5.25 × 4.75.

## EXPLANATION OF THE PLATES.

## PLATE XLIV.

- Fig. 1. *Micippa excavata*, p. 725. *a.* Rostrum. *b.* Chelipede. *c.* Pterygostomian region.  
 2. *Lambrus tumidus*, p. 727. *a.* Dorsal view. *b.* 5th ambulatory leg.  
 3. *Harrovia albolineata longipes*, p. 729. *a.* Dorsal view.  
 4. *Carpilodes socius*, p. 731. *a.* Dorsal view. *b.* 3rd maxillipede.

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- Fig. 5. *Etisodes anaglyptus*, p. 739. *a.* Dorsal view. *b.* Frontal region.  
 6. *Actæopsis pallida*, p. 741. *a.* Dorsal view. *b.* Frontal and buccal regions. *c.* Male abdomen.  
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## PLATE XLVI.

- Fig. 8. *Achelous rubro-marginatus*, p. 746. *a.* Dorsal view. *b.* 3rd maxillipede.  
 9. *Carcinoplax subinteger*, p. 750. *a.* Anterior portion of carapace.  
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## PLATE XLVII.

- Fig. 11. *Macrophthalmus dilatatus carens*, p. 759. *a.* Chelipede.  
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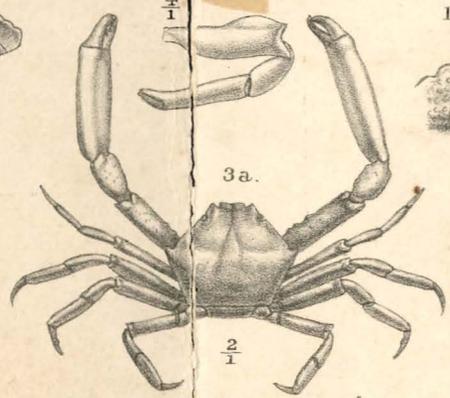


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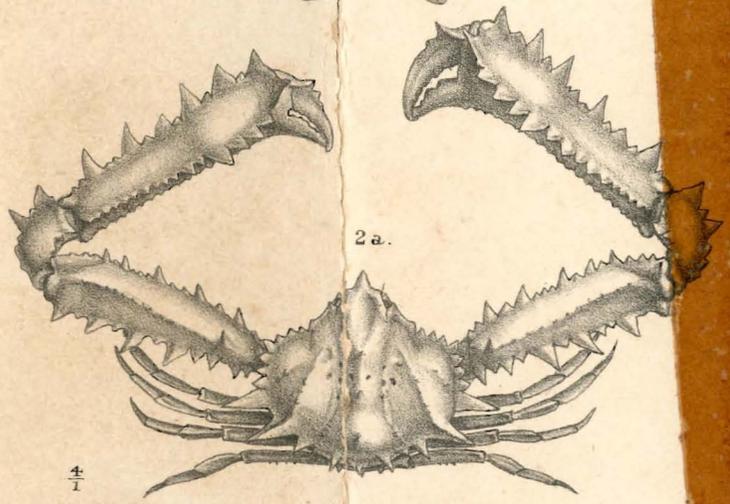
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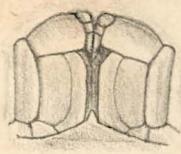
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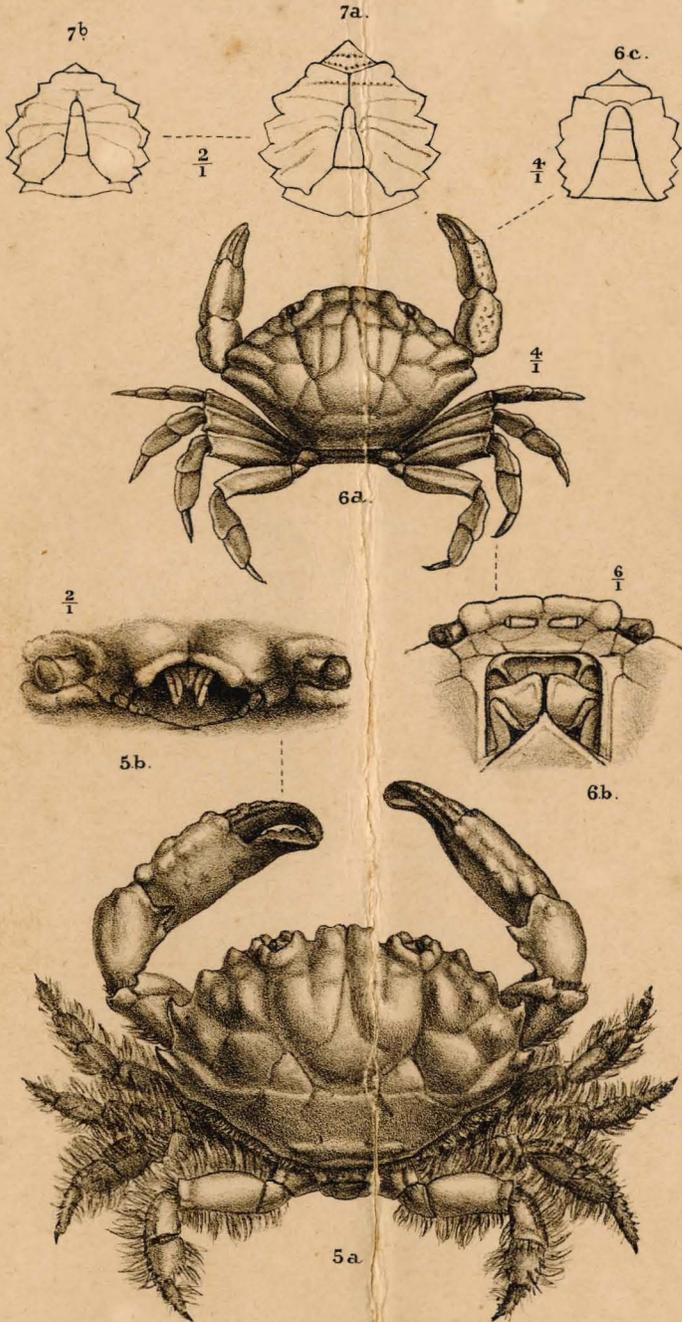


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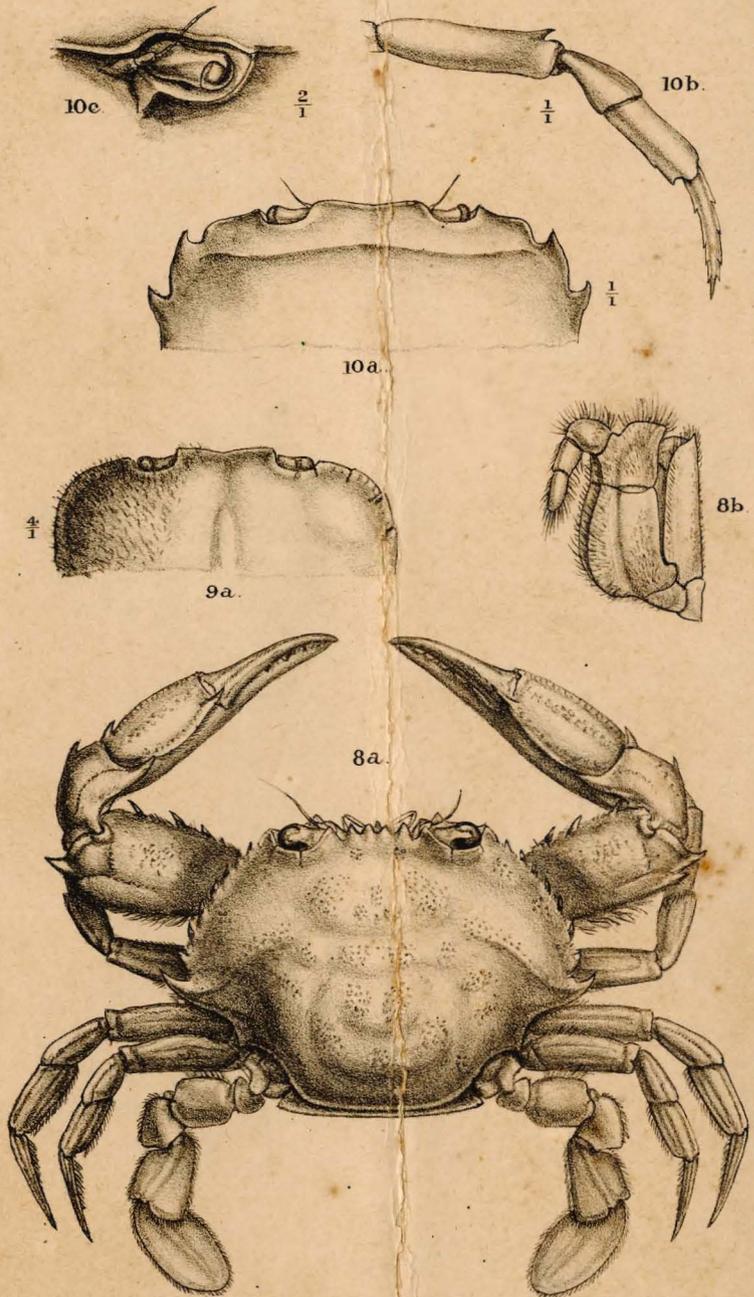
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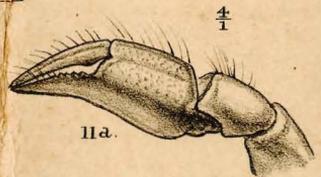
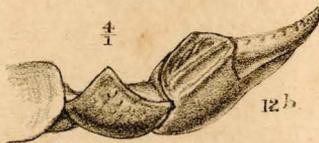
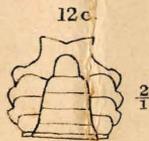
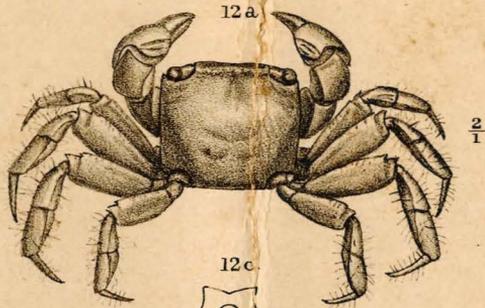
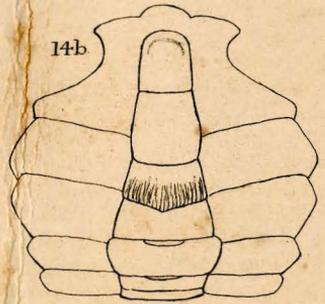
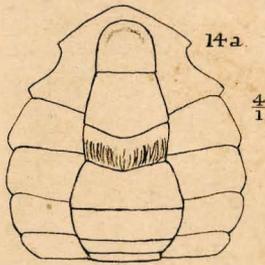
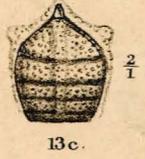
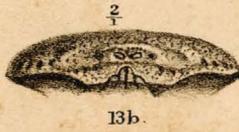
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### NOTICE.

The Proceedings are issued in four parts, as follows:  
 Part I containing papers read in January and February  
 " " " " March and April  
 " " " " May and June  
 " " " " November and December