

NEW INDO-PACIFIC GENERA ALLIED TO SESARMA SAY 1817
(BRACHYURA, DECAPODA, CRUSTACEA)

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NEW INDO-PACIFIC GENERA ALLIED TO *SESARMA* SAY 1817 (BRACHYURA, DECAPODA, CRUSTACEA)

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The genus *Sesarma* SAY *sensu largo* presently includes more than 100 Indo-Pacific species. The key of TESCH (1917) in many cases does not provide a satisfactory grouping of the species and it is hard to identify some. The new genera here briefly described are steps toward a revision under preparation of all the Indo-pacific species.

The revision is conducted in the National Museum of Singapore and mainly will refer to material of its collection; we thank first of all Mr. E. R. ALFRED, Acting Director of this Museum for his kind assistance. For specimens and photographs provided to us we express our gratitude to Drs. CAMPBELL, Brisbane Museum; CAPART, Brussell Museum; HOLT-HUIS, Leiden Museum; INGLE, British Museum; GRIFFIN, Australian Museum, Sydney; GUINOT, Paris Museum; KHRISNASWAMY, Indian Museum; DJAJASASMITA, Bogor Museum; MACNAE, Johannesburg; ROBERT, United States National Museum, Washington; TORTONESE, Torino Museum; SAKAI, Kamakura; WOLF, Copenhagen Museum.

Among the species included by TESCH (1917) into *Sesarma* (*Sesarma*) some were already separated by TWEEDIE (1950) into *Nanosesarma*. All the species included by TESCH (1917) into *Sesarma* (*Sesarma*) RATHBUN 1897 and *Sarmatium* DANA 1851 and other described since TESCH (1917) are included into thirteen genera, ten being new. Some of our genera are still heterogeneous and among them some are subdivided into subgenera. The positions of a few species are still uncertain.

In our new system, *Geosesarma* DE MAN 1892 amended with a new definition is a valid taxon and with *Chiromanthes* GISTEL 1848, *Holome-topus* H. MILNE EDWARDS 1865, *Parasesarma* DE MAN 1890 is moved at the generic level. Further those genera also will be revised. The genus *Sesarma* SAY 1817 *sensu stricto*, with reference to its type species: *S. reticulatum* (SAY 1817) an Atlantic American species, is not represented in the Indo-west pacific region.

The studied genera of the present paper are:

1. *Nanosesarma* TWEEDIE 1950. — 2. *Neosesarma* gen. nov. — 3. *Neoepisesarma* gen. nov. — 4. *Sarmatium* DANA 1851. — 5. *Neosarmatium* gen. nov. — 6. *Tiomanium* gen. nov. — 7. *Bresedium* gen. nov. — 8. *Pseudosesarma* gen. nov. — 9. *Sesarmops* gen. nov. — 10. *Labuanium* gen. nov. — 11. *Geosesarma* DE MAN 1892. — 12. *Sesarmoides* gen. nov. — 13. *Namlacium* gen. nov.

The numbers (1—13) given to those genera correspond to their position in the order of our key. The non-revised genera without receiving a number are included in our key in order to provide an overall figure of our new system, but their characters need to be improved. In regard to the previous system all revised genera have an antero-lateral tooth behind the external orbital angle. However, in some species (*Neosarmatium integrum*, *N. biroi*) and the genus *Namlacium* the tooth is obsolete, but those forms cannot be confused with *Holometopus*. In our key, the characters of chelipeds are always those of male. The pectinated crest when existing is made of chitinous process like the teeth of a comb and clearly distinct from the upper inner border of palm, which is sometimes a granular rim which does not have to be interpreted as a pectinated crest.

For the revised genera and subgenera the key is complemented by brief diagnosis and comments, followed by a list indicating the distribution of all the Indo-Pacific species into the genera and subgenera according to our revision. With the exception of *Namlacium crepidatum* the Type species of all genera and subgenera are illustrated.

Key for the separation of the Indo-Pacific genera and subgenera allied to *Sesarma* SAY 1817

- 1 — Antennal peduncle not excluded from orbit 2
- Antennal peduncle entirely excluded from orbit 21
- 2(1) — Merus of pereopods 4-5 with postero-lateral border denticulate or serrate; small species . 1 - *Nanosesarma* TWEEDIE 1950 3
- Merus of pereopods 4-5 without denticulation or serration on postero-lateral border 4
- 3(2) — Chelipeds with outer surface of palm entirely covered by a fur of hairs concealing lines of granules; postero-distal border

- of merus of pereopod 4 with short serration; male abdomen remarkably elongated
- **Nanosesarma (Nanosesarma) subgen. nov.**
- Cheliped with outer surface of palm smooth and naked or with only a limited patch of hairs; postero distal border of merus of pereopod 4 with 2-3 long acute spinules; male abdomen not remarkably elongated
- **Nanosesarma (Beamium) subgen. nov.**
- 4(2) — One or two antero-lateral tooth behind external orbital angle 5
- No antero-lateral tooth behind external orbital angle 20
- 5(4) — Upper surface of palm of male cheliped with pectinated crest 6
- Upper surface of palm of male cheliped without pectinated crest distinctly separated from inner upper margin or with a series of 4-7 transverse grooves separating transverse swollen wrinkles 10
- 6(5) — Upper surface of palm of cheliped with only one longitudinal pectinated crest clearly separated from upper inner margin of palm 7
- Upper surface of palm of cheliped with 2-3 transverse pectinated crests **Chiromanthes** GISTEL 1848
- 7(6) — Anterior frontal margin nearly straight (without well marked median concavity). Postfrontal lobe few salient; frontal breadth much more than half extraorbital breadth. Anterior border of merus of cheliped with a feeble subdistal granular convexity 2 - **Neosesarma gen. nov.**
- Anterior frontal margin with a strongly marked median concavity; postfrontal lobe strongly salient; frontal breadth few more than half extraorbital breadth. Anterior border of merus of cheliped with subdistal triangular process, distally denticulate 3 - **Neopisesarma gen. nov.**
- 8
- 8(7) — Dactyli of pereopods 2-5 remarkably short, clearly less than half length of propodi; pectinated crest of palm strongly salient and proximally replaced by a nearly smooth salient rim; transverse dactylar tubercles not swollen. Vertical gra-

- nular crest on inner surface of palm of cheliped faintly indicated **Neopisesarma (Selatium) subgen. nov.**
- Dactyli of pereopods 2-5 few shorter than (nearly as long as) propodi. Vertical granular crest on inner surface of palm of cheliped strongly salient 9
- 9(8) — On palm low pectinated crest continuous from stem to stern; numerous transverse broader than long swollen dactylar tubercles closely fitted together as a continuous rim
. **Neopisesarma (Neopisesarma) subgen. nov.**
- High pectinated crest limited to median part, proximally and distally continued by a smooth rim; dactylar tubercles not swollen somewhat longitudinally elongated and conical, widely separated from one another; a longitudinal groove in interspace of tubercles
. **Neopisesarma (Muradium) subgen. nov.**
- 10(5) — Antennular basal segment very few or not at all swollen and always at least twice as broad as long. Pereopods 2-5 not remarkably long and narrow; merus with anterior and posterior border at least slightly convex 11
- Basal segment of antennulae swollen and very few broader than long. Pereopods 2-5 remarkably long and narrow; merus with anterior and posterior border generally subparallel, if not like some species of **Geosesarma**, they are small species 17
- 11(10) — Carapace dorsally strongly convex from stem to stern . . 12
- Carapace dorsally somewhat flattened, never very convex from stem to stern 14
- 12(11) — Upper surface of palm of cheliped with 4-7 transverse grooves separating swollen wrinkles, of which some are fringed by pectinated ridges 4 - **Sarmatium** DANA 1851
- Upper surface of palm of cheliped without transverse grooves or wrinkles 13
- 13(12) — Palm of cheliped with upper surface somewhat flattened and limited outside by a longitudinal smooth wrinkle, sometimes only faintly indicated; inner surface with salient vertical granular crest. Inner upper margin never ended by a long distal spine; carpus with not remarkably long and acute inner

- angle. Male abdomen with telson generally remarkably elongated 5 - **Neosarmatium** *gen. nov.*
- Palm of cheliped with upper surface not flattened and outside without indication of longitudinal wrinkle; inner surface of palm without granular crest; upper inner margin ended by a long distal spine. Carpus with long and acute inner angle. Male abdomen with telson not remarkably elongated 6 - **Tiomanium** *gen. nov.*
- 14(11) — Anterior margin of front straight without marked median concavity; antero-lateral tooth feably marked; carapace remarkably broad. Inner surface of palm of cheliped granular on median part but without defined granular vertical crest **Sesarma** SAY 1817
- Anterior margin of front with generally a well marked median concavity; if feable, antero-lateral teeth well marked. Carapace few broader than long. Inner surface of palm of cheliped with a vertical row of granules reaching the upper inner margin of palm 15
- 15(14) — Male abdomen with telson deeply inserted into distal border of segment 6. Male pleopod with its distal part as an elongated slim process 7 - **Bresedium** *gen. nov.*
- Male abdomen with telson very few or not at all inserted into distal border of segment 6. Male pleopod with short chitinous apical process as habitual in Sesarminae 16
- 16(15) — Middle-sized species. Carapace a few shorter than extraorbital breadth. Anterior frontal margin with feable median concavity. Postfrontal lobes not remarkably salient. Dorsal surface of carapace slightly convex from side to side and from stem to stern. Lateral border of carapace very few or not divergent backward 8 - **Pseudosesarma** *gen. nov.*
- Large species. Carapace as long or longer than extraorbital breadth. Anterior frontal margin with marked median concavity. Postfrontal lobes generally remarkably salient. Dorsal surface of carapace somewhat flattened. Lateral border of carapace clearly divergent backward. Third maxilliped with ischium 1.72 as long as broad. Dactyli of pereopods 2-5 slim and nearly as long as propodi 9 - **Sesarmops** *gen. nov.*

- 17(10) — Front breadth at least subequal to breadth of posterior border of carapace 18
- Front breadth clearly shorter than breadth of posterior border of carapace 19
- 18(17) — Large species; postfrontal lobes anteriorly strongly acute. Carapace with lateral border at least slightly convex, not diverging backward; pereopods 2-5 with anterior and posterior border of merus subparallel. Dactyli generally clearly shorter than propodi. Male abdomen narrow and elongate 10 - **Labuanium** *gen. nov.*
- Small species; postfrontal lobes anteriorly less acute; carapace with lateral border straight or slightly concave and diverging backwards; pereopods 2-5 with anterior and posterior border of merus slightly convex, dactyli slim and nearly as long as propodi. Male abdomen broad 11 - **Geosesarma** DE MAN 1892 *comb. nov.*
- 19(17) — Lateral border of carapace strongly divergent backwards, straight or a few concave; dactyli of pereopods 2-5 slim and nearly as long as propodi 12 - **Sesarmoides** *gen. nov.*
- Lateral border of carapace convergent backward, strongly convex; dactyli of pereopods 2-5 very short nearly one third of length of propodi. 13 - **Namlacium** *gen. nov.*
- 20(4) — Palm of cheliped without or with a single longitudinal pectinated crest. **Holometopus** H. MILNE EDWARDS 1865
- Palm of cheliped with 2-3 transverse pectinated crests **Parasesarma** DE MAN 1890
- 21(1) — No antero-lateral tooth on border of carapace **Metasesarma** H. MILNE EDWARDS 1853
- Antero-lateral teeth on border of carapace **Clistocoeloma** A. MILNE EDWARDS 1873

Sesarma SAY 1817

Sesarma SAY 1817 is used *s. stricto* with *Sesarma reticulatum* (SAY 1817) as Type species. The subgenus *Sesarma* (*Sesarma*) used by TESCH (1917) is a composite taxon of several distinct genera. Our separation of

genera and subgenera refer to the examination of specimens of all (save few exceptions) revised Indo-Pacific species with a special attention to the Type species. Apart from those for the illustrated specimens, the data on the examined specimens are not given in the present note.

Not a single Indo-West Pacific species of *Sesarma* (*Sesarma*) RATHBUN 1897 has a carapace as broad as *S. reticulatum* which has a carapace 1.27 broader than long; none is congeneric with *S. reticulatum*.

1 - *Nanosesarma* TWEEDIE 1950

Type species: *Sesarma minutum* DE MAN 1887.

The genus is subdivided into two subgenera: *Nanosesarma* and *Beanium*.

Nanosesarma (*Nanosesarma*) subgen. nov.

Diagnosis. — Carapace and appendages densely covered by hairs. Male cheliped with: a) upper surface of palm without pectinated crest. — b) outer surface of palm entirely covered by hairs concealing lines of granules. — c) dactylus with upper border smooth (*minutum*) or ornamented by a row of numerous (more than 50) very fine transverse striae. Antero-lateral tooth clearly marked. Merus of pereopods 2 - 5 with distal postero-lateral border armed by short denticles. Telson of male abdomen elongated.

Type species: *Nanosesarma minutum* (DE MAN 1887). Surely *S. jousseaumei* NOBILI 1906 and probably *gordoni* SHEN 1935 are synonyms of *minutum*. Not without hesitation we also include *pontianacensis* DE MAN 1893 in the subgenus. In spite of being with a postero-lateral border finely serratulate, the merus of the pereopods 2 - 5 does not correspond to the genus as defined by TWEEDIE (1950). The shape of the carapace also strongly differs from that of *minutum* and at first view the two species can hardly be considered as congeneric. However, they are closer to one another than to any other species of *Nanosesarma*. The presence on the two species of a strong acute granule on the outer side of the proximal part of the dactylus of cheliped, a long telson on male abdomen support their close relation.

NOBILI (1906) noticed the relation between *jousseaumei* (= *minutum*) and *pontianacensis*. *Sesarma pontianacensis* DE MAN 1893 was described

for a female; *Nanosesarma tweediei* SERENE 1967 corresponds to the male of *pontianacensis* and is its synonym. The two species are marine and have the same habitat.

Nanosesarma (*Beanium*) subgen. nov.

Diagnosis. — The subgenus differs from *N.* (*Nanosesarma*) by: 1) On male cheliped: a) upper surface of palm with at least one oblique pectinated crest. — b) Outer surface of palm smooth and bare or only partly covered by an hairy patch around cutting edges of fingers. — c) Dactylus with upper border ornamented by a regular row of (10 - 20) somewhat swollen transverse tubercles. — 2) Antero-lateral tooth not marked (sometimes indicated on *batavicum* and *edamensis*). — 3) Merus of pereopods 2 - 5 with distal postero-lateral border armed with some 2 - 3 long spinules. — 4) Telson of male abdomen not remarkably elongated.

Type species: *Nanosesarma batavicum* (MOREIRA 1903).

Other species: *edamensis* (DE MAN 1887), *andersoni* (DE MAN 1887), *nunongi* (TWEEDIE 1950). The situation of *Nanosesarma vestitum* (STIMPSON 1858) is uncertain as *N.* (*Beanium*) or *N.* (*Nanosesarma*).

2 - *Neosesarma* gen. nov.

Diagnosis. — The genus differs from *Sesarma* by: 1) On male cheliped: a) a row of regular dactylar tubercles. — b) on upper part of palm a longitudinal pectinated crest separated from the inner margin. — c) antero-lateral tooth acute and separated by a deep sulcus from the external orbital angle and a second smaller tooth clearly marked.

It differs from *Neoepisesarma* by: 1) On male cheliped: a) a row of conical dactylar tubercles instead of transverse ones on *Neoepisesarma*. — b) inner surface of palm with nearly obsolete row of granules. — c) anterior border of merus with a subdistal convexity instead of a triangular dentate process. — 2) Carapace less high. — 3) Anterior margin of front nearly straight and postfrontal lobes feable. — 4) Frontal breadth much more than half the extraorbital breadth instead of being few broader on *Neoepisesarma*.

Type species: *Sesarma gemmiferum* TWEEDIE 1936.

The genus includes *gemmiferum* (TWEEDIE 1936) and *rectipectinatum*

(TWEEDIE 1950). The first strongly differs from the second at least by its covering of setae all over the carapace and legs as well as by the shape of the dactylar tubercles. However several characters lead to consider that they are congeneric.

The genus *Neosesarma* and specially *N. rectipectinatum* is closer to *Sesarma* s.s. than to any other genus by the broad front with its anterior margin nearly straight, the postfrontal lobe few salient, the rounded subdistal process of the anterior border of merus of cheliped. However it differs at least by the presence of a pectinated crest on palm of male cheliped and antero-lateral teeth strongly marked.

Sesarma laevis A. MILNE EDWARDS 1869 and *Sesarma acquifrons* RATHBUN 1914 are provisionally included in *Neosesarma* referring to their close relation with *rectipectinatum* mainly in regard to the shape of the front and aspect of the carapace. The two species are clearly distinct and differs from the genus by the absence of pectinated crest on palm of the male cheliped. The character is not certain on *laevis*, a species only known by the Type specimen, which is a female.

3 - *Neoeprisesarma* gen. nov.

Diagnosis. — The genus differs from *Sesarma* by: 1) On male cheliped: a) a row of numerous regular transverse dactylar tubercle conspicuously shaped instead of a row of 7—9 depressed spinules in *Sesarma*. — b) a longitudinal pectinated crest on upper part of palm running parallel to the margin instead of a granulated line not distinct from the margin in *Sesarma*. — c) anterior border of merus with subdistal triangular dentate process instead of a granular subdistal convexity on *Sesarma*. — 2) Narrower carapace (less than 1.2 broader than long) and narrower front (its length at most very few more than half extraorbital breadth). — 3) Antero-lateral tooth behind the external orbital angle marked instead of being only indicated in *Sesarma*.

Type species: *Sesarma mederi* H. MILNE EDWARDS 1853.

Discussion. — The new genus generally corresponds to the Indo-Pacific species of *Sesarma* which were included by DE MAN (1887) in his group A and (or) in *Episesarma* by DE MAN (1895-97); in some ways it is an extension of the concept of the *taeniolata* (= *mederi*) group defined by TWEEDIE (1936).

The unsufficient definition of *Episesarma* by DE MAN (1895-97,

p. 165): margin of carapace with one or two "flattened"? epibranchial teeth, chela of male without two parallel pectinate crests, does not differ from that of *Sesarma* SAY 1817. RATHBUN (1909) rightly gave priority to the name of SAY. DE MAN (1897) failed to designate a type species for *Episesarma*. DE MAN (1887) seems to indicate that he considers *S. tetragonum* (FABRICIUS) as type for his group A, but DE MAN (1897) does not mention *tetragonum* among the species of *Episesarma*; the designation of *tetragonum* as type for *Episesarma* by RATHBUN (1918, p. 284) cannot be accepted.

However *tetragonum* is not a typical form of *Neoepisesarma* and justify the establishment of a new subgenus. Under the name *taeniolata*, *mederi* is included by DE MAN (1895) in *Episesarma* and is here designated as type species for *Neoepisesarma* and the subgenus *Neoepisesarma* (*Neoepisesarma*). But not all the species referred to *Episesarma* by DE MAN (1895) belong to *Neoepisesarma*. It is the case for example of *impressum* and *meinerti*. The specimens of *meinerti* recorded by DE MAN (1895) were further corrected as *Sarmatium rotundifrons* by DE MAN (1929). Such a confusion indicates that our concept of *Neoepisesarma* differs from that of DE MAN (1895) for *Episesarma*.

The genus is subdivided into three subgenera: *Neoepisesarma*, *Muradium*, *Selatium*.

***Neoepisesarma* (*Neoepisesarma*) subgen. nov.**

Diagnosis. — On male cheliped, pectinated crest of palm low and continuous from proximal to distal margin of palm. Transverse dactylar tubercles swollen closely arranged together in a continuous rim and with above transverse sulci. Carapace nearly quadrangular, dorsally flattened.

Type species: *Neoepisesarma* (*Neoepisesarma*) *mederi* (H. MILNE EDWARDS 1853).

The subgenus corresponds to the *mederi* group of TWEEDIE (1936) and includes *mederi* (H. MILNE EDWARDS 1853), *chentongensis* (SERENE and SOH 1967), *lafondi* (JACQUINOT and LUCAS 1853), *singaporensis* (TWEEDIE 1936), *versicolor* (TWEEDIE 1940), *palawanensis* (RATHBUN 1914).

***Neoepisesarma* (*Muradium*) subgen. nov.**

Diagnosis. — The subgenus differs from *N.* (*Neoepisesarma*) by: 1) On male cheliped: a) The pectinated crest high but limited to the median

part being proximally and distally continued by a smooth rim. — b) The dactylar tubercles not swollen, neither transverse but longitudinal, triangular and clearly separated from one another; a longitudinal sulcus runs between them.

Type species: *Neoepisesarma (Muradium) tetragonum* (FABRICIUS 1798) which is the single species of the subgenus.

***Neoepisesarma (Selatium)* subgen. nov.**

Diagnosis. — The subgenus differs from:

- A — *Neoepisesarma (Neoepisesarma)* by: 1) On male cheliped: a) the pectinated crest of palm high but proximally replaced by a smooth rim. — b) the transverse dactylar tubercles not swollen, well separated from one another, without transverse sulci above.
- B — *Neoepisesarma (Muradium)* by: 1) On male cheliped: a) the pectinated crest of palm distally reaching the anterior margin of palm. — b) the dactylar tubercles transverse.
- C — The other two subgenera by: a) the dactyli of pereopods 2 - 5 remarkably short. — b) the inner surface of palm of cheliped without marked vertical granular crest.

Type species: *Neoepisesarma (Selatium) brocki* (DE MAN 1887).

4 - *Sarmatium* DANA 1851 s. restr.

Diagnosis. — The genus differs from *Sesarma* by: 1) the dorsal surface of carapace strongly convex from stem to stern. — 2) the presence of a series of transverse grooves separating swollen wrinkles occupying entirely the upper surface of palm of male cheliped.

Type species: *Sarmatium crassum* DANA 1851.

The genus includes another species *germaini* (A. MILNE EDWARDS 1868).

5 - *Neosarmatium* gen. nov.

Diagnosis. — The genus differs from *Sarmatium* by: 1) On male cheliped, the absence of the series of grooves and ridges which ornament the upper part of the palm on *Sarmatium*. — 2) Median notch of epistome

nearly obsolete, antennular septum broader. — 3) third maxilliped ischium and merus broader.

The genus differs from the relatively close genus *Neoepisesarma* by: 1) On male cheliped: a) small number of acute triangular dactylar tubercles. — b) no longitudinal pectinated crest on the palm. — c) anterior border of merus with convex granular subdistal process. — 2) Carapace dorsally more convex from stem to stern.

Type species: *Sesarma smithi* H. MILNE EDWARDS 1853.

The genus includes *integrum* (A. MILNE EDWARDS 1873), *inermis* (DE MAN 1887), *indicum* (A. MILNE EDWARDS 1868), *indicum malabarium* (HENDERSON 1893), *smithi* (H. MILNE EDWARDS 1853), *punctatum* (A. MILNE EDWARDS 1873), *meinerti* (DE MAN 1887), *rotundifrons* (A. MILNE EDWARDS 1868), *biroi* (NOBILI 1905).

The Indo-pacific species described as *Metagrapsus indicus* by A. MILNE EDWARDS (1868), *integer* and *punctatus* by A. MILNE EDWARDS (1873), and previously moved into *Sarmatium* differ from *Metagrapsus* H. MILNE EDWARDS 1853, a genus which is distinct from *Sarmatium* as well as from *Neosarmatium*. With two atlantic species *curvatus* H. MILNE EDWARDS 1837 and *pectinatus* H. MILNE EDWARDS 1853, *Metagrapsus* differs from *Neosarmatium* by: 1) On upper outer surface of palm on male cheliped, a longitudinal pectinated ridge which is only represented by a smooth swollen ridge on *Neosarmatium*, but not clearly defined on some species. — 2) Above the dactylus the presence of transverse oblique rugose ridges and just outside a longitudinal, milled ridge instead of the dactylar tubercles of *Neosarmatium*.

6 - *Tiomanum* gen. nov.

Diagnosis. — The genus differs from *Neoepisesarma* by: 1) On male cheliped: a) dactylus with a row of 11-12 acute triangular tubercles. — b) no longitudinal pectinated crest on upper border of palm which is marked by a granular rim. — c) no defined row of granules on inner surface of palm. — d) anterior border of merus acutely granular but without marked triangular subdistal process. — 3) Carapace dorsally more convex from stem to stern.

Type species: *Sesarma indicum* H. MILNE EDWARDS 1837.

The genus is close to *Neosarmatium* but differs by: a) The palm with its upper inner margin ending by a spine, 3 - 4 feeble oblique granular lines on upper outer region without indication of a longitudinal swollen

rim. On *Neosarmatium* the inner margin is always marked by a continuous longitudinal granular line and the outer region marked by a swollen rim more or less developed. — b) the inner angle of carpus as an acute somewhat long spine, which is never such on *Neosarmatium*. — 2) The antenna segment 2 very short at least on its axis and with its inner border far to reach the frontal border (it reaches the frontal border on *Neosarmatium*). — 3) The orbital hiatus narrower and antennal peduncle not reaching the orbital cavity (it reaches the orbital cavity in *Neosarmatium*). — 4) The male telson shorter.

It differs from *Sesarma* by its carapace dorsally convex and its antero-lateral teeth well marked as well by numerous other characters.

7 - *Bresedium* gen. nov.

Diagnosis. — The new genus differs from all genera related to *Sesarma* SAY by the type of its male abdomen and pleopod as mentioned in our key.

Type species: *Sesarma brevipes* DE MAN 1899.

The genus includes *brevipes* (DE MAN 1899) and *sedilensis* (TWEEDIE 1950) and probably *edwarsi philippinensis* RATHBUN 1914. It is close to *Pseudosesarma* and *Sesarmops* and the three genera form a homogeneous group by several common characters.

Among the species aff. to *Sesarma*, only *Geosesarma solomonensis* SERENE 1968 has a male pleopod in some ways close to the type of *Bresedium*, but still it is different and by several characters the species belongs to *Geosesarma*.

8 - *Pseudosesarma* gen. nov.

Diagnosis. — The new genus differs from *Sesarma* by: 1) The frontal anterior margin with a shallow but marked median concavity. — 2) The anterior border of cheliped with a subdistal triangular process. — 3) The gastric and cardiac region well delimited by a groove. — 4) The antero-lateral tooth well marked. — 5) The carapace few shorter than the breadth between external orbital angle.

Type species: *Sesarma edwarsi* DE MAN 1887.

Pseudosesarma corresponds to the species of the *edwarsi* group and a part of the *intermedium* group. The first group includes *edwarsi* DE MAN 1887, *edwarsi* var. *crassimanum* DE MAN 1887, *edwarsi* var. *brevipes* DE

MAN 1889, *edwarsi* var. *laevimanum* ZEHTNER 1894, *edwarsi* var. *philippinensis* RATHBUN 1914. The second includes *intermedium*, *sinensis*, *moeschi*, *johorensis*. TESCH (1917) mentions in a footnote the varieties of *edwarsi* but does not include them in his key. TWEEDIE (1940) considers *crassimanum* as a distinct species, and adds a new species: *sedilensis*.

The two species *brevipes* and *sedilensis* belong to *Bresedium* and *philippinensis* described with a male abdomen of the same type but unknown pleopod is included by us in the genus, being closer to *brevipes* than to *edwarsi*.

DE MAN (1887) situates *edwarsi* and *crassimanum* as close to *intermedium* and *sinensis*. Further DE MAN (1892) establishes his *intermedium* specimen of 1887 as a different species (*moeschi*); the characters given by DE MAN (1887) to separate *edwarsi*, *crassimanum* from *intermedium* are valid for *moeschi* not *intermedium*. To the group *edwarsi* we add *bocourti*, *modestum*.

The typical *edwarsi* group has at inner angle of carpus of cheliped an acute flattened process which is much less developed on the *moeschi* group.

We include into *Pseudosesarma*: *bocourti* (A. MILNE EDWARDS 1868), *edwarsi* (DE MAN 1887), *edwarsi laevimanum* (ZEHTNER 1894), *crassimanum* (DE MAN 1887), *modestum* (DE MAN 1902), *moeschi* (DE MAN 1892), *johorensis* (TWEEDIE 1940).

The genus has several characters close to those of *Sesarmops* and the separation of the two genera need to be improved. As it is *Pseudosesarma* is still heterogeneous. Perhaps a new genus would have to be established giving priority to the shape of the male pleopod and grouping *bocourti* with the species of *Sesarmops* which, like *intermedium* have the same type of male pleopod. The species *moeschi* and *johorensis* with their smooth shining carapace and other characters are also a few aberrant into *Pseudosesarma*.

9 - *Sesarmops* gen. nov.

Diagnosis. — The genus differs from *Sesarma* by: 1) the anterior frontal border with a deep median concavity. — 2) the postfrontal lobe strongly marked. — 3) the antero-lateral tooth acute and separated by a clear sulcus from external orbital angle. — 4) the gastric and cardiac region well delimited. — 5) the carapace as long or longer than the breadth between external orbital angles.

Type species: *Sesarma impressum* H. MILNE EDWARDS 1837.

The genus includes: *impressum* (H. MILNE EDWARDS 1837), *atrorbens* (HESS 1865), *mindanaoensis* RATHBUN 1915, *weberi* (DE MAN 1892), *intermedium* (DE HAAN 1835), *sinensis* (H. MILNE EDWARDS 1853).

As mentioned before, the genus is close to *Pseudosesarma*. If priority is given to the shape of the male pleopod *intermedium*, *sinensis* can hardly be considered as congeneric with *impressum*. However, the type of the male pleopod of *weberi* is identical with that of *intermedium* and the fact that DE MAN (1902) considered *intermedium* as a synonym of *impressum* is at least an indication to support the present position.

S. sinensis by its carapace clearly shorter than breadth between the external orbital angles and with lateral border nearly parallel seem to be aberrant in the genus. At least by the ornamentation of the dactylus of male cheliped *weberi* is somewhat aberrant into *Sesarmops*.

Mainly by the salient postfrontal lobes and also by some other characters, *Sesarmops* is close to *Labuanium* from which it differs by: 1) The antennular peduncle comparatively less swollen and postfrontal lobe less salient. — 2) The lateral border of carapace more divergent and always a few concave instead to be convex on *Labuanium*. — 3) The ischium of third maxilliped comparatively a few broader. — 4) The shape of the male cheliped. On *Sesarmops* (like on *Pseudosesarma*) the cutting edge of the fixed finger form a continuous straight line with the distal border of propodus occupied by the articulation with the dactylus, instead of making an obtuse angle on *Labuanium*. — 5) The male abdomen broader and male pleopod different. — 6) The merus of pereopods 2 - 5 less narrow with anterior and posterior border at least slightly convex instead to be subparallel on *Labuanium*. — 7) On pereopods 2 - 5, the dactyli slim and mainly as long as propodi instead to be generally broader and clearly shorter on *Labuanium*.

10 - *Labuanium* gen. nov.

Diagnosis. — The genus differs from *Sesarma* by: 1) The antennular basal segment strongly swollen and the antennular fossae nearly circular (1.59 times as broad as long). — 2) The antennae nearly longitudinal. — 3) The lateral border of carapace at least slightly convex. — 4) The male abdomen narrow. — 5) The dactyli of pereopods 2 - 5 clearly shorter than propodi.

Type species: *Sesarma politum* DE MAN 1887.

The genus includes *politum* (DE MAN 1887), *demani* (BURGER 1893),

cruciatum (BURGER 1893), *rotundatum* (HESS 1865), *gracilipes* (H. MILNE EDWARDS 1853), *finni* (ALCOCK 1900) and *trapezoideum* H. MILNE EDWARDS 1837.

The genus close to *Geosesarma* and *Sesarmoides* by its antennular-antennal disposition, clearly differs from the two by the shape of its salient post-frontal lobe and carapace; its male abdomen and pleopod are also different; its ischium of third maxilliped is comparatively narrower. As already mentioned mainly its separation from *Sesarmops* need to be improved.

The genus is heterogeneous with two different groups of species which perhaps further would have to be separated under a new subgenus or genus.

The group 1 with *politum*, *demani*, *cruciatum*, *rotundatum*, is characterized by the elongate shape of the male abdomen, a similar type of male pleopod, and short dactyli on pereopods 2 - 5 (no specimen of *cruciatum* was examined).

The group 2 with *gracilipes*, *finni* and *trapezoideum* is characterized by a male pleopod a few different, a row of transverse tubercles on the dactyli of the male cheliped and the dactyli of pereopods 2 - 5 comparatively slimmer and longer. However, the male abdomen of *gracilipes* and *finni* are broader but that of *trapezoideum* is elongate like those of the species of the group 1.

Some characters of *gracilipes* and *finni*, but not of *trapezoideum* are close to *Geosesarma* which still is a heterogeneous genus.

11 - *Geosesarma* DE MAN 1892 comb. nov.

Diagnosis. — The genus differs from *Sesarma* by: 1) the basal antennular segment swollen and globular; antennal peduncle nearly longitudinal.

Type species: *Sesarma* (*Geosesarma*) *noduliferum* DE MAN 1892.

DE MAN (1892) established *Geosesarma* for two species *noduliferum* and *sylvicolum*, small forms with a terrestrial habitat and female bearing a few (less than 50) large eggs. The definition of the genus was controverted by DE MAN (1902) himself. With reference to our new definition are included into *Geosesarma* the following species *amphinome* DE MAN 1899, *celebensis* SCHENKEL 1902, *peracca* NOBILI 1903, *johnsoni* SERENE 1968, *sylvicolum* DE MAN 1892, *sylvicolum gordonae* SERENE 1968, *vicentensis* RATHBUN 1914, *maculatum* DE MAN 1892, *solomonensis* SERENE

1968, *ternatensis* SERENE 1968, *sarawakensis* SERENE 1968, *clavicuris* SCHENKEL 1902, *rathbunae* SERENE 1968, *foxi* KEMP 1918, *thelxinoe* DE MAN 1908, *penangensis* TWEEDIE 1940, *rouxi* SERENE 1968, *noduliferum* DE MAN 1892, *leprosum* SCHENKEL 1902, *araneum* NOBILI 1899, *angustifrons* A. MILNE EDWARDS 1879, *ocypodum* NOBILI 1899, *gracillimum* DE MAN 1902.

The species generally belongs to the section 20 - 31 of the key of TESCH (1917) and two to his section 40; the others were described since TESCH (1917). Among the 23 species, at least 21 are recorded from a terrestrial habitat and only one (*ternatensis* under the name of *maculata* in DE MAN 1902) is reported to bear a great number of small eggs.

By the condition of the front, antennula, antenna and orbit, *Geosesarma* is close to *Sesarmoides* and *Labuanium*. It is closer to *Sesarmoides* from which mainly it differs by a lateral border of carapace nearly parallel or few divergent backward and not strongly like on *Sesarmoides*. Also the ischium of the third maxilliped is comparatively less broad; it is remarkably broad on *Sesarmoides*. *Geosesarma* mainly differs from *Labuanium* by: 1) The merus of the third maxilliped comparatively much shorter. — 2) The dactyli of pereopods 2 - 5 slim and nearly as long as propodi instead to be shorter on *Labuanium*. — 3) The shape of its male abdomen. — 4) Its small size.

Geosesarma is still heterogeneous and at least the position of some of the species presently included like *angustifrons* need to be re-considered. However, no material of the following species: *celebensis*, *thelxinoe*, *leprosum* was examined by us. All species of the genus seem to be recorded from fresh water stream and several from high altitude.

12 - *Sesarmoides* gen. nov.

Diagnosis. — The genus differs from *Sesarma* by: 1) Carapace flattened with lateral border strongly divergent backward. — 2) Basal antennular segment swollen and globular; antennal peduncle nearly longitudinal. — 3) On epistome a strong transverse rim with a deep median notch. — 4) Frontal breadth clearly less than posterior border of carapace. — 5) The pereopods 2 - 5 slimmer and elongated; pereopod 4 is more than twice the carapace length with its merus at least as long as carapace length.

Type species: *Sesarma kraussi* DE MAN 1887.

The genus corresponds to the division 12 of the key of TESCH (1917) but includes more species. They are: *kraussi* DE MAN 1887, *kraussi*

borneensis TWEEDIE 1950, *longipes* KRAUSS 1843, *cerberus* HOLTHUIS 1964, *jacksoni* BALSS 1934, *jacobsoni* IHLE 1912 and as atlantic species at least *verleyi* RATHBUN 1914 and probably *jarvisi* RATHBUN 1914.

13 - *Namlacium* gen. nov.

Diagnosis. — The genus differs from *Sesarma* by: 1) the narrow front. — 2) the carapace flattened with lateral border convex. — 3) the slim and elongate ambulatory legs with a short dactylus.

Type species: *Sesarma crepidatum* CALMAN 1925.

The species was "provisionally" referred to *Sesarma* by CALMAN (1925) who noticed: "of the subgenera which are recognized in that genus, it probably approaches most closely to *Holometopus*". On the Holotype and single known specimen, the antero-lateral tooth behind the extraorbital angle is hardly visible. On the photograph of the Type specimen, kindly provided to us by the British Museum it is less visible than on the drawing published by CALMAN (1925). CALMAN (1925) indicated that the species differs "from most and probably from all the described species of *Sesarma* in the strongly curved lateral margins of carapace and the narrowness of the front". By the narrow front, the slim elongate pereopods *Namlacium* is close to *Sesarmoides* and by the last character it is also close to *Labuanium*. The short dactyli of pereopods 2-5 with brushes of dense setae of *Namlacium* are not much different from that of *Labuanium politum*. Besides the rounded outline of the carapace of adult specimens of *L. rotundatum* is close to that of *N. crepidatum*. Further observations on new material could lead to make *Namlacium* only a subgenus of *Labuanium*.

Remark

The reference literature will be given at the end of the revision, which will include a synopsis of all the species or the revised genera.

Distribution of the Indo-Pacific species of *Sesarma* s.l. into genera in accordance with the present revision

1 — *Nanosesarma* TWEEDIE 1950

Nanosesarma (*Nanosesarma*) subgen. nov.

N. (Nanosesarma) minutum (DE MAN 1887)

„ *jousseamei* (NOBILI 1906) = *minutum*

- N. (Nanosesarma) gordonii* (SHEN 1935) = *minutum*
 „ *pontianacensis* (DE MAN 1893)
 „ *tweediei* SERENE 1967 = *pontianacensis*
 ? „ *vestitum* (STIMPSON 1858)

— *Nanosesarma (Beanium)* subgen. nov.

- N. (Beanium) batavicum* (MOREIRA 1903).
 „ *edamensis* (DE MAN 1887)
 „ *andersoni* (DE MAN 1887)
 „ *nunongi* TWEEDIE 1950

2 — *Neosesarma* gen. nov.

- Neosesarma gemmiferum* (TWEEDIE 1936)
 „ *rectipectinatum* (TWEEDIE 1950)
 ? „ *laevis* (A. MILNE EDWARDS 1869)
 ? „ *aequifrons* (RATHBUN 1914)

3 — *Neoepisesarma* gen. nov.

Neoepisesarma (Neoepisesarma) subgen. nov.

- N. (Neoepisesarma) mederi* (H. MILNE EDWARDS 1853)
 „ *taeniolata* WHITE 1848 = *mederi*
 „ *chentongensis* (SERENE and SOH 1967)
 „ *lafondi* (JACQUINOT and LUCAS 1853)
 „ *singaporensis* (TWEEDIE 1936)
 „ *versicolor* (TWEEDIE 1940)
 „ *palawanensis* (RATHBUN 1914)

— *Neoepisesarma (Muradium)* subgen. nov.

- N. (Muradium) tetragonum* (FABRICIUS 1798)

— *Neoepisesarma (Selatium)* subgen. nov.

- N. (Selatium) brocki* (DE MAN 1887)

4 — *Sarmatium* DANA 1851

- Sarmatium crassum* DANA 1851
 „ *germaini* (A. MILNE EDWARDS 1867)

5 — *Neosarmatium* gen. nov.

- Neosarmatium integrum* (A. MILNE EDWARDS 1873)
 „ *inermis* (DE MAN 1887)
 „ *indicum* (A. MILNE EDWARDS 1868)
 „ *indicum malabaricum* (HENDERSON 1893)
 „ *smithi* (H. MILNE EDWARDS 1853)

Neosarmatium punctatum (A. MILNE EDWARDS 1873)

„ *meinerti* (DE MAN 1887)

„ *rotundifrons* A. MILNE EDWARDS 1868

„ *fryatti* TESCH 1917 = *rotundifrons*

„ *biroi* (NOBILI 1905)

6 — *Tiomanium* gen. nov.

Tiomanium indicum (H. MILNE EDWARDS 1837)

7 — *Bresedium* gen. nov.

Bresedium brevipes (DE MAN 1899)

„ *sedilensis* (TWEEDIE 1950)

8 — *Pseudosesarma* gen. nov.

Pseudosesarma bocourti (A. MILNE EDWARDS 1868)

„ *crassimanum* (DE MAN 1887)

„ *modestum* (DE MAN 1902)

„ *edwarsi* (DE MAN 1887)

„ *edwarsi laevimanum* (ZEHTNER 1894)

„ *moeschi* (DE MAN 1892)

„ *johorensis* (TWEEDIE 1940)

9 — *Sesarmops* gen. nov.

Sesarmops impressum (H. MILNE EDWARDS 1837)

„ *frontalis* (A. MILNE EDWARDS 1869) = *impressum*

„ *similis* (HESS 1865) = *impressum*

„ *atorrubens* (HESS 1865)

„ *mindanaoensis* RATHBUN 1914

„ *weberi* (DE MAN 1892)

„ *sinensis* (H. MILNE EDWARDS 1853)

„ *intermedium* (DE MAN 1835)

10 — *Labuanium* gen. nov.

Labuanium politum (DE MAN 1887)

„ *demani* (BURGER 1893)

„ *cruciatum* (BURGER 1893)

„ *rotundatum* (HESS 1865)

„ *gracilipes* (H. MILNE EDWARDS 1853)

„ *finni* (ALCOCK 1900)

„ *trapezoideum* (H. MILNE EDWARDS 1837)

? „ *sinuatifrontatum* (ROUX 1933)

11 — *Geosesarma* DE MAN 1892 nov. comb.

- Geosesarma amphinome* (DE MAN 1899)
„ *celebensis* (SCHENKEL 1902)
„ *peraccae* (NOBILI 1903)
„ *johnsoni* SERENE 1968
„ *sylvicolum* DE MAN 1892
„ *gordonae* SERENE 1968
„ *vicentensis* (RATHBUN 1914)
„ *ternatensis* SERENE 1968
„ *solomonensis* SERENE 1968
„ *maculatum* (DE MAN 1892)
„ *sarawakensis* SERENE 1968
„ *clavicruris* (SCHENKEL 1902)
„ *rathbunae* SERENE 1968
„ *foxi* (KEMP 1918)
„ *thelxinoe* (DE MAN 1908)
„ *penangensis* (TWEEDIE 1940)
„ *rouxi* SERENE 1968
„ *noduliferum* (DE MAN 1892)
„ *leprosum* (SCHENKEL 1902)
„ *araneum* (NOBILI 1899)
„ *angustifrons* (A. MILNE EDWARDS 1879)
„ *ocypodum* (NOBILI 1899)
„ *gracillimum* (DE MAN 1902)
? „ *nannophyes* (DE MAN 1897)

12 — *Sesarmoides* gen. nov.

- Sesarmoides kraussi* (DE MAN 1887)
„ *kraussi borneensis* (TWEEDIE 1950)
„ *jacksoni* (BALSS 1934)
„ *cerberus* (HOLTHUIS 1964)
„ *jacobsoni* (IHLE 1912)
„ *longipes* (KRAUSS 1843)

13 — *Namlacium* gen. nov.

- Namlacium crepidatum* (CALMAN 1925)
-

Text of illustration

Plate I

Sesarma reticulatum, PM, male of 21×15.3 ; A, dorsal view of carapace and chelipeds. — B, outer face of right cheliped.

Nanosesarma (Nanosesarma) minutum, NMS, male of 4×5 ; C, dorsal view.

Nanosesarma (Beanium) batavicum, NMS, male of 8.5×10 ; D, outer face of left cheliped.

Plate II

Neosesarma gemmiferum, NMS, male of 21×23 ; A, dorsal view. — B, outer face of right cheliped.

Neoepisesarma (Neoepisesarma) mederi, Paratype, PM, male of 38×40.5 ; C, dorsal view of carapace and cheliped. — D, outer face of left cheliped.

Plate III

Neoepisesarma (Neoepisesarma) mederi, NMS, male of 37×38.5 ; A, median part of the row of dactylar tubercles. — B, entire row of dactylar tubercles and pectinated crest of palm.

Neoepisesarma (Muradium) tetragonum, NMS, male of 35.5×39 ; C, outer face of left cheliped. — D, row of dactylar tubercles and pectinated crest of palm.

Plate IV

Neoepisesarma (Selatium) brocki, ZSI, male of 26×28 ; A, dorsal view. — B, outer face of right cheliped.

Sarmatium crassum, NMS, male of 23×24 ; C, outer face of right cheliped. — D, transverse grooves and swellings of upper surface of palm.

Plate V

Neosarmatium smithi, CM, male of 27×29 ; A, dorsal view. — B, outer face of right cheliped.

Tiomanium indicum, NMS, male of 35×38 ; C, dorsal view. — D, outer face of right cheliped.

Plate VI

Bresedium brevipes, PM, male of 22×24 ; A, dorsal view of carapace. — B, outer face of left cheliped.

Pseudosesarma edwardsi, ZSI, male of 18.5×20.5 ; C, dorsal view of carapace and cheliped. — D, outer face of left cheliped.

Plate VII

Sesarmops impressum, PM, male of 24.5×24 ; A, dorsal view of carapace.

Sesarmops impressum var., LM, male of 30×28 ; B, dorsal view.

Labuanium politum, NMS, male of 41×33 ; C, dorsal view. — D, outer face of right cheliped.

Plate VIII

Geosesarma noduliferum, MZB, male of 9.7×10 ; A, dorsal view. — B, outer face of right cheliped.

Sesarmoides kraussi, NMS, male of 12×11.5 ; A, dorsal view. — B, outer face of right cheliped.

All sizes are given in millimeters; the first number is the length of carapace, the second the breadth between external orbital angle.

CM	— Copenhagen Museum
LM	— Leiden Museum
NMS	— National Museum Singapore
PM	— Paris Museum
MZB	— Museum Zoologicum Bogoriense
ZSI	— Zoological Survey of India

The photos C, D of Pl. II are of Mr. REBIERE of the Paris Museum; the others of the authors.

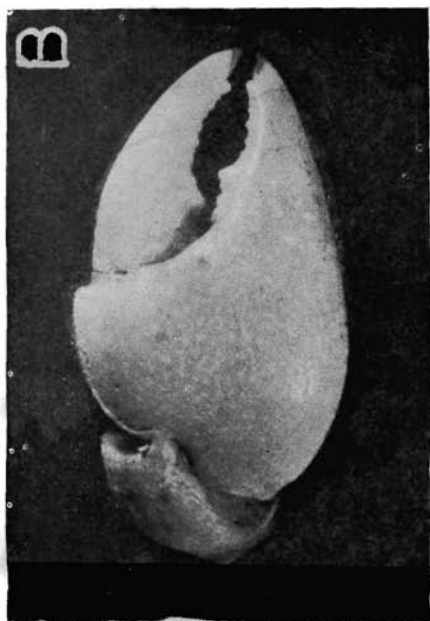
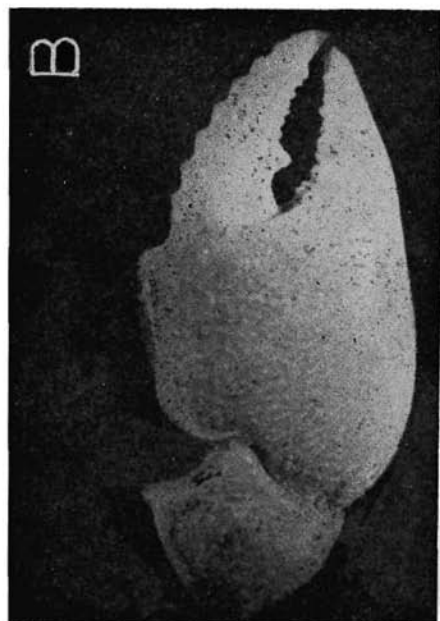


Plate I.



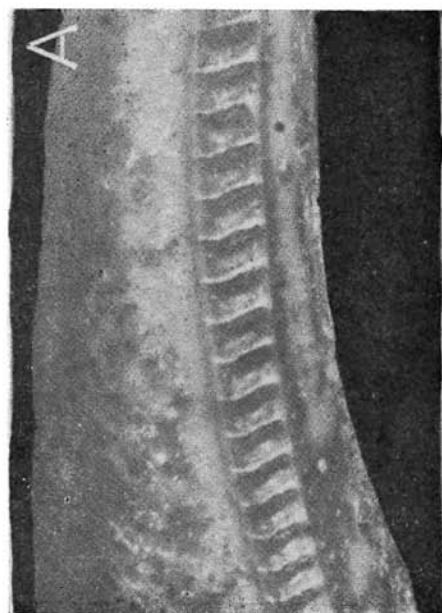
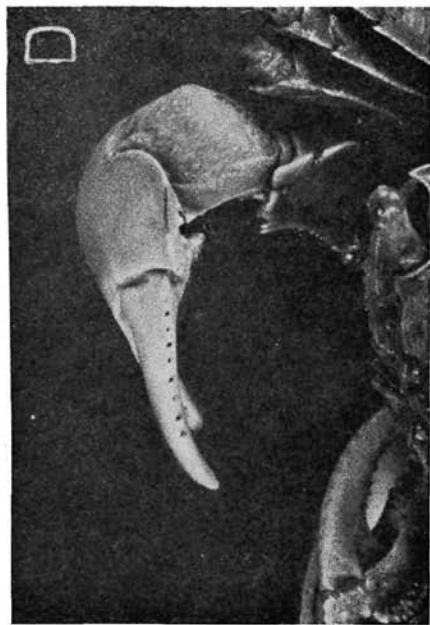


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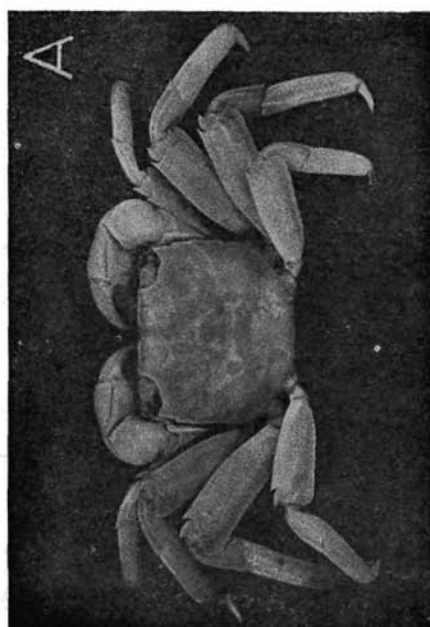
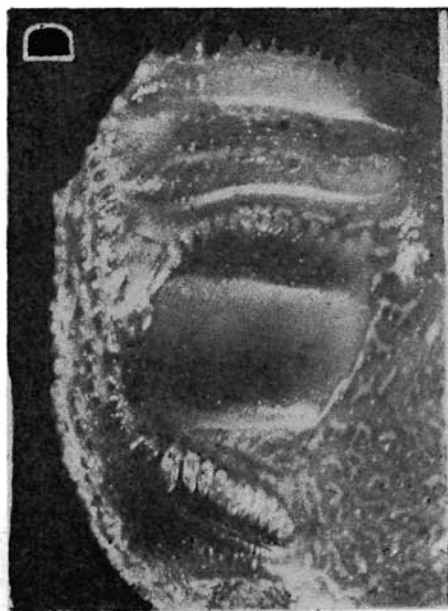
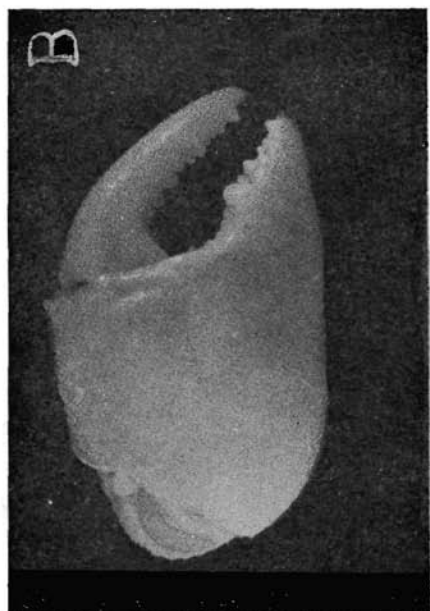


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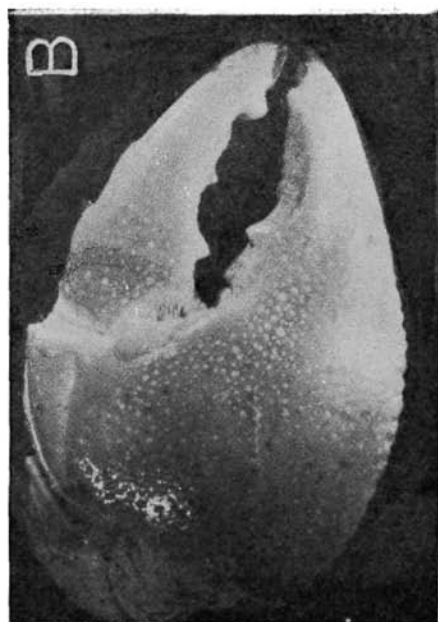
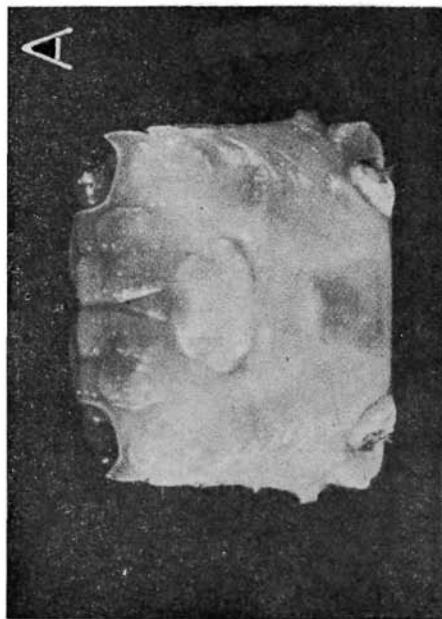
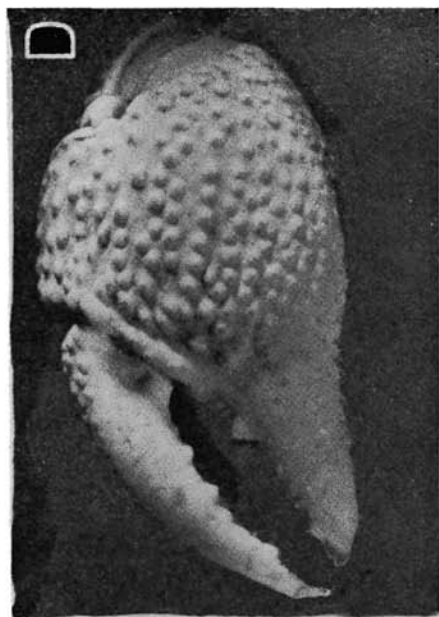
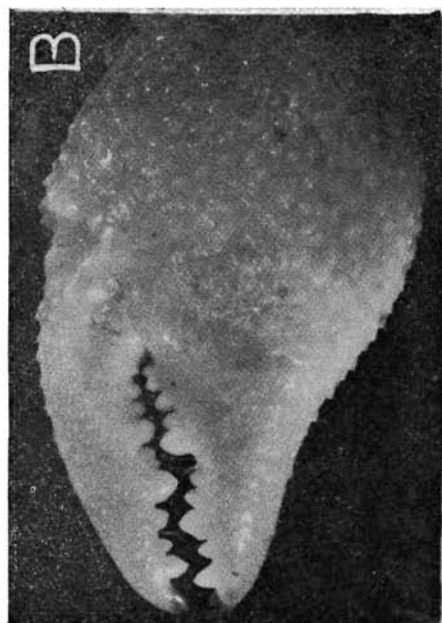


Plate V.



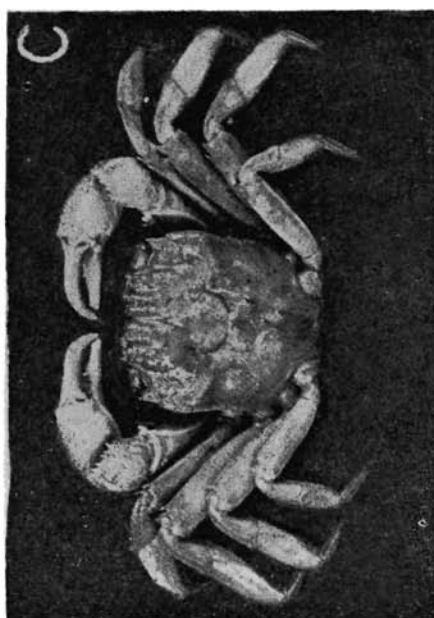
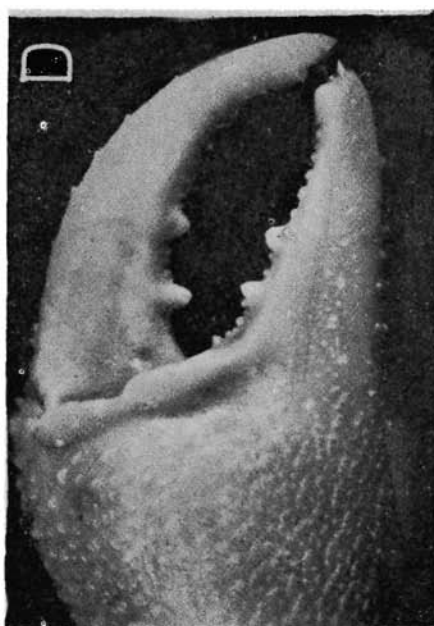


Plate VII.

