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XXVIII. ON *CARIDINA NILOTICA* (ROUX)  
AND ITS VARIETIES.

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The collection of Crustacea obtained from brackish water ponds at Port Canning, Lower Bengal, which is described at p. 211 of this Journal, comprised also very numerous specimens of a variety of *Caridina nilotica* (Roux) which proved to be new. As our knowledge of this species and its varieties appears still much confused and unsatisfactory, the present paper will, I think, be welcome.

The typical species, *Caridina nilotica* (Roux) from the Nile, was described by Roux, as a *Pelias*, in the *Annales des Sciences Naturelles*, t. xxviii, 1833, p. 73, pl. 7.

Compare the following papers:—

*Hickson, S. J.*, On a new Species of the genus *Atya* (*A. wyckii*) from Celebes, in: *Annals and Magaz. of Natural History* for Nov. 1888, p. 357, pls. xiii, xiv.

*de Man, J. G.*, in: *Max Weber's Zoolog. Ergebnisse einer Reise nach Niederl. Ost-Indien*, ii, 1892, p. 386, pl. xxiv, figs. 29, 29 k.

*Max Weber*, Zur Kenntniss der Süßwasser-Fauna von Süd-Afrika, in: *Zoolog. Jahrbücher (Spengel)*, Abth. f. System. x, 1897, p. 168.

*Schenkel, E.*, in: *Verhandl. der Naturf. Gesellschaft in Basel* xiii, 1902, Heft 3, pp. 497-499.

*de Man, J. G.*, in: *Abhandl. der Senckenberg. Naturf. Gesellschaft*, xxv, 1902, p. 895.

*Bouvier, E. L.*, in: *Bulletin Scientif. de la France et de la Belgique*, t. xxxix, 1905, pp. 78-80.

*Calman, W. T.*, in: *Proceed. Zoolog. Soc. London*, 1906, vol. i, p. 189.

The following material lies before me:—

1. Twenty-three specimens, some of which are adult and egg-bearing, collected, December 1903, in ponds and canals near Cairo, Egypt, and presented to me by Capt. S. S. Flower, Director of the Zoological Gardens at Giza, near Cairo, January 1904.
2. Twenty specimens, some of which are egg-bearing, of *Caridina longirostris*, H. M. Edw., from the river Macta, near Oran, co-types, received in 1890 from the



Museum at Paris; these specimens have already been described by me in my paper of 1892 (*l.c.*).

3. An egg-bearing female and a younger specimen without eggs from the Lake Victoria Nyanza, Bay Kavirondo, received, May 1904, from Prof. E. L. Bouvier,—*Caridina wyckii*, Hicks., var. *paucipara*, de Man; these specimens were collected, Sept. 1903, by M. Alluaud.
4. Three egg-bearing females from the river Umgeni, Natal, collected Nov. 1894, and received from Prof. Max Weber,—*Car. wyckii*, Hicks.
5. Six adult specimens, three of which are ova-bearing, from the river Umhlasine, Natal, collected by Prof. Max Weber in 1894 and presented by him,—*Car. wyckii*, Hicks. var. *paucipara*, M. Weber.
6. One egg-bearing adult female and 60 young specimens collected by Dr. N. Annandale, Jan. 28—30th, 1906, in brackish water ponds at Port Canning, Lower Bengal.
7. Fourteen ova-bearing adult females and 48 younger specimens collected, Nov. 12th, 1906, in the same locality.
8. Twenty-four ova-bearing females of somewhat smaller size than the preceding and 40 young specimens gathered, Dec. 8th, 1906, in the same locality.
9. Four specimens, one of which is adult, collected at Dhappa, near Calcutta, in slightly brackish water.
10. Three adult specimens with eggs from the river near Palopo, Luwu, Celebes, described by me, *l.c.*, 1892, p. 388, as the typical form of *Car. wyckii*.
11. Three adult specimens with eggs, from the river near Mbawa, Flores, described by me, *l.c.*, 1892, p. 393, also as the typical form of *Car. wyckii*.
12. Three adult females with eggs from Maros, Celebes, described by me, *l.c.*, 1892, p. 393, as the variety *gracilipes* of *Car. wyckii* (Hickson).

A punctual and close examination of this large interesting material and accurate measurements of the thoracic legs led to the following results:—

- (a) *Caridina longirostris*, H. M. Edw., from Oran is not identical with *Car. nilotica* (Roux) from Egypt, but proved to be a *distinct variety* of it.
- (b) The specimens from Lake Victoria Nyanza ought not to be referred to the var. *paucipara*, M. Weber<sup>1</sup>; as regards the measurements of their legs, they almost fully resemble the var. *gracilipes*, de M., from Celebes,

<sup>1</sup> Prof. Bouvier in his valuable paper on the *Atyidæ* (*l.c.*, 1905), erroneously supposes this variety to have been described by me.



but they agree with the typical *nilotica* from Egypt by the large size of their eggs.

- (c) The specimens collected in the river Umgeni, Natal, were wrongly referred by Prof. Weber to *Car. wyckii*, Hicks.; they ought to be considered as a distinct variety *natalensis* nov.
- (d) The specimens obtained from Port Canning and from Dhappa, Lower Bengal, though closely related to the var. *gracilipes* from Celebes, are, at least for the present, to be regarded as a distinct and new variety *bengalensis* nov.
- (e) The specimens from the river near Palopo, Luwu, Celebes, from the river near Mbawa, Flores, and from the other localities mentioned by me, *l.c.*, 1892, p. 386, are not to be referred to *Car. wyckii* (Hicks.), but ought to be considered as a proper variety, for which the name of *brachydactyla* nov. is proposed.
- (f) According to Dr. Calman (*l.c.*, p. 190), the co-types of Prof. Hickson's species from Celebes should have the carpus exactly as in the types of *longirostris*; they are therefore different from the var. *brachydactyla* and ought to be considered as a distinct variety *wyckii* (Hicks.).
- (g) All the varieties living on the islands of the Indian Archipelago and in Bengal are certainly distinct from those occurring in Africa.

The typical *Car. nilotica* (Roux) inhabits Egypt (the Nile, freshwater ponds and canals); its at present known varieties are the following:—

- |  |  |
|--|--|
| 1. var. <i>longirostris</i> , H. M. Edw. | River Macta, Oran.   |
| 2. var. <i>natalensis</i> , n.           | Natal.   |
| 3. var. <i>paucipara</i> , M. Weber.     | Natal.   |
| 4. var. <i>bengalensis</i> , n.          | Bengal.  |
| 5. var. <i>wyckii</i> , Hicks.           | Lake Tondano, Minahassa,<br>Celebes, at a height of 2,000<br>feet above sea-level. |
| 6. var. <i>minahassa</i> , de M.         | Minahassa, Celebes.  |
| 7. var. <i>brachydactyla</i> , n.        | Celebes, Saleyer, Flores.  |
| 8. var. <i>gracilipes</i> , de M.        | Celebes, Saleyer.  |

*Key to the varieties of Caridina nilotica (Roux).*

- I. Number indicating the proportion between length and breadth of the carpus of 1st pair of legs usually 2 or more than 2; rarely falling to 1.8, or quite exceptionally to 1.66 (var. *bengalensis*).



- a.* Dactylus of 3rd pair of legs always longer than  $\frac{1}{5}$  of the propodite (number indicating the proportion between the length of both joints varying between 3.3 and 4.6); dactylus of 5th pair also longer than  $\frac{1}{5}$  of the propodite (the number of proportion varying between 2.87 and 4.5).
- b.* Number indicating the proportion between length and breadth<sup>1</sup> of the dactylus of 3rd pair less than 4.
- c.* Number indicating the proportion between length and breadth of the dactylus of 5th pair varying between 4 and 4.6; dactylus of 5th pair with 40—50 spinules.
- d.* ova 0.7—0.86 mm. long .. *nilotica* (Roux).
- dd.* ova 0.42—0.46 mm. long .. *natalensis*, nov.
- cc.* Number indicating the proportion between length and breadth of the dactylus of 5th pair varying between 4.6 and 6.2; dactylus of 5th pair with 60—74 spinules; ova 0.96—1.06 mm. long. .. *paucipara*, M. Weber.
- bb.* Number indicating the proportion between length and breadth of the dactylus of 3rd pair usually larger than 4, of 5th pair varying between 5 and 6.
- e.* Number of proximal teeth of the upper margin of the rostrum usually varying between 12 and 20; ova usually 0.35 mm. long, their length varying between 0.33 and 0.4 mm. .. *var. gracilipes*, de M.
- ee.* Number of proximal teeth of the upper margin of the rostrum usually varying

<sup>1</sup> The breadth of the dactylus is measured at the level of the 1st lateral spinule.



- between 20 and 24; ova usually 0.45 or 0.46 mm. long, varying between 0.42 and 0.49 mm. . . var. *bengalensis*, nov.
- aa. Dactylus of 3rd pair about  $\frac{1}{6}$  the length of the propodite (number indicating the proportion between the length of both joints varying between 5.8 and 6.2); dactylus of 5th pair  $\frac{1}{5}$ — $\frac{1}{6}$  of the propodite. Ova 0.39—0.44 mm. long . . var. *brachydactyla*, nov.
- II. Number indicating the proportion between length and breadth of the carpus of 1st legs usually less than 1.8, rarely rising to 1.9, but never reaching to 2.
- f. Number indicating the proportion between the length of propodite and dactylus of 3rd pair larger than 5, of 4th pair, 4. . . var. *wyckii* (Hicks.).
- ff. Number indicating the proportion between the length of propodite and dactylus of 3rd pair usually less than 4, rarely reaching to 4.2; that of 5th pair always less than 4.
- g. ova 0.55 mm. long . . var. *minahassa*, de M.
- gg. ova 0.33—0.39 mm. long. . . var. *longirostris*, H. M. Edw.

Whereas in the foregoing key the principal characters are indicated by which the varieties may be distinguished, the following part contains my observations on the rostrum and on the thoracic legs.

I. *Caridina nilotica* (Roux), typical form.

TABLE A.

(Plate xx, figs. 1, 1a, 1b.)

In the figure of Roux's quoted paper of 1833, the rostrum extends distinctly beyond the antennal scales; its upper margin carries 13 teeth, two of which are on the carapace, there is no subapical tooth, and the lower margin is armed with 14 teeth. In the 21 specimens from Cairo which lie before me, not one presents such a small number of teeth on the upper margin. On Table A



the tothing-formulæ of the rostrum of 10 specimens are indicated, the other 11 specimens show the following tothing<sup>1</sup> :—

$$\frac{20^3 + 1}{14}; \quad \frac{20^3 + 1 + 1}{11} \text{ (young individual).}$$

$$\frac{21^2 + 1 + 2}{13} \text{ (young individual).}$$

$$\frac{22^3 + 1}{17}; \quad \frac{22^3 + 1 + 1}{15}.$$

$$\frac{23^3 + 1}{14}; \quad \frac{24 - ?}{15}; \quad \frac{24^3 + 2}{12}; \quad \frac{25^3 + 1}{15};$$

$$\frac{24^2 + 4}{0} \text{ (in this specimen the rostrum is abnormal, quite}$$

straight, longer than the carapace and than the scaphocerites, whereas the proximal row of teeth reaches to the end of the antennular peduncles; the teeth of the lower edge are wanting).

$$\frac{27^4 + ?}{\text{probably 16 or 17}} \text{ (the first two or three teeth of the lower}$$

margin are grown together, the tip is broken off and the proximal row of teeth reaches beyond the scaphocerites).

In these specimens the usual number of proximal teeth of the upper margin proves therefore to vary from 20 to 24 and two or three are placed on the carapace. In four specimens one observes an isolated tooth between the proximal row and the subapical tooth, in one case even two isolated teeth are observed.

Of 16 specimens, in which the tip of the rostrum is well preserved 13 are armed with a single subapical tooth, in 2 specimens two are observed and in 1 even four, but the latter specimen is apparently abnormal, because the lower margin carries no teeth at all. In the specimens the rostrum of which is not injured, the number of teeth of the lower margin varies from 11 to 20, there being ordinarily 11, 14, 15 or 16 teeth present. The rostrum commonly extends beyond the scaphocerites, appearing a little longer than the rest of the carapace. The proportion between the length of the unarmed terminal part of the upper edge and that of the proximal row of teeth is very variable; sometimes, as in the specimen figured by Roux, the proximal row appears little more than once and a half as long as the unarmed terminal part (Table A, Nos. 5--8), in other cases the unarmed part is shorter and in No. 4 it measures barely one-third the length of the proximal row.

Though the carpus of the 1st pair of legs appears usually twice or more than twice as long as broad, it presents sometimes a stouter shape, as in No. 5 of the Table; in such specimens the carpus has exactly the same shape as in some individuals of the var.

<sup>1</sup> In each formula near the number of proximal teeth a smaller type indicates how many teeth are placed on the carapace.



*longirostris* from Oran, which variety may, however, still be distinguished by the more slender dactyli of the three posterior legs and by the much smaller eggs. The fingers of the 1st pair of legs are about once and a half as long as the palm, and those of the 2nd pair are also less than twice as long as the palm.

The ischium of the three posterior legs is unarmed. The meropodite of the 3rd pair of legs is armed with three stout spines, the first placed at the level of the proximal third part of the upper margin; the third is situated near the distal extremity, the second midway between the two others. Carpus of the three posterior legs with a similar spine near the distal extremity. The meropodites of the 5th pair of legs carry two spines, like those of the third pair, 0.24 mm. long; the first is placed immediately beyond the middle, the second near the distal extremity.

The dactylus of the 3rd pair is usually armed with 8 or 9 spines the terminal claw included, in the largest specimen (No. 1) it carried 10 spines and in another (No. 8) I observed even 12; in a specimen 20 mm. long, on the contrary, the dactylus presented only 7 spines; their number appears, therefore, to be rather variable. The dactyli of the 5th legs are armed with 40—50 spinules.

The eggs (fig. 1b) are few in number but large, larger than in all the other varieties except the var. *paucipara*, being 0.7—0.86 mm. long and 0.42—0.5 mm. broad. The size of the eggs is not only variable in different individuals, but those of one and the same specimen present slight differences as regards their length and breadth. So, e.g., the ova of the female No. 3 presented the following measurements: 0.7 mm.  $\times$  0.42 mm.; 0.7 mm.  $\times$  0.43 mm.; 0.7 mm.  $\times$  0.44 mm.; 0.71 mm.  $\times$  0.42 mm.; 0.73 mm.  $\times$  0.44 mm.; 0.74 mm.  $\times$  0.44 mm. Of the female No. 5, however, the measurements were as follows: 0.8 mm.  $\times$  0.47 mm.; 0.82 mm.  $\times$  0.47 mm.; 0.84 mm.  $\times$  0.49 mm.; 0.86 mm.  $\times$  0.48 mm.

The largest specimen, received from Capt. Flower, is a female with eggs, 29 mm. long.

The two specimens from Lake Victoria Nyanza (compare Table B) differ from the preceding by the dactyli of the three posterior legs; these joints show a *slenderer* shape, somewhat as in the var. *gracilipes* from Celebes, as is proved by comparing the two Tables A and B. In the ova-bearing female, 27 mm. long, the dactylus of the 3rd pair (fig. 2) is armed with 10 spines, in the other with 11; the dactyli of the 5th pair (fig. 2a) are armed with 49 and 50 spinules respectively. In the female 27 mm. long the ischium of the 3rd legs is unarmed, the meropodite carries three spines, 0.21 mm. long, the 2nd spine is placed a little nearer to the proximal than to the distal extremity of the joint, the 1st just midway between the proximal extremity and the 2nd spine, the 3rd near the distal extremity. In the other specimen, however, the meropodite of the 3rd legs presented four spines, the 2nd somewhat nearer to the proximal than to the distal extremity, the 3rd just beyond the 2nd, the 1st midway between the 3rd and the proximal extremity, the 4th near the far end of the joint. The eggs (fig. 2b)



of the female No. 1 are a little smaller than those of the typical form, being 0.62--0.7 mm. long and 0.38--0.4 mm. broad; the measurements of nine eggs are as follows: 0.62 mm.  $\times$  0.38 mm.; 0.62 mm.  $\times$  0.39 mm.; 0.62 mm.  $\times$  0.4 mm.; 0.63 mm.  $\times$  0.38 mm.; 0.64 mm.  $\times$  0.39 mm.; 0.65 mm.  $\times$  0.4 mm.; 0.66 mm.  $\times$  0.38 mm.; 0.68 mm.  $\times$  0.4 mm. and 0.7 mm.  $\times$  0.39 mm.

The measurements of these eggs agree with those indicated by Dr. Calman (*l.c.*) for specimens from the same Lake Victoria Nyanza; also as regards the measurements of the 1st legs, his specimens agree with those of Table B, but the dactyli of the three posterior legs are apparently a little shorter in Calman's specimens.

2. *Caridina nilotica* (Roux), var. *natalensis*, nov

TABLE C.

(Plate xx, figs. 3, 3a, 3b.)

Prof. Max Weber, in his quoted paper on the freshwater fauna of South Africa, referred numerous specimens collected by him in the rivers of Natal, partly to the typical form of *Car. wyckii* (Hicks.), partly to a new variety *paucipara*. A close examination of three adult ova-bearing females from the river Umgeni,—co-types received from him,—proved, however, that they only differ from the typical species, inhabiting Egypt, by the much smaller size of the eggs, whereas they fully agree with it as regards the measurements of the thoracic legs (compare Table C with Table A).

According to Max Weber the dactyli of the 3rd pair should measure  $\frac{1}{6}$ , those of the 5th  $\frac{1}{5}$ , of the length of the propodites; in the three co-types, however, measured on Table C, the dactyli appear distinctly longer. But even when supposing that the dactyli are in other specimens indeed as short as indicated by Prof. Weber, there are apparently still other differences between this Natal variety and the var. *brachydactyla*, nov., from Celebes. The fingers of the 1st legs are in the females from the river Umgeni about once and a half as long as the palm, but in the var. *brachydactyla*<sup>1</sup> twice or more than twice as long; the fingers of the 2nd legs appear also comparatively longer in the var. *brachydactyla* than in the var. *natalensis*. The dactyli of the three posterior legs show a still stouter shape in the Indian variety, and those of the 3rd pair carry only six or seven spines, the terminal claw included, but in the var. *natalensis*, though sometimes seven, also often eight or nine, as was already indicated by Max Weber.

The ischium of the three posterior legs appears unarmed in the females from the river Umgeni. The meropodite of the 3rd legs is armed with three spines, the 1st just or nearly in the middle of the joint, the 3rd near the distal extremity and the 2nd midway between the 1st and the 3rd, or a little nearer to the 2nd. The

<sup>1</sup> Prof. Weber did compare, of course, his Natal specimens with the material described by me in 1892 (*l.c.*); the "typical form" of *Car. wyckii* appears now as the var. *brachydactyla*.



carpus has also a spine near the far end. The meropodite of the 5th legs has but one spine near the distal extremity, there is also a spine on the carpus near the far end, and one observes five small spinules between this spine and the proximal extremity of this joint.

The ova are 0.42—0.48 mm. long and 0.24—0.295 mm. broad, presenting the same size as those of the var. *bengalensis* and of the var. *brachydactyla*. The measurements of ten eggs are as follows: 0.42 × 0.27 mm.; 0.42 × 0.29 mm.; 0.43 × 0.26 mm.; 0.43 × 0.28 mm.; 0.44 × 0.24 mm.; 0.44 × 0.27 mm. (two eggs); 0.44 × 0.29 mm.; 0.455 × 0.285 mm.; 0.46 × 0.295 mm.

The specimens from the Lake Nyasa, described by Dr. Calman (*l.c.*, p. 190), are probably to be referred to this variety.

3. *Caridina nilotica* (Roux), var. *paucipara*, M. Weber.

TABLE D.

(Plate xx, figs. 4, 4a, 4b.)

*Caridina wyckii*, Hickson, var. *paucipara*, Max Weber, *l.c.*, p. 168.

This variety, which inhabits the rivers Umhloti and Umhlasine, and together with the var. *natalensis* the river Umbilo, all situated in Natal, differs from the typical form of Egypt (1) by the *slenderer* dactyli of the 5th legs, which dactyli are armed with 60—74 spinules instead of 40—50; (2) by *somewhat larger* eggs; and (3) perhaps also by the rostrum. The teeth on the upper edge should be, according to Max Weber, 11—20 in number, less, therefore, than in the Egyptian species; in two of the five co-types the measurements of which are given in Table D the rostrum carries one subapical tooth, in two others this tooth is wanting altogether, in the fifth specimen the tip of the rostrum is injured. The unarmed terminal part is described as being somewhat shorter or just as long as the toothed part of the upper margin; in No. 2 of Table D the unarmed part appears even a trifle longer than the row of teeth, in No. 1 it is just as long, and in two other specimens the toothed part appears once and a half as long as the unarmed one. As regards the number of teeth on the lower margin (12—18) this variety agrees with the typical form.

When the measurements of the legs given in Table D are compared with those of the Egyptian form in Table A, one observes a close resemblance except only in the *proportion between length and breadth* of the dactyli of the 5th pair; in the *paucipara* specimens this proportion varies between 4.6 and 6.2, in the typical form, however, between 4 and 4.6. It ought, however, to be remarked that in some specimens of both varieties the same number (4.6) sometimes occurs, and in these individuals the dactyli present just the same form. In the egg-bearing female No. 1 the ischium of the 3rd legs is armed with a spine near the far end of its lower margin; the meropodite carries three spines, the 2nd somewhat nearer to the distal extremity than to the proximal, the 1st midway between the 2nd and the



proximal extremity, the 3rd near the far end. Carpus with a spine near the distal extremity. The ischium of the 5th legs is unarmed, the meropodite carries two spines, the 1st nearer to the distal than to the proximal extremity, the 2nd near the distal end. Carpus also with a spine near the distal extremity. Another co-type (No. 4) agrees as regards the armature of ischium and meropodite with the preceding specimen.

According to Weber's description the dactylus of the 3rd and 4th pairs should measure about  $\frac{1}{5}$ , that of the 5th  $\frac{1}{4}$  of the propodite: in the co-types measured on Table D, these dactyli appear a little longer.

The eggs (fig. 4b) are few in number and *the largest* of all the other varieties: they are 0.96—1.06 mm. long and 0.55—0.67 mm. broad. Nine eggs of No. 1 presented the following measurements: 0.96 × 0.6 mm.; 0.97 × 0.62 mm.; 0.98 × 0.62 mm.; 0.98 × 0.67 mm.; 1 × 0.62 mm.; 1.02 × 0.62 mm.; 1.02 × 0.63 mm.; 1.02 × 0.64 mm.; 1.05 × 0.6 mm. Four eggs of female No. 3 presented the following measurements: 1.1 × 0.64 mm.; 1.04 × 0.64 mm.; 1.04 × 0.65 mm.; 1.06 × 0.62 mm.; and the measurements, finally, of four eggs of No. 4 were 0.96 × 0.55 mm.; 0.97 × 0.58 mm.; 0.98 × 0.59 mm. and 1 × 0.58 mm.

4. *Caridina nilotica* (Roux), var. *longirostris*, H. M. Edw.

TABLE E

(Plate xx, figs. 5, 5a, 5b.)

*Caridina longirostris*, H. Milne Edwards, Hist. Nat. Crust., ii, 1837, p. 363; de Man, *l.c.*, 1892, p. 396, tab. xxiv, fig. 29l, 29m, 29 mm; Bouvier, *l.c.*, 1905, p. 78.

The 20 specimens, co-types, of *Car. longirostris* from the river Macta, Oran, that are lying before me are the same that were examined and figured by me in 1892. Ten have been measured (Table E). This form proved to be *quite different* from the Egyptian typical species; it may at once be distinguished by its *much smaller eggs* (fig. 5b), which are as small as those of the varieties *gracilipes*, de M., and *brachydactyla*, de M., from Celebes, being 0.33—0.39 mm. long and 0.21—0.26 mm. broad. So, *e.g.*, five eggs of the female No. 2, which was 18.5 mm. long, presented the following measurements: 0.35 × 0.21 mm.; 0.38 × 0.24 mm.; 0.38 × 0.25 mm.; 0.38 × 0.26 mm.; 0.39 × 0.23 mm.; and five eggs of the female No. 7, 16.5 mm. long, the following: 0.33 × 0.23 mm.; 0.34 × 0.23 mm.; 0.36 × 0.23 mm.; 0.36 × 0.24 mm.; 0.37 × 0.25 mm.

The tothing-formulae of the rostrum of three specimens that are not in the Table are as follows:—

$$\frac{15^1 + 1}{13} ; \frac{18^2 + 1}{14} ; \frac{19^2 + 1}{15} ;$$

and in these specimens the proportion between the length of the



toothed part and that of the terminal unarmed part of the upper margin is respectively expressed by the numbers 1.38, 2 and 1.4. Besides one subapical tooth, the upper edge is armed with 14—21 teeth, the lower with 11—17. On an average the toothed part of the upper edge appears only once and a half as long as the terminal unarmed part, but in the typical form from the Nile the unarmed part is usually *shorter*, measuring sometimes even barely one-third of the toothed part (Table A, No. 4). My contention (*l.c.*, 1892, p. 396) that all the upper teeth are placed on the rostrum proper, proved to be erroneous, for one or two are placed on the carapace behind the orbital margin. This variety is, however, also distinguished by the thoracic legs. The carpus of the 1st legs appears usually *broader* in proportion to its length than in the typical form of Egypt and than in the other varieties, except the var. *wyckii*, Hicks., and the var. *minahassa*, de M. The average number, indeed, indicating the proportion between length and breadth of the carpus is for the eight measured specimens from the river Macta 1.64, but for the ten of the typical form from Cairo 2; the carpus of the var. *longirostris* appears therefore *on the average once and a half as long as broad*. As is proved by the measurements, the shape of the carpus of the 2nd legs is *very variable*: in some specimens, indeed, this joint is not quite four times, but in other cases almost five times as long as broad.

The dactyli of the three posterior legs are always *a little longer than one-fourth of the propodite*, nearly as in the Egyptian form, but they are *a little slenderer*; those of the 3rd pair are armed with 7—10 spines, the terminal claw included, those of the 5th with 35—40. The ischium of the 3rd legs carries a spine in the middle, the meropodite of these legs is armed with 3 spines, the 2nd about in the middle, the 1st midway between the 2nd and the proximal extremity, the 3rd near the distal end. Carpus with a spine near the far end and with two smaller spinules between this spine and the proximal extremity. The meropodite of the 5th legs carries a spine just in the middle and one near the distal extremity, while one also observes a spine near the distal end of the carpus.

The var. *longirostris* attains a length of 19 mm., its size being smaller than that of the typical form.

5. *Caridina nilotica* (Roux), var. *bengalensis*, nov.

TABLE F.

(Plate xx, figs. 6, 6a, 6b.)

*Caridina wyckii* (Hickson), Henderson, "A Contribution to Indian Carcinology," 1893, p. 434 (Trans. Linnean Soc. Zool., Ser. 2, vol. v); Nobili, Boll. Mus. Zool. Torino, xviii, No. 452, 1903, p. 6.

The 191 specimens enumerated above and collected in brackish ponds at Port Canning and at Dhappa, near Calcutta, apparently belong to a new variety, different from those living in Africa as also from the varieties that have been observed on the islands of the Indian Archipelago. This new variety differs from



the typical form of *Car. nilotica* of Egypt by the *slenderer* dactyli of the three posterior legs and by the *much smaller* eggs; it presents a greater resemblance to the var. *gracilipes*, de M., from Celebes.

The examination of 61 specimens, mostly adult or egg-bearing, from Port Canning, proved the following: *The usual number of teeth in the proximal series of the upper margin varies between 20 and 24*; in ten specimens 24 teeth were observed, in nine 23, in nine 22, in ten 21 and in eight 20; in two specimens the proximal row consisted of 25 teeth, in three of 26, in three of 27, in one of 29; in only two individuals were 19 teeth and in only one (very young) specimen were 17 teeth observed. The rostrum usually extends slightly beyond the antennal scales, or it appears just as long, rarely is it a little shorter. In all the specimens the proximal row of teeth appears *considerably longer* than the terminal unarmed part and the proportion between the length of the latter and that of the proximal row of teeth is as 1: 2—4.5. Whereas in the adult ova-bearing female (No. 1 of Table F) 28 mm. in length, the proximal row of teeth is only twice as long as the terminal unarmed part, it is 4 or 5 times as long in a quite young specimen (No. 15) 12.5 mm. in length, and, as is shown by the Table, the other specimens present all possible intermediate proportions. Usually two teeth are placed on the carapace, often, however, three and in one specimen four teeth are placed on the carapace. One observes one subapical tooth as often as two; of the 61 specimens 24 carried one subapical tooth, in 31 two subapical teeth were found, in 2 three and in 1 specimen even four (compare the tothing-formulæ). In some specimens one or two isolated teeth occur on the unarmed terminal part of the upper edge between the proximal row and the subapical tooth: of the 61 examined specimens, 13 presented one isolated tooth and in one case two existed. The usual number of teeth on the lower margin varies between 11 and 14: of the 61 specimens in sixteen the lower margin was armed with 11 teeth, in eleven with 12, in eight with 13, in ten with 14, in two with 15, in two with 16, in one with 17, in five with 10, in three with 8 and in one with 6. One of the specimens in which the lower margin is armed with 8 teeth and also that with 6 are adult ova-bearing females.

The largest specimen from Dhappa (26.5 mm. long) differs a little from the preceding. The rostrum projects with one-third of its length beyond the antennal scales, *i.e.*, farther than in the Port

Canning specimens; it is  $\frac{21^1 + 1}{13}$  dentate and the two foremost

teeth of the upper margin are farther distant from each other than the rest. In this specimen the proximal row of teeth is but 1.8 times as long as the terminal unarmed part.

In Table F the tothing-formulæ of 16 specimens are indicated; the formula—

$$\frac{17^2 + 1 + 1}{6}$$



is that of an ova-bearing female, 16.5 mm. long, the rostrum of which is slightly shorter than the scaphocerites and than the carapace; and the formulæ of 45 other specimens, all from Port Canning, are as follows:—

$$\frac{19 + 1 + 2}{11}, \text{ one specimen.}$$

$$\frac{19^2 + 1}{11}, \text{ " "}$$

$$\frac{20^2 + 1}{8}, \text{ " "}$$

$$\frac{20^2 + 3}{10}, \text{ " "}$$

$$\frac{20^2 + 2}{11}, \text{ " "}$$

$$\frac{20^2 + 1}{13}, \text{ " "}$$

$$\frac{20^4 + 1}{13}, \text{ " "}$$

$$\frac{20^2 + 1 + 1}{12}, \text{ " "}$$

$$\frac{20^3 + 1 + 2}{12}, \text{ " "}$$

$$\frac{21^3 + 2}{8}, \text{ a female with eggs.}$$

$$\frac{21^2 + 2}{10}, \text{ one specimen.}$$

$$\frac{21^2 + 1}{11}, \text{ two specimens.}$$

$$\frac{21^2 + 2}{12}, \text{ one specimen.}$$

$$\frac{21 + 3}{13}, \text{ " "}$$

$$\frac{21^3 + 1 + 1}{14}, \text{ one "}$$

$$\frac{22^2 + 1}{11}, \text{ " "}$$

$$\frac{22^3 + 1}{11}, \text{ one egg-bearing female, 15.5 mm. long.}$$

$$\frac{22^3 + 1 + 1}{11}, \text{ two specimens.}$$

$$\frac{22^2 + 2}{11}, \text{ one specimen.}$$

$$\frac{22^3 + 2}{12}, \text{ " "}$$

$$\frac{27^3 + 1}{14}, \text{ " "}$$

$$\frac{22^2 + 1 + 2}{13}, \text{ one specimen.}$$

$$\frac{22^3 + 2 + 1}{12}, \text{ " "}$$

$$\frac{23 + 2}{8}, \text{ " "}$$

$$\frac{23^2 + 2}{10}, \text{ " "}$$

$$\frac{23^2 + 2}{12}, \text{ two specimens.}$$

$$\frac{23^2 + 1}{14}, \text{ one specimen.}$$

$$\frac{23^4 + 2}{14}, \text{ " "}$$

$$\frac{23^2 + 1 + ?}{14}, \text{ one "}$$

$$\frac{23^2 + 1 + 2}{11}, \text{ " "}$$

$$\frac{24^2 + 1}{10}, \text{ " "}$$

$$\frac{24^3 + 2}{10}, \text{ " "}$$

$$\frac{24^3 + 2}{12}, \text{ " "}$$

$$\frac{24^4 + 1}{12}, \text{ " "}$$

$$\frac{24^3 + 2}{13}, \text{ " "}$$

$$\frac{24 + 1 + 2}{13}, \text{ " "}$$

$$\frac{24 + 1 + 4}{14}, \text{ " "}$$

$$\frac{25^3 + 1}{11}, \text{ " "}$$

$$\frac{26^3 + 1}{14}, \text{ " "}$$

$$\frac{26^3 + 2}{16}, \text{ " "}$$

$$\frac{27^4 + 2}{12}, \text{ " "}$$

$$\frac{29^2 + 1 + 2}{15}, \text{ " "}$$



According to my original description in Max Weber's *Zoolog. Ergebn. einer Reise in Niederl. Ost-Indien*, ii, 1892, p. 393, pl. xxiii, figs. 29 and 29e, according to Schenkel (*Beitrag z. Kenntniss der Dekapoden-fauna von Celebes*, 1902, p. 498) and also according to Bouvier (*l.c.*, 1905, p. 73), the rostrum of the var. *gracilipes* is characterised (1) by the proximal row of the upper edge consisting of 12—20 teeth, the usual number being 15—17 (de Man); (2) by the occurrence, usually, of one subapical tooth, rarely two; (3) by the unarmed terminal part being longer than the proximal row, or just as long, or rarely shorter, but in the latter case the proximal row of teeth is no more than twice as long as the unarmed part. Schenkel, indeed, remarks about the rostrum: "meist ungefähr die Hälfte, seltener nur  $\frac{1}{3}$  des Oberrandes zahnlos." In a single specimen from the river Bonéa on the island of Saleyer the upper margin presented 24 teeth (de Man, *l.c.*, 1892, p. 395), but this is, no doubt, an exceptional case.

The upper surface of the telson carries four pairs of spinules, in some specimens five spinules were observed on one side and four on the other; the telson ends posteriorly in a very short tooth, 0.06 mm. long, whereas the hinder edge itself, *i.e.*, the linear distance between the outer angles, is 0.35 mm. broad; at either side of the median tooth four spines are inserted, the first of which, at the outer angle, is the shortest of all—0.12 mm. long; the next spine is the longest—0.33 mm.; the third and the fourth are subequal, the third being 0.22 mm. long, the fourth, contiguous to the median tooth, 0.2 mm. The telson of typical specimens of the var. *gracilipes*, de M., from Maros, Celebes, which are lying before me, fully agrees with that of the Bengal variety.

External maxillipeds reaching to the end of the antennular peduncle.

The legs of the 1st and 2nd pair agree with those of the typical form from Egypt and also with those of the var. *gracilipes*. The carpus of the 2nd legs presents a rather variable form: sometimes (No. 1) it is very slender, as in the var. *gracilipes*, but in other specimens, also adult, its shape is as stout as in the var. *longirostris* from Oran (egg-bearing female No. 3).

The dactylus of the 3rd pair of legs (fig. 6), which is armed with 8—10 spines, the terminal claw included, usually presents *the same slender shape* as in the var. *gracilipes*, it being 4 or more than 4 times as long as broad; rarely, however, has the dactylus the same stout shape as in the typical *Car. nilotica* from Egypt, so, *e.g.*, in the egg-bearing female No. 7, the dactylus of which is 3.8 times as long as broad. The meropodites of the 3rd legs are, in the adult female, No. 1, ten times as long as broad and armed with three stout spines of equal length (0.26—0.27 mm.); the first is inserted a little nearer to the proximal than to the distal extremity, the second is as far distant from the distal extremity as the first from the proximal, and the third is placed close to the distal extremity. A similar spine occurs near the middle of the ischium and another near the distal end of the lower margin of the carpus.



The meropodites of the 5th pair—nine times as long as broad—are armed with one spine just beyond the middle and another near the distal extremity; also a spine near the distal end of the carpus. The dactyli, which are armed with 45—55 spinules, have *the same slender shape* as in the var. *gracilipes*, being five or more than five times as long as broad.

The eggs (fig. 6b) are a *little larger* than those of the var. *gracilipes*; they are usually 0.45 or 0.46 mm. long and 0.28 mm. or 0.3 mm. broad, the length varying between 0.42 mm. and 0.49 mm., the breadth between 0.25 mm. and 0.3 mm. Females (15.5 mm. long) gathered in December in the brackish ponds of Port Canning are already provided with eggs which are of just the same size as those of the largest specimens, as, *e.g.*, those of the female (28 mm. long) collected in November.

This variety has also been observed by Henderson at Madras and by Nobili at Pondicherry.

6. *Caridina nilotica* (Roux), var. *wyckii* (Hickson).

Dr. Calman (*l.c.*, 1907, p. 190) has pointed out, as was already made probable by Prof. Bouvier, that the species described by Hickson (*l.c.*) as *Atya wyckii*, has the first carpus exactly as in the types of *Car. longirostris*, H. M. Edw., and he adds that specimens received from Prof. Hickson agree very closely with the var. *minahassa* described by me, differing chiefly in the shorter dactylus of the three posterior legs, that of the 4th pair being less than one-fifth, and that of the 5th pair one-fourth of the corresponding propodus. Hickson's species, which was discovered in Lake Tondano, situated also in that mountain district of Minahassa, Celebes, thus proves to be a proper variety distinguished from the var. *minahassa*, de M., as from the var. *longirostris*, H. M. Edw., by the *short dactyli* of the three posterior legs. Unfortunately neither Hickson nor Calman indicate the size of the eggs. Hickson's variety is not lying before me, so that as regards the other characters of this form I must refer to his paper.

7. *Caridina nilotica* (Roux), var. *brachydactyla* nov.

TABLE G.

(Plate xx, figs. 8 a—c.)

Synon.: *Caridina wyckii*, de Man, *l.c.*, 1892, pp. 386—393, tab. xxiv, fig. 29f, 29g, 29i, 29ii, 29k, 29cc, 29dd (typical form).

The preceding remarks about the var. *wyckii* (Hickson) prove at once that that form which I considered in 1892 (*l.c.*) to be the typical form of *Car. wyckii*, is, indeed, quite distinct, differing chiefly by the *more slender carpus of the 1st pair of legs*. This carpus, indeed, appears 2.1—2.5 times as long as broad, presenting the same form as in the typical *Car. nilotica* from the Nile. This variety, which has been observed on the islands of Celebes, Saleyer and Flores, may henceforth be known under the name of *brachydactyla*.



Though it has been fully described in my work of 1892, I wish to add the following: In this work, p. 390, the fingers of the first legs are said to be about once and a half as long as the palm; this observation, probably made by means of a feeble magnifying-glass, proved to be erroneous. Four adult ova-bearing females, co-types of the specimens described in 1892 and taken out of Prof. Weber's collection, have now been exactly measured under the microscope, (Table G): the fingers of the 1st pair now appear to be 2—2.5 times as long as the palm. The carpus of the 2nd legs appears in some specimens very slender (six times as long as thick distally) (Table G, No. 3), but in other individuals it presents the same form as in the typical *nilotica* from the Nile and as in the var. *longirostris*. The fingers of the 2nd chelæ now prove also to be more than twice as long as the palm.

There is no spine on the ischial joint of the three posterior legs. The meropodites of the 3rd legs are armed with 3 spines; the 2nd spine is placed just beyond the middle, the 1st midway between the 2nd and the proximal extremity of this joint or somewhat nearer to the 2nd spine, the 3rd near the distal extremity. Carpus with a spine near the far end. The dactyli measure about  $\frac{1}{6}$  the length of the propodite.

The meropodites of the 5th legs carry one spine near the distal extremity, as also their carpus; the dactyli are also short, measuring  $\frac{1}{5}$ — $\frac{1}{6}$  the length of the propodite.

Quite characteristic is *the stout shape* of the dactyli of the three posterior legs, though it ought to be remarked that the shape of those of the 3rd legs is somewhat variable (*cf.* Nos. 1 and 4 of Table G).

The eggs are very numerous and small, 0.39—0.44 mm. long and 0.22—0.25 mm. broad, presenting nearly the same size as those of the var. *bengalensis* and *natalensis*. Nine eggs of the female No. 1 from Mbawa, Flores, show the following measurements: 0.39 mm.  $\times$  0.23 mm.; 0.4 mm.  $\times$  0.23 mm.; 0.4  $\times$  0.24 mm.; 0.41  $\times$  0.22 mm.; 0.42  $\times$  0.23 mm.; 0.42  $\times$  0.24 mm.; 0.42  $\times$  0.25 mm.; 0.43  $\times$  0.23 mm.; 0.44  $\times$  0.24 mm.

#### 8. *Caridina nilotica* (Roux), var. *gracilipes*, de M.

##### TABLE H.

(Plate xx, figs. 7, 7a, 7b.)

*Caridina wyckii*, Hickson, var. *gracilipes*, de Man, *l.c.*, 1892, p. 393, tab. xxiv, figs. 29 a—e.

This variety, which inhabits the islands of Celebes and Saleyer, is chiefly characterised by the slender dactyli of the three posterior legs, by the carpus of the 1st legs being twice or a little more than twice as long as broad, by the shape and tothing of the rostrum and by its small eggs, which are usually 0.35 mm. long. Three co-types, adult ova-bearing females, from Maros, Celebes, are measured on Table H. In two of the three the fingers of the 1st chela appear



a little more than once and a half, and those of the 2nd pair 1.8 to 2 times as long as the palm. The dactyli of the 3rd legs, which in two of the three females appear a little shorter, but in the third even a little longer than  $\frac{1}{4}$  of the propodite, are armed with 9 or 10 spines, the terminal claw included, but, according to the original description, they are often armed with 11 or 12 spines.

The specimens referred by Schenkel (*l.c.*, p. 498) to this variety seem partly to belong to another form,—probably to the var. *wyckii* (Hicks.),—because in some of his specimens the carpus presented the same shape as in the var. *longirostris*.

The var. *gracilipes* is most closely related to the var. *bengalensis*, from which it seems to differ by the characters of the rostrum and by slightly smaller eggs.

9. *Caridina nilotica* (Roux), var. *minahassa*, de M.

TABLE I.

(Plate xx, figs. 9, 9a, 9b.)

*Caridina nilotica* (Roux), var. *minahassa*, de Man, *l.c.*, 1902, p. 895.

Table I is taken from that in the quoted paper, the numbers having been calculated. This variety is *most closely related* to the var. *longirostris*, H. M. Edw., from Oran, but differs (1) *by the much larger size* of its eggs which are 0.55 mm. long, or once and a half as long as those of the variety inhabiting the river Macta; (2) by the dactyli of the third legs being *slightly shorter* in proportion to the length of the propodite (compare Tables E and I). The dactyli of the three posterior legs have the same slender shape as those of the varieties *longirostris* and *gracilipes*, but those of the third pair are armed with 7 or 8 spines, the terminal claw included, whereas those of the fifth pair carry 33—38 spinules as in the African variety.



Measurements of the typical form of *Caridina*

	No. 1	No. 2	No. 3
Length from tip of rostrum to tip of telson in millimetres .. .. .	29	28.5	27.5
Toothing-formula of the rostrum .. .. .	$\frac{23^3 + 1}{20}$	$\frac{19 + 1 + 1 + ?}{16}$	$\frac{19^3 + ?}{11}$
Rostrum longer >, or shorter < than the scaphocerites .. .. .	>	>	>
Rostrum longer >, or shorter < than the carapace .. .. .	>	=	>
Proportion between the length of the toothed and that of the unarmed part of the upper margin .. .. .	2		
Length of carpus .. .. .	1	1	1.02
Breadth of carpus .. .. .	0.54	0.52	0.46
Proportion between length and breadth of carpus .. .. .	1.85	1.92	2.22
Length of chela .. .. .	1.4	1.36	1.3
Breadth of chela .. .. .	0.65	0.63	0.6
Length of fingers .. .. .	0.83	0.79	0.82
Proportion between length of fingers and that of palm .. .. .	1.45	1.39	1.7
Proportion between length and breadth of chela .. .. .	2.15	2.15	2.16
Length of carpus .. .. .	1.76	1.8	1.8
Breadth of carpus at distal extremity .. .. .	0.41	0.42	0.36
Proportion between length and breadth of carpus .. .. .	4.3	4.3	5
Length of chela .. .. .	1.5	1.5	1.45
Breadth of chela .. .. .	0.57	0.59	0.55
Length of fingers .. .. .	0.92	0.88	0.91
Proportion between the length of fingers and that of palm .. .. .	1.6	1.4	1.7
Proportion between length and breadth of chela .. .. .	2.6	2.54	2.6
Length of propodite .. .. .	2.35	2.48	2.48
Breadth of propodite in the middle .. .. .	0.194	0.19	0.18
Proportion between length and breadth of propodite .. .. .	12.1	13	13.8
Length of dactylus .. .. .	0.63	0.6	0.62
Proportion between length of propodite and that of dactylus .. .. .	3.9	4.1	4
Breadth of dactylus .. .. .	0.176	0.16	0.16
Proportion between length and breadth of dactylus .. .. .	3.6	3.75	3.87
Number of spines of dactylus, terminal claw included .. .. .	10	9	9
Length of propodite .. .. .		2.9	
Breadth of propodite in the middle .. .. .		0.19	
Proportion between length and breadth of propodite .. .. .		15	
Length of dactylus .. .. .		0.92	
Proportion between length of propodite and that of dactylus .. .. .		3.26	
Breadth of dactylus .. .. .		0.2	
Proportion between length and breadth of dactylus .. .. .		4.6	
Number of spines of dactylus, terminal claw included .. .. .		43	



## nilotica (Roux) from Cairo, Egypt.

No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	REMARKS.
$\frac{27}{20^2 + 1}$ 16	$\frac{26}{21^3 + 1}$ 17	$\frac{26}{21^3 + 1 + 1}$ 16	$\frac{25.5}{18^3 + 1}$ 15 or 16	$\frac{23.5}{20 + 1}$ 15	$\frac{20}{22^3 + 1}$ 11	$\frac{17.5}{22 + ?}$ 14	No. 1, No. 3 and No. 5 are ova-bearing females. In specimen No. 2 the unarmed part of the upper margin is shorter than the toothed part; in No. 3 and No. 10 the tip of the rostrum is injured.
>	>		>	>	>	>	
>	>		>	>	>	>	
3.1 1 0.49	1.83 0.92 0.51	1.68 0.94 0.46	1.65 1 0.52	1.86 0.9 0.36	2.46 0.78 0.36	0.65 0.29	In No. 8 the dactylus of fifth legs is broken at the extremity.
2 1.34 0.59 0.82	1.8! 1.28 0.628 0.78	2 1.15 0.59 0.71	1.92 1.25 0.66 0.75	2.5 1.05 0.47 0.68	2.17 1 0.46 0.63	2.2 0.88 0.38 0.56	
1.58	1.56	1.61	1.5	1.84	1.7	1.75	
2.3 1.68 0.38	2 1.64 0.37	2 1.64 0.36	1.9 1.56 0.38	2.23 1.46 0.28	2.17 1.34 0.276	2.3 1.1 0.22	
4.42 1.44 0.53 0.92	4.4 1.4 0.55 0.92	4.55 1.3 0.554 0.8	4.1 1.35 0.56 0.83	5.2 1.15 0.426 0.73	5 1.1 0.435 0.69	5 0.96 0.36 0.64	
1.77	1.91	1.6	1.6	1.74	1.68	2	
2.7 2.3 0.184	2.55 2.14 0.16	2.35 2.18 0.166	2.4 2.12 0.172	2.7 1.94 0.154	2.53 1.75 0.16	2.7 1.5 0.13	
12.5 0.56	13.4 0.56	13.1 0.52	12.3 0.56	12.6 0.55	11 0.49	11.5 0.45	
4.1 0.16	3.8 0.15	4.2 0.14	3.8 0.156	3.53 0.14	3.6 0.14	3.3 0.116	
3.5	3.7	3.71	3.6	3.93	3.5	3.9	
8 2.55 0.186	8 2.56 0.184	8 2.58 0.174	8 2.55 0.18	12 2.52 0.154	7 2.04 0.16	8 1.8 0.13	
13.7 0.74	14 0.8	14.8 0.8	14.2 0.8	16.4	12.7 0.64	14 0.58	
3.44 0.184	3.2 0.2	3.22 0.18	3.2 0.19	0.16	3.2 0.14	3.1 0.13	
4	4	4.4	4.2		4.57	4.5	
44	42	42	46		37	35	



TABLE B.

*Measurements of specimens from the Lake Victoria Nyanza.*

	No. 1	No. 2
Length from tip of rostrum to tip of telson in millimetres .. .. .	27	22
Toothing-formula of the rostrum .. .. .	$17^2 + 1$	$21^2 + 1$
Rostrum longer >, or shorter < than the scaphocerites	19	17
Rostrum longer >, or shorter < than the carapace ..	>	>
Proportion between the length of the toothed and that of the unarmed part of the upper margin ..	1	3.1
Length of carpus .. .. .	0.88	0.82
Breadth of carpus .. .. .	0.404	0.35
Proportion between length and breadth of carpus ..	2.2	2.34
Length of chela .. .. .	1.1	1
Breadth of chela .. .. .	0.5	0.43
Length of fingers .. .. .	0.68	0.61
Proportion between length of fingers and that of palm	1.62	1.56
Proportion between length and breadth of chela ..	2.2	2.3
Length of carpus .. .. .	1.58	1.38
Breadth of carpus at distal extremity .. .. .	0.306	0.27
Proportion between length and breadth of carpus ..	5.2	5
Length of chela .. .. .	1.22	1.14
Breadth of chela .. .. .	0.446	0.384
Length of fingers .. .. .	0.77	0.72
Proportion between the length of fingers and that of palm .. .. .	1.71	1.7
Proportion between length and breadth of chela ..	2.73	3
Length of propodite .. .. .	2.16	1.8
Breadth of propodite in the middle .. .. .	0.15	0.13
Proportion between length and breadth of propodite	14.4	14
Length of dactylus .. .. .	0.57	0.51
Proportion between length of propodite and that of dactylus .. .. .	3.8	3.53
Breadth of dactylus .. .. .	0.13	0.104
Proportion between length and breadth of dactylus ..	4.4	5
Number of spines of dactylus terminal claw included	10	11
Length of propodite .. .. .	2.42	2.02
Breadth of propodite in the middle .. .. .	0.17	0.14
Proportion between length and breadth of propodite	14.1	14.4
Length of dactylus .. .. .	0.8	0.7
Proportion between length of propodite and that of dactylus .. .. .	3	2.9
Breadth of dactylus .. .. .	0.16	0.14
Proportion between length and breadth of dactylus ..	5	5
Number of spines of dactylus, terminal claw included	50	49



TABLE C.

Measurements of *Cari-  
dina nilotica* (*Roux*),  
*var. natalensis nov.*

No. 1	No. 2	No. 3	No. 1	No. 2	No. 3	No. 4	No. 5	REMARKS.
39 20 <sup>2</sup> +1	36.5 18 <sup>1</sup> +1	34 17 <sup>2</sup> +1	34 13 <sup>3</sup> +1	33.5 13+0	32.5 16 <sup>2</sup> +0	32 19 <sup>3</sup> +?	29 16+1	
14	16	18	18	14	12	16	20	
>	>	>	>	=	=		>	
>	>	>	>	>	<		>	
1.35	1.04	1.1	1	0.95	1.5	..	1.43	
1.4	1.26	1.22	1.2	1.34	1.26	1.28	1.06	
0.72	0.62	0.56	0.68	0.684	0.64	0.71	0.47	
2	2	2.2	1.76	1.96	2	1.8	2.3	
1.7	1.64	1.5	1.55	1.7	1.56	1.65	1.22	
0.81	0.74	0.73	0.84	0.93	0.78	0.87	0.6	
0.97	1.01	0.85	0.89	0.92	0.86	0.87	0.76	
1.33	1.6	1.31	1.35	1.18	1.23	1.11	1.65	
2.1	2.2	2.1	1.84	1.83	2	1.9	2.1	
2.3	2.3	2.1	2.36	2.4	2.2	2.34	1.9	
0.5	0.47	0.45	0.51	0.49	0.47	0.48	0.37	
4.6	5	4.66	4.63	5	4.7	5	5.1	
1.75	1.76	1.64	1.8	1.9	1.7	1.75	1.44	
0.67	0.68	0.64	0.74	0.76	0.71	0.72	0.54	
1.08	1.12	1.04	1.19	1.25	1.07	1.05	0.98	
1.6	1.75	1.73	1.95	1.9	1.9	1.5	2.1	
2.6	2.6	2.5	2.43	2.5	2.4	2.43	2.66	
3.1	2.96	2.85	2.95	3	3.08	2.85	2.35	
0.226	0.208	0.19	0.22	0.23	0.22	0.224	0.224	
13.7	14.2	15	13.4	13	14	12.7	10.5	
0.68	0.67	0.63	0.68	0.66	0.72	0.66	0.6	
4.6	4.4	4.5	4.3	4.5	4.3	4.3	3.9	
0.188	0.18	0.18	0.186	0.2	0.188	0.194	0.178	
3.7	3.7	3.5	3.65	3.3	3.8	3.4	3.37	
8	9	7	9	8	8	8	9	
3.7	3.6	3.46	3.7	3.76	3.7	3.66	3.3	
0.216	0.22	0.195	0.244	0.24	0.21	0.238	0.196	
17	16.4	18	15	15.7	18	15.1	16.8	
0.82	0.88	0.82	1.07	1.07	1.18	1.15	0.98	
4.5	4.1	4.22	3.4	3.5	3.1	3.2	3.36	
0.2	0.198	0.186	0.232	0.22	0.19	0.22	0.184	
4.1	4.4	4.4	4.6	4.9	6.2	5.2	5.32	
50	50	46	62	70	72	72	68	

TABLE D.

Measurements of *Car. nilotica*  
(*Roux*), *var. paucipara*,  
*Max Weber.*

No. 1 of Table B is an ova-bearing female.

The three specimens of Table C are ova-bearing females from the river Umgeni, Natal.

The five specimens of Table D are from the river Umhlasine, Natal; they are, like those of Table C, co-types from Prof. Weber's collection. No. 1, No. 3 and No. 4 are ova-bearing females; in No. 3 and No. 2 a subapical tooth is wanting, and in No. 4 the rostrum is injured.



Measurements of *Caridina nilotica* (Roux)

	No. 1	No. 2	No. 3	No. 4	No. 5
Length from tip of rostrum to tip of telson in millimetres .. .. .	19 $21^2 + 1$	18.5 $17^2 + 1$	18 $16^2 + 1$	18 $17^1 + 1$	17.5 $15^1 + 1$
Toothing-formula of the rostrum .. .. .	17	16	12	14	15
Rostrum longer >, or shorter < than the scaphocerites .. .. .	slightly >	slightly >	slightly >	>	slightly >
Rostrum longer >, or shorter < than the carapace .. .. .	slightly >	slightly <	slightly >	>	>
Proportion between the length of the toothed and of the unarmed part of the upper margin	1.65	1.32	1.24	1.26	1.42
Length of carpus .. .. .	0.84	0.82		0.75	0.7
Breadth of carpus .. .. .	0.48	0.54		0.5	0.4
Proportion between length and breadth of carpus .. .. .	1.75	1.52		1.5	1.75
Length of chela .. .. .	1.12	1.2		1.08	1
Breadth of chela .. .. .	0.56	0.67		0.59	0.5
Length of fingers .. .. .	0.66	0.64		0.64	0.68
Proportion between length of fingers and that of palm .. .. .	1.5	1.16		1.46	2.1
Proportion between length and breadth of chela	2	1.8		1.83	2
Length of carpus .. .. .	1.46	1.42			1.32
Breadth of carpus at distal extremity .. .. .	0.335	0.38			0.288
Proportion between length and breadth of carpus	4.36	3.7			4.6
Length of chela .. .. .	1.18	1.18			1.08
Breadth of chela .. .. .	0.5	0.58			0.424
Length of fingers .. .. .	0.78	0.78			0.78
Proportion between the length of fingers and that of palm .. .. .	1.95	1.95			2.6
Proportion between length and breadth of chela	2.36	2			2.55
Length of propodite .. .. .	1.88	1.8	1.82		1.65
Breadth of propodite in the middle .. .. .	0.146	0.15	0.124		0.122
Proportion between length and breadth of propodite .. .. .	13	12	14.7		13.5
Length of dactylus .. .. .	0.51	0.52	0.5		0.47
Proportion between length of propodite and that of dactylus .. .. .	3.7	3.6	3.64		3.5
Breadth of dactylus .. .. .	0.12	0.124	0.11		0.1
Proportion between length and breadth of dactylus .. .. .	4.25	4.2	4.5		4.7
Number of spines of dactylus, terminal claw included .. .. .	8	9	9		8
Length of propodite .. .. .	2.08		1.88	1.84	
Breadth of propodite in the middle .. .. .	0.12		0.115	0.11	
Proportion between length and breadth of propodite .. .. .	17		16.3	16.7	
Length of dactylus .. .. .	0.6		0.55	0.52	
Proportion between length of propodite and that of dactylus .. .. .	3.46		3.4	3.54	
Breadth of dactylus .. .. .	0.12		0.11	0.11	
Proportion between length and breadth of dactylus .. .. .	5		5	4.7	
Number of spines of dactylus, terminal claw included .. .. .	37		35	35	



E.

*var. longirostris*, H. M. Edw.*Measurements of Caridina nilotica (Roux), var. brachydactyla nov.*

No. 6	No. 7	No. 8	No. 9	No. 10	No. 1	No. 2	No. 3	No. 4	REMARKS.
17 16+1	16.5 15+1	16.5 rostrum broken off.	16+1	14 16 <sup>2</sup> +1	31.5 19 <sup>3</sup> +1	31 21+1+2	33 26 <sup>3</sup> +2	29 22+1	No. 2 and No. 7 of Table E are ova-bearing females. The four specimens of Table G are all ova-bearing; No. 1 and No. 2 are from Mbawa, Flores; No. 3 and 4 from Palopo, Celebes, all co-types of Max Weber's collection of 1892.
16 slightly	16		16	14	13 slightly	16	15	15 slightly	
>	>		>	>	<	=	<	>	
>	slightly		>	>	slightly	slightly	<	slightly	
1.25	1.18		1.6	1.44	1.9	3.3	4.4	2	
0.78	0.75	0.8		0.59	1.32	1.15	1.56	1.3	
0.48	0.48	0.42		0.39	0.64	0.48	0.63	0.54	
1.62	1.56	1.9		1.51	2.1	2.4	2.5	2.4	
1.1	1.1	1.02		0.91	1.7	1.56	1.94	1.6	
0.6	0.58	0.5		0.5	0.77	0.61	0.88	0.71	
0.67	0.64	0.65		0.54	1.14	1.11	1.34	1.1	
1.56	1.39	1.75		1.5	2	2.5	2.23	2.2	
1.83	1.9	2.04		1.82	2.2	2.56	2.2	2.25	
	1.34	1.38	1.35	1	2.18	1.95	2.76	2.3	
	0.33	0.295	0.34	0.296	0.48	0.4	0.464	0.42	
	4	4.7	4	3.4	4.5	4.87	6	5.5	
	1.08	1.1	1.06	0.92	1.74	1.75	2.03	1.72	
	0.5	0.45	0.5	0.48	0.72	0.6	0.76	0.64	
	0.7	0.74	0.71	0.59	1.25	1.2	1.45	1.18	
	1.15	2.05	2	1.78	2.55	2.2	2.5	2.2	
	2.6	2.44	2.1 (4th pair).	1.9	2.5	2.9	2.7	2.7	
1.58	1.78	1.7	1.62	1.36	3.1	3.25	3.4	3	
0.13	0.122	0.118	0.122	0.11	0.224	0.2	0.232	0.17	
12.1	14.6	14.4	13.3	12.3	13.8	16.2	14.7	18.2	
0.44	0.51	0.46	0.44	0.4	0.5	0.52	0.58	0.52	
3.6	3.5	3.7	3.7	3.4	6.2	6.2	6	5.8	
0.11	0.108	0.096	0.1	0.094	0.186	0.168	0.198	0.146	
4	4.7	4.8	4.4	4.2	2.7	3.1	3	3.5	
8	10	8	9	7	7	6	6	6	
1.9	1.84		1.75	1.44	4.1		4.5		
0.118	0.102		0.106	0.098	0.24		0.22		
16.1	18		16.3	14.7	17.1		20		
0.54	0.56		0.51	0.44	0.68		0.83		
3.5	3.28		3.4	3.27	6		5.4		
0.115	0.102		0.11	0.094	0.2		0.22		
4.7	5.5		4.6	4.68	3.4		3.8		
36	39		35	30	34		50		



Measurements of *Caridina nilotica* (Roux),

	No. 1	No. 2	No. 3	No. 4	No. 5
Length in millimetres from tip of rostrum to tip of telson .. .. .	28	25	23	23	21.5
Toothing-formula of the rostrum .. .. .	$20^2 + 2$	$22^2 + 1$	$21^2 + 2$	$24 + 2$	$27^2 + 1^2$
Rostrum longer >, or shorter < than the scaphocerites .. .. .	11	17	11	14	16 or 17
Rostrum longer >, or shorter < than the carapace .. .. .	slightly >	slightly >	slightly >	>	>
Proportion between the length of the toothed and that of the unarmed part of the upper margin .. .. .	2	4.4	3.26	3	3.2
Length of carpus .. .. .	1.06	1.02	0.9	0.85	0.8
Breadth of carpus .. .. .	0.48	0.58	0.46	0.43	0.36
Proportion between length and breadth of carpus .. .. .	2.2	1.8	2	2	2.2
Length of chela .. .. .	1.3	1.34	1.1	1.1	1.06
Breadth of chela .. .. .	0.56	0.7	0.56	0.56	0.5
Length of fingers .. .. .	0.78	0.8	0.67	0.63	0.63
Proportion between length of fingers and that of palm .. .. .	1.5	1.5	1.56	1.34	1.5
Proportion between length and breadth of chela .. .. .	2.3	1.9	2	2	2.1
Length of carpus .. .. .	1.95	1.8	1.5	1.48	1.46
Breadth of carpus at distal extremity .. .. .	0.33	0.38	0.36	0.314	0.26
Proportion between length and breadth of carpus .. .. .	6	4.7	4.2	4.7	5.6
Length of chela .. .. .	1.35	1.34	1.28	1.15	1.1
Breadth of chela .. .. .	0.46	0.56	0.47	0.44	0.38
Length of fingers .. .. .	0.84	0.88	0.86	0.75	0.72
Proportion between length of fingers and that of palm .. .. .	1.65	1.9	2	1.87	1.9
Proportion between length and breadth of chela .. .. .	3	2.4	2.7	2.6	2.9
Length of propodite .. .. .	2.46	2.2	1.96		
Breadth of propodite in the middle .. .. .	0.18	0.166	0.146		
Proportion between length and breadth of propodite .. .. .	13.7	13.2	13.4		
Length of dactylus .. .. .	0.6	0.55	0.5		
Proportion between length of propodite and that of dactylus .. .. .	4.1	4	4		
Breadth of dactylus .. .. .	0.14	0.138	0.12		
Proportion between length and breadth of dactylus .. .. .	4.3	4	4.1		
Number of spines of dactylus, terminal claw included .. .. .	10	9	9		
Length of propodite .. .. .	2.95		2.2	2.28	
Breadth of propodite in the middle .. .. .	0.175		0.126	0.142	
Proportion between length and breadth of propodite .. .. .	17		17	16	
Length of dactylus .. .. .	0.88			0.7	
Proportion between length of propodite and that of dactylus .. .. .	3.35			3.3	
Breadth of dactylus .. .. .	0.16			0.13	
Proportion between length and breadth of dactylus .. .. .	5.5			5.4	
Number of spines of dactylus, terminal claw included .. .. .	54			45	



*var. bengalensis nov., from Port Canning.*

No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14	No. 15	No. 16	REMARKS.
20 23 <sup>2</sup> +2 11	20 24 <sup>3</sup> +1 13	17.5 21 <sup>3</sup> +2 11	17 21+1 11 slightly < slightly	17 26 <sup>2</sup> +1+2 14	16	16 25 <sup>3</sup> +2 14	14.75 24 <sup>2</sup> +1 15	14.5 21+1 13 slightly >	12.5 22+2 12	10 17+2 11 slightly > slightly	
>	= slightly <	= slightly <	< slightly <	>		>	>	>	= slightly <	> slightly >	
2.6 0.78 0.42	3.3 0.82 0.46	4 0.79 0.44	2.7 0.76 0.39	2 0.55 0.24	0.68 0.41	3.8 0.56 0.26	2.85 0.53 0.22	2.7 0.5 0.22	4.5 0.56 0.35	2.55 0.32 0.16	
1.9 1.06 0.52 0.64	1.8 1.1 0.55 0.6	1.8 1.02 0.54 0.62	1.95 0.95 0.472 0.59	2.3 0.77 0.32 0.49	1.66 0.98 0.5 0.62	2.1 0.75 0.3 0.46	2.4 0.72 0.29 0.455	2.3 0.65 0.3 0.4	1.6 0.8 0.41 0.48	2 0.46 0.204 0.274	
1.52	1.2	1.55	1.6	1.75	1.72	1.6	1.75	1.6	1.5	1.47	
2 1.3 0.3	2 1.46 0.3	1.9 1.33 0.31	2 1.3 0.26	2.4 1.02 0.17	1.96 1.25 0.268	2.5 1 0.18	2.5	2.2 0.88 0.166	1.95 0.98 0.22	2.25 0.55 0.13	
4.3 1.1 0.48 0.72	4.9 1.2 0.45 0.81	4.3 1.05 0.45 0.69	5 1.03 0.37	6 0.85 0.28 0.55	4.7 1 0.42 0.67	5.5 0.82 0.266 0.52		5.3 0.7 0.24 0.46	4.4 0.86 0.33 0.57	4.23 0.51 0.17 0.34	
1.9	2.1	1.9		1.8	2	1.75		1.9	1.96	2	
2.3 1.76 0.128	2.7 1.84 0.146	2.33 1.7 0.13	2.8	3 1.4 0.106	2.4 1.55 0.108	3.1 1.3	1.2 0.08	3 1.16 0.094	2.6 1.24 0.09	3 0.76 0.062	
13.7 0.47	12.6 0.47	13 0.5		13.2 0.4	14.3 0.45		15 0.36	12.4 0.33	14 0.36	12 0.226	
3.74 0.108	3.9 0.124	3.4 0.12		3.5 0.088	3.44 0.096		3.33 0.076	3.9 0.08	3.4 0.08	3.36	
4.4 10	3.8 9	4.1 10		4.5 8	4.7 8		4.7 8	4.1 6	4.5 9	6	
	2.06	1.86	1.72	1.8	1.68	1.66		1.4	1.46		
	0.146	0.122	0.125	0.095	0.114	0.094		0.08	0.1		
	14 0.68	15.2 0.62	14 0.6	19 0.54	15 0.56	17.7 0.53		18	14.6 0.48		
	3 0.136	3 0.12	2.87 0.12	3.3 0.095	3 0.1	3.1 0.1		0.086	3 0.09		
	5	5.2	5	5.7	5.6	5.3			5.4		
49	43	47	47	41	40	41			40		

No. 5, No. 10, Nos. 12-14, Port Canning, January 28-30th, 1906.  
 Nos. 1-4, No. 6 and No. 16, Port Canning, November 12th, 1906.  
 Nos. 7-9, No. 11 and No. 15, Port Canning, December 8th, 1906.  
 Nos. 1-9 and No. 11 are ova-bearing females. The rostrum of No. 5 was injured.



TABLE H.

*Measurements of Caridina nilotica (Roux), var. gracilipes, de M.*

	No. 1	No. 2	No. 3
Length in millimetres from tip of rostrum to tip of telson	28.5	27	
Toothing-formula of the rostrum .. .. .	$17^2 + 1$	$20^2 + 1$	$13^2 + 1$
	13	17	11 slightly
Rostrum longer >, or shorter < than the scaphocerites..	>	>	>
Rostrum longer >, or shorter than the carapace ..	=	>	>
Proportion between the length of the toothed and that of the unarmed part of the upper margin ... ..	1.17	1.6	0.75
Length of carpus .. .. .	1.16	1.1	1.06
Breadth of carpus .. .. .	0.49	0.55	0.48
Proportion between length and breadth of carpus ..	2.37	2	2.2
Length of chela .. .. .	1.36	1.42	1.26
Breadth of chela .. .. .	0.59	0.7	0.6
Length of fingers .. .. .	0.78	0.87	0.8
Proportion between length of fingers and that of palm ..	1.34	1.6	1.74
Proportion between length and breadth of chela ..	2.3	2	2.1
Length of carpus .. .. .		2.14	1.9
Breadth of carpus at distal extremity .. .. .		0.39	0.35
Proportion between length and breadth of carpus ..		5.5	5.4
Length of chela .. .. .		1.5	1.4
Breadth of chela .. .. .		0.59	0.52
Length of fingers .. .. .		0.96	0.94
Proportion between the length of fingers and that of palm ..		1.8	2
Proportion between length and breadth of chela ..		2.54	2.7 (4th pair).
Length of propodite .. .. .	2.46	2.64	2.4
Breadth of propodite in the middle .. .. .	0.178	0.18	0.15
Proportion between length and breadth of propodite ..	13.8	14.7	16
Length of dactylus .. .. .	0.64	0.61	0.55
Proportion between length of propodite and that of dactylus .. .. .	3.84	4.32	4.4
Breadth of dactylus .. .. .	0.14	0.128	0.13
Proportion between length and breadth of dactylus ..	4.6	4.8	4.2
Number of spines of dactylus, terminal claw included ..	9	10	10
Length of propodite .. .. .	3.1	3.1	2.7
Breadth of propodite in the middle .. .. .	0.178	0.164	0.16
Proportion between length and breadth of propodite ..	17.4	19	17
Length of dactylus .. .. .	0.84	0.82	0.72
Proportion between length of propodite and that of dactylus .. .. .	3.7	3.8	3.75
Breadth of dactylus .. .. .	0.156	0.14	0.146
Proportion between length and breadth of dactylus ..	5.4	6	5
Number of spines of dactylus, terminal claw included ..	56	57	46



TABLE I.

Measurements of *Caridina nilotica* (Roux), var. *minahassa*, de M.

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	REMARKS.
0.86	0.84		0.8	0.8		0.72	0.6	0.64	0.6	Nos. 1—3 of Table H co-types of the var. <i>gracilipes</i> , de M., from the river at Maros, Celebes; No. 1 and No. 2 ova-bearing.
0.52	0.49		0.47	0.49		0.48	0.48	0.4	0.35	
1.65	1.71		1.7	1.6		1.5	1.25	1.6	1.7	
1.18	1.18		1.04	1.1		1.02	1.06	0.92	0.9	
0.62	0.62		0.55	0.6		0.58	0.54	0.49	0.48	
0.68	0.68		0.64	0.6		0.64	0.6	0.56	0.52	
1.36	1.36		1.6	1.2		1.7	1.3	1.6	1.4	
1.9	1.9		1.9	1.8		1.8	2	1.9	1.9	
1.5	1.4		1.3		1.2		1.12	1.12	1.1	
0.35	0.34		0.29		0.32		0.32	0.266	0.25	
4.3	4.1		4.5		3.7		3.5	4.2	4.4	
1.2	1.16		1.04		1.04		1.04	0.92	0.94	
0.56	0.5		0.45		0.51		0.5	0.42	0.43	
0.8	0.74		0.66		0.6		0.6	0.6	0.58	
2	1.76		1.7		1.4		1.4	1.9	1.6	
2.1	2.32		2.3		2		2.1	2.2	2.2	
1.84		1.72	1.66		1.54	1.52	1.6	1.3	1.4	
0.13		0.11	0.115		0.11		0.11	0.1	0.092	
14		16	14.4		14		15	13	15	
0.44		0.42	0.44		0.4	0.38	0.44	0.33	0.35	
4.2		4.1	3.8		3.8	4	3.6	4	4	
0.1		0.09	0.1		0.09	0.08	0.09	0.08	0.08	
4.4		4.6	4.4		4.4	4.7	4.9	4.1	4.4	
	1.96	1.9	1.8			1.76			1.56	
	0.1	0.1	0.1			0.106			0.092	
	19	19	18			17			17	
	0.56	0.55	0.52			0.51			0.47	
	3.5	3.4	3.5			3.4			3.3	
		0.1	0.1			0.1			0.092	
		5.5	5.2			5.1			5	

Nos. 1—10 of Table I co-types of the var. *minahassa* from the Minahassa (Celebes) (Kü-kenthal's Collection).



Measurements in millimetres of *Caridina propinqua* and *Car. lævis*.

	1	2	3	4	5	6	7	8
Length in millimetres from tip of rostrum to tip of telson	20.5		19.5	13.5				
Length of merus .. .. .	0.66	0.64	0.6		0.75	0.78	0.75	
Length of carpus .. .. .	0.88	0.86	0.8		0.83	0.84	0.82	
Breadth of carpus .. .. .	0.335	0.348	0.306		0.326	0.32	0.34	
Proportion between length and breadth of carpus .. .. .	2.6	2.5	2.6		2.54	2.6	2.4	
Length of chela .. .. .	1.1	1.1	1.06		1.04	1.05	1.04	
Breadth of chela .. .. .	0.52	0.46	0.46		0.454	0.4	0.44	
Proportion between length and breadth of chela .. .. .	2.11	2.4	2.3		2.3	2.6	2.4	
Length of fingers .. .. .	0.72	0.7	0.7		0.64	0.64	0.61	
Proportion between length of palm and that of fingers .. .. .	1.9	1.75	2		1.6	1.56	1.42	
Length of merus .. .. .	0.95	0.94	0.78		1.12	1.1	1.06	
Length of carpus .. .. .	1.5	1.42	1		1.6	1.6	1.52	
Breadth of carpus at distal extremity .. .. .	0.27	0.27	0.23		0.206	0.22	0.24	
Proportion between length and breadth of carpus .. .. .	5.5	5.2	4.4		7.7	7.3	6.3	
Length of chela .. .. .	1.16	1.18	0.96		1.34	1.26	1.28	
Breadth of chela .. .. .	0.42	0.4	0.3		0.285	0.28	0.31	
Proportion between length and breadth of chela .. .. .	2.7	2.95	3.2		4.7	4.5	4	
Length of fingers .. .. .	0.74	0.74	0.63		0.79	0.72	0.72	
Proportion between length of palm and that of fingers .. .. .	1.76	1.7	1.9		1.44	1.33	1.3	

} of 1st pair of legs.

} of 2nd pair of legs.



Length of meropodite .. .. .	1.9	1.82	1.7	1.28	2.06	2	2.06	
Breadth of meropodite.. .. .	0.22	0.22	0.2	0.162	0.24	0.22	0.235	
Proportion between length and breadth of meropodite .. .. .	8.6	8.3	8.5	8	8.6	9	8.8	
Length of propodite .. .. .	1.6	1.4	1.55	1.16; 1.16	1.7	1.6	1.66	
Breadth of propodite .. .. .	0.14	0.15	0.13	0.1; 0.1	0.136	0.13	0.132	
Proportion between length and breadth of propodite .. .. .	11.4	9.3	12	11.6; 11.6	12.5	12.3	12.5	
Length of dactylus .. .. .	0.46	0.42	0.53	0.4; 0.42	0.5	0.5	0.52	
Breadth of dactylus .. .. .	0.11	0.108	0.11	0.08; 0.08	0.116	0.12	0.118	
Proportion between length and breadth of dactylus .. .. .	4.2	4	4.8	5; 5	4.3	4.2	4.4	
Proportion between length of propodite and that of dactylus .. .. .	3.5	3.3	3	2.9; 2.8	3.4	3.2	3.2	
Number of spines of dactylus .. .. .	6	5	5	4; 6	9	9	8	
Length of meropodite .. .. .			1.4		1.6		1.58	1.62
Breadth of meropodite.. .. .			0.175		0.2		0.2	0.204
Proportion between length and breadth of meropodite .. .. .			8		8		8	8
Length of propodite .. .. .			1.76		2.06		2.06	2.15
Breadth of propodite .. .. .			0.122		0.13		0.13	0.12
Proportion between length and breadth of propodite .. .. .			14.4		16		16	18
Length of dactylus .. .. .			0.74		0.85		0.84	0.92
Breadth of dactylus .. .. .			0.13		0.132		0.13	0.12
Proportion between length and breadth of dactylus .. .. .			5.7		6.44		6.5	7.66
Proportion between length of propodite and that of dactylus .. .. .			2.38		2.4		2.45	2.33
Number of spines of dactylus, terminal claw included .. .. .			48		78		75	

Nos. 1—4 *Caridina propinqua*, sp. nov. No. 1 20.5 mm. long; No. 2 about the same length, rostrum broken off; No. 3 19.5 mm. long; No. 4 13.5 mm. long (in No. 4 both legs of third pair are measured). Nos. 5—8 *Car. laevis*, Heller, adult ovigerous specimens.









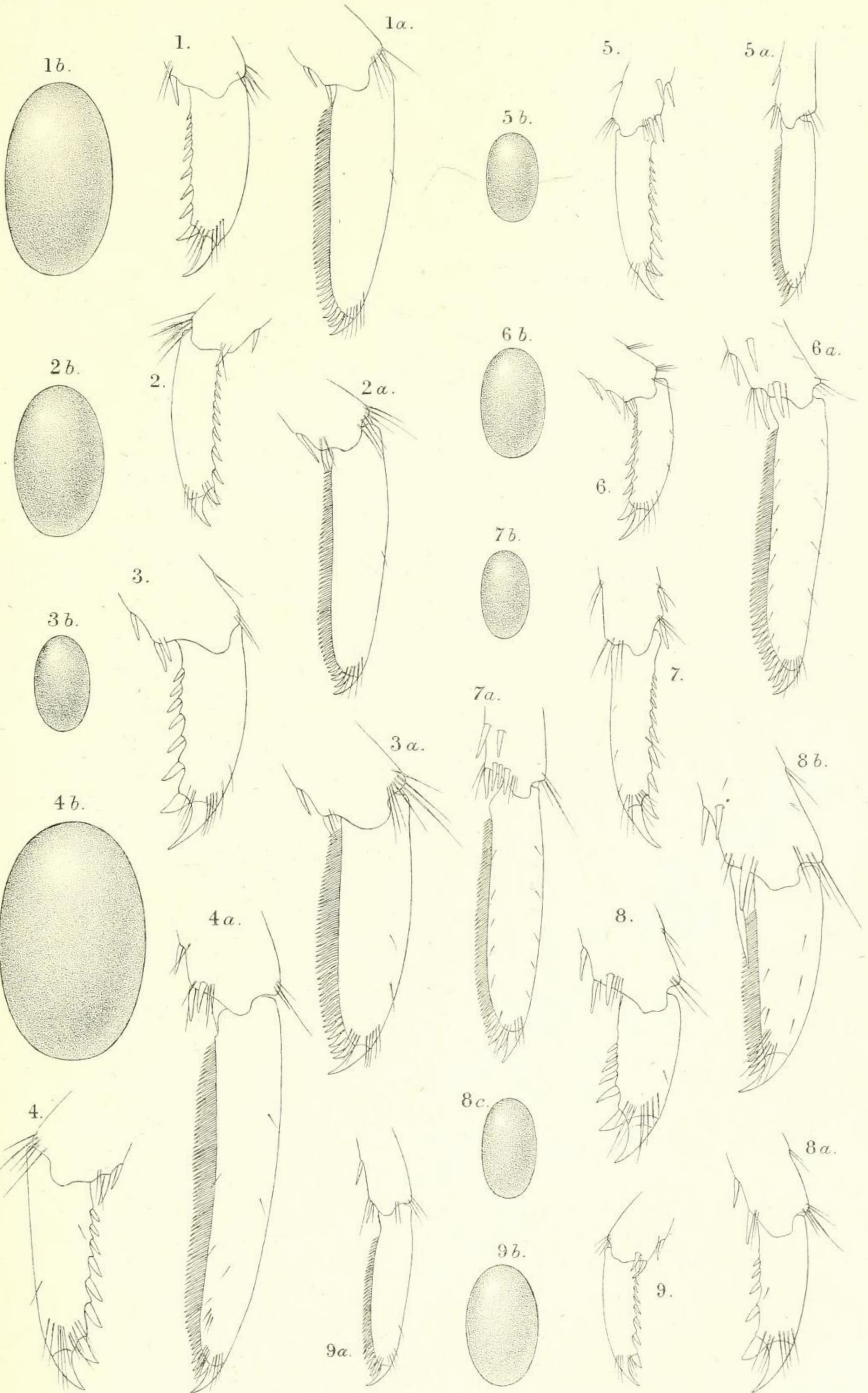


## EXPLANATION OF PLATE XX.

*The dactyli are enlarged 50 times, the eggs 33 times.*

- FIG. 1.—*Caridina nilotica* (Roux), typical form from Cairo, dactylus of third pair of the egg-bearing female (No. 1 of Table A); 1*a* dactylus of fifth pair of the specimen No. 7; 1*b* egg, 0.86 mm. long, of the female No. 5.
- „ 2.—*Car. nilotica* (Roux), variety from Lake Victoria Nyanza, dactylus of third pair of the female 27 mm. long, 2*a* dactylus of fifth pair and 2*b* egg, 0.67 mm. long, of the same female.
- „ 3.—*Car. nilotica* (Roux), var. *natalensis* nov., dactylus of third pair of the female No. 1 of Table C; 3*a* dactylus of fifth pair of the same female; 3*b* egg, 0.42 mm. long, of the female No. 2.
- „ 4.—*Car. nilotica* (Roux), var. *paucipara*, M. Weber, dactylus of third pair; 4*a* dactylus of fifth pair and 4*b* egg, 1.04 mm. long, of the female No. 3 of Table D.
- „ 5.—*Car. nilotica* (Roux), var. *longirostris*, H. M. Edw., dactylus of third pair and 5*a* of fifth pair of the female No. 7 of Table E; 5*b* egg, 0.39 mm. long, of the female No. 2.
- „ 6.—*Car. nilotica* (Roux), var. *bengalensis* nov., dactylus of third pair of the female No. 6 of Table F; 6*a* dactylus of fifth pair and 6*b* egg, 0.47 mm. long, of the female No. 1.
- „ 7.—*Car. nilotica* (Roux), var. *gracilipes*, de Man, dactylus of third pair, 7*a* of fifth pair and 7*b* egg, 0.38 mm. long, of the female No. 2 of Table H.
- „ 8.—*Car. nilotica* (Roux), var. *brachydactyla*, nov., dactylus of third pair, 8*b* of fifth pair and 8*c* egg, 0.44 mm. long, of the female No. 1 of Table G; 8*a* dactylus of third pair of the female No. 4.
- „ 9.—*Car. nilotica* (Roux), var. *minahassa*, de Man, dactylus of third pair and 9*a* of fifth pair of a specimen, 16 mm. long, co-type from Kükenthal's Collection; 9*b* egg, 0.55 mm. long.





J. G. de Man, del.

McFarlane & Erskine, Lith. Edin'

CARIDINA NILOTICA (Roux), AND ITS VARIETIES.



