

## A small collection of deep-sea crabs from the Florès Sea

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**ABSTRACT:** The deep-sea crabs from the Florès Sea collected by R.V. *Hakuhō Maru* during the KH-85-1 cruise are referred to 11 species of 6 families. Based upon this material, systematic problems of some rare species are discussed, and a new species of the family Cymonomidae, *Cymonomus hakuhoae*, is described.

### 1 INTRODUCTION

The KH-85-1 cruise of R.V. *Hakuhō Maru* of the Ocean Research Institute, University of Tokyo (ORI-UT), was carried out in the Florès Sea from January 22 to March 5, 1985, as a joint research with the Lembaga Oseanologi Nasional, Lembaga Ilmu Pengetahuan Indonesia (LON-LIPI) which should be called, owing to a change of organization, the Pusat Penelitian dan Pengembangan Oseanologi (PUSLITBANG Oseanologi-LIPI), and also with the Intergovernmental Oceanographic Commission (IOC-UNESCO).

As recorded in the preliminary report (Horikoshi & Ohta, 1987), the cruise aimed at fundamental researches on biota of the deep-sea system in the Florès Sea. The macrobenthos and megalobenthos of the bathyal zone were collected at 4 stations (A-D in the Florès Sea (Fig. 1), with a 3 m Sigsby-Agassiz beam trawl (twice at st. A, twice at st. B, and once at st. D) and a 4 m shrimp net beam trawl (once at st. C). Of these stations, sts. A-2 and D were negative to crabs. The exact location of the stations and the results of identification, with numbers of the individuals obtained, are recorded in the following lines.

All the specimens except for some duplicate specimens of *Cyclodorippe rostrata* are preserved in the National Science Museum, Tokyo.

St. A-1 (5°47.3'S, 119°35.4'E - 5°46.9'S, 119°34.6'E; 250-285 m)

Majidae: *Platymaia bartschi* Rathbun, 1916 - 1 male

Portunidae: *Ovalipes iridescens* (Miers, 1886) - 1 male, 7 females, 1 juv.

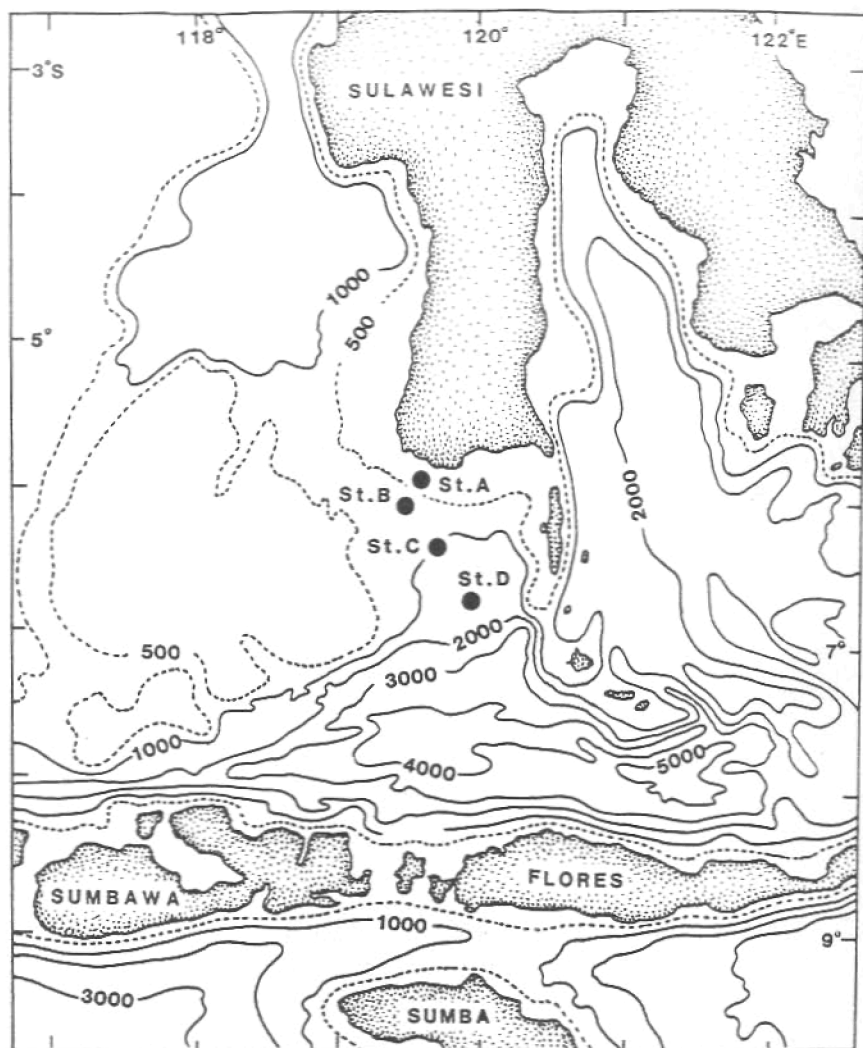


Figure 1. Sampling stations in the Flores Sea during the KH-85-1 cruise of R. V. *Hakuhō Maru*.

St. B-1 (5°56.0'S, 119°28.5'E - 5°56.0'S, 119°29.5'E; 630-657 m)

Cyclodorippidae: *Cyclodorippe rostrata* Ihle, 1916 - 3 males, 3 ovig. females

*Tymolus uncifer* (Ortmann, 1892) - 1 male

Dorippidae: *Ethusa indica* Alcock, 1894

Majidae: *Cyrtomaia tenuipedunculata* Ihle & Ihle-Landenberg, 1931 - 1 young female

*Rochinia soela* Griffin & Tranter, 1986 - 1 female

Atelecyclidae: *Trachycarcinus glaucus* Alcock, 1894 - 1 juv. male

St. B-2 (5°55.4'S, 119°29.5'E - 5°54.5'S, 119°29.5'E; 558-593 m)

Cyclodorippidae: *Cyclodorippe rostrata* Ihle, 1916 - 2 males, 2 ovig. females

Cymonomidae: *Cymonomus hakuhoae* sp. nov. - 1 female.

Majidae: *Cyrtomaia balssi* Ihle & Ihle-Landenberg, 1931 - 1 ovig. female

*C. tenuipedunculata* Ihle & Ihle-Landenberg, 1931 - 1 young female

St. C (6°19.1'S, 119°34.9'E - 6°17.7'S, 119°38.0'E; 935-960 m)

Majidae: *Rochinia sibogae* Griffin & Tranter, 1986 - 1 male

## 2 SYSTEMATIC ACCOUNT

### FAMILY CYCLODORIPPIDAE

Genus *Cyclodorippe* A. Milne Edwards, 1889

***Cyclodorippe rostrata*** Ihle, 1916 (Fig. 2; Pl. 2 Fig. F)

*Cyclodorippe rostrata* Ihle, 1916, pp. 128 (in key), 129, Figs. 69, 70.

*Cyclodorippe spinosa* Zarenkov, 1970, p. 460, 8 Figs., syn. nov.

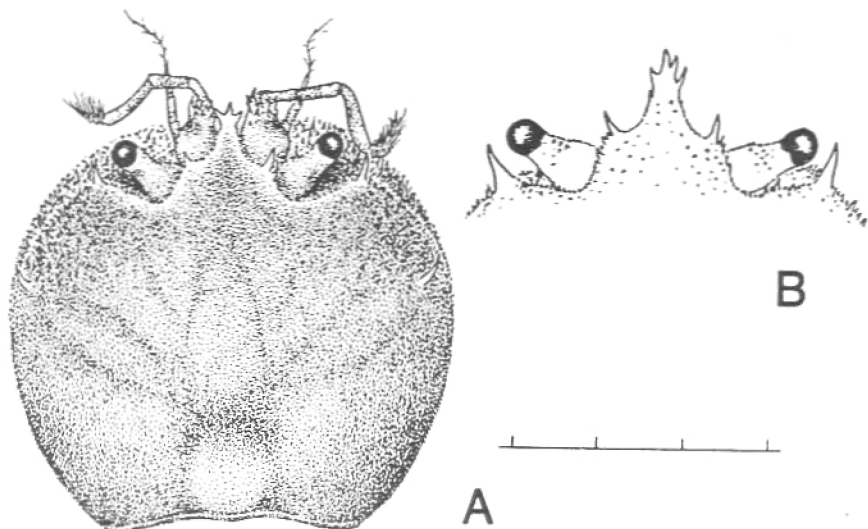


Figure 2. *Cyclodorippe rostrata* Ihle. A, carapace of a male. Scale in mm; B, frontorbital region of a male to show the variation in armature.

*Material examined*

St. B-1; 3 males (Breadth of carapace, 5.4 mm  $\times$  Length of carapace in median line including front, 5.1 mm; 4.3  $\times$  4.1 mm; 3.7  $\times$  3.5 mm), 3 ovig. males (5.7  $\times$  5.2 mm; 5.4  $\times$  4.9 mm; 5.2  $\times$  4.8 mm).

St. B-2; 2 males (5.2  $\times$  5.0 mm; 4.5  $\times$  4.2 mm), 2 ovig. females (5.1  $\times$  4.8 mm; 4.9  $\times$  4.5 mm).

*Description*

Carapace almost circular in its outline, with shallowly concave posterior border and strongly convex lateral borders; dorsal surface flattened as a whole, with longitudinal narrow mesogastric region and small but rounded cardiac region demarcated by grooves; lateral grooves of mesogastric region linear and shallow, but the transverse groove between mesogastric and cardiac regions wide and deep; each lateral groove of cardiac region indistinct in the middle, its anterior half being longitudinal and its posterior half convergent; an oblique spindle-shaped region formed by indistinct linear furrows at each epibranchial region; dorsal surface of carapace wholly and uniformly covered with microscopical tubercles which are sharper at anterior and marginal regions in most specimens.

A small spine present at anterior third of each lateral border of carapace, just in front of lateral end of spindle-shaped epibranchial region; it is usually distinct and weakly curved forwards, but in some specimens not conspicuously separated from other spinules. Front extended forwards like a spearhead, being armed with variable numbers of spinules at borders of both sides; in some specimens the tip is trifid, but in some others the arrangement of the spinules is asymmetrical. Armature of inner part of orbital border also remarkably variable; a spine at inner angle is always distinct, but the following spinules are quite microscopical just like the spinules on the dorsal regions or distinct just like the spinules of the frontal lateral borders. Outer part of orbital border weakly directed forwards, being about one and a half length of inner part; at its lateral end is a slender spine which is directed obliquely outwards and weakly upwards. Eyestalk basally inflated and medially constricted, being sparsely covered with microscopical spinules. Basal segment of antennule markedly thickened and constricted at subterminal part. Third maxilliped long and armed with spinules, with lamellar exopod which bears no flagellum; carpus articulated with inside of merus at the level of indentation from anterior one-third of inner margin.

Chelipeds not heavy in both sexes, being sparingly covered with long hairs and thickly with spinules of variable size. Inner margin of carpus, outer surface and upper margin of palm, and upper margin of movable finger fringed with longer spinules. Both margins of palm, upper margin of movable finger and lower margin of immovable finger are so thin that the inner surface of chela is rather concave as a whole.

First two pairs of legs or the ambulatory legs slender and about two and a half

times the carapace breadth, being covered with microscopical granules and fringed with long sparse hairs. Dactylus slightly longer than propodus and subequal to merus. Last two pairs of legs or the prehensile legs subdorsal as usual, with long ischium which is subequal to merus in length; propodus weakly convex, provided with setae along inner margin, and thus more or less prehensile with talon-like dactylus which is slightly shorter than propodus.

Abdomen composed of five segments in male and six in female; all segments connected with each other only at median part. In both sexes, first segment very narrow, occupying the space between the last pair of prehensile legs. In male abdomen, second segment widened distally, with a sharp spine at each end; second and third segments similar to each other and armed with spinules on whole surfaces and a median spine on each segment; terminal segment narrow, triangular and as long as the length of all other segments combined. In female abdomen, first segment narrow and similar to that of male abdomen; second segment obliquely cut off at each outer margin, with rounded distal end; third and fourth segments similar to each other, with rounded lateral ends and sparse spinules; fifth segment basically resembling preceding segments, but the lateral parts are directed distally at each side; terminal segment as long as preceding three segments combined, tapering only weakly; pleopods articulated at lateral ends of second to fifth segments.

#### Remarks

This small species generally agrees with the description and figures of *Cyclodorippe spinosa* Zarenkov, and disagrees with those of *C. rostrata* Ihle in having an epibranchial spine at each side. As was already described, however, the armature of the carapacial and frontal borders is remarkably variable. In some specimens the tiny epibranchial spine may be easily overlooked, and otherwise the epibranchial spine is extremely fragile. Considering such a variability of the armature, it may have been inevitable that the epibranchial spine was not mentioned in the original description of *C. rostrata*, which was based on one male and two females. Only a difference between these two species is the presence or absence of the epibranchial spine, and it is very difficult to find other distinguishing characters.

The genus *Cyclodorippe* A. Milne Edwards, 1889, is generally considered to be a synonym of *Tymolus* Stimpson, 1858, but the orbit is quite imperfect, the abdominal segments are distinctly isolated from one another except for the median part, with rather triangular terminal segment in both sexes, and the first male pleopod is distinctly tubular throughout its length, with subfiliform second pleopod. Accordingly, it can be noted at present that *C. rostrata*, the sole representative of the Indo-West Pacific, is generically distinct, at least, from *Tymolus japonicus* Stimpson from Japan and *T. uncifer* (Ortmann) from the Indo-West Pacific. It is also highly probable that the three western Atlantic species of *Cyclodorippe*, *C. agassizii* A. Milne Edwards from the West Indies

and two allied species. *C. antennaria* A. Milne Edwards from the Gulf of Mexico and the West Indies, and *C. bouvieri* Rathbun from off Cuba and Puerto Rico, may be generically distinct from *C. rostrata* in view of the convex or triangular front and the rounded terminal segment of the female abdomen. As we have had no opportunities to examine the Atlantic species for comparison, the present species is tentatively referred to the genus *Cyclodorippe* in accordance with Ihle (1916) and Zarenkov (1970).

#### *Distribution*

This species is known from north of New Guinea, 411 m deep, and west of Kei Island, 984 m deep (as *C. rostrata*), and off Western Australia, 820 m deep (as *C. spinosa*).

#### *Genus Tymolus Stimpson, 1858*

##### *Tymolus uncifer* (Ortmann, 1892)

*Cyclodorippe uncifera* Ortmann, 1892, p. 560, pl. 26 Fig. 6; Doflein, 1902, p. 653; 1904, p. 34, pl. 12 Figs. 4-7; Parisi, 1914, p. 197, pl. 13 Fig. 2; Ihle, 1916, pp. 128 (in key), 134.

*Cyomonops glaucomma* Alcock, 1894, p. 406; 1896, p. 287; Alcock & Anderson, 1895, pl. 14 Fig. 9.

*Tymolus uncifer*: Balss, 1922, p. 186; Yokoya, 1933, p. 103; Sakai, 1937, p. 70, pl. 10 Fig. 2; 1965a, p. 21, pl. 10 Fig. 3; 1976, p. 33, pl. 8 Fig. 3.

#### *Material examined*

St. B-1; 1 male (Breadth of carapace, 6.0 mm × Length of carapace, 6.2 mm).

#### *Remarks*

This specimen was compared with the specimens from Japanese waters referable to *T. uncifer*, the type locality of which is Sagami Bay. The species is a deeper water inhabitant than its congener, *T. japonicus* Stimpson, in which the front is divided into four subequal teeth and the first two pairs of legs or the ambulatory legs are distinctly shorter than three times the carapace length. In the present species the front is divided into three, with the median tooth divided into two only at the tip, and the ambulatory legs are much longer than four times the carapace length.

#### *Distribution*

This species is widely distributed in the Indo-West Pacific waters, from Japan through Indonesia and the Andaman Sea to the east coast of Africa. Its bathymetric range is from 55 to 959 m.

*Genus Cymonomus* A. Milne Edwards, 1880

*Cymonomus hakuhoae* sp. nov. (Fig. 3; Pl. 2 Fig. G)

*Material examined*

St. B-2; 1 female (Length of carapace in median line including rostrum, 5.2 mm × Breadth of carapace, 5.2 mm).

*Description of holotype.* Carapace distinctly quadrate with rounded four corners, and thickly covered with microscopical granules which are sharper near the frontal and anterolateral borders. Dorsal surface divided into indistinct areolae, weakly convex in both directions at its anterior third and lateral fifth at each side; a transverse gastro-cardiac furrow rather distinct, with a small but deep depression; a very shallow flattened area is formed at the outside of gastro-cardiac furrow, its lateral end extending to median part of lateral border of carapace as a linear indistinct furrow; a deep transverse furrow present in front of posterior border of carapace. Median part of posterior border of carapace deeply concave. Anterolateral part of carapace sparsely covered with long silky hairs, its right shoulder being armed with a spinule.

Eyestalk slender, fixed, covered with microscopical granules and only weakly directed outwards and upwards, tapering gradually. Rostrum narrow, triangular and about one-fourth the length of eyestalk. Frontal border shallowly concave just at junction of eyestalk, and its lateral part almost transverse, ending in a prominent lobe at each side, which is directed obliquely downwards and outwards along its proximal half, but is horizontal at its distal half; obtuse apex of frontal lateral lobe attaining to the midpoint of eyestalk, being twice the length of rostrum in dorsal view. Third maxilliped long and sparsely covered with minute tubercles; ischium ornamented with a longitudinal ridge along submarginal furrow; merus very long, almost reaching distal part of antennular basal segment in its natural position; elongated distal half of merus fringed thickly with long hairs.

Abdomen composed of six segments; terminal segment rather angulated at the median part of lateral border and at the apex.

Left cheliped, two ambulatory legs and one prehensile leg are present, being covered with microscopical granules and short hairs; merus, carpus and palm almost cylindrical; inner angle of carpus armed with a spinule; fingers as long as palm and weakly curved inwards.

Ambulatory legs also covered with minute frosted granules and short silky hairs; dactylus as long as propodus and carpus combined, and also equal to breadth of carapace. In prehensile leg, ischium and merus subequal in length, and carpus and propodus also subequal in length and about two-thirds as long as ischium or merus.

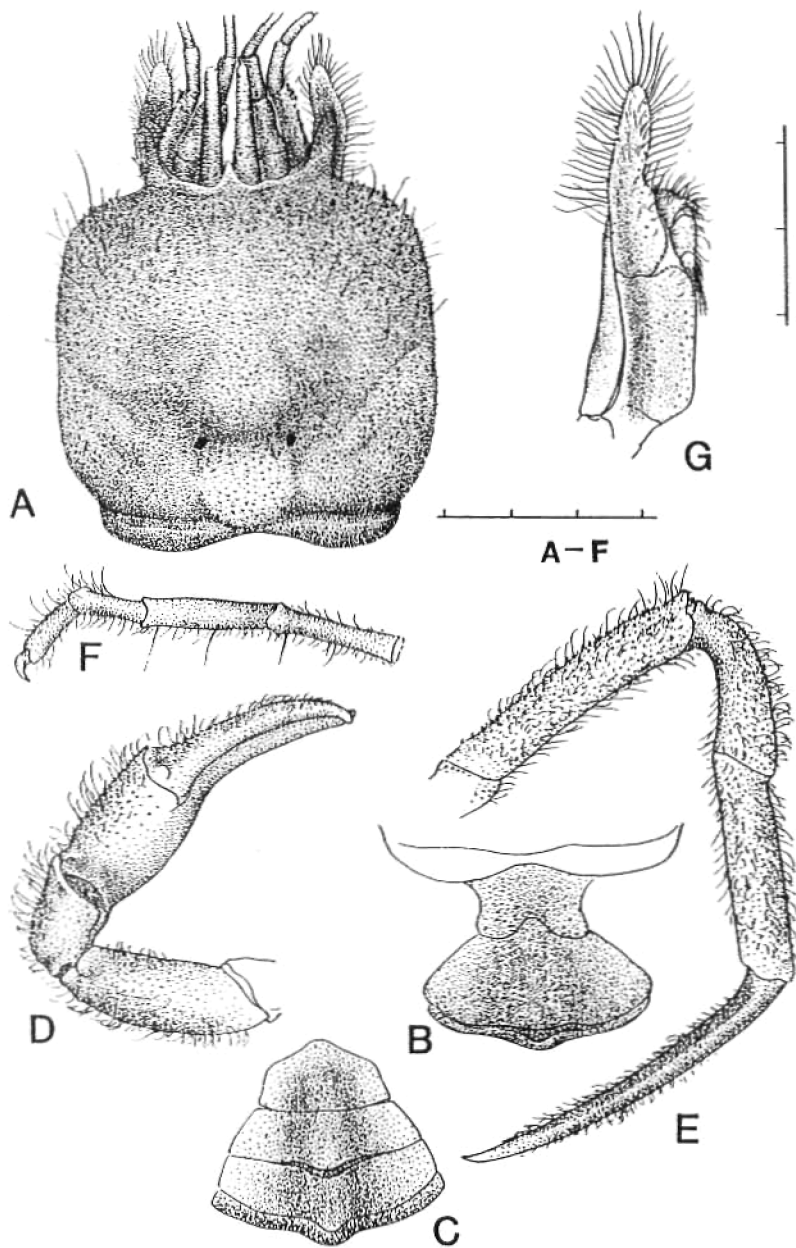


Figure 3. *Cynomonius hakuhoae* sp. nov., holotype female (Length in median line and breadth of carapace, 5.2 mm, respectively). A, carapace; B, right third maxilliped; C and D, abdomen in dorsal and ventral view, respectively; E, left cheliped; F, right ambulatory leg; G, left prehensile leg.



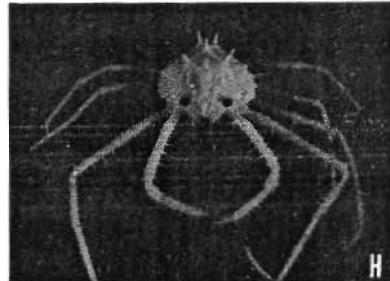
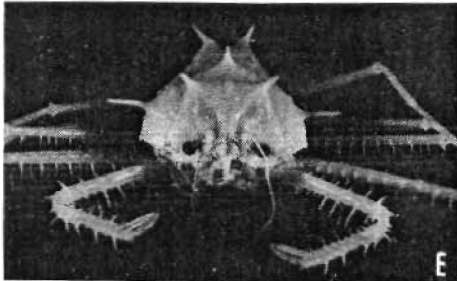
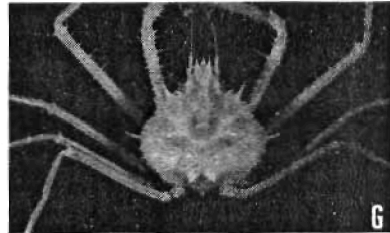
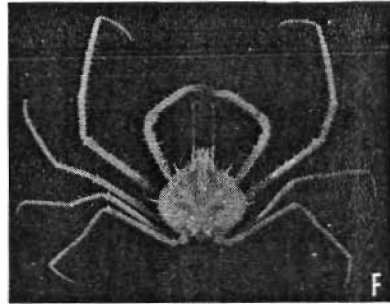
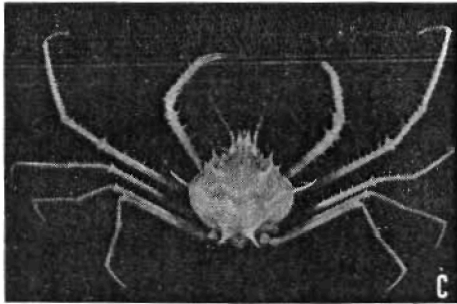
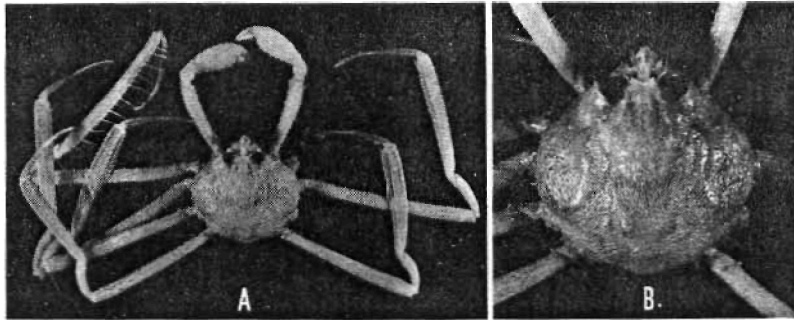


Plate 1

A, B. *Platymaia bartschi* Rathbun, male (Breadth of carapace, 44.8 mm).

C-E. *Cyrtomaia balssi* Ihle & Ihle-Landenberg, ovig. female (Breadth of carapace excluding branchial spines, 15.5 mm).

F-H. *Cyrtomaia tenuipedunculata* Ihle & Ihle-Landenberg, young female (Breadth of carapace excluding branchial spines, 12.8 mm).

*Remarks*

After the contribution of Dell (1971) who described two new species from New Zealand and enumerated the known species, the following four species, *C. menziessi* Garth, 1971, from Peru, *C. delli* Griffin & Brown, 1976, from eastern Australia, *C. umitakae* Takeda, 1981, from Japan, and *C. sagamiensis* Sakai, 1983, from Japan, were described. The known species are now 18 in number, and are divided into two groups, viz., the *granulatus* group with the rostrum extending beyond the tip of eyestalk, and the *quadratus* group with the rostrum shorter than the eyestalk.

In the *quadratus* group, to which the new species is referred, *C. umitakae* Takeda is the closest congener of the new species due to having the eyestalks fixed almost longitudinally. In *C. umitakae* the rostrum is longer, nearly reaching the midpoint of the eyestalk; the frontal external angle is sharply pointed at its apex, and the anterolateral angle of the carapace is armed with two spines. In all the other species except for *C. sagamiensis* Sakai the eyestalks are directed outwards at an angle of about 30 to 45°. *C. sagamiensis* differs from the new species in having the short median and frontal teeth and the angled and bidentate anterolateral corner of the carapace.

*Cymonomus andamanicus* Alcock from the Andaman Islands, *C. valdiviae* Lankester from off East Africa and north of Ceram, and *C. bathamae* Dell from New Zealand also have some resemblance, but as already noted, the new species is distinguished from all these species by the shape of the eyestalk. Apart from this character, in *C. andamanicus* the rostrum is triangular and the frontal external angle is quite inconspicuous, in *C. valdiviae* the rostrum reaches the median part of the eyestalk, and in *C. bathamae* the rostrum is half to one-third the length of the eyestalk and the external orbital tooth is very sharply pointed at the tip.

## FAMILY DORIPPIDAE

*Genus Ethusa Roux, 1830****Ethusa indica* Alcock, 1894**

*Ethusa indica* Alcock, 1894, p. 405; 1896, p. 283; Alcock & Anderson, 1895, pl. 14 Fig. 2; Ihle, 1916, p. 136; Sakai, 1965a, p. 24, pl. 12 Fig. 4; 1976, p. 64, Fig. 27; Chen, 1986, p. 189, Figs. 8, 9, pl. 1 Fig. 1, pl. 2 Fig. 5.

*Material examined*

St. B-1; 1 juv. (Length of carapace including frontal spine, 3.8 mm × Breadth of carapace, 3.5 mm).

*Remarks*

In this juvenile specimen the external orbital spine is distinctly spiniform and directed obliquely forwards and weakly upwards, its tip being at the level of

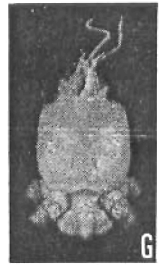
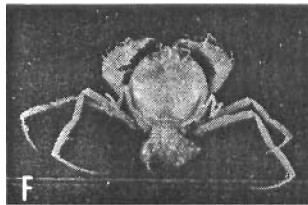
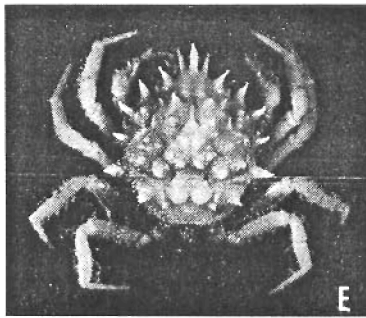
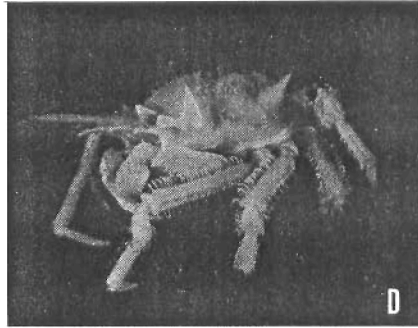
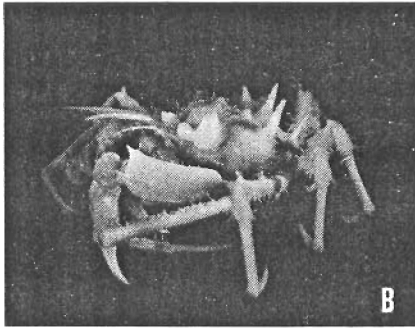
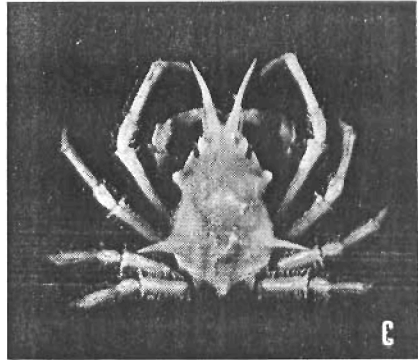
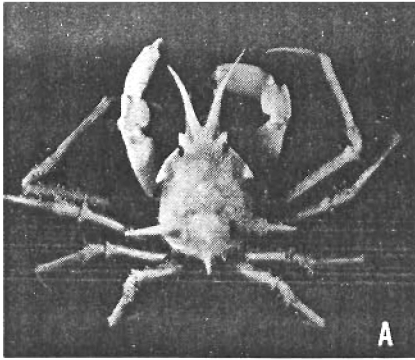


Plate 2

A, B. *Rochinia sibogae* Griffin & Tranter, male (Breadth of carapace excluding branchial spines, 13.8 mm).

C, D. *Rochinia soela* Griffin & Tranter, female (Breadth of carapace excluding branchial spines, 11.8 mm).

E. *Trachycarcinus glaucus* Alcock & Anderson, juv. male (Breadth of carapace excluding lateral spines, 9.0 mm).

F. *Cyclodorippe rostrata* Ihle, ovig. female (Breadth of carapace, 5.4 mm).

G. *Cymonomus hakuhoae* sp. nov., female (Breadth of carapace, 5.2 mm).

median part of the inner supraorbital border. The eyestalk is thick, with comparatively large cornea. In the adult specimens the external orbital spine usually projects beyond the frontal spine, but Chen (1986) made a comment that in some specimens the external orbital spine is of the same length as, or shorter than, the frontal spine. According to her, the specimens identified as *Ethusa gracilipes* Miers by Serène & Lohavanijaya (1973) and the species named *E. serenei* by Sakai (1983) belong to the present species.

#### *Distribution*

From Japan through the East and South China Seas, the Philippines, Indonesia to the Andaman Sea, 30-1, 315 m deep. This species is a deep water inhabitant usually ranging from 300 to 800 m deep, and the shallow water records in Japan are rather unusual.

#### FAMILY MAJIDAE

#### *Genus Cyrtomaia* Miers, 1886

***Cyrtomaia balssi*** Ihle & Ihle-Landenberg, 1931 (Pl. 1 Figs. C-E)

*Cyrtomaia hispida*: Balss, 1929, p. 3

*Cyrtomaia Balssi* Ihle & Ihle-Landenberg, 1931, p. 157.

*Cyrtomaia balssi*: Guinot & Richer de Forges, 1982, p. 63, Figs. 40, 41.

#### *Material examined*

St. B-2; 1 ovig. female (Breadth of carapace excluding lateral spines, 15.5 mm × Length of carapace in median line, 15.0 mm).

#### *Remarks*

This rare species was thoroughly redescribed by Guinot & Richer de Forges (1982) on the holotype ovigerous female. This species is close to *C. owstoni* Terazaki in the basic pattern of the dorsal armature, with a branchial spine at each side much longer than the others, but differs remarkably from it in having the broadened fourth and fifth segments of the antenna. These segments are without doubt broadened, but not strongly lamellate like those of *C. lamellata* Rathbun, with which *C. hispida* Borradaile and *C. platypes* Yokoya were synonymized by Griffin & Tranter (1986a).

According to the figure given by Guinot & Richer de Forges (1982), the fourth antennal segment forms a triangular process at its outer distal angle, but in the specimen at hand it is armed with a slender spine which is only slightly shorter than three spines of the preceding segment. In the holotype the spines of both antennae are probably broken off.

#### *Distribution*

This species is known from Timor and west of New Guinea. Only a reliable record of depth is 798 m (Siboga Expedition).

*Cyrtomaia tenuipedunculata* Ihle & Ihle-Landenberg, 1931 (Pl. 1 Figs. F-H)

*Cyrtomaia Smithi tenuipedunculata* Ihle & Ihle-Landenberg, 1931, p. 152.

*Cyrtomaia tenuipedunculata*: Guinot & Richer de Forges, 1982, p. 40, Figs. 21, 22.

#### *Material examined*

St. B-1; 1 young female (Breadth of carapace excluding lateral spines, 12.8 mm × Length of carapace in median line, 12.5 mm). St. B-2; 1 young female (13.0 × 12.8 mm).

#### *Remarks*

The specimens at hand are young, but well agree with the remarks given by Guinot & Richer de Forges (1982). The dorsal surface is uneven, with frosted granules on the whole surface and curled hairs on the anterior half; some granules on the branchial region are larger than the others. All the spines are slender, subequal in length and very weakly curved forwards; one on each protogastric region, one on mesogastric region in front of a line between the protogastric spines of both sides, one on metogastric region, two side by side on cardiac region, one on the anterolateral part of each branchial region, and one as an external orbital spine. In the smaller specimen, the mesogastric spine is much smaller than the others. The hepatic spine is about a half, or less, of the main spines, and slightly longer than the intercalated spine. The antennal basal segment is armed with three slender spines, of which the anteriormost is directed obliquely outwards and forwards and the following two are downwards. The eyestalk is provided with a boss at its tip.

In the key prepared by Griffin & Tranter (1986a), this species is placed near *C. goodridgei* McArdle and differs from it in having sharp spines on the ridge from the protogastric region to the intercalated spine. As for the specimens at hand, this ridge is armed only with minute granules not much different from the others. According to Guinot (1985) who redescribed and illustrated a juvenile male from the original material collected by the Investigator, *C. goodridgei* is most clearly characterized by having very long, oblique and divergent protogastric spines. The intercalated spine is present in this species, but substituted by a very small, indistinct tubercle in *C. goodridgei*.

#### *Distribution*

This species is known from the Moluccas, 445 to 567 m deep.

#### *Genus Platymaia* Miers, 1886

*Platymaia bartschi* Rathbun, 1916 (Pl. 1 Figs. A, B)

*Platymaia bartschi* Rathbun, 1916, p. 529; Sakai, 1965b, pp. 39, 43, frontispiece 3; 1976, p. 176, pl. 56; Griffin, 1976, p. 205; Guinot & Richer de Forges, 1986, p. 98, Figs. 5, 10(A-D), pl. 3 Figs. A-E; Griffin & Tranter, 1986a, p. 44, Fig. 10(e, f), pl. 4 Fig. a.

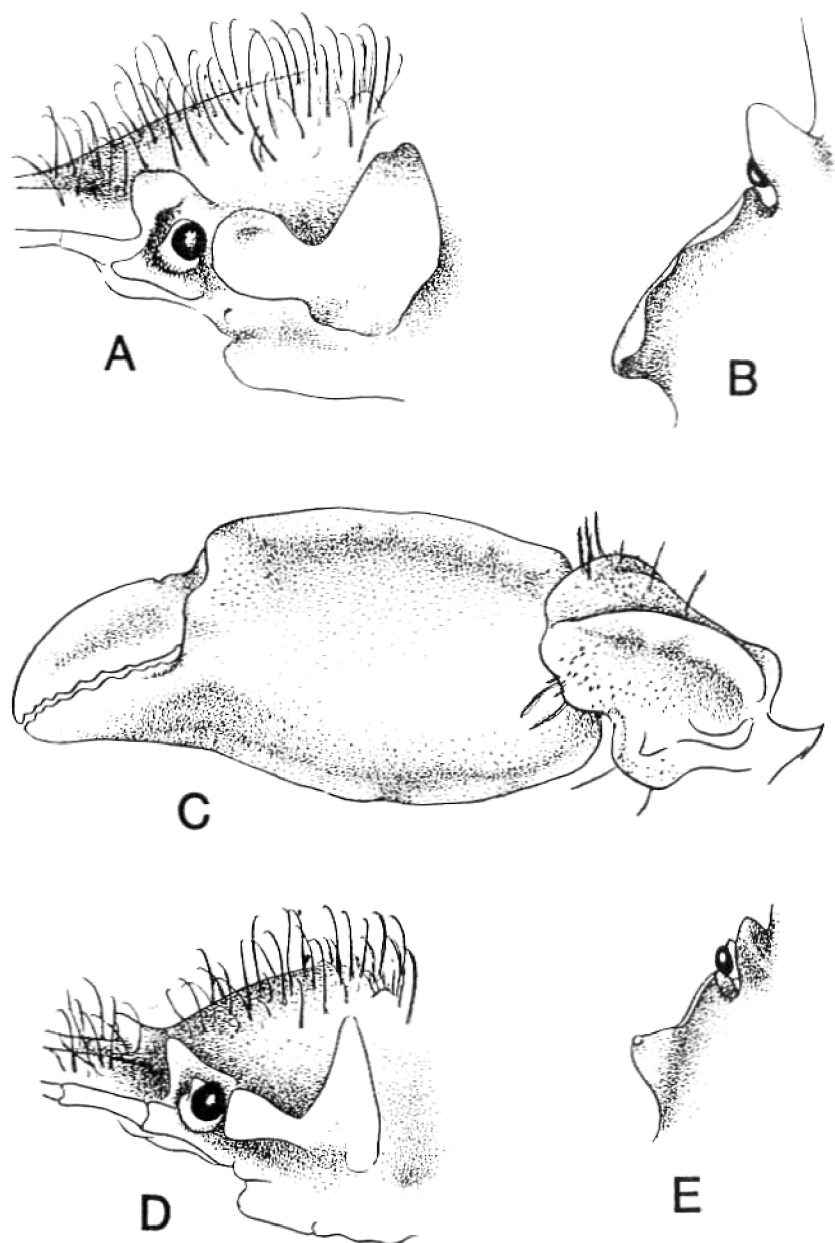


Figure 4. *Rochinia sibogae* Griffin & Tranter, male (Breadth of carapace excluding branchial spines, 13.8 mm). A and B, orbital region in lateral and dorsal view, respectively; C, left chela. *Rochinia soela* Griffin & Tranter, female (Breadth of carapace excluding branchial spines, 11.8 mm). D and E, orbital region in lateral and dorsal view, respectively.

*Material examined*

St. A-1; 1 male (Breadth of carapace, 44.5 mm × Length of carapace including frontal median tooth, 45.5 mm).

*Remarks*

Some species of the genus *Platymaia* have been confused for many years, but all the species were recently studied by Guinot & Richer de Forges (1986) and Griffin & Tranter (1986a), who discriminated eight species. Furthermore, Griffin & Tranter (1986b) added one new species from off Western Australia. Due to these contributions there is no difficulty in the identification of the species. In the specimen at hand the granulation and ornamentation of the carapace seem to be typical for the species, but the first abdominal segment is unarmed, which conflicts with the key prepared by Griffin & Tranter (1986a).

*Distribution*

Japan, South China Sea, the Philippines, Indonesia, eastern Australia, 185-592 m deep.

*Genus Rochinia* A. Milne Edwards, 1875

There is a wide discrepancy between Guinot & Richer de Forges (1986) and Griffin & Tranter (1986a, b) in recognizing the validity of the genus *Sphenocarcinus* A. Milne Edwards. The French authors retain it following the precedents, though they discussed the systematic position of '*Sphenocarcinus*' *velutinus* (Miers), '*S.*' *nodosus* Rathbun and their related species. The Australian authors considered *Sphenocarcinus* to be synonymous with *Rochinia*, with the comment that they found it impossible to divide a series of species into two or more distinct groups on the basis of carapace shape. Two species in the present collection belong to *Rochinia* s.str.

***Rochinia sibogae*** Griffin & Tranter, 1986 (Fig. 4 A-C; Pl. 2 Figs. A, B)

*Rochinia sibogae* Griffin & Tranter, 1986b, p. 363, Fig. 12.

*Material examined*

St. C; 1 male (Postrostral length of carapace excluding intestinal spine, 20.0 mm × Breadth of carapace excluding branchial spines of both sides, 13.8 mm).

*Remarks*

The specimen at hand agrees well with the original description based on the female holotype. The photographs of a male in the present collection are supplementary to the somewhat schematic original figures. The following is the description of the male.

Carapace pyriform and thickly covered with setae of various lengths, the longer ones of which are curled at the apices; its dorsal surface ornamented with spines and tubercles which are symmetrically arranged. Gastric region with

three tubercles, viz., one at posterior end of each protogastric part and one at anterior part of mesogastric part. Branchial region with a long spine which is about a half as long as the carapace and directed obliquely upwards; two tubercles in a longitudinal line at inner part of branchial region; a smaller tubercle obliquely in front of its anterior tubercle. Cardiac region with a long erect spine which is about a half as long as branchial spine. Intestinal region with a long spine at submarginal part, which is subequal to and subparallel with cardiac spine.

Rostral spine dilated from base and more strongly so at median part, being two-thirds as long as postrostral carapace length. Supraorbital eave expanded to become a flattened plate with a basal constriction, being directed obliquely upwards. Postorbital lobe rounded, flattened laterally and continuous posteriorly with hepatic lobe which is also truncated laterally, polished and directed dorsally; in dorsal view, postorbital and hepatic lobes separated from carapace by a deep groove, only distal part of hepatic lobe being curved inwards.

Male chelipeds heavy. Three margins of merus, two margins of carpus and two margins of palm distinctly crested; dorsal part of upper margin of merus sharply produced.

Ambulatory legs slender and covered with sparse setae and dense pavements on borders.

#### *Distribution*

Only the known locality is the Ceram Sea ( $3^{\circ}37.7'S$ ,  $131^{\circ}26.4'E$ ), 924 m deep. It is highly probable that *Rochinia* aff. *strangeri* recorded by Serène & Vadon (1981) from the Philippines, 757-685 m deep, is identical with the present species.

***Rochinia soela*** Griffin & Tranter, 1986 (Fig. 4 D, E; Pl. 2 Figs. C, D)

*Rochinia soela* Griffin & Tranter, 1986b, p. 366, Fig. 13.

#### *Material examined*

St. B-1: 1 female (Postrostral length of carapace including intestinal spine, 18.5 mm  $\times$  Breadth of carapace excluding branchial spines of both sides, 11.8 mm).

#### *Remarks*

The specimen at hand is also referred to the species recently described by Griffin & Tranter (1986b). The small discrepancies in the shape of the postorbital lobe and the stoutness of the branchial spine are insignificant and can be referred to individual variation. The general formation of the carapace is close to that of the preceding species, *Rochinia sibogae*, but it is readily distinguished from the latter by the different nature of the tubercles and spines of the carapace and the postorbital and hepatic lobes. The diagnostic features are given in the following lines.

Carapace narrower than in the preceding species. Gastric region with three



tubercles, but in reality a tubercle on each protogastric part is a small protuberance and the median one is an obtuse tip of a mound. Cardiac region conical as a whole. Branchial region with a slender spine which is about a half as wide as carapace and directed obliquely upwards; anterior inner part of branchial region convex, with an obtuse tip somewhat similar to cardiac tubercle; a much smaller tubercle present between cardiac tubercle and branchial main spine. Intestinal spine about one-third as long as branchial spine, with obtuse tip.

Rostral spines divergent and weakly curved outwards along distal halves, being two and one-third as long as postrostral length of carapace. Supraorbital eave directed upwards, with a sharp tip, its inner surface being insensibly excavated. Postorbital lobe flattened laterally, narrowing posteriorly and confluent with hepatic lobe, being truncated at its anterior end; hepatic lobe also flattened at its outer surface, directed upwards as a narrow triangle, with sharp tip.

Female chelipeds not heavy. Three margins of merus, upper margin of carpus and both margins of palm crested; inner margin of carpus not crested unlike that in the preceding species. Ambulatory meri, carpi and propodi provided with four rows of clab-shaped setae.

#### *Distribution*

Known only from the north-west shelf of Australia 18°40'S, 116°42'E, 600 m deep.

#### FAMILY ATELECYCLIDAE

#### *Genus Trachycarcinus Faxon, 1893*

***Trachycarcinus glaucus*** Alcock & Anderson, 1899 (Pl. 2 Fig. E.)

*Trachycarcinus glaucus* Alcock & Anderson, 1899, p. 8; Alcock, 1899, p. 59, pl. 2 Fig. 2; Alcock & McGilchrist, 1905, pl. 76 Figs. 1, 2; Gordon, 1953, Figs. 2A, 6A; Kensley, 1981, p. 75, Figs. 10, 11.

#### *Material examined*

St. B-1; 1 juv. male (Length of carapace including frontal spine, 10.8 mm × Breadth of carapace excluding lateral spines, 9.0 mm).

#### *Remarks*

As was argued by Dell (1968) and Guinot (1986), the genera *Trichopeltarion* A. Milne Edwards, 1880, and *Trachycarcinus* Faxon, 1893, are not sharply separated from each other, and may even be supposed synonymous. Detailed discussion on this subject is out of the scope of this paper, but it may be worth noting that the three Indo-West Pacific species referred to *Trichopeltarion*, viz., *T. ovale* Anderson, *T. fantasticum* Richardson & Dell, and *T. wardi* Dell, can be placed in the genus *Trachycarcinus*. If this were accepted by the direct compari-

son of specimens, *Trichopeltarion nobile* A. Milne Edwards becomes the monotypical representative of the genus. At least the difference in the anterolateral armature cannot be considered to be of generic value.

The Indo-West Pacific species of the genus *Trachycarcinus* are six in number, three of which are restricted to Japanese and adjacent waters. The other three, *T. glaucus* Alcock & Anderson, *T. alcocki* (Doflein) and *T. crosnierri* Guinot, are the inhabitants of the Indian Ocean. The young specimen at hand was identified with *T. glaucus* with a certainty. Richardson & Dell (1964) and Guinot (1985) showed the developmental variability of their new species, that is, in the young specimens, the carapace is usually narrower, covered with coarser granules on the areolae and armed with longer spines on the frontal and lateral margins. In the specimens at hand the dorsal areolae are covered with frosted granules and tubercles. The front is composed of three spines as usual, but the median one is much stouter and longer than the laterals. This formation of the front agrees well with the original figures. Three frontal, two orbital and four marginal spines are not much different in length from each other and weakly constricted at the subterminal part, each with a small and knobbed tip which appears to be fragile. This feature may be characteristic of the young specimens, and the subtruncated frontal and marginal tubercles figured by Alcock (1899) and also shown in the Illustrations of the Investigator (Alcock & McGilchrist, 1905) are reasonable.

#### *Distribution*

This species is known from off Travancore coast, southern India, 860 m deep, and off Natal coast, South Africa, 625-900 m deep.

#### FAMILY PORTUNIDAE

#### *Genus Ovalipes Rathbun, 1898*

#### **Ovalipes iridescens** (Miers, 1886)

*Platyonychus iridescens* Miers, 1886, p. 202, pl. 17 Fig. 2.

*Ovalipes iridescens*: Yokoya, 1933, p. 174; Leene, 1938, p. 2; Sakai, 1939, p. 375, pl. 42 Fig. 4; 1976, p. 331, pl. 112 Fig. 1; Grindley, 1961, p. 129, Fig. 2; Stephenson & Rees, 1968, p. 235, Figs. 1G, 2F, 3F, 4F, pl. 36 Fig. D, pl. 40 Fig. A, pl. 41 Fig. A, pl. 42 Fig. G; Stephenson; 1972, p. 130; Crosnier & Thomassin, 1975, p. 1098, Fig. 1.

#### *Material examined*

St. A-1; 1 male (Breadth of carapace, 42 mm × Length of carapace, 35.5 mm), 7 females (49 × 41 mm in the largest specimen), 1 juv.

#### *Remarks*

This beautiful species is well described, figured and compared with the allied species by Stephenson & Rees (1968) who reviewed all the *Ovalipes* species and

divided them into two groups, A and B, each with two subgroups. This species represents the *iridescens* subgroup together with *O. molleri* (Ward) in Group B. These two species are remarkably different from each other in the number of frontal teeth (3 in this species and 4 in *O. molleri*).

#### Distribution

Japan, Indonesia, Australia, South Africa, Mozambique and Madagascar, 80-520 m deep.

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## ADDENDUM TO PROOF

Guinot (1989) completed the systematic study on seven *Trachycarcinus* species collected by the MUSORSTOM Expeditions I-III in the Philippine waters and the CORINDON II Expedition in the Strait of Makassar. The species recorded in this paper as *Trachycarcinus glaucus* Alcock & Anderson is, without doubt, conspecific with one of three new species described by her, *T. moosai*, from the Strait of Makassar, 313 m deep. The distinguishing characters are referred to the original description.