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ON SOME PORTUNID CRABS FROM THE INDO-WESTPACIFIC REGION

by

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In 1939 during a visit to the British Museum, London, the first author (Leene) examined a number of indo-westpacific Portunidae belonging to the collection of this Museum. Part of the material was then reserved to be studied more extensively in Holland. Through the outbreak of World War II it was not before 1947 that this material came to Holland; it then was taken from London to Leiden by the second author (Buitendijk). The material was studied jointly by the two authors, who intended to publish the results of this study as a single paper. Circumstances beyond the control of the authors, however, necessitated the separate publication of a report on only three of the species (Leene & Buitendijk, 1949). The present paper deals with the rest of the material and with a new species of the genus *Charybdis* from the collection of the Rijksmuseum van Natuurlijke Historie at Leiden. Also some material of the genus *Lupocyclus* from the Amsterdam and Leiden Museums, which has been used for comparison with the specimens from the British Museum, is discussed here ¹).

1) The first author deeply regrets that her friend passed away before all the results of their cooperation could be published. In kind memory to the second author her biography is given here:

Alida Margaretha Buitendijk was born in Leiden April 1, 1903. Her father, Pieter Buitendijk, was a ship-surgeon who had a keen interest in biology. Especially the fishes had his full attention and on his numerous trips, mostly to the East Indies, he collected a large material of fishes as well as of other animals, all of which were donated to the Rijksmuseum van Natuurlijke Historie at Leiden. His daughter inherited his interest in zoology and after finishing the secondary school she studied biology at the Leiden University. In 1926 she obtained a degree permitting her to teach biology in secondary schools. Through circumstances it was not possible for her to obtain any actual University degree, though she certainly possessed the necessary qualities for them. In 1930 Miss

The first author wants to thank Dr. L. B. Holthuis, Leiden, for writing Miss Buitendijk's biography and for his kind and adequate assistance in preparing this paper for the press.

Lupocyclus philippinensis Nauck

Lupocyclus philippinensis Leene, 1940, Temminckia vol. 5, p. 174, textfig. 5, pl. 3.

British Museum (Nat. Hist.)

Karachi, May 29, 1906. — 1 female.

Remarks. The specimen from Karachi undoubtedly belongs to *Lupocyclus philippinensis*, though it presents some differences from the specimen described by Leene in 1940. The cephalothorax has the groups of granules more elevated, furthermore the front is slightly less prominent and the anterior border of the merus of the right cheliped bears only six instead of seven spines (the second spine from the distal end of the merus, shown in the Siboga specimen, lacks in the Karachi female); in the left leg the merus bears the usual 7 spines.

Buitendijk accepted a small administrative position at the Rijksmuseum van Natuurlijke Historie. Soon her knack for scientific work was recognized and in 1938 she was appointed assistant curator of the division of Arthropoda, being entrusted with the care for the non-insect arthropods. By 1940 the collections of the Crustacea and the other non-insect Arthropoda of the Leiden Museum were considered to be of sufficient importance to let them rank as a separate division. Miss Buitendijk was then appointed curator of this division. In September 1949 an illness from which Miss Buitendijk suffered already some years made it impossible for her to continue her work at the Museum, and after a sick-bed of about one year she passed away in Leiden, September 12, 1950. The main interest of Miss Buitendijk was with the Decapod Crustacea. She wrote several papers on Paguridea and Brachyura of the indo-westpacific region, while short before her death a paper on Mexican Brachyura was published. A monographic treatment of the Dutch Brachyura is now in the press. Also the Mysidacea received Miss Buitendijk's attention and the material of this group collected during the Zuiderzee investigations was studied by her. Outside the Crustacea Miss Buitendijk studied the Dutch Collembola, about which she wrote a handbook and several smaller papers. Of great importance also is her catalogue of the Oudemans Acari-collection, which gives acarologists a much desired list of the existing material and drawings of the famous Oudemans collection, which now is in the Leiden Museum. Miss Buitendijk was entirely devoted to her work, and up till her last days she had a vivid interest in everything connected with carcinology and with the Leiden Museum. Her attachment to the Museum is well shown by the fact that she bequeathed the larger part of her possessions to this institution. In her spare time Miss Buitendijk devoted herself to girl-scout work and was one of the leading personalities in these circles. Miss Buitendijk's keen intelligence, her unselfishness, her honesty and her continuous readiness to help others always will be remembered by her friends and colleagues.

Lupocyclus granulatus nov. spec. (Pl. XVI fig. 1; textfig. 1a).

Lupocyclus rotundatus p.p. Leene, 1938, Siboga Exped., mon. 39c3, p. 11.

British Museum (Nat. Hist.)

Holothuria Bank, March 26, 1892, leg. P. W. Bassett Smith, Reg. No. 158-167. — 1 male and 1 female.

Siboga Expedition

Station 49a, Sapeh Strait, Sumbawa, 8° 23'5 S, 119° 4'6 E, depth 69 m, bottom coral and shells, April 14, 1899. — 2 juveniles.

Station 71, Makassar, Celebes, depth up to 32 m, bottom mud, sand with mud, coral, May 10-June 7, 1899. — 2 juveniles.

Station 133, anchorage off Lirung, Salebabu Island, Talaud Archipelago, depth up to 36 m, bottom mud and hard sand, July 25-27, 1899. — 1 male.

Station 204, northern entrance of Buton Strait between Buton and Wowoni islands, S.E. Celebes, 4° 20' S, 122° 58' E, depth 75 to 94 m, bottom sand with dead shells, September 20, 1899. — 1 female.

Station 240, Banda anchorage, depth 9-45 m, bottom black sand, coral, lithothamnion bank in 18-36 m, November 22-December 1, 1899. — 2 males, 1 female.

Station 299, Cyrus Bay, southcoast of Roti Island, 10° 52'4 S, 123° 1'1 E, depth up to 34 m, bottom mud, coral, lithothamnion, January 27-29, 1900. — 1 male.

In the present species the granulation of the cephalothorax is much more pronounced than in *Lupocyclus rotundatus* Adams & White, with which species it up till now was confused. The transverse granular ridges so characteristic in *L. rotundatus* for the larger part are replaced here by groups of granules which are placed on elevated tubercles. These tubercles generally are very distinct, even when the specimens are examined without a lens. The general impression given by *L. rotundatus* is that of a species with a striate cephalothorax, while the cephalothorax of *L. granulatus* gives the impression of being granulate.

The arrangement of the granular tubercles on the cephalothorax in the new species is as follows:

1. In the proto-gastric region there are two groups of granules on each half, so that the cephalothorax bears there a transverse row of four distinctly elevated granulated tubercles. In *L. rotundatus* the cephalothorax shows here a single and continuous transverse row of granules, which at most is interrupted in the middle. This row is very flat and not at all elevated. The difference of the granulation of the proto-gastric region is the most distinct and most constant character to distinguish the two species.

2. Behind the two inner of the tubercles mentioned under 1, two larger tubercles each bearing a group of granules are present. In *L. rotundatus*

these two tubercles are replaced by two short transverse single rows of granules.

3. In the cardiac region there are also two elevated and rather large submedian tubercles, each bearing a group of granules. In the smaller specimens of *L. rotundatus* seen by us (cephalothorax breadth 10-24 mm) these tubercles are replaced by a short transverse single row of granules, in the two largest specimens examined (cephalothorax breadth 43 mm) the granules are placed more or less irregularly together, but the surface on which they are placed is much less elevated than in *L. granulatus*.

4. A far smaller tubercle also bearing granules is placed in the median line of the intestinal region. This tubercle sometimes is indistinct. In *Lupocyclus rotundatus* it is replaced by a few flat granules, which sometimes even are lacking.

5. A row of granules begins at the last anterolateral tooth, bends rather abruptly forwards till it reaches the level of the base of the penultimate anterolateral tooth and then curves inward over the branchial region; it ends just before reaching the gastric region. The submedian end of this row is curved slightly backwards. The row is very similar to that in *L. rotundatus*, but it is somewhat more elevated.

6. On the mesobranchial region there are two groups of granules:

a. one group slightly behind the submedian end of the row of granules mentioned under 5; this group is placed at a level about midway between the end of the just mentioned row and the group of granules mentioned under 2.

b. one group placed behind and externally of group 6a.

Both group 6a and 6b are placed on an elevated tubercle. In *L. rotundatus* these groups of tubercles are replaced by short transverse rows of granules, which in the smaller specimens are single, but in the larger specimens have some granules placed before and especially behind them.

7. An elevated granular ridge is placed in the mesobranchial region. It starts some distance behind group 6b and curves from there outwards and forwards. This ridge is formed by a double row of granules. In *L. rotundatus* this ridge is far less elevated and consists of a single row of granules only. In the larger specimens of the latter species this ridge is shorter and less curved than in the smaller.

Apart from these groups of granules, one observes in the present new species several scattered single granules on the cephalothorax. These granules are especially distinct in the anterior and lateral portions of the cephalothorax.

The shape of the front in *L. granulatus* also shows some differences from that of *L. rotundatus*. The submedian teeth are broad and blunt and are far

less prominent than the median teeth. The lateral teeth are very small. The incisions between the teeth are far shallower than in *L. rotundatus*. There is, however, some variation in the shape of the front. The specimens from Siboga Station 240 have the teeth of the front more prominent than in the specimen figured here, but still they are less slender than in *L. rotundatus*.

The small anterolateral teeth, which are placed between the five larger anterolateral teeth are far smaller in *L. granulatus* than in *L. rotundatus*. In the latter species the anterior of these smaller teeth often is only slightly smaller than the second larger tooth, in *L. granulatus* the difference in the

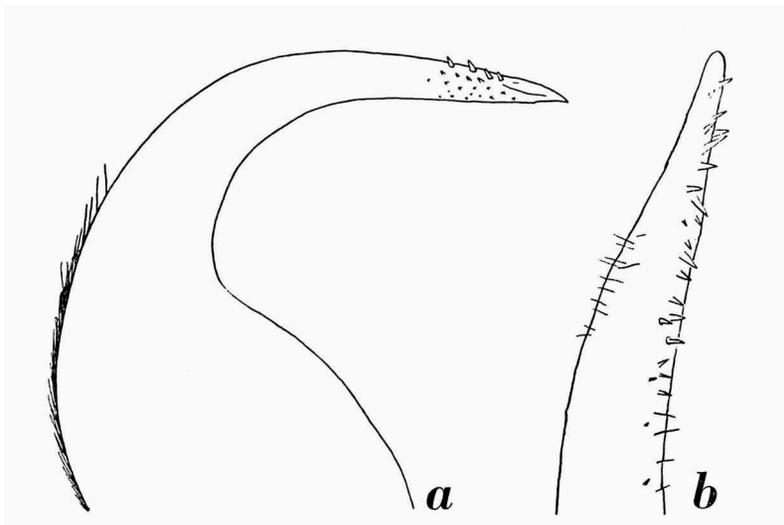


Fig. 1. a, *Lupocyclus granulatus* nov. spec., first pleopod of male holotype; b, *Charybdis* (*Goniohellenus*) *padangensis* nov. spec., apex of first pleopod of male holotype. a, $\times 50$.

size of the two teeth is considerable. Often the last small tooth in *L. granulatus* is extremely inconspicuous.

The first pleopod of the male of *Lupocyclus granulatus* (fig. 1a) differs from that of *L. rotundatus* in that it is more robust, with the neck shorter, relatively broader and far more strongly curved. The spinules are confined to the extreme distal part of the neck and dorsally are distinctly larger than those of *L. rotundatus*.

The cephalothorax breadth of the specimens of *L. granulatus* examined lies between 6 and 15 mm. The species seems to be smaller than *L. rotundatus* of which specimens with a cephalothorax breadth of 5 to 44 mm were seen.

Type. Holotype is the male from Holothuria Bank, the other specimens are paratypes.

Remarks. *Lupocyclus granulatus* and *L. rotundatus* are closely related. The differences enumerated here, however, are sufficiently constant to justify their separation as distinct species. The character of the different granulation of the proto-gastric region of the cephalothorax is especially distinct and constant.

The two species occur side by side in our material from Holothuria Bank and in that from Siboga Station 71. The Siboga material has been reported upon by Leene (1938) under the name *L. rotundatus*.

Lupocyclus rotundatus Adams & White (Pl. XVI figs. 2, 3).

Lupocyclus rotundatus p.p. Leene, 1938, Siboga Exped., mon. 39c3, p. 11.

Lupocyclus rotundatus Leene, 1940, Temminckia, vol. 5, p. 169, textfig. 3, pl. 1.

British Museum (Nat. Hist.)

Holothuria Bank, March 26, 1892, leg. P. W. Bassett Smith. — 2 males, 3 juveniles.
Martaban, Birma, leg. E. W. Oates. — 1 male, 1 female.

Siboga Expedition

Station 71, Makassar, Celebes, depth up to 32 m, bottom mud, sand with mud, coral, May 10 to June 7, 1899. — 3 males.

Station 77, Borneo Bank, 3° 27' S, 117° 36' E, depth 59 m, bottom fine grey coral sand, June 10, 1899. — 1 male.

Station 273, Jedan, Aru Islands, depth 13 m, bottom sand and shells, December 23-26, 1899. — 1 male.

Station 303, Haingsisi, Samau Island near Timor, depth up to 36 m, bottom lithothamnion, February 2-5, 1900. — 1 male.

Snellius Expedition

Station 223, near Obi Major, Moluccas, 1° 39'.5 S, 127° 21'.0 E, depth 0-1 m, March 23, 1930, about 21 p.m. — 1 small male.

Museum Leiden

Amboina, Moluccas, 1863, leg. E. W. A. Ludeking. — 2 males.

The differences between the present species and *L. granulatus* nov. spec. have already been discussed under the latter species. The figure of *Lupocyclus rotundatus* by Adams and White (1848, pl. 12 fig. 4) leaves not the least doubt that the type specimen of that species is conspecific with the specimens identified here with it. Also Walker's (1887, p. 116, pl. 8 fig. 4) *Goniosoma inaequale* obviously is identical with the present species.

Gordon (1938, p. 175) states that her specimen of *Lupocyclus rotundatus*, a female with a cephalothorax breadth of about 33 mm, is the largest specimen so far captured of this species. It must be pointed out, however,

that the specimens of this species from Amboina reported upon by De Man (1883, p. 153) have the cephalothorax 43 mm broad. These specimens still are present in the collection of the Leiden Museum, one of them is figured here. In these large specimens the neck of the first pleopod of the male is still more slender and more straight than that figured by Leene (1940, fig. 3). Some other differences between these large specimens and smaller individuals of *L. rotundatus* have been enumerated in the text dealing with *L. granulatus*.

***Charybdis (Charybdis) rathbuni* Leene**

Charybdis (Goniosoma) orientalis Laurie, 1906, Rep. Ceylon Pearl Oyster Fish., vol. 5, p. 418.

Charybdis (Charybdis) rathbuni Leene, 1938, Siboga Exped., mon. 39c3, p. 97, fig. 52.

British Museum (Nat. Hist.)

Ceylon, Pearl Banks in the Gulf of Manaar, May 22, 1902, leg. W. A. Herdman, Reg. No. 333-37. — 15 females, 2 males and 2 juveniles.

Remarks. The present material was identified by Laurie (1906) as *Charybdis (Goniosoma) orientalis* Dana. Leene (1938, p. 68), who in 1938 was unaware of the actual identity of this material, under *Charybdis (Charybdis) orientalis* still gave a reference to Laurie's paper. Reexamination of Laurie's material, which unfortunately is not in a too good state of preservation, leaves no doubt that it belongs to *Charybdis (C.) rathbuni* Leene. The largest specimen from Ceylon, a male, was compared with the holotype of Leene's species. The differences found between the two specimens proved not to be sufficiently important to make it necessary to place Laurie's material in a separate species. The characters in which the Ceylon specimen differs from the holotype of *C. rathbuni* are the following:

1. The granular ridge between the posterior anterolateral teeth is interrupted by the cervical groove, but no interruption is found in the middle of the ridge.
2. The median frontal teeth are broader, and therefore the difference in breadth between the median and the submedian teeth is less distinct than in Leene's figure; the lateral frontal teeth are broader too.
3. The fifth anterolateral tooth is much less broad than the fourth and of a rather different shape, being more spine-like.
4. The inner part of the upper orbital border is granular, but this granulation is indistinct.
5. The median of the three spinules on the wrist of the chela is rather large, this is especially apparent in the examined male from Ceylon.

6. There are only five granular ridges on the palm. On page 98 of her Siboga paper Leene (1938) mentioned the presence of four spines on the palm, but later she enumerates five. Actually there are indeed five spines here, just as in the male from Ceylon.

7. On p. 99 Leene (1938) mentions the presence of granules on the posterior border of the propodus of the natatory leg. As may be seen in the figure this border is provided with spines, not with granules. In the male from Ceylon this border too bears spines.

The second and third tergum of the abdomen in the male from Ceylon are carinate, the fourth and fifth terga are fused, the sixth is broader than long. The lateral borders of the sixth tergum are rather strongly curved, the posterior border is straight, the anterior is curved.

The collection of the British Museum contains a female specimen which has been collected on August 2, 1892 at Macclesfield Bank by P. W. Bassett Smith. This specimen also proves to belong to *Charybdis* (*Charybdis*) *rathbuni*.

***Charybdis* (*Goniohellenus*) *padangensis* nov. spec. (fig. 1b, fig. 2).**

Museum Leiden

Padang, W. Sumatra, leg. H. G. Wittenrood. — 1 male, 1 female.

Description of the male (holotype). The rather strongly convex and smooth cephalothorax has the regions ill defined, while only some traces of granular ridges are left. The ridge between the posterior anterolateral teeth is the most distinct. The slightly prominent front is cut into six teeth. The median teeth are blunt and separated from each other by a very shallow incision, they are less broad than the equally blunt submedian teeth. Of these latter teeth the median borders are curved, the outer borders are very short and slightly inclined outwards. These outer borders overlap the lateral teeth which are equally blunt, much smaller and slightly more prominent than the submedian and median teeth. The anterolateral border is cut into six teeth. The anterior of these is strongly bilobed, each lobe is blunt. The following four teeth are of about equal breadth, though their shape is not the same. The second tooth is blunt and its outer margin is only slightly curved. In the third tooth the outer margin is more curved, while the curve in the fourth tooth is still stronger. The fifth tooth is quite different in shape: its outer angle is sharply pointed. The posterior anterolateral tooth is much larger than the others, being spine-like and directed outwards. The margins of all these teeth, except the posterior margin of the last tooth, are very indistinctly granular. The posterolateral borders are strongly convergent. The posterior margin is straight and forms an eared junction with the

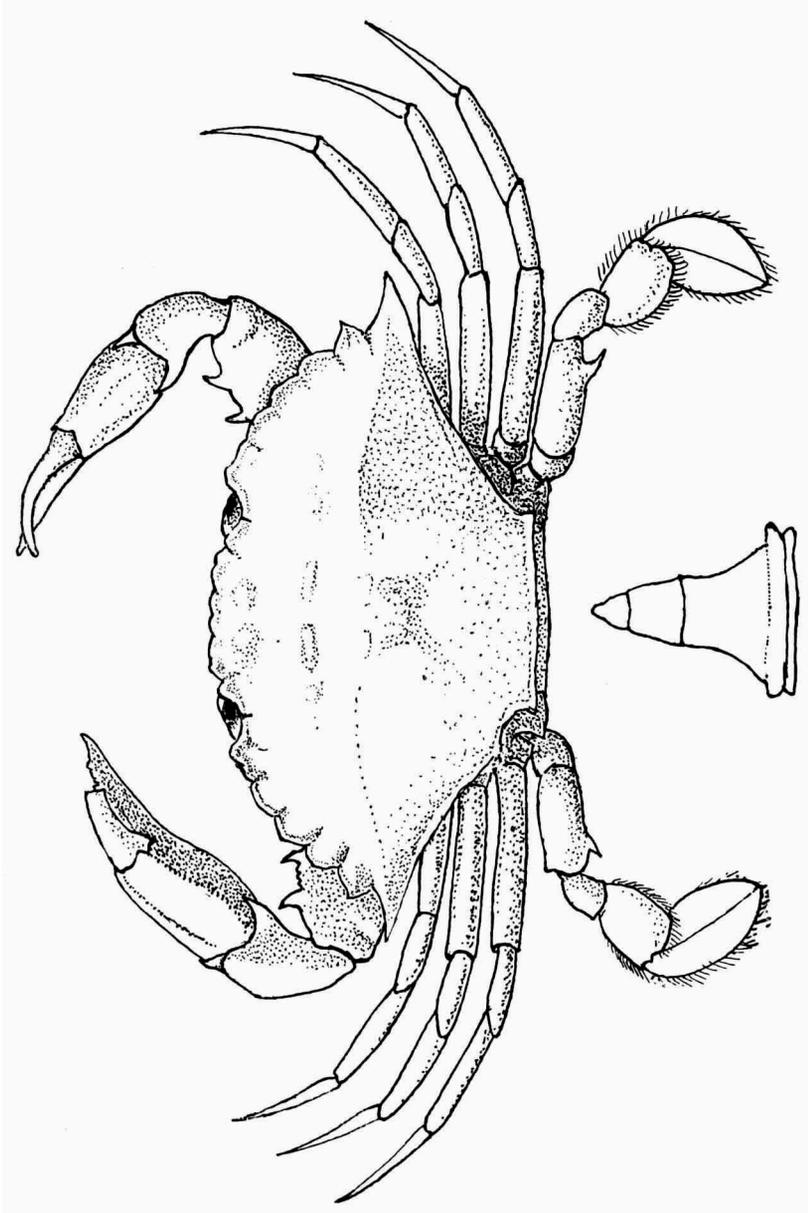


Fig. 2. *Charybdis (Goniohellemus) padangensis* nov. spec., male holotype. X 2.5.

posterolateral borders. The orbital margin is nearly smooth and is divided into different parts by the usual sutures. Both upper angles are dentiform, the inner lower angles are rounded.

The "basal" antennal joint touches the front and thereby excludes the flagellum from the orbit. The joint is smooth with a low and smooth, rounded ridge.

The ventral surface of the cephalothorax is granular and hairy. The pleural groove is distinct.

The third to fifth tergum of the male abdomen are fused, the second and third are transversely keeled. The anterior border of the sixth tergum is nearly straight, the posterior border is slightly anteriorly curved, the lateral borders are convergent. The length of the sixth tergum is about $\frac{3}{4}$ of its greatest breadth.

The chelipeds are unequal, the right is more slender than the left. In both the anterior border of the merus is granular and hairy, moreover it is armed with two teeth. The upper surface of the merus is granular. The smooth wrist is armed with one spine at its inner angle. The palm is smooth and bears three low and smooth ridges on the outer surface; moreover it possesses a small spine near the articulation with the wrist. The movable finger of the larger cheliped is broken, that of the smaller cheliped is slightly longer than the palm. The other pereopods show no specific characters. The natatory leg bears one spine at the posterior border of the merus at a short distance from the distal end.

For the characters of the male pleopod we refer to figure 1b.

Remarks. The female specimen of our material is very much damaged and lacks several legs, moreover it has the cephalothorax overgrown and dirty; still we have not the slightest doubt that it belongs in the same species as the male specimen. Both specimens formed part of the collection of the Zoological Laboratory of the Leiden University. They were presented to the Rijksmuseum van Natuurlijke Historie by Professor Dr. C. J. van der Klaauw, the director of the Zoological Laboratory, whom we wish to tender our best thanks for his kindness to enable us to study this interesting material.

This species differs from the other species of the genus *Charybdis* in the shape of its cephalothorax as well as in that of its anterolateral teeth. The first of these teeth, namely, is so strongly bilobed that the number of anterolateral teeth seems to be seven instead of six. Still we are of the opinion that the species is a true *Charybdis* and that it should be placed in the subgenus *Goniohellenus* on account of the angular junction between the posterolateral and posterior borders of the cephalothorax.

LITERATURE

- ADAMS, A. & A. WHITE, 1848. Crustacea. In: A. Adams, The Zoology of the Voyage of H. M. S. Samarang, pp. i-viii, 1-66, pls. 1-13.
- GORDON, I., 1938. On three species of Portunidae (Decapoda, Brachyura) from the Malay Peninsula. Bull. Raffles Mus., vol. 14, pp. 175-185, figs. 1-6.
- LAURIE, R. D., 1906. Report on the Brachyura collected by Professor Herdman, at Ceylon, in 1902. In: W. A. Herdman, Report to the Government of Ceylon on the Pearl Oyster Fisheries of the Gulf of Manaar, vol. 5, pp. 349-432, textfigs. 1-12, pls. 1, 2.
- LEENE, J. E., 1938. Brachygnatha: Portunidae. The Decapoda Brachyura of the Siboga Expedition. VII. Siboga Exped., mon. 39c3, pp. 1-156, figs. 1-87.
- , 1940. The Portunidae of the Snellius Expedition (Part I). Biological Results of the Snellius Expedition VI. Temminckia, vol. 5, pp. 163-188, textfigs. 1-7, pls. 1-5.
- LEENE, J. E. & A. M. BUITENDIJK, 1949. Note on *Charybdis ihlei* nov. spec., *Charybdis beauforti* nov. spec., and *Charybdis edwardsi* nom. nov., from the Collections of the British Museum (Natural History), London. Bijdr. Dierk., vol. 28, pp. 291-298, figs. 1-4.
- MAN, J. G. DE, 1883. Carcinological Studies in the Leyden Museum. No. 3. Notes Leyden Mus., vol. 5, pp. 150-169.
- WALKER, A. O., 1887. Notes on a Collection of Crustacea from Singapore. Journ. Linn. Soc. Lond. Zool., vol. 20, pp. 107-117, pls. 6-9.

PLATE XVI

- Fig. 1. *Lupocyclus granulatus* nov. spec., male holotype in dorsal view. $\times 3$.
- Fig. 2. *Lupocyclus rotundatus* Adams & White, male specimen from Siboga Station 303, in dorsal view. $\times 3$.
- Fig. 3. *Lupocyclus rotundatus* Adams & White, male specimen from Amboina, in dorsal view. $\times 11$.

