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Deel X, n° 8.

Brussel, Januari 1934.

LARVAL CRUSTACEA (*DECAPODA* AND *STOMATOPODA*)
EXPEDITION S. A. R. PRINCE LEOPOLD OF BELGIUM,
DUKE OF BRABANT, TO THE EXTREME EAST (1932),

by Marie V. LEBOUR (Plymouth).

In May 1933, M. Van Straelen, Director of the Royal Belgian Museum of Natural History, confided to me six tubes containing crustacean larvae from the Philippine Islands, collected during the Expedition of S. A. R. Prince Leopold of Belgium, Duke of Brabant, to the Extreme East in 1932. These larvae have proved to be of considerable interest although it is not possible to place any of them in the species to which it belongs for the very good reason that we know too little about the adult decapods in these regions and practically nothing about their larval stages. It is, however, useful to study any collection of larvae which come from little-known localities and if we can place them even approximately in their proper positions and describe them, we shall have done something in the way of laying a foundation for the systematic study of the life-histories of marine decapods.

The specimens are all from fairly shallow water in the Philippine Islands and are labelled thus:

- Tube 1 Bacuit 6/IV/32.
- 2 Asia Negros (Sud) 11/IV/32.
- 3 Asia Negros (Sud) 11/IV/32.
- 4 Asia Negros 11/IV/32.
- 5 Baie de Malampaya 1932.
- 6 Asia Negros 11/IV/32.

On further enquiry as to the conditions under which the speci-

mens were collected I was informed that they were almost certainly taken at the surface of the water with a net provided with a light, at night, the light attracting the larvae, the depth of the water being from 20 to 30 metres. Thus they are probably all shallow-water forms.

The tubes contained one *Squilla* larva, one crab zoea, some pagurid larvae, several crab megalopae and one young *Galathea*. Crab megalopae were the most numerous and were of five types belonging to 10 species of the Brachyrhyncha: next in numbers were three species of pagurids all of the symmetrical Glaucothoë type. The remaining larvae were single specimens.

In the following pages each larva is figured, described briefly, and placed as near as possible in the group to which it belongs. Far as these are from being delegated to any species it yet may help future workers to know that these forms were collected in these localities and may serve as a small beginning of our knowledge of the crustacean larvae of the Philippine Islands.

Anomura.

Paguridea.

Paguridae.

Three species of pagurids, all post-larval stages (Glaucothoë stage) and all perfectly symmetrical, occurred, all from Asia Negros; 3 specimens 11/IV/32 (tube 2, Asia Negros [Sud]), 2 belonging to one species, one to another; 2 specimens 11/IV/32 (tube 4, Asia Negros), of another species but closely related to the two in tube 2.

These pagurids are of two types, one (Type A), large, the other (Type B) much smaller. The two types differ in many ways and almost certainly belong to different genera. There are two specimens of each species in Type A and only one in Type B. The interest of these post-larvae lies in the fact that they have symmetrical bodies similar to those deep-water Glaucothoës which have always been a matter of controversy. Gurney (1924) sets forth the problem in a clear manner and describes such a symmetrical Glaucothoë from the « Terra Nova » Expedition. The few known deep-water Glaucothoës are all very large, but there are also some from shallow waters known. Gurney (1926) has shown that *Diogenes pugilator* from the Suez Canal also has a symmetrical Glaucothoë stage. Bouvier (1891) describes several shallow water forms and quotes a description of *Diogenes va*

rians by Czerniavsky (in Russian, unfortunately not seen by the present writer) in which he found symmetrical uropods. At Plymouth, although the pagurids have not been worked out, it was noticed that there was certainly one species which was symmetrical, possibly *Diogenes pugilator*. Bouvier (1891, 1905) has discussed the question of *Glaucothoë* very thoroughly and came to the conclusion that they were the post-larvae of certain pagurids whose life histories were as yet unknown, the shallow water forms usually with symmetrical chelae, such as *Glaucothoë rostrata* belonging possibly to *Clibanarius* and its relatives which live in shallow water, the deep-water forms belonging to deeper water genera. He suggests however that these very large deep water *Glaucothoës* of the *Glaucothoë peronii* type, may be abnormal forms which have been prevented in some way from metamorphosing. In the present specimens we have symmetrical post-larvae, from 3 mm (Type B) to 6 and 8 mm (Type A) long, with elongated abdomen, no ocular scales and pagurid limbs of the same type as the *Glaucothoës*, especially those of the smaller kinds. It seems certain that they must be the post-larvae of the ordinary shallow water pagurids and very likely one (Type A) belongs to *Clibanarius* which is probably one of the commonest shallow water genera in the Philippines. Alcock (1905) records it from these regions in his catalogue of Indian Decapods in the collection of the Indian Museum. Although we know that certain genera, e. g. *Eupagurus*, *Spiropagurus* (Sars 1889-90, Thompson 1903) have unsymmetrical *Glaucothoë* larvae it does not follow that those we do not know may not be symmetrical; moreover as mentioned above Gurney has found in *Diogenes pugilator* a typical *Glaucothoë* without ocular scales and with symmetrical uropods. Being thus in agreement with Bouvier, Gurney and others that the symmetrical *Glaucothoës* are almost certainly the post-larvae of pagurids I should suggest that those from the Philippines of Type A belong to species of *Clibanarius*, those of Type B to another genus. The telson differs greatly in the two types but both have sub-chelate fourth legs and chelate fifth legs which restricts somewhat a choice of a genus. One specimen of Type A was dissected to see the appendages and gills and the gills were found to agree with those of *Clibanarius* and allied primitive genera. Type B was not studied so closely as there was only one specimen, therefore we do not know what the gills are like and any suggestion as to the genus to which it might belong would be merely a guess.

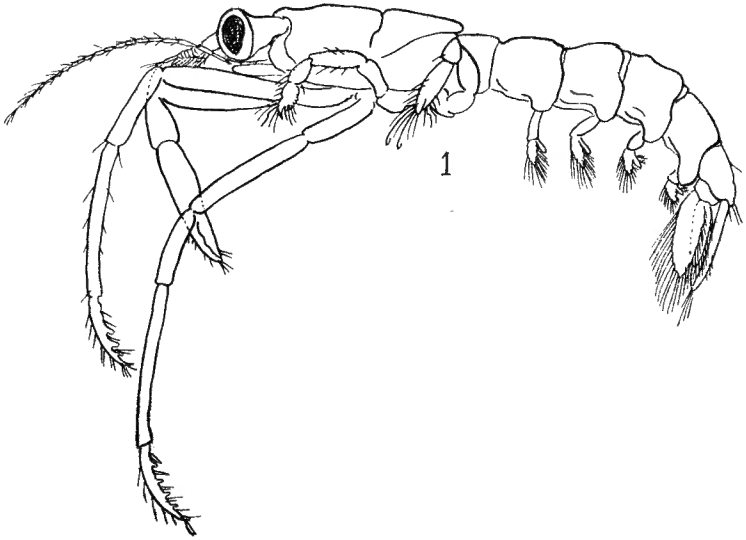


Fig. 1. — *Pagurid Glaucothoë larva*, Type A, species 1, side view, 6 mm. long.

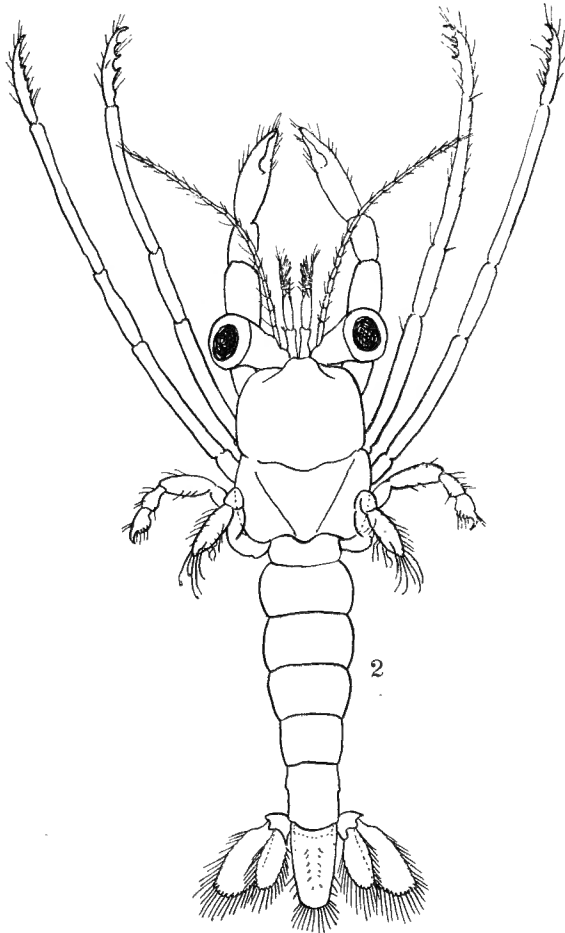


Fig. 2. — *Pagurid Glaucothoë larva*, Type A, species 1, dorsal view, 6 mm. long.

Pagurid Glaucothoë larva Type A, Species 1 (perhaps *Clibanarius*). — 2 specimens from Tube 2, Asia Negros (Sud), 11/IV/32, ca 6 mm. long from tip of rostrum to end of telson (Figs 1-5). Abdomen much longer than carapace; eyes large, much larger at the distal end; chelae narrow and symmetrical; legs 2 and 3 longer than the chelae with 3 and 4 teeth respectively on the last segment, carapace deeply grooved, fourth leg sub chelate, fifth leg chelate; pleopods setose and symmetrical; uropods with rami rounded; telson long with rounded end. Mouth parts as in a typical pagurid. Gills 13 and an epipodite on the third maxillipede. Gill formula :

| | maxillipedes | | | legs | | | | |
|-------------------|--------------|---|--------|------|---|---|---|---|
| | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 5 |
| Epipodite . . . | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Arthrobranch. . . | 0 | 0 | 2 rud. | 2 | 2 | 2 | 2 | 0 |
| Pleurobranch. . . | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |

The epipodite agrees with Gurney's *Glaucothoë* larva which however has only one arthrobranch on the third maxillipede and a pleurobranch only on the fourth leg, in this it is more like the other deep water *Glaucothoës* than the present specimens. Gurney identifies his *Glaucothoë* with *G. peronii* which is always found in deep water but is usually very large.

Pagurid Glaucothoë larva Type A. Species 2 (perhaps *Clibanarius*) 2 specimens from Tube 4, Asia Negros, 11/IV/32, ca 8 mm. long from tip of rostrum to end of telson (Fig. 6). Much like Species 1 and evidently belonging to the same genus. It is larger, the chelae longer and slightly thicker, the second and third legs with fewer teeth on the last segment (2 on each), the eyes thicker at the base, the abdomen more slender and the telson (Fig. 9) almost square at the end with fewer setae, the uropods less rounded.

Pagurid Glaucothoë larva. Type B. One specimen only, from Tube 4, Asia Negros, 11/IV/32, with Species 1, Type A, and from the same locality as Species 2. Thus all the *Glaucothoës* come from the same place. 3 mm. long (Fig. 7). This is quite a different form from Type A and should belong to a different genus.

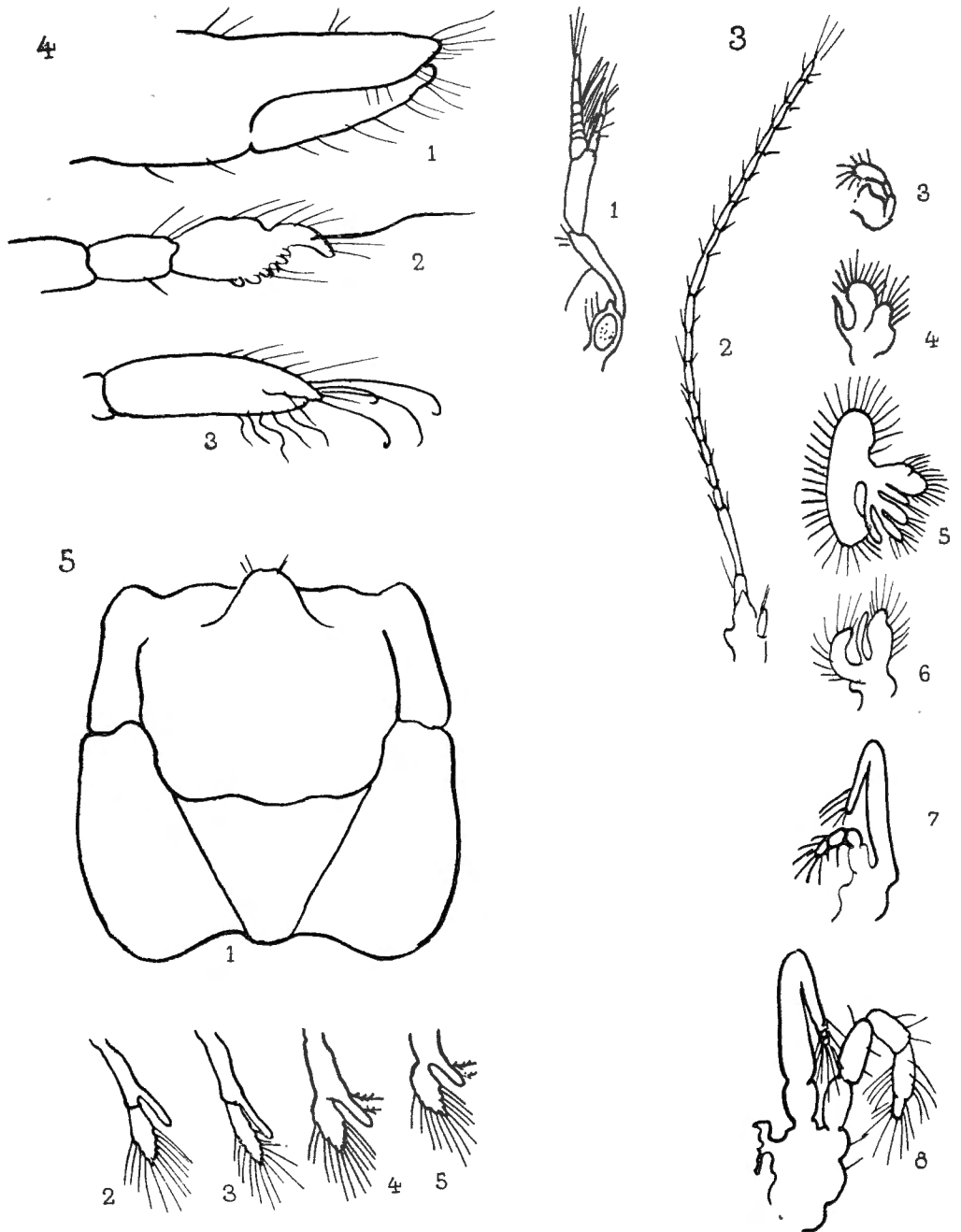


Fig. 3. — *Pagurid Glaucotohö larva*, Type A, species 1. — 1. antennule, 2. antenna, 3. mandible, 4. first maxilla, 5. second maxilla, 6. first maxillipede, 7. second maxillipede, 8. third maxillipede.

Fig. 4. — *Pagurid Glaucotohö larva*, Type A, species 1.

1. end of first leg, 2. end of fourth leg, 3. end of fifth leg.

Fig. 5. — *Pagurid Glaucotohö larva*, Type A, species 1.

1. carapace, 2-5. first to fourth pleopods.

Unfortunately the chelae are missing. The larva is symmetrical in every way. Eyes long and enlarging little towards the tips; second and third legs with three teeth on the last segment.

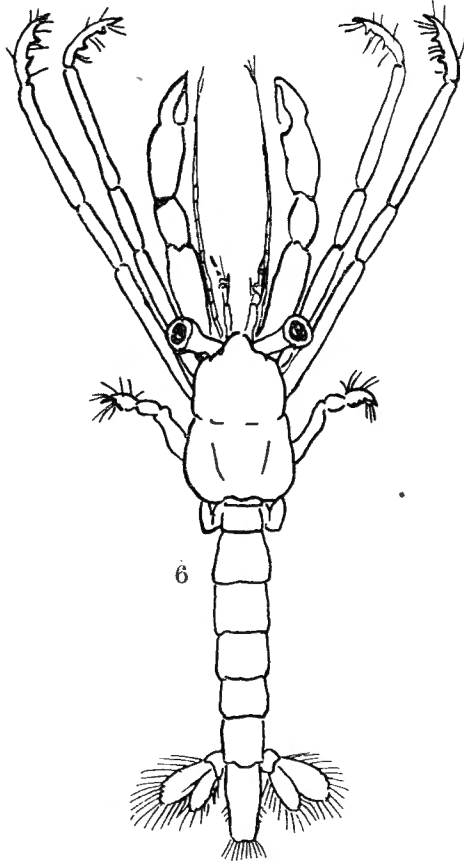


Fig. 6. — *Pagurid Glaucothoë larva*, Type A, species 2.
8 mm. long.

Carapace grooves not very distinct; abdomen widening out in the first half; uropods concave on one side and quite different in shape from Type A. The appearance of this larva is in some ways more like the asymmetrical pagurids such as *Eupagurus* although the second and third legs are quite different and the uropods are symmetrical.

All these three species of *Glaucothoë* larvae have the pleopods

absent from the first abdominal segment which separates them at once from the Pylochelidae.

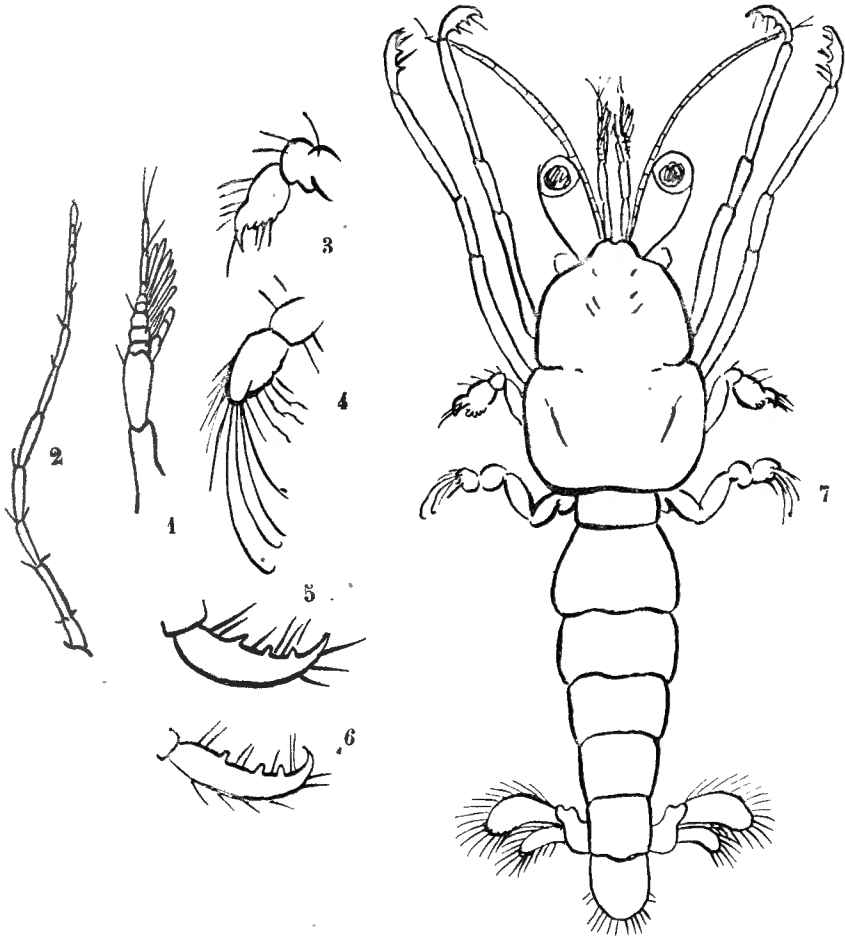


Fig. 7. — *Pagurid Glaucothoë larva*, Type B, 3 mm. long.
 1. antennule, 2. antenna, 3. end of fourth leg, 4. end of fifth leg,
 5. end of second leg, 6. end of third leg.

BRACHYURA.

Brachyrhyncha.

Ten species of crabs are represented, one of which is in the zoeal stage, the rest being megalopae. The zoea is a Xanthiid in the last zoeal stage. The megalopae belong to five groups and

nine species: four species belonging to the Portunidae, one to the Xanthiidae, one to the Grapsidae, one probably to the Pinnotheridae or to the Oxystomata and two probably to the Ocypodidae. All these are characteristically different and have been placed in these positions by comparison with forms already

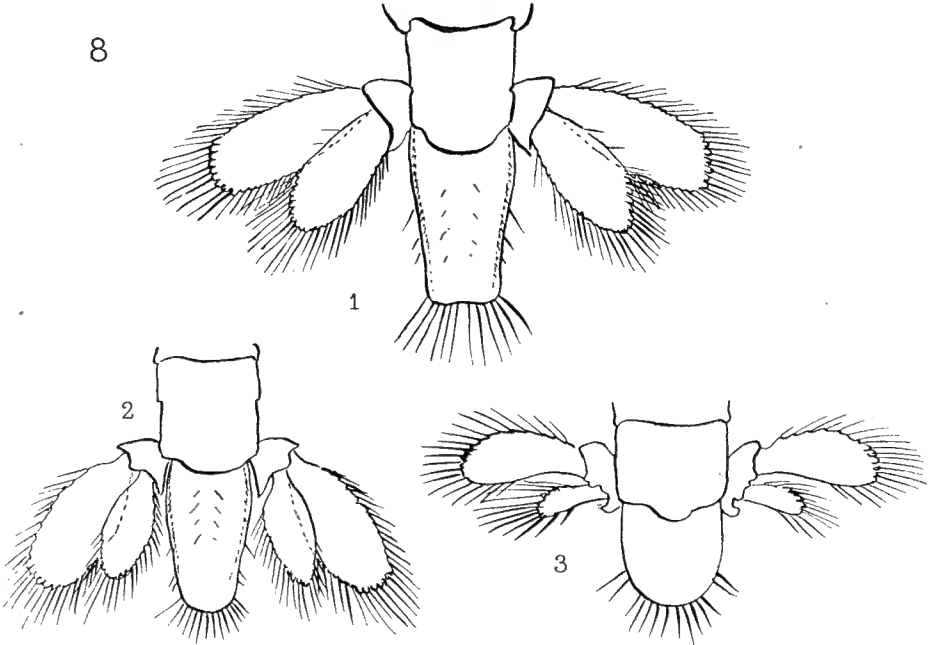


Fig. 8. — Telson of *Pagurid Glaucotohœs*. 1. Type A, species 2, 2. Type A, species 1, 3. Type B (3 is enlarged twice as much as 1 and 2).

described, or by comparing the larvae with the adult. The chief literature drawn upon has been Hyman (1923, 1924, 1925), Lebour (1928) and Rathbun (1923).

Portunidae.

Megalopae, Group C. Four species occur in this group which evidently belong to the Portunidae, having a simple pointed rostrum, no spine on the carapace, which has no conspicuous prominences; fairly long antennae, chelae not specially large or thick; eyes large. The coxa of the fourth leg bears a very large hook-like spine, projecting behind so that it shows beyond the last legs; small hook-like spines on the coxae of legs two to three and a hook on the ischia of the first leg (chela). All these

are characters of the Portunidae, at any rate in the British species. It has been found possible to distinguish these British species by the number of setae on the uropods (Lebour, op. cit.). These are also different in the present species but a very distinct difference in these from any of the Portunidae (indeed from almost all the megalopae of the Brachyrhyncha so far described) is the number of long feelers on the tip of the last legs which usually are three in number but in the Philippine Island forms are five. Legs two to four are more or less spiny and some have very long setae on the penultimate segment. The four species may be distinguished by their size, form of rostrum, armature of the legs and uropods, and the form of the telson.

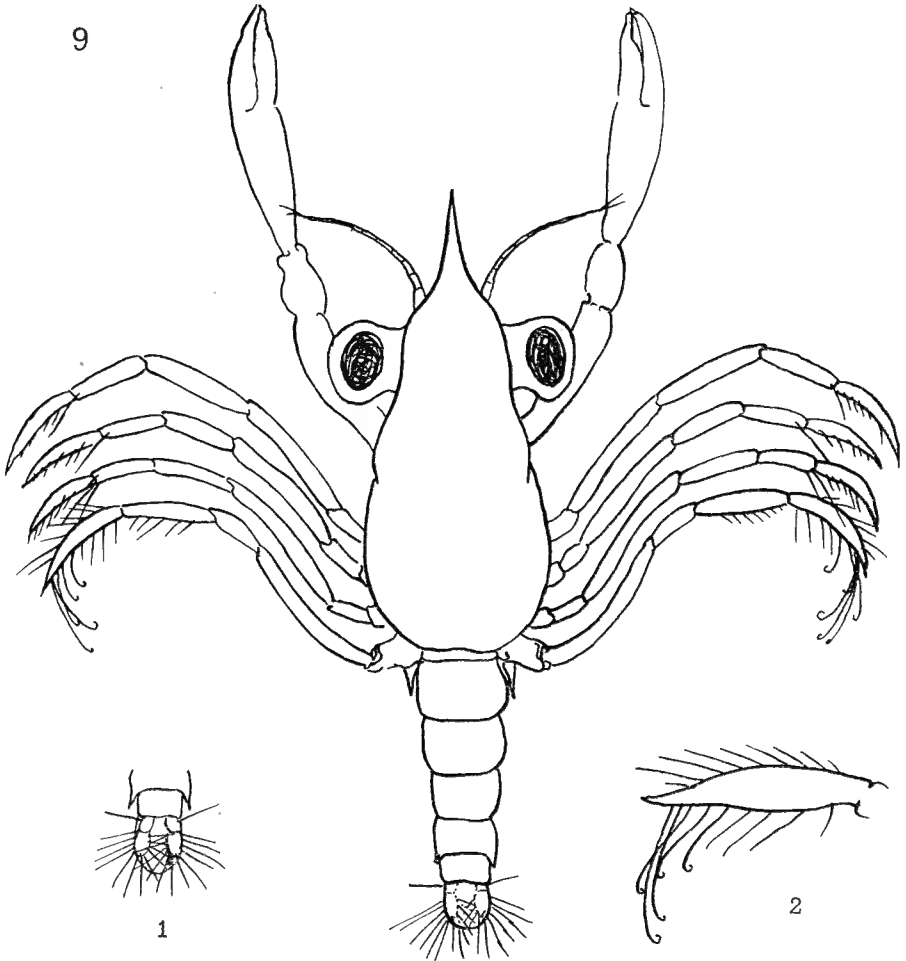


Fig. 9. — *Portunid megalopa* C 1, 4 mm. long, 1. ventral view of telson, 2. tip of fifth leg.

Portunid megalopa C 1, Tube 2, Asia Negros (Sud), 11/IV/32. One specimen only (Fig. 9), 4 mm. long from tip of rostrum to end of telson; carapace 2.56 mm. including rostrum. Rostrum long and finely pointed; second and third legs each with one long seta on the penultimate joint, fourth leg with 2 long setae; telson rounded and about twice the length of the sixth abdominal segment, uropods with 12 setae on the distal segment, one on the proximal segment.

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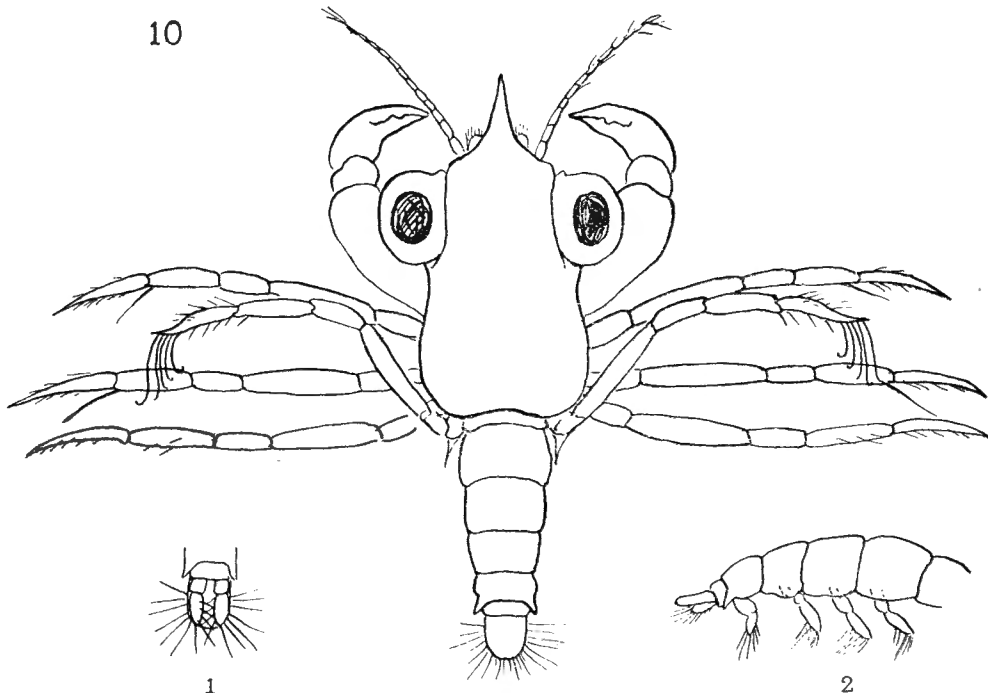


Fig. 10. — *Portunid megalopa* C 2, 3.2 mm. long, 1 ventral view of telson, 2. side view of abdomen.

Portunid megalopa C 2, Tube 2, Asia Negros (Sud), 11/IV/32, 24 specimens, tube 4, Asia Negros, 11/IV/32, one specimen, tube 5, Baie de Malampaya, 1932, 3 specimens; 28 specimens in all (Fig. 10) ca 3.2 mm. from tip of rostrum to end of telson. This megalopa comes second in abundance of all the larvae present in the collection. It is smaller than C 1, carapace 2.08 mm. long; rostrum angular at the base, the point projecting more abruptly from the base than in C 1; second and third legs with one long seta on the penultimate joint, none on the fourth; telson

rounded, about three times the length of the sixth abdominal segment; uropods with 11 setae on the distal segment.

Portunid megalopa C 3, Tube 2, Asia Negros (Sud), 11/IV/32, 34 specimens, tube 4, Asia Negros, 11/IV/32, 3 specimens,

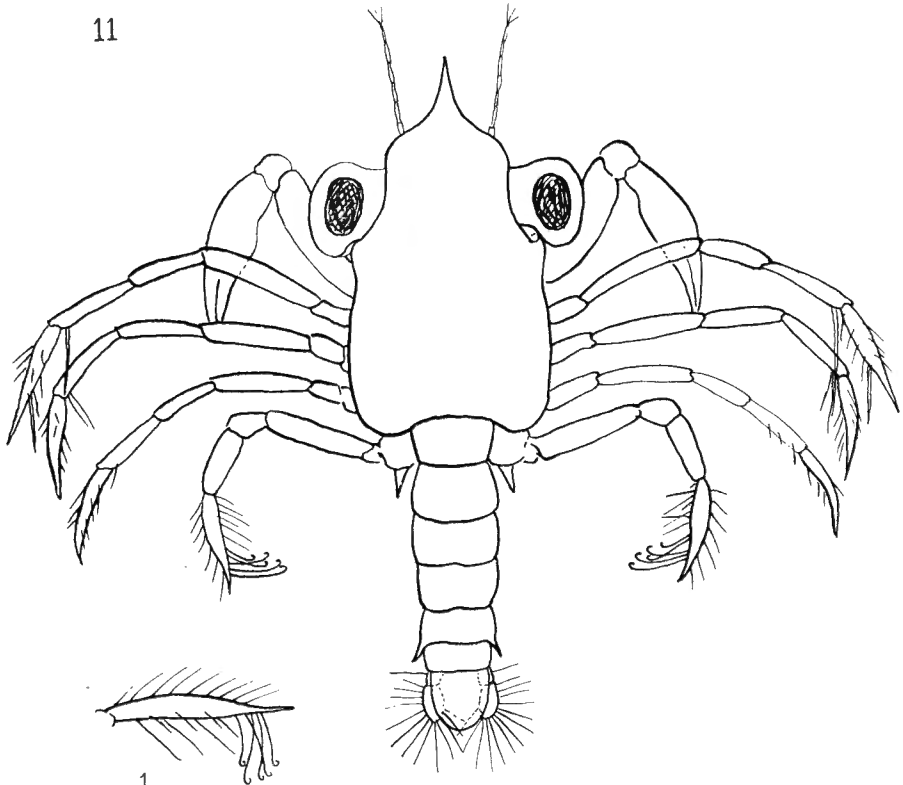


Fig. 11. — *Portunid megalopa*, C 3, 4.62 mm. long, 1 end of last leg.

tube 5, Baie de Malampaya, 11/IV/32, 4 specimens; 42 specimens in all (Fig. 11). This is the most abundant of the whole collection. A large species, 4.62 mm. from tip of rostrum to end of telson; rostrum rather like C 2 but angle not quite so abrupt; carapace 2.4 mm. long; second leg with a very large and long seta on the penultimate joint and a large one on the last joint; third with two not very long setae; fourth with only a short seta in the same position as the long seta in the other species; telson rounded, about twice the length of the sixth abdominal segment; uropods with 13 setae on the distal segment, one seta on the proximal segment.

Portunid megalopa C 4, tube 2, Asia Negros (Sud), 11/IV/32, one specimen only (Fig. 12), the largest of the four portunids, very like C 3 but with certain differences, length 4.8 mm. from tip of rostrum to end of telson, rostrum very like C 3; carapace

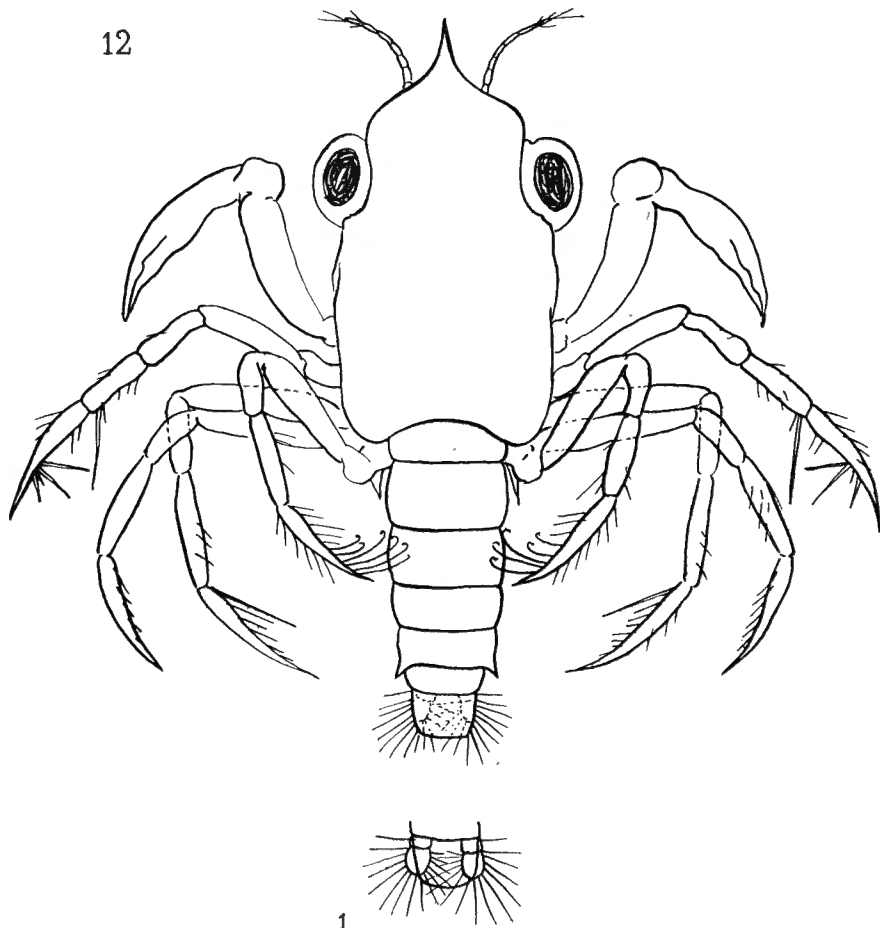


Fig. 12. — *Portunid megalopa*, C 4, 4.8 mm. long, (1) end of telson.

2.7 mm. long; second leg with one long seta on the penultimate joint, two long and one short setae on last joint; third with one long seta on penultimate joint, last without long setae; telson twice as long as the sixth abdominal segment, cut off nearly straight behind; uropods with 14 setae on the distal joint, one seta on the proximal joint. This species has more setae on the second legs than any of the others.

These four megalopae closely resemble a megalopa attributed to *Callinectes* from Cape St. Lucas figured by Rathbun (1923, Plate XXXVI, fig. 3) who states that according to Dr Fish the larva figured is almost identical with that of *Callinectes sapidus* of the Atlantic coast. This larva appears to have five feelers also on the last joint of the fifth leg and has the very long hooks projecting behind from the base (presumably) of the fourth legs, both characteristics of Megalopa C. As Rathbun's larvae came from the South Coast of Lower California, where, she states, there are three species of *Callinectes* it seems not impossible that the Philippine Islands megalopae C may belong to this genus.

Xanthiidae.

Zoea of Xanthiid, last stage, Tube 2, Asia Negros (Sud), 11/IV/32 (Fig. 13), one specimen only, 4.8 mm. long from the tip of the dorsal spine to the tip of the rostral spine. This zoea has the long pleopods of a last larval stage and has 10 setae on the exopodites of the first and second maxillipedes. Comparing it with other zoeae it thus is in the fourth zoeal stage (Lebour, op. cit.) and agrees with the British species of *Xantho* in this. It almost certainly belongs to the Xanthidae which is an enormous family the members of which chiefly live in shallow water near the shore and are well represented in the Philippine Islands. The telson is forked and of the Type C of Aikawa (1929) having no lateral spines and no accessory spines internal to the three each side posteriorly. All the group Xanthozoea of Aikawa (1933) cited by him have lateral spines on the carapace as do also those described by Hyman (1925) in the Xanthiidae, and all the British species. The present zoea has no lateral spines but in other respects it closely resembles members of the Xanthiidae. As so few zoeae of the family are known it is not at all surprising that one or more should lack these spines. *Carcinus* in the Portunidae has none although it is present in all the Portunus zoeae known (Lebour, op cit.). The present zoea is very like Aikawa's (1933) *Xanthozoea elongata* from Japan which however has lateral spines on the carapace and a rather longer antennal exopodite. The zoeae of the family Xanthiidae may be divided into two groups, one to which *Panopeus* and *Xantho* belong has an extremely minute exopodite on the antenna, the other, represented by *Pilumnus* and its allies, has a well developed exopodite. The present zoea belongs to the first group.

The following is a brief description of it: — carapace large, very long rostral spine slightly up-curved at the tip; dorsal spine about half the length of the rostral. Eyes not very large; antennules short; antennae with long spinous process armed with spines and a very short exopodite with one small spine at the end. Exopodites of the first and second maxillipedes armed with 10 setae; other limbs rudimentary; small knobs laterally on abdominal segments 2 and 3 and rudimentary lateral spines on segments 2, 3 and 4; long pleopods on segments 2 to 5; small on segment 6; telson long and narrow with nearly straight sides, 3 internal spines each side in the fork; no outside lateral spines.

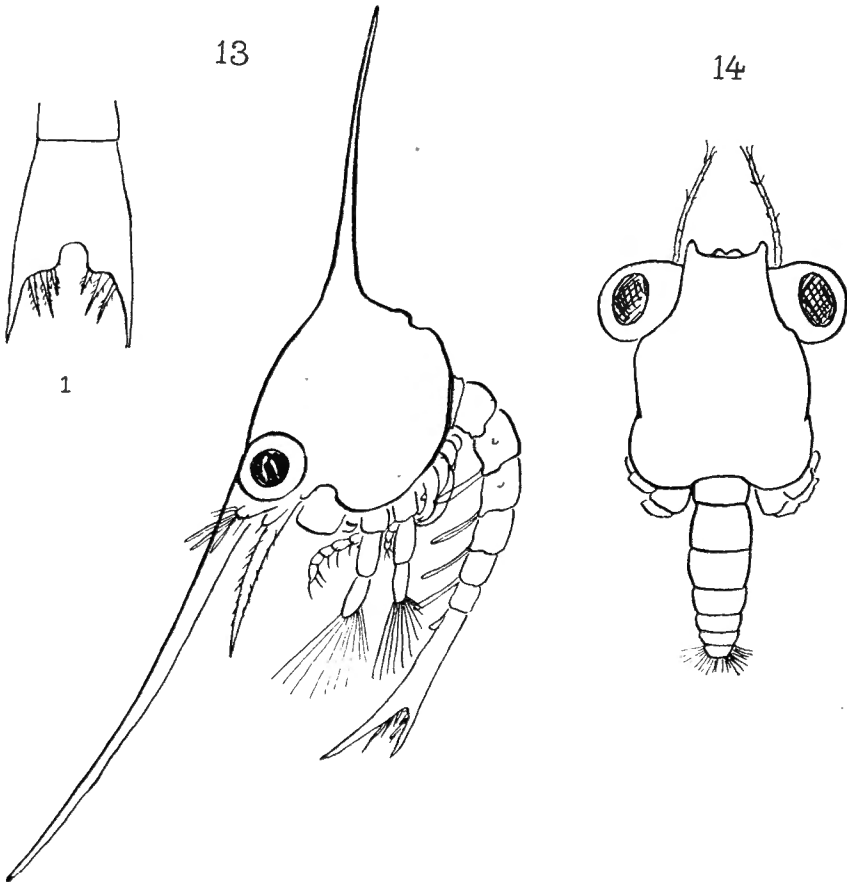


Fig. 13. — *Xanthiid zoea*, 4.8 mm. long from tip of dorsal spine to tip of rostrum, 1. telson.

Fig. 14. — *Xanthiid megalopa*, 2 mm. long.

Megalopa of Xanthiid, tube 5, Baie de Malampaya, 1932 (Fig. 14), one specimen only, 2 mm. long from front of carapace to end of telson. This is a small megalopa with the form and characteristic rostrum of all Xanthiid megalopae (Hyman, op. cit., Lebour, op. cit.), the centre of the rostrum bent down so that there are two horn-like processes in front of the carapace. Unfortunately all the legs are missing. Antennae fairly long; eyes large; carapace without spines; abdomen narrow, slightly swollen in the centre; telson rounded; uropods armed with 10 setae.

The following megalopa is difficult to place and probably belongs to the Pinnotheridae or the Oxystomata for the reasons given below:

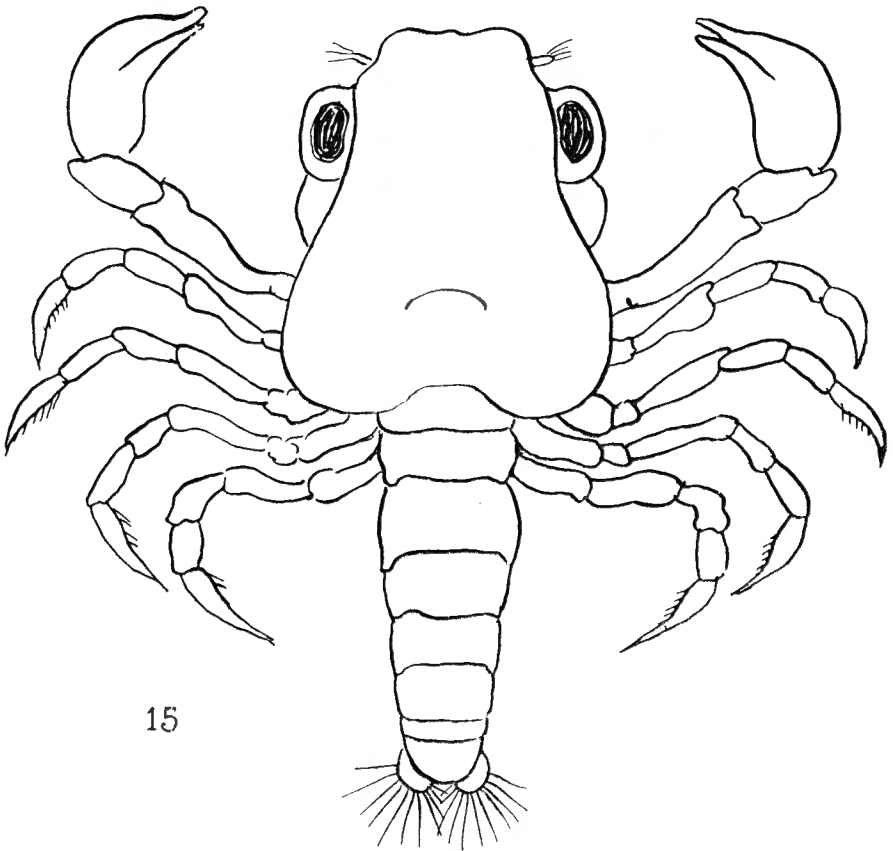


Fig. 15. — *Crab megalopa* E, 4 mm. long.

Megalopa E, tube 2, Asia Negros (Sud), 11/IV/32, one specimen only (Fig. 15), 4 mm. long from anterior end of carapace to end of telson; no feelers on the last segment of the last legs no rostrum, and no spines on the carapace, for these reasons it is placed here and probably belongs either to the Pinnotheridae or to the Oxystomata. The megalopae belonging to these groups have been shown to lack such feelers and have a similar front. The Oxyrhyncha which also lack the feelers, in all those known, are quite different in other ways. This megalopa is not at all unlike that of *Pinnotheres* and *Ebalia* (Lebour, op. cit.) which closely resemble one another. Carapace oblong, flattened anteriorly without rostrum; short antennae, chelae moderately large; abdomen rather narrow; telson rounded; uropods with 11 setae.

Grapsidae ?

Grapsoid (?) megalopa, Type B, tube 2, Asia Negros (Sud), 11/IV/32, one specimen, tube 4, Asia Negros, 11/IV/32, one specimen without legs (Fig. 16), 3.4 mm. long from front of carapace to end of telson; carapace 2 mm. long. Carapace straight in front where the rostrum is bent down; antennae very short; eyes large; chelae not very large; legs 2 to 4 armed with a curved tooth at the end of the penultimate joint and teeth on the last joint (3 on the second and third, 4 and some small tooth-like spines on the fourth); fifth leg with three feelers on the last joint; abdominal segments 2 to 6 prolonged laterally into slight processes at the sides, broader on sixth segment; telson rounded, about the same length as the sixth abdominal segment; uropods with 14 setae.

This megalopa is very like Rathbun's figures of *Pachygrapsus crassipes* and *Sesarma magdalensis* (op. cit., plate XXXIV, figs 1-5) and is obviously of the same type, the armature being very similar. If these be rightly identified there seems little difference in the megalopae of the two genera and it is impossible to guess to which genus the Philippine Island specimen belongs. It is interesting to find that Rathbun's specimens were caught with an electric light. Hyman (1924) also shows megalopae with similarly armed legs belonging to *Pachygrapsus marmoratus*.

Ocypodidae ?

Crab megalopae. Type A. A large type of megalopa belonging to two species occurred in tube 1 from Bacuit, the smaller of the two also occurring in tube 4 from Asia Negros, the larger species 12 mm. long, the smaller 9 mm. or rather less. Both are orange red when preserved with spots on the carapace, heavy and solid with large rounded carapace with rounded protuber-

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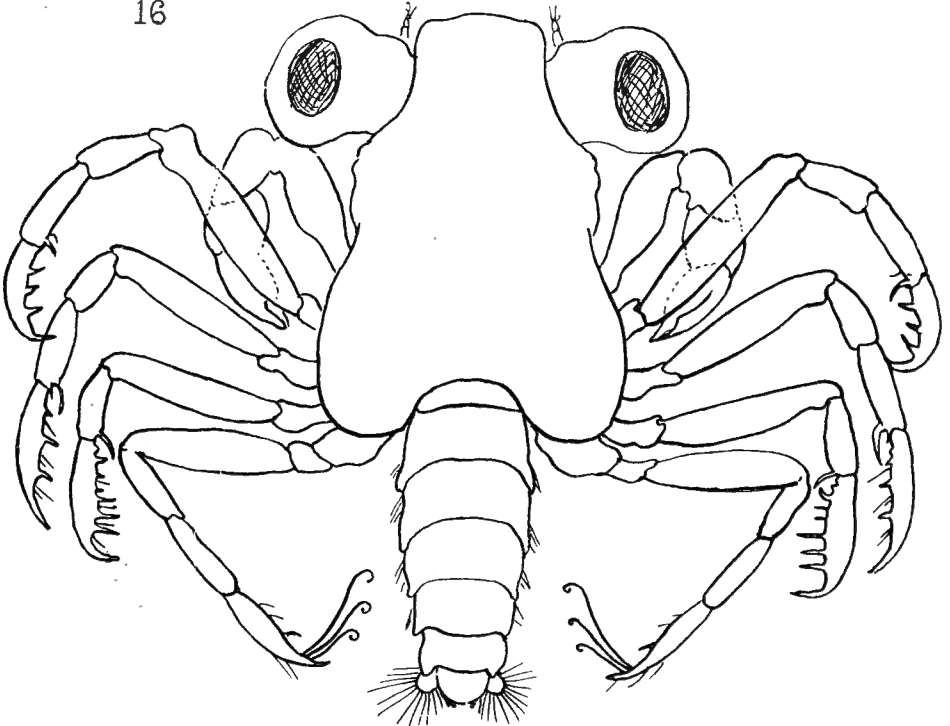
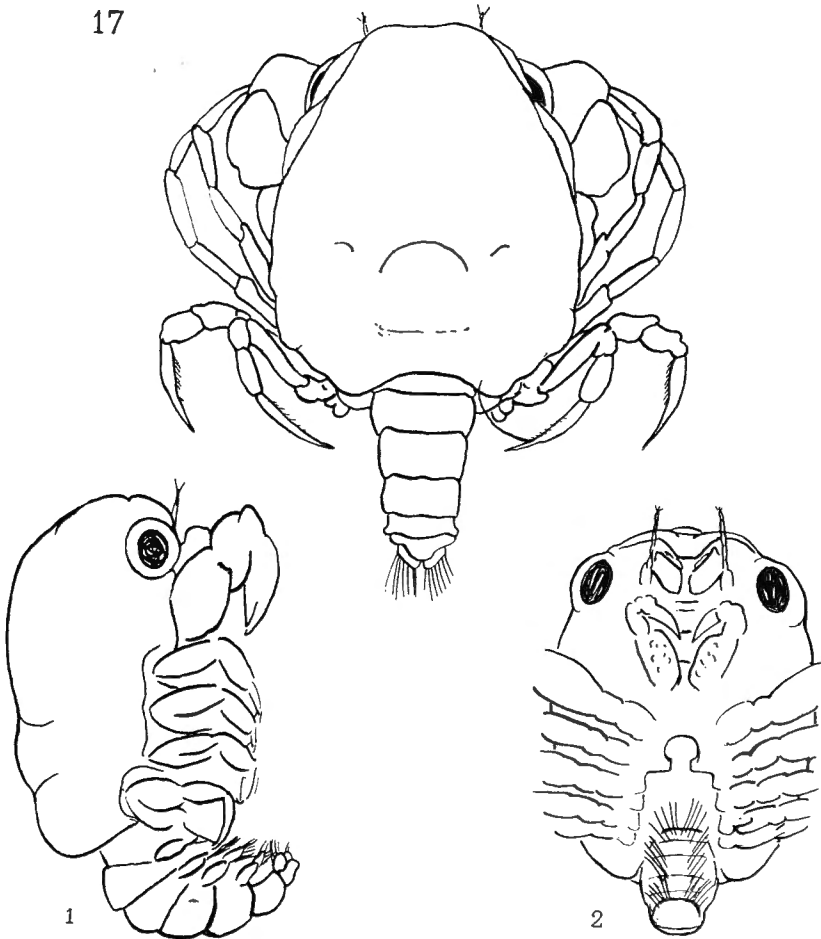


Fig. 16. — *Grapsoid (?) megalopa*, B, 3.4 mm. long.

rances, almost straight in front dorsally and curved down into a small rostrum; legs small, the second, third and fourth fitting into a side groove in the carapace, the last fitting into a latero-posterior groove so that the legs can be packed to fit very tight against the body; chelae broad and short; eyes not very prominent; antennule almost hidden, antennae very short; last legs of the smaller species with 3 feelers on the last segment; in the larger species one is present on the right fifth leg, but probably

the others have been lost; abdomen broad and short; telson three-lobed, the middle lobe projecting. These megalopae appear to belong to the Ocypodidae. I am indebted to Dr. I. Gordon of the British Museum for the suggestion that the smaller species in perhaps *Ocypode* or *Uca* which is borne out by the general form, antennules and antennae and by the fact that the third

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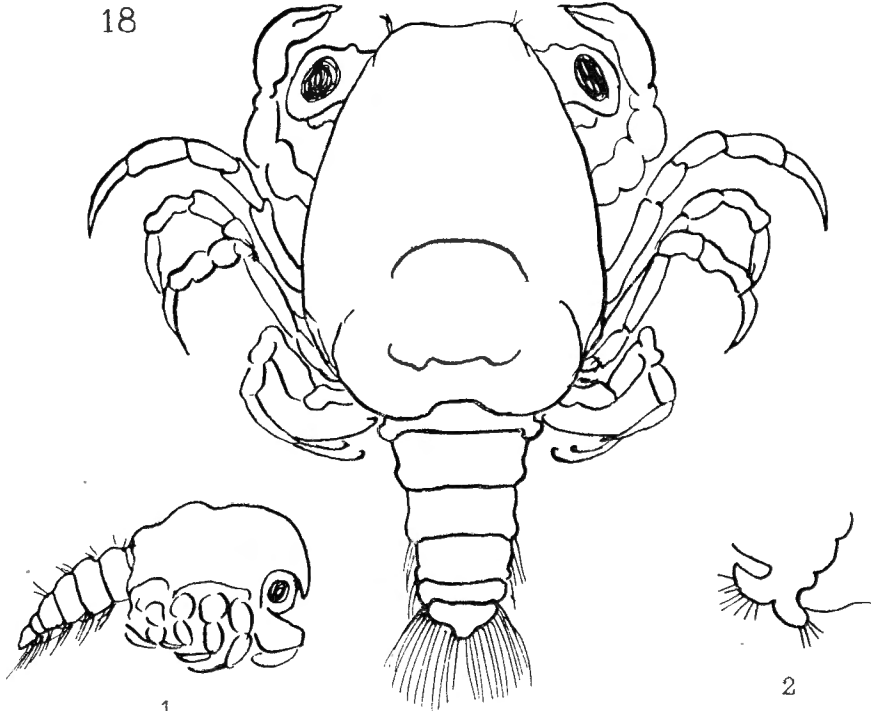


and fourth legs bear hairs on prominences at the base which may be the beginning of the entrance to the hairy edged pouch leading into the branchial cavity which is present in this family. The larger species is much like this but is without these

Fig. 17. — *Ocypodid* (?) *megalopa*, A 1. 12 mm. long.
1. side view, 2. ventral view.

hairs and differs in several minor points. It seems probable that they are species of *Ocypoda* as they have the antennules almost hidden and very short antennae. Also they do not agree with the megalopa of *Gelasimus* (= *Uca*) described by Hyman (1923).

Megalopa A, species 1, tube 1, Bacuit, 6/IV/32 (Fig. 17), one specimen only, 12 mm. long from anterior end of carapace to end of telson. Carapace much rounded; eyes hardly projecting; chelae thick and short, no hairs at the base of third and fourth legs; last leg with only one feeler on the last joint of the right



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Fig. 18. — *Ocypodid* (?) *megalopa A 2*, 9 mm. long.

1. side view, 2. base of front leg.

leg, the others probably lost; telson three-lobed; uropods projecting beyond the telson, armed with 7 setae.

Megalopa A, species 2, tube 1, Bacuit, 6/IV/32, one specimen, tube 4, Asia Negros, 11/IV/32, 4 specimens (Fig. 19), 9 mm. long or slightly smaller, from anterior end of carapace to end of telson. Carapace like species 1; eyes oblique and slightly projecting; chelae small and slender; 3 feelers on the end of the

last legs; bases of third and fourth legs with projections armed with hairs; telson similar to species 1 but uropods not projecting beyond it; uropods with many setae (over 12).

The Ocypodidae are land crabs which have aquatic larvae like the ordinary marine crabs. Hyman (op. cit.) gives an account of the life-history of *Gelasimus* which goes through several zoeal stages and one megalopal stage. The megalopa is sufficiently unlike the present specimen to show that they represent at least different genera, but yet they resemble one another in some ways so that they might well belong to the same family.

Stomatopoda.

Squilla species larva (late *Alima* stage); from Tube 6, Asia Negros, 11/IV/32. One specimen, length 15 mm. from tip of rostrum to end of telson (Fig. 19). This larva is very like the larva described by Hansen (1895) as *Alima Bigelowi* from Fernando Noronha, and is of the same type. Kemp (1915) gives eight species of *Squilla* from the Philippines and this probably belongs to one of them. Hansen's specimen measures 16.3 mm. in length and differs from the Philippine specimen especially in the uropods. The present specimen has well developed setose pleopods on the abdominal segments 1 to 5, those on the 6th, the uropods, having an unjointed exopod and endopod of two rami, the exopod with a small and a large tooth on the outer edge and setae round the end, the endopod with a tooth on the outer ramus whose end is drawn out into a point, the inner ramus being setose. The shape of the carapace with rostrum and spines closely resembles *A. Bigelowi*; length of carapace 1.9 mm. including spines, the rostrum long and projecting well beyond the eyes, the lateral ends of the carapace drawn out into a long spine each side and armed on the inner side with two spines, only one of which shows in the dorsal view, and there is a median spine dorsally at the extreme posterior end.

Two narrow thoracic segments show behind the carapace gradually enlarging towards the abdomen which also gradually widens towards the telson. The telson is drawn out into four points, the two median points slightly longer than those outside, with denticulations in the hollows between, those in the middle being finer than those outside. There is a small lateral tooth slightly behind the centre of the telson at each side. Eyes are large on thin stalks swollen towards the free end.

Antennules armed with setae; antennae with a smooth palp and setose plate. First thoracic limb ends in smooth points without any setae, the second, the prehensile claw, has a long simple end folding down on to the penultimate joint which has two small,

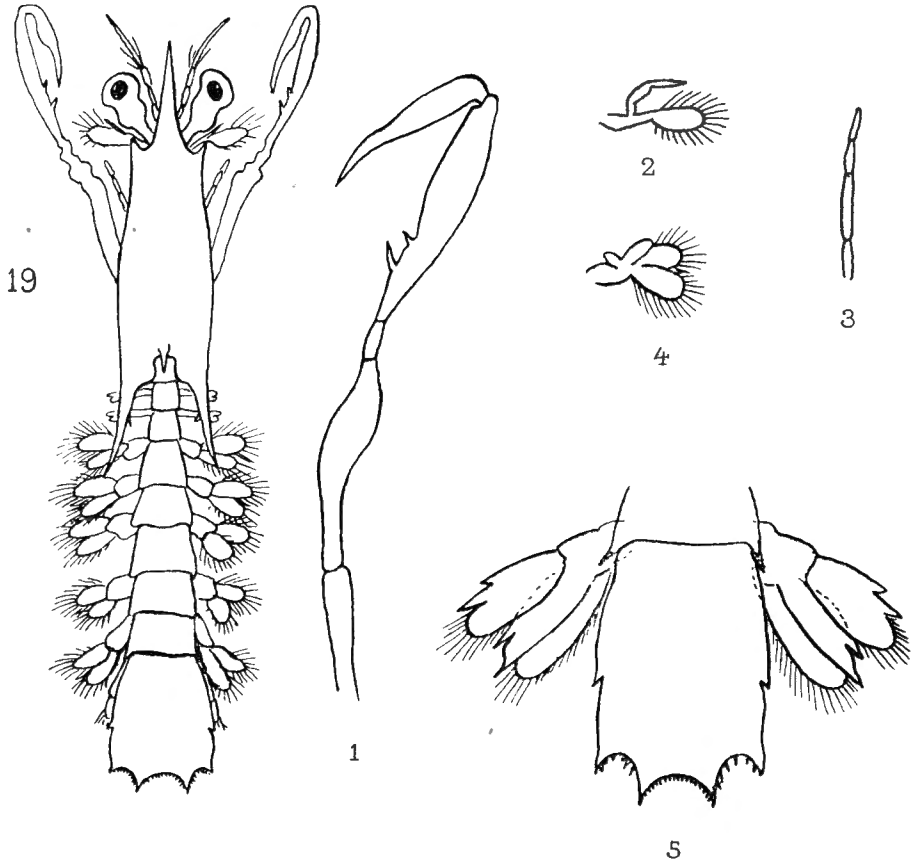


Fig. 19. — *Squilla larva (Alima)*, 15 mm. long.
1. second thoracic limb, 2. antenna, 3. end of first thoracic limb,
4. first pleopod, 5. telson.

thick spines internally behind the second half of its length, the next segment very small and narrow, the next irregularly swollen; third, fourth and fifth legs very small with incipient chelae. Although very much like *Alima Bigelowi* it is probably a different species, but closely related.

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LIST OF SPECIMENS IN EACH TUBE

- Tube 1.* — Bacuit, 6/IV/32: 2 crab megalopae 1 A 1, 1 A 2.
Tube 2. — Asia Negros (Sud), 11/IV/32: 2 pagurid Glaucothoë larvae Type A, species 1; 1 Glaucothoë larva, Type B; 1 crab zoea (Xanthiid), last stage; 1 Portunid megalopa C 1; 24 Portunid Megalopae C 2; 34 Portunid megalopae C 3; 1 Portunid megalopa C 4; 1 crab megalopa (Grapsoid) B; 1 crab megalopa E.
Tube 3. — Asia Negros (Sud), 11/IV/32: 1 Galathea (young).
Tube 4. — Asia Negros, 11/IV/32: 2 Glaucothoë larvae of a pagurid (Type A. species 2); 1 Portunid megalopa, C 2; 3 Portunid megalopae, C 3; 4 Crab megalopae, A 2; 1 Crab megalopa (Grapsoid) B.
Tube 5. — Baie de Malampaya, 1932: 1 Xanthiid crab megalopa; 3 Portunid megalopae, C 2; 4 Portunid megalopae, C 3.
Tube 6. — Asia Negros, 1/IV/32. One *Squilla* larva (Alima).

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