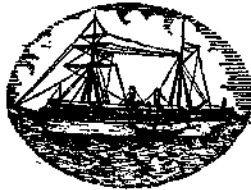


**PROCEEDINGS**  
**SYMPOSIUM ON CRUSTACEA**

**HELD AT**  
**ERNAKULAM**  
*FROM JANUARY 12 TO 15, 1965*

**PART I**



**SYMPOSIUM SERIES 2**

**MARINE BIOLOGICAL ASSOCIATION OF INDIA**  
**MARINE FISHERIES P.O., MANDAPAM CAMP**  
**INDIA**

# ON DECAPODA BRACHYURA FROM THE GULF OF MANNAR AND PALK BAY\*

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## ABSTRACT

Materials forming the basis of the present investigation are 88 species of Brachyura representing the families Dromiidae, Dorippidae, Calappidae, Leucosiidae, Hymenosomidae, Mairidae, Parthenopidae, Pinnotheridae, Gonoplacidae, Portunidae, Grapsidae, Ocypodidae and Xanthidae collected from the Indian coast of the Gulf of Mannar and Palk Bay. Of the total of 88 species, *Zalasia indica* is new to science, *Portunus samoensis* (Ward) is perhaps known only from the type locality and *Rhabdonotus pictus* A. Milne Edwards has so far been reported only by A. Milne Edwards (1878) and De Man (1888); the additional records for the Indian region are *Dromidopsis crantoides* (De Man), *Dorippe polita* Alcock and Anderson, *Elamena sindensis* Alcock, *Halimus aries* (Latreille), *Metopograpsus frontalis* Miers, *M. thukuar* (Owen), *Thalamita spinifera* Borradaile, *T. parvidens* Rathbun, *Charybdis (Charybdis) anisodon* (De Haan), *Portunus pubescens* (Dana) and *P. samoensis*. *Xenophthalmus pinnotheroides* White, *Philyra verrucosa* Henderson and *Aethra scruposa* (Linnaeus) are species of interest.

A brief outline on the species of Brachyura associated with the various habitats of this area has been given, in so doing only species typical of the particular habitat is included.

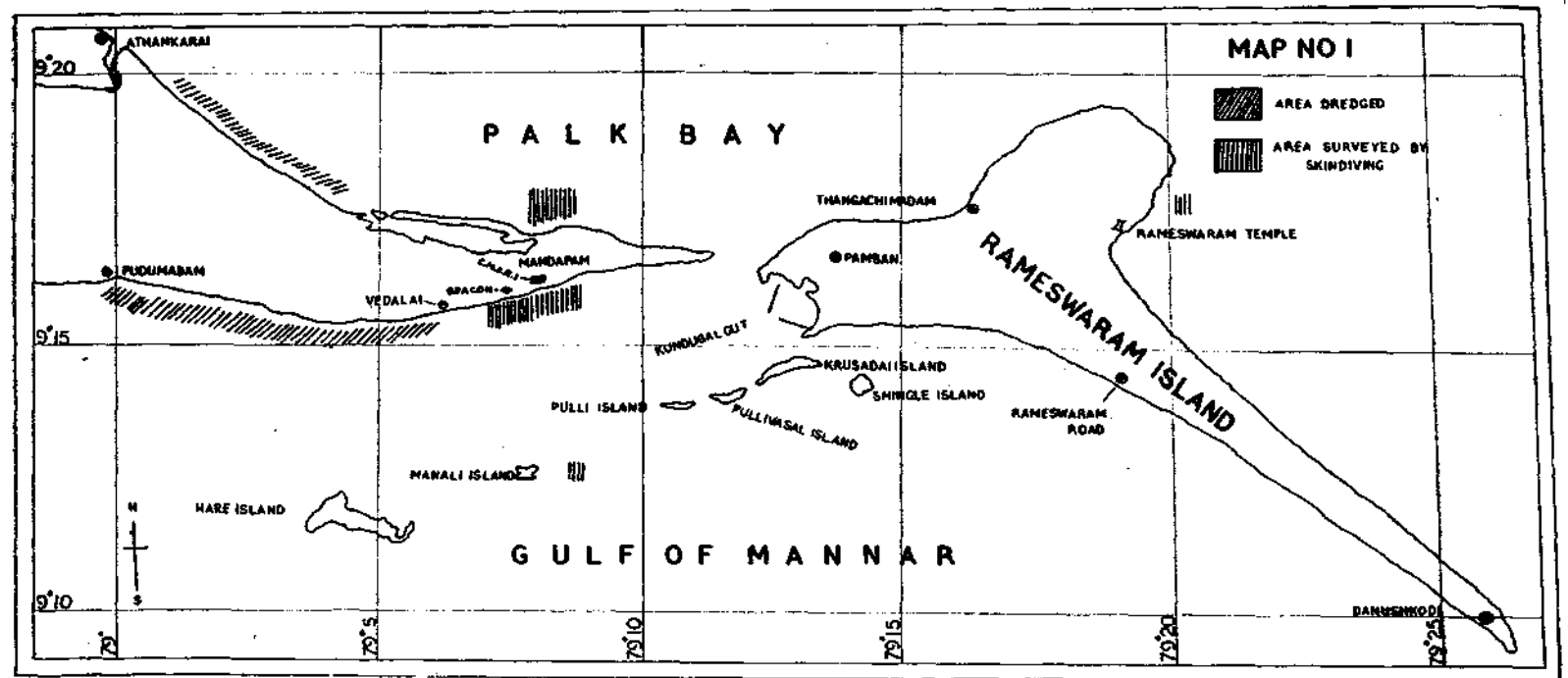
THE Gulf of Mannar and Palk Bay along the Indian coast are well known for their faunistic richness and variety. Henderson (1893) has aptly remarked "No collection ground in the Indian seas can show greater profusion of animal life than the Gulf of Mannar between India and Ceylon, famous for its pearl fisheries." Of those who have contributed towards the knowledge of the brachyuran fauna of these areas, mention must be made of Henderson (*loc. cit.*), Alcock (1895-1900), Laurie (1906), Southwell (1911), Kemp (1919), Gravely (1927), Chopra (1931), and Balss (1935).

A perusal of the literature on the collections from this area reveals that the species of *Metopograpsus* commonly encountered is *M. messor* (Forskål). Banerjee (1960), in his studies on the genera *Grapsus*, *Geograpsus* and *Metopograpsus*, has indicated that the species identified and recorded as *M. messor* by earlier workers, may be either of the two closely related species of *Metopograpsus*, viz., *M. messor* and *M. frontalis* Miers (refer Sankarankutty, 1961, for figure of the first male pleopod of latter). A careful study of a large series of the species collected from this area showed that they belong to *M. frontalis*; and it is presumed that *M. messor* recorded by earlier workers may all be *M. frontalis* since the intensive survey during the present investigation failed to show the occurrence of *M. messor* in this area.

Materials forming the basis of the present investigation are 88 species of Brachyura representing the families Dromiidae, Dorippidae, Calappidae, Leucosiidae, Hymenosomidae, Mairidae, Parthenopidae, Pinnotheridae, Gonoplacidae, Portunidae, Grapsidae, Ocypodidae and Xanthidae. Of these, *Zalasia indica* is new to science; *Portunus samoensis* (Ward) and *Rhabdonotus pictus* A. Milne Edwards are known only from their type localities; *Dromidopsis crantoides* (de Man), *Dorippe polita* Alcock and Anderson, *Elamena sindensis* Alcock, *Halimus aries* (Latreille), *Metopograpsus frontalis*, *M. thukuar* (Owen), *Thalamita spinifera* Borradaile, *T. parvidens* Rathbun, *Charybdis (Charybdis) anisodon* (De Haan) and *Portunus pubescens* (Dana) are additional records for the Indian region; *Xenophthalmus pinnotheroides* White, *Philyra verrucosa* Henderson and *Aethra scruposa* (Linnaeus) are species of interest.

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MAP 1. Showing the Mandapam area with localities of collection.

Collections were made from the intertidal zone representing the various habitats during the extensive shore collection trips. Fish traps and shore seines operated from the various fish landing places were also examined frequently, often providing good representatives of crabs. *Portunus pelagicus* (Linnaeus) were obtainable in good numbers from the crab nets operated along this coast. Extensive skin-diving around this area enabled me to collect and observe good number of species of crabs, especially those which are commensals. Dredging in the Gulf of Mannar and Palk Bay also contributed a number of species of crabs. Two species (*Dromidiopsis cranioides* and *Rhabdonotus pictus*) were collected from a depth of 25 metres off Tuticorin, using Aqualung.

As good descriptive accounts on most of the species of the present collection already exist, only *Zalasia indica*, *Rhabdonotus pictus*, *Harrovia albolineata* Adams and White, *Thalamita parvidens*, *Charybdis* (*Charybdis*) *anisodon*, *Portunus pubescens* and *P. samoensis* are described here. First male pleopod and male abdomen of *Achaeus lacertosus* Stimpson (Text-Figs. 8 and 27), *Elamena sindensis* (Text-Figs. 12 and 33), *Paratymolus hastatus* Alcock (Text-Figs. 24 and 26), *Thalamita spinifera* (Text-Figs. 21 and 32) and *Pinnotheres ridgewayi* Southwell (Text-Figs. 23 and 28) are illustrated along with the first male pleopods of *Dorippe granulata* de Haan (Text-Fig. 15), *D. polita* (Text-Fig. 16), *Philyra adamsia* Bell (Text-Fig. 25), *Halimus aries* (Text-Fig. 11), *Micippa thalia* Herbst (Text-Fig. 9), *M. philyra* (Herbst) (Text-Fig. 10), *Metopograpsus thukuar* (Text-Fig. 17), *Scopimera pilula* Kemp (Text-Fig. 13) and *S. proxima* Kemp (Text-Fig. 14).

All the species reported here have been deposited in the Reference Collections of the Central Marine Fisheries Research Institute, Mandapam Camp.

## LIST OF SPECIES

Species	Material examined	Locality
1. <i>Dromia dromia</i> (Linn.)	A male	Rameswaram
2. <i>Dromidiopsis cranioides</i> (de Man)	A female	Tuticorin
3. <i>Dromidia unidentata</i> (Rüp.)	A male and a female	Vedalai
4. <i>Pseudodromia integrifrons</i> Hend.	Two females	Mandapam in Gulf of Mannar
5. <i>Dorippe frascone</i> (Hbst.)	3 ovigerous and 2 non-ovigerous females and 7 males	Pudumadam
6. <i>D. granulata</i> de Haan	A male	Pudumadam
7. <i>D. polita</i> Alc. and And.	2 males and a female	Pudumadam
8. <i>Calappa hepatica</i> (Linn.)	A female	Hare Island
9. <i>C. philargius</i> (Linn.)	A male	Palk Bay
10. <i>Matuta lunaris</i> (Forskål)	2 males, 2 females and a juvenile	Hare Island, Mandapam in Palk Bay
11. <i>M. planipes</i> Fabr.	2 females and a male	Mandapam in Palk Bay
12. <i>Philyra scabriuscula</i> (Fabr.)	10 males and 5 females	Mandapam in Palk Bay
13. <i>P. verrucosa</i> Hend.	A male	Pudumadam
14. <i>P. adamsia</i> Bell	17 ovigerous and 9 non-ovigerous females and 15 males	Pudumadam
15. <i>Elamena cristatipes</i> Grvly.	An ovigerous female	Madras Harbour
16. <i>E. sindensis</i> Alc.	A male, 3 females and a juvenile	Mandapam in Gulf of Mannar
17. <i>Achaeus lacertosus</i> Stmpn.	2 ovigerous and 2 non-ovigerous females and a male	Pudumadam
18. <i>Paratymolus hastatus</i> Alc.	3 males, one ovigerous and 3 non-ovigerous females	Athankarai
19. <i>Acanthonyx macleayi</i> Krauss	A male and a female	Vedalai
20. <i>Menaethius monoceros</i> (Latr.)	2 males, 4 ovigerous and 11 non-ovigerous females	Vedalai
21. <i>Halimus aries</i> (Latr.)	2 males	Kilakarai
22. <i>H. pleione</i> (Hbst.)	2 males and 3 females	Kilakarai
23. <i>Schizophrys aspera</i> (H. M. Edws.)	A female and 2 males	Pamban, Manoli Island
24. <i>Micippa thalia</i> Hbst.	A male	Hare Island
25. <i>M. philyra</i> (Hbst.)	2 females and 2 males	Hare Island
26. <i>Rhabdonotus pictus</i> A. M. Edws.	A female	Tuticorin

Species	Material examined	Locality
27. <i>Harrovia albolineata</i> Adams and White	2 females	Vedalai
28. <i>Aulacolambus hoplonotus</i> (Adams and White)	2 males, one ovigerous and 3 non-ovigerous females	Hare Island
29. <i>Aethra scruposa</i> (Linn.)	A female	Rameswaram
30. <i>Zalasia indica</i> Sp. nov.	A female	Devipatnam
31. <i>Grapsus albolineatus</i> Lmck.	An immature male, one ovigerous and one non-ovigerous female	Mandapam in Gulf of Mannar
32. <i>Metopograpsus frontalis</i> Miers	Numerous specimens of both sexes	Pamban, Mandapam in Palk Bay
33. <i>M. thukuar</i> (Owen)	A male, one ovigerous and one non-ovigerous female	Kundugal point
34. <i>Sesarma plicata</i> Latr.	2 males, one ovigerous and one non-ovigerous female	Pullivasal Island
35. <i>Metaplex distincta</i> H. M. Edws.	A female	Athankarai
36. <i>Percnon planissimum</i> (Hbst.)	2 males	Shingle Island
37. <i>Plagusia depressa</i> var. <i>tuberculata</i> Lmck.	2 males and a female	Mandapam in Gulf of Mannar
38. <i>Thalamita crenata</i> (Latr.)	4 males, one ovigerous and 5 non-ovigerous females	Mandapam in Palk Bay, Shingle Island
39. <i>T. prymna</i> (Hbst.)	7 males and 6 females	Mandapam in Palk Bay, Manoli Island, Tuticorin
40. <i>T. spinifera</i> Borr.	A male, 3 ovigerous and 2 non-ovigerous females	Vedalai
41. <i>T. integra</i> Dana	Numerous specimens of both sexes	Mandapam in Palk Bay, Vedalai
42. <i>T. parvidens</i> Rath.	4 males and 2 ovigerous females	Vedalai
43. <i>Charybdis</i> ( <i>Charybdis</i> ) <i>annulata</i> (Fabr.)	A male	Krusadai Island
44. <i>C.</i> ( <i>Charybdis</i> ) <i>helleri</i> (A. M. Edws.)	7 males, 3 females and 3 juveniles	Krusadai Island, Mandapam in Palk Bay
45. <i>C.</i> ( <i>Charybdis</i> ) <i>feriata</i> (Linn.)	A male and a female	Vedalai, Pudumadam
46. <i>C.</i> ( <i>Charybdis</i> ) <i>nataator</i> (Hbst.)	3 females and 5 males	Vedalai, Mandapam in Palk Bay
47. <i>C.</i> ( <i>Charybdis</i> ) <i>anisodon</i> (de Haan)	A male	Vedalai
48. <i>Portunus pelagicus</i> (Linn.)	A male, a female, many juveniles and 6 with <i>Saccullna</i>	Pamban, Vedalai, Devipatnam
49. <i>P. sanguinolentus</i> (Hbst.)	4 males	Vedalai, Dhanushkodi
50. <i>P. pubescens</i> (Dana)	4 ovigerous and one non-ovigerous females, an immature male	Vedalai
51. <i>P. hastatoides</i> Fabr.	18 males, one ovigerous and 2 non-ovigerous females	Athankarai, Panaikulam
52. <i>P. samoensis</i> (Ward)	A male	Hare Island
53. <i>Scylla serrata</i> (Forsk.)	A male	Mandapam in Palk Bay
54. <i>Eucrate crenata</i> var. <i>dentata</i> Alc.	2 females	Vaighai estuary
55. <i>Xenophthalmus pinnotheroides</i> White	A female	Devipatnam
56. <i>Pinnotheres deccanensis</i> Chopra	7 ovigerous and 7 non-ovigerous females	Mandapam in Gulf of Mannar
57. <i>P. ridgewayi</i> Southwell	Numerous specimens of both sexes	Mandapam in Palk Bay and Gulf of Mannar
58. <i>Ocypode ceratophthalma</i> (Pallas)	11 males and 19 females	Mandapam in Gulf of Mannar, Kundugal point
59. <i>O. macrocera</i> H. M. Edws.	5 males and 2 females	Mandapam in Palk Bay, Kundugal point
60. <i>O. cordimana</i> Desmarest	3 males and 2 females	Mandapam in Gulf of Mannar, Kundugal point
61. <i>O. platytarsis</i> (H. M. Edws.)	A male	Rameswaram Road
62. <i>Uca annulipes</i> (H. M. Edws.)	Numerous specimens of both sexes	Kundugal point, Vaighai estuary
63. <i>U. marionis</i> var. <i>nitidus</i> Dana	6 males and a female	Manoli Island
64. <i>Dotilla myctiroides</i> (H. M. Edws.)	6 males and 4 females	Vedalai, Kundugal point
65. <i>Scopimera pilula</i> Kemp.	14 males, one ovigerous and 9 non-ovigerous females	Kundugal point
66. <i>S. proxima</i> Kemp.	2 males and 4 females	Mandapam in Gulf of Mannar
67. <i>Macrophthalmus depressus</i> Rüpp.	19 males, 2 ovigerous and 7 non-ovigerous females	Palk Bay lagoon, Kundugal point, Manoli Island

Species	Material examined	Locality
68. <i>M. convexus kempii</i> Grvly.	A male	Manoli Island
69. <i>Carpilius maculatus</i> (Linn.)	A female	Kilakarai
70. <i>Chlorodiella nigra</i> (Forsk.)	A male, 4 females and 2 juveniles	Manoli Island
71. <i>Phymodius monticulosus</i> (Dana)	A male	Pulli Island
72. <i>Eisus (Eisus) laevimanus</i> Randall	2 males	Kilakarai
73. <i>E. (Eisodes) electra</i> (Hbst.)	A male	Hare Island
74. <i>Xanthias lamarcki</i> (H. M. Edws.)	A male	Shingle Island
75. <i>Cymo melanodactylus</i> de Haan	9 males, 15 ovigerous and one non-ovigerous females and 4 juveniles	Mandapam in Gulf of Mannar, Manoli Island
76. <i>C. andreossyi</i> (Audouin)	A female	Manoli Island
77. <i>Ategratis intergerrimus</i> (Lmck.)	3 males, a female and an immature male	Kilakarai, Manoli Island
78. <i>Actaea ruppelli</i> (Krauss)	2 females	Mandapam in Gulf of Mannar
79. <i>A. granulata</i> (Audouin)	A male	Pudumadam
80. <i>Leptodius exaratus</i> (H. M. Edws.)	Numerous specimens of both sexes	Shingle Island, Pulli Island, Krusadai Island, Mandapam in Palk Bay
81. <i>L. crassimanus</i> A. M. Edws.	A female	Shingle Island
82. <i>Menippe rumphii</i> Fabr.	3 males and a female	Mandapam in Palk Bay
83. <i>Heteropanope laevis</i> (Dana)	A male	Pudumadam
84. <i>Eurycarcinus grandieri</i> A. M. Edws.	A male	Pamban
85. <i>Pilumnus vespertilio</i> (Fabr.)	A female	Mandapam in Palk Bay
86. <i>Eriphia sebana</i> (Shaw and Nodder)	A male, one ovigerous and 4 non-ovigerous females	Pullivasal Island
87. <i>Trapezia areolata</i> Dana	An ovigerous female	Rameswaram reef
88. <i>Tetralla glaberrima</i> (Hbst.)	4 males, one ovigerous and 6 non-ovigerous females	Mandapam in Gulf of Mannar, Rameswaram reef

Genus *Zalasius* Rathbun

(Plate I)

The genus includes only four species, viz., *Z. dromiaeformis* (de Haan) (McNeill and Ward, 1930), *Z. horii* Miyake (Miyake, 1940), *Z. sakaii* Balss (Balss, 1938) and the present new species *Z. indica*. The genus is recorded for the first time from Indian waters.

*Zalasius indica* sp. nov.

(Plate I, Fig. 4)

*Holotype*: A female measuring 37.0 mm. in breadth and 33.0 mm. in length.

*Type locality*: Devipatnam in Palk Bay.

*Description*: Carapace highly tomentose like *Dromia dromia*, conspicuously convex in either directions, regions indicated by deep grooves and postero-lateral region with few miliary granules. Front narrow but broader than orbit, bilobed with median part deflexed and almost touching the epistome thereby separating antennular fossa of either side; frontal lobes not separated from inner angle of orbit. Orbit complete with its upper border divided into three regions by two deep fissures of which inner being more prominent. Outer angle of orbit not pronounced and not forming any tooth or lobe. Antero-lateral border immediately outside orbit forming a concave zone followed by uniformly convex tuberculated border, the line of tubercles curving inwards and ending on either sides of cardiac region. Postero-lateral border short and more or less straight.

Antennules fold obliquely; antenna separated from the orbit by the fusion of basal antennal joint to the inner side of orbit, antennal flagellum reduced. Pterygostomian, sub-hepatic and sub-branchial regions tomentose; pterygostomian region granulated.

External maxilliped not closing the buccal cavern completely, its exposed surface completely clothed in plumose hairs. Ischium narrow and elongated, widening distally, merus longer than broad with concave inner and outer borders and rounded distal border. Palp short, attached to the middle of the distal end of merus and partly concealed in a groove at the inner distal end of merus; exopod with short flagellum.

Chelipeds sub-equal and like the walking legs completely covered with hairs excepting the inner side of propodus and fingers. Merus short and high, being higher than long, its borders tuberculate, similar tubercles found on upper surface of the outer side also. Ventral hinge of merus elongated (length of merus along ventral border including the ventral hinge considerably more than length along the upper border but slightly less than height of merus) and almost coming in contact with the proximal hinge of propodus. Carpus with a line of tubercles on the inner side in the proximal half and at about the middle of the segment drooping down on the inner side. Propodus higher than long (length measured along the upper border) and shorter than movable finger, upper border slightly on the inner side with three rows of tubercles reducing in size distally. Outer surface of propodus tuberculated, a group of tubercles on the inner side of propodus at the proximal end. Ventral border of propodus with a longitudinal row of about eight tubercles. Fingers sharp, pointed with serrated cutting edges and leaving a wide gap at the proximal end between them.

First two pairs of walking legs sub-equal and longer than last two pairs, fourth pair shortest. Dactylus of all legs thin and long ending in sharp hook-like claw, its length more than the length of merus in the last two legs but about as long as merus in first two legs.

Sternal segment of cheliped with three enlarged tubercles arranged in a triangle—two on the outer and one on the inner side; a deep groove between inner tubercles of either side through which project out the long pleopods. Each of the following sternal segments with one such tubercle reducing in size posteriorly (those on last two segments being indistinct); another transverse tubercle between two sternal segments and closer to the base of legs, being prominent only on the last two segments.

Abdomen in female of seven separate segments with a median broad convex ridge along the entire length of abdomen except in the last segment. Third segment broadest from where abdomen narrowing distally, end segment conical and broader than long.

The species can be easily separated from other three known species by the conspicuous absence of the coarse granulation on the carapace.

Genus *Rhabdonotus* A. Milne Edwards

*Rhabdonotus pictus* A. Milne Edwards

(Figs. 1-4)

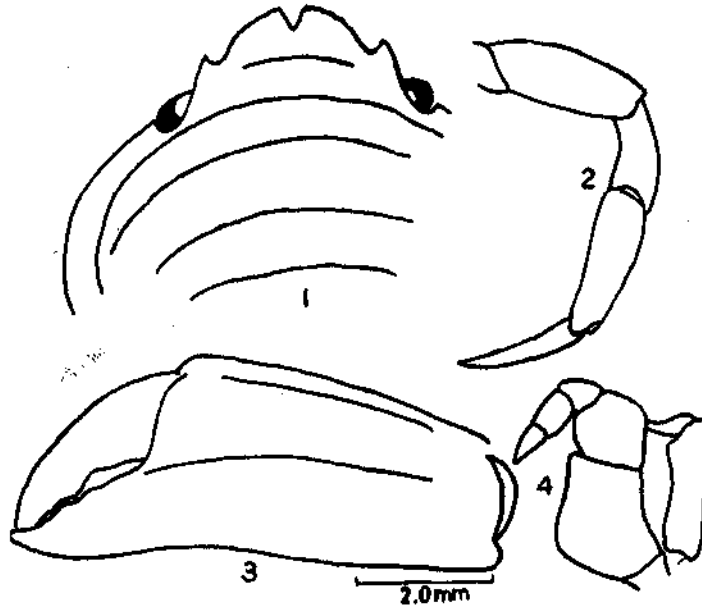
*Rhabdonotus pictus*, A. Milne Edwards, 1878, p. 6: Viet-Nam; R. Serene and K. Romimoharto, 1963, p. 9: Singapore.

*Material*: A female.

*Locality*: Tuticorin in the Gulf of Mannar.

*Description*: Carapace nearly as long as broad, perfectly smooth and polished, convex in either direction, glabrous and without any indication of regions. Front prominent and quadrilobate, all the lobes lying in the same plane and with serrated border; inner frontal lobe broader than outer

and separated by a deep median cleft, its inner end more prominent than outer and its border oblique and straight; outer frontal lobe conical and small, separated from inner lobe by a concavity and not projecting to the extent of inner lobes. Outer border of outer frontal lobes oblique and forming partly the upper border of orbit. Outer angle of orbit not distinct as a tooth and at a lower level. A minute fissure on the supra-orbital border towards the outer angle. Antero-lateral border together with the postero-lateral border forming a smooth, convex, sharp and entire border. Posterior border of carapace broad and concave. Antennules fold obliquely. Basal antennal joint broad closing the inner gap of orbit, antennal flagellum consisting of few segments. Infra-orbital border slightly concave and entire.



TEXT-FIGS. 1-4. *Rhabdonotus pictus*. (1) Part of carapace; (2) walking leg; (3) outer surface of the propodus of the cheliped; (4) external maxilliped.

Cheliped sub-equal, smooth to the naked eye but granulated microscopically, segments nearly cylindrical. Inner angle of carpus not prominent. Propodus stout, sub-cylindrical and its upper border longer than dactylus. Fingers toothed and pointed, dactylus closing inside the tip of fixed finger.

Legs reducing in size posteriorly, segments smooth and glabrous, dactylus nearly as long as propodus.

Female abdomen consisting of seven separate segments.

Carapace in live condition slightly brownish in colour with transverse red lines. A short narrow line between orbits immediately followed by three or four short transverse lines equally spaced and parallel to each other. An oval or circular ring in the gastro-cardiac region, posterior part of carapace with irregularly disposed lines. Propodus of cheliped on the outer side with two longitudinal lines.

The species was observed to be commensalic on *Virgularia* sp. and was collected from the pearl banks off Tuticorin in the Gulf of Mannar from a depth of 25 metres.



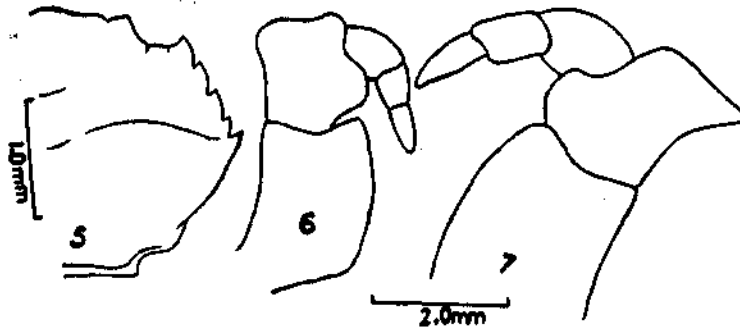
Genus *Harrovia* Adams and White*Harrovia albolineata* Adams and White.

*Harrovia albolineata*, Laurie, 1906, p. 393: Ceylon; Serene, Tran Van Duc and Nguyen van Loum, 1958, p. 200: Viet-Nam; Jones and Sankarankutty, 1960, p. 194: Gulf of Mannar (refer for figure and photographs).

*Material*: Two females.

*Locality*: Vedalai.

*Description*: Carapace flattish, broader than long, smooth and hexagonal, regions not very markedly distinguishable, a faint transverse groove representing the posterior boundary of gastric region. Front quadrilobate and minutely spiny and granulate; median lobe broader than lateral having more or less straight or slightly convex border, inner end of median frontal lobes slightly deflexed; lateral lobes narrow and conical in shape and a little more pronounced than median lobes. Supra-orbital border a semicircular concavity without any division. Antero-lateral border divided into four lobes of unequal size; first lobe with nearly straight border forming the outer orbital angle; second similar to the first; third and fourth conical in shape and spiny, third lobe variable in size (refer Jones and Sankarankutty, Figs. 3 and 4). Posterior border of carapace nearly straight. Antennules fold obliquely; antenna at the inner end of orbit, basal antennal joint not touching front. Infra-orbital border coarsely granulate and cut into two lobes, inner larger and outer smaller. Inner border of ischium of external maxilliped uniformly serrated.



TEXT-FIGS. 5-7. (5) Carapace of *Thalamita parvidens*; (6) external maxilliped of *Portunus pubescens*; (7) external maxilliped of *P. samoensis*.

Chelipeds sub-equal and decidedly more than the length of carapace; merus and propodus sub-cylindrical long segments, propodus longer than merus and compressed from side to side with slightly bulging middle part. All segments of cheliped covered with minute granules. Dactylus shorter than upper border of propodus, much curved and covered with granules on the dorsal surface. Fingers pointed and toothed on the cutting edge.

Legs reducing in size posteriorly, merus of all legs minutely spiny on the dorsal surface. Dactylus of all legs nearly as long as propodus.

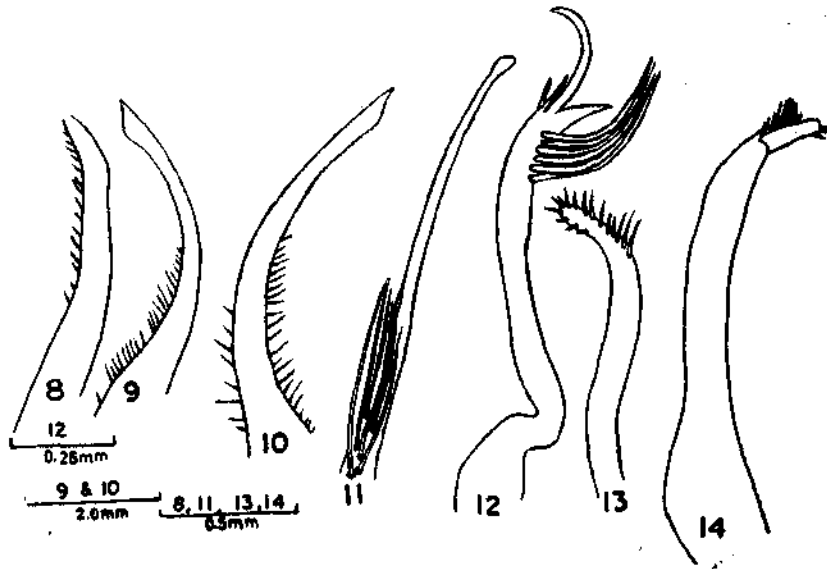
Carapace in live specimen with a circular broad black ring running parallel to the borders of the carapace; two transverse bands join this ring in the anterior half; cardiac region with a shorter spindle-shaped black band not connected to the ring. Cheliped with median longitudinal whitish portion bordered on either side by broad black border.

Genus *Thalamita* Latreille*Thalamita parvidens* Rathbun

(Text-Figs. 18, 19 and 30)

*Thalamita parvidens*, Stephenson, 1961, p. 122: Western Australia.**Material:** Four males and two ovigerous females.**Locality:** Dredged from the Gulf of Mannar off Vedalai.

**Description:** Carapace almost glabrous and with the following faintly distinguishable ridges—epibranchial interrupted only by the cervical groove, lateral cardiac, mesogastric and frontal. Front bilobed with a fairly distinct median notch, inner orbital lobe oblique and narrower than frontal lobe. Antero-lateral border of carapace with five sub-equal teeth, or fourth slightly smaller than rest, first or first three blunt. Basal part of all teeth granulated. Breadth of basal antennal joint more than diameter of orbit (1.16–1.33). Crest of basal antennal joint minutely serrated.



TEXT-FIGS. 8-14. First male pleopod of: (8) *Achaeus lacertosus*; (9) *Micippa thalia*; (10) *M. phillyra*; (11) *Halimus arles*; (12) *Elamena sindensis*; (13) *Scopinera pilula*; (14) *S. proxima*.

Cheliped unequal; anterior border of merus with three blunt teeth and few granules preceding them, upper surface of merus also granulated. Inner angle of carpus with a spine and outer side with blunt projections, ridges join spines, upper surface of carpus minutely granulated. Upper surface of propodus with two longitudinal ridges, inner one alone with a spine in the middle, spine on the proximal dorsal hinge in the form of a blunt projection. Upper surface of propodus including carina granulated, a single faint ridge on the outer surface of propodus entering fixed finger. Ventral proximal end of propodus minutely granulated. Fingers long, toothed; dactylus carrying a recurved tooth at its base.

Male abdomen consisting of five separate pieces with segments 3-5 fused together. Penultimate segment broader than long and with nearly parallel sides. End segment triangular in shape and distinctly broader than long.

*Remarks:* The examination of the first male pleopod of the specimen of the present collection showed a marked difference in the curvature and armature of the tip compared to the figure provided by Stephenson.

Genus *Charybdis* de Haan

*Charybdis (Charybdis) anisodon* (de Haan)

(Text-Figs. 22 and 31; Plate II, Fig. 1)

*Charybdis anisodon*, Sakai, 1939, p. 405: Japan.

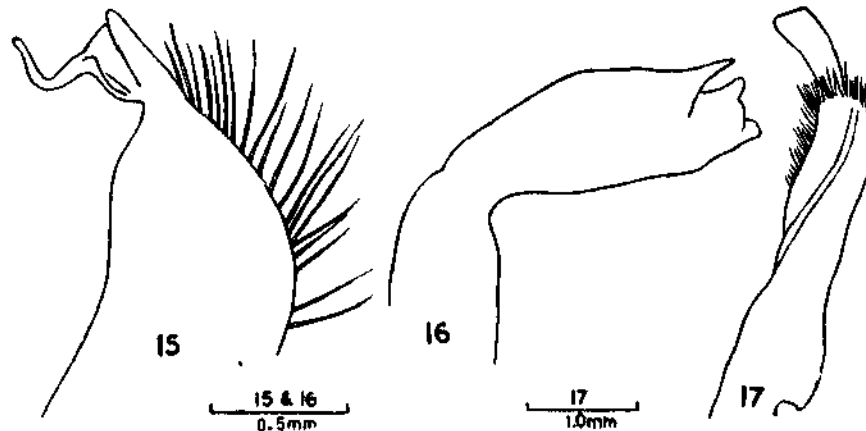
*Charybdis (Goniosoma) anisodon*, Gordon, 1931, p. 527: Coast of China; Shen, 1937, p. 117: Singapore.

*Charybdis (Charybdis) anisodon*, Leene, 1938, p. 64: Gier and Kleiweg de Zwaan collection, off the river mouth near Tello, Celebes, Makassar; Stephenson, Hudson and Campbell, 1957, p. 493: Australia.

*Material:* A male.

*Locality:* Vedalai.

*Description:* Carapace convex, smooth and naked; regions ill-defined, following transverse ridges noticeable—protogastric, mesogastric interrupted and epibranchial interrupted in the middle of gastric region and by the cervical groove. Front cut into six teeth, median tooth a little more prominent than sub-median and with an almost straight border, sub-median similar in shape as median and at a higher plane, lateral as prominent as sub-median but narrow. Supra-orbital border with two distinct clefts. Antero-lateral border of carapace divided into six teeth, first two smaller than rest with rounded tips, second smallest, third and fourth sub-equal and broader than fifth, sixth a long spine almost pointing laterally and much more than twice the length of fifth.

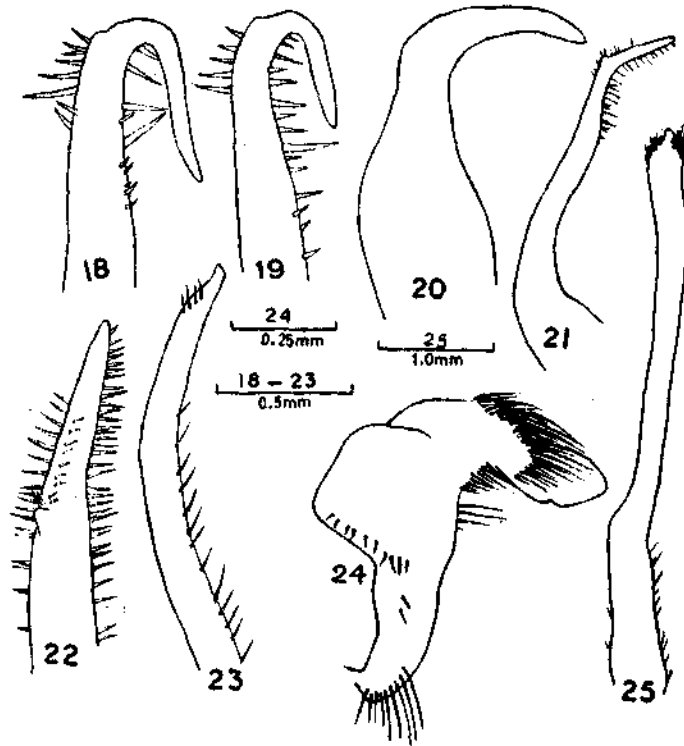


TEXT-FIGS. 15-17. First male pleopod of: (15) *Dorippe granulata*; (16) *D. polita*; (17) *Metopograpsus thukuar*.

Chelipeds slightly dissimilar in size. Anterior border of merus armed with two spines, posterior border unarmed. Carpus with the usual large spine on the inner side but three spines on the outer side represented by tubercles. Upper surface of propodus provided with two spines, but spine on the proximal hinge remaining as tubercle, second spine in the middle on the inner side of propodus. Dactylus longer than upper border of propodus.

Posterior border of propodus of natatory leg unarmed.

Male abdomen with transverse carinae on second and third segments; sixth segment broader than long and with convex borders.



TEXT-FIGS. 18-25. First male pleopod of: (18 and 19) *Thalamita parvidens*; (20) *Portunus samoensis*; (21) *Thalamita spinifera*; (22) *Charybdis (Charybdis) anisodon*; (23) *Pinnotheres ridgewayi*; (24) *Paratymolus hastatus*; (25) *Philyra adamsia*.

Genus *Portunus* Weber

*Portunus pubescens* (Dana)

(Text-Fig. 6; Plate II, Fig. 2)

*Neptunus pubescens*, Sakai, 1934, p. 303: Japan.

*Neptunus (Achelous) pubescens*, Doflein, 1904, p. 98: Sandwich Island.

*Neptunus (Neptunus) pubescens*, Sakai, 1939, p. 338: Japan.

*Portunus pubescens*, Edmondson, 1954, p. 237: Hawaiian Islands; Stephenson and Campbell, 1959, p. 99: Australia.

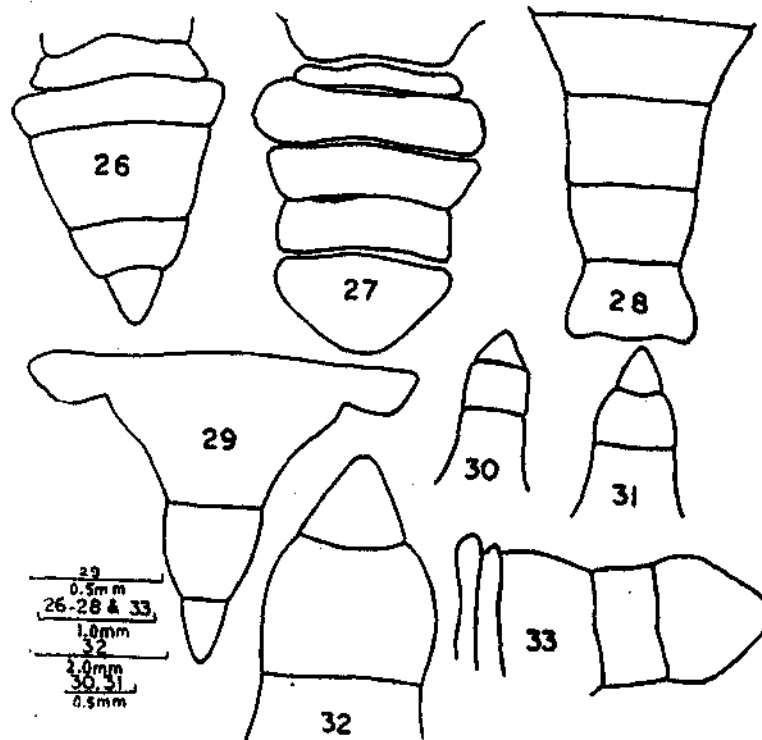
**Material:** Four ovigerous and one non-ovigerous females, and one immature male.

**Locality:** Vedalai,

*Description*: Carapace convex, covered with a coating of hairs concealing the granulated ridges, following ridges recognisable—curved mesogastric and epibranchial. Front cut into four lobes with squarish or rounded tips, inner frontal lobe a little smaller than outer. All frontal lobes project beyond the inner orbital lobe. Supra-orbital border with two distinct clefts. Antero-lateral border provided with nine teeth, first being a little larger than the rest, last largest and spiny projecting laterally.

Chelipeds sub-equal and short. Merus armed with three spines along the anterior border and unarmed along the posterior. Carpus with four distinct carinae all of which terminate in spines; inner and outer carinae reach up to the distal end of the segment, inner ending in the usual large spine of carpus; two carinae in the middle being short and not reaching the distal end of the segment; a short oblique carina confined to the distal half of the segment joining the dorsal hinge of carpus. Upper surface of propodus with three carinae of which inner two terminate in spines. Inner and outer surfaces of propodus provided with a carina each.

Antero-external angle of merus of third maxilliped not produced laterally.



TEXT-FIGS. 26-33. Male abdomen of: (26) *Paratymolus hastatus*; (27) *Achaeus lacertosus*; (28) *Pinnotheres ridgewayi*; (29) *Portunus samoensis*; (30) *Thalamita parvidens*; (31) *Charybdis (Charybdis) anisodon*; (32) *Thalamita spinifera*; (33) *Elamena sindensis*.

*Portunus samoensis* (Ward)

(Text-Figs. 7, 20 and 29)

*Monomia samoensis*, Ward, 1939, p. 4: Samoa.

*Portunus samoensis*, Stephenson and Campbell, 1959, p. 60.

*Material*: A male.

*Locality*: Dredged from the Gulf of Mannar near Hare Island.

*Description*: Carapace fairly convex, covered with sparse hairs not concealing the granulated area, its breadth about 1.66 times its length. A faint metagastric ridge recognisable in the present specimen. Following regions well defined—cardiac, lateral cardiac and branchial. Front cut into four teeth, median pair minute and its inner end deflexed; lateral tooth more prominent than median frontal and inner supra-orbital lobes. Supra-orbital border with two distinct clefts. Anterolateral border divided into nine teeth, last being largest and spiny. First tooth blunt tipped and larger than following seven acute subequal teeth. Lower border of orbit with 'V'-shaped cleft at the outer angle.

Chelipeds sub-equal, anterior border of merus with four and posterior border with two spines, both borders fringed with hairs. Upper surface of merus more or less granulated, a terminal spine on the ventral side of merus. Carpus with the usual spine to which joins a carina arising from the proximal end of the segment, another shorter carina arising from the proximal end of carpus but not reaching the distal end of the segment and not terminating in a spine. Propodus with seven distinct ridges, three on dorsal surface of which the innermost being granular, strongest and with a fringe of hairs along the inner side and terminating in a spine. Two ridges on the outer side of propodus, the lower entering the fixed finger. Two ridges on the inner side of propodus less distinct than those on the outer side. Dactylus longer than upper border of propodus.

Antero-external angle of merus of external maxilliped produced laterally.

Penultimate segment of male abdomen longer than broad with its sides converging distally.

*Remarks*: The lone specimen in the present collection is provisionally identified as *P. samoensis* since it shows the following differences from *P. argentatus* (A. Milne Edwards): (1) absence of a spot on dactylus of natatory leg, (2) presence of fringes of hairs on antero-lateral border of carapace and chelipeds, (3) relatively longer terminal segment of male abdomen and (4) shape of first male pleopod (refer Edmondson, 1954 for figures of male pleopod and male abdomen and photograph of *P. argentatus*).

#### DISTRIBUTION OF BRACHYURA IN THE MANDAPAM AREA

The Gulf of Mannar and Palk Bay around Mandapam, termed here as Mandapam area (refer Map 1), present diverse ecological habitats (refer Plate II, Figs. 3-5) including the luxuriant growth of corals, each with a distinct fauna of its own. During the present investigation, an attempt was made to study the branchyuran fauna in its natural environment. In this part of the study, the term sub-terrestrial is used to indicate those forms which are exposed at least during the ebb tide, and aquatic, those which are always confined to the area below the low tide mark. Mention must also be made that only typical and conspicuous species are dealt with here; the rare, and forms of doubtful distribution are omitted.

#### AQUATIC

##### Sandy:

*Matuta lunaris*, *M. planipes*, *Philyra scabriuscula*, *Portunus pelagicus*, *P. sanguinolentus* and *P. hastatoides*.

##### Beneath and among Rocks:

*Schizophrys aspera*, *Micippa thalia*, *M. philyra*, *Thalamita crenata*, *T. prynna*, *Charybdis* (*Charybdis*) *helleri* and *C. (Charybdis) natator*.

## Among Sea Weeds:

*Menaethius monoceros*, *Aulacolambrus hoplonotus* and *Thalamita integra*.

## SUBTERRESTRIAL

## Rocky Coast:

*Grapsus albolineatus* and *Plagusia depressa* var. *tuberculata*.

## Sandy:

*Ocypode ceratophthalma*, *O. macrocera*, *O. cordimana*, *O. platytarsis*, *Dotilla myctiroides* and *Scopimera proxima*.

## Broken Coral Rocks:

*Metopograpsus frontalis*, *Percnon planissimum*, *Leptodius exaratus*, *Atergatis intergerrimus*, *Etisus (Etisus) laevimanus*, *Eriphia sebana*, *Pilumnus vespertilio* and *Menippe rumphii*.

## Marshy:

*Uca annulipes*, *U. marionis* var. *nitidus*, *Macrophthalmus depressus*, *Scopimera pilula*, *Metopograpsus thukuar* and *Sesarma plicata*.

## Commensal on Corals:

*Trapezia areolata*, *Tetralla glaberrima*, *Chlorodiella nigra*, *Cymo melanodactylus*, *C. andreossyi* and *Phymodius monticulosus*.

## Other Commensals:

*Pseudodromia integrifrons* within ascidian.

*Harrovia albolineata* on crinoid.

*Pinnotheres ridgewayi* inside *Pinna* sp.

*P. deccanensis* within *Holothuria scabra* Jäger.

## ACKNOWLEDGEMENTS

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## DISCUSSION

- Dr. R. Serene: How do you consider your collections as rich since you have described only 88 species in your account?
- Dr. C. Sankarankutty: I only mentioned that the area is rich in fauna. It may be noted here that earlier works in this area have revealed a large number of species; as for example in 1906 Laurie has recorded 208 species of Brachyura from the Gulf of Mannar.

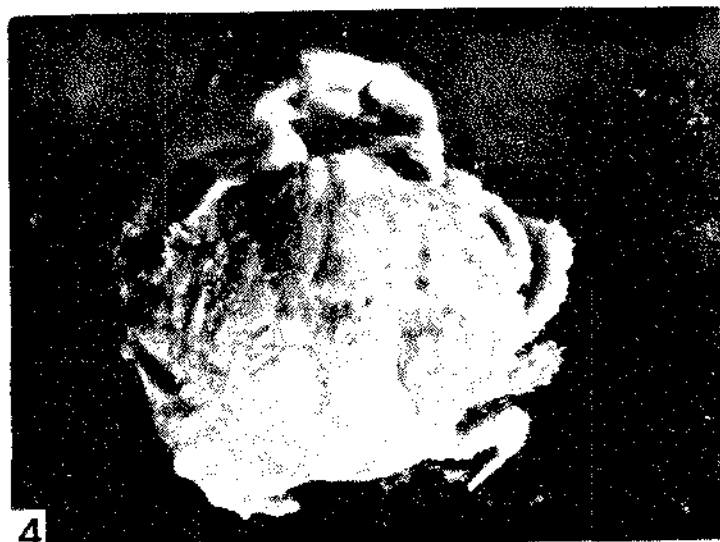
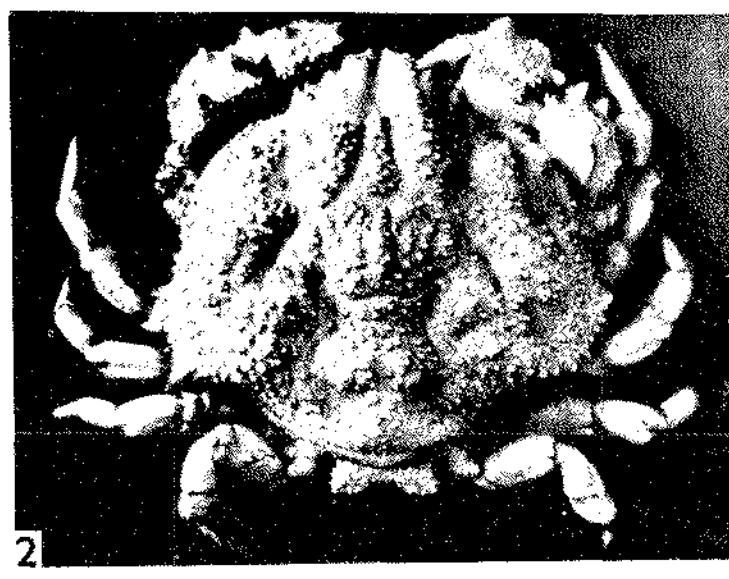
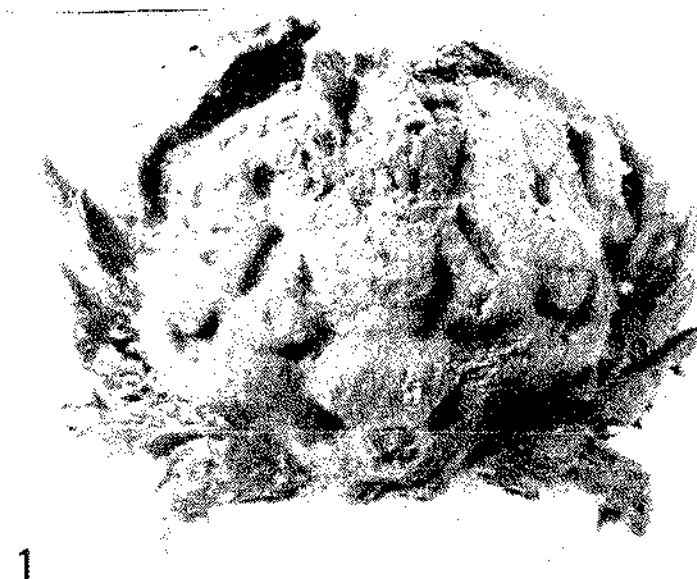
## EXPLANATION TO PLATES I AND II

## PLATE I

FIGS. 1-4. Figs. 1 and 2. *Zalasia dromiaeformis* (de Haan). Fig. 3. *Z. horii* Miyake. Fig. 4. *Z. indica* new species.

## PLATE II

FIGS. 1-5. Fig. 1. *Charybdis (Charybdis) anisodon*. Fig. 2. *Portunus pubescens*. Fig. 3. Large expanse of marshy area at Kundugal Point exposed during ebb tide. Fig. 4. Sand-stone rock formations inhabited by *Grapsus albolineatus* and *Plagusia depressa* var. *tuberculata*. Fig. 5. Dilapidated granite pier in the Gulf of Mannar close to the C.M.F.R. Institute colonised by *Grapsus albolineatus* and *Plagusia depressa*.



FIGS. 1-4



FIGS 1-5