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THE  
**ZOOLOGY**  
OF THE  
**VOYAGE OF H.M.S. SAMARANG;**

UNDER THE COMMAND OF  
CAPTAIN SIR EDWARD BELCHER, C.B., F.R.A.S., F.G.S.

DURING THE YEARS 1843-1846.

(Published under the Authority of the Lords Commissioners of the Admiralty.)

EDITED BY

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**CRUSTACEA,**

**PART II.**

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## INTRODUCTION.

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THE first indication of the Crustacea which presented itself during the late Voyage of H.M.S. Samarang, occurred on the 10th of June, 1843, as we slowly sailed through the Straits of Sunda, the surface of which being nearly calm, was swarming with myriads of Stomapodons, such as the transparent *Erichthus* and *Alima*, together with several other genera, as *Phronima*, *Nerocila*, and *Sphæroma*. These were swimming apparently in dense masses near the surface, carried bodily on by the current setting through the Straits, and darting about among themselves. The *Nerocila* and *Sphæroma* rapidly revolve in the water and swim in every direction, while *Erichthus*, *Alima*, and *Phronima* propel themselves more steadily onwards by repeated flexion and extension of the abdomen.

While the trawl supplied us with specimens of these, the employment of the dredge furnished us with several forms of Podosomatous spider-like Crustaceans, which occur, however, most frequently and in the greatest number among coral barriers surrounding islands, where they are found concealed among the coral branches and in the holes of madrepores. I have also taken them from tubular sponges and even from among the spines of the larger Echinoderms. We found them in large numbers in the Mindoro Sea, in twenty fathoms water and sandy bottom, on which occasion they were found entangled in huge bunches of a species of pinnatifidous keratophyte. Mr. Adam White, in the Proceedings of the Zoological Society, has described two new species of the genus *Nymphon* obtained in this manner, under the names of *Nymphon Johnstonianum* and *Nymphon Phasma*.<sup>1</sup> These Crustaceans are very slow and languid in their progression, moving their slender articulations but feebly. In the Straits, we likewise obtained by the dredge several fine specimens of the

<sup>1</sup> Ann. and Mag. Nat. Hist., 2nd Ser. vol. i. p. 227.

beautifully marked *Galathea elegans*, a figure of which we have given; it is very active in its movements, darting backwards by sudden powerful jerks, snapping its fore-legs quickly together and producing a clicking noise; when at rest the fore-legs are extended in the same line as the body, perfectly straight; when swimming, the tail is first bent under the body and again forcibly reflexed backwards. Near the same spot a specimen of our very rare *Tlos muriger* was dredged at a depth of ten fathoms, with other species of Crustaceans, chiefly belonging to the genus *Philyra* and *Leucosia*. The *Tlos*, like *Oreophorus* and *Leucosia*, is apathetic and inert, slow in its progressive movements, and relying for security upon its stone-like form. Arrived among the islands of the China Sea, crustaceous animals were observed in all their prolific variety, for in these organisms, as in others, the existence of a high temperature seems to increase their numerical importance, and invest them with more singular modifications of form and with greater brilliancy of colour.

Two of the most remarkable Crustaceans to be met with among the group of islands next visited, namely, that of the Meïa-co-shimah, are the *Scopimera globosa* of De Haan, and the *Mycteris deflexifrons* of the same naturalist. The former burrows in the muddy banks and sandflats, just above low-water mark, perforating the surface in every direction. In some parts of Koo-kien-san (one of this group) they are so numerous as to impart a peculiar colour to the shores, when seen at a distance. They walk but slowly and are very inactive in their habits; when disturbed they make awkward scrambling habits to get out of sight, by burying themselves in the mud in the manner of certain *Macrophthalmi*. The latter genus (*Mycteris*), although somewhat resembling the genus *Ocypode* in many particulars, yet differs considerably in regard to vivacity and locomotion; like their swift-footed consimilars, they form superficial burrows in the sandy mudflats, into which they retreat in the same clumsy scrambling manner as do the *Scopimera* on the approach of danger. In some parts of the Meïa-co-shimahs I have ridden over many acres of sandy mud covered with these bright blue crabs, and on looking behind could perceive a dark straight line made by the passage of the horse, as he caused them to conceal themselves in the soil in his progress onwards. They delight to bask at the mouth of their apertures in the sun, just after the receding tide has left the flats partially dry, and appear then to be most on the alert in procuring food. Here likewise we met with a species of *Gelasimus* allied to *G. Chlorophthalmus* of Professor Milne Edwards, with bright orange fore-legs, the left one being bigger than its carapace or, indeed, than the entire body, which inhabits burrows, formed obliquely among

the grass in muddy places near the sea. The *Ocypode ceratophthalma* and other species are collected by the poorer classes as food; they dig them out of their deep sandy burrows with great eagerness and diligence, by means simply of their hands. I have seen the natives sometimes drive them out by insinuating a long pliant twig into the aperture, and have known them also pour water into the hole and so force its occupant to appear; by minutely examining the foot-prints near the burrow, they are able to say with certainty whether it is vacated or occupied by an *Ocypode*. On the flat sandy beaches of this group, if the stones which the tide has left dry are turned over, hundreds of *Porcellanæ* are perceived shuffling along, with their bodies closely applied to the under surface of the stones, seeking protection by quickly gliding to the opposite side. Our species, *P. pulchripes*, is active and bustling in its habits, but another new species (*P. versimana*), found among the coral-reefs of Koo-kien-san, is apathetic and indolent, and the *P. obesula*, A. and W., which was dredged from twenty-four fathoms in the Sooloo Sea, was very sluggish in its movements. The *Elamæna unguiformis* of De Haan was found here also; slow in its movements, it lurks concealed in holes of the under surface of stones below high-water mark. A species of *Calappa*, allied to *C. spinosissima*, is found in the shallow bays, which covers itself with sand, and when captured feigns death, folding the fore-legs close against the front and retracting the hind-legs under the carapace. All the species of *Calappa* that I have seen alive are timid and slow-moving. A species of *Alpheus*, probably new, inhabits pools under stones on the sandy beaches, and when disturbed makes a loud clicking noise by snapping together the claws of the fore-legs; and in the padi-fields, a *Gecarcinus*, allied to *G. lateralis*, is very common, running about in all directions, feeding on the larvæ of *Libellulidæ* and other insects.

The *Paguridæ*, or Pirate-Crabs, are very numerous throughout the shores of the Indian Islands, taking refuge, some in the prostrate bodies of decayed trees that usually lie upon the strand, some among the loose stones and in the dead leaves and underwood, and some even penetrating the verge of the forest and ascending the trees that border upon the sea. These are almost entirely terrestrial; some, however, are quite littoral in their habits, while others again live at great depths. We obtained one species of *Pagurus* off the Cape of Good Hope, living in 230 fathoms water, which was remarkable for having fabricated a dwelling in the form of a univalve turbinated shell out of the dead *Ancillaridæ* which abound there, and which are covered with masses of alcyonoid sponge. In the Bashee Group, numerous fine

specimens of the large *Birgus latro* were obtained. Respecting this species, which lives high up among the mountains, the natives of Batan (one of the islands of this group) tell very remarkable stories, maintaining that it utters a sharp cry when caught, that it bites most severely and defends itself with desperation, that it carries its eyes in its tail, runs with surprising celerity backwards, feigning death when alarmed, and does much mischief in the cocoa-nut plantations by cutting down the young trees with its powerful fore-legs. From my own observation I may safely affirm that it runs swiftly backwards, feigns death when disturbed, feeds on fruits, and is of immense strength. They are esteemed, especially the female in spawn, great delicacies in these islands, and from experience I can say that the partiality for them seems well bestowed. We found the same species at the Meïa-co-shimah Group of Islands, where they inhabit holes in the banks among the pine woods, and frequent the cemeteries, where they feed on the bodies of the dead, several being caught in the act by one of our officers. We obtained several live specimens, as large as a common Lobster, also from the Cocos or Keeling Islands, where they are said to be very destructive to the young cocoa-nut trees, and where their principal food consists of the pulp of the cocoa-nut, which they obtain through a round hole made by tearing away the fibres and breaking through the shell. On the flat, weedy, sandy beach of the island of Ibugos (another island of the Bashee Group) I observed a species of *Callianassa*, which digs pits in the sand in which it conceals itself until its prey is in the vicinity, when it seizes upon it and drags it below the surface.

In many parts these islands are over-run with various kinds of *Sesarma*, the species of which differ very much in their habits. Among those I detected as belonging to the fauna of this group, one was found under stones, on sandy flats just below high-water mark; another inhabited the coral reefs; a third, fresh-water rivulets and pools, hiding under stones and logs, and climbing the roots of trees with great facility. Another species, allied to *S. affinis* of De Haan, has the same habits, but running more about upon the dry land among the roots of grass, &c. One, of a marbled light sandy colour, with pale grey blotches, lives in holes in the sand; another, with a hairy carapace, dark brown and purple, inhabits holes in the sandy beach above high-water mark; while in Mindanao I found a species living in fresh-water rivulets among weeds, and in the forests of Celebes, another under damp stones and logs, at some considerable distance from any water. On the summits of the hills near the sea coast, particularly on those of Koo-kien-san, I procured numerous *Talitri* and *Gammari*, from among the roots of the long damp grass in the society of *Tropidinoti* and

other orthopterous insects, and on one occasion observed the natives employing the *Eriocheir Japonicus*, De Haan, as food, throwing them alive upon the embers of their fire, and, when burnt crisp, consuming them, shell and all.

In the course of our dredgings in the China Sea, numerous new species of *Leucosia* were collected, generally affecting a sandy bottom, and living among the corallines and madrepores at considerable depths. They are seldom found in muddy places, but prefer deep sandy banks, where they move in a sluggish manner, and seem destitute of acute perceptions. Sufficiently protected by their hard porcellanous shells, they want the rapid progression and threatening attitudes assumed by many other genera. We have figured one of the most beautiful of these new discoveries, which is of a dead white colour covered with numerous round crimson spots. The genus *Dorippe* is another form very common in the China Sea, living in deep water, from twenty to thirty fathoms, on a muddy bottom. The Chinese fishermen often bring them up in their nets, and among large numbers which I have observed in their boats, I have found nearly every individual with an adventitious body (I believe an alcyonoid sponge) attached to the upper surface of the carapace, and retained in its position by the hooked claws of the two small posterior dorsal pairs of legs. This body is divisible into a thin brown layer, with concentric fibres, and an external white lamina with radiating fibres and a dark central nucleus. I have frequently noticed the same peculiarity in *Dromia verrucosipes*, and in many specimens both of *Dorippe* and *Dromia* which I examined in this condition, the carapaces were perfectly soft, as if this foreign body served them as a protection during the period of their moulting. The *Caphyrea pectinicola*, White, which was dredged by us in the Sunda Straits from thirteen fathoms, bears a small pecten shell in a similar manner, hooking itself on to the ears of the shell by the claws of its hinder legs, its soft carapace being thus secured from harm by this adventitious covering. Sir E. Belcher informs me that he discovered another species in the Gulf of Papagaya inhabiting the single valve of a *Terebratula*, which he states was in a partially softened condition. Many other genera, as *Hyas*, *Maia*, *Aretopsis*, *Mithrax*, and *Pericera*, are known to have similar propensities, loading their backs with foreign bodies, such as sponges, algæ, and other phytozoic and vegetable productions.

Near Manado, in the island of Celebes, I visited a woody tract which harboured numbers of *Gelasini* of several species, many of them of the most beautifully varied markings and colour. Among them were varieties of our *G. bellator*, of a green colour with black

markings; another was black, with two bright ultramarine spots in the middle of the earapace; while another species was grey, marbled with white, with an enormous light yellow chela. These *Gelasimi* cover the ground by thousands, stalking about in a deliberate manner, and holding up and occasionally snapping the claws of their huge fore-legs. Notwithstanding that they appear to be over-burdened with this unwieldy member, they are by no means easy to capture, but run quickly to the mouths of their burrows, where they remain stationary, holding up their fore-claws as organs of defence, and, if further pursued, retreat backwards into their holes, their bodies protected by the same member. In the pools of fresh water and under damp stones, a dark olive-green *Sesarma* with bright yellow blotches was obtained, and on the coast numbers of the elegant and agile *Thelphusa grapsoides*, which is found on the coral flats left dry by the receding tide. The *Chasmagnathus convexus* of De Haan is another crab which appears to be rather common among the Philippine Islands. I have found it in the company of *Xenophthalmus pinnotherides*, in the firm black mud of Manila Bay, where it forms oblique cylindrical holes.

Near the Dyak village of Samahratan, not far from the mouth of the Lundu River in Borneo, there are certain mud-banks left dry at low-water, and which are perfectly eribriform with the cylindric holes of *Gelasimi*, *Oeypode*, and other genera. When their communities are no longer flooded by the water, these Crustaceans make their appearance in large numbers, but retreat on the slightest alarm into their subterranean burrows. They are of every variety of colour, some of them being milk-white, some purple, others reddish and mottled, while many are perfectly black. So numerous are these crabs, that seen at a little distance they give the surface a variegated appearance, nearly obscuring the original colour of the mud.

In many parts of Borneo, as soon as the water recedes from the shore on the ebbing of the tide, and the large firm mud-flats are left exposed, numbers of Crustaceans of different genera and species issue from their various holes and hiding-places. The males of many species, after looking cautiously around them, stalk a few paces with their huge fore-legs raised, the claws of which they snap frequently together, producing a slight elicking sound, then rushing eagerly towards the females they embrace them with their fore-legs. The salute is very brief, and is immediately followed by the swift retreat of the females into their different burrows. Other species are seen feeding on worms and shell-fish, feeding alternately first with one hand and then with the other. The common species of *Grapsus varius* is



found running over the rocks near the sea, feeding on the Blennies and *Periophthalmi* that quit the water occasionally; they feed also on the different Cirripedes. There is one species (*G. latifrons*, White) that I have found inhabiting fresh-water rivulets and ponds, which, however, has all the quick and wary habits of the other species, and when pursued hides under weeds and stones. Among numerous other forms observed along the Bornean coast, I may allude to the *Sicyonia* of Edwards, which swims in a slow and deliberate manner forwards, and occasionally propels itself backwards with a sudden jerk; it keeps at a considerable distance from the shore, and appears to love deep still water.

The *Spheromæ* are generally obtained in company with *Cymodoceæ*, *Cypridinæ*, *Amphipodeæ*, and others, among dense masses of floating sea-weeds, where they appear to lead an active predatory life amid the populous mazes of the *Sargassum*, &c. They are constantly spinning and darting about, rolling up their bodies into a ball, then straightening them, and crawling among the algæ and keratophytes, with a great deal of vivacity. Among the collection brought home in the Samarang, are several species not before known to Crustaceologists. Like the genera *Thcnus* and *Ibacus*, the *Scyllarus* lives at some distance from the shore, and in tolerably deep water. It swims in the manner of *Crangon*, by rapid inflexions of the abdomen, occasionally springing through the water with the greatest velocity in a backward direction, and, when caught, wounds the hands with its tail, throwing it about with violent jerks. At Unsang in Borneo, which was the next place visited, I discovered a new species of *Alope*, (White,) an active restless Crustacean, darting and whirling forwards and backwards, and frequently producing a loud elicking noise by snapping the elaws of their fore-legs, in the manner of *Callianassa* and *Squilla*. Specimens were found under nearly every stone which I turned on the beach at low water. The *Gonodactyli* appear to differ slightly from the *Squilla* in their habits, inasmuch as they are generally found in deeper water, whereas the *Squilla* affect the shallow, weedy, and sandy bottoms, within coral-reefs and on flat beaches, where they hide in holes of the banks of pools, across which they dart occasionally in straight lines, leaving a turbid track behind them. Both genera have, however, the same power of producing a loud elicking noise with the elaws of their fore-legs, and of inflicting very severe wounds with their chelæ, using them in a scythe-like manner, like the *Mantis* which they resemble. The *Trapeziæ* are tolerably lively in their habits, with the same manner of hiding and shuffling under stones as the *Porcellanæ*, but unlike them they inhabit the coral branches and madrepores of deep sunken reefs.

Many species of *Idotea* and *Iara* would appear to inhabit the sea-weed along the shores, as well as that found floating on the high seas. At the island of Quelpart, I found a large and singular species in considerable numbers in the former situation, and in the Sea of Celebes I met with several new forms among algæ far from land. Off Tampassook in Borneo, to which island we again returned, several *Ixæ* were obtained by the dredge, one of which (our *I. megaspis*) was new to science; they inhabit very deep water, and are inactive and feeble. Near the same part of the coast several specimens of *Parthenope*, which simulated death when taken, and species of *Lambrus* and *Arcania*, which have similar habits, likewise were obtained from a rocky bottom by means of the dredge. Off Balambangan, our new genus *Ceratocarcinus* was procured from twelve fathoms water; and at Unsang, on the east coast, another new genus, our *Cosmonotus*, was dredged among the clear sandy pools within the reef-barrier, which extends along a part of the coast; and near the mouth of the Pantai River a third new genus, our *Zebrida*, rewarded our research, the habits of which Crustaceans are alluded to in the following pages. On the return of the Samarang across the Atlantic, at which we have now arrived, *Erichthi* and *Alimæ*, with their spiny carapaces and elongated abdomens, were obtained, by trawling, in large numbers, swimming in an erratic manner on the surface when the water was calm. Among the vast quantities of *Acalephæ* which became entangled in the trawls, were several containing living *Phronimæ*, which, on being extricated, swam freely about. Here also was obtained, at the same time as *Nemichthys* of Richardson,<sup>1</sup> our new genus *Rhabdosoma*, which swims by suddenly straightening its body when in a bent position, moving either backwards or forwards; it is sluggish in its movements compared with other *Hyperiadæ*. The *Phyllosomata*, diaphanous and sluggish of movement, were frequently assembled during this calm by many thousands on the surface of the Atlantic, and, together with numbers of anomalous *Zoææ*, afforded ample amusement during the protracted passage. Among the Entomostracous Crustacea, several specimens of *Cypridinæ* of large size (*C. Adamsii*, Baird<sup>2</sup>) were obtained, as they were revolving and darting about the surface. The specimens described and figured in the following pages are deposited in the British Museum. A. A.

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<sup>1</sup> *Vide* Fishes, Pl. X. Fig. 1.

<sup>2</sup> *Ann. and Mag. Nat. Hist.*, 2nd Ser., vol. i. p. 21.

1. GONATONOTUS PENTAGONUS, *Adams & White*. (Tab. VI. Fig. 7.)

*Thorace* supra confertim verrucoso, verrucis depressis; robustâ carinâ dorsali, ab uno laterali angulo ad alterum pertinente, duobus tuberculis in medio.

*Fronte* medio sulcatâ, medio dorsi duabus longitudinalibus impressionibus; ultimo articulo abdominis in feminâ verrucoso. Primo pedum pari verrucoso, digitis sulcatis.

HAB. Oram Brunensem.

*Gonatonotus pentagonus*, Adams and White, Proc. Zool. Soc.

*Carapace* above closely verrucose, the warts depressed; a rather strong ridge across the back, extending from one lateral angle to the other, with two tubercles in the middle; the front grooved down the middle; the centre of the back with two longitudinal impressions; terminal joint of abdomen, in the female, verrucose.

HAB. Coast of Borneo.

When alive, this species is of a brick-red colour, with the chelæ crimson, and the under surface rufous.

4. CERATOCARCINUS, *Adams & White*.

*Thorax* subpentagonalis; latera supra insertionem chelarum in magnam spinam paululum prorsum directam producta.

*Frons* lata et prominens, cornibus conicis inter se valde distantibus utrinque eminens; oculi parvuli, pedunculis brevibus, sulcis in lateribus rostri aptatis. Exteriores antennæ permagnæ, terminales appendices certe dimidiâ longitudine antennarum, et ultra cornua rostri prominentes.

*Chelæ* valde elongatæ; latera fere parallela, carpus subpyriformis, sine spinis in parte interiore; acies digitorum convenientes et serratæ. Secundum par pedum longius et gracilius quam postrema tria paria; articulus tarsalis gracilis et elongatus; quartum et quintum æqualia longitudine; quintum par, ut in *Eumedono*, tam alte positum ut quarti paris insertionem fere celet; tarsales articuli horum pedum crassi; unguis ad extremitatem translucidus.

Abdomen maris ut in *Eumedono*: femina incognita.

HAB. Maria Orientalia.

*Carapace* somewhat pentagonal; the sides, over the insertion of the first pair of legs, produced into a large spine directed slightly forwards.

*Front* wide and prominent, projecting on each side in the form of conical horns, widely separate from each other. Eyes rather small, peduncles short, the eye fitting into a groove on the side of the front; outer antennæ considerably developed, the terminal appendages at least half the length of the whole antennæ, and projecting beyond the horns of the front.

*First pair of legs* much elongated, the sides nearly parallel, the wrist somewhat pear-shaped, without spines on the inside, the edges of the pincers meeting and serrated. Second pair of legs longer and more slender than the last three pairs; the tarsal joint slender and elongated; fourth and fifth pairs of legs of equal length; the fifth pair, as in *Eumedonus*, placed so high as nearly to conceal the insertion of the fourth pair; the tarsal joints of these legs thick; the claw at the end translucent.

Abdomen of male, as in *Eumedonus*; that of female unknown.

This genus is closely allied to *Eumedonus* of Professor Milne Edwards (Crust. vol. i. p. 349), and, like it, comes from the Eastern Seas.

1. CERATOCARCINUS LONGIMANUS, *Adams & White*. (Tab. VI. Fig. 6.)

Duobus acuminatis transversis tuberculis, ad extremitatem pilis cristatis, in dorso thoracis, post oculos; primo pedum pari minutis verrucis obsito compluribus altis longitudinalibus sulcis; digitis basi exceptâ nigro-fuscis.

HAB. Oram Brunensem (Balambangan).

*Cerotocarcinus longimanus*, Proc. Zool. Soc.

Two pointed transverse tubercles, tufted with hair at the end, on the back of the carapace, behind the eyes; the first pair of legs covered with minute warts and with several deep longitudinal grooves; the pincers blackish brown, except at the base.

HAB. North coast of Borneo (Balambangan).

When alive, the colour of this species is blood-red, with five light bands across the carapace.

5. PARTHENOPE, *Fabricius*.

1. PARTHENOPE CALAPPOIDES, *Adams & White*. (Tab. V. Fig. 5.)

*Thorace* subtrigono postice truncato, antice rotundato, dorso verrucosiformibus subdepressis tuberculis obsito; lateribus in parte anteriore obtuso rotundato lobo; alto sinu post lobum; branchialibus regionibus permagnis, compluribus tuberculis, jugo majorum tuberculorum ad angulos latero-posteriores pertinentium et brevibus æquis intervallis circum margines alte incis. Medianâ regione serie magnorum rotundatorum tuberculorum, anterioribus tuberculis proxime appropinquantibus, posterioribus distantibus; duabus cavis inter laterales et medianas regiones, et post cavas duabus altis foveis.

*Fronte* latâ, obtusâ, antice rotundatâ, ad extremitatem subemarginatâ, denticulis in lateribus, tuberculiferâ in dorso.

*Chelis* breviusculis et crassis; brachio verrucoso, validâ anteriore spiniferâ cristâ; carpo externe lævi, serie tuberculorum in superficie interiore; manu serie magnorum tuberculorum pertinentium a digito superiore intus ad basin articuli, exteriore carinâ lævi et sine spinis; digitis magnis et validis, inferiore tribus magnis dentibus.

Abdomine in feminâ septem articulis, depressis tuberculis obsito.

HAB. Maria Orientalia.

*Carapace* subtrigonal, truncate behind, rounded in front, upper surface covered with wart-like, rather depressed tubercles; sides at the forepart with an obtuse rounded lobe, behind which is a deep notch; branchial regions very much developed, covered with tubercles, with a ridge of larger tubercles extending to the latero-posterior angles, and deeply incised at short regular intervals round the edges; the middle region with a row of large rounded tubercles, the anterior of which are close together, and the posterior isolated; two hollows between the lateral and middle regions, and two deep pits behind the hollows.

*Front* wide, obtuse, rounded anteriorly, slightly emarginate at the end, faintly dented on the sides, and tuberculiferous on the upper surface.

*Fore-legs* rather short and stout; third joint verrucose, with a strong anterior spiniferous crest; fourth joint smooth externally, with a row of tubercles on the inner surface; fifth joint with a row of large tubercles, extending from the upper claw to the base of the joint, on the inner surface, outer keel smooth and without spines; claws large and strong, the lower one with three large teeth.

*Abdomen*, in the female, seven jointed, and covered with flattened tubereles.

HAB. Eastern Seas.

2. PARTHENOPE TARPEIUS, *Adams & White*. (Tab. VII. Fig. 2.)

*Thorace* subtrigono, compluribus lævibus depressis rotundatis tuberculis, in regionibus medianâ et laterali majoribus obsito: lobo rotundato integro, in margine latero-anteriore; alto sinu lobum a lateralibus regionibus dividente; lateralibus regionibus dilatatis, rotundatis, postice angustatis, magnis superficialibus crenationibus circum margines; posteriore margine serie validorum obtusorum subconicalium tuberculorum extrorsum et retrorsum directis.

*Fronte* latâ obtusâ rotundatâ subcrenulatâ, alte sulcatâ, vix lævi in superiore superficie.

*Chelis* validis tuberculiferis, brachiis uno magno et compluribus minoribus tuberculis in acie anteriore; carpo lævi, externe noduloso; manu subtuberculifero latere in interiore superficie; pedibus posterioribus depressis, marginatis depressis subtriangularibus obtusioribus processibus.

*Abdomine* in feminâ septem-articulato, obsito tuberculis, fimbriato crebris setis.

HAB. Maria Orientalia.

*Carapace* subtrigonal, covered with numerous smooth, depressed tubercles, larger in the middle and lateral regions; a rounded entire lobe on the latero-anterior margin, and a deep notch, which separates it from the lateral regions, which are dilated, rounded, narrowed posteriorly, with large superficial crenations round the edges; the hind margin with a row of strong, obtuse, sub-conic tubercles, directed outwards and backwards.

*Front* wide, obtuse, rounded, subcrenulate, deeply channelled, and nearly smooth on the upper surface.

*Fore-legs* strong, tuberculiferous; third joint with one large and several smaller tubereles on the front edge; fourth joint smooth, externally nodulous; fifth joint with a rather faint tuberculiferous ridge on the inner surface; hind-legs flattened, edged with flattened, sub-triangular, bluntish processes.

*Abdomen*, in the female, seven-jointed, covered with tubercles, fringed with close-set setæ.

HAB. Eastern Seas (Caramatta Passage).

LAMBRUS, *Leach*.

[*Additional Species.*]

11. LAMBRUS HOPLONOTUS, *Adams & White*. (Tab. VII. Fig. 3.)

*Thorace* subpentagono, antice acuminato, ad latera subangulato, postice lato, obsito rotundis æquis tuberculis, majoribus et crebrioribus in regionibus medianâ et branchiali; lateribus crenatis antice, armatis

in medio crassis obtusis tuberculiformibus processibus, postice desinentibus in longâ prominente acuminatâ spinâ extrorsum et paululum retrorsum directâ; acie posteriore octo validis spinis instructâ, marginibus thoracis, cum tuberculis et spinis, fimbriatis longis rigidis subcurvatis setis.

*Fronte* acuminata triangulari, aciebus subcrenulatis et validâ spinâ supra canthum.

*Chelis* ter thorace longioribus; brachiis serie crebrorum æquorum tuberculorum antice; quatuor vel quinque magnis rotundatis tuberculis, paululum inter se distantibus in latere exteriori, quinque validis spinosis processibus a margine posteriore retrorsum et extrorsum tendentibus; carpo serie tuberculorum supra, et tribus validis spinis externe; manu cristâ octo validarum spinarum supra, serie tuberculorum interne, et serie fere duodecim crassarum obtusarum spinarum in acie inferiore.

Pedibus posterioribus gracilibus minoribus, duobus posterioribus paribus longis subcurvatis setis fimbriatis.

*Abdomine* (in mare) quinquarticulato, crebris setis circum margines.

HAB. Maria Orientalia.

*Carapace* subtriangular, anteriorly acuminate, somewhat angulated at the sides, wide behind, covered with rounded equal-sized tubercles, larger in the middle and branchial regions, the sides anteriorly crenated, armed in the middle with thick, obtuse, tuberculiform processes, and ending posteriorly in a long, prominent, acuminate spine, directed outwards and a little backwards; posterior edge with eight strong spines and tubercles, the spines fringed with long, rigid, slightly curved hairs.

*Front* acuminately triangular, the edges subcrenulated, and with a strong spine above the orbit.

*Fore-legs* three times longer than the carapace, the third joint with a row of equal-sized tubercles anteriorly; four or five large rounded tubercles slightly separated from each other on the outer surface; five strong spiny processes, extending backwards and outwards from the hinder margin; the third joint with a row of tubercles above and three strong spines externally; the fifth joint with a crest of strong spines above, a row of tubercles internally, and a row of about twelve thick, obtuse spines on the lower sharp edge.

Hind-legs slender, rather small, the two posterior fringed with long slightly curved setæ.

*Abdomen* (in the male) five-jointed, the crenated margins beset with short hairs.

HAB. Eastern Seas.

#### IV. CANCERIDÆ.

In their habits, the *Canceridæ* are evasive and prone to concealment, passive in defence, and though voracious and predatory, they do not exhibit the same activity, intelligence, and cunning as the *Ocypodidæ*, the *Gonoplacidæ*, or the *Grapsidæ*. The *Æthræ* inhabit deep water, living in sandy mud, among shells and coral débris, while such genera as *Carpilius*, *Atergatis*, *Xantho*, and *Chlorodius*, select shallow waters along the shores, preferring weedy and rocky bottoms, where they hide among the stones, and prey on shrimps and small fishes. *Pilumnus* and *Trapezia* are tolerably lively in their movements; the latter genus having the

same habit of hiding and shuffling under stones as *Porcellana*, but unlike that genus it inhabits the coral branches of deep sunken reefs and the cavities of madrepores.

At the island of Koo-kien-san a species of *Eriphia* was common, hiding under stones below high-water mark, having the carapace, legs, and chelæ covered with stiff red hairs, the colour of the shell itself being dark greenish brown, the legs lighter and banded with dark brown, while the under surface of the body was ultramarine blue, and the terminal joint of the abdomen the same colour.

The *Zozymus* lives among rocks, hiding in holes, while *Pilumnus* is sluggish in its movements, hiding in the crevices and cavities of the under surface of stones below high-water mark.

### 1. CARPILIUS, *Leach*.

#### 1. CARPILIUS CINCTIMANUS, *White*. (Tab. VII. Fig. 4.)

*Thorace* sine dente laterali, latissimo; lateribus in quatuor lobos divisus; digitis nigris, subalbis ad extremitatem; manu in medio latâ nigrâ fasciâ cum nigro digiti immobilis commixtâ; thorace et pedibus lævibus, intense rubris.

HAB. Insulas Philippinas.

*Carapace* without lateral tooth; very wide; the side divided into four lobes; claws of fore-legs black, whitish at the tip; fifth joint of fore-legs with a broad black band in the middle which runs into the black of the immovable claw.

Carapace and legs smooth, of a rich red colour.

HAB. Philippine Islands.

#### 2. CARPILIUS SIGNATUS, *Adams & White*. (Tab. X. Fig. 1.)

*Thorace* valde convexo, supra punctis carinisque latiusculis impresso, aurantiaco, signaturis pallide-citrinis variegato.

HAB. In littore Mauritiano.

*Carapace* very convex, the upper surface distinctly punctulated and beautifully marked, in the dried specimen, with symmetrical figures of a pale yellow on an orange ground, which are well expressed in our figure; the several regions are separated from each other by shallow grooves, rendering them much more prominent than in other species of the genus; the anterior convex margin is furnished with long crenulations, the crenulation in front being longer than the one behind.

*Front* slightly projecting, deeply notched in the middle line with an obtuse tubercle before, and a smaller one behind the eyes.

*Fore-legs* large, with the claws very black, the under claw with four obtuse tubercles, the hind-legs as in *C. corallinus*, but the fifth pair are unfortunately wanting.

HAB. Isle of France.

2. ATERGATIS, *De Haan*.1. ATERGATIS SINUATIFRONS, *Adams & White*.

*Thorace* marginali membro integerrimo, crassiore, omnino subfusco-rubro colore.

*Fronte* tribus lobis, unoquoque in medio nictato; digitis chelarum cristis pilorum, nigris, summâ extremitate albâ.

*Thorace* quatuor digitorum latitudine.

HAB. Mauritium.

*Carapace* with the marginal limb very entire, rather thick, and of a uniform brownish red.

*Front* with three lobes, each notched in the middle; claws of fore-legs with tufts of hair; claws of a black colour, with the extreme tip white.

Width of carapace four inches.

HAB. Mauritius.

2. ATERGATIS SUBDIVISUS, *Adams & White*. (Tab. VIII. Fig. 3.)

*Thorace* membro marginali quatuor lobis valde indistinctis diviso; majore parte summi thoracis intense rubrâ, postice subrubrâ; digitis nigris, basi digitorum mobilium flavâ.

*Fronte* thoracis duobus rectis lobis, proxime oculus sinuatâ.

*Thorace* trium digitorum octo linearum latitudine.

HAB. Insulas Philippinas.

*Carapace* with the marginal limb divided into four very indistinct lobes; the greater part of upper surface of carapace deep red with yellowish spots, behind paler. Claws of fore-legs black, base of movable one yellow; front of carapace with two rather straight lobes, sinuated close to the eye.

Width of carapace three inches, eight lines.

HAB. Philippine Islands.

This species comes near *A. marginatus*.

3. ATERGATIS INSULARIS, *Adams & White*. (Tab. VIII. Fig. 2.)

*Thorace* anterioribus lateribus acie incisore; parte thoracis post hanc punctatâ; reliquâ superiore superficie fere levi, tribus vel quatuor lineis impressis antice.

*Manibus* rugosis præsertim supra; digitis et mobilibus et fixis profunde sulcatis. Flaveolo rubro, pedibus colore intensiore; digitis chelarum pallidis; cornu colorato.

HAB. Insulas Philippinas.

Latero-anterior sides of carapace with a cutting edge; part of carapace behind this punctate, the rest of upper surface very nearly smooth, with three or four impressed lines in front; fifth joint of fore-legs rugose, especially above; claws, both movable and fixed, deeply channelled. Pale yellowish-red; legs darker; claws of fore-legs pale horn-colour.

HAB. Philippine Islands. Cuming.



4. ATERGATIS LATERALIS, *Adams & White*. (Tab. VIII. Fig. 1.)

*Thorace* lævi irregulari, lineis impressis, lateribus latero-anterioribus in tres dentes latos divisis.

*Fronte* latâ, denticulatâ, in medio submarginatâ.

HAB. Maria Orientalia.

*Carapace* smooth, irregular, with numerous impressed lines; latero-anterior margins divided into three broad teeth.

*Front* wide, denticulated, submarginate in the middle; fifth joint of fore-legs rugose, elaws tipped with dark brown.

HAB. Eastern Seas.

3. ACTÆA, *De Haan*.1. ACTÆA NODULOSA, *Adams & White*. (Tab. VIII. Fig. 4.)

*Thorace* et pedibus supra dense obsitis rotundatis tuberculis maximis in chelis et anterioribus marginibus; tuberculo in cantho inferiore; thorace in medio longitudinaliter impresso; acie posteriore rectâ et duabus lincis transversis parvorum tuberculorum instructâ. Chelis et superiore et inferiore carinis longitudinalibus; cornu colorato.

HAB. Mauritium.

*Carapace* and legs, above, thickly covered with rounded tubercles, largest on fore-legs and fore-margins of carapace; a tubercle on the under orbit; carapace, in the middle, longitudinally impressed; the posterior edge straight and furnished with two transverse lines of small tubereles; elaws, both upper and under, with longitudinal keels, and horn coloured.

HAB. Mauritius.

4. XANTHO, *Leach*.1. XANTHO DEPRESSA, *Adams & White*.

*Thorace* valde depresso, antice tuberculato, compluribus tubereulorum acuminatis.

*Fronte* in medio profunde nictatâ; lateribus tribus dentibus. Manibus extra tuberculatis, tribus posterioribus articulis pedum parvis tuberculis, paucis capillis.

HAB. Insulas Philippinas.

*Carapace* much depressed; in front tuberculated, many of the tubercles sharp-pointed.

*Front* deeply notched in the middle; sides with three teeth; fifth joint of fore-legs tuberculated on the outside; the three last joints of legs slightly tuberculated, and with a few hairs.

HAB. Philippine Islands.

2. XANTHO CULTRIMANUS, *Adams & White*.

*Thorace* supra convexiore; fronte nictatâ; lateribus quatuor dentibus; parte anteriore et lateribus parvulis tuberculis; thorace post oculos impressis lineis quæ in medio conveniunt; manibus quatuor longitudinalibus impressis lincis in superficie exteriori quæ parvis subasperis tuberculis exornatur; thorace et pedibus flaveolis rubro commixtis.

HAB. Insulas Philippinas.

*Carapace* slightly convex above, front notched, sides with four teeth; front part and sides with very slight tubercles; carapace, behind the eyes, with impressed lines, which meet in the middle; fifth joint of fore-legs with four longitudinal impressed lines on the outside, which is covered with small roughish tubercles; carapace and legs pale yellowish varied with red.

HAB. Philippine Islands. Cuming.

3. XANTHO LAMELLIGERA, *Adams & White*.

*Thorace* supra convexiore, quatuor dentibus in utroque laterc; superiore parte ad latera subsuberculari. Manibus extra asperis; acie carpi superiore margine dentato; acie manuum et supra et infra margine lamellari; pedibus posterioribus in acie superiore lamellaribus.

HAB. Mauritium.

*Carapace* rather convex above, with four teeth on each side, upper part on the sides slightly tubercular, fifth joint of fore-legs rough on the outside, edge of fourth joint, above, with a toothed margin; edge of fifth joint, both above and below, with a lamellar border; hind-legs, on the upper part, lamellar.

HAB. Mauritius.

5. CHLORODIUS, *Edwards*.

1. CHLORODIUS HIRTIPES, *Adams & White*. (Tab. XI. Fig. 4.)

*Thorace* levi.

*Fronte* latissimâ, vix in medio nictatâ; lateribus quatuor dentibus obtusis.

*Chelis* longis, brachio crassissimo; acie superiore ad basin uno crasso dente; pedibus posterioribus multis fuscis capillis.

HAB. Insulas Philippinas.

*Carapace* smooth.

*Front* very broad, scarcely notched in the middle; the sides with four blunt teeth.

*Fore-legs* long; fourth joint very thick, upper edge, at the base, with one thick tooth; hind-legs with many brownish hairs.

HAB. Philippine Islands.

2. CHLORODIUS FRAGIFER, *Adams & White*. (Tab. XI. Fig. 2.)

*Thorace* obsito tuberculis rotundatis bacciformibus gregatim dispositis, definitis impressis lineis separatis; pediculo oculi duabus spinis prope oculum dispositis; pedibus tuberculis oryziformibus obsitis, albis, latâ carmincâ longitudinali lineâ per medium in fronte; quinque carmineis notis in posteriore thoracis parte.

HAB. Insulas Philippinas.

*Carapace* covered with roundish berry-like tubercles, arranged in groups and separated by definite impressed lines; pedicel of eye with two spines close to the eye; legs covered with rice-like tubercles; white, with a broad pinkish longitudinal line down the middle in front; five pink marks on hind part of carapace.

HAB. Philippine Islands.

3. CHLORODIUS PILUMNOIDES, *Adams & White*. (Tab. IX. Fig. 3.)

*Thorace* et pedibus fuscis pilis obsitis; thorace depresso; lateribus tribus dentibus, spinis exornatis, priora parte thoracis compluribus eminentiis et spinosis tuberculis asperâ. *Manibus* magnis; acie superiore serratâ extra et supra tuberculis majoribus; digitis extra et supra sulcatis compluribus tuberculis ad basin digiti mobilis; digitis nigris; concavis extremitatibus albis; pedibus posterioribus supra serratis.

HAB. Singapuram et Insulas Philippinas.

*Carapace* and legs covered with brown hair; carapace somewhat depressed; sides with three teeth covered with spines; fore part of carapace with several bosses, and rough with spiny tubercles; four transverse raised lines on hind part; the inmost the shortest; fifth joint of fore-legs large, upper edge serrated on the outside and top with rather large tubercles. *Claws* on the outside and top channelled; several tubercles at the base of the movable claw: claws black, the hollowed ends white; hind-legs serrated above; second and third joints with three rows of serratures.

HAB. Singapore. Philippine Islands.

4. CHLORODIUS AREOLATUS, *Milne Edwards*. (Tab. XI. Fig. 3.)

*Thorace* tuberculis et granulis multis obsitis.

*Fronte* latâ, in lobos quatuor distinctos iucisâ; margine latero-anteriori in quatuor dentes triangulares diviso, hiatus anguli canthi interno angusto.

*Chelis* granulosis, pedibus posterioribus sublævibus.

*Abdomen* (feminae) articulis septem.

HAB. Insulas Philippinas.

*Chlorodius areolatus*, Milne Edwards, Crust. vol. i. p. 400.

*Carapace* covered with tubercles and granules.

*Front* wide, divided into four distinct lobes; latero-anterior margins short, nearly straight, and divided into four, triangular teeth; fissure of orbital angle internal, narrow, lodging the movable joint of the outer antennæ.

*Fore-legs* granular; hind-legs and lower surface of body nearly smooth.

*Abdomen* (of female) seven-jointed, fringed with setæ.

HAB. Philippine Islands.

6. PANOPEUS, *Edwards*.1. PANOPEUS DENTATUS, *White*. (Tab. XI. Fig. 1.)

*Thorace* rotundato, lævi, postice coarctato, lateribus productis tuberculis postfrontalibus transversis irregularibus; margine latero-anteriore lobis quinque magnis dentiformibus, lineis elevatiusculis duabus ab angulo latero-anteriore porrectis.

*Fronte* in lobos quatuor divisâ; angulo externo canthi acuto.

*Chelis* in carpo dentibus duobus conicis, manu externe granulâtâ, interne valde reticulâtâ, ad basin lineâ tuberculâtâ; digito superiore inermi, digito inferiore tuberculis quinque depressis.

*Abdomine* (maris et feminæ) articulis septem.

HAB. Insulas Philippinas.

*Carapace* rounded in front, produced at the latero-anterior angles, and contracted behind, upper surface smooth, marbled with a row of irregular transverse tubercles extending across the postfrontal portion; latero-anterior margin with five large, prominent, dentiform lobes, the anterior three obtuse, the two posterior acute; two curved, slightly elevated lines proceeding inwards from the latero-anterior angle.

*Front* divided into four lobes, the two inner wide and obtuse, the two outer narrower and more prominent, upper surface slightly concave, outer angle of orbit acute.

*Fore-legs* with two strong teeth on the inner and upper part of the fourth joint, the fifth joint slightly granulated externally, coarsely reticulated internally, and with a tubercular ridge at the base; upper claw unarmed, under claw with five round depressed tubercles.

*Hind-legs* transversely rugose, fringed with short, stiff setæ.

*Abdomen* (both of male and female) seven-jointed, the former fringed with long, the latter with short, setæ.

HAB. Philippine Islands.

## 2. PANOPEUS CAYSTRUS, *Adams & White*. (Tab. IX. Fig. 2.)

*Thorace* subtrigonalî, antice convexo, marginibus rotundatis lineis impressis obsitis; margine latero-anteriore serratulis tribus subdistantibus.

*Fronte*, in medio, emarginatâ, supra sulcatâ, angulo externo canthi obtuso.

*Chelis* lævibus, digito superiore arcuato inermi, digito inferiore tuberculis quatuor parvis acutis.

*Abdomine* (feminæ) articulis septem.

HAB. Maria Orientalia.

*Carapace* subtrigonal, rounded in front and at the sides, surface smooth, marked with faintly impressed lines; latero-anterior margin with three rather distant sharp serrations.

*Front* emarginate in the middle, without lobes, a trifid groove on the upper surface; outer angle of orbit rather obtuse.

*Fore-legs* smooth, upper claw strong, arched, unarmed; lower claw with three or four small acute tubercles.

*Hind-legs* smooth, fringed on the last and penultimate joints with long hairs.

*Abdomen* (of female) seven-jointed, the second joint narrower than the rest, fringed with short stiff setæ.

HAB. Eastern Seas.

## 3. PANOPEUS FORMIO, *Adams & White*. (Tab. IX. Fig. 1.)

*Thorace* latiore quam longiore, lateribus rotundatis, lineâ valde distinctâ ab angulo latero-anteriore projectâ; margine latero-anteriore lobis quatuor longis rotundatis, dente parvo ad angulum latero-anteriorem.

*Fronte* lobis quinque subobsoletis, supra sulcatâ, angulo externo canthi fissurâ parvâ.

*Chelis* manu subtuberculatâ, digito inferiore tuberculo magno cum multis tuberculis parvis.

*Abdomine* (maris) articulis septem, articulo tertio ad latera dilatato.

HAB. Maria Orientalia.

*Carapace* transversely oval, the sides rounded, surface smooth, marked with faintly impressed lines, a strongly marked line extending across the middle from the latero-anterior angle, and a fainter line posteriorly; latero-anterior margin with four long, rounded crenulations, and a small tooth at the latero-anterior angle.

*Front* with four slightly developed lobes, a bifurcate groove on the upper surface, outer angle of orbit slightly fissured.

*Fore-legs* smooth, with the upper and outer surface of fifth joint faintly tuberculated, upper claw unarmed, lower claw with one large and several small tubercles.

*Hind-legs* transversely rugose and slightly granulated, not fringed with hairs.

*Abdomen* (of male) seven-jointed, the third joint dilated at the sides; fringed with short stiff setæ.

HAB. Eastern Seas.

#### 7. ÆGLE, *De Haan*.

1. ÆGLE RUGATA (sp.), *Milne Edwards*. (Tab. VIII. Fig. 5.)

*Thorace* granulis minutis dense dispositis; margine latero-anteriore lobis quatuor rotundatis distinctis.

*Chelis* sublævibus.

*Abdomine* (feminæ) articulis septem.

HAB. Insulas Philippinas.

*Zoëmus rugatus*, Edw. Crust. vol. i. p. 385.

*Carapace* covered with small close-set granulations; latero-anterior margins divided into four rounded very distinct lobes.

Surface of body and fore-legs comparatively smooth.

*Abdomen* (of female) seven-jointed, and fringed with long, close-set, coarse setæ.

HAB. Philippine Islands.

#### 8. GALENE, *De Haan*.

1. GALENE OCHTODES (*junior*), *Herbst*. (Tab. X. Fig. 2.)

*Cancer* thorace lævi, lateribus verrucosis.

*Fronte* bilobâ, brachiis, carpis, manibus, digitisque verrucosis.

HAB. Maria Orientalia.

*Galene ohtodes*, Mus. Cat. p. 18. *Cancer ohtodes*, Herbst. vol. 1. p. 158. t. 8. f. 54.

*Carapace* smooth, sides verrucose.

*Front* bilobed, second, third, and fourth joints of chelæ, and the claws, verrucose.

HAB. Indian Ocean.

We have figured a young specimen of this species, which does not seem to be common in collections.

## 9. PILUMNUS, *Leach*.

### 1. PILUMNUS DILATIPES, *Adams & White*. (Tab. IX. Fig. 4.)

*Thorace* latiore quam longiore, granulis multis distinctis setigeris obsito; regionibus lineis depressis distinctis separatis; margine latero-anteriore dentibus quatuor, magnis denticulatis.

*Fronte* emarginatâ, antice crenulatâ fasciculis duobus pilosis; margine superiore canthi multidentato.

*Chelis* externe tuberculis multis rotundatis obsitis, margine superiore scitifero.

Pedibus posterioribus valde dilatatis, tuberculis lineisque setigeris instructis.

*Abdomine* (maris) articulis septem, lævi.

HAB. Maria Orientalia.

*Pilumnus dilatipes*, White, Pro. Zool. Soc.

*Carapace* wider than long, covered with coarse granulations, each beset with several short setæ; the different regions divided by distinct shallow grooves; latero-anterior margin with four prominent denticulated teeth, the first small, the second wide, and the two posterior equal and triangular.

*Front* emarginate, with numerous serrations and with two tufts of straight setæ; upper margin of orbit with numerous dentations.

*Fore-legs* covered with granules and short stiff hairs on the outer and upper surface, smooth internally.

*Hind-legs* considerably dilated, beset with fine granulations and numerous rows of short bristles, the edges fringed with long hairs.

*Abdomen* (of male) seven-jointed and smooth.

HAB. Eastern Seas.

### 2. PILUMNUS SCABRIUSCULUS, *Adams & White*. (Tab. IX. Fig. 5.)

*Thorace* vix longiore quam latiore, granulis multis parvis setigeris obsito, regionibus lineis depressis vix distinctis separatis; marginibus latero-anterioribus dentibus tribus denticulatis.

*Fronte* prominente triangulari crenulatâ, margine superiore canthi unidentato.

*Chelis* tuberculis granulosis distinctis obsitis, parte superiore setis brevibus rigidis fimbriatâ.

Pedibus posterioribus scabriusculis, pilosis.

*Abdomine* (feminae) lateribus subparallelis, septem articulis.

HAB. Maria Orientalia.

*Carapace* nearly as long as wide, covered with numerous granulations, each beset with several short setæ; the regions of carapace separated by several faintly impressed grooves, antero-lateral margins with three wide denticulated teeth fringed with stiff hairs.

*Front* subtriangular, slightly produced, finely crenulated on the margin, which is furnished with a single fringe of stiff setæ; upper edge of orbit with a single rounded dentation.

*Fore-legs* covered with numerous distinct granular tubercles on the upper and outer surface, and fringed with short hairs.

*Hind-legs* rough with granules and short hairs, arranged in transverse rows.

*Abdomen* (of female) villose, seven-jointed, the sides subparallel.

HAB. Eastern Seas.

### 3. PILUMNUS URSULUS, *Adams & White*. (Tab. IX. Fig. 6.)

*Thorace* vix longiore quam latiore, dense tomentoso, granulis multis rotundatis setigeris obsito, marginibus latero-anterioribus dentatis.

*Fronte* denticulatâ, fasciculis quinque pilosis longis instructâ.

*Chelis* granulosis, pilis longis dense coopertis.

*Abdomine* (maris) dense tomentoso, articulis septem.

HAB. Maria Orientalia.

*Carapace* nearly as long as wide, densely tomentose, covered with numerous large close-set granules beset with very long coarse hairs, latero-anterior margins dentated.

*Front* toothed, with five tufts of long straight hairs.

*Fore-legs* covered with coarse granulations, and very long, coarse, slightly curved hairs.

*Hind-legs* granular, thickly beset with numerous, long, coarse hairs.

*Abdomen* (of male) densely tomentose, seven-jointed.

HAB. Eastern Seas.

## V. PORTUNIDÆ.

The large species of this family are much esteemed as food among the poor islanders of the Meïa-co-shimahs, and in the markets of China large species of *Neptunus* (*N. pelagicus*), are frequently offered for sale. Two well-marked genera have been added to this group by our researches in the Eastern Seas, besides numerous species. The island of Balambangan, at the north end of Borneo, harbours the *Lupocyclus*, which is very active in its habits, keeping close in shore like *Lupa*, *Oceanus*, and other swimming crabs; it swims by rapid jerks along the bottom, and, when caught, will wound the fingers by striking side-ways with its spiny fore-legs. The other new genus, *Lissocarcinus*, was obtained at some considerable distance from land, concealed in the internode of a fragment of floating bamboo, and is a powerful swimmer. The *Cancer* (*Thalamita*) *admete* of Herbst, and the *Cancer* (*Thalamita*) *prymna* of the same Crustaceologist, besides three new species of *Amphitrite*, and a new species of *Neptunus*, were likewise procured.

### 1. LISSOCARCINUS, *Adams & White*.

*Pedipalpi externi* articulo tertio, ad basin, latiore quam longiore, ad marginem anteriorem non incisum prope angulum.

*Thorax* trapezoidalis, postice coarctatus.

*Frons* prominens, lamellaris, in medio valde incisa. Antennæ internæ articulo secundo elongato, usque ad fissuram porrecto.

*Pedes posteriores* pedibus *Portuno* simillimi.

*Abdomen* (feminæ) articulis septem lateribus subparallelis. Mas adhuc latet.

*External pedipalps* with the third joint broader at the base than long, and not notched at its anterior margin near the angle.

*Carapace* trapezoidal, considerably contracted posteriorly.

*Front* projecting, lamellar, deeply cleft in the middle. Inner antennæ with the second joint elongated and reaching to the commencement of the notch.

*Legs* very much as in *Portunus*.

*Abdomen* (of female) seven-jointed, the sides nearly parallel.

This generic group, described from a female, will be found an interesting connecting link between the genera *Portunus*, *Platyonychus*, and *Polybius*. We have named it *Polybioides* from its resemblance to the genus of Leach, which, as Professor Bell remarks, is of a more decided natatory character than any other Brachyurous form found on the British coast.

#### 1. LISSOCARCINUS POLYBIOIDES, *Adams & White*. (Tab. XI. Fig. 5.)

*Thorace* pentagonali, in fronte producto, postice coarctato, lævissimo, multis parvis rotundatis maculis, lineâ distinctâ ab angulo latero-anteriore projectâ; margine latero-anteriore valde dentato, dentibus prorsum inclinatis.

*Fronte* lamellari, prominente, antice bifidâ, antennis lateralibus fronte occultis.

*Chelis* articulo quinto bicarinato; carinâ antice valde dentatâ. Pedibus posterioribus depresso, pari ultimo unguibus valde dilatatis.

HAB. Maria Orientalia.

*Carapace* five-sided, produced in front, narrowed behind, very smooth on the upper surface, and covered with numerous small round markings, a strong line extending from the latero-anterior angle across the carapace towards the middle line; latero-anterior margin strongly toothed, the teeth directed forwards.

*Front* lamellar, projecting, bifid anteriorly, covering and concealing the lateral antennæ, a wide space between the eyes.

*Fore-legs* with the fourth joint doubly keeled, the keels strongly toothed anteriorly.

*Hind-legs* flattened, the fifth pair with the penultimate joint more flattened than the corresponding joint of the other pairs, and with a greatly dilated flattened claw.

HAB. Eastern Seas.

#### 2. LUPOCYCLUS, *Adams & White*.

*Pedipalpi externi* articulo secundo ad apicem tenuiore (quam in *Lupá*—*L. forceps*), articulo tertio minore (quam in *Lupá*).



*Thorax* suborbicularis, postice coarctatus, margine latero-anteriori spinis acutis conicis prorsum inclinatis.

*Frons* semicircularis, in lobos quinque equales divisa; canthi margine superiore subfisso postice, dente magno, conico, curvato.

*Chelæ* longæ, spiniferæ, pedes posteriores graciles, compressæ, pari quinto valde dilatato.

*Abdomen* (maris) triangulare, articulis quinque; femina adhuc latet.

*External pedipalps* with the second joint rather more slender towards the tip (than in *Lupa forceps*), the third joint considerably smaller.

*Carapace* suborbicular, contracted posteriorly, latero-anterior margin with sharp conical spines directed forwards.

*Front* divided into five equal dentiform lobes, orbit with the upper margin slightly notched, a large curved conical tooth behind it.

*Fore-legs* long and spiniferous.

*Hind-legs* slender and compressed, the fifth pair greatly dilated.

*Abdomen* (of male) triangular, five-jointed.

1. LUPOCYCLUS ROTUNDATUS, *Adams & White*. (Tab. XII. Fig. 4.)

*Thorace* minutissime punctulato, tuberculis parvis aggregatis lineisque granulosis adperso, marginibus latero-anterioribus spinis quinque magnis, spinis quinque parvis interpositis; regionibus lateralibus pallidulo-luteo, corneo-fusco discoloratis; in medio thoracis tæniâ latâ rubrâ.

HAB. Balambangan.

*Carapace* subcircular, slightly narrowed behind, surface irregular, very finely punctulated, and covered with isolated clusters of minute tubercles and transverse granulated lines; the latero-anterior margin with five large, sharp, conical spines directed forwards, and an equal number of small intermediate spines.

*Front* semicircular, divided into five equal dentiform lobes; orbit with a slight notch at the upper margin, and bounded behind by a strong, curved, conical tooth, directed forwards.

*Fore-legs* with the third joint furnished with a row of five sharp, curved, conical spines on the anterior margin, numerous transverse ridges of small tubercles on the upper surface, and a longitudinal granulated line ending externally in a sharp spine; fourth joint with a strong spine on the upper edge; upper surface of fifth joint with a large spine at the base, and two ridges each ending anteriorly in a prominent spine; claws long, slender, grooved, and slightly curved.

*Hind-legs* slender, compressed, finely punctulated and granulated, the last pair with all the joints horizontally flattened, the last and penultimate joint greatly dilated and fringed with close-set stiff hairs.

*Abdomen* (of male) triangular, five-jointed.

HAB. Island of Balambangan, north end of Borneo.

In colour this pretty and curious genus is of a pale yellow, marbled with light pinkish brown on the lateral regions of the carapace, and a broad scarlet longitudinal stripe extending from the front to the hind margin, narrowed opposite the orbits and in the middle of the back. The fore-legs are marbled with scarlet and yellow, with a broad scarlet band in the middle of the fifth joint, and two broad bands of the same colour on each claw. The hind-legs are light pinkish yellow, with broad transverse scarlet bands.

### 3. CHARYBDIS, *De Haan*.

#### 1. CHARYBDIS DURA, *Adams & White*.

*Thorace* valde duro, lævi, marginibus lateralibus quinque-dentatis, primo et secundo dentibus ad basin denticulo minuto instructo.

*Fronte* sex dentibus obtusis, dente externo prominentiore quam in speciebus aliis.

*Chelis* carpo externe scabro, tuberculato, interne spinâ longâ crassâ in medio, manu margine superiore spinis sex in serie duplicatâ parallelâ dispositis, externe carinis tribus longitudinalibus.

*Pedibus* posterioribus externe spinâ magnâ prope extremitatem.

HAB. Mauritium.

*Carapace* very hard and smooth, lateral margin five-toothed, the first and second teeth with a minute tooth at the base.

*Front* with six large bluntish teeth, the external tooth rather more prominent than in the other species.

*Fore-legs* with the fourth joint rough and tubercular on the outside, with a very long thick spine on the middle of the inside, the fifth joint with six spines, in two parallel rows, on the upper edge, and three longitudinal keels on the outside.

*Hind-legs* with a large spine on the outside near the end.

HAB. Mauritius.

## VI. OCYPODIDÆ.

Species of *Ocypode* and *Gelasimus* are extremely numerous throughout the islands of the China Sea. Every sandy shore is perforated above high-water mark with the holes of the former, and the banks of the rivers, the mangrove swamps, damp forest margins, and muddy places near the sea, are peopled with the latter, which form oblique burrows frequently penetrating to a considerable depth. The *Ocypodes* appear to be chiefly crepuscular in their habits, remaining concealed in their holes during the heat of the day, but as evening approaches running side-ways in a curvilinear manner at the edge of the sea, where the waves break along the sandy shores. The *Gelasimi* remain concealed in their burrows during the high tide or in the dry hot part of the day, but delight to come out of their holes after a shower, or when the tide has receded and left their mud banks moist, but they never

venture very far from their habitations. The clicking noise produced by snapping the claws of their larger fore-leg together, when made by many hundreds at a time, may be heard at some considerable distance. On the least alarm they retreat precipitately to their burrows.

### 1. GELASIMUS, *Latreille*.

#### 1. GELASIMUS CULTRIMANUS, *Adams & White*.

*Thorace* lævi; marginibus lateralibus rotundatis, sine carinâ acutâ ab angulo canthi externo.

*Fronte*, inter oculos, lobo parvo rotundato, dilatato; margine canthi inferiore distincte crenulato; chelâ majore digitis latis, finibus extrorsum curvatis; digito inferiore in medio profunde sinuato, lobo lato, prope extremitatem margine serrato-crenulato; digito superiore margine inferiore fere recto.

HAB. Insulas Philippinas.

*Carapace* with the upper surface smooth; the lateral edges rounded, without any sharp keel from the outer orbital angle.

*Front*, between the eyes, with a small dilated rounded lobe; edge of lower orbit very distinctly crenated; fifth joint of fore-legs with the claws wide, both slightly curved outwards at the ends; the lower claw with a very wide sinus in the middle, a wide serrato-crenated lobe on the edge near the end; upper claw with the lower edge very nearly straight.

HAB. Philippine Islands.

#### 2. GELASIMUS CRASSIPES, *Adams & White*.

*Thorace* valde arcuato, postice subito coarctato.

*Fronte* lobo sine pedunculo angusto.

Pedibus posterioribus crassioribus et robustioribus quam in speciebus aliis.

HAB. Insulas Philippinas.

*Carapace* very much arched, suddenly narrowed behind.

*Front* with a lobe, without narrow stalk.

Four hind pairs of legs thicker and stronger than in the other species.

HAB. Philippine Islands.

#### 3. GELASIMUS BELLATOR, *Adams & White*.

*Thorace* antice (prope insertionem canthorum pedunculorum) sinuato.

*Fronte* in lobum rotundatum subdilatatâ; chelis manu digitis perlongis; digito superiore lateribus subparallelis, margine prope ad basin tuberculis duobus vel tribus; digito inferiore infra marginato, acie ad basin sinus superficiali tuberculari, dente robusto lato ad extremitatem.

HAB. Insulas Philippinas.

*Carapace*, in front, just behind the insertion of eye-peduncles, sinuated.

*Front* slightly dilated into a rounded lobe; fifth joint of the larger fore-leg, with the claws very long; the upper, or movable claw, with the sides nearly parallel, two or three larger

tubercles on the edge near the base ; fixed or lower claw margined on the under side ; the cutting edge with a very wide shallow tubercular sinus at the base ; at the end of the sinus, beyond the middle, a strong wide tooth, gradually sloping down to the end, which curves upwards.

HAB. Philippine Islands.

4. GELASIMUS PORCELLANUS, *Adams & White.*

*Oculorum pedunculis* perlongis.

*Thorace* parte frontali non coarctatâ ad basin ; parte posteriore longiore quam latera.

*Chelis* digito inferiore ad finem incrassato, marginibus internis digitorum amborum tuberculis magnis quatuor inter parvos crenulos.

HAB. Borneonem.

*Eye-pedicels* very long.

*Frontal* portion of carapace not narrowed at the base ; hind part of carapace much longer than the sides.

*Fore-legs* with the lower claws thickened at the end, the inner margins of both claws with four larger tubercles amongst the small crenules.

HAB. Borneo.

5. GELASIMUS FORCIPATUS, *Adams & White.*

*Thorace* valde postice coarctato.

*Fronte*, inter oculos, lobo dilatato, lineâ acuto-marginatâ, ab angulo canthi externo porrectâ.

*Chelâ* majori digitis æqualibus, dente prope medium, et prope extremitatem, lobo truncato.

HAB. Borneonem.

*Carapace* much narrowed behind.

*Front* with a dilated lobe between the eyes ; from the outer orbital angle a sharp-edged line continued beyond the middle of carapace.

*Fore-legs* with the larger claw nearly equal in size, with a tooth near the middle, and a truncated lobe towards the end ; a rather broad impressed line along the middle of each claw ; upper edge of palmar portion with a slight ridge ; outer side of palm covered with very slight tubercles.

HAB. Borneo.

## VII. GONOPLACIDÆ.

The *Macrophthalmi* inhabit muddy flats along the sea-shores, and, when disturbed, bury themselves quickly in the yielding soil, leaving the ends, however, of their long telescope-eyes above the surface. When taken, they are quite defenceless, not using their fore-legs as organs of aggression, or erecting and snapping them as do the *Gelasimi*. They are numerous distributed throughout the Philippine Archipelago and the islands in the China Sea.

1. MACROPHTHALMUS, *Latreille*.1. MACROPHTHALMUS JAPONICUS, *De Haan*.

*Thorace* lato-quadrato, ad latera obtuse dentato; manibus (marium) latere exteriore lævibus et inermibus, interiore glaberrimis, carinâ superiore granulatis; digitis (in maribus) deorsum inflexis.

Japonice *Suna gani*, i. e., Cancer arenarius, quod se in arenâ abscondere solet.

*Ocypode* (*Macrophthalmus*) *Japonicus*, De Haan, F. I. p. 54. t. 15. f. 2. (mas) t. 7. f. 1. (femina.)

HAB. Insulas Mëia-co-shimalis et Japoniam.

*Carapace* widely-quadrate, sides obtusely toothed; the fifth joint of fore-legs, in the male, smooth and unarmed on the outer side, very smooth on the inner side, granulated on the upper keel; claws in the male bent downwards.

In Japanese *Suna gani*, i. e., Sand Crab, because it is in the habit of burying itself in the sand.

HAB. Mëia-co-shimah Islands; Adams. Japan; De Haan.

2. MACROPHTHALMUS DEFINITUS, *White*.

*Thorace* anguste-quadrato, lateribus dentibus tribus, angulo canthi incluso, dente secundo latiore, dente tertio parvo.

*Chelis* articulis perlongis vix supra marginatis, digito superiore dente parvo prope basin; digito inferiore sinu valde profundo, manu infra tubereulatâ, interne pilosâ.

HAB. Insulas Philippinas.

*Carapace* narrowly-quadrate; sides with three teeth, including the orbital angle; the second widest, turned up considerably, the third very small.

*Fore-legs* with the joints very long, scarcely margined above; movable or upper claw with a very slight tooth near the base; fixed or under claw with a very deep sinus; fifth joint tubereulated on the under side, hairy on the inside.

HAB. Philippine Islands.

3. MACROPHTHALMUS SERRATUS, *White*.

*Thorace* anguste-quadrato, lateribus antice dentibus tribus robustis, postice carinâ subcrenulatâ.

*Chelis*, manu ab basin interne dilatâtâ, longitudinaliter exeavatâ; digitis pilis longis densis obsitis; digito superiore, in medio, dente truncato.

Pedibus posterioribus, parte superiore, spinâ prope extremitatem.

HAB. Insulas Philippinas.

*Carapace* narrowly-quadrate, with three strong teeth on the sides in front, succeeded by a slight somewhat erenated keel which margins the rest of the carapace.

*Fore-legs* with the fifth joint dilated on the inside from the base, and longitudinally hollowed out; inside of both claws densely clothed with long hairs; upper or movable claw with a large truncated tooth in the middle.

Hind-legs with a spine on the upper side near the end.

HAB. Philippine Islands.

2. CHASMAGNATHUS, *De Haan*.1. CHASMAGNATHUS CONVEXUS, *De Haan*.

*Thorace* gibbo, granulato, brevi-setoso, dorso subtetragono, lateribus areuato.

*Fronte* areuatâ, medio sinuatâ.

HAB. Maria orientalia.

*Octypode* (*Chasmagnathus*) *convexa*, De Haan, F. 1. p. 56. t. 7. f. 5.

*Carapace* gibbose, granulated, shortly-setose, subtetragonal on the back, arched at the sides.

*Front* arcuated, sinuated in the middle.

HAB. Eastern Seas.

## VIII. GRAPSIDÆ.

The *Sesarmæ* are found in various localities, sometimes in fresh-water rivulets, among weeds; sometimes under damp logs and stones at a considerable distance from any water, and most frequently among the roots of mangroves in salt-water swamps. They are active and extremely wary in their habits, and, like the *Grapsi*, very predacious. The *Grapsus plicatus* is a very common species in Borneo, and appears to vary greatly in colour according to the localities in which it is found. The *Grapsi* are fond of rocks, over which they run with surprising agility; they frequently remain stationary for hours, basking in the sun, when the tide has just left the high rocks.

1. UTICA, *White*.

*Pedipalpi externi* articulo tertio externe recto non dilatato.

*Thorace* 8-angulato, depresso, post-medium carinâ transversâ valde distinctâ; margine latero-anteriore dentibus tribus; parte latero-posteriore obliquâ, parte posteriore reetâ.

*Chelis* parvis.

*Pedibus* posterioribus perlongis, tarso vix dilatato subelongato, pilis fimbriato.

Outer *jaw-feet* with the third joint, on the outside, straight, not dilated.

*Carapace* somewhat eight-angled, tabular, a very strong transverse ridge behind the middle; latero-anterior margin with three teeth; latero-posterior part oblique, posteriorly very straight.

*Fore-legs* small.

Hind-legs very long, tarsus not particularly dilated, somewhat elongated, fringed with hairs as is the preceding joint.

This genus is nearly allied to *Trichopus*, De Haan, which is synonymous with *Varuna*, M. Edwards.

1. UTICA GRACILIPES, *White*. (Pl. XIII. Fig. 6.)

*Fronte* latâ, anteriore margine valde recto, post-frontem ad medium thoracem pertinente, eminentiâ magnâ latâ subtriangulari, a transversâ carinâ separatâ per altam lunatam depressionem, lineâ subimpressâ a finibus ad latus carinæ porrectâ. *Pedibus* gracillimis, pilis fimbriatis.

HAB. Insulas Philippinas.

*Utica gracilipes*, White, Pro. Zool. Soc., May, 1847.

*Front* wide, fore-edge very straight; behind it and extending to the middle of the carapace, a considerable, wide, somewhat three-sided elevation, separated from the transverse ridge by a deep lunated depression, from the ends of which a slight impressed line proceeds to the side of the ridge, where it deepens.

*Hind-legs* very slender, and fringed with hair.

HAB. Philippine Islands.

Mr. Cuming found this species in a fresh-water rivulet among the mountains of the Island of Negros. It was also obtained during the Expedition of the Samarang in the Island of Mindanao, in the deep still muddy fresh-water rivulets near Samboangan, hiding under weeds and rotten wood. When caught, it feigns death, contracting its limbs and rendering them perfectly rigid. Its colour, when alive, is dark-red brown, on the under-surface dark chocolate-brown, lighter on the legs and abdomen, which latter in the female has a yellowish line down the middle.

## IX. LEUCOSIDÆ.

Besides several species of *Leucosia* new to science, a few *Philyræ* were obtained in the Sooloo Sea, and on the coast of Borneo from a rocky stony bottom; among them was the *P. scabriuscula* of Leach, which, when alive, is of a chocolate colour, with red-brown legs; the *Philyra latifrons* (A. & W.), which is of a deep red brown, with orange fore-legs; and another with a dead-white polished carapace, marked with dark olive brown, and the fore-legs banded with the same. The *Philyræ* have much the same habits as the *Leucosidæ*, being slow-moving, torpid Crustaceans, never using their fore-legs for defence, and living in deep water on a clean rocky or stony floor. A pretty species of *Myra* was dredged in the Sooloo Sea of a delicate flesh colour, with two blood-red spots on the carapace. The *Myra fugax*, which is punctulated and dark liver-coloured on the carapace, and a new species with white carapace and pinkish legs, were also procured; they are found usually in about eight or ten fathoms on a muddy bottom; one species is common in the mud of Manila bay. The *Arcaniæ* are usually of a dead-white colour, variously marked with red, with the legs spotted or banded; they prefer deep water and a clear gravelly bottom; several were dredged on the coast of Borneo in twenty-four fathoms. The *Ixæ* inhabit very deep water, and are inert and feeble; when taken they contract their legs and remain perfectly immovable. The *Iphides* are usually found concealed in madrepores and sponges, and live in a coral bottom in from fifteen to twenty fathoms; they are numerous on the coast of China.

1. LEUCOSIA, *Fabricius*.1. LEUCOSIA HÆMATOSTICTA, *Adams & White*. (Tab. XII. Fig. 2.)

*Thorace* trapezoidali supra valde convexo, post angulum latero-anteriorem in-scissurâ profundâ, maculis multis sanguineis rotundatis obsito.

HAB. Maria Orientalia.

*Carapace* trapezoidal, very convex, of a light yellow, covered with numerous small round blood-red spots, fewer posteriorly, and in the middle line a deep notch behind the latero-anterior angle.

*Front* obtuse.

*Fore-legs* with round, scattered, blood-red spots, and a large quadrate mark of the same colour on the outer surface of each claw.

*Hind-legs* with a blood-red band on the upper half of each joint.

HAB. Eastern Seas.

2. OREOPHORUS, *Ruppell*.1. OREOPHORUS RETICULATUS, *Adams & White*. (Tab. VI. Fig. 1.)

*Thorace* subtrigono, reticulato, fossis subdivisis duabus latero-anterioribus, postice fossâ profundâ, in medio tuberculo clypeoformi, regionibus lateralibus valde elevatis.

*Fronte* rotundatâ antice submarginatâ supra exsculptâ.

*Chelis* reticulatis.

HAB. Maria Orientalia.

*Carapace* subtrigonal, covered with a net-work of beaded lines, the intermediate areas finely granulated; a long semilunar, irregularly-shaped cavity extending along the latero-anterior margin on each side, separated by a strong post-frontal septum, each lateral cavity divided in two portions by two over-arching processes, which unite above, leaving a round foramen of communication; the posterior sublongitudinal portion partially divided by a conical projecting process; a small hole in the floor of the hind portion of the latero-anterior fossa; a cavity at the hind part of carapace nearly divided in two by a granulated tongue-shaped tubercle, and bounded posteriorly by two-obtuse tubercles of the hind margin; a solid shield-shaped reticulated process arising out of the hind part of the cavity; a beaded line around the margins of both fossæ; lateral regions convex, elevated into large obtuse prominences; lateral edges coarsely tuberculated.

*Front* thick and rounded, slightly emarginate, rather deeply excavated on the upper surface.

*Fore-legs* covered with coarse reticulations, formed of granulated lines. Upper claw spatulate, slightly curved downwards, flattened above, narrow beneath, a row of pits on the outer and inner margins, under edge tuberculiferous; upper surface with several rows of beaded lines. Under claw horizontally inclined, slightly curved upwards, elongately conical;



upper surface sharp and granular; under surface thin and tuberculated; inner surface concave, with two finely granulated parallel lines; outer surface convex, with two rows of holes, and two series of tuberculated lines.

*Abdomen* (of female) convex, wide, divided into about six pits by strong reticulations formed of granuliferous lines.

HAB. Straits of Sunda.

### 3. IXA, *Leach*.

#### 1. IXA MEGASPIS, *Adams & White*. (Tab. XII. Fig. 1.)

*Thorace* subgranuloso, canaliculis dorsalibus angustis valde profundis, postice lineâ impressâ profundâ transversâ; lateribus valde productis granulosis retrorsum inclinatâ, finibus obtusis, dente terminali parvo curto.

HAB. Borneonem. Insulas Philippinas.

*Carapace* subgranular, the channelled grooves which separate the middle from the lateral regions very deep and narrow, a deep transverse posterior groove, the lateral prolongations granular, inclined backwards, long and slender, the ends obtuse, and slightly curved forwards, the stiliform tooth at their extremities very short and small.

HAB. Borneo (Tampasook); Philippines (Bohol).

The species, when alive, has the carapace of a light red colour, with dark crimson in the middle, the lateral prolongations of the carapace being purple, with orange tips: the legs are bright red. It differs from the *Iva cylindrica* in the lateral prolongations being inclined backwards, more slender and longer, the ends more obtuse, and curving forwards, the terminal spine is much shorter and smaller, the surface of the carapace is less granular, the middle region is not so deeply notched on each side, the dorsal grooves are narrower and deeper, and the hind groove is more transverse.

### 4. HARROVIA, *Adams & White*.

*Thorace* subpentagono, dense tomentoso, lineis duabus elevatis, tuberculisque quatuor obtusis; marginibus latero anterioribus dentibus tribus obtusis.

*Fronte* valde rectâ in medio emarginatâ, angulo canthi externe prominente dentiformi.

*Chelis* granulosis, brachio supra spinis duabus interne spinâ duplicatâ, carpo tuberculo unico, manu cylindricâ sulcatâ, digito ad basin tuberculo parvo externe.

*Carapace* subpentagonal, densely tomentose, with two transverse raised lines on the upper surface, each ending externally in a prominent blunt tubercle, and two faintly-impressed lines posteriorly; latero-anterior margins with three obtuse teeth, the anterior small and rounded, the middle large and more prominent, and the posterior strong and conical.

*Front* very straight, emarginate in the middle, the inner angle of the orbits forming a strong tooth in the same line as the front.

*Fore-legs* granulose, twice the length of the carapace; third joint with two spines on the upper edge, and a double spine on the inner edge; fourth joint with a single tubercle above, and an elongated simple lobe externally; fifth joint subcylindrical, with two longitudinal grooves externally, and a single groove internally.

*Claws* short; upper claw curved, with a single small tubercle, externally, near the base, lower edge with numerous teeth; lower claw triangular, grooved externally, the upper edge sharp and dentate.

*Abdomen* (of female) seven-jointed, tomentose, the edges fringed with coarse short hairs.

1. HARROVIA ALBO-LINEATA, *Adams & White*. (Tab. XII. Fig. 5.)

*Thorace* rubro, lineis pallidis.

*Chelis* carmineis, infra rufescente.

HAB. Borneonem et Insulas Philippinas.

*Carapace* of a red colour, with light transverse markings.

*Fore-legs* crimson; under surface of body rufous.

HAB. Borneo. Philippine Islands.

5. IPHIS, *Leach*.

1. IPHIS NOVEM-SPINOSA, *Adams & White*. (Tab. XIII. Fig. 1.)

*Thorace* lævi granuloso, granulis antice aggregatis, postice sparsis, marginibus latero-anterioribus spinis duabus subobtusis prorsum et extrorsum porrectis; marginibus latero-posterioribus spinis duabus retrorsum et extrorsum directis, infra has spinis duabus brevis conicis retrorsum et extrorsum porrectis; margine posteriore, spinâ longâ rectâ in medio retrorsum directâ.

*Fronte* in lobos duos conicales divergentes divisâ.

HAB. Insulas Philippinas.

*Carapace* polished, granular, granules close together in front, more sparsely disposed towards the hinder part; latero-anterior borders with two short, stout, somewhat obtuse spines directed forwards and outwards; latero-posterior borders with two long spines directed backwards and a little outwards, with their ends curving upwards, and below these, nearer the middle line, two short conical spines proceeding backwards and outwards; posterior border with a long straight spine in the middle, projecting directly backwards.

*Front* ending in two conical diverging lobes.

HAB. Philippine Islands (Mindoro).

This species differs from *Iphis septem-spinosa* of Leach, in the general form of the carapace, which is less triangular, more oval, covered with granules, and wants the sharp ridge which extends along the middle of the carapace of *I. septem-spinosa*; in the lateral spines being short and curved; in the possession of two additional spines placed anteriorly to these latter; in the greater comparative size of the upper posterior pair of spines; in the

stouter condition of the prehensile and ambulatory feet ; and in the well-marked peculiarity of the front.

#### 6. IPHICULUS, *Adams & White.*

*Thorax* sublatisior quam longior, denso tomento spongioso obsitus ; marginibus latero-anterioribus spinis quatuor fimbriatis ; marginibus latero-posterioribus tuberculis duobus obtusis, parte coarctatâ lineis impressis duabus longitudinalibus, et sulco transverso, postice tuberculo subelevatiusculo.

*Frons* tuberculis duobus depressis, fissâ separatis.

*Chelæ*, manu gibbosâ, digitis perlongis, gracilibus, multis denticulis longis instructis.

*Abdomen* (maris) ad articulum basalem foveâ profundâ sublongitudinali.

*Carapace* rather wider than long, covered with a dense woolly tomentum, resembling fine sponge ; latero-anterior margins with four fringed spines, increasing in size from the front backwards, the fourth spine, forming the latero-anterior angle, being very strong and prominent ; latero-posterior margins with two obtuse tubercles, separated by a sinus ; the coarctate portion of carapace marked by two longitudinal and one transverse groove, and ending in a rounded slightly-elevated tubercle.

*Front* consisting of two very short depressed tubercles, separated by a notch, each tubercle rounded in front ; mouth extending beyond the front.

*Fore-legs* with the fifth joint gibbous ; the claws very long and slender, with numerous fine long sharp teeth.

*Abdomen* (of male) with its basial joint with a deep sublongitudinal fovea.

#### 1. IPHICULUS SPONGIOSUS, *Adams & White.*

*Thorace* fusco, tomento denso spongioso oblecto ; lateribus, anteriore spinis quatuor fimbriatis, posteriore tuberculis duobus.

HAB. Insulas Philippinas.

*Carapace* brown, covered with a thick sponge-like woolly tomentum ; sides with four fringed spines anteriorly, and two tubercles posteriorly.

HAB. Philippine Islands.

This genus should properly follow *Ceratocarcinus*, with which it is closely allied, and should be placed in the same group as that Crustacean ; it appears, among the *Parthenopidæ*, to hold the same place as *Oreophorus* does among the *Leucosidæ*.

#### 7. TLOS, *Adams & White.*

*Thorax* latior quam longior lævis ; regionibus lateralibus valde excavatis, marginibus lateralibus trilobatis, margine posteriore excavato, loliâ bicarinatâ ; multis tuberculis parvis ad basin circumdatis.

*Frons* integra rotundata deorsum reflexa.

*Chelæ* branchio triangulare, carpo supra bicarinato, manu carinâ tuberculiferâ, digitis ad fines curvatis.

*Abdomen* (femine) articulis septem, ovale tuberculosum.

*Carapace* much wider than long, smooth, the lateral regions cup-shaped, with raised edges, with an anterior and posterior groove; lateral edges divided into three lobes, the front lobe straight and reflexed backwards, the middle simple and rounded, the posterior elevated and wedge-shaped; the middle region with a strong vertical ridge ending behind in an obtuse tubercle, and on each side with two perpendicular three-sided elevations, truncated at their apices, with a small tubercle at their fore-bases; posterior margin of carapace excavated, with a large projecting lobe flattened above, with two ridges behind, a rounded elevation in front, and numerous small tubercles near the base.

*Front* entire, rounded, reflected backwards, showing a central groove on the under surface.

*Fore-legs* with the third joint triangular, the edges tuberculiferous; the fourth joint with two tubercular ridges on the upper surface; fifth joint with a tubercular keel above; claws slightly curved at the ends.

*Abdomen* (of female) oval, tuberculated, seven-jointed, surrounded by an elevated ridge.

It is interesting to see the analogous armature of the carapace with that of *Xanthasia murigera* (White) amongst the *Pinnotheridæ*. The name *Tlos* is from the town of that name in Lyeia, so well described by Sir Charles Fellowes in his Asia Minor. It is distinct enough from *Tylos*, another genus of *Crustacea*, so as not to be confounded with it in sound.

1. TLOS MURIGER, *Adams & White*. (Tab. XIII. Fig. 2.)

*Thorace* lævi, regionibus lateralibus valde excavatis; marginibus lateralibus trilobatis; margine posteriore excavato, lobo bicarinato multis parvis tuberculis ad basin.

HAB. Borneonem.

*Carapacc* smooth; lateral regions deeply excavated; side-margins with three lobes, hind margin excavated, a two-ridged lobe with numerous small tubercles at the base.

HAB. Borneo.

## X. CORYSTIDÆ.

The genus *Trichocera* is not uncommon among the islands of the Philippine Archipelago, where it is found among the reefs concealed in the coral, or hiding under stones; it has all the habits of the *Xantho* group; the *Corystes* inhabits rather deep water, preferring the same localities as the *Leucosiæ*, which it likewise resembles in its habits; a species of *Gomezia* was dredged by Mr. Cuming in the Philippines, but the other genera of this family do not appear to be found among the islands of the Eastern Seas.

1. TRICHOCERA, *De Haan*.

1. TRICHOCERA GIBBOSULA, *De Haan*.

Parva, pilosa, thorace dilatato, brevi, setoso, tuberculato, tuberculis mediis planis quinque transversim dispositis; lateribus 10-dentatis; fronte 5-dentatâ.

HAB. Japonian.

*Corystes (Trichocera) gibbosula*, De Haan, Faun. Japon. t. 2. f. 4; t. 13. f. 3.

Small, hairy, the carapace dilated, short, setose, tuberculated, the five middle plane tubercles disposed transversely; sides ten-toothed; front five-toothed.

HAB. China Sea. Japan.

## 2. TRICHOCERA PORCELLANA, *Adams & White*.

*Thorace* depresso lævi, lineis multis denticulatis transversis obsito; lateribus spinis quinque robustis acutis curvatis.

*Fronte* valde supra sulcatâ, lobis duobus obtusis dente magno externe.

*Chelis* lævibus, lineis transversis denticulatis obsitis; digito superiore supra dentato; digito inferiore tubereulis quatuor supra, lineis duabus longitudinalibus infra.

*Pedibus* posterioribus lævibus, pilis longis fimbriatis.

HAB. Insulas Philippinas.

*Carapace* depressed, polished, covered with numerous transverse finely-denticulated lines, some interrupted and some continued into the lateral spines; sides with five sharp strong curved spines, the first and last simple, the others with small spines at their bases.

*Front* deeply grooved above, with two obtuse denticulated lobes, each with a large tooth externally.

*Fore-legs* polished, covered with short finely-denticulated transverse lines; claws long, with the spatulate extremities abruptly curved, upper claw dentated above, with small tubercles below, lower claw with four tubercles above, and two longitudinal denticulated lines externally.

*Hind-legs* dilated, smooth, fringed with long hairs.

HAB. Philippine Islands.

By Professor De Haan, the most able of modern Crustaceologists, this species would be referred to the division which contains *Xantho*, and we must confess that in its general appearance it has some resemblance to the Chilian genus *Paraxanthus* of Lucas, of which there are specimens in the British Museum; with the genus *Thia* of the family *Corystidae* it has some considerable analogy, and may be said, in the group *Xantho*, to represent that family. Like the *Cancer (Xantho) integer* of M. De Haan, this species is of a bright yellow brown, with golden hairs (in the dried state), and both species are found in the Philippine Archipelago.

## XI. HIPPIDÆ.

The genera which compose this small but very natural group have, so far as I have observed, very nearly the same habits. They swim by sudden rapid jerks, like the *Galathea*, and appear to prefer the deep pools of the coral ledges; they are pre-eminently swimming Crustaceans, progressing but badly when taken from the water. An interesting addition to

our national collection in the form of *Notopus dorsipes*, De Haan, was obtained by us in the province of Unsang in Borneo, and a new genus (*Cosmonotus*) also rewarded our exertions while examining the same locality.

1. COSMONOTUS, *Adams & White*.

*Thorax* ovalis, antice acuminatus, lateribus valde compressis, in lineâ mediâ carinâ prominente, lateribus integris, angulo latero-anteriore spinâ brevi acutâ.

*Frons* profunde incisa, ad latera spina parva acuta.

*Chelæ* trigonales, interne planæ, externe convexæ.

*Abdomen* (maris) articulis septem, articulo ultimo trigonali.

*Carapace* oval, very much compressed laterally, especially in front, with a distinct prominent keel extending down the middle line, very strongly marked in front, but fainter posteriorly.

*Front* with a very small spine on each side of a deep angular notch, in which are placed the eyes.

*Fore-legs* strong, triangular, the upper claw arched, the lower claw small and dentated on the edge.

*Abdomen* (in the male) seven-jointed.

1. COSMONOTUS GRAYII, *Adams & White*. (Tab. XIII. Fig. 3.)

*Thorace* punctis multis depressis obsito.

*Fronte* valde incisâ externe spinâ parvâ acutâ.

*Chelis* trigonalibus brachio infra plano, externe convexo lineis multis transversis interruptis, supra carinato pilis fimbriato, interne concavo, carpo incurvato subcompresso, externe convexo, interne spinâ obtusâ; manu compressâ asperâ, margine superiore arcuato; digito inferiore angusto, elongato dente robusto prope extremitatem, digito inferiore brevissimo incurvato; pedibus posterioribus gracilibus brevibus.

HAB. Borneonem.

*Carapace* about an inch in length and half an inch wide, covered with numerous minute depressed punctures.

*Fore-legs* trigonal, the third joint plane on the under surface, the exterior convex with transverse, interrupted, engraved or impressed lines, the upper angle covered with long thick hairs, the inner surface concave; the fourth joint incurved, sub-compressed, convex externally, less convex internally, ending above and in front in a blunt spine; fifth joint compressed, elevated, with the upper edge arched, but not so sharp as in *Notopus*; the sides convex and covered with asperities or minutely denticulated ridges, interrupted and transverse; upper claw narrow, compressed, elongated, with a sharp apex, and a strong tooth near the distal extremity.

*Feet* short and weak as in *Notopus*; the first tibia bicarinated; the tarsus subquadrate, anteriorly bicarinate, with a scalpel-shaped claw; the second tibia one-keeled, with the tarsus

oblong, and a sharp elongated trigonal claw; the third tibia subtriangular, the tarsus short, flattened, trigonal, with a falcate claw; the fifth tibia triangular, very short, flattened; tarsus transversely ovate, with a small narrow claw.

*Abdomen* (of male) seven-jointed, the joints from the first to the sixth nearly of the same width as in *Notopus*, the last joint trigonal.

HAB. Borneo (Unsang).

*Cosmonotus* differs from *Notopus*, De Haan, in wanting the post-frontal, elevated denticulated ridge; in the dorsal keel ending abruptly in front, instead of terminating in a central frontal spine; in the front being notched, with a single spine on each side; in the carapace being much compressed, more especially in front, and in the produced and angular form, while in *Notopus* it is almost straight across the front; and in the sides being entire, with a short sharp spine at the antero-lateral angle. The species is named in compliment to J. E. Gray, Esq., F.R.S., Keeper of the Zoological department in the British Museum.

## XII. PENÆIDÆ.

A new species of *Sicyonia*, Edwards, of a scarlet colour, finely variegated with orange and yellow, with a greyish pubescence on the dorsal surface near the crest, was obtained in the Sooloo Sea together with a few *Zoææ*. The *Stenopus*, *Sicyonia*, and *Penæus*, usually swim in a slow and deliberate manner forwards, and occasionally with a sudden jerk propel themselves backwards. They keep at a considerable distance from the shore and seem to love deep still water, never appearing when the surface of the sea is ruffled.

### 1. STENOPUS, *Latreille*.

#### 1. STENOPUS HISPIDUS, *Latreille*. (Tab. XII. Fig. 6.)

*Thorace* spinis multis parvis pilisque sparsis obsito.

*Fronte* acuminatâ gracili sursum directâ, non ultra articulum basali antennarum superiorum pertinente; antennis perlongis filiformibus.

*Chelis* brevioribus quam paria pedum secunda, longe ultra appendicem lamellarem antennarum inferiorum porrectis. Pari tertio pedum longiore quam totum corpus multis seriebus longitudinalibus dentium acutarum, tarsis duorum parium ultimorum pedum bifidis.

*Abdomine* laminâ mediâ pinnæ caudalis in centro sulcato, supra seriebus duabus spinarum.

HAB. Insulas Philippinas.

*Stenopus hispidus*, Latr. R. A. vol. iv. p. 93. Cuv. R. N. (Croch), t. 50. f. 2. Edw. Crust. vol. ii. p. 407. t. 25. f. 1. *Palaemon hispidus*, Oliv. Enc. vol. viii. p. 666. Seba, vol. iii. t. 21. f. 617.

*Carapace* covered with numerous small spines and scattered hairs.

*Front* pointed, slender, elevated, not extending beyond the basal joint of the upper antennæ; antennæ very long and filiform.

*Fore-legs* not so long as the second pair, but extending considerably beyond the lamellar appendage of the lower antennæ. Third pair of legs longer than the whole body, with many longitudinal rows of pointed teeth; tarsi of the two last pairs of legs bifid.

*Abdomen* with the middle lamina of the caudal fin grooved in the centre, and furnished above with two rows of spines.

HAB. Coast of Borneo, and Philippinc Islands.

Our figure is coloured from a living specimen taken by me in the China Sea. *A. A.*

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[*Additional Species.*]

CRYPTOSOMA, *Brullé.*

CRYPTOSOMA ORIENTIS, *Adams & White.* (Tab. XIII. Fig. 4.)

*Thorace* rotundato; marginibus latero-posterioribus rectiusculis. Thorace post frontem et oculos sine sulcis.

*Fronte* tribus lobis subacutis.

*Pedibus* gracilibus; articulo prætersali tenui, non incrassato.

HAB. Maria Orientalia.

*Carapace* subcircular, as broad as long, narrowed behind, covered with numerous small red tubercles, and five rows of larger tubercles; latero-anterior margins distinctly dentate; latero-anterior angle with a rather long and sharp spine.

*Front* with three subacute lobes; upper margin of orbit deeply notched in the middle.

*Fore-legs* with the third joint armed with two long spines on the outer side near the end, the fourth joint tubercular, the fifth joint compressed, with an elevated toothed crest above, and covered externally with tubercular spines.

*Hind-legs* smooth, slightly compressed, slender, with the pretarsal joints not thickened or dilated.

*Abdomen* (in the male) four-jointed.

HAB. Eastern Seas.

This species comes very near to *Cryptosoma cristatum*, figured by Brullé in Webb and Berthelot's Hist. des Iles Canaries (Tab. Crust. fig. 2). The *Mursia cristata*, Leach; *Cycloes granulosa*, De Haan, Faun. Jap. t. 19. f. 3; *Thealia acanthophora*, Lucas, Ann. Soc. Ent. Fr. 1839, p. 579. t. 21. f. 1 (*Mursia armata*, De Haan, Faun. Jap. p. 73. t. 19. f. 2); and this species, belong to a group of *Calappidæ* which seems very widely distributed.



XENOPHTHALMUS *White.*

XENOPHTHALMUS PINNOTHEROIDES, *White.* (Tab. XII. Fig. 3.)

*Thorace* punctulato, sulcis duobus longitudinalibus ab oculis porrectis, lateribus antice ciliatis.

*Pedibus* articulis ciliatis.

HAB. Insulas Philippinas.

*Xenopthalmus pinnotheroides*, White, Annals and Mag. Nat. Hist.

*Carapace* with the sides, in front, having a sharp ciliated edge; carapace punctured; two slight waved longitudinal grooves, one extending from each eye over the back of the carapace; most of the joints of the legs ciliated.

HAB. Philippine Islands.

We figure this curious genus on account of our being able to give a coloured representation from a drawing made from life in the Eastern Seas. *A. A.*

RHABDOSOMA, *Adams & White.*

*Oxycephalus*, M. Edwards.

We regret that the state of the only specimen in the British Museum is such that we cannot give the generic character with that detail which we should wish. It is founded on the third species of Professor Milne Edwards, indeed Mr. White has the authority of that eminent Crustaceologist that it is his very species: it is so different from the *Oxycephalus piscator*, M. Edwards (Crust. III. p. 100. t. 30. f. 10), that we have traced the figure of *O. piscator*, and added it below that of the *O. armatus*, to show the difference. Some day it may be proved to be a sexual character, when of course our name will sink, but *as yet* we know of no such discrepancies in the sexes of these Crustacea.

The head is as long as the rest of the body, and ends in a very long beak; from the state of our specimen we cannot describe this, but indicate it on the plate from a drawing made at the time of capture. The immense length of the body and the beak would sufficiently mark this generic form. The first two pairs of legs are shown in the figure, which must serve till we can procure further specimens, when we hope to give ample details of this very singular crustaceans and to analyse its characters at length. It forms a singularly interesting link between the *Amphipoda* and *Læmodipoda*, uniting, as it were, the two; we should like to have this form examined particularly by Prof. M. Edwards or Dr. Kroyer.

RHABDOSOMA ARMATUM, *Adams & White.* (Tab. XIII. Fig. 7.)

*Oxycephalus armatus*, M. Edw. Crust. III. p. 101. pl. 30. f. 10, copied. (Tab. XIII. Fig. 8.)

The specimen described by Professor Milne Edwards was found by MM. Quoy and Gaimard in the ocean between Amboina and Van Dieman's Land, and is now in the Paris Museum. Ours was taken during a calm, floating on the surface of the South Atlantic Ocean.

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REEVE, BENHAM, AND REEVE,  
PRINTERS AND PUBLISHERS OF SCIENTIFIC WORKS,  
KING WILLIAM STREET, STRAND.

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# INDEX.

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	Page.		Page.
Achæus Japonicus . . . . .	5	Gonatonotus pentagonus (TAB. VI. Fig. 7) . . . . .	33
Actæa nodulosa (TAB. VIII. Fig. 4) . . . . .	39	Halimus auritus . . . . .	23
Ægle rugata (TAB. VIII. Fig. 5) . . . . .	43	Harrovia albolineata (TAB. XII. Fig. 5) . . . . .	56
Atergatis insularis (TAB. VIII. Fig. 2) . . . . .	38	Huenia frontalis (TAB. IV. Fig. 3) . . . . .	20
— lateralis (TAB. VIII. Fig. 1) . . . . .	39	— Proteus (TAB. IV. Fig. 4-7) . . . . .	21
— sinuatifrons . . . . .	38	— Proteus, var. tenuipes (TAB. IV. Fig. 5) . . . . .	22
— subdivisus (TAB. VIII. Fig. 3) . . . . .	<i>ib.</i>	Hyastenus Schæ . . . . .	11
Arctopsis Styx . . . . .	10	Inachus lorina (TAB. II. Fig. 2) . . . . .	3
Camposcia retusa . . . . .	6	Iphiculus spongiosus . . . . .	57
Carpilius cinctimanus (TAB. VII. Fig. 4) . . . . .	37	Iphis novemspinosa (TAB. XIII. Fig. 1) . . . . .	56
— signatus (TAB. X. Fig. 1) . . . . .	<i>ib.</i>	Ixa megaspis (TAB. XII. Fig. 1) . . . . .	55
Ceratocarcinus longimanus (TAB. VI. Fig. 6) . . . . .	34	Lambrus carinatus (TAB. V. Fig. 3) . . . . .	27
Charybdis dura . . . . .	48	— diacantha . . . . .	30
Chasmagnathus convexus . . . . .	52	— harpax (TAB. VI. Fig. 3) . . . . .	25
Chlorodius fragifer (TAB. XI. Fig. 2) . . . . .	40	— hoplonotus (TAB. VII. Fig. 3) . . . . .	35
— hirtipes (TAB. XI. Fig. 4) . . . . .	<i>ib.</i>	— laciniatus . . . . .	29
— areolatus (TAB. XI. Fig. 3) . . . . .	41	— lamellifrons (TAB. V. Fig. 1) . . . . .	26
— pilumnoides (TAB. IX. Fig. 3) . . . . .	<i>ib.</i>	— longimanus . . . . .	30
Chorinus acanthonotus (TAB. I. Fig. 1) . . . . .	11	— pisoides (TAB. V. Fig. 4) . . . . .	28
— aculeatus . . . . .	13	— serratus . . . . .	30
— longispina . . . . .	12	— turriger (TAB. V. Fig. 2) . . . . .	26
— verrucosipes . . . . .	13	— validus . . . . .	29
Cosmonotus Grayii (TAB. XIII. Fig. 3) . . . . .	60	Latreillia phalangium . . . . .	5
Cryptopodia dorsalis (TAB. V. Fig. 6) . . . . .	30	— valida . . . . .	<i>ib.</i>
— fornicata (TAB. VI. Fig. 4) . . . . .	32	Leucosia hæmatosticta (TAB. XII. Fig. 2) . . . . .	54
Cryptosoma orientis (TAB. XIII. Fig. 4) . . . . .	62	Lissocarcinus polybioides (TAB. XI. Fig. 5) . . . . .	46
Dione affinis . . . . .	15	Lupocyclus rotundatus (TAB. XII. Fig. 4) . . . . .	47
Doclea calcitrata (TAB. I. Fig. 2) . . . . .	7	Maia spinigera . . . . .	15
— hybrida . . . . .	<i>ib.</i>	Macrocheira Kæmpferi . . . . .	5
— muricata . . . . .	8	Macrophthalmus definitus . . . . .	51
— ovis . . . . .	7	— Japonicus . . . . .	<i>ib.</i>
Egeria Indica . . . . .	6	— scrratus . . . . .	<i>ib.</i>
— longipes . . . . .	7	Menæthius incisus . . . . .	20
Galene ochtodes (TAB. X. Fig. 2) . . . . .	43	— porcellus . . . . .	19
Gelasimus bellator . . . . .	49	— quadridens . . . . .	20
— crassipes . . . . .	<i>ib.</i>	— subserratus (TAB. IV. Fig. 1, 2) . . . . .	18
— cultrimanus . . . . .	<i>ib.</i>	— tuberculatus . . . . .	19
— foreipatus . . . . .	50	Micippa bicarinata . . . . .	16
— porcellanus . . . . .	<i>ib.</i>	— cristata . . . . .	<i>ib.</i>

Micippa philyra .....	Page. 15	Pilumnus ursulus (TAB. IX. Fig. 6.) .....	Page. 45
— Thalia .....	15	Pisa planasia (TAB. II. Fig. 4, 5) .....	9
Mithrax dichotomus .....	13	— Sinope .....	8
Naxia diacantha .....	10	Rhabdosoma armatum (TAB. XIII. Fig. 7) .....	63
Oncinopus aranea .....	3	Schizophrys serratus .....	16
— Neptunus (TAB. II. Fig. 1) .....	1	— spiniger .....	17
Orcophorus reticulatus (TAB. VI. Fig. 1) .....	54	Stenopus hispidus (TAB. XII. Fig. 6) .....	61
Panopeus Caystrus (TAB. IX. Fig. 2) .....	42	Telmessus serratus (TAB. III.) .....	14
— dentatus (TAB. XI. Fig. 1) .....	41	Tlos muriger (TAB. XIII. Fig. 2) .....	58
— formio (TAB. IX. Fig. 1) .....	42	Trichocera gibbosula .....	ib.
Paramithrax Edwardsii .....	14	— porcellana .....	59
Parthenope calappoides (TAB. V. Fig. 5) .....	34	Utica gracilipes (TAB. XIII. Fig. 6) .....	53
— Tarpeius (TAB. VII. Fig. 2) .....	35	Xantho cultrimanus .....	39
Pericera cornigera .....	18	— depressa .....	ib.
— setigera .....	17	— lamelligera .....	40
— tiarata .....	ib.	Xenophthalmus pinnotheroides (TAB. XII. Fig. 3) .....	63
Pilumnus dilatipes (TAB. IX. Fig. 4) .....	44	Zelbrida Adamsii (Tab. VII. Fig. 1) .....	24
— scabriusculus (TAB. IX. Fig. 5) .....	ib.		







1. ZEBRIDA ADAMSII. White.

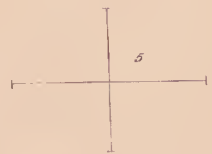
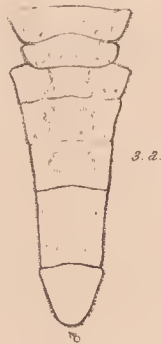
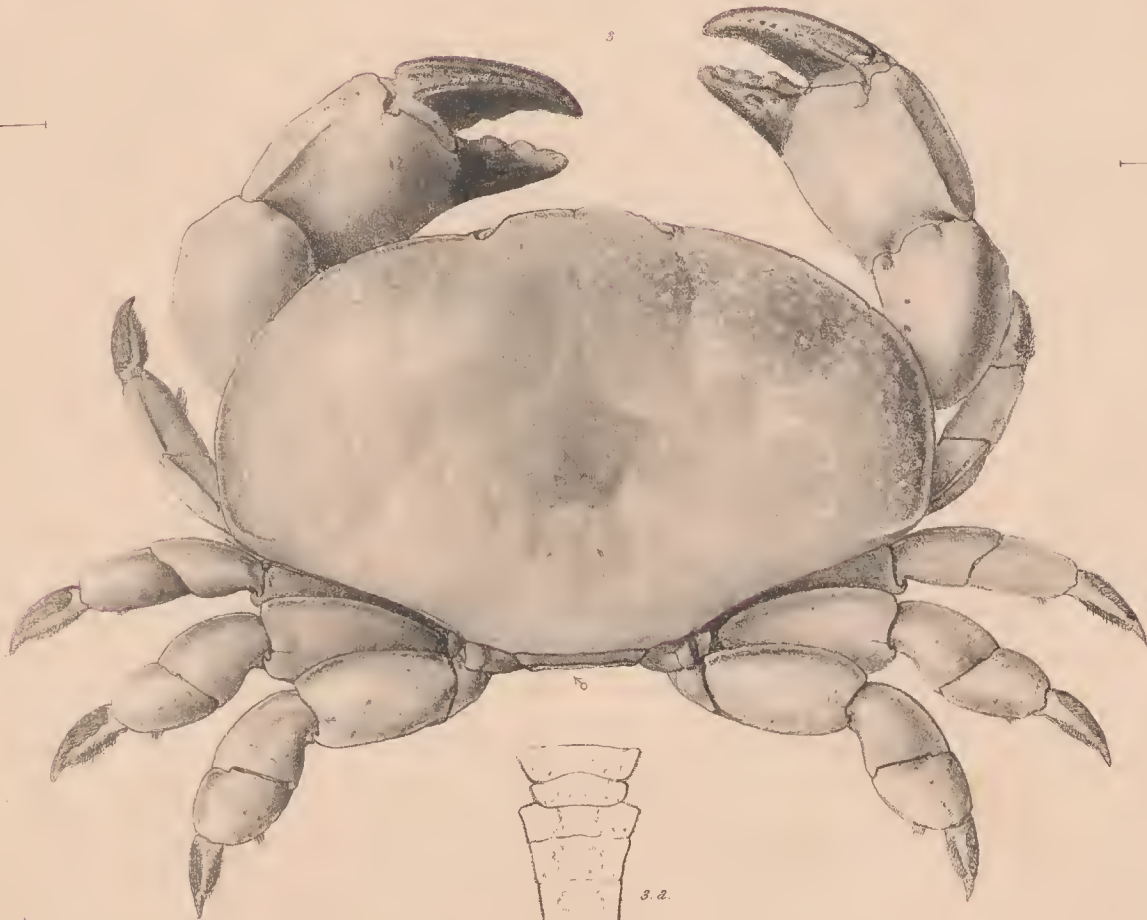
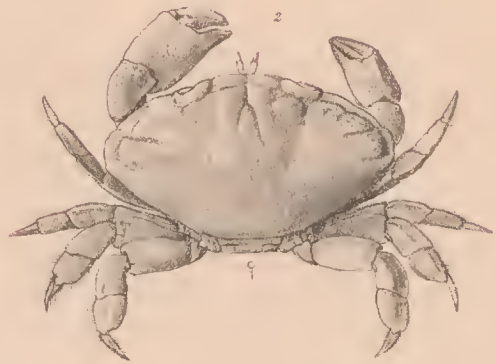
3 LAMBRUS HOPLONOTUS. Adams & White.

2. PARTHENOPE TARPEIUS. Adams & White.

4 CARPILIUS CINCTIMANUS Adams & White.







1. ATERGATIS LATERALIS Adams & White.

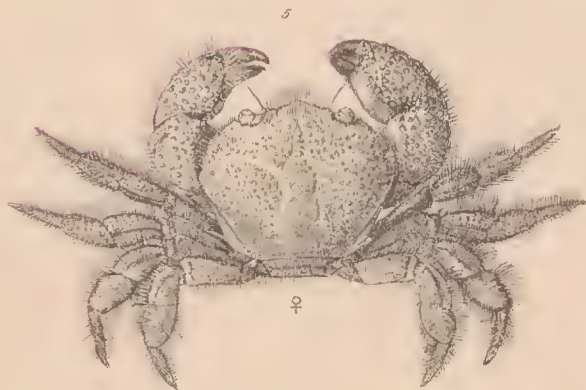
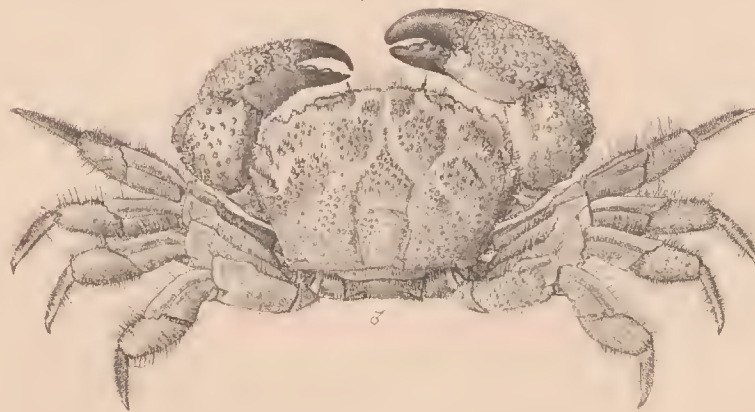
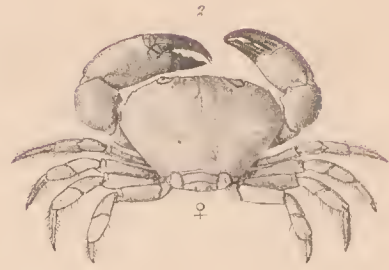
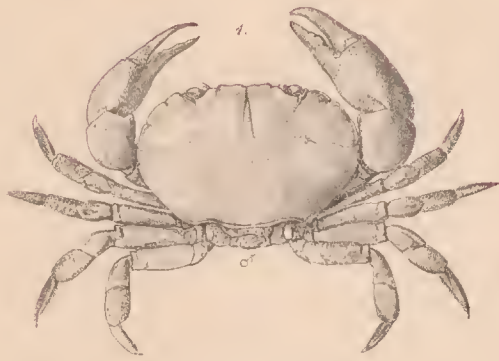
3. ATERGATIS SUBDIVISUS. Adams & White.

2. ATERGATIS INSULARIS. Adams & White.

4. ACTÆA NODULOSA. Adams & White.

5. ÆGLE RUGATA. Adams & White.





1. PANOPEUS FORMIO, Adams & White.

4. PILUMNUS DILATIPES, Adams & White.

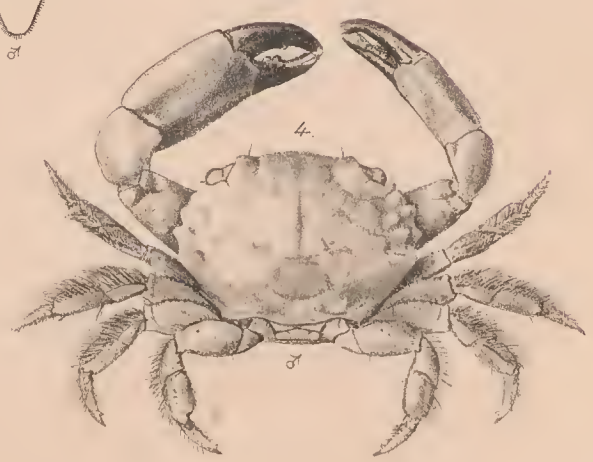
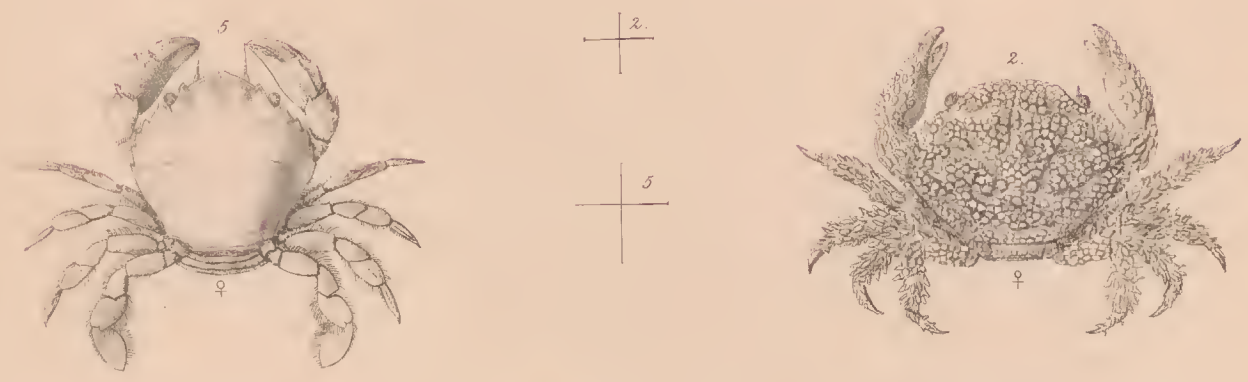
2. PANOPEUS CAYSTRUS, Adams & White.

5. PILUMNUS SCABRIUSCULUS, Adams & White.







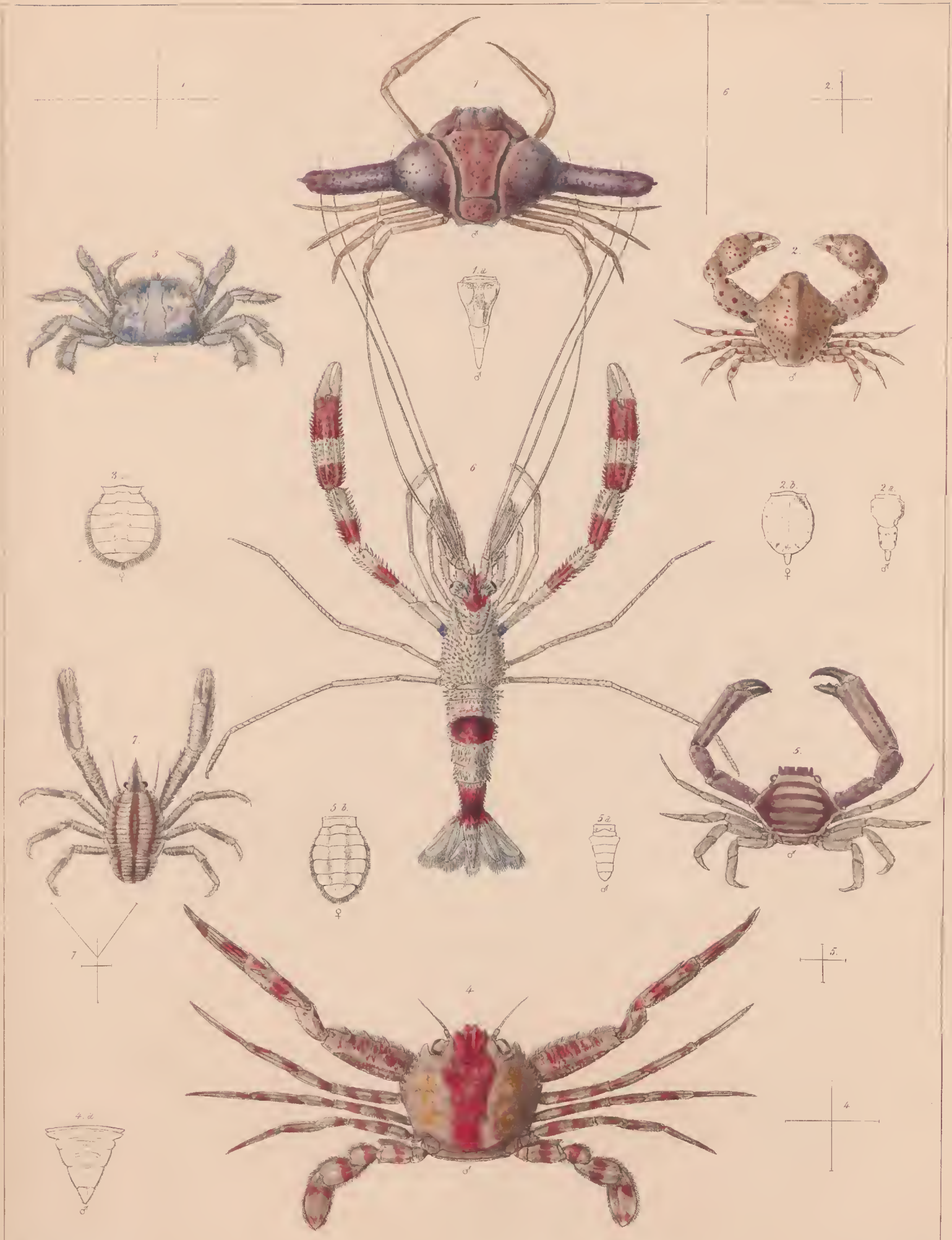


William Wing, del. et lith. Reeve, Benham & Beeve, imp.

1. PANOPEUS DENTATUS. White. 3. CHLORODIUS AREOLATUS. Milne Edwards.  
 2. CHLORODIUS FRAGIFER. Adams & White. 4. CHLORODIUS PIRTIPES. Adams & White.  
 5. LISSOCARCINUS POLYBIOIDES. Adams & White.





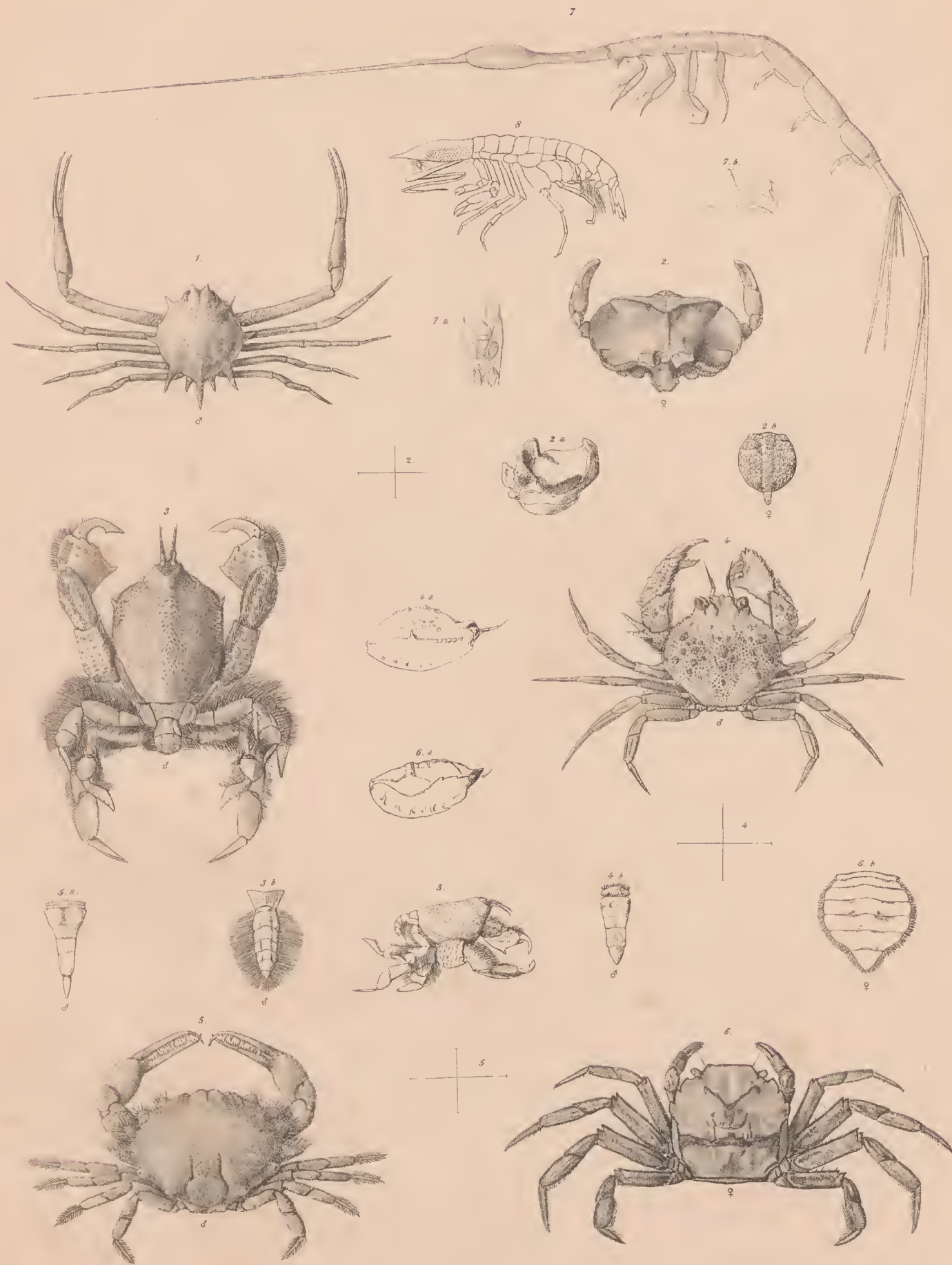


Wm. Wood, del. et lith.

Reeve, Scullan & Rowing sculp.

1. IXA MECASPIS. Adams & White. 4. LUPOCYCLUS ROTUNDATUS. Adams & White.  
 2. LEUCOSIA HÆMATOSTICTA. Adams & White. 5. HARROVIA ALBOLINEATA. Adams & White.  
 3. XENOPHTHALMUS PINNOTHEROIDES. White. 6. STENOPUS HISPIDUS. Latr.  
 7. GALATHEA ELEGANS. White





William Wing, del. et lith.

Reeve Benham & Reeve, imp.

- 1. IPHIS NOVEM-SPINOSA. Adams & White.
- 2. TLOS MURIGER. White.
- 3. COSMONOTUS GRAYII. Adams & White.
- 4. CRYPTOSONA ORIENTIS. Adams & White.

- 5. IPHICULUS SPONGIOSUS. Adams & White.
- 6. UTICA GRACILIPES White
- 7. RHABDOSOMA ARMATUM (M. Edw.)
- 8. OXYCEPHALUS PISCATOR. Milne Edwards.

