

LIBRARY
DEPARTMENT OF GEOLOGY

UNIVERSITY OF CALIFORNIA
LIBRARY
GEOLOGY
Berkeley

**OBSERVATIONS ON SPECIES OF THE GROUP *TRAPEZIA*
RUFOPUNCTATA-MACULATA, WITH A PROVISIONAL KEY FOR
ALL THE SPECIES OF *TRAPEZIA***

**OBSERVATIONS ON SPECIES OF THE GROUP *TRAPEZIA*
RUFOPUNCTATA-MACULATA, WITH A PROVISIONAL KEY FOR
ALL THE SPECIES OF *TRAPEZIA***

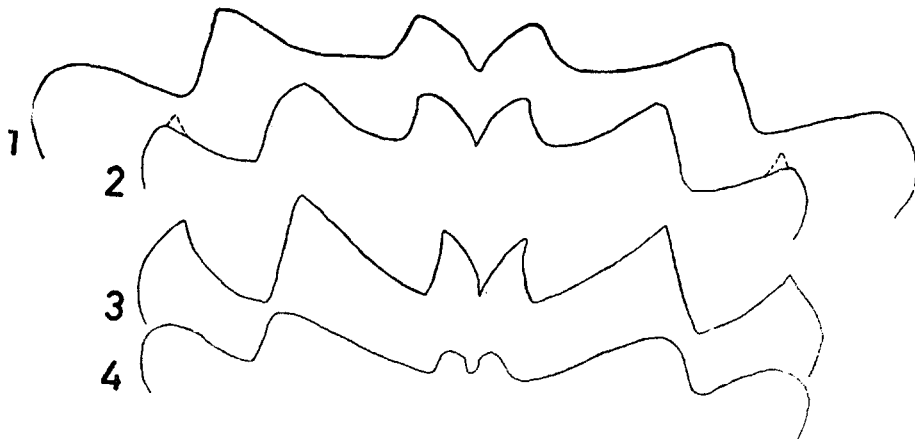
By R. SERENE

C/o National Museum, Singapore-6

I DEVOTED some months in 1962 in the National Museum of Paris to work on material of *Trapezia* from an Israeli collection ; the result of this work never came out. Since, carcinologist colleagues are calling on me for assistance referring to a work which has never been published. A recent request of Dr. Garth to check the identification of some of his material provided an opportunity to look again at my notes of 1962. The specimens are no more in my hands, but it is by referring to those notes that here a special attention is given to the species of the group *rufopunctata-maculata*.

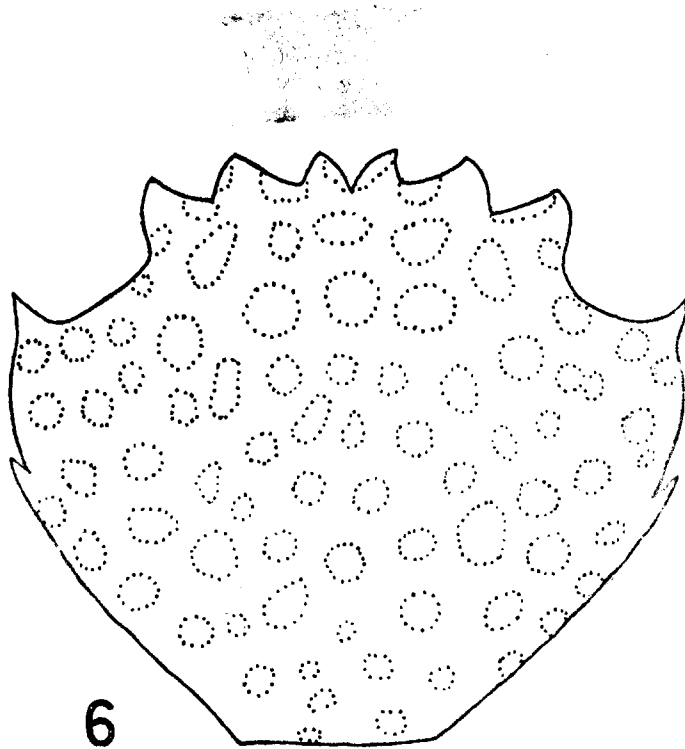
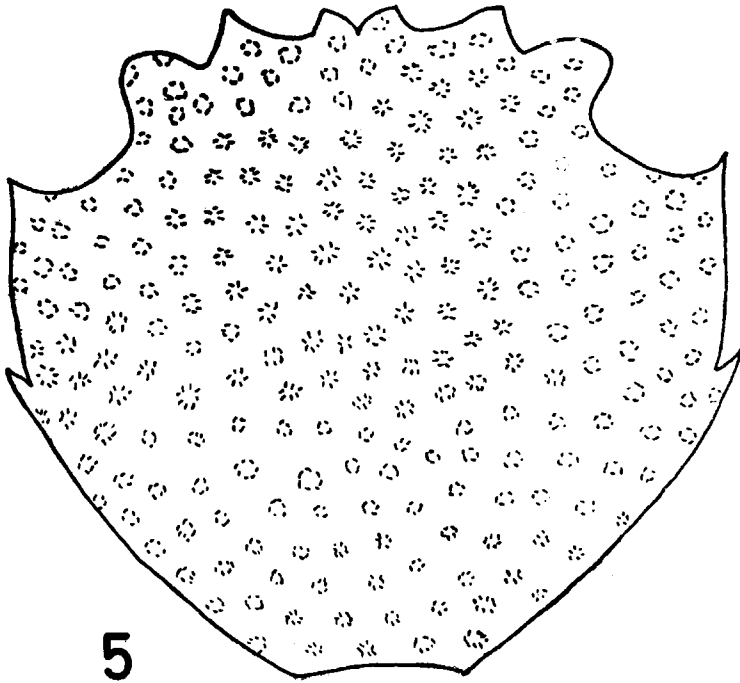
The species of the *rufopunctata-maculata* group

The group includes species which belongs to two different types : one with frontal border deeply cut and lower margin of palm of cheliped serrulate : *rufopunctata*, *acutifrons*, *maculata*, *tigrina*; the other with frontal border much less sinuous and lower margin of palm of cheliped smooth : *danai* and *intermedia*.

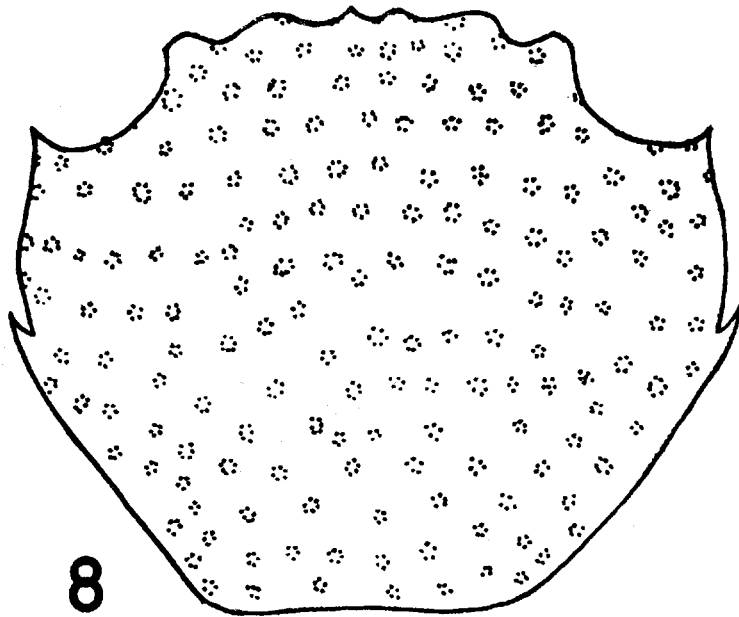
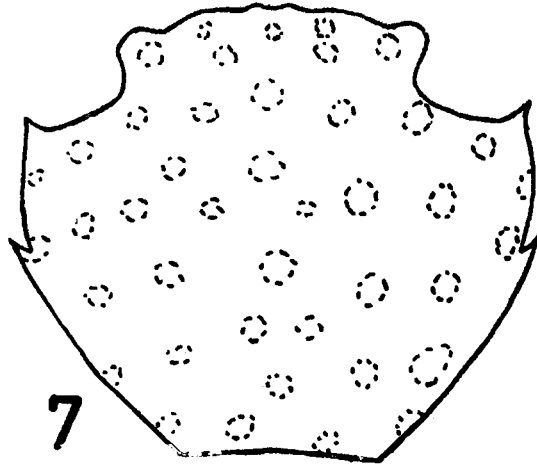


1-4 : Frontal border of : (1) *rufopunctata* (ION 42123), male of 16×18. (2) *aff. maculata* (Maldives, coll. GUINOT 1964), male of 15×17. (3) *acutifrons* (Type, Paris Museum), male of 18×21. (4) *tigrina* (Type, Paris Museum), female of 15×17.

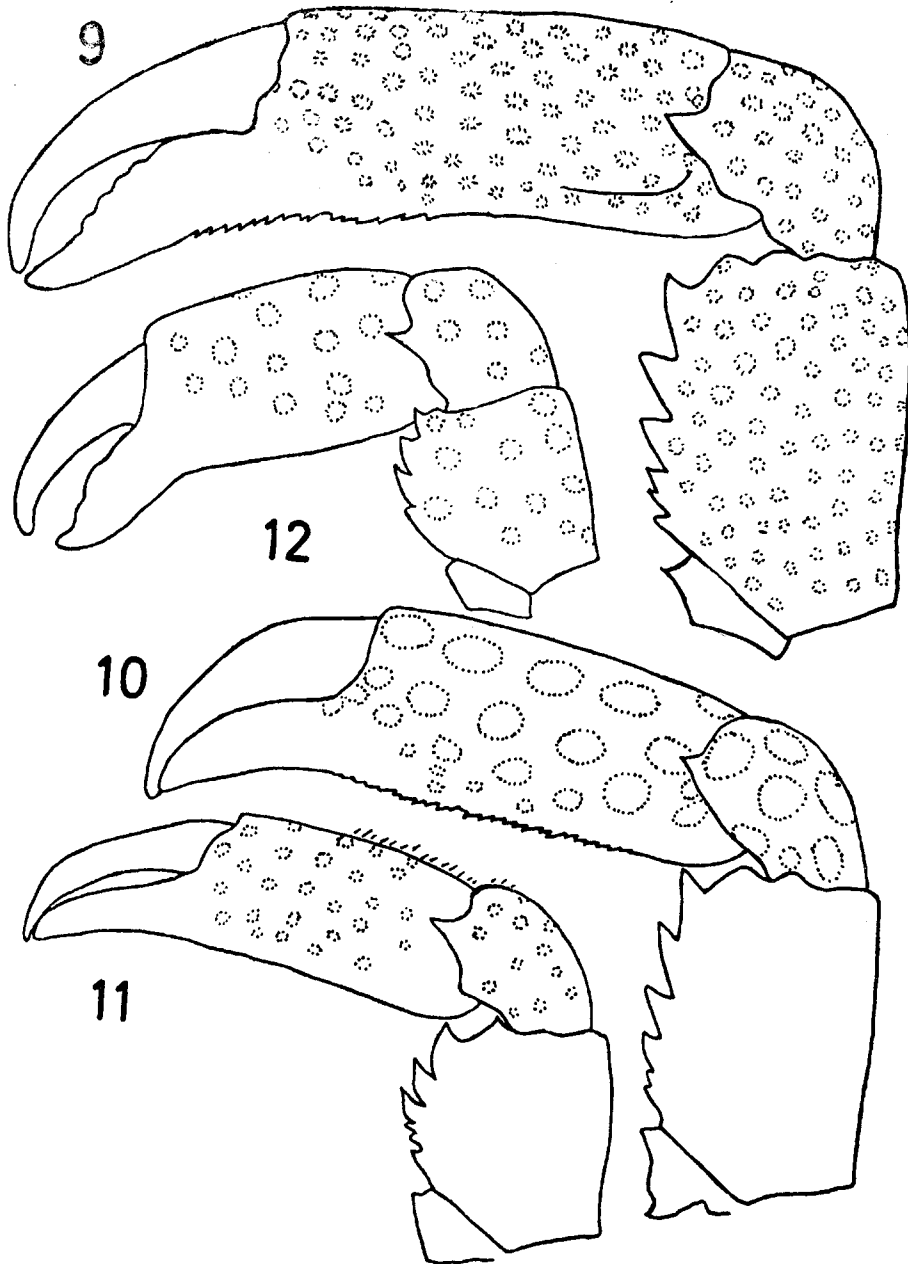
Those morphological characters generally have not received sufficient consideration. By its frontal border the *rufopunctata* morphological type is somewhat close to *cymodoce*, the *danai* morphological type to *ferruginea*. Such relation can explain why sometimes *maculata* is made a variety of *cymodoce*, sometimes a variety of *ferruginea*. On the contrary the ornamental characters, size and numbers of coloured spots, were too much emphasized for the separation of the species. These



5-6 : Carapace of : (5) *rufopunctata* (ION 42123), male of 16×18. (6) *aff. maculata* (Maldives, coll. GUNOT 1964), male of 15×17.



7-8: Carapace of: (7) *wardi* (Type), male of 11×12. (8) *aff. wardi* (Mauritius, Carrie coll.), male of 12.5×15.3.



9-12 : Cheliped of same specimens : (9) *rufopunctata*. (10) *aff. maculata*. (11) *wardi*. (12) *affardi*.

ornamental characters can allow to separate the species in two categories : those with small (puncta) and numerous spots : *rufopunctata* and those with larger (macula) and less numerous spots : *maculata*, *acutifrons*, *tigrina*, *danai*. The size and number of spots strongly vary in one species in relation with the size and probably the sex of the specimen. But to what extent, exactly we don't know. The only indication is that in one species the number of spots is much smaller and their size much larger on smaller specimens. On larger specimens of 'macula' species, the number and size could approach the situation of the 'puncta' species. As a result a clear discrepancy between the two categories of ornamentation is hard to establish and comparison are necessary between specimens of the same size and sex. Each of the two morphological types of species includes forms (species) corresponding to different forms of ornamentation. At least three different forms of ornamentation seem to exist on the *rufopunctata* morphological type ; they are : *rufopunctata*, *maculata*, *tigrina*. Similarly in the *danai* morphological type, two and perhaps three exist ; they are *danai*, *wardi* nov. sp.

The morphological characters for the separation of the species need to be improved. In the present paper the observations are mainly limited to the characters of the frontal border, lower border of palm of cheliped and anterior border of merus, with some attention to the outline of the carapace.

Giving priority to the characters of the frontal border and lower margin of the palm, a re-examination of the authors' identifications demonstrates that under *rufopunctata* are recorded by the authors the three different types of ornamentation : *rufopunctata*, *maculata*, *tigrina* and perhaps forms which belong to the other morphological type (*danai-wardi*). Similarly under *maculata* are recorded specimens which could belong to *maculata* or *tigrina* as well as to *danai* or *wardi* or new forms to be described.

The present collection includes specimens which provide an opportunity to precise the situation of *maculata*, *tigrina* and *danai* and establish a new one *wardi*.

Tr. flavomaculata is not included in the group having an ornamentation of another kind ; the background colour of the carapace is brown red and the spots are white. In *rufopunctata-maculata* group, the background of the carapace is white lightly pinkish and the darker spots are red brown.

Trapezia aff. *maculata* MAC LEAY 1838

(Figs. 2, 6, 10, 13A, 13B)

? *Grapsillus maculatus*, MAC LEAY, 1838, p. 67.

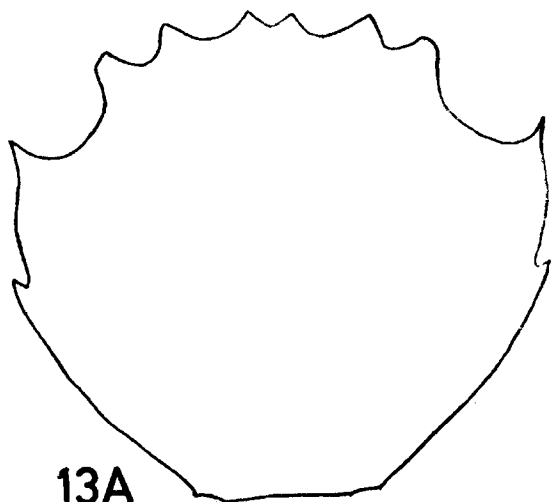
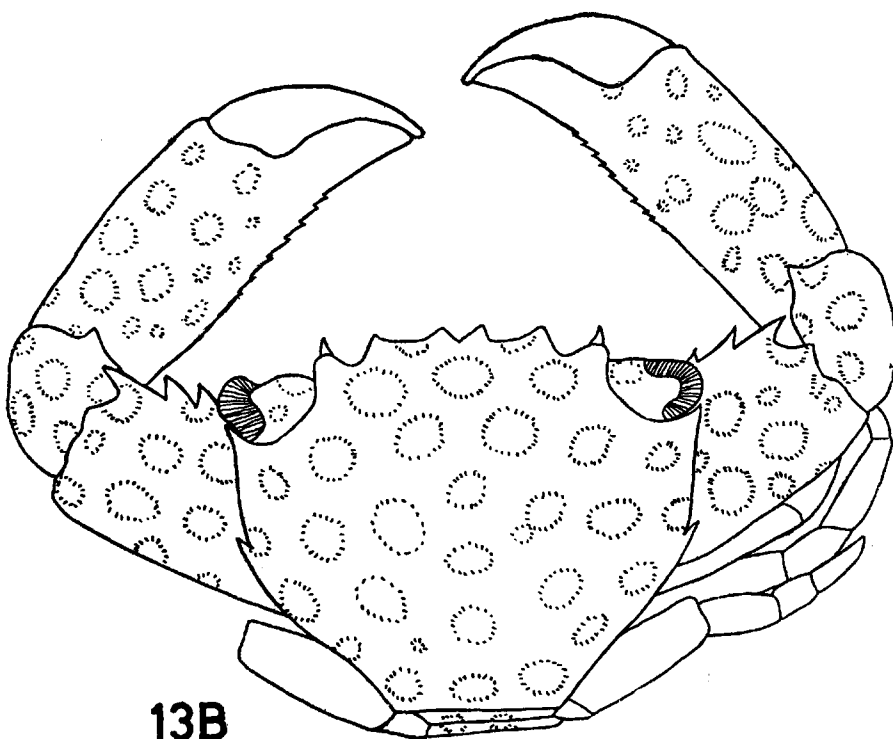
? *Trapezia rufopunctata*, DANA, 1852, p. 255, pl. 15, fig. 32b.—BOONE, 1934, p. 166, pl. 86, fig. 1, 2.—EDMONSON, 1962, p. 300, fig. 31c.—Not *rufopunctata* (HERBST 1801).

Trapezia rufopunctata, BOUVIER, 1915, p. 96 (part).

Trapezia rufopunctata var. *maculata*, GUINOT, 1964, p. 240.

Material.—male of 13.80×16 ; female of 15×17 ; GA 64 22a(1) 21-III-64.

GA 64-18b (Galle, Ceylon) 1 ♀ ov, 16.5×19.3 mm. (without limbs).

**13A****13B**

13A, B: *Trapezia aff. maculata* : A, male of 13.8 × 16 (Garth's collection). B, male of 11.9 × 14.3 (Maldives coll. GUINOT 1964)

GA 64-27a (1) (Maldive Islands) 1 ♀ ov, 14.0×16.7 mm.

GB B-4 (Maldive Islands) 1 ♂, 15.8×17.7 mm. ; 1 ♀ ov, 16.7×19.1 mm.

Observations.—In regard to the morphological structure of the frontal border and lower margin of palm of cheliped the present specimens are nearly similar to that of *rufopunctata*.

WARD (1939) examined the Type specimen of *maculata* in order to establish *danai* but overlooked the character of the inferior border of the palm ; he did not mention it as a discrepancy between *maculata* and *danai*, and speculations could be made that *maculata* like *danai* has the lower margin of palm smooth. Fortunately BARNARD (1950, p. 278) who considered *maculata* as a synonym of *rufopunctata* mentioned that he examined the photograph of MAC LEAY'S type sent to him by WARD and writes : ' The photograph shows traces of large spots on the cheliped, which have a serrulate lower border.'

Tr. acutifrons A. MILNE EDWARDS 1864 is close if not identical with *maculata*. Only a comparison between the type of the two species could demonstrate their common morphological identity. According to BARNARD (1950), the type specimen of *maculata* has large spots ; how many in number on the carapace is unknown. The type specimen of *acutifrons*, a male of 18×21 and a female from Hawaii examined in the Museum of Paris, are dry specimens and have lost their coloration ; the species has never been illustrated. According to A. MILNE EDWARDS (1867) *acutifrons* is close to *tigrina* and from this remark it can be speculated that it has large and few numerous spots. On the back of the box containing the type of *acutifrons*, there is a handwritten note of A. MILNE EDWARDS : ' C'est la variete a front fortement dente de *Trapezia rufopunctata*.' A. MILNE EDWARDS (1873) initiated the confusion when he considered that *acutifrons*, *tigrina*, *maculata* were only variations of *rufopunctata*.

The identity between *acutifrons* and *maculata* cannot yet be surely demonstrated. There are few doubts according to their illustration that the specimens of *rufopunctata* of DANA (1852), ROONE (1934) and EDMONSON (1962) do not belong to *rufopunctata* but to the form *maculata-acutifrons-tigrina* which have larger and less numerous spots. DANA (1852) noticed that his specimens have spots much larger and less numerous than on *rufopunctata* and the submedian frontal lobe separated by a 'rounded concavity' ; the last remarks can lead to identify his specimens as *tigrina* instead of *maculata*.

BOUVIER (1915) recorded as *rufopunctata* 2 specimens from Mauritius (Coll. Carrie) indicating that the first belongs to the typical form ; the second to the var. *flavopunctata* (sic.). In the Paris Museum two jars from the Carrie's collection have a handwritten label of BOUVIER : ' *Tr. rufopunctata* HERBST.' One jar with a single specimen, male of 8 with large spots (*maculata*) ; the other with 13 specimens ; among them 2 females of 17 and 22 belong to *maculata*, the eleven other to *danai* and *wardi*. The present specimens are identical with those 3 *maculata* specimens of BOUVIER (1915) and those recorded by GUINOT (1964) as *rufopunctata* var. *maculata*. Provisionally they are designated as aff. *maculata*.

In order to be used as comparative reference two of GUINOT'S specimens (1964) from Maldive Islands are illustrated here, a male of 15×17 (fig. 2, 6, 10) and a male of 11.9×14.3 (fig. 13B). For *rufopunctata*, the illustration (fig. 1, 5, 9) are established with a male of 16×18 (ION 42123) not yet recorded from Nhatrang, Vietnam and belonging to the collection of the Oceanographic Institute of Nhatrang.

The *aff. maculata* so defined differs from *rufopunctata* by : (1) the outline of the carapace ; (2) the frontal border ; (3) the merus of cheliped narrower ; (4) the coloured spots less numerous.

The outline of the carapace of the present male is illustrated (fig. 13A). In regard to the ornamentation, the present male has approximated 70 spots on the carapace and the female 140. On the carapace of the specimens illustrated here, *rufopunctata* has more than 200, *aff. maculata* 70 on the largest male and 31 largest on the few smaller ones. The present specimens can suggest that at the same size the spots are less numerous on the male than on the female.

? *Trapezia tigrina* EYDOUX and SOULEYET 1841

Trapezia tigrina, EYDOUX and SOULEYET, 1841, p. 232, pl. 2, fig. 4.

Not *Trapezia tigrina*, WARD, 1939, p. 13, fig. 15, 16. = *Trapezia wardi* nov. sp.

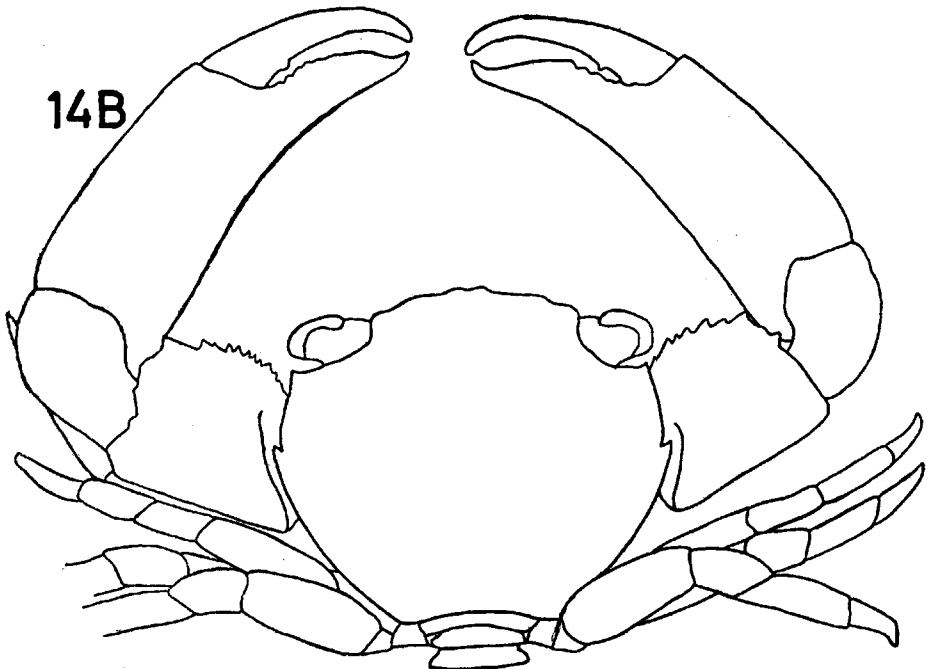
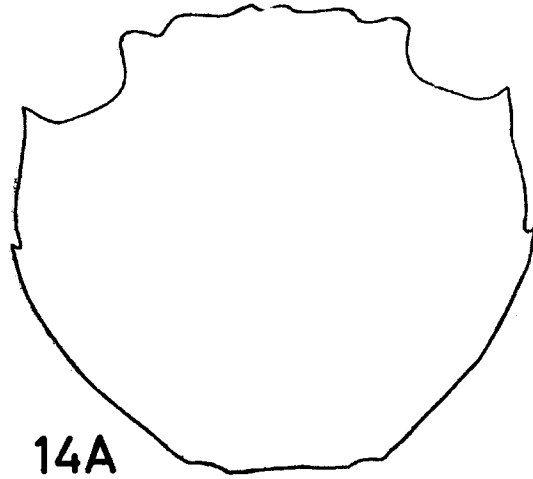
Material.—3 males, the largest of 7×9, GA 64-16c ; 5-III-64 ; ex live *Pocillopora*.

Observations. The original description of EYDOUX and SOULEYET (1841) compares and separates the species from *flavomaculata* (which clearly differs from *rufopunctata*) and only briefly mentioned that *tigrina* differs from *rufopunctata* by its shape, the frontal teeth and the length of chelipeds. The type specimen examined in the National Museum of Paris is a female of 15×17 kept in dry condition which has lost all coloration. At the verso of the box where it is maintained there is a handwritten note of A. MILNE EDWARDS : 'C'est une variete de *rufopunctata*. A. MILNE EDWARDS.' It has : (1) the frontal lobes well marked but comparatively less salient and less acute than *rufopunctata* and *acutifrons* ; (2) the lower margin of palm of cheliped strongly granular ; the granules are acute but not like spines and larger distally at the origin of the fixed finger.

Tr. tigrina differs from *rufopunctata* by : (1) The lobes of the frontal anterior margin less salient and less acute ; the two small submedian are rounded. (2) The external orbital angle and epibranchial tooth longer and more acute. (3) The merus of cheliped a few shorter. (4) The spots larger and much less numerous. In my notes of 1962, I found a drawing of the outline of the frontal border, which is reproduced here (fig. 4), but nothing about the shape of the carapace, antero-lateral teeth and merus of cheliped. Only that the chelipeds (merus as well as propodus) are comparatively longer on *rufopunctata* than on *tigrina*. In regard to the ornamentation the type specimen has lost its coloration. On the illustration of EYDOUX and SOULEYET (1841, pl. 2, fig. 4), approximately 60 spots exist. On a specimen of the same size and sex the number will be more than 200 on *rufopunctata*.

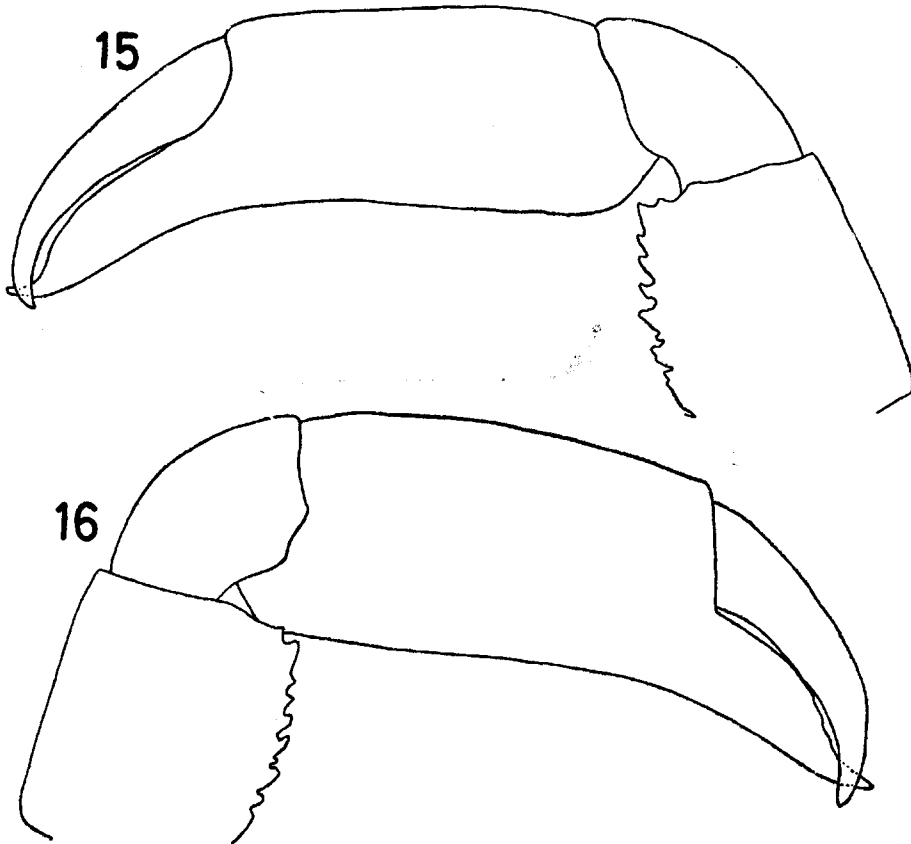
Tr. tigrina differs from *aff. maculata* by : (1) The frontal border less salient with small submedian lobes rounded. (2) The smaller number of spots. A female of the same size that the type of *tigrina* have approximately 150 spots on *aff. maculata*.

The specimens of Dr. Garth's collection are juveniles as indicated by their size and several characters like the large size of the eyes. The lower border of the palm of cheliped is serrulate, like on *rufopunctata* and *maculata*. The small submedian frontal lobes seems to be less rounded than on the type specimen of *tigrina*.



14: *Trapezia* aff. *danai*: (14A) male of 13×15 (Garth's collection). *Trapezia danai*. (14B) male of 10×12.14 (Mauritius, Carrie coll. 1913).

The external orbital angle and epibranchial teeth are much longer than on *rufopunctata* and *aff. maculata* but this character seems to have few values at the size



15-16 : *Trapezia danai*, same specimen. (15) right cheliped. (16) left cheliped.

of the present specimens and without comparative material. The largest male has only 26 large coloured spots on the carapace. Specimens of *maculata aff.* of the same size are needed as comparative material and the identification is given with reserve.

The specimens recorded by LAURIE (1906) as *maculata*, at least one male of 6.5×6 from Ceylon, with 28 coloured spots is not too much different, but it has the frontal border nearly straight and belong to the morphological type of *danai*.

The specimen of *tigrina* of WARD (1939) with the lower margin of palm smooth belongs to another species close to *danai* and described further as *wardi* nov. sp. The original description of EYDOUX and SOULEYET (1841) is not clear in regard to this character : 'la portion palmaire est garnie d'une crete tranchante en dessous.' The original figure also does not demonstrate accurately the character. But my examination of the type specimen let no doubt and confirm the relation to *rufopunctata*.

Trapezia aff. *danai* WARD 1939
(Figs. 14A, 14B, 15, 16, 21, 22, 24)

Trapezia maculata, DANA, 1852, p. 256 (part), pl. 15, fig. 4d. (Not fig. 4a, b, c).—
DE MAN, 1888, p. 319, pl. 13, fig. 2.—Stimpson, 1858, p. 37, 1907, p. 73.—
? RAMADAN, 1936, p. 35.—Not *Grapsillus maculatus* MAC LEAY, 1838, p. 67.

Trapezia danae, WARD, 1939, p. 13, figs. 17, 18.

Trapezia rufopunctata, BOUVIER, 1915, p. 58 (pars.).

? *Trapezia rufopunctata*, KLUNZINGER, 1913, p. 103, pl. 12, fig. 13.

? *Trapezia rufopunctata* var. *maculata*, ORTMANN, 1893, p. 484.

? *Trapezia ferruginea* var. *maculata*, ORTMANN, 1897, p. 206.—LENZ, 1900, p. 553.

? *Trapezia cymodoce* var. *maculata*, ALCOCK, 1898, p. 221.—RATHBUN, 1911, p. 234.—
1930, p. 558, pl. 228, fig. 3, 4.—LAURIE, 1914, p. 462.—EDMONSON, 1946, p. 301,
fig. 180f.—1962, p. 300, fig. 32b.

? *Grapsillus maculatus*, RATHBUN, 1906, p. 865.—LAURIE, 1906, p. 410.

Material. GA 64-35 (2) 19-IV-64 ex Pocillopora, one male of 13×15 and one female of 15×17.

Observations. WARD (1939) examining the type specimen of *maculata* MAC LEAY 1838 in the Sydney Museum stated that the specimen of DANA belongs to a different species, identical with specimens he describes as *danai* nov. sp. He briefly separated *danai* from *maculata* by: (1) The carapace more elongate. (2) The frontal teeth less developed. (3) The spots of the carapace and chelæ smaller. If the character 2 is easy to evaluate, the characters 1 and 3 request comparative material.

As already mentioned WARD (1939) overlooked the character of the lower border of the palm which is serrulate on *maculata* and referring to his illustration is smooth on *danai*. Another character of *danai* is given by the denticulation of the anterior border of the merus of the cheliped. The comparison between the illustrations given for *danai* by WARD (1939, fig. 17, 18) and for *tigrina* (= *wardi*) (figs. 15, 16) demonstrates that the anterior border of merus of cheliped is armed with numerous short denticulation on *danai* and with less numerous and more acute denticulation on *tigrina* (= *wardi*). In my opinion the two forms correspond to only one of the three different forms recorded by DANA (1852) under the name *maculata*.

DANA (1852) recorded 2 specimens from Hawaii and one from Tahiti which differ from *rufopunctata* by a 'less deeply dentate front' (DANA, fig. 4b). The three specimens are different. Among the two from Hawaii, one has the denticulation of the anterior margin of the cheliped normal (DANA, fig. 4c), the other more numerous and shorter (DANA, fig. 4d). The specimen from Tahiti (DANA, fig. 4a) has a carapace longer. DANA, who made those remarks noticed: 'the different dentation of the arm . . . may indicate a more important difference than is here admitted'.

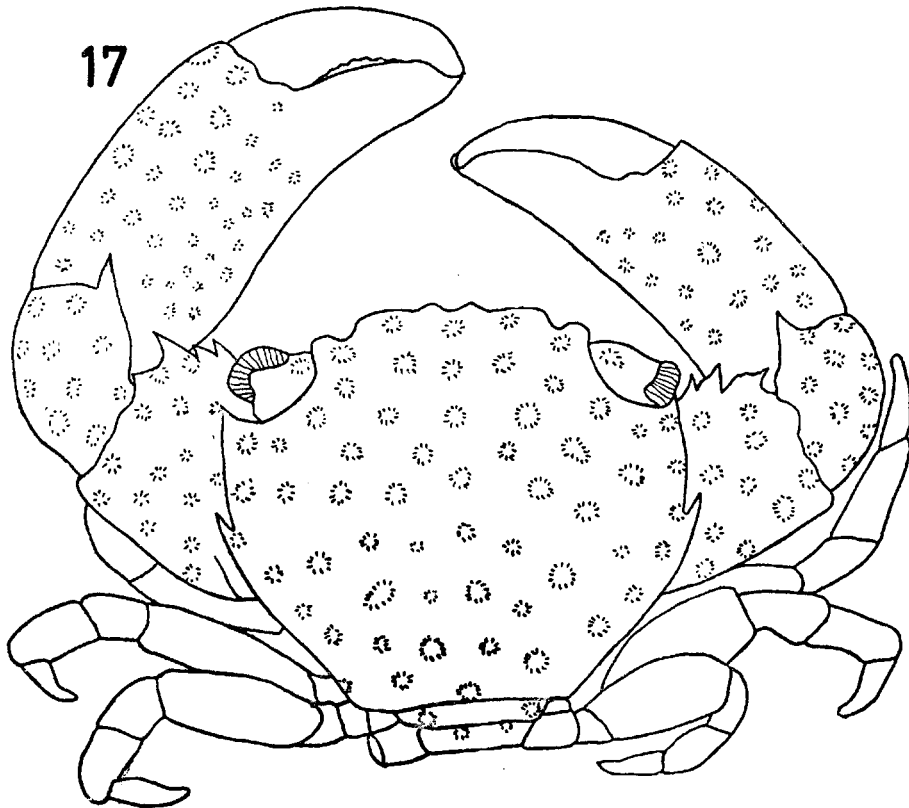
In my opinion *danai* of WARD corresponds to the species characterized by the denticulation of merus shorter and more numerous. DANA wrote: 'subdivided

and illustrated' (DANA, fig. 4d). The second specimen from Hawaii (DANA, fig. 4c) probably corresponds to *wardi*; I notice that according to the figure the merus is comparatively broader. Perhaps the specimen of Tahiti belong to another form. The specimens of *maculata* from the Red Sea recorded by DE MAN (1888) are *danai*; he noticed the frontal border with round instead of triangular lobes; external orbital angle and epibranchial teeth not very acute, carapace narrowing behind external orbital angle, merus of cheliped with short denticulation (DE MAN suggests accidentally broken). Several authors mentioned on *maculata*, the lower border of palm smooth and frontal border feebly sinuous.

The conspicuous disposition of the denticulation of the anterior border of merus are already mentioned by FOREST and GUINOT (1961) as a character of *Trapezia guttata* and is associated in *danai* with a merus comparatively longer than on the related species *wardi*.

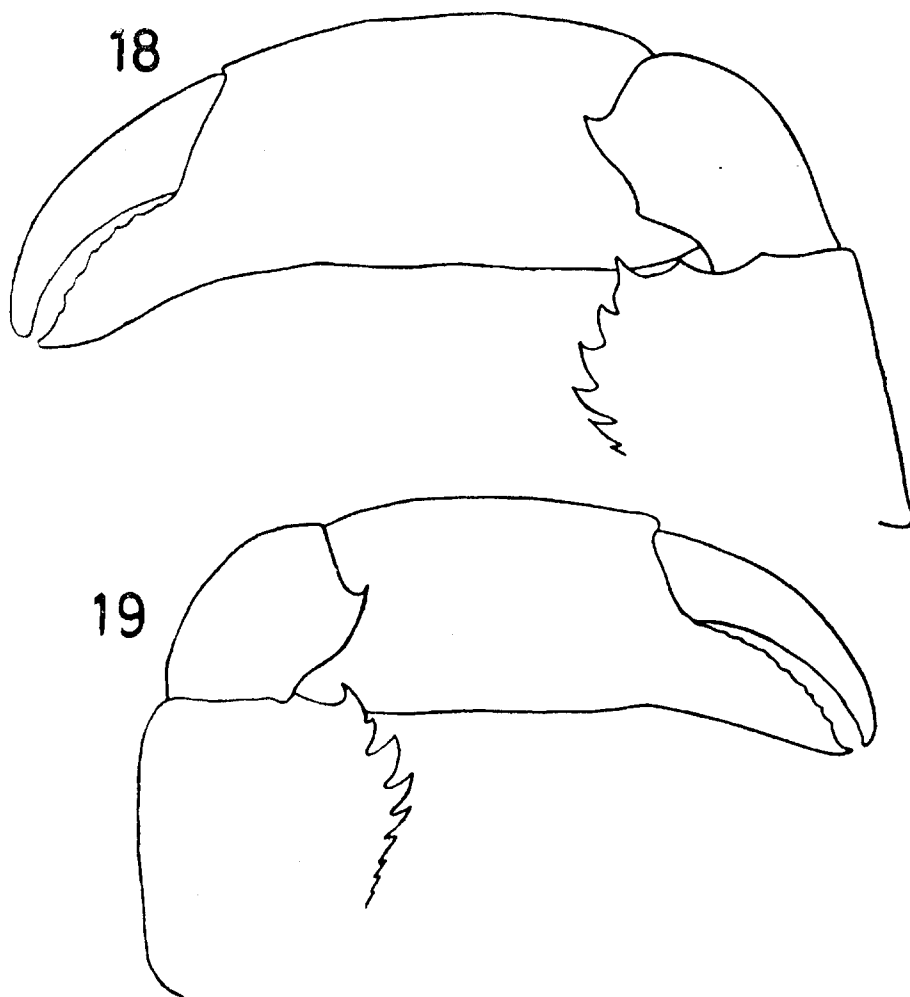
With those morphological characters in mind a review of the literature demonstrates that under the name of *maculata* generally are recorded species which are close to *danai* but not to *maculata*.

As a comparative material, I drew out from my notes of 1962, the drawing (figs. 14b, 15, 16) of a male of 10×12.14 from Mauritius, which belongs to the *Carrie*



17: *Trapezia wardi* (Israel coll.), male of 10.15×12 .

1913 collection (Paris Museum) and was recorded by BOUVIER (1915) as *rufopunctata*. Another specimen of the same collection, a male of 11×12.8 selected among a series identified as *ferruginea maculata* by BOUVIER (1915) (which also includes specimens of

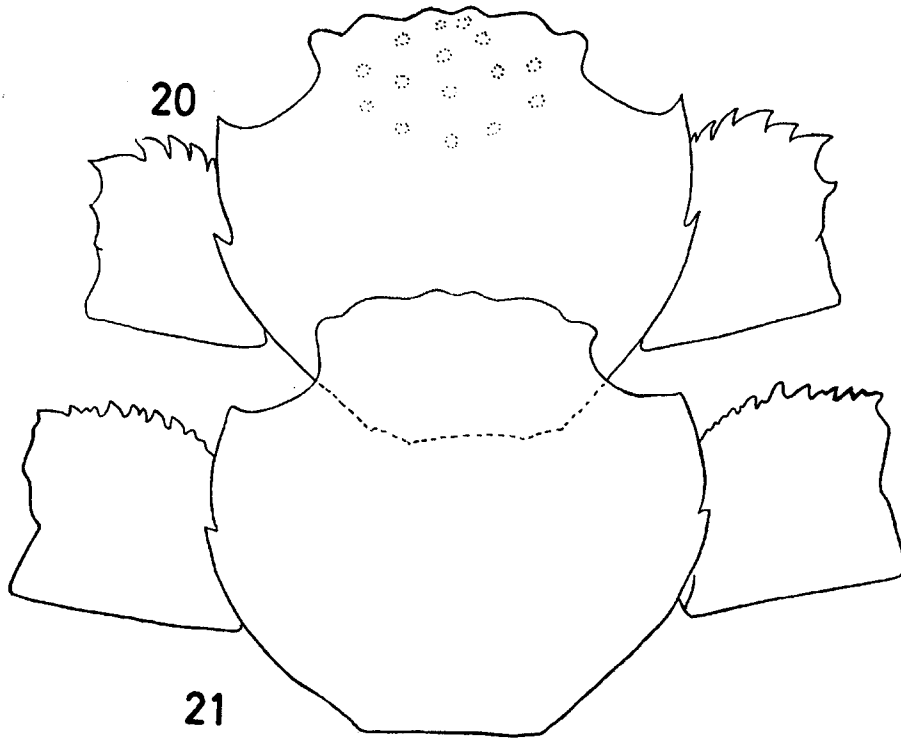


18-19 : *Trapezia wardi*, same specimen. (18) right cheliped. (19) left cheliped.

wardi) is also illustrated (figs. 20, 22, 24) in order to serve as comparative material for the study of *wardi*. Unfortunately all characterized specimens of *danai*, I have the opportunity to observe have lost their coloration like those of the Carrie's collection and I cannot have a clear opinion on the ornamentation of the species. The type of WARD (1939) on his figure has approximately 50 spots ; the present specimens are much more larger ; the male has 120 spots on the carapace, the female 150-160. On the figure of RATHBUN (1930) for *cymodoce maculata* which has the morphological characters of *danai*, the ornamentation is nearly identical with that of the figure of WARD (1939). It seems to be the case also for the figure of EDMONSON (1962) for *maculata*. The ornamentation of *danai* seems to correspond to that of *maculata*-

tigrina in the morphological type of species of the group in spite of the remark of WARD (1939) that on *danai* the spots are smaller than on *maculata*.

With regard to their ornamentation with smaller and more numerous spots, the specimens of the present collection, as well as those of the Carrie's collection illus-



20-21 : Carapace and merus of cheliped of : (20) *wardi* (Mauritius, Carrie coll. 1913), male of 108×12.3 . (21) *danai* (Mauritius, Carrie coll. 1913), male of 11×12.8 .

trated here and probably those of DE MAN (1888) and KLUNZINGER (1913) seem to belong to a different form designated here as *aff. danai* and corresponding in the other morphological group to the form *aff. maculata* of the present paper. On the contrary the specimens of RATHBUN (1930) and EDMONSON (1962) are identical with the specimens of WARD (1939).

I must mention also that on the present specimen, the outer surface of palm of cheliped has a light tomentum of fine setæ, which also exists similarly on the specimens of *aff. wardi* illustrated here (fig. 11). However on the present specimen the anterior border of merus of cheliped presents a denticulation relatively short but comparatively less subdivided than on the specimen of *aff. danai* illustrated here (figs. 15, 16, 20).

Trapezia wardi SERENE 1970

(figs, 7, 8, 11, 12, 17, 18, 19, 20, 23, 25)

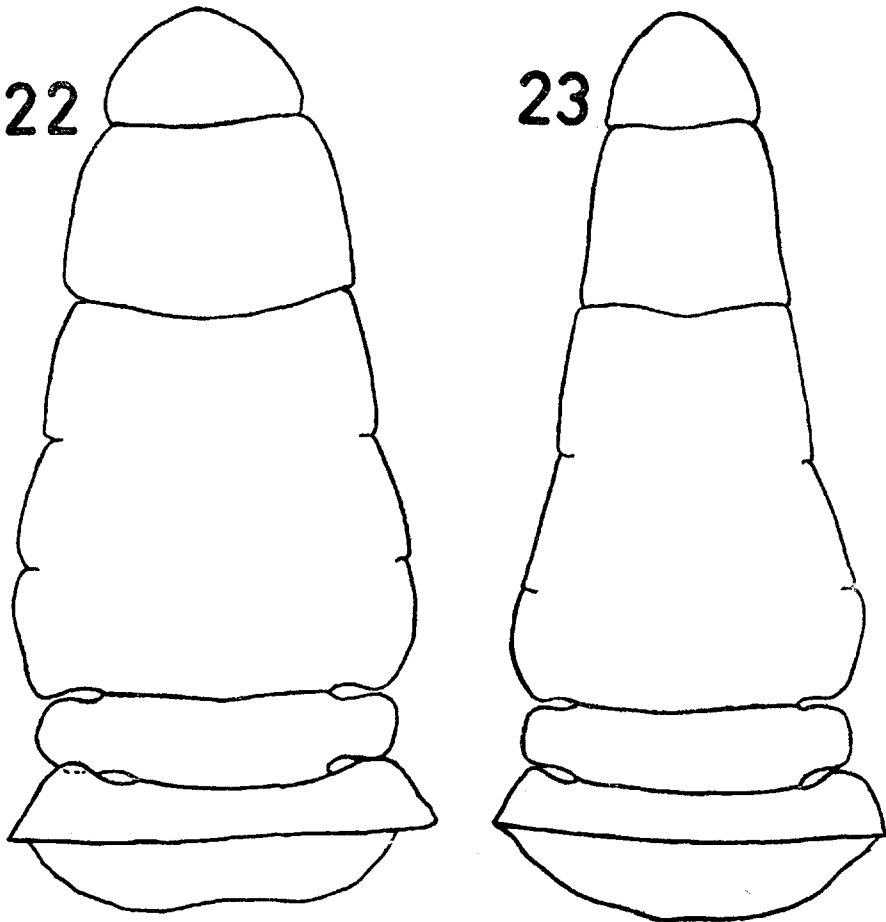
? *Trapezia maculata* (part), DANA, 1852, p. 256, pl. 15, fig. 4b, c (Not fig. 4d).—
 ? NOBILI, 1906, p. 293.

? *Trapezia ferruginea* var. *rufopunctata*, PAULSON, 1875, p. 48, pl. 7, fig. 3.

Trapezia ferruginea var. *maculata* (part), BOUVIER, 1915, p. 58.

Trapezia tigrina, WARD, 1939, p. 13, fig. 15, 16. Not *tigrina* EYDOUX and SOULEYET
 1841.

Material. GA 64-22a (1) 21-III-64 ex *Pocillopora*, one male of 5×6, one female
 of 8×9.

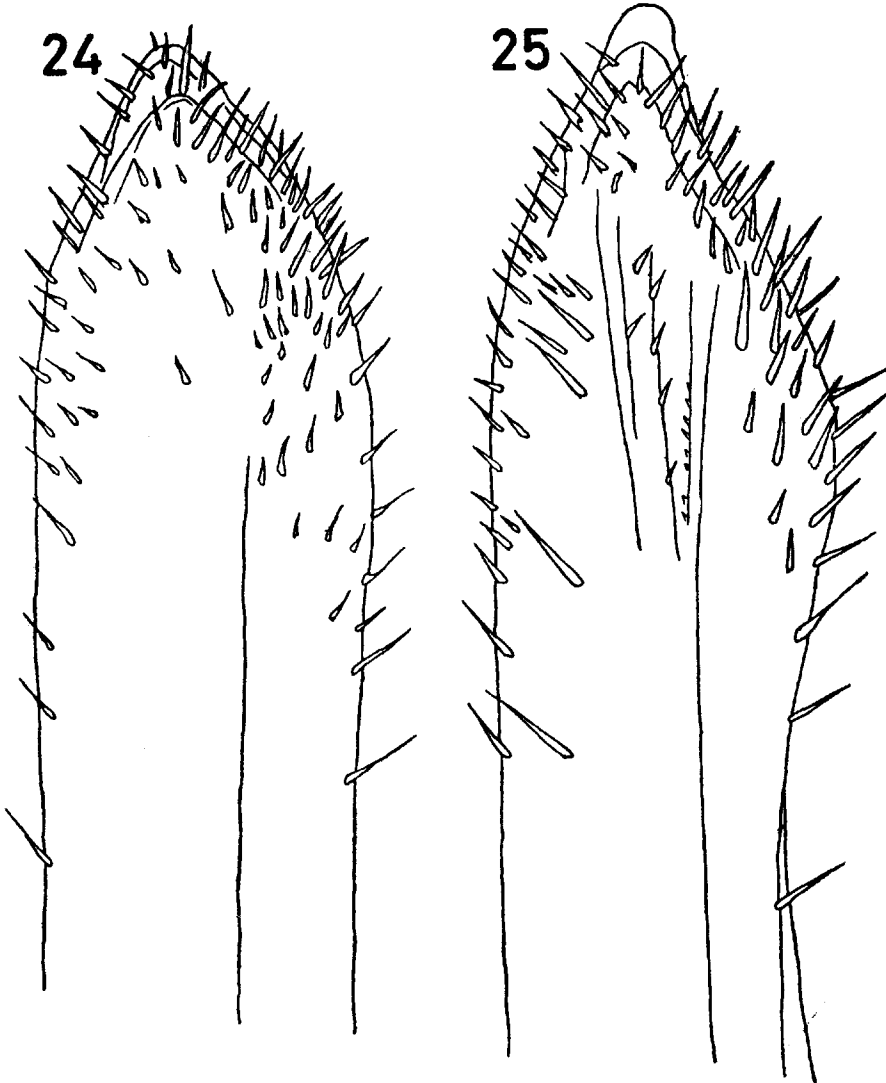


22-23 : Abdomen of the same specimens : (22) *danai*, (23) *wardi*.

GA 64-16c (2) (Galle, Ceylon) 2 ♂, 4.5×5.9 & 5.8×7.0 mm.; 1 yg., 2.8×3.9 mm.

GA 64-35 (1) (Maldive Islands) 1 ♂, 5.9×7.2 mm. ; 1 yg., 3.6×4.8 mm.

GB B-4 (Maldive Islands) 1 ♂, 8.0×9.4 mm. ; 1 ♀ ov. 7.8×9.3 mm. ;
1 yg., 5.0×6.3 mm.

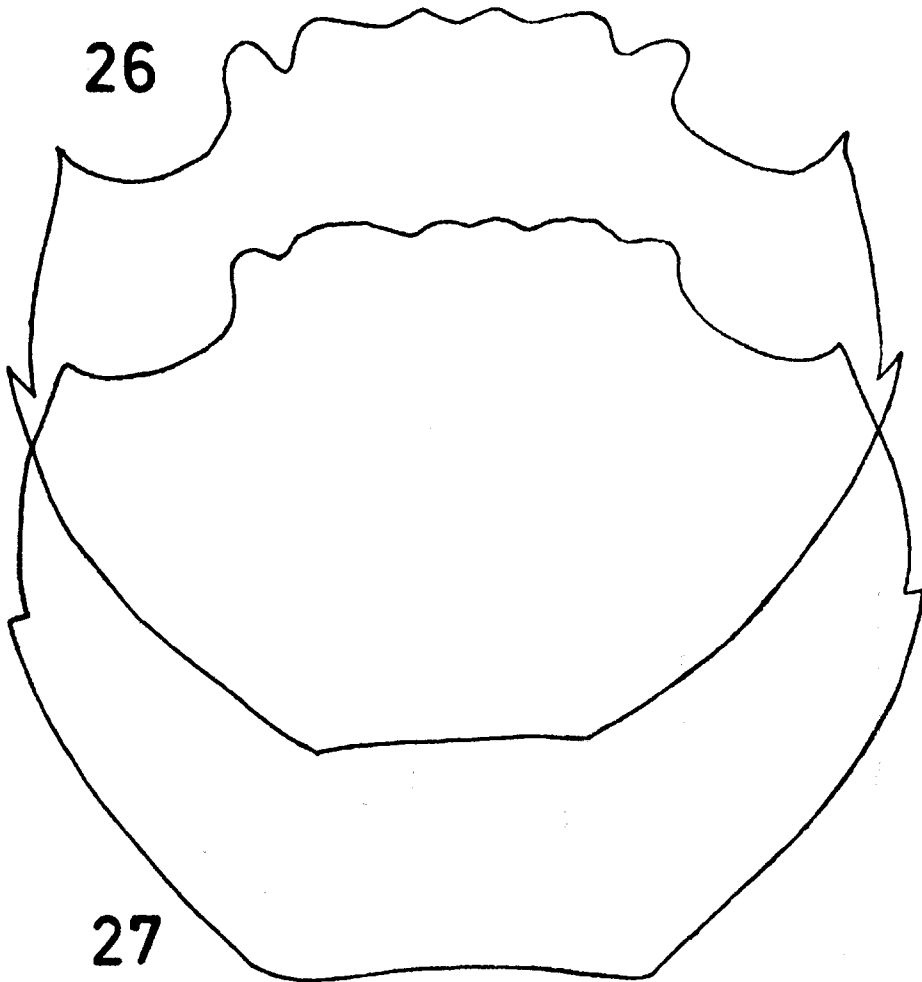


24-25 : Pleopod 1 of the same specimens : (24) *danai*. (25) *wardi*.

Observations. The species was briefly described and illustrated by SERENE (1970) in a preliminary note. The type and other material are here examined in more detail. The holotype is a male of 10×11, and the paratype, a male of 10×10.5, collected in the Nhatrang Bay, Vietnam and deposited in the National Museum of Singapore.

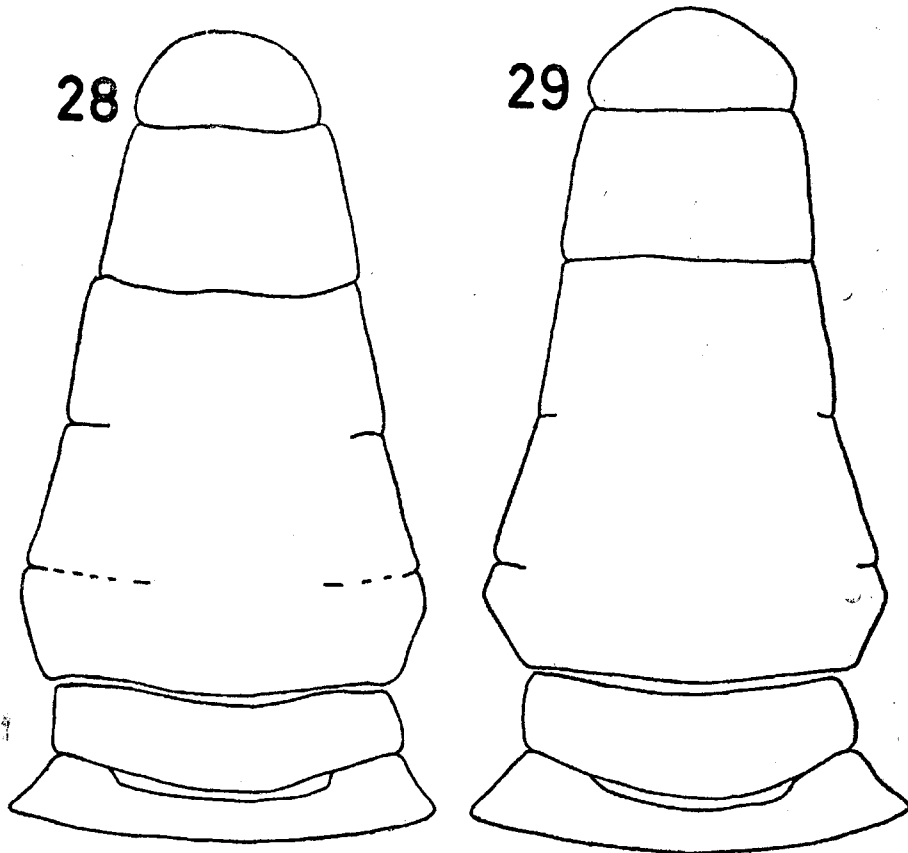
Diagnosis. Frontal border lobulate. External orbital angle and epibranchial tooth long and acute. Lateral border of carapace with a feable concavity behind external orbital angle. Anterior border of merus of cheliped with 5-6 deeply separated teeth, distally curved and acute. Inuer angle of carpus of cheliped with acute spine. Carapace on male with 30-40 spots.

Tr. wardi differs from *aff. danai* by : (1) Carapace anteriorly broader ; the breadth between the tips of external orbital angle is very few less than between the epibranchial teeth ; it is much less on *aff. danai*. (2) Merus of cheliped a few (shorter) narrower with anterior border deeply cut into 5-6 acute teeth instead of being cut into 8-9 short not acute teeth. (3) Propodus of cheliped shorter ; its total length subequal to breadth of carapace, instead to be clearly more. (4) Male abdomen is narrower ; segment 6 is a few longer than its breadth at base instead to be clearly



26-27 : Outline of carapace of : (26) *Tr. cymodoce* (Mauritius, Carrie coll., Bouvier 1915 det.), male of 13.5 × 15.1. (27) *Tr. ferruginea* (same coll.), male of 13.7 × 16.6.

shorter on *danai*. (5) Male pleopod with a subdistal convexity more marked. (6) Spots less numerous 30-40 on the male instead of 50 on *danai*.



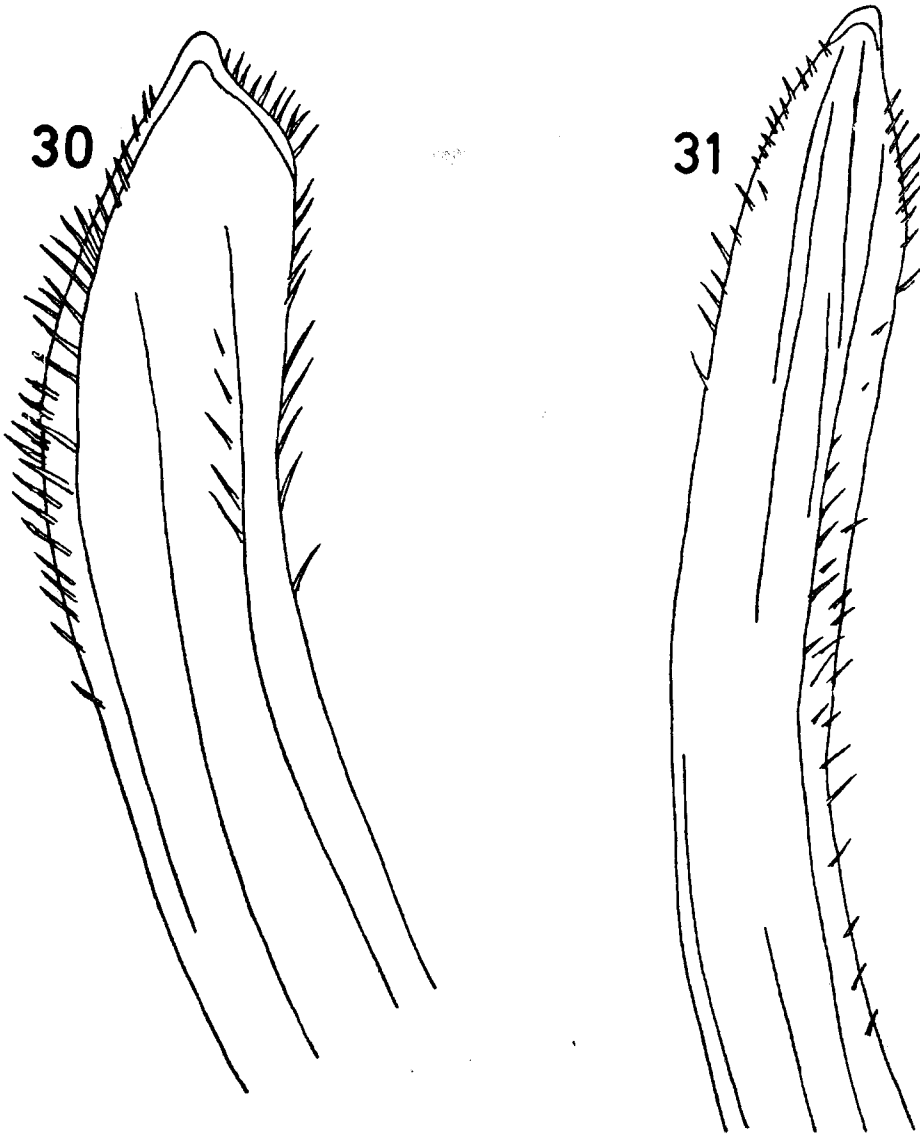
28-29: Abdomen of the same specimens : (28) *cymodoce*, (29) *ferruginea*.

Those discrepancies (save for the coloration) were established in my notes of 1962 by using as reference material specimens illustrated here (figs. 20, 22, 24) for *aff. danai* : a male of 11×12.8 from Mauritius (Carrie coll.) and for *wardi* as complementary material to the types two specimens from Mauritius (Carrie coll.) male of 12.5×15.3 (fig. 8), one of 10×12.3 (figs. 21, 23, 25) and one from Eylath (Israel coll.) male of 10.15×12 (figs. 17-19).

The type specimens of *wardi* has the lower border of palm finely denticulate, but nothing which could be compared with the denticulation of the specimen of the present collection recorded as *aff. tigrina*, which besides has a dentate frontal border.

The forms *danai*, *aff. danai*, *wardi*, *aff. wardi* correspond in the group with lobulate front to the *maculata*, *aff. maculata*, *tigrina*, *acutifrons* forms of the group with dentate front. In such a grouping with regard to the ornamentation *aff. danai* seems to correspond more to *rufopunctata* or *aff. maculata* and *wardi* more to *maculata*.

The specimens of the present collection are too small, mainly the male to be identified with some certitude ; but they are closer to *wardi* than to *danai*.



30-31 : Male pleopod I of the same specimens : (30) *cymodoce*. (31) *ferruginea*.

Brief note on other species with a key

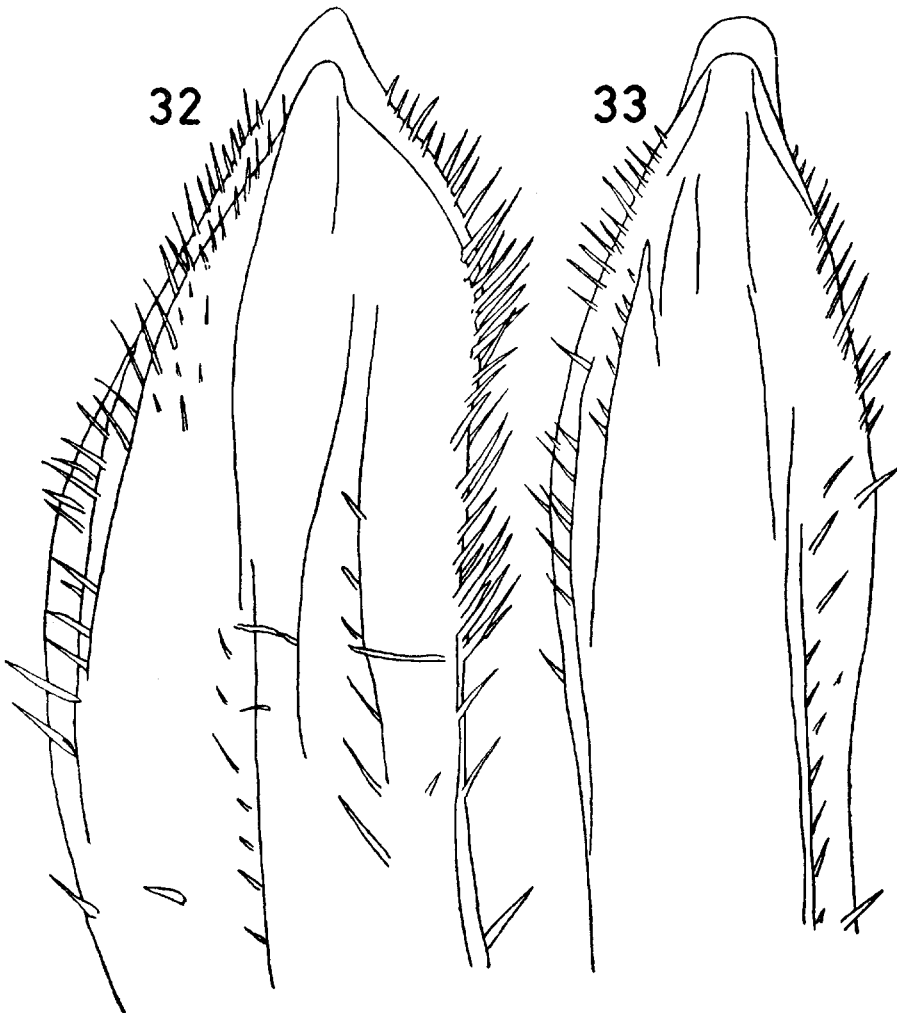
(figs. 26-33)

The collection of Dr. Garth also includes specimens of *Tr. cymodoce*, *ferruginea* *aerolata*, *digitalis*. The situation of those species as well as that of the others are,

much less confused, in spite of the controversial views of several authors, mainly in regard to the taxonomic level to be given to the forms : specific or subspecific.

The subspecies system with different forms in some subspecies is a nomenclature at least too much heavy to use for field observations. The separation of the forms, whatever the level given (specific or subspecific) need improvement. A review similar to that considered here for species of the *rufopunctata-maculata* group seems necessary for the *cymodoce-ferruginea* group. The artificial key given here is only a guide-line for field taxonomists, the main need being to increase the observations on fresh material on the spot as well as comparison between specimens of large series. Kept as a blue print in my file since 1962, the key here is given as such.

To complement the key, the two most common species are illustrated. The specimens have approximately the same size : *cymodoce*, male of 13.5×15.1 ; *ferru-*



32-33 : Male pleopod of the same specimens : (32) *cymodoce*, (33) *ferruginea*.

ginea, male of 13.7 × 16.6 and belong to the Carrie collection from Mauritius identified by BOUVIER (1915). Generally the characters of the key are given for fully developed male specimens and some have less value for smaller specimens.

Key of *Trapezia* species

- 1—Carapace of adult specimen with epibranchial tooth well marked. 2
 —Carapace of adult specimen with epibranchial tooth feable and nearly obsolete. 16
- 2(1)—Carapace of uniform colour without conspicuous coloured spots or lines. 3
 —Carapace with carapace ornamented by coloured spots or lines. 7
- 3(2)—Chelipeds and ambulatory legs of uniform colour. 4
 —Ambulatory legs with small dark red spots or/and 2-3 rows of small dark red broken line on carpiropodi 6
- 4(3)—External surface of palm of cheliped covered by tomentum of fine setae. Upper border of palm somewhat marked by an obtuse rim ; lower border very finely serratulate. Frontal border with submedian lobe salient and a deep (antennal) sulcus between lateral lobe and inner rounded supraorbital angle which is strongly salient. External orbital angle and epibranchial tooth acute. Male pleopod in BARNARD (1950, fig. 52a, b).
 *cymodoce* (HERBST 1801).
 —External surface of palm of cheliped bare. Upper border of palm which on a transverse section is regularly rounded ; lower border perfectly smooth. Frontal border with lateral lobes longer and antennal sulcus much less deep than on *cymodoce* ; inner rounded supra-orbital angle much less salient. 5
- 5(4)—Frontal border with submedian lobe rounded and few salient. External orbital angle and epibranchial teeth not acute. Male pleopod in FOREST and GUINOT (1961, fig. 137a, b).
 *ferruginea* LATREILLE 1825.
 ?—Frontal border with submedian lobe more salient and subpointed. Epibranchial teeth acute ; dentations of anterior border of merus of chelipeds more deeply separated and acute.
 *dentata* DANA 1852.
- 6(3)—Frontal border lobulate with shallow antennal sulcus ; anterior border of merus of cheliped with (7-8) numerous short denticulation. Male pleopod in FOREST and GUINOT (1961, fig. 139a, b). Carapace uniformly brown reddish or yellowish. Ambulatory legs with red or brown spots.
 *guttata* RUPPELL 1830.
 ?—Carapace white cream or light brown with a dark brown (red brick) stripe all along frontal border. External surface of cheliped with an upper proximal half a network of red lines (meshes). On pereopods 2-5, meri and carpi with dark red spots ; propodi with broken red brown lines.
 ? *davaoensis* WARD 1941.
- 7(2)—Carapace whitish or light pink with a network of red spots 8
 —Carapace and chelipeds whitish or light pink with a network of red meshes and ambulatory legs uniformly coloured without network of dots or lines, or carapace and chelipeds brown dark red with large white spots and ambulatory legs striped white and brown red.
 14
- 8(7)—Palm of cheliped without red spots and with a network of fine red meshes ; red spots limited to merus and carpus of cheliped, as well as carapace and ambulatory legs where they are feable. Outer surface of palm of cheliped with tomentum. Frontal border lobulate.
 *intermedia* MIERS 1886.
 —Palm of cheliped with red spots similar to those of carapace and ambulatory legs. 9

- 9(8)—Lower margin of palm of cheliped strongly granular (serrated); front dentate with triangular and salient lobes. 10
 —Lower margin of palm of cheliped nearly smooth (almost finely serrated); front lobulate with few salient and rounded lobes. 13
- 10(9)—Carapace and legs with small and numerous coloured spots. Approximately 200 spots on male carapace. (Antero-lateral border of carapace nearly straight; concavity behind external orbital angle and convexity beyond epibranchial tooth few marked?).
 *rufopunctata* (HERBST 1801)
 —Carapace and legs with larger and less numerous spots. 11
- 11(10)—Frontal triangular lobes remarkably acute, like spine-tipped. (Number of spots on carapace unknown).
 *acutifrons* A. MILNE EDWARDS 1867.
 —Frontal triangular lobes not remarkably acute. 12
- 12(11)—Frontal triangular lobes strongly salient; the two submedian triangular. (Number of spots on carapace unknown? 50).
 *maculata* (MACLEAY 1837)
 ?—Antero-lateral border of carapace sinuous; approximately 70 spots on male carapace.
 *aff. maculata*
 —Frontal triangular lobes less salient; the two submedian rounded. Approximately 25-30 spots on male carapace.
 *tigrina* EYDOUX and SOULEYET 1841
- 13(9)—Merus of cheliped long with 9-10 short denticulations on anterior border. Approximately 50 spots on male carapace.
 *danai* WARD 1939.
 ?—Denticulations on anterior border of merus 7-8 less short than on *danai*. Approximately 120 spots on male carapace.
 *aff. danai*
 —Merus of cheliped shorter with 5-6 long acute denticulations on anterior border. Approximately 35 spots on male carapace.
 *wardi* nov. sp.
- 14(7)—Palm of cheliped with lower border strongly granular (serrated). Carapace and cheliped with large round white spots; approximately 18 on carapace. Ambulatory legs with transverse white and brown stripes.
 *flavomaculata* EYDOUX and SOULEYET 1841
 —Palm of cheliped with lower border smooth. On carapace and legs a network of slim, straight red lines with angular junctions organising pentagonal or hexagonal areoles. . . . 15
- 15(14)—Angular areoles small and numerous; front lobulate; anterior border of merus of cheliped with numerous denticulations.
 *areolata* DANA 1851
 ?—Angular areoles larger and less numerous; front subdentate; anterior border of merus of cheliped with less denticulations.
 ? *reticulata* STIMPSON 1858
- 16(1)—Carapace uniformly coloured without dots or network of meshes. 17
 —Carapace ornamented by dots or a network of meshes. 19
- 17(16)—Palm of cheliped with lower margin granular; carapace light brown yellowish.
 *plana* WARD 1941.
 —Palm of cheliped with lower margin smooth. 18

- 18(17)—Colour of carapace dark brown.
*digitalis* LATREILLE 1825.
 —Colour of carapace orange.
*formosa* SMITH
 —Colour of carapace bright red (coral).
*coralina* GESTAECKER
- 19(16)—Carapace ornamented by a network of broad white lines irregularly organised.
*speciosa* DANA 1852.
 —Carapace with red spots.
*bella* DANA 1852.