

CUMACEA FROM THE VISAKHAPATNAM COAST, EAST COAST OF INDIA

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ABSTRACT

The paper deals with a collection of Cumacea from 40-60 m depth, off Visakhapatnam, from a sandy and clayey ground obtained in 1980. Out of the ten species dealt with six have been previously collected from the Indian Coasts. *Pseudosymphodomma indica* Kurian, *Cyclaspis cingulata* Calman, *Iphinoe calmani* Fage and *I. macrobrachium* Calman were previously obtained from the east coast of India, while *Eocuma lata* Calman, *E. striata* sp. nov., *Cyclaspis levis* Thompson, *Iphinoe serrata* Norman and *Makrokyllindrus (Coalescuma) fistularis* (Calman) are new records from the Indian Coast. Family Bodotriidae predominates in the collection and *I. calmani* is the most common species in the region.

INTRODUCTION

THE CUMACEA dealt with in this paper are from the benthic collections obtained using Petersen grab from a depth of 40-60 m (sand and clay ground) during 1980. There are 40 specimens and they are identified to 10 species. *Eocuma striata* is described as a new species and the females of *Makrokyllindrus (Coalescuma) fistularis* (Calman) is recorded for the first time.

All identified specimens are deposited at the Zoological Survey of India, Calcutta.

The above specimens were made available for our study by late Prof. P. N. Ganapati of Andhra University. The work was carried out as a part of the Emeritus Scientist's programme (ICAR) at the Pelagic Fisheries Laboratory of OMFRI, Cochin.

Family : BODOTRIIDAE

Sub-family : VAUNTHOMPSONIINAE

Pseudosymphodomma indica Kurian

Sub family : BODOTRIINAE

Eocuma lata Calman

Eocuma travancoricum Kurian

Eocuma striata sp. nov

Cyclaspis levis Thompson

Cyclaspis cingulata Calman

Iphinoe calmani Fage

Iphinoe serrata Norman

Iphinoe macrobrachium Calman

Family : DIASTYLIDAE

Makrokyllindrus (Coalescuma) fistularis
Calman)

Pseudosymphodomma indica Kurian

Pseudosymphodomma indica Kurian 1954, *Rec. Indian Mus.*, 52, parts 2-4 ; 299-302, figs. 9, 10.

Locality: Off Visakhapatnam, 40-60 m, ground: sand and clay, 1 immature ♂, 10.2 mm.

Immature male (Fig. 1): Closely resembles type specimen. Carapace one-fifth of total length. Pseudorostrum very short. A distinct dorso-median carina present with a well

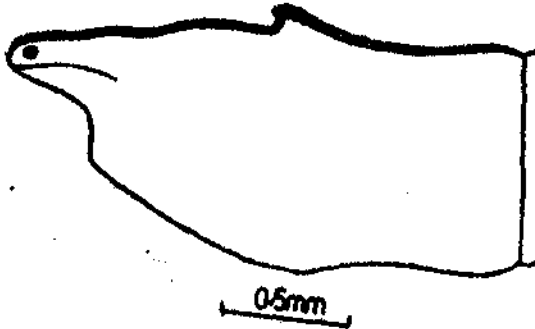


FIG. 1. *Pseudosymphodomma indica* Kurian: Side view of carapace of immature male.

marked blunt tooth projecting forward in median line. First pedigerous segment distinct, devoid of carina, second, third and fourth with dorso-median carinae. Third maxilliped with apical process well produced. First peraeopod long, basis shorter than combined length of the other segments, with two short plumose setae on apical region, propodus very long, carpus only one-third of propodus, dactylus three-quarters propodus with setae on inner margin.

Pleopods poorly developed. Fifth pleon somite twice as long as telsonic somite, well produced in between uropods. Peduncle long, with twenty-nine short and long spines on inner margin, endopod slightly shorter than exopod, more than half of peduncle, first joint slightly shorter than second, with fourteen spines; second with nine spines and three unequal terminal spines; exopod, three quarters the peduncle, with numerous plumose setae on inner margin and setae on outer margin.

The adult male specimen obtained previously from Kilakarai has a smooth crest devoid of serrations while the ovigerous fema

had a dentate crest on the carapace. The present young specimen from the east coast of India shows a clear blunt tooth projecting forward on the carapace.

Distribution: Kilakarai in Ramnad Dist.

Eocuma lata Calman

Eocuma lata Calman 1907. *Trans. Zool. Soc., London*, 18(1): 22-23, pl. 6, figs. 7-12. Gamo 1958, *Zool. Mag., Tokyo*, 67, 12, pp. 383-385, Fig. 1.

Eocuma latum Kuran 1954. *Rec. Indian Mus.*, 52, parts 2-4, pp. 285-287, fig. 3.

Locality: Off Visakhapatnam, 40-60 m, ground: sand and clay, 1 ♀ 4 mm and 2 immature ♂♂, 4.1 and 5.2 mm.

Female: Carapace with well marked lateral carinae. Lateral cornua well developed and tips directed forwards. Pseudorostral lobes distinctly rounded. Antero-lateral tooth not visible or very short and region between pseudorostral lobe and lateral cornua nearly straight (triangular tooth, Calman 1907, rounded knob-like projection, Kurian 1954). Median carina slightly developed. Surface of carapace with reticulate texture.

Basis of first peraeopod shorter than combined length of remaining segments, terminal process projects forward and produced to a long plumose seta; propodus slightly longer than carpus. Second peraeopod shorter than third. Abdominal segments cylindrical; telsonic somite only slightly shorter than previous segment.

Uropods show differences from type description, peduncle one-third the subequal exopod and endopod, with four or five plumose setae, endopod with nine plumose setae and three spinules, exopod with three short plumose setae, ends more or less blunt, with a swelling near its terminal region.

Immature male : Resembles female in most of characters. Carapace little shorter than that of female. Median carina more prominent in male, which continued upto fifth pleon somite. This is absent in the pedigerous segments in case of female. Peduncle of uropod with five plumose setae ; endopod with eleven plumose setae and three spinules, exopod with four plumose setae.

Distribution : Gulf of Siam, 10-20 m, Trivandrum 24 m, Hatusima, Off Yosihama, Japan 20 m.

***Eocuma travancoricum* Kurian**

Eocuma travancoricum Kurian 1951. *Bull. Centr. Res. Inst. Univ. Travancore*, (CE) 2 (1): 97-99, pl. 2, figs. 16-23.

Locality : Off Visakhapatnam, 40-60 m, ground : sand and clay, 1 ovigerous ♀ 6.7 mm.

setae on its inner margin and terminal region. First leg not very long, basis broad, remaining segments slender, last two segments reach beyond lateral horns. Second peraeopod shorter than telsonic somite. Peduncle of uropod less than half length of telsonic somite with three or four plumose setae. Uropods broken. Numerous eggs present.

Distribution : Trivandrum, from surface to 30 m.

***Eocuma striata* sp. nov.**

Locality : Off Visakhapatnam, ground : sand and clay 40-60 m, 1980, 1 ♀ 5.5 mm.

Female (Figs. 2, 3) : Integument of body opaque, strongly calcified. Surface of carapace finely pitted. Under high magnification carapace shows minute shallow pits which are arranged to form a fine reticulated texture

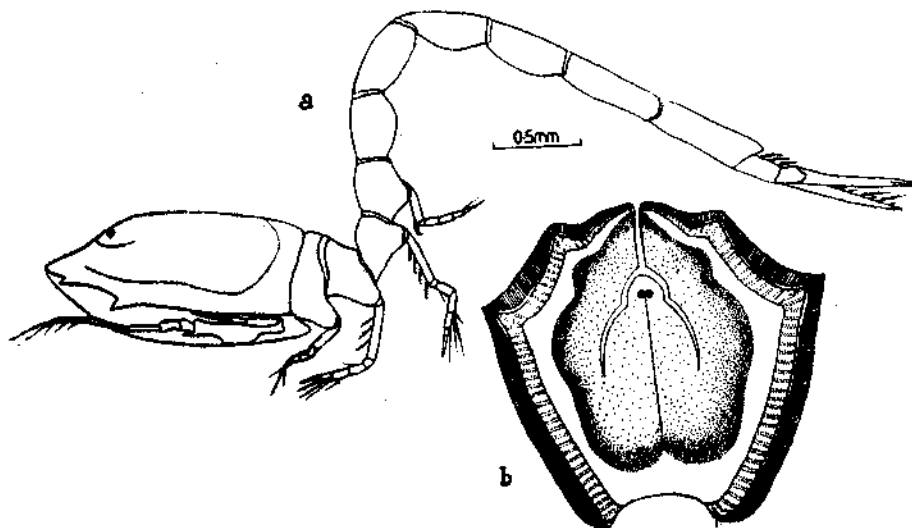


FIG. 2 a. *Eocuma striata* sp. nov. — female and b. Dorsal view of carapace.

Ovigerous female : Closely agreed with type description. Lateral cornua horn-like situated behind level of eye lobe. Carapace rigid, covered with hairs and tubercles. All segments of third maxilliped broad except slender dactylus. Propodus bears numerous

Lateral margins of carapace and pleural plates of thoracic somites are lamellate, rather opaque, beset with many short striated texture.

Pseudorostral lobes slightly in advance of triangular tooth at antero-lateral margin.

Lateral cornua short and directed forwards. Space between antero-lateral tooth and lateral horn concave. Anterior portion of carapace in between lateral cornua as wide as length of carapace. Lateral carinae well marked and extend posteriorly where they turn dorsalwards and meet dorso-median carina. Dorso-median carina is well marked and continued upto fifth pleon somite. Side of carapace striated and striation very clear in anterior region.

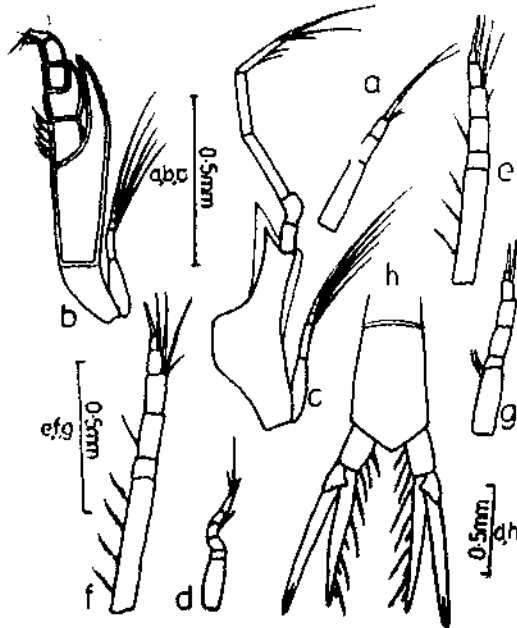


FIG. 3. *Eocuma striata* sp. nov. — female; a. First antenna, b. Third maxilliped, c. First pereopod, d. Second pereopod, e. Third pereopod, f. Fourth pereopod, g. Fifth pereopod and h. Uropod.

First pedigerous segment fused with carapace. Abdomen long, one and three fourth times longer than carapace, segments long and cylindrical. Fifth pleon somite and telsonic somite equal in length, but telsonic somite broader.

First segment of peduncle of antennule longer than other two combined; second and third sub-equal. Main flagellum three-

segmented and accessory flagellum very minute. Basis of third maxilliped has a long terminal lobe extending upto merus which also expanded terminally; ischium and merus sub-equal; ischium has short plumose seta on its inner margin.

Basis of first pereopod shorter than length of remaining joints combined together. It is produced forwards, ischium and merus sub-equal and short; carpus, propodus and dactylus slender, last two being subequal. Dactylus has two or three long terminal spines.

Second pereopod very short; basis shorter than rest of joints combined together; carpus slightly shorter than merus or sub-equal, has three terminal setae; propodus with a terminal seta which reaches beyond terminal setae of dactylus. Inner margin of basis has plumose setae.

Fourth pereopod similar to third, but slightly long. Fifth pereopod short, but longer than second; basis shorter than remaining joints combined together; dactylus short with a terminal spine.

Peduncle of uropod short, less than half of exopod, with three plumose setae in inner margin. Endopod, slightly shorter than exopod, has four plumose setae and three spinules. Exopod without any setae; terminal end bifid.

Remarks: The present species is distinguishable from other known species of the genus *Eocuma* by its unique shape of carapace which is very wide. The opaque integument with strong calcified and pitted reticulated texture of the carapace shows some resemblance to *Eocuma amakusensis*. Gamo, but its carapace is not broad as in the present species. The lateral carina is characteristic, posteriorly it joins with the carina which is very distinct unlike in all other species of *Eocuma* and is continued upto the fifth pleon somite. Moreover the distinct striated texture

of the sides of the carapace is a specific character of this species which distinguishes it from all other related species of the genus.

Cyclaspis levis Thompson

Cyclaspis levis Thompson 1892. *J. Limn. Soc. Zool. London*, 24: 264, pl. 16, figs. 1-6, pl. 17, figs. 7-26. Stebbing 1913. *Das Tierreich*, 39: 32-33. Jones 1963, *N. Z. Dept. Sci. Indust. Res. Bull.*, 152: 28-30, fig. 42.

Locality: Off Visakhapatnam, 40-60 mm, ground: sand and clay, 1 ♀ 2.3 mm.

Female: Carapace granular. Basis of first peraeopod as long as other segments combined together, a long apical plumose seta on basis; carpus and propodus sub-equal; dactylus little longer than carpus or propodus. Fifth pleon somite twice as long as telsonic somite. Peduncle of uropod slightly serrated on inner margin. Endopod with five spines posteriorly and an apical spine; exopod slightly longer than endopod, with four or five setae on inner margin.

Distribution: New Zealand.

Cyclaspis cingulata Calman

Cyclaspis cingulata Calman 1907. *Trans. Zool. Soc. London*, 18 (1): 7, 15, pl. 14, figs. 1-10. Stebbing 1913, *Das Tierreich*, 39: 36-37. Kurian 1954, *Rec. Indian Mus.*, 52: (2-4): 278.

Locality: Off Visakhapatnam, 40-60 mm, ground: Sand and clay, 4 ♀♀ (3 ovigerous), 3.2-4.3 mm.

Female: Closely resembles type description. Characteristic collar-like ridge well marked, pseudorostrum very short. Antero-lateral margin of carapace near free end of collar ridge with a tooth, projecting forward. Dorso-median keel extends from fifth peraeon somite to fifth pleon somite. Telsonic somite well produced in between uropods and as long as peduncle as in specimens recorded

from S. India by Kurian (peduncle distinctly shorter than telsonic somite, Calman 1907). Endopod of uropod longer than exopod and peduncle, with three spines as in type description (eight to eleven, Kurian 1954) and tapers to a sharp point. Exopod as long as peduncle with two short spines and two unequal terminal spines.

Distribution: Gulf of Siam, Kilakarai in Ramnad Dist. (S. India).

Iphinoe calmani Fage

Iphinoe calmani Fage 1945. *Arch. Zool. exp. gen.*, 84 (3): 189, Figs. 15-19. Kurian 1954, *Rec. Indian Mus.*, 52 (2-4): 276-277, figs. 1 a & b.

Locality: Off Visakhapatnam, 40-60 mm, ground: sand and clay, 8 ♂♂ (3 immature), 4.1-5.0 mm, 13 ♀♀ (5 ovigerous), 2.8-4.9 mm.

Male: Carapace one-fifth of total length; no teeth on carapace. First peraeopod very long and slender; basis half of remaining segments combined together. Peduncle of uropod less than twice as long as endopod and exopod, with eleven spines, and two or three rows of short plumose setae in posterior region. First joint of endopod broad with four short and four long spines, second with seven to twelve spines. Exopod with six to eleven plumose setae on inner margin and seven setae externally, with four long apical setae.

Ovigerous female: Four prominent teeth on carapace; first one large and separated from rest by a wide space. Peduncle of uropod with eleven spines on inner border, first joint of endopod with four spines; terminal being long and stout, second joint with eight spines and three unequal terminal setae, exopod with six or seven plumose setae on inner margin.

Distribution: Annam, Andaman Islands.

***Iphinoe serrata* Norman**

Iphinoe serrata Norman 1867. *Rep. Brit. Ass. Sci.*, 36 : p. 201. Fage 1951, *Fauna de France*, 54, Paris, pp. 49-52, figs. 43-45. Jones, *Discovery Rep.*, 27 : 287.

Locality : Off Visakhapatnam, 40-60 m, ground : sand and clay, a ovigerous ♀ 3.5 mm.

Ovigerous female : Thirteen teeth on median carina of carapace. Basis of first peraeopod long and denticulated on outer margin ; carpus, propodus and dactylus sub-equal. Inner margin of bases of all peraeopods provided with numerous plumose setae. Peduncle of uropod with ten inner marginal spines ; exopod and endopod sub-equal, three quarters the peduncle. First joint of endopod with three strong spines and a long apical spine, second joint with nine marginal spines and three unequal terminal setae ; exopod with seven plumose setae on inner margin, four apically and two on external margin.

Distribution : British Islands, Mediterranean, Bay of Naples.

***Iphinoe macrobrachium* Calman**

Iphinoe macrobrachium Calman 1904. *Ceylon Pearl oyster fish. Rept.*, 12 : 173, pl. 4, figs. 72-75. Jones 1955. *Discovery Rep.*, 27 : 287.

Locality : Off Visakhapatnam, 40-60 m, ground : sand and clay, 1 ovigerous ♀, 3.3 mm.

Ovigerous female : Calman's description of this species is based on an immature specimen and hence certain details observed in the ovigerous female are included here.

Carapace only one-fourth of total length pseudorostrum short and lobes meet above ocular lobe. First antennal peduncle three-segmented, third being longest. Basis of third maxilliped broad and shorter than other segments combined together, produced terminally with two long plumose setae at its apex

and three on inner margin ; merus expanded into a broad lobe with numerous plumose setae in its margin.

Basis of first peraeopod less than half length of remaining segments combined together carpus and propodus sub-equal, dactylus shorter and slender than propodus, with four inner marginal setae and three unequal terminal spines. Second peraeopod shorter than third, dactylus longer than carpus and propodus combined together, with numerous setae on sides.

Telsonic somite well produced in between uropods. Peduncle of uropod with six spines endopod, longer than exopod, two joints sub-equal (proximal joint nearly half as long again as distal segment - Calman), first joint with four spines and distal with two marginal spines and three unequal terminal spines. Exopod with four setae on inner margin and five on outer margin along with three on terminal region.

Remarks : Calman's immature specimen has a close resemblance to *I. crassipes* Hansen. But the adult specimens of *I. macrobrachium* described here and the specimens from Vizhinjam described by Radhadevi (1983) show that it is a distinct species having many dissimilarities in the nature of the maxilliped, peraeopod and uropod when compared to *I. crassipes* Hansen.

Distribution : Gulf of Mannar, Cheval Paar, Kondatchi Paar.

***Makrokyllindrus (Coalescuma) fistularis* (Calman)**

Diastylis (?) fistularis Calman 1911. *Trans. Zool. Soc. London*, 18 (4) : 383-385, figs. 26-36.

Calman (1911) divided the family Diastylidae into nine genera mainly on the basis of the length of the telson. Stebbing (1912) classified the species coming under Diastylidae

considering the length of the post-anal part of the telson and he created a new genus *Makrokyllindrus* which has very short-post-anal part. Bacescu (1962) identified a sub-genus *Coalescuma* under *Makrokyllindrus* depending upon the union of the third and fourth pedigerous segments which are free in the subgenus *Makrokyllindrus*. The present species which was originally described by Calman as *Diastylis fistularis* comes under the subgenus *Coalescuma*. Calman identified only one immature male specimen, whereas in the present collection both immature males and ovigerous females are present.

Locality: Off Visakhapatnam, ground: sand and clay, 40-60 m, 1980, 4 ♂♂ (immature) 3.6-4.7 mm, 2 ♀♀ (Ovigerous) 4.5 mm.

Immature male: Carapace one-third of total length. Antennal notch hardly indicated, antero-lateral angle highly concave. Carapace has a superficial resemblance to

distally and produced into a lobe which reaches upto carpus, with numerous thickly packed plumose setae. Exopod present as a knob with a few setae.

Basis of first peraeopod slightly broad at its proximal end and distally provided with numerous long plumose setae. Carpus, propodus and dactylus slender, propodus longer than carpus and thrice as long as dactylus.

Basis of second peraeopod broad at middle, slightly shorter than other segments combined together, with numerous short setae on convex margin; ischium very short, propodus one-seventh of carpus.

Third and fourth peraeopods similar in structure, basis slightly shorter than remaining segments combined together; merus half of basis, carpus less than half of merus, dactylus very short; carpus with four or five plumose setae terminally and propodus with one.

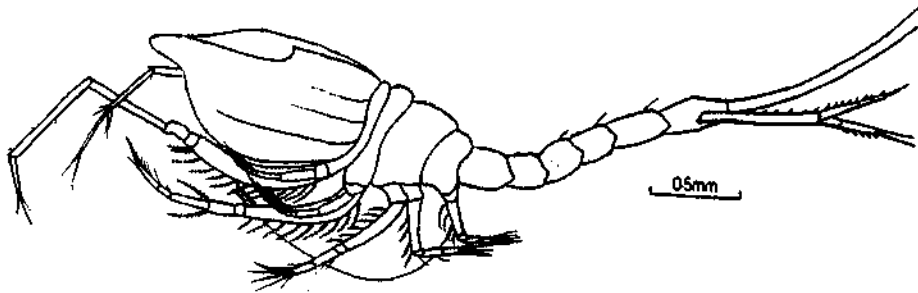


FIG. 4. *Makrokyllindrus (Coalescuma) fistularis* (Calman) — Ovigerous female.

that of *Dinorphostylis*, pseudorostrum acutely pointed. Longitudinal ridges faintly marked. Anteriorly on each side is a vertical ridge forming 'a marked shoulder when viewed from above' (Calman, 1911). Ocular lobe with corneal lenses distinct.

First pedigerous segment short, partly concealed laterally. Third and fourth coalesced dorsally which is characteristic of subgenus. First antenna closely resembles type description. Basis of third maxilliped expanded

Basis of fifth peraeopod short, merus longer than carpus, with three terminal setae and propodus with one.

Telson very long, longer than last four pleon segments combined together, cylindrical in form bluntly pointed at tip, without any spine or setae. Peduncle of uropod only half of telson with four very short spines. Exopod more than half of peduncle. Endopod slightly longer than exopod, three-jointed, first joint longer than other two combined together.

Spines arranged in order 3, 1, and 1 and one terminal spine. Exopod, broader than endopod, has five spines on external margin and two unequal terminal spines and two short setae on inner margin at distal part; both exopod and endopod are highly serrated on both margins.

Ovigerous female (Figs. 4, 5): Longitudinal ridges on lateral side of carapace

anterior half. When viewed from above vertical ridges form a marked shoulder as in males.

First, segment of peduncle of antennule longer than second or third. Main flagellum two-jointed and accessory single. Third maxilliped without an exopod, carpus terminally has a long plumose seta.

Third and fourth pedigerous segments

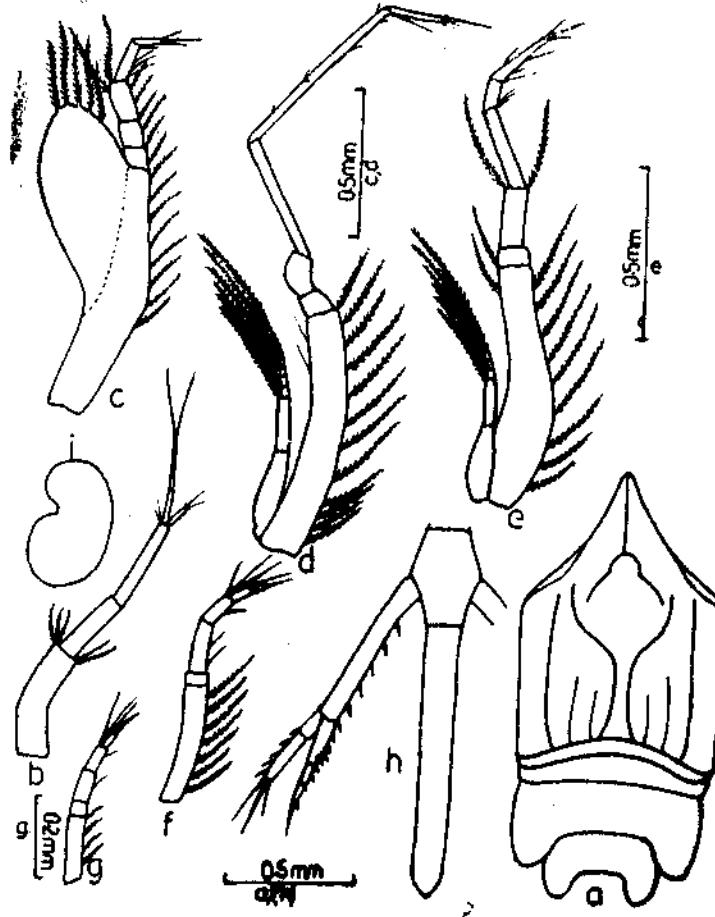


FIG. 5. *Makrokyllidrus (Coalescuma) fistularis* (Calman) — Ovigerous female: a Dorsal view of carapace, b. First antenna, c. Third maxilliped, d. First paraeopod, e. Second paraeopod, f. Third paraeopod, g. Fifth paraeopod, h. Uropod with telson and i. Egg.

more distinct than in male. Dorso-ventral longitudinal ridges lying in between lateral ridges are short and thin and they do not reach

united. Peraeopods similar to that of male. Pleon longer than cephalothorax including telson. Dorso-median keel seen on first to

fifth pleon somites. Fifth pleon somite slightly longer than telsonic somite which in turn slightly widened at postero-lateral side.

Telson twice as long as peduncle of uropod, bluntly pointed at tip, without any spines. Peduncle with six spines on inner margin. Endopod of uropod more than half of

peduncle, first joint longer than other two, spines arranged in order 5, 2 & 1 and a long terminal. Exopod little shorter than endopod, with two long terminal spines and five spines on external margin.

Fifteen matured ova of 0.3 mm long are seen in one of the ovigerous females.

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