

XXIV. THE FAUNA OF BRACKISH PONDS
AT PORT CANNING, LOWER BENGAL.

PART X.—DECAPOD CRUSTACEA, WITH AN ACCOUNT OF A SMALL
COLLECTION FROM BRACKISH WATER NEAR CALCUTTA AND
IN THE DACCA DISTRICT, EASTERN BENGAL.

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The collection of Decapod Crustacea, chiefly gathered in brackish water ponds at Port Canning, comprises eleven species, three of which are new to science. Very interesting are also the numerous specimens of *Palæmon lamarrei*, H. M. Edw., a species that, since its first description in 1837, did no more appear in literature, or that has been misunderstood.

The collected species are the following:—

- Scylla serrata* (Forsk.), de Haan.
- Tympanomerus stapletoni*, sp. nov.
- Pachygrapsus propinquus*, sp. nov.
- Varuna litterata* (Fabr.), M. Edw.
- Metaplex dentipes* (Heller).
- Leander*, sp.
- Palæmon* (*Eupalæmon*) *lamarrei*, H. M. Edw.
- Palæmon*, sp.
- Caridina*, sp.
- Caridina propinqua*, sp. nov.
- Caridina nilotica* (Roux), var. *bengalensis*, var. nov.

The last-mentioned species is described in another paper, which appears at p. 255 of this Journal, entitled "On *Caridina nilotica* (Roux) and its varieties."

I. *Scylla serrata* (Forsk.), de Haan.

Scylla serrata (Forsk.), de Haan, Alcock, "Materials for a Carcinological Fauna of India," No. 4, pt. ii, Calcutta, 1899, p. 27 (*ubi synonym.*).

Two young males and a female of medium size from Port Canning (estuary of the Matla River).

The carapace of the female is 95 mm. broad and 64 mm. long. Outer angle of the wrist of the chelipedes with one small spine. In the smaller of the two males the last antero-lateral spine of the carapace is distinctly larger than the rest; the distance between the tips of these teeth, *i.e.*, the greatest breadth of the carapace, mea-

sure 20 mm., whereas it is 13.3 mm. long without the abdomen. Frontal lobes rounded, little prominent. In the other male, the carapace of which is 38 mm. broad and 25.5 mm. long, the last antero-lateral tooth is hardly larger than the rest and the four frontal lobes are already triangular, the lateral lobes being subacute. In this specimen the anterior margin of the right cheliped carries four spines, that of the left, as usually, three; in both males there is also but one small spine on the outer side of the wrist.

2. *Tympanomerus stapletoni*, sp. nov.

(Plate xviii, fig. 1.)

Forty-seven males and fifteen females, four of which are egg-bearing. They were collected by Mr. H. E. Stapleton in the Dacca District from a tidal river, the water of which is more or less brackish throughout the year.

Reg. No. $\frac{5137}{10}$.

As has already been observed by Col. Alcock (*Journal Asiatic Soc. Bengal*, vol. lxxix, pt. ii, No. 3, 1900, p. 371) the name *Tympanomerus* is a most unfortunate one, for, both in *Tymp. orientalis* (de M.) and in the present species, there are no tympana on the meropodites of the ambulatory legs; it is only in *Tymp. pusillus* (de Haan), from Japan, that small tympana exist on the meropodites of the last pair of legs. Specimens of *Tymp. orientalis* and *Tymp. pusillus* are lying before me. *Tymp. stapletoni* is intermediate in size between the two other species; it is somewhat larger than *Tymp. orientalis* but it does not attain the size of *Tymp. pusillus*. Both in the male and in the female the distance between the outer orbital angles is *one-fifth* longer than the length of the carapace, the epistome excluded. From the middle of the cardiac region the upper surface gradually slopes down towards the fronto-orbital margin and towards the moderately deflexed front. As in the two other species, the intestinal region, which is smooth and obliquely deflexed downward, is bounded anteriorly by a transverse ridge that runs between the coxæ of the fifth pair of legs; the intestinal area appears in *Tymp. stapletoni* higher (longer) in proportion to its breadth than in the two other species. Whereas in *Tymp. stapletoni* the transverse ridge runs quite parallel with the posterior margin of the carapace, it curves, laterally, a little backward in *Tymp. pusillus*; the posterior margin of the carapace measures, in *Tymp. stapletoni*, two-thirds the distance between the outer orbital angles. The other regions are not or very indistinctly defined. Somewhat nearer to the transverse ridge just described than to a line uniting the outer angles of the orbits, the shallow, transverse, median part of the cervical groove is situated, which median part is interrupted in the middle. The depressed upper surface is marked with transverse, symmetrically arranged, short, impressed lines, which are more numerous on the lateral regions than on the

gastric area ; they are wanting on the deflexed, somewhat pubescent, branchial regions and near the transverse, intestinal ridge. On the lateral regions of the carapace these lines are situated on transverse, pubescent ridges and prominences with crenulated margins. The anterior margin of the front measures one-fourth the distance between the outer orbital angles, and reaches in the middle further forward than at its rounded lateral angles ; the lateral margins of the front are first slightly directed inward and then pass with a regular curve into the sinuous, transverse, upper margin of the orbits. The upper surface of the front is broadly and rather deeply grooved in the middle, whereas the lateral parts carry five or six oblique, impressed lines at either side.

The orbits are *transverse* as in *Tymp. orientalis* and almost once and a half as broad as the front. The antero-lateral portion of the lateral borders of the carapace, formed by the extraorbital and by the epibranchial tooth, slightly diverges, whereas the postero-lateral portion slightly converges backward. The outer margin of the extraorbital tooth is at a right angle with the upper orbital margin, so that the extraorbital tooth is not very sharp and moderately prominent. The epibranchial tooth, hardly discernible when the carapace is looked at from above, appears, in a lateral view of the latter (fig. 1c), as a tooth larger than the extraorbital one, from which it is separated by a deep, vertical notch, the anterior margin of the epibranchial tooth being at a right angle with the outer margin of the other. Whereas the margins of the extraorbital and of the epibranchial tooth are rather sharp and continuous, the postero-lateral margins are often interrupted and appear therefore ill defined ; the oblique, ciliated line on the sides of the carapace is directed towards the posterior end of the epibranchial tooth. In *Tymp. pusillus* the postero-lateral margin is well defined and the epibranchial tooth is obtuse, but quite visible from above, as it projects laterally beyond the small extraorbital tooth ; this is also the case in *Tymp. orientalis*, but the divergent, antero-lateral margin is here much longer, and the oblique, ciliated line runs to the middle of the lateral border of the carapace (compare de Man, *Zoolog. Jahrb.* (Spengel), iv, 1889, p. 448).

Eye peduncles stout, smooth, transverse ; eyes terminal. Antennules folding obliquely. Lobe or tooth on the posterior margin of the epistome triangular, acute, very prominent. Lower margin of the orbits finely serrated, running nearly as in *Tymp. pusillus*, but less prominent ; no tooth therefore at the outer angle, as is observed in *Tymp. orientalis*. Pterygostomian region finely granulated and ciliated, as in *Tymp. pusillus*, but the lower, oblique groove that runs from the antero-external angle of the buccal frame obliquely backward, is very shallow and situated nearer to the lower orbital margin than to the lateral margin of the buccal frame, whereas in *Tymp. pusillus* it runs farther distant from the orbital margin than from the buccal frame.

Posterior margin of the buccal frame (fig. 1b) once and a half as broad as the distance between its antero-external angles, and

measuring two-thirds the greatest width. External maxillipeds shutting closely together. Ischium a little broader than long, its antero-internal angle produced, antero-external corner situated lower than the rest of the surface and bounded by a hairy line that runs obliquely from the outer margin to the antero-internal angle. Merus a little longer than the ischium and, though slightly broader than long, hardly as broad as the latter; this joint is sculptured with a sort of Y-shaped sulcus starting from the antero-external angle, as in *Tymp. orientalis*, but the outer branch is shorter and reaches hardly beyond the middle of the joint. Carpus ovate, concave, two last joints cylindrical. The outer margin of merus and ischium combined is regularly arcuate. Exognath completely concealed.

Sternum and abdomen are smooth. The abdomen (fig. 1d) of the male, which somewhat more resembles that of *Tymp. orientalis* than that of *Tymp. pusillus*, is 7-jointed. The terminal or seventh segment is, in the adult male, 1.5 mm. long,¹ and its posterior margin is 1.35 mm. broad; the lateral margins are a little concave and the tip is rounded. The penultimate segment, 1.1 mm. long, is a little shorter than the terminal, and as its lateral margins are convex, it presents its greatest breadth of 1.88 mm. in the middle, appearing almost twice as broad as long. The fifth joint is 1.52 mm. long, *i.e.*, as long as the terminal segment, and, *being strongly constricted just behind the middle*, appears *time-glass-shaped*; the anterior margin of this joint is 1.6 mm. broad, the posterior 1.72 mm. and at the constriction it is 1.1 mm. broad. The fourth joint is 0.96 mm. long, two-thirds of the preceding and its straight, posterior margin, 2.52 mm. broad, is $2\frac{1}{2}$ -times as broad as this joint is long. The third joint is 1.14 mm. long, a little longer than the fourth, and, as its margins are somewhat arcuate, it is 3.1 mm. broad, also two and a half times as broad as long, like the preceding segment. The second segment is very short, 0.62 mm. long, half as long as the third and 2.76 mm. broad. The first joint, finally, is the shortest and the broadest of all, 0.32 mm. long and 3.2 mm. broad; the posterior margin of the sternum, however, between the coxæ of the fifth legs, is 4.6 mm. broad.

The broad abdomen of the female much resembles that of *Tymp. pusillus*; the terminal joint, which is rounded at the tip, is 1.04 mm. long and its posterior margin is 1.9 mm. broad.

Chelipedes equal both in the male and in the female. The chelipedes of the male (fig. 1) more resemble those of *Tymp. pusillus* (de Haan) than those of *Tymp. orientalis*; they are just twice the length of the carapace and are thus rather short. The margins of the arm are unarmed, but they are granular, especially the upper one, the outer surface is nearly smooth, though a few microscopical granules are scattered on it, mostly near the upper margin; the granules are only visible by means of a lens. The upper surface of the carpal joints, which resemble those of *Tymp. pusillus*,

¹ All the joints are measured in the middle.

is smooth, their inner border is unarmed but microscopically granular, and one observes also a tuft of hair on the inner side just below the inner margin. Measured horizontally, the length (6.4 mm.) of the chelæ (fig. 1e) appears equal to that of the carapace, whereas the fingers, measuring one-third that length, appear half as long as the palm; the palm, 4.4 mm. long and 3 mm. high, is a little longer than high and the chelæ are, therefore, twice as long as high. The very finely granulated upper margin of the palm is obtuse, but in *Tymp. pusillus* the upper margin appears slightly compressed; the convex, outer surface of the palm is nearly smooth, but the rounded lower border appears again very finely granular, when examined under a lens, and this fine granulation extends nearly to the end of the immobile finger. Like the outer, so also the inner surface of the palm is marked with dark reticulate lines; on the inner surface these lines are finely granular. The straight, upper margin of the very oblique dactylus is also finely granular, but the granules are wanting along the middle line; the outer surface is slightly convex, smooth, somewhat punctate, and the prehensile edge carries eleven or twelve small teeth of equal size along its whole length. In *Tymp. pusillus* the outer side of the immobile finger is obtusely carinate longitudinally, though the granulate carina does not reach to the tip; in *Tymp. stapletoni* this carina is hardly discernible and the outer side of the finger is smooth; the immobile finger which is in a line with the lower margin of the palm is also finely denticulate like the dactylus. The fingers, which have slightly excavated tips, are, in younger males, comparatively longer.

The chelipedes of the female that are shorter than the legs, resemble those of *Tymp. pusillus*; the chelæ are half as long as the length of the carapace and the fingers that have broad-tipped, spoon-shaped extremities are slightly longer than the palm; the immobile finger is carinate longitudinally on its outer side.

The two middle pairs of ambulatory legs are a little longer than the others; in the adult male the legs of the antepenultimate pair are just twice as long as the distance between the outer orbital angles. *Tymp. stapletoni* is a species in which the meropodites carry no trace at all of "tympana," and proves more than any other the unfitness of the name of the genus. The meropodites are moderately dilated, so, e.g., are those of the antepenultimate pair little more than twice as long as broad, being 5 mm. long and 2.25 mm. broad in the middle. Their unarmed upper margin is granulated, and on the meropodites of the three first pairs the granules extend almost to the middle of the outer surface, but those of the last pair are nearly smooth; the lower margin is also finely granulated. The two following joints are less strongly compressed than those of *Tymp. pusillus* and are smooth, though somewhat punctate; finally, the terminal joints, which are compressed laterally, are a little shorter than the propodites.

Eggs very numerous, small, globular, 0.28—0.3 mm. broad.

Upper surface of the carapace dark blue, chelipedes and legs

marbled with partly reticulate, darker lines on a pale, olivaceous ground-colour; fingers ochraceous towards the tip. Ischium and posterior part of the merus of the outer foot-jaws and adjacent parts of the pterygostomian region whitish. Sternum and abdomen mottled with very small, dark points.

Measurements in millimetres.

| | ♂ | ♂ | Ovigerous ♀ | |
|---|-----|------|-------------|------|
| Distance between the outer orbital angles | 7.7 | 7.2 | 6.2 | 5.75 |
| Greatest breadth of carapace | 9 | 8.4 | 7 | 6.5 |
| Length of carapace, without epistome | 6.4 | 6 | 5.1 | 5 |
| Length of the chelipedes | 13 | 12.5 | 5.75 | 6.25 |
| Length of the antepenultimate legs | 15 | 14.5 | 9 | 9.5 |

3. *Pachygrapsus propinquus*, sp. nov.

(Plate xviii, fig. 2.)

A young male and a somewhat larger, sterile female from brackish water pools at Port Canning, Lower Bengal.

Carapace quadrangular, the distance between the outer orbital angles being one-third greater than the length. Upper surface depressed, very slightly arched transversely and longitudinally. Cervical groove quite distinct, interrupted at either side of the transverse median part, which is a little arcuate and placed immediately behind the middle. For the rest the regions are not defined, except the posterior cardiac area, which is indistinctly separated by shallow grooves from the branchial regions. Lateral margins of the carapace moderately convergent posteriorly, slightly concave in the middle, *with no tooth or spine* behind the acute outer orbital angles, that are directed outward. Branchial regions with eight or nine oblique, linear ridges, that barely extend on to the horizontal part of the upper surface; there is but a single transverse ridge on the hepatic regions, about midway between the orbits and the lateral parts of the cervical groove.

Front little more than half as broad as the distance between the outer orbital angles; it is strongly deflexed, though it is still partly visible when the carapace is looked at from above. Frontal lobes *four* in number, rounded, little prominent; lateral lobes a little broader than the internal ones; lower margin of the front very slightly concave in the middle, as in *Pach. minutus*. Anterior half of the gastric region and frontal lobes with numerous, transverse markings that are continued on to the front; the rest of the upper surface perfectly smooth. Posterior margin of the carapace about three-fourths the breadth of the front.

Orbits moderately oblique, eye-peduncles nearly smooth. Lower margin of the orbits sharp; opposite the basal part of the eye-peduncle, between its base and the cornea, the infraorbital

margin is divided into three or four small obtuse teeth and the arcuate, inner part appears somewhat uneven; the outer part of the margin carries a small, rounded notch not far from the outer orbital angle, and appears for the rest entire. Between the crenulate anterior margin of the buccal cavity and the arcuate, inner part of the infraorbital margin one observes a small, obtuse, dentiform lobe, at some distance from the anterolateral angle of the buccal cavity; in *Pach. minutus* this lobe is broader, transverse, almost contiguous to the antero-lateral angle of the buccal cavity and nearly in a line with the anterior margin of the latter. Subhepatic and subbranchial regions smooth, though pubescent. Lobe or tooth near the arcuate, inner part of the orbital margin triangular, subacute, separated by a rather broad hiatus from the front.

External maxillipeds (fig. 2a) as in *Pach. minutus*, a male specimen of which from the Bay of Batavia is lying before me; inner margin of the ischium straight (in *Pach. lævis*, Borr., concave), merus slightly broader than long, little shorter than the ischium, its inner angle obtuse, less produced than in *Pach. lævis*. Terminal segment (fig. 2b) of the male abdomen obtuse, almost as long as broad at base and distinctly longer than the penultimate segment; sternum and abdomen smooth.

Outer and inner sides of the merus of the right chelipede (the left is wanting in both specimens) furnished with transverse, squami-form, pubescent ridges, lower margin denticulate and with a sharp spine at the far end; anterior margin with a large, acute spine distally, followed on the distal margin by two smaller ones and preceded by three or four very small, acute teeth. Upper surface of the carpus with transverse and oblique ridges and with a small acute spine at the inner angle. Chela (fig. 2c) less convex than in *Pach. minutus*, upper margin of the palm with finely granular, oblique ridges, outer surface very finely granular, the granules only visible through a lens; a strong longitudinal ridge runs from near the tip of the immobile finger until near the carpal articulation; lower side of the palm with oblique markings and ridges. Fingers a little shorter than the palm, dactylus granular above and at its base, outer side of the fingers and lower margin of the index smooth; tips of the fingers spoon-like, glabrous.

Ambulatory legs (fig. 2) slenderer than those of *Pach. minutus*. Meri with transverse ridges on their outer surface and with an acute tooth above; the meri of the first pair are armed with two strong spines at the far end of their lower margin, those of the two middle legs with three and those of the last pair also with two, but on the three posterior legs these teeth are smaller than the two spines with which the lower margin of the meri of the 1st pair is armed. The three last joints are bristly and the dactyli, which are slightly curved at the acuminate tips, are but little shorter than the propodites.

Pachygrapsus lævis, Borr., from Funafuti (*Proc. Zool. Soc.*, 1900, p. 592, pl. xlii, fig. 7) is no doubt different. Of the single female on which this species was founded, the distance between the

outer orbital angles should be 7.5 mm., the length 6 mm., but the abdomen is apparently included, for, according to the figure, the length appears to be 5 mm., so that in this species the carapace is broader in proportion to its length, being just once and a half as broad as long. The frontal lobes are *seven* in number, the front is broader and the external maxillipeds are also different.

Pachygrapsus longipes, Rathb. (*Proc. National Museum*, xvi, 1893, p. 247, and *Bull. U. S. Fish Commission* for 1903, Wash., 1906, p. 840, pl. viii, fig. 7), from Honolulu, appears to resemble very much *Pach. planifrons*, de Man, from the Bay of Batavia (*Archiv. f. Naturg.*, bd. 53, 1888, p. 368, pl. xvi, fig. 2), but it is quite remarkable that neither Miss Rathbun nor Dr. Borradaile make mention of this species.¹ Unfortunately Miss Rathbun does not say whether, in *Pach. longipes*, the front is deflexed or not, but in the figure, published in 1906, the front resembles that of *Pach. planifrons*. According to this figure the propodal joints of the ambulatory legs should be *slenderer* than those of our species from Port Canning, so, *e.g.*, the propodites of the penultimate pair appear, in that figure, four times as long as broad; in the larger specimen of *Pach. propinquus*, however, these joints are *three times as long as broad*, *viz.*, 5 mm. long (measured along their posterior margin) and 1.6 mm. broad. I therefore suppose this Hawaiian form to be distinct from the species of the brackish pools at Port Canning. The slate-coloured upper surface of the carapace, and the red-brown legs are mottled with small dark spots. Measurements of the two specimens in millimetres—

| | | |
|---|------|------|
| Distance between the outer orbital angles | 10.7 | 8.3 |
| Length of carapace | 8 | 6.25 |
| Breadth of front | 5.8 | 4.4 |
| Breadth of posterior margin of carapace | 4.5 | 3.5 |

4. *Varuna litterata* (Fabr.), M. Edw.

Varuna litterata (Fabr.), M. Edw., Alcock, *l.c.*, No. 6, 1900, p. 401.

Port Canning, brackish water pools, January 28—30, 1906, collected by Dr. N. Annandale, four males, two females (Reg. No. $\frac{5115}{10}$; Nov. 12, 1906, nine males, three females).

Backergunge, seven males, nine females, collected by H. E. Stapleton (Reg. No. $\frac{5138}{10}$).

Dhappa, near Calcutta, slightly brackish water, twenty-eight males, two females.

All the specimens are young, the largest being a female from

¹ I wish to call attention to the fact that in vol. xxv of the *Zoological Record* for 1888 my paper on the Crustacea collected by Dr. Brock (*Archiv. f. Naturg.*, bd. 53, 1888) was mentioned in the List of Publications but not in the Systematic Part. The *Zoological Record* should not have been entrusted to such regardless authors.

Port Canning, the carapace of which is 23 mm. long. The anterior margin of the front is straight or very slightly concave. The specimens gathered at Dhappa are the youngest of all, the carapace of the smallest being hardly 4 mm. long.

5. *Metaplax dentipes* (Heller).

Helice dentipes, Heller, *Crustaceen der Novara-Reise*, 1865, p. 62, pl. v, fig. 5.

Metaplax dentipes, de Man, in *Journal Linnean Soc.*, xxii, 1888, p. 162, pl. xi, figs. 1—3; Alcock, *l.c.*, 1899, p. 433.

A male and a female, both adult, from brackish water pools at Port Canning.

The carapace of the male is 27.5 mm. broad and 20 mm. long, the epistome excluded. The infraorbital ridge consists of 23 lobules, that are quite typical. The penultimate segment of the abdomen is 3.5 mm. long, its anterior margin is 3.25 mm. broad, the posterior 5 mm., whereas the antepenultimate joint is 3 mm. long and the terminal joint as much.

The musical crest does not reach to the middle of the anterior margin of the arm and does not extend as far as the ischium; in a younger male from the Mergui Archipelago, lying before me, the crest is placed on the middle third of the anterior margin, conformably with my description of 1888; in this male the carapace is 19 mm. broad and 13.5 mm. long. The chelipedes of this male from Port Canning are equal, the chelæ are 26 mm. long, the palm 16.5 mm. long and 10.5 mm. high; the length of the palm is in proportion to its height as 13 : 8.3, according to my paper of 1888 this proportion should be 13 : 9½ for *Met. dentipes* and 13 : 8 for *Met. distinctus*, H. M. Edw. The chelæ closely resemble, indeed, those of the latter species (de Man, *l.c.*, pl. 10, fig. 9), as regards their shape and the serrations of the fingers.

The carapace of the female is 22 mm. broad and 16.5 mm. long, the infraorbital ridge consists of 23 lobules and hardly reaches beyond the lower margin of the orbits. The chelipedes are equal, 21 mm. long, almost as long as the carapace is broad; the two lower margins of the arm are finely denticulate, the outer surface granular, the upper margin hairy. Upper surface of the wrist minutely granular; chelæ 10 mm. long, about three times as long as high, fingers a little longer than the palm, the outer surface of which is minutely granular. In my work on the Crustacea collected by Capt. Storm I have pointed out that the ambulatory legs of *Met. elegans*, de M., are *slenderer* in the male than in the female (*Zoolog. Jahrb.* (Spengel), viii, Abth. f. Syst. 1895, p. 596); the same difference is presented by the male and female of *Met. dentipes*, the ambulatory legs being *much slenderer* in the male than in the female. So, e.g., are the legs of the penultimate pair of the male 56 mm. long, those of the female 41 mm., about twice as long as the carapace is broad; the meropodites of these legs are, in the male, 20 mm. long and 5.3 mm. broad; in the female, however, 14.5 mm. long

and 5.5 mm. broad, appearing, in the latter, *considerably broader* than in the male; the following joints are also slenderer in the male. The upper margin of the meropodites of the four ambulatory legs is armed, in the female, with an acute tooth near the distal end and this tooth is preceded, on the antepenultimate and penultimate pairs, by nine or ten smaller teeth that gradually become smaller. In the adult male the subdistal tooth is present on the meropodites of the four legs, but it is comparatively smaller than in the female, and the teeth that precede it, on the antepenultimate and penultimate pairs, are quite rudimentary, hardly recognizable. The ambulatory legs of the male are everywhere tomentose; in the female the mero- and carpopodites are nearly glabrous.

Geographical distribution: Ceylon (Heller), Mergui Archipelago (de Man), banks of the Hooghly, the mud-flats of Arakan, Tenasserim, and Mergui (Alcock).

6. *Leander*, sp.

(Plate xviii, fig. 3.)

Seventy specimens from Dhappa, near Calcutta, collected in slightly brackish water.

These specimens are all young, the largest are 23 or 24 mm. long from tip of rostrum to end of telson, but the majority are still younger and of different size. They belong to the group of *L. styliferus*, M. Edw. = *longirostris*, H. M. Edw. (*Hist. Nat. Crust.*, ii, p. 394), *L. tenuipes*, Hend., *L. japonicus*, Ortm., *L. carinatus*, Ortm., *L. hastatus*, Auriv., etc., but they show differences from all these species. I suppose, however, that these differences are *juvenile* characters and I therefore do not wish to describe these specimens as a new species, for probably they will later prove to belong either to *L. styliferus* or to *L. tenuipes*, the former of which inhabits an estuary of the Ganges, the Sunderbunds, Mergui, the Gulf of Martaban and Karachi, while the second has also been observed in the Gulf of Martaban, at Madras and at Bombay.

The rostrum, the distal half of which is upturned, exceeds the antennal scales by one-third or one-fourth of its length, but in the youngest individuals it hardly reaches beyond them. The basal crest, which reaches to the end of the first joint of the antennular peduncle or to the middle of the second, is usually armed with six, more rarely with seven or five teeth; these teeth are equidistant or the first is a little farther distant from the second than the following from each other, and the first tooth is situated just above the orbital margin or, just behind it, on the carapace. There is but one apical tooth; only in one specimen was a trace of a second observed by means of the microscope; the lower margin carries usually five, more rarely six or four teeth; in the youngest specimens there are often only three.

Branchiostegal spine a little larger than the antennal spine. Abdominal segments *not* carinate; in one of the largest specimens, the carapace of which is 9 mm. long, the rostrum included, and 3.9

mm. without it, the sixth segment of the abdomen is 2.4 mm. long, almost two-thirds the length of the carapace without the rostrum. The telson (fig. 3), distinctly longer than the sixth segment, reaches almost to the level of the spine on the outer margin of the exopodite of the caudal fin; the strongly tapering telson terminates in a slender, acute, median point or spine, the short, subterminal, outer spinules hardly reach to the middle of the median spine, but the inner spinules are almost twice as long as the median point. The two pairs of spinules on the upper surface are situated on its posterior half.

The shortest of the three antennular flagella extends by one-third of its length beyond the antennal scales. The spine at the outer margin of the antennal scales, is placed near the obtuse, oblique tip of the blade; the distance between the extremity of the blade and the tip of the spine measures only $\frac{1}{11}-\frac{1}{10}$ the length of the outer margin of the scale.

The legs of the first pair are slightly shorter than the antennal scales; carpus and merus are of equal length and one-fifth or one-sixth longer than the chela (fig. 3a), which is four times as long as broad, and the fingers of which are a little longer than the palm. In one of the largest specimens the merus of first legs is 1.4 mm. long, the carpus 1.45 mm.; the chela is 1.2 mm. long and 0.29 mm. broad.

The legs of the second pair are equal and extend with the fingers beyond the antennal scales (fig. 3b). Merus a little broader, but *slightly shorter* than the ischium, together as long as the chela. The carpus, which gradually thickens distally, measures two-thirds the length of the ischium and appears also distinctly *shorter* than the merus; its thickness at the distal end is about one-fourth its length. The chela much resembles that of *L. tenuipes*, Hend. (Henderson, "A Contribution to Indian Carcinology," 1893, pl. 40, fig. 14). The chela appears, in the largest specimens, just as long as the carapace without the rostrum; the palm, which is somewhat inflated, is very slightly longer, but much thicker than the carpus, whereas the elongate, slender fingers are *once and two-thirds* as long as the palm; the fingers have sharp cutting edges, but no teeth, and their apices are strongly curved inward; the palm appears in the middle once and a half as thick as the distal end of the carpus. The whole leg seems to be smooth. In one of the largest specimens ischium, merus, carpus, palm and fingers are respectively 2.04 mm., 1.75 mm., 1.36 mm., 1.46 mm. and 2.4 mm. long; in a younger specimen, about 17 mm. long, these numbers are, in the same order, 1.6 mm., 1.4 mm., 1.02 mm., 1.02 mm., and 1.74 mm., the palm appearing here just as long as the carpus.

The three other legs are very slender and in the largest specimens reach slightly beyond the antennal scales. The measurements of a leg of the fifth pair (fig. 3c) of a specimen 18 mm. long are as follows: merus 1.86 mm. long and 0.14 mm. broad, 13 times as long as broad; carpus 0.85 mm. long, propodus 2 mm. long and 0.1 mm. broad in the middle, 20 times as long as broad; dactylus 0.85 mm. long, 0.1 mm. broad near the propodal articulation,

and regularly tapering to the acuminate point which is slightly curved inward.

The adult *L. styliferus*, H. M. Edw., differs according to Henderson's description (*l.c.*, p. 439) by the following: There are often two or three apical teeth on the rostrum, the lower margin of which is armed with 7—10 teeth. The last four abdominal segments are dorsally more or less carinated. The distal spine on the outer margin of the antennal scale is placed farther distant from the apex, the distance equalling nearly one-third of the total length of the outer margin. The palm of the chelæ of the second legs should be sulcate on its outer side, the sulcus bounded by two ridges.

The adult *L. tenuipes*, Hend., differs at first sight by the merus of the second legs that has twice the length of the ischium and that has an ill-defined sulcus on its upper surface. The apex of the telson is described as blunt, but may perhaps have been worn off as is often the case. The shortest of the antennular flagella does not reach the end of the antennal scales.

7. *Palæmon (Eupalæmon) lamarrei*, H. M. Edw.

(Plate xix, fig. 4.)

Palæmon lamarrei, H. Milne Edwards, *Hist. Nat. Crustacés*, ii, 1837, p. 397.

Nec: *Palæmon lamarrei*, de Haan, *Fauna Japonica*, Crustacea, p. 171.

Nec: *Palæmon lamarrei*, Ortmann, in *Zool. Jahrb.*, v, Abth. f. Syst. 1890, p. 701, taf. xlvii, fig. 2.

Twenty-five specimens from brackish water pools at Port Canning, Lower Bengal, collected by Dr. N. Annandale, 28—30th January, 1906.

Thirty-nine specimens from Calcutta (Museum tank, fresh water), collected 19th December, 1906.

These specimens, though very numerous, are all young, the largest specimen from Port Canning being 38.5 mm. long from tip of rostrum to end of telson; the largest individual from Calcutta is 30.5 mm. long, the rest are all of a smaller size. The fact that no adult specimens have been gathered is so much the more to be regretted, because they apparently belong to *Pal. lamarrei*, M. Edw., a species which since its first description does no more appear in literature or has been misunderstood.

I have already pointed out ("Notes from the Leyden Museum," i, 1879, p. 166) that a species described by de Haan as *Pal. lamarrei* was identical with *Pal. amaxonicus*, Heller, from South America, but the existence of this species in Japan has not been confirmed as far as I am aware.

Without any ground Dr. Ortmann (*l.c.*) declared the localities mentioned by Milne Edwards and by de Haan as false, and, therefore, described Heller's species under the name of *Pal. lamarrei*.

Henderson ("A Contribution to Indian Carcinology," 1893, p. 442) regards *Pal. lamarrei* as being merely the young of *Pal. carcinus* (Fabr.), and by Lanchester *Pal. lamarrei* is regarded as a variety of *Pal. carcinus* ("Annals and Mag. Nat. History," ser. 7, vol. vi, 1900, p. 263 and "Proc. Zool. Soc." London, 1901, p. 565).

The rostrum, that exceeds the antennal scales in the largest specimen by one-third, in the younger individuals by one-fourth of its length, whereas in the youngest specimens it barely reaches beyond them, is upturned distally and presents, as regards its tothing, a great variation. In 21 specimens from Port Canning the following tothing was observed:—

| | | |
|-----------------------------------|------------------------------------|-----------------------------------|
| $\frac{7+1+2}{9}$, one specimen. | $\frac{5+1+1}{8}$, one specimen. | $\frac{5+1+2}{7}$, one specimen. |
| $\frac{6+1+1}{9}$, " " | $\frac{7+2}{7}$, " " | $\frac{5+2}{7}$, " " |
| $\frac{7+2}{8}$, " " | $\frac{7+1+1}{7}$, " " | $\frac{5+1}{7}$, " " |
| $\frac{7+1+1}{8}$, " " | $\frac{7+1}{7}$, " " | $\frac{7+2}{6}$, " " |
| $\frac{7+1}{8}$, " " | $\frac{6+2}{2}$, three specimens. | $\frac{6+1}{6}$, " " |
| $\frac{6+2}{8}$, two specimens. | $\frac{6+1}{7}$, one specimen. | $\frac{5+2}{6}$, " " |

In 35 specimens from Calcutta the tothing was as follows:—

| | | |
|------------------------------------|---|------------------------------------|
| $\frac{8+2}{9}$, one specimen. | $\frac{7+1}{8}$, one specimen. | $\frac{6+2}{7}$, three specimens. |
| $\frac{8+1}{9}$, " " | $\frac{7+?}{8}$, two specimens, in which the tip is broken. | $\frac{6+1+1}{7}$, one specimen. |
| $\frac{7+1}{9}$, " " | $\frac{6+2}{8}$, one specimen. | $\frac{6+1}{7}$, three specimens. |
| $\frac{9+2}{8}$, " " | $\frac{6+1}{8}$, " " | $\frac{8+1+1}{6}$, one specimen. |
| $\frac{8+2}{8}$, " " | $\frac{8+1+2}{7}$, " " | $\frac{8+2}{6}$, " " |
| $\frac{8+1}{8}$, " " | $\frac{7+1+?}{7}$, one specimen, in which the tip is broken. | $\frac{8+1}{6}$, " " |
| $\frac{7+1+1}{8}$, " " | $\frac{7+2}{7}$, three specimens. | $\frac{7+2}{6}$, " " |
| $\frac{7+2}{8}$, three specimens. | $\frac{7+1}{7}$, " " | $\frac{7+1}{6}$, " " |

These numbers prove that there are proximally in most cases 7 or 6, more rarely 8 and exceptionally 9 or 5 upper teeth, that

specimens with one apical tooth are as numerous as those the rostrum of which carries two apical teeth, and that the lower margin usually is armed with 7 or 8, rarely with 6 or 9 teeth. According to Milne Edwards the rostrum should carry 6 or 7 upper teeth proximally and as many on the lower margin, but it is remarkable that he makes no mention at all of the apical tooth or teeth. Generally the *two* first teeth are placed on the carapace, only in two specimens from Calcutta one tooth is placed on the carapace, and in a single specimen from the same locality the three first teeth are placed upon it. The apical tooth or teeth, which are much smaller than those on the proximal part of the upper margin, are usually separated from the latter by a long smooth interspace, which is as long as the distance between the foremost proximal tooth and the anterior margin of the carapace, rarely somewhat shorter than that distance; rarely, *i.e.*, in 11 out of 56 specimens, the foremost proximal tooth is placed on the smooth interspace, about midway between the preceding and the apical teeth. In the largest specimen from Port Canning (fig. 4), the rostrum of which presents the toothing formula $\frac{5+1+2}{7}$, the foremost proximal tooth of the

upper margin is placed just above the first of the lower, immediately in front of the distal end of the first joint of the antennular peduncle; in other individuals the foremost proximal tooth is situated more or less in front of the first tooth of the lower margin; the proximal teeth of the upper as well as those of the lower margin are equidistant, and the former are larger than the latter. The rostrum is moderately broadened at the level of the first tooth of the lower margin and the latter appears a little concave at the base.

Several specimens of *Pal. carcinus* from the Kutei river, Borneo (Siboga Expedition), lie before me, amongst which are several young ones, the youngest specimen being nearly 70 mm. long, rostrum included. The rostrum of *Pal. carcinus* is narrower, less broadened than in *Pal. lamarrei*, it reaches farther beyond the antennal scales and the toothing is different; of the twelve or thirteen teeth of the upper margin the *three* first are placed on the carapace, and there is *no long smooth interspace* as in *Pal. lamarrei*, though the three or four teeth on the upturned part of the rostrum are farther distant from each other than the proximal teeth; the lower margin, finally, presents also a larger number of teeth, eleven or twelve, which reach to near the tip.

The sixth segment of the abdomen (plate xix, fig. 5) is *comparatively longer and broader* in *Pal. lamarrei* than in *Pal. carcinus*. In the specimen of the latter species, which is 70 mm. in length, the carapace, rostrum excluded, being 12 mm. long, the sixth segment is 5.5 mm. long and 4.3 mm. broad in the middle; in the largest specimen of *Pal. lamarrei*, which has a length of 38.5 mm., the carapace of which, without the rostrum, being 6.8 mm. long, the sixth segment of the abdomen is 3.9 mm. long and 2.4 mm. broad.

The slender telson (fig. 4d) apparently tapers less strongly than that of *Pal. carcinus* (fig. 5a), but it reaches almost to the

end of the endopodite of the caudal fin; this is not the case in *Pal. carcinus*; the telson ends in an acute point which reaches beyond the short, outer pair of subterminal spinules, whereas the long, inner pair extends far beyond the median spine. The telson is somewhat flattened on its posterior half, and the two pairs of spinules on the upper surface are placed as in *Pal. carcinus*; in the largest specimen from Port Canning there are three spinules on the left side and two on the right.

The shortest antennular flagellum which, as in *Pal. carcinus*, is united with the outer for a very short distance, exceeds the antennal scales by two-thirds of its length; free end of the antennal scales obtuse, reaching far beyond the outer spine. The third or distal joint of the mandibular palp is once and a half as long as the second; the third joint carries five setæ, two of which at the distal end are a little longer than the joint itself. External maxillipeds as in *Pal. carcinus*, extending with half their terminal joint beyond the tip of the antennal peduncle.

The first pair of legs reach to the spine at the far end of the outer margin of the antennal scales. The slender carpus, which is somewhat thickened distally, is one-fourth longer than the merus, which is nine times as long as broad and broader than the carpus; the chela is almost half as long as the carpus, its length being to that of the carpus as 4 : 9; the fingers are one-fourth longer than the palm. In the largest specimen from Port Canning the merus is 2.75 mm. long and 0.3 mm. broad; the carpus is 3.4 mm. long, the chela 1.52 mm., the palm 0.68 mm., the fingers 0.84 mm.; in a specimen from Calcutta which is 29 mm. in length, the merus is 2.3 mm. long and 0.23 mm. broad, just ten times as long as broad; the carpus 2.7 mm. long, the chela 1.26 mm., the palm 0.62 mm., the fingers 0.64 mm.

The second legs (fig. 4e) project with one-fourth of their propodites beyond the antennal scales and are twice as long as the carapace, rostrum excluded. The merus measures one-fourth the whole leg and is eleven times as long as broad; the carpus, which has a slenderer shape, and which thickens at the distal end, is just *once and a half* as long as the merus, *almost twice as long as the chela and three times as long as the palm*. The palm (fig. 4f) is a little longer than the fingers; it is a little broader than the distal extremity of the carpus and once and a half as broad as thick, being slightly compressed. Of the largest specimen from Port Canning, the carapace of which is 6.75 mm. long without the rostrum, the merus is 3.35 mm. long and 0.3 mm. broad; the carpus is 5.1 mm. long, the chela 2.97 mm., the palm 1.6 mm. and the fingers 1.37 mm. In one of the largest specimens from Calcutta (carapace 4.8 mm. long without the rostrum) the merus is 2.75 mm. long and 0.2 mm. broad, the carpus 3.9 mm. long, the chela 2.26 mm., the palm 1.15 mm., the fingers 1.11 mm.; in a younger specimen from Calcutta (carapace 3.7 mm. long without the rostrum) the merus is 1.9 mm. long and 0.16 mm. broad, the carpus 2.75 mm. long, the chela 1.65 mm., the palm 0.84 mm., the fingers 0.81 mm.

The following legs are slender, those of the fifth pair extend with their dactyli beyond the antennal scales. In a young specimen from Calcutta, which is 24 mm. in length, the legs of the fifth pair show the following measurements: merus 2.66 mm. long and 17 times as long as broad, carpus 1.4 mm. long, propodus 3 mm. long and 0.11 mm. broad in the middle, dactylus 1 mm. long and just as broad at the articulation as the preceding joint in the middle. The propodite, much slenderer than the merus and thickening towards the distal extremity, is just three times as long as the dactylus, which is very slightly curved towards the extremity.

Pal. amazonicus, Heller, with which *Pal. ensiculus*, Smith, and *Pal. jelskii*, Miers, are regarded as identical by Dr. Ortmann, is no doubt a different species. Three specimens of de Haan's *Pal. dieperinkii* from Surinam (Leyden Museum), a species identical with *Pal. amazonicus* (de Man, "Notes, Leyden Museum," i, 1879, p. 167) are lying before me. In this species the telson tapers to a pointed extremity, whereas the lateral spinules do not reach the tip; the two pairs of spinules on the upper surface are situated more forward, the anterior pair being farther distant from the tip of the telson than from its base. The rostrum is higher at its base, though in this species also the two first teeth are on the carapace. Unfortunately the three specimens are adult, the carapace of the youngest, without the rostrum, being 21 mm. long, so that I am unable to compare the legs, the measurements of which show other proportions than in very young specimens.

As regards *Pal. carcinus*, I wish to observe that in the youngest specimen from the Kutei river the carpus (6.75 mm.) of the second legs is but *little longer* than the merus (5.5 mm.); *slightly shorter* than the chela (7.25 mm.) and only once and a half as long as the palm (4.25 mm.).

Geographical distribution: Coast of Bengal (H. M. Edw.).

8. *Palæmon*, sp.

Two specimens from Dhappa, near Calcutta, slightly brackish water.

The two specimens are of equal size, 17—18 mm. long from tip of rostrum to end of telson; they are apparently very young and the legs, especially those of the first and second pairs, are wanting, so that I am unable to identify them with any known form.

The lanceolate rostrum is straight and barely reaches beyond the antennal scales. In both specimens the rostrum is $\frac{1}{3}$ dentate; the two first teeth are placed on the carapace and are once and a half respectively almost twice as far distant from each other as the second from the third; the following teeth are equidistant, but in one specimen the tenth tooth is farther remote from the eleventh, the distance between these two teeth being equal to the distance between the eleventh tooth and the tip, in the other the ninth and the tenth are farther distant than the preceding.

Body smooth. The telson tapers to a median point, far exceeded by the long, inner pair of subterminal spinules; the anterior

pair of spinules on the upper surface is placed just in the middle of the telson.

Prof. Henderson ("A Contribution to Indian Carcinology," 1893) describes five species observed near Calcutta and in rivers of India, but all seem to be different. *Pal. altifrons* differs by a shorter and deeper rostrum, that of *Pal. dayanus* presents another toothing $\frac{7-9}{5-6}$; in *Pal. scabriculus* the four to six first teeth are situated on the carapace, *Pal. dispar* is probably also different and this is, of course, also the case with *Pal. carcinus*.

9. *Caridina*, sp.

Three specimens which seem to belong either to *Car. gracilirostris*, de M., or to *Car. gracillima*, Lanch., were gathered at Dhappa, near Calcutta, in slightly brackish water. Unfortunately, the rostrum is broken or incomplete at the tip and most of the legs are wanting, so that it proved to be impossible to determine them with certainty.

10. *Caridina propinqua*, sp. nov.

(Plate xix, fig. 6.)

Five specimens of different size from Dhappa, near Calcutta, collected in slightly brackish water. This species is closely related to *Car. syriaca*, Bouv., from Syria, and still more to *Car. fossarum*, Heller, from Persia, but is perhaps different.

The largest specimen is 20.5 mm. long from tip of rostrum to tip of telson and all are devoid of eggs, so that these specimens are, therefore, probably young.

In the largest specimen the rostrum, which just reaches beyond the far end of the second joint of the antennular peduncles, projects at first straight forward to the middle and then turns slightly downward. The upper margin is armed with 21 rather small teeth that stand until near the tip; the three first teeth are placed on the carapace. On the slightly convex median part of the upper margin the teeth are placed nearer together (fig. 6); the penultimate tooth is a little farther distant from the antepenultimate than the preceding, and the foremost tooth is still slightly farther distant from the penultimate. The distance between the foremost tooth and the acute tip of the rostrum is only one-tenth the length of the rostrum proper, and not yet twice as long as the distance between the foremost tooth and the penultimate. The rostrum, 3.1 mm. long from the tip to the anterior margin of the carapace and 0.46 mm. broad, not yet seven times as long as broad, appears a little lower (less broad) than that of *Car. syriaca* (Bouvier, "Observations nouvelles sur les crevettes de la famille des Atyidés," 1905, p. 82, fig. 6). The lower margin carries a single tooth that is smaller than the teeth of the upper margin and placed at the anterior third of the rostrum; the anterior part of the lower margin between this

tooth and the tip, which appears slightly concave in *Car. syriaca*, appears in *Car. propinqua* straight and the rostrum is proximally less concave:

In another specimen nearly of the same size the rostrum of which is broken off, four teeth are placed on the carapace. In the third specimen, 19.5 mm. long, the rostrum is turned downward from the base and reaches to the end of the second joint of the antennular peduncle; the rostrum—2.5 mm. long from the tip to the anterior margin of the carapace and 0.4 mm. high (broad)—has the same form as in the first specimen. The upper margin carries 17 equidistant teeth, four of which are placed on the carapace; the foremost tooth is farther remote from the acute tip than in the preceding specimen, its distance from the tip is nearly one-sixth the length of the rostrum proper and as long as the space occupied by the four anterior teeth together. The lower margin carries two teeth on its anterior half; these teeth, smaller again than those of the upper margin, are situated just below the foremost and the penultimate tooth of the latter.

The fourth specimen is much younger, being 13.5 mm. long. The rostrum, little longer than the first joint, rises at first a little upward, but soon curves downward and has, therefore, another shape than in the preceding specimens. There are again 17 teeth on the upper margin, four of which are on the carapace; the distance between the foremost tooth and the tip measures one-seventh the length of the rostrum proper. The rostrum appears a little less broad (high) than in the preceding specimens, its height being only one-eighth of its length. There is but one small tooth on the lower margin, situated just below the penultimate tooth of the upper.

Unfortunately in the youngest specimen, 10 mm. long, the tip of the rostrum is broken off, the existing part reaches quite horizontally to the end of the first joint of the antennular peduncle and carries 16 teeth, five of which are on the carapace; the lower margin bears two teeth. The telson of the third specimen carries, on the posterior third of its upper surface, two pairs of spinules, the posterior spinule on the left side is wanting; the triangular tip carries at either side four or five spinules, the first of which, at the outer angles, is as usual the shortest, the second the longest, 0.3 mm. long, the third 0.24 mm. long, the fourth 0.16 mm. The telson (fig. 6a) of the second specimen carries at its posterior extremity at the right side six, at the left seven spinules (fig. 6b), the first small spine at the left angle being apparently supernumerary. The upper surface carries two pairs of spinules, but one spinule at the right side is wanting. The telson of the largest specimen carries three pairs of spinules above, the anterior pair placed somewhat nearer to the base than to the tip of the telson.

Antennular peduncle reaching to the middle of the distal spine of the antennal scales, shorter therefore than the latter. The first joint, *i.e.*, the distance between the anterior margin of the carapace and the far end of this joint, is slightly longer than the

two following joints taken together ; the second joint is little more than half as long as the first and about three times as long as broad ; the third joint measures three-fifths the length of the second. The acuminate stylocerite reaches, as in *Car. syriaca*, almost to the end of the first joint and diverges slightly outward ; the spine at the end of the outer margin of the first joint measures two-fifths the length of the second. External maxillipeds reaching to the end of the second joint of the antennular peduncle.

The legs of the first pair (fig. 6c) reach almost to the end of the antennal peduncle. The carpus, which is one-third longer than the merus, resembles that of *Car. lævis*, Heller, and is 2.5—2.7 times as long as broad distally ; its upper margin is slightly concave, the lower straight, and it is just half as thick proximally as distally. The chela, one-fourth longer than the carpus, is a little more than twice as long as broad, and the fingers are once and a half to twice as long as the palm.

The second legs (fig. 6d) reach to the middle of the antennal scales, projecting just beyond the antennal peduncles. The carpus, once and a half as long as the merus, is moderately slender and 4.5—5.5 times as long as thick distally. The chela (fig. 6e), shorter than the carpus, is nearly three times as long as broad, the proportion between length and breadth varying between 2.64 and 3.32 ; the fingers are a little more than once and a half to twice as long as the palm.

Merus of third legs nine times as long as broad and armed near its lower margin with four spines which are 0.21 mm. long ; the second spine is placed somewhat nearer to the proximal than to the distal extremity, the first just midway between the second and the proximal extremity, the third as far from the second as the second from the first, the fourth near the distal extremity. There is also a spine near the distal end of the carpus. The dactyli (fig. 6f) measure barely one-third the length of the propodites ; they carry five or six spines. In the third specimen, the rostrum of which is $\frac{1}{2}$ toothed, the dactyli are five times as long as broad and armed with four spines, besides the terminal claw ; the third is separated by a long, smooth interspace from the penultimate spine, probably abnormally, for, in the two larger specimens, the five or six spines are arranged regularly as in other species.

The meropodites of the fourth legs are 8 times as long as broad and armed with four spines near their lower margin, the fourth being inserted near the distal end. The propodites, 13.6 times as long as broad, are 3.6 times as long as the dactyli, that are almost five times as long as broad ; the dactyli are armed with nine spines, the terminal claw included.

Unfortunately, only in one specimen, the third, a fifth leg is present ; in the other specimens these legs are wanting. The meropodite, 1.4 mm. long, is 8 times as long as broad ; there is a spine 0.18 mm. long near the distal extremity of the lower margin. Propodite 1.76 mm. long, about 14 times as long as broad ; the dactylus, almost six times as long as broad, measures *two-fifths* the

length of the propodite and is armed with 48 spinules, the terminal claw included. *Caridina syriaca*, Bouv., is at once distinguished by the upper teeth of the rostrum, *none of which are placed on the carapace.*

When the descriptions of *Car. fossarum* (Heller, in "Sitzungsber. K. Akad. Wiss.," 1862, p. 411, and de Man, in Max Weber's "Zool. Ergebn. Reise Niederl. Ost-Indien," ii, 1892, p. 397) are compared, it becomes obvious that the Bengal species chiefly differs by the lower margin of the rostrum presenting only 1 or 2 teeth instead of 7—9. In the same paper (*l.c.*, p. 377) I have, however, pointed out that in *Car. lævis*, Heller, a closely related species from Java, the lower margin presents not only 3 teeth, as was described by Heller, but sometimes 4 to 9, 11 or 15, though also a specimen was observed from the same locality with 2 teeth and another in which the lower margin carried only one tooth! This great variation may also be proper to *Car. propinqua*, and in that case this species should perhaps prove to be identical with *Car. fossarum*: a further observation of specimens of the Bengal species appears therefore necessary. Several ovigerous females of *Car. lævis*, Heller, from the freshwater lake Situ Bagendit, Java (de Man, *l.c.*, p. 376) are lying before me. This species may easily be distinguished by the legs of the first and of the second pair. The carpus of the first legs closely resembles that of *Car. propinqua*, as it is also two and a half times as long as broad, but the fingers are a little shorter. The carpus (plate xix, fig. 7) of the second legs has a slenderer shape, being almost eight times as long as thick distally; the chief difference is, however, presented by the chela which has a *much slenderer form*, being 4—4.7 times as long as broad (fig. 7a); in *Car. propinqua* only about 3 times (fig. 6e).

As regards the other legs the two species closely agree as is proved by the measurements given below, and also by the following: The meropodites of the third pair are about 9 times as long as broad, there is a spine on the middle of the lower margin of the ischium and three on that of the meropodites; the second spine is inserted a little nearer to the distal than to the proximal extremity, the first just midway between the proximal extremity and the second spine, the third near the distal extremity; these spines are 0.2 mm. long. A similar spine occurs at the far end of the carpus. The propodites carry 16—18 spinules along their lower margin; the dactyli are in the same proportion to the propodites as in *Car. propinqua*, but they are armed with eight or nine spines.

The meropodites of the fifth pair are, in *Car. lævis*, just 8 times as long as broad and one-fourth shorter than those of the third; the ischium has no spine, but there is a spine near the middle of the lower margin of the meropodites and another, not far from the distal extremity. There is also a spine at the far end of the carpus and three smaller spines between the former and the proximal extremity.

Car. hova, Nob., from Madagascar and *Car. opaensis*, Roux, from Celebes are also related species. In the Madagascar species

the tip of the rostrum is slightly directed upward. The third joint of the antennular peduncle is described as subequal to the second; the stylocerite reaches to the middle of the second joint. External maxillipeds projecting beyond the antennal scales. The carpus of first legs is more distinctly excavate and more regularly conical; the fingers are as long as or barely longer than the palm. The chela of the second legs is shorter in proportion to the carpus, the dactyli of the third pair measure one-fourth and those of the fifth barely one-fifth of the propodite, appearing much shorter than in *Car. propinqua* (Nobili, "Boll. Mus. Zool. Torino," xx, 1905, No. 499).

The rostrum of *Car. opaensis*, Roux, is also *turned upward* at the tip and carries three or four teeth on the lower margin. The carpus of the first legs is three times as long as thick distally and *the fingers are slightly shorter than the palm*; those of the second legs, as also the dactyli of the following, are shorter than those of *Car. propinqua* (Roux, "Décapodes d'eau douce de Célèbes, Genève," 1904, p. 547, figs. 8, 9 and 10).

