

## FIVE SPECIES OF MATUTA (CALAPPIDAE, BRACHYURA, DECAPODA) FROM INDONESIA

By

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### ABSTRACT

Five species of *Matuta* from Indonesia i.e. *lunaris*, *planipes*, *banksii*, *inermis* and *cuntispina* are differentiated and grouped according to several important morphological characters.

Each species is briefly described but extensively illustrated including the first and the second male pleopods. The first male pleopod of *M. cuntispina* is quite different from the other four.

The use of the structure of the stridulating organs as one of the important characters in classifying the species is emphasized and a new key is established.

### INTRODUCTION

In a previous paper (ROMIMOHTARTO 1967) I recorded four species of *Matuta* from eastern Indonesian waters, two of which were not identified.

I was able to re-examine that material and compared it with the reference material of the National Museum of Singapore.

Several corrections in identification and synonyms given by some authors have been made, but sometimes the situation of some species is somewhat confused in the literature.

In the existing keys, some of the discrepant characters to separate the species, such as the breadth of the frontal border in regard to the length of the orbit have a relative value. A comprehensive review of the morphological characters of the species, therefore, seems to be necessary in order to facilitate the grouping of those species and their identification.

My new key refers to such a review for the five species of *Matuta* i.e. *lunaris*, *planipes*, *banksii*, *cuntispina* and *inermis*.

### MORPHOLOGICAL ACCOUNT

1. Stridulating organs. — The stridulating organs provide one of the most clear characters to separate at least the male of the five species. Three pairs of stridulating organs always exist on the male

and at least two pairs exist on the female, i.e. one on the pterygostomian region close to the cavity; one on the inner surface of the palm of the cheliped; and one stridulating organ, like a longitudinal striated line, on the external face of the dactylus or on the outer face of the palm of the cheliped (Fig. 1 - 4).

That organ is considered as a "subsidiary" or additional stridulating mechanism by BARNARD (1950), who mentions it on *lunaris* and *banksii*. It is called accessory stridulating organ by GUINOT & DUMORTIER (1960).

The accessory stridulating organs do not exist or are very feeble on the female of certain species (*lunaris*, *planipes* and *banksii*) while they are well developed on the outer face of the dactylus of the male.

In *curtisipina* and *inermis*, the accessory stridulating organs are well developed in both sexes, but instead of being on the dactylus, they are on the longitudinal median line of the outer face of the palm extending from the cleft between the dactylus and the palm to the posterior border of this palm. In *inermis* this organ differs in both sexes. In the male it runs along the middle line from the left between the dactylus and the palm to the posterior border of the palm, while in the female it is replaced by five sharp tubercles. In *curtisipina* there is no difference in both sexes.

Those morphological structures emphasize the sexual dimorphism existing on *Matuta*, which is only briefly mentioned by some authors (MIERS, 1879, 1884, ALCOCK, 1896). But BARNARD (1950) has noticed that on *lunaris* and *banksii* the accessory stridulating organs are feeble or nil on females and young males.

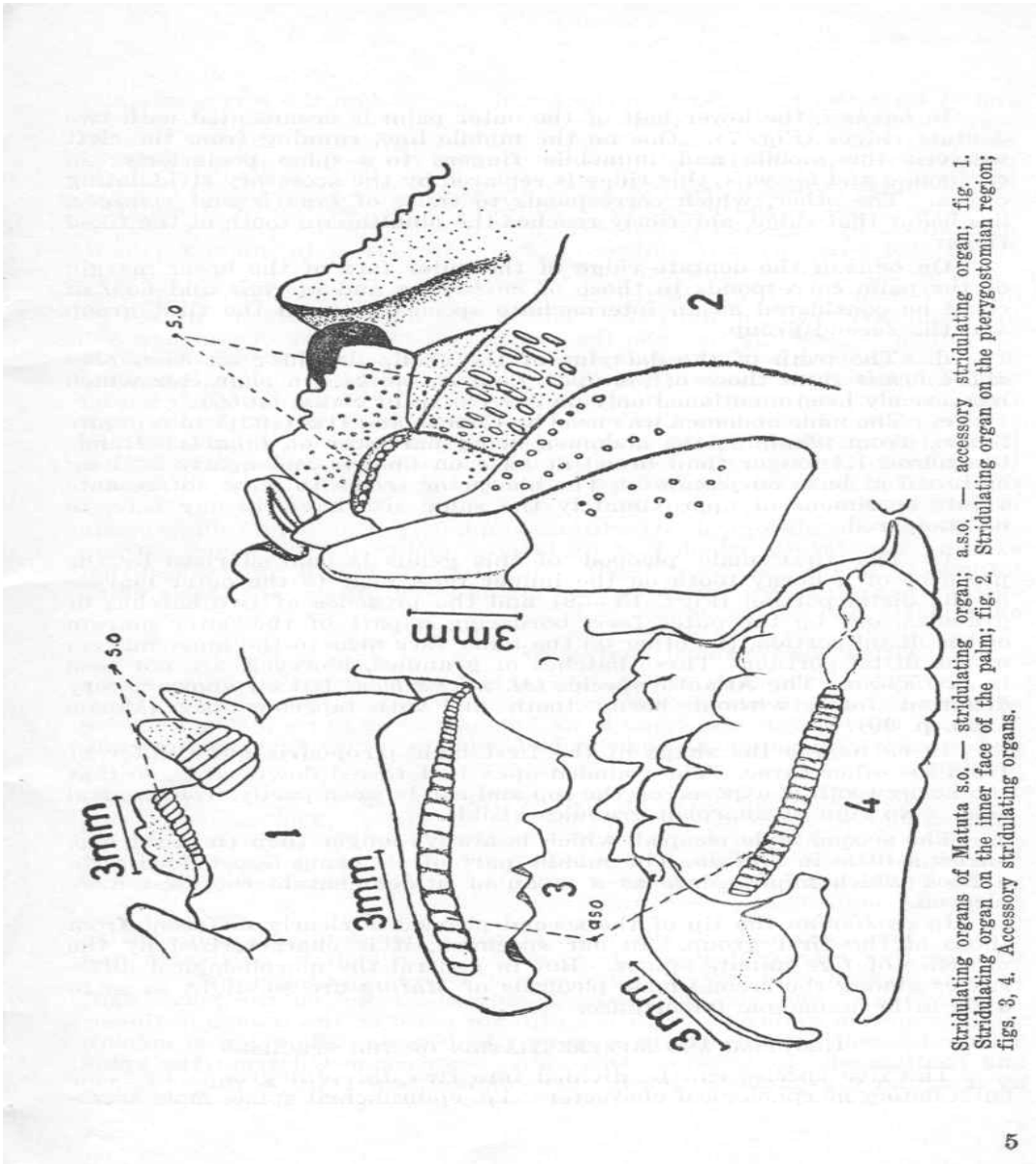
## 2. Other discrepant characters.

a. The development of the epibranchial spine gives a clear separation of the species into two groups i.e. group I (*lunaris*, *planipes*, *banksii*), of which the epibranchial spine is well developed and group II (*curtisipina* and *inermis*), of which the epibranchial spine is poorly developed or rudimentary.

b. The tubercles on the dorsal surface of the carapace are clearly more salient in some species and less so in others. The values of this character is sometimes difficult to evaluate without comparative material. Nevertheless the presence of a salient tubercle on the postero-lateral border of the carapace in *banksii* provides a good character, as it never or faintly indicated in any other species.

c. The outer face of the palm of the cheliped is ornamented with four or five ridges, three on the upper half, which in *curtisipina* and *inermis* is somewhat irregular and one or two on the lower half.

In *lunaris* and *planipes* there is only one ridge on the lower half, which connects anteriorly with penultimate tooth of the immobile finger. This ridge ends posteriorly in a spine. In *lunaris*, this ridge is smooth and continuous. In *planipes*, this ridge is disconnected from the spine by irregularly granulated line in the proximal half (Fig. 5 - 6).



Stridulating organs of *Matuta* s.o. — stridulating organ; a.s.o. — accessory stridulating organ; fig. 1. Stridulating organ on the inner face of the palm; fig. 2. Stridulating organ on the pterygostomial region; figs. 3, 4. Accessory stridulating organs.

In *banksii*, the lower half of the outer palm is ornamented with two dentate ridges (Fig. 7). One on the middle line, running from the cleft between the mobile and immobile fingers to a spine posteriorly; in *curtispina* and *inermis*, this ridge is replaced by the accessory stridulating organ. The other, which corresponds to those of *lunaris* and *planipes*, lies below that ridge, anteriorly reaches the pinultimate tooth of the fixed finger.

On *banksii* the dentate ridge of the outer face of the lower margin of the palm corresponds to those of *curtispina* and *inermis* and *banksii* could be considered as an intermediate species between the first group and the second group.

d. The teeth of the dactylus of the chelipeds differ on *curtispina* and *inermis* from those of *plariipes*, *lunaris*, *banksii*; a character which has already been mentioned only on *curtispina* by SAKAI (1965).

e. The male abdomen was used by CHOPRA and DAS (1931) to separate *lunaris* from *planipes*; the abdomen being narrower on *lunaris*. It has the telson 1.4 longer than broad at base on *lunaris* and nearly as long as broad at base on *planipes*. The character seems to have no absolute value; specimens of approximately the same size have, in any way, to be compared.

f. The first male pleopod of this genus is characterized by the presence of a horny tooth on the inner face, near to the outer margin of the distal portion (Figs. 15 - 38) and the presence of two batches of granules, one on the outer face, bordering a part of the outer margin of the distal portion, the other on the inner face near to the inner margin of the distal portion. These batches of granules, however, are not seen in *curtispina*. The Atlantic species (*M. michaelsoni* BALSS) shows a very different form, without horny tooth and with tapering apex. (MONOD 1956, p. 99).

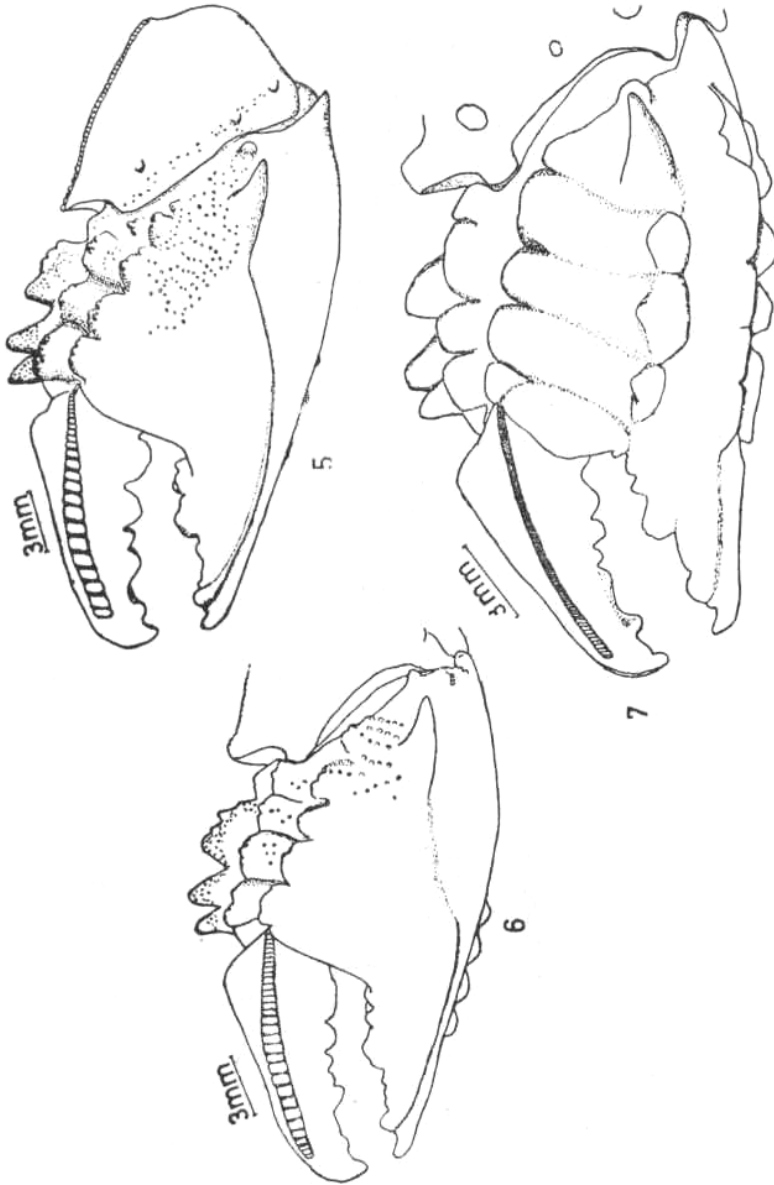
In *curtispina* the shape of the first male pleopod is quite different from the other three. The rounded apex is deflexed downwards, so that the horny tooth is exposed on the top and can be seen partly from ventral side. No sign of sharpish granules visible.

The second male pleopod, which is always longer than the first one, varies a little in *Matuta*. The middle part of its hemp is provided with a hook which might serve as a mean of attachment to the first male pleopod.

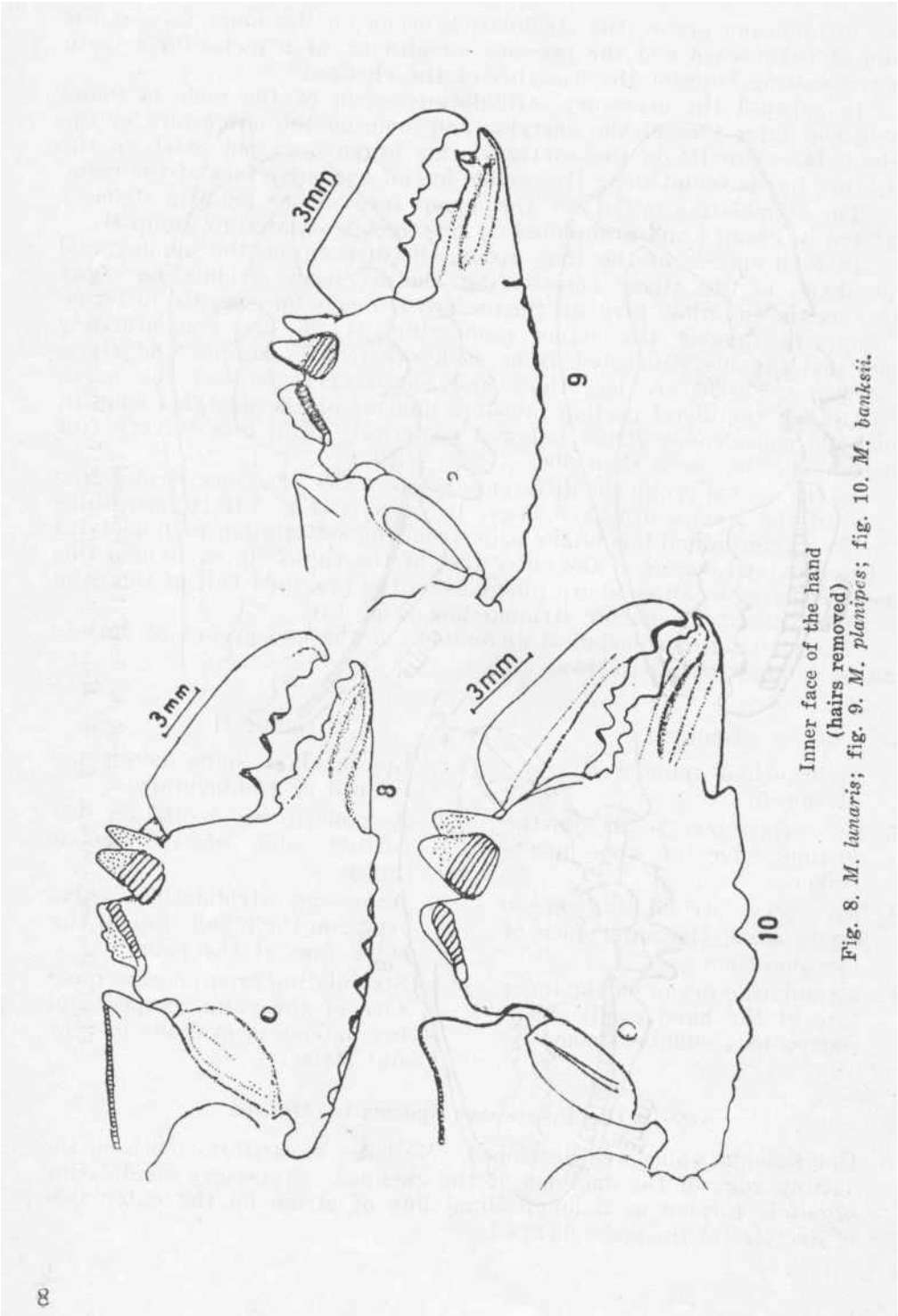
In *curtispina* the tip of the second pleopod is clearly different from those of the first group. In our specimen, it is characterized by the presence of five minute spines. But in general the morphological differences among the second male pleopods of *Matuta* are so slight so as to have little taxonomic importance.

#### GROUPING AND DIFFERENTIATION OF THE SPECIES.

The five species can be divided into two different groups by some outstanding morphological characters; i.e, epibranchial spine, male acces-



Outer face of the hand (hairs removed)  
 Fig. 5. *Matuta lunaris*; fig. 6. *Matuta planipes*; fig. 7. *Matuta banksii*.



Inner face of the hand  
(hairs removed)  
Fig. 8. *M. lunaris*; fig. 9. *M. planipes*; fig. 10. *M. banksii*.

sory stridulating organ, the stridulating organ on the inner face of the palm of both sexes and the presence or absence of a molariform tooth on the cutting edge of dactylus of the cheliped.

In group I the accessory stridulating organ of the male is found along the outer face of the dactylus and none on the outer face of the palm. In group II, on the contrary, this organ does not exist on the dactylus, but is found along the middle line of the outer face of the palm,

The stridulating organ on the inner face of the palm is strongly striated in group I and granulated or very feebly striated in group II.

In each species of the first group, the disposition, the number and the shape of the striae constituting the accessory stridulating organ are specific and thus give by themselves a mean for specific differentiation. In *lunaris* the striae numbering 24 - 26 are comparatively thick and broadly separated from each other. In *planipes* the striae numbering 34 - 36 are less thick and narrower. In *banksii* the organ consists, on the distal portion (about a quarter of the dactylus length), about 26 conspicuous striae followed posteriorly by a line of very fine ones numbering more than 300.

In the second group the difference between the accessory stridulating organ of the species are as follows: In *inermis* (Fig. 14) it constitutes a median longitudinal line of the palm from the articulation with dactylus to the proximal border of the outer face of the palm. In *curtisipina* this line is replaced by three sharp tubercles on the proximal half of the palm so as to constitute shorter striated line (Fig. 12).

The striking morphological differences of the two groups of *Matuta* can be summarized as follows:

#### GROUP I

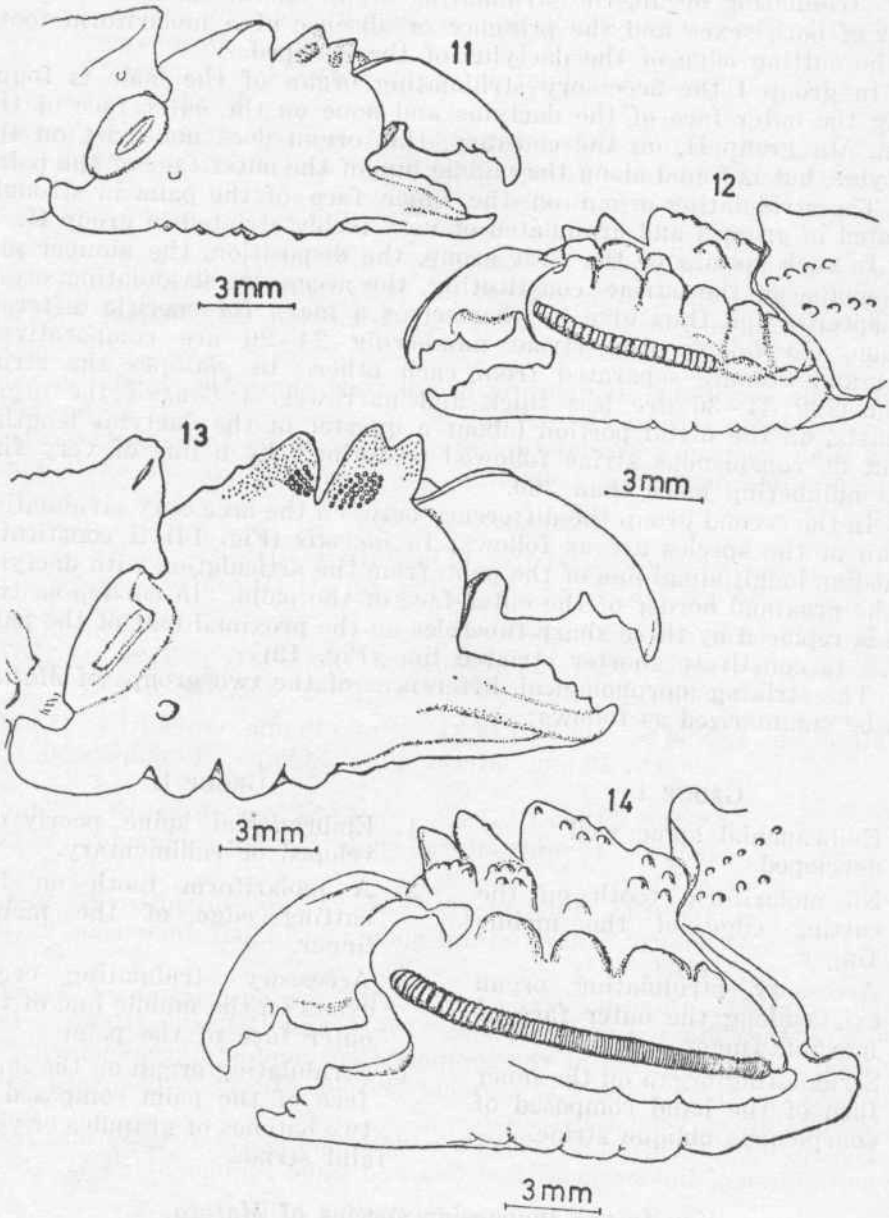
1. Epibranchial spine well developed,
2. No molariform tooth on the cutting edge of the mobile finger.
3. Accessory stridulating organ exists along the outer face of movable finger.
4. Stridulating organ on the inner face of the hand composed of conspicuous oblique striae.

#### GROUP II

1. Epibranchial spine poorly developed or rudimentary.
2. A molariform tooth on the cutting edge of the mobile finger.
3. Accessory stridulating organ exists on the middle line of the outer face of the palm.
4. Stridulating organ on the inner face of the palm composed of two batches of granules or very faint striae.

#### Key to the Indonesian species of *Matuta*.

- A. Epibranchial spine well developed. No large molariform tooth on the cutting edge of the dactylus of the cheliped. Accessory stridulating organ is formed as a longitudinal line of striae on the outer face of dactylus of the male cheliped.



Hand of *Matuta*  
(hairs removed)

*M. curtispina*: fig. 11. inner face fig. 12 outer face.  
*M. inermis*: fig. 13. inner face; fig. 14. outer face.



- a.1. None or a faint postero-lateral tubercle.
  - a.1.1. Accessory stridulating organ with 24 - 26 striae. .... *M. lunar is*
  - a.1.2. Accessory stridulating organ with 34 - 36 striae. .... *M. planipes*
- a.2. A salient postero-lateral tubercle. Accessory stridulating organ with some 26 conspicuous distal striae and about three hundred very fine ones proximally ..... *M. banksii*
- B. Epibranchial spine poorly developed or rudimentary. A large molariform tooth on the cutting edge of the dactylus of the cheliped. Accessory stridulating organ is formed as a median longitudinal line on the outer face of the hand.
  - b.1. Male accessory stridulating organ runs along the middle line of the outer face of the palm ..... *M. inermis*.
  - b.2. Male accessory stridulating organ replaced by three teeth on the proximal half ..... *M. curtispina*.

#### TAXONOMIC ACCOUNT.

##### *Matuta lunaris* (FORSKAL 1775)

(Figs. 1-3; 5, 8; 15-20; Pls. Ia, a<sup>1</sup>; IIIa, a<sup>1</sup>)

*Matuta victor* ALCOCK 1896 : 160 - 161.

*Matuta lunaris* BALLS, 1922: 124; CHOPRA & DAS 1931: 383; SAKAI 1937: 100, PL 13, fig. 3; BARNARD 1950: 358, fig. 67, L.

Material, i. N.M.S. 1965.10.13.21, ♂ of 40 mm. breadth; 38 mm. length; 12 mm. lateral spine; Siglap, Singapore, 6/12/1933

N.M.S. 1965.10.13.22, ♀ of 34mm. breadth; 32mm. length; 10mm. lateral spine; Siglap, Singapore, 6/12/1933.

ii. LM.R.D. 1968.4.8.1, ♀ of 34mm. breadth; 32.4mm. length; 7 mm. lateral spine; Sesiil Isl., Indonesia, 26/5/1964.

Observation. Our specimens agree with the description of ALCOCK (1896, for *M. victor*), CHOPRA & DAS (1931) and BARNARD (1950). The length-breadth proportion of the composite segment of the abdomen (3 - 5) is 1.05 and that of the last segment is 1.33. The male- pleopod of the species has never been illustrated.

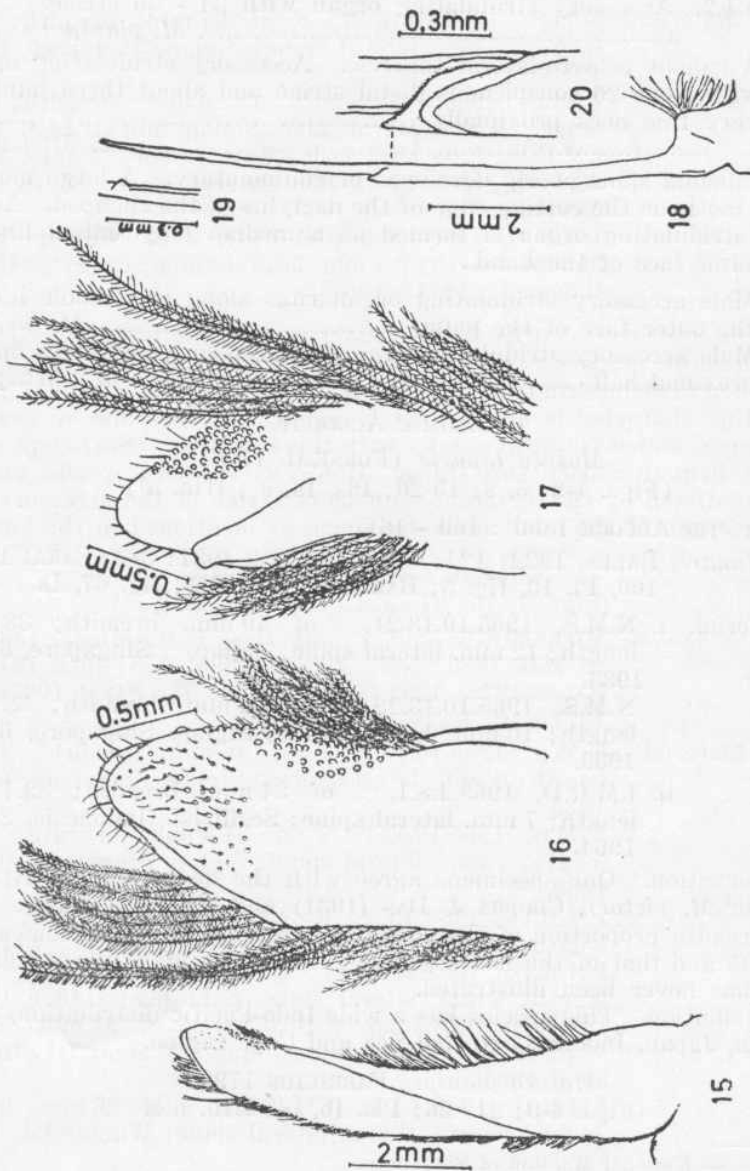
Distribution. This species has a wide Indo-Pacific distribution, from Polynesia, Japan, Indonesia to Red Sea and Cape region.

##### *Matuta planipes* FABRICIUS 1798.

(Figs.6-9; 21-26; Pls. Ib, b<sup>1</sup>; Illb. b<sup>1</sup>).

i. N.M.S. — National Museum of Singapore.

ii. LM.R.D. — Institute of Marine Research, Djakarta.



Left male pleopods of *M. lunaris*. Fig. 15. First male pleopod; fig. 16. outer face of the distal portion; fig. 17. inner face of the distal portion; fig. 18. second male pleopod; fig. 19. distal portion; fig. 20 middle portion.

*Matuta lunaris* ALCOCK 1896: 161 -162.

*Matuta planipes* CHOPRA & DAS 1931: 384; SAKAI 1936: 50, Pl. 8, fig. 1; SAKAI 1965: 60, PL 24, fig. 3.

Material. N.M.S. 1965.10.13.31, ♂ of 37mm. breadth; 36mm. length; 8mm. lateral spine; Siglap, Singapore, 6/10-12/1933.

N.M.S. 1965.10.13.32, ♀ of 26mm. breadth; 35mm. length; 8 mm. lateral spine; Siglap, Singapore, 6/12/1933.

I.M.R.D. 1968.4.8.2 (CB 061) ♀ of 32 mm. breadth; 28.4mm. length; 7.5mm. lateral spine; South coast of Merauke, Indonesia, 3/10/1968.

I.M.R.D. 1968.4.8.3. (CB 064), ♂ of 37.8mm breadth; 36 mm. length; 9.7 mm. lateral spine; 08°27'S. 139°05'E. Indonesia, 10/12/1967.

Observation. CHOPRA & DAS (1931) use, among other characters, the length-width proportion of the 3-5 segment and terminal segment of the abdomen to differentiate this species and the closely allied one (*M. lunaris*). But this character is not absolutely applicable since one or two of our specimens do not conform exactly with this character. Sufficient material might help to clarify this thing. However, the two species are easily differentiated by the different number of striae of the accessory stridulating organ of the adult male specimen, as mentioned in the key.

*Matuta banksii* LEACH 1817.

(Figs. 7, 10; 27-32; Pis. Ic, c<sup>1</sup>; IIIc, c<sup>1</sup>)

*Matuta banksii* MIERS, 1876: 245, PL 40, figs. 1, 2; MIERS, 1880: 315; DE MAN 1888: 389; ALCOCK 1896: 158; IHLE 1918: 185; BALSS 1922: 125; GORDON 1934: 73; SAKAI 1937: 98, PL 13, fig. 2; BARNARD 1950: 382.

Material. N.M.S. 1965.10.13.2, ♂ of 26 mm. breadth; 36.5 mm. length; 9 mm. lateral spine; Siglap, Singapore, 6/10-12/1933.

N.M.S. 1965.10.13.3. ♀ of 31.5mm. breadth; 32mm. length; 7mm. lateral spine; Siglap, Singapore, 6/10-12/1933.

I.M.R.D. 1968.4.8.4, ♂ of 33 mm. breadth; 35mm. length; 7mm. lateral spine, Selu Island 15/6/1964.

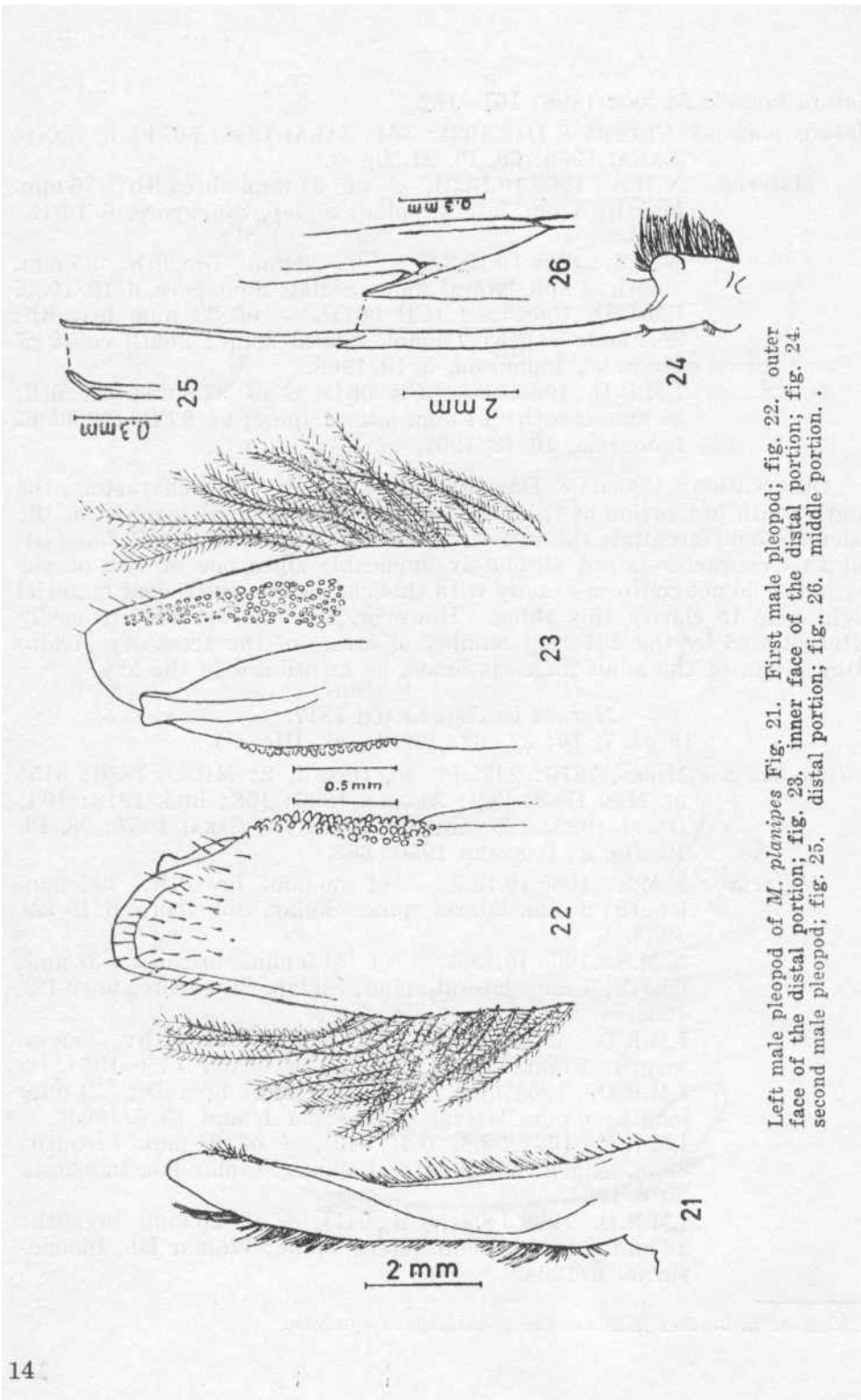
I.M.R.D. 1968.4.8.5, ♂ of 30mm. breadth; 31mm. length; 6mm. lateral spine, Selu Island 15/6/1964.

I.M.R.D. 1968.4.8.6. (CB 040), ♂ of 31mm. breadth; 33 m. length; 6 mm. lateral spine; Wamar Isl, Indonesia SO/6/1964.

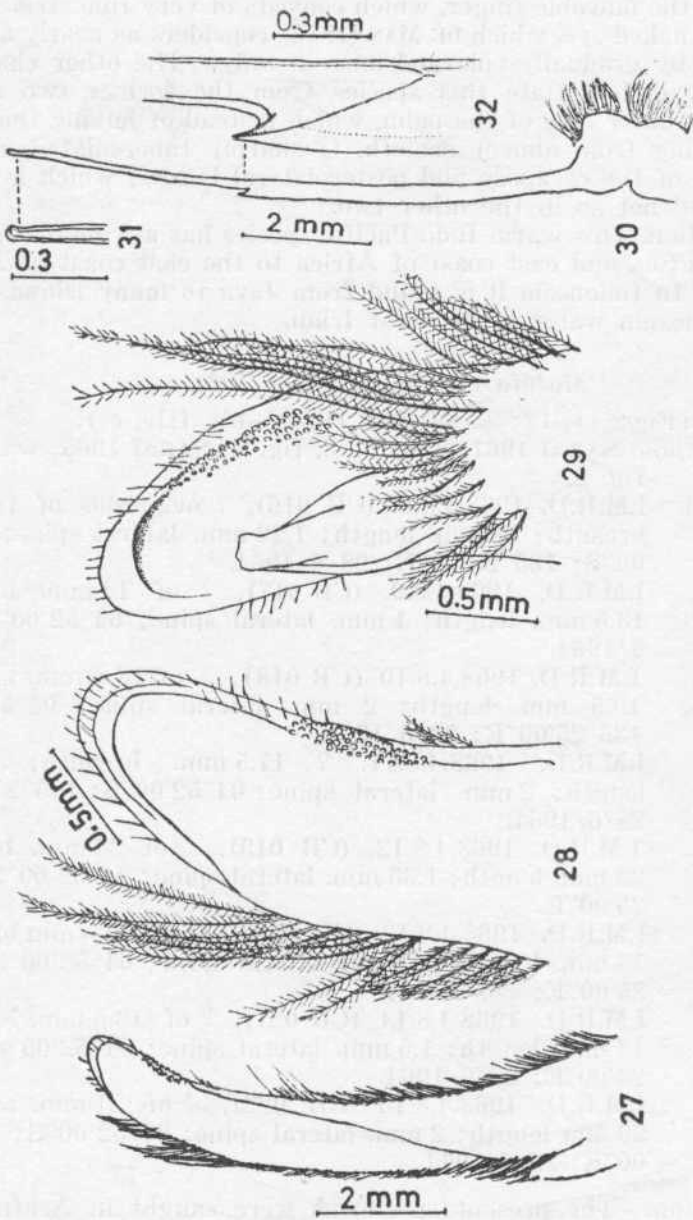
I.M.R.D. 1968.4.8.7. (CB 041), ♀ of 26mm. breadth; 28 mm. length; 6 mm. lateral spine; Wamar Isl., Indonesia 30/6/1964.

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1. Number in bracket indicates the re-catalogued specimen.



Left male pleopod of *M. planipes* Fig. 21. First male pleopod; fig. 22. outer face of the distal portion; fig. 23. inner face of the distal portion; fig. 24. second male pleopod; fig. 25. distal portion; fig. 26. middle portion. .



Left male pleopods of *M. banksii*. Fig. 27. First male pleopod; fig. 28. outer face of the distal portion; fig. 29. inner face of the distal portion; fig. 30. second male pleopod; fig. 25. distal portion; fig. 26. middle portion.

Observation. The adult male specimen of this species is easily recognizable by the structure of the accessory stridulating organ, on the outer face of the movable finger, which consists of very fine striae hardly visible to the naked eye, which DE MAN (1886) considers as nearly obsolete and followed by gradually enlarged ones distally. The other character which clearly differentiates this species from the former two are the texture of the outer face of the palm, which instead of having the fourth ridge (counting from above) smooth, is sharply tuberculated, and the tuberculation of the carapace and posterolateral border, which is always prominent and not so in the other two.

Distribution. This warm Indo-Pacific species has a wide distribution from the Red Sea and east coast of Africa to the east coast of Asia - ] to Polynesia. In Indonesia it is found from Java to many islands in the eastern Indonesian water up to West Irian.

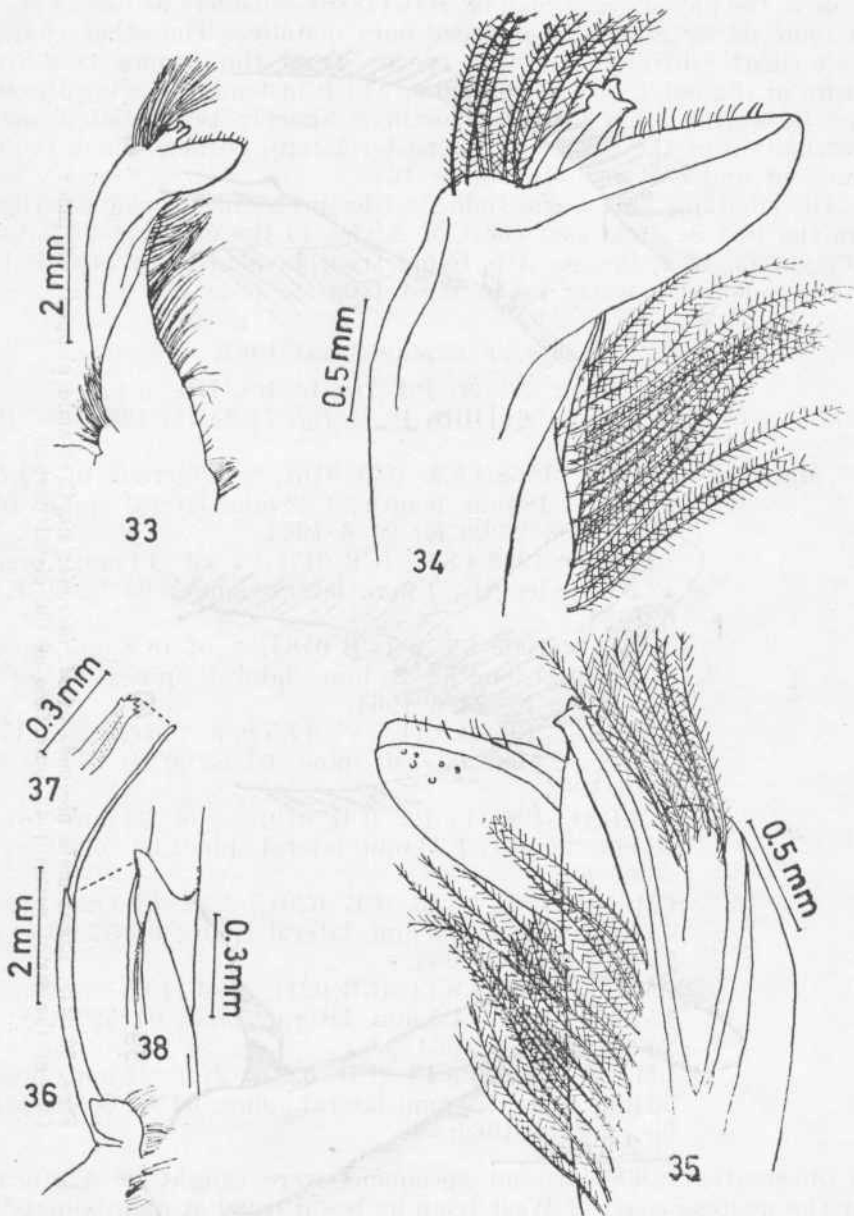
*Matuta curtispina* SAKAI 1961.

(Figs. 11, 12; 33-38; Pls. IIb, b<sup>1</sup> b<sup>11</sup>, Hie, e<sup>1</sup>).

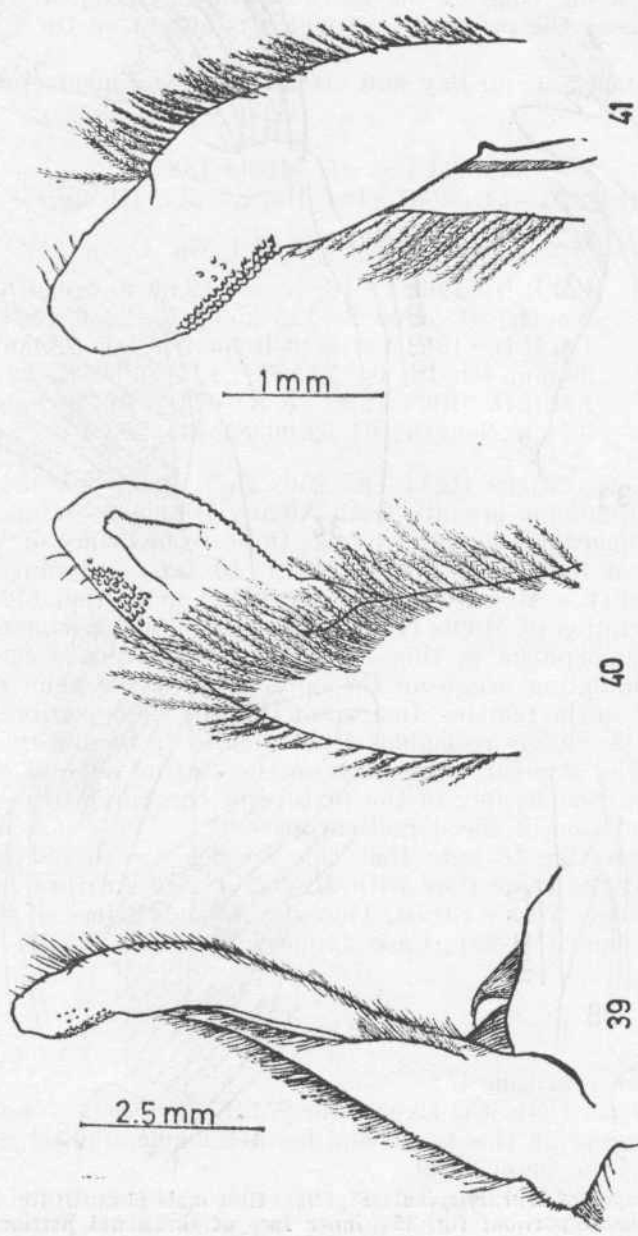
*Matuta curtispina* SAKAI 1961: 139, Pl. 3, fig. 7; SAKAI 1965: 60. Pl. 24 fig. 2.

- Material. I.M.R.D. 1968.4.8.8. (CB 016), ♀ ovigerous of 18.7 mm breadth; 18mm. length; 1.22mm. lateral spine; 04°52'00"S; 135°25'00"E; 28/6/1964.  
 I.M.R.D. 1968.4.8.9. (CB 017), ♀ of 14 mm. breadth 13.5mm. length; 1mm. lateral spine; 04°52'00"E; 28/6/1964.  
 I.M.R.D. 1968.4.8.10 (CB 018), ♂ of 18.8 mm. breadth 19.5 mm. length; 2 mm. lateral spine; 04°52'00"S 135°25'WE; 28/6/1964.  
 I.M.R.D. 1968.4.8.11. ♀ 17.5 mm. breadth; 17 mm length; 2mm. lateral spine; 04°52'00"S; 135°25'00"E 28/6/1964.  
 I.M.R.D. 1968.4.8.12. (CB 019), ♂ of 24 mm. breadth 23 mm. length; 1.33mm. lateral spine; 04°52'00"S; 135°25'WE.  
 I.M.R.D. 1968.4.8.13 (CB 020), ♂ of 14.5 mm breadth 13mm. length; 1.5mm. lateral spine; 04°52'00"S; 135°25'WE; 28/6/1964.  
 I.M.R.D. 1968.4.8.14 (CB 021), ♂ of 13.5 mm. breadth 13mm. length; 1.5mm. lateral spine; 04°52'00"S; 135°25'WE; 28/6/1964.  
 I.M.R.D. 1968.4.8.15 (CB 022), ♂ of 21 mm. breadth 20mm length; 2mm. lateral spine; 04°52'00"S; 135°25'00"E; 28/6/1964.

Observation. The present specimens were caught in Arafura Sea near the western coast of West Irian by beam trawl at approximately the same depth (70 m) with that of the type specimen from Japan and was a little smaller than the type.



Left male pleopod of *M. curtispina*. Fig. 33. first male pleopod; fig. 34. outer face of the distal portion; fig. 35. inner face of the distal portion; fig. 36. second male pleopod; fig. 37. distal portion; fig. 38. middle portion.



Figs. 39 - 41. Right male pleopods of *M. inermis*: 39, first male pleopod; 40, inner face of the distal portion; 41, outerface of the distal portion.



This species is characterized by the very small lateral spine and the presence of the accessory stridulating organ on the middle line of the outer face of the palm, instead of along the outer face of the movable finger. The cutting edge of the movable finger equipped with a molariform tooth near the proximal end which is absent on the former three species.

Distribution. Sagami Bay and off Mikawa Archiprefecture, Arafura Sea.

*Matuta inermis* MIERS 1884.  
(Figs. 13-14, 39-41; Pls. Ha, a<sup>1</sup>, a<sup>II</sup>; III d, d<sup>1</sup>).

*Matuta inermis* MIERS 1884: 256, PL XXVI, fig. C.

Material. I.M.R.D. 1968.4.8.16, S of 19mm. breadth; 19.5mm. length; 04°52'00"S; 135°25'00"E; 28/6/1964.

I.M.R.D. 1968.4.8.17 (CB 003), ♂ of 28 mm. breadth; 30mm. length; 04°52'WS; 135°25'00"E; 28/6/1964.

I.M.R.D. 1968.4.8.18 (CB 003), of 30mm. breadth; 32mm. length; 04°52'00"S; 135°25'00"E; 28/6/1964.

Observation. MIERS (1884, p. 256 - 257) describes one female of 21 mm. length, 20 mm. breadth from Albany Island, 3 - 4 fms; two small males from Thuerday Island, 3 - 4 fms; three from Prince of Wales channel, 7 fms. and four from Torres Strait, 10 fms. and four other with uncertain locality. All of them are deposited in British Museum.

The description of MIERS (1884) agrees with our specimens. But the presence of dimorphism in this species is not mentioned by him. The accessory stridulating organ on the outer face of the palm of the male does not exist on the female. Instead of this the ridge consists of 5 teeth.

This species closely resembles *M. curtispina* in having the very short lateral spine and a molariform tooth on the cutting edge of the movable finger, differs considerably in the texture of the outer face of the palm and the granulation of the dorsal carapace.

It is interesting to note that this species was found in the same locality and at the same time with *M. inermis*, in Arafura Sea.

Distribution. Torres Strait, Thursday Island, Prince of Wales Channel, Albany Island (MIERS) ; Cape Jaubert, 42 miles W.S.W. (RATHBUN) ; Arafura Sea.

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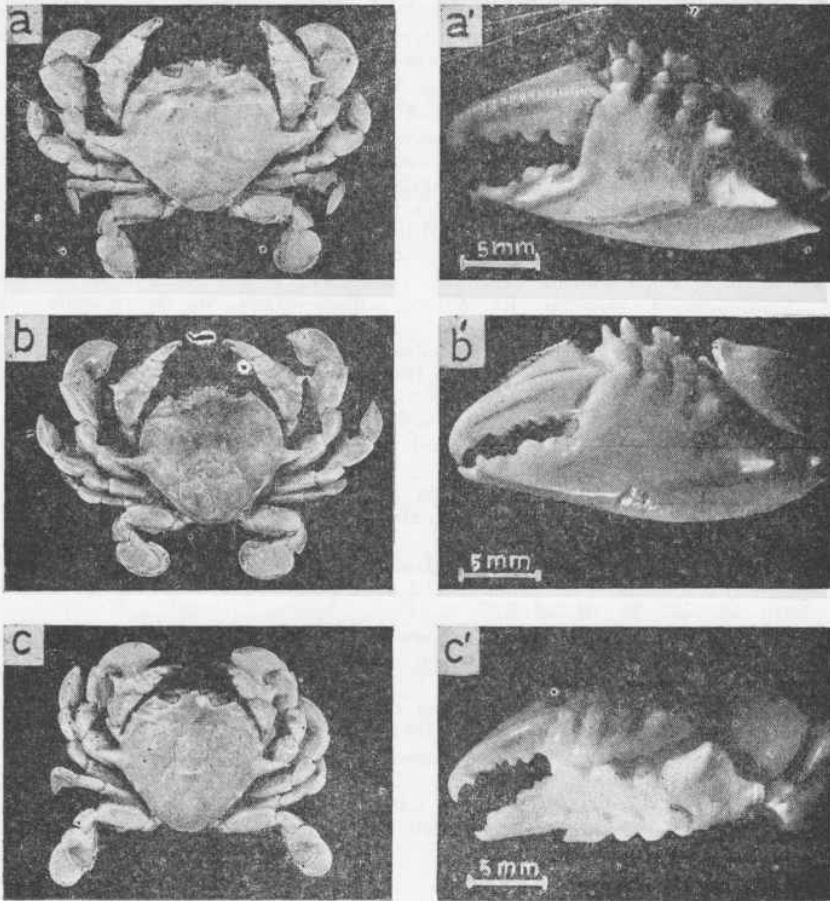


Plate I.

- a. *Matuta lunaris* (♂ of 40 mm. breadth, 38 mm. length).
- a' Outer face of hand and finger.
- b. *Matuta planipes* (♂ of 37 mm. breadth, 36 mm. length).
- b' Outer face of hand and finger.
- c. *Matuta banksii* (♂ of 36 mm. breadth, 36,5 mm. length).
- c' Outer face of hand and finger.

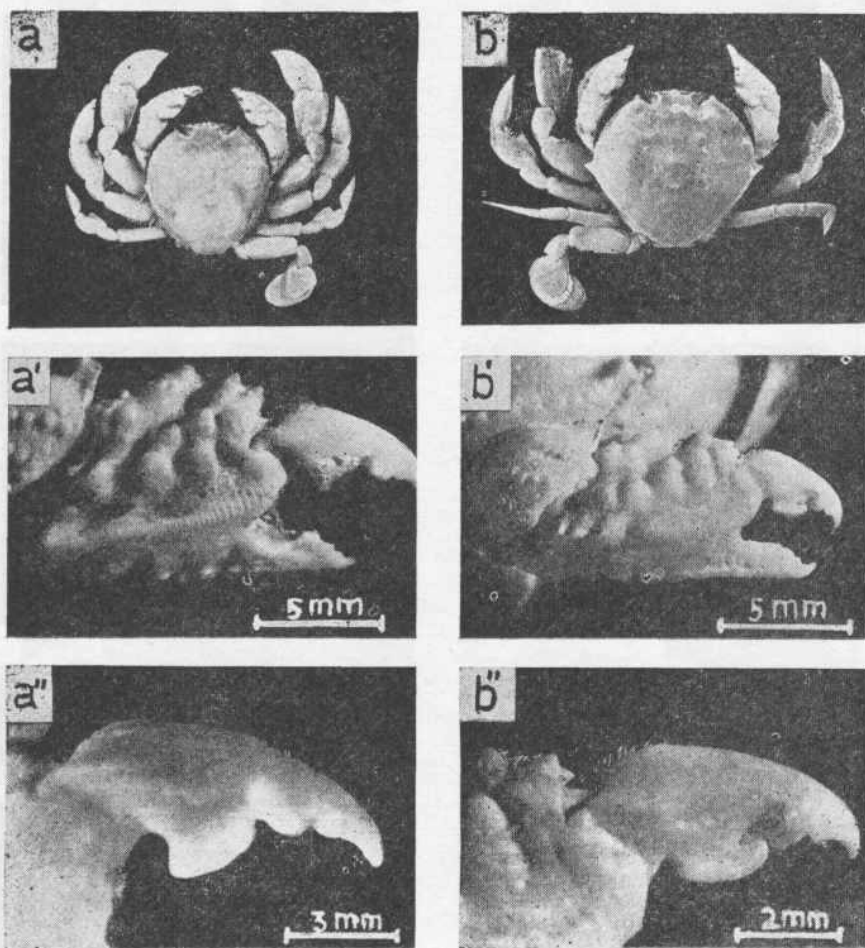


Plate II.

- a. *Matuta incermis* (♂ of 30 mm. breadth, 32 mm. length).  
 a' Outer face of hand and finger.  
 a'' Outer face of finger.  
 b. *Matuta curtispina*. (♂ of 24,5 mm. breadth, 32 mm. length).  
 b' Outer face of hand and finger.  
 b'' Outer face of finger.

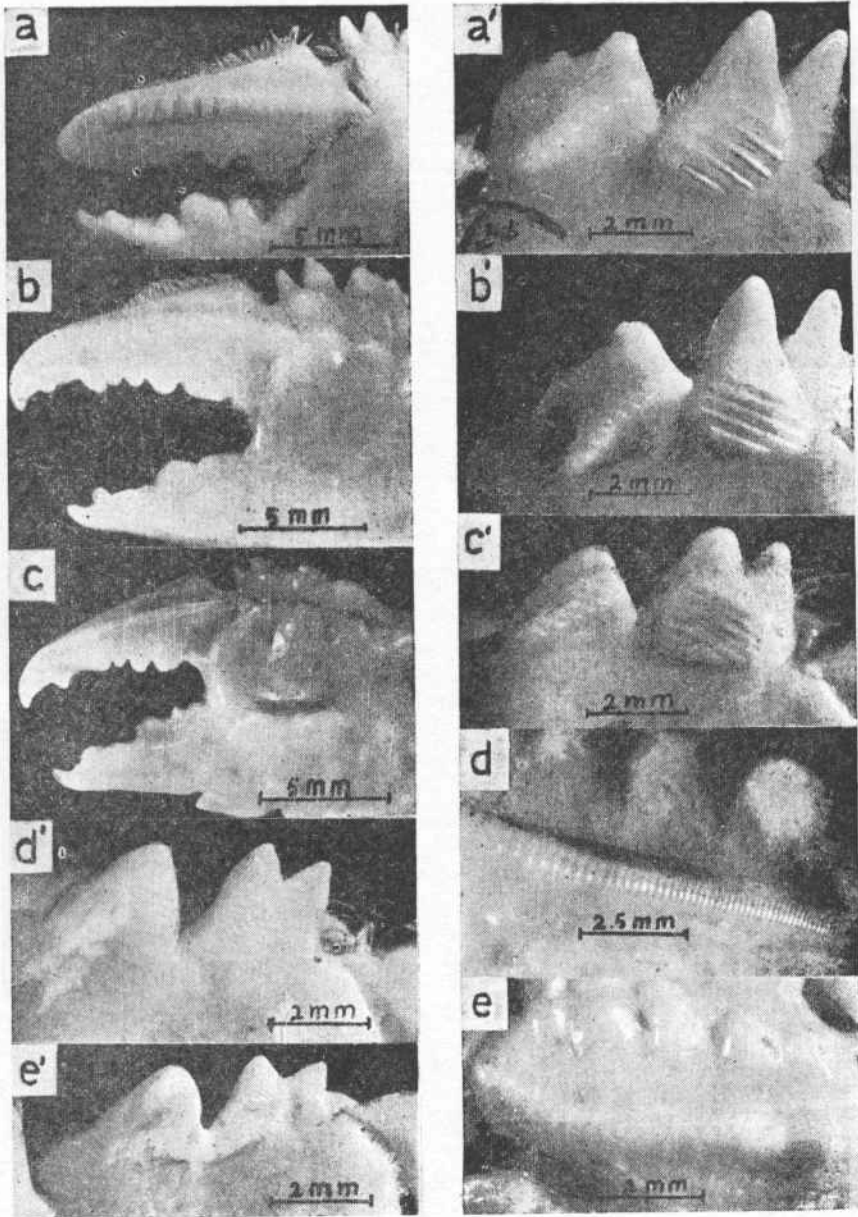


Plate III.

Accessory stridulating organs of:

a. *M. lunaris*, b. *M. planipes*, c. *M. banksii*, d. *M. inermis* and e. *M. curtispina*.

Stridulating organs of:

a'. *M. lunaris*, b'. *M. planipes*, c' *M. banksii*, d' *M. inermis* and e' *M. curtispina*.