

## Decapod Crustacea : Raninidae

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## ABSTRACT

Nine species of frog crabs of the family Raninidae were collected during the 1976 and 1980 MUSORSTOM cruises to the Philippines and the 1980 CORINDON II cruise in Makassar Strait. A proposed new genus, *Lysirude* (containing 3 species) is described and separated from the closely related genus *Lyreidus*. Five species (*Raninoides hendersoni*, *R. personatus*, *Lyreidus tridentatus*, *L. stenops* and *Lysirude channeri*) are represented by numerous specimens with far fewer specimens of *Cosmonotus grayi*, *Notopoides latus*, *Lyreidus brevifrons* and *Lysirude griffini* sp. nov. present.

## RÉSUMÉ

Neuf espèces de Crabes de la famille des Raninidae ont été récoltées au cours des campagnes MUSORSTOM 1976 et 1980 aux Philippines et de la campagne CORINDON II dans le détroit de Macassar. Un nouveau genre *Lysirude* (avec trois espèces) est décrit et séparé du genre très proche *Lyreidus*. Cinq espèces (*Raninoides hendersoni*, *R. personatus*, *Lyreidus tridentatus*, *L. stenops* et *Lysirude channeri*) sont représentées par de nombreux spécimens, tandis que d'autres (*Cosmonotus grayi*, *Notopoides latus*, *Lyreidus brevifrons* et *Lysirude griffini* sp. nov.) ne comprennent qu'un nombre moins élevé d'échantillons.

The Raninidae of the Philippines are a diverse group well represented in the MUSORSTOM collections. Species of this fossorial group collected in the Philippines were most recently detailed by SERÈNE and UMALI (1972) and SERÈNE and VADON (1981). This contribution presents a systematic review of the Philippine species with an updated key to the recognized species of frog crabs known from the region.

## List of Stations

## MUSORSTOM I

- Station 1. — 18.03.1976, 14°28,0' N, 120°42,0' E, 36-37 m : *Raninoides hendersoni*, *R. personatus*.  
 Station 2. — 19.03.1976, 14°02,8' N, 120°18,8' E, 182-187 m : *Raninoides personatus*.  
 Station 5. — 19.03.1976, 14°01,5' N, 120°23,5' E, 200-215 m : *Raninoides personatus*.  
 Station 9. — 19.03.1976, 14°01,8' N, 120°17,6' E, 180-194 m : *Lyreidus tridentatus*.  
 Station 11. — 20.03.1976, 13°59,8' N, 120°23,7' E, 217-230 m : *Raninoides personatus*, *Lyreidus tridentatus*, *Lysirude griffini*.  
 Station 16. — 20.03.1976, 13°59,0' N, 120°10,5' E, 150-164 m : *Lyreidus stenops*.  
 Station 20. — 21.03.1976, 13°59,2' N, 120°20,3' E, 208-222 m : *Lyreidus tridentatus*.  
 Station 21. — 21.03.1976, 14°01,0' N, 120°22,8' E, 174-223 m : *Raninoides personatus*.  
 Station 24. — 22.03.1976, 14°00,0' N, 120°18,0' E, 189-209 m : *Lyreidus tridentatus*.  
 Station 25. — 22.03.1976, 14°02,7' N, 120°20,3' E, 191-200 m : *Raninoides personatus*, *Cosmonotus grayi*, *Lyreidus tridentatus*.  
 Station 26. — 22.03.1976, 14°00,9' N, 120°16,8' E, 189 m : *Cosmonotus grayi*, *Lyreidus tridentatus*.  
 Station 27. — 22.03.1976, 13°59,8' N, 120°18,6' E, 188-192 m : *Lyreidus tridentatus*.

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- Station 30. — 22.03.1976, 14°01,3' N, 120°18,7' E, 177-186 m : *Lyreidus tridentatus*.  
 Station 31. — 22.03.1976, 14°00,0' N, 120°16,0' E, 187-195 m : *Lyreidus tridentatus*, *L. stenops*.  
 Station 32. — 23.03.1976, 14°02,2' N, 120°17,7' E, 184-193 m : *Lyreidus tridentatus*.  
 Station 34. — 23.03.1976, 14°01,0' N, 120°15,8' E, 188-191 m : *Lyreidus tridentatus*.  
 Station 35. — 23.03.1976, 13°59,0' N, 120°18,5' E, 186-187 m : *Lyreidus tridentatus*.  
 Station 36. — 23.03.1976, 14°01,2' N, 120°20,2' E, 187-210 m : *Raninoides personatus*, *Lyreidus tridentatus*.  
 Station 40. — 24.03.1976, 13°57,4' N, 120°27,8' E, 265-287 m : *Lyreidus tridentatus*.  
 Station 43. — 24.03.1976, 13°50,5' N, 120°28,0' E, 448-484 m : *Raninoides hendersoni*.  
 Station 45. — 24.03.1976, 13°46,0' N, 120°23,8' E, 100-180 m : *Raninoides hendersoni*, *R. personatus*.  
 Station 50. — 25.03.1976, 13°49,2' N, 120°01,8' E, 415-510 m : *Lyreidus tridentatus*, *L. brevifrons*.  
 Station 51. — 25.03.1976, 13°49,4' N, 120°04,2' E, 170-200 m : *Lyreidus tridentatus*.  
 Station 55. — 26.03.1976, 13°55,0' N, 120°12,5' E, 194-200 m : *Lyreidus tridentatus*, *Cosmonotus grayi*.  
 Station 56. — 26.03.1976, 13°53,1' N, 120°08,9' E, 129-134 m : *Raninoides hendersoni*, *Cosmonotus grayi*.  
 Station 61. — 27.03.1976, 14°02,2' N, 120°18,1' E, 184-202 m : *Lyreidus tridentatus*, *L. stenops*.  
 Station 62. — 27.03.1976, 13°59,5' N, 120°15,6' E, 179-194 m : *Lyreidus tridentatus*.  
 Station 64. — 27.03.1976, 14°00,5' N, 120°16,3' E, 194-195 m : *Cosmonotus grayi*.  
 Station 65. — 27.03.1976, 14°00,0' N, 120°19,2' E, 194-202 m : *Lyreidus tridentatus*.  
 Station 68. — 27.03.1976, 14°00,8' N, 120°17,4' E, 183-199 m : *Lyreidus tridentatus*.  
 Station 69. — 27.03.1976, 13°58,8' N, 120°17,3' E, 187-199 m : *Lyreidus stenops*, *Notopoides latus*.  
 Station 71. — 28.03.1976, 14°09,3' N, 120°26,2' E, 174-204 m : *Cosmonotus grayi*, *Lyreidus tridentatus*, *L. brevifrons*, *L. stenops*.  
 Station 72. — 28.03.1976, 14°11,8' N, 120°28,7' E, 122-127 m : *Raninoides hendersoni*, *Lyreidus stenops*.

## MUSORSTOM II

- Station 1. — 20.11.1980, 14°00,3' N, 120°19,3' E, 188-198 m : *Lyreidus tridentatus*.  
 Station 2. — 20.11.1980, 14°01,0' N, 120°17,1' E, 184-186 m : *Lyreidus tridentatus*.  
 Station 4. — 20.11.1980, 14°01,2' N, 120°18,4' E, 183-190 m : *Lyreidus tridentatus*, *L. stenops*.  
 Station 10. — 21.11.1980, 14°00,1' N, 120°18,5' E, 188-195 m : *Lyreidus tridentatus*.  
 Station 11. — 21.11.1980, 14°00,4' N, 120°19,7' E, 194-196 m : *Lyreidus tridentatus*.  
 Station 12. — 21.11.1980, 14°01,0' N, 120°19,7' E, 197-210 m : *Lyreidus tridentatus*.  
 Station 18. — 22.11.1980, 14°00,0' N, 120°18,6' E, 188-195 m : *Lyreidus tridentatus*.  
 Station 20. — 22.11.1980, 14°00,9' N, 120°18,1' E, 185-192 m : *Lyreidus tridentatus*.  
 Station 21. — 22.11.1980, 14°00,2' N, 120°17,8' E, 191-192 m : *Lyreidus tridentatus*.  
 Station 25. — 23.11.1980, 13°39,0' S, 120°42,6' E, 550-520 m : *Lysirude channeri*.  
 Station 26. — 23.11.1980, 13°49,6' N, 120°51,0' E, 299-320 m : *Lysirude griffini*.  
 Station 36. — 24.11.1980, 13°31,4' N, 121°23,9' E, 569-595 m : *Lysirude channeri*.  
 Station 39. — 25.11.1980, 13°02,8' N, 122°37,1' E, 1 030-1 190 m : *Lysirude channeri*.  
 Station 40. — 25.11.1980, 13°07,7' N, 122°39,1' E, 280-340 m : *Lyreidus brevifrons*.  
 Station 41. — 25.11.1980, 13°15,3' N, 122°45,9' E, 166-172 m : *Raninoides personatus*.  
 Station 44. — 26.11.1980, 13°23,2' N, 122°20,7' E, 760-820 m : *Lysirude channeri*.  
 Station 46. — 26.11.1980, 13°25,7' N, 122°17,0' E, 445-520 m : *Lysirude channeri*, *Lyreidus brevifrons*.  
 Station 49. — 26.11.1980, 13°38,4' N, 121°44,1' E, 416-425 m : *Lysirude channeri*, *Lyreidus brevifrons*.  
 Station 50. — 27.11.1980, 13°36,7' N, 120°33,7' E, 810-820 m : *Lysirude channeri*.  
 Station 51. — 27.11.1980, 13°59,3' N, 120°16,4' E, 170-187 m : *Lyreidus stenops*.  
 Station 52. — 27.11.1980, 14°00,7' N, 120°18,7' E, 181-190 m : *Lyreidus stenops*, *L. tridentatus*.  
 Station 57. — 28.11.1980, 13°51,9' N, 120°03,6' E, 156-182 m : *Notopoides latus*.  
 Station 62. — 29.11.1980, 14°00,4' N, 120°17,0' E, 186-189 m : *Lyreidus tridentatus*.  
 Station 63. — 29.11.1980, 14°07,3' N, 120°15,0' E, 215-230 m : *Lyreidus tridentatus*.  
 Station 64. — 29.11.1980, 14°01,5' N, 120°18,9' E, 191-195 m : *Lyreidus tridentatus*.  
 Station 66. — 29.11.1980, 14°00,6' N, 120°20,3' E, 192-209 m : *Raninoides personatus*, *Lyreidus tridentatus*.  
 Station 67. — 29.11.1980, 14°00,1' N, 120°18,5' E, 193-199 m : *Lyreidus tridentatus*.  
 Station 68. — 29.11.1980, 14°01,9' N, 120°18,8' E, 195-199 m : *Lyreidus tridentatus*.  
 Station 72. — 30.11.1980, 14°00,7' N, 120°19,4' E, 182-197 m : *Lyreidus stenops*, *L. tridentatus*.  
 Station 78. — 01.12.1980, 13°49,1' N, 120°28,0' E, 441-550 m : *Lyreidus brevifrons*, *Lysirude channeri*.  
 Station 80. — 01.12.1980, 13°45,1' N, 120°37,7' E, 178-205 m : *Lyreidus tridentatus*.  
 Station 82. — 02.12.1980, 13°46,1' N, 120°28,4' E, 550 m : *Lysirude channeri*.

## CORINDON II

- Station 267. — 7.11.1980, 1°56,6' S, 119°16,7' E, 186-134 m : *Cosmonotus grayi*, *Raninoides personatus*.  
 Station 271. — 7.11.1980, 1°57,8' S, 119°15,0' E, 252-215 m : *Raninoides personatus*.  
 Station 273. — 7.11.1980, 1°56,0' S, 119°16,0' E, 220-180 m : *Lyreidus stenops*, *Raninoides personatus*.  
 Station 276. — 8.11.1980, 1°54,6' S, 119°13,8' E, 450-395 m : *Lysirude channeri*.

## LIST OF SPECIES

*Cosmonotus grayi* Adams and White, 1848 :

MUSORSTOM I : St. 25, 26, 55, 64, 71.

CORINDON II : St. 267.

*Lyreidus tridentatus* de Haan, 1841 :

MUSORSTOM I : St. 9, 11, 20, 24, 25, 26, 27, 30, 31, 32, 34, 35, 36, 40, 50, 51, 55, 61, 62, 65, 68, 71.

MUSORSTOM II : St. 1, 2, 4, 10, 11, 12, 18, 20, 21, 52, 62, 63, 64, 66, 67, 68, 72, 80.

*Lyreidus brevifrons* Sakai, 1937 :

MUSORSTOM I : St. 50, 71.

MUSORSTOM II : St. 40, 46, 49, 78.

*Lyreidus stenops* Wood-Mason, 1887 :

MUSORSTOM I : St. 16, 31, 61, 69, 71, 72.

MUSORSTOM II : St. 4, 51, 52, 72.

CORINDON II : St. 273.

*Lysirude channeri* (Wood-Mason, 1885) :

MUSORSTOM II : St. 25, 36, 39, 44, 46, 49, 50, 78, 82.

CORINDON II : St. 276.

*Lysirude griffini* sp. nov.

MUSORSTOM I : St. 11.

MUSORSTOM II : St. 26.

*Notopoides latus* Henderson 1888 :

MUSORSTOM I : St. 69.

MUSORSTOM II : St. 57.

*Raninoides hendersoni* Chopra, 1933 :

MUSORSTOM I : St. 1, 43, 45, 56, 72.

*Raninoides personatus* Henderson, 1888 :

MUSORSTOM I : St. 1, 2, 5, 11, 21, 25, 36, 45.

MUSORSTOM II : St. 41, 66.

CORINDON II : St. 267, 271, 273.

## SYSTEMATIC REMARKS

### RANINIDAE de Haan, 1839

The family Raninidae has a confused systematic background and members have been assigned to many of the higher taxa within the traditional classification of the Decapoda. LINNAEUS (1758) recognized a single species, *Cancer raninus* and placed it among the *Insecta Aptera*. LAMARCK (1801 ; 1837) included this species among the Macrura and later among the Paguridea (Anomura). LATREILLE (1806) considered the group among the Oxyrhyncha of Brachyura. H. MILNE-EDWARDS (1837) included the frog crabs with the Anomura, but at a higher level than the family rank accepted by most previous authors. Subsequent workers to accept the anomuran classification were DANA (1852), who first used the familial name Raninidae, SMITH (1881) and HENDERSON (1888 ; 1898). The traditional brachyuran classification of this group within the oxystomatous crabs dates from DE HAAN (1833) and was used by ORTMANN (1892), ALCOCK (1896) and most other authors until 1922.

One of the most significant works on this family was accomplished by BOURNE (1922) who concentrated on morphological traits. He hypothesized an independent origin for the family from the Macrura and proposed the new tribe Gymnopleura for the group. Although most workers have accepted this classification (RATHBUN, 1937 ; MONOD, 1956 ; BALSS, 1957 ; GORDON, 1963 ; WILLIAMS, 1965 ; SERÈNE and UMALI, 1972), some authors (BOUVIER, 1940 ; GLAESSNER, 1960 ; 1969) have retained the oxystomatous classification based on a proposed affinity to calappid crabs.

In a recent revision of the Brachyura, GUINOT (1978) replaced the traditional groupings of the Oxystomata, Oxyrhyncha, etc., by what she considers to be more natural or monophyletic groupings. In this classification, the Raninoidea is placed within the Archaeobrachyura of the Podotremata.

SERÈNE and UMALI (1972) recognized two subfamilies within the Raninidae. The first subfamily, Notopodinae (Notopinae of SERÈNE and UMALI, 1972) is composed of three recent genera with the remaining (except *Symethis*) seven genera assigned to the Ranininae. GOEKE (1981) created a third subfamily, the Symethinae, for the American genus *Symethis*. These groupings are based on the structure of the pleopod one of males and the direction of retraction of the eyestalks. The distinction between the Ranininae and the Notopodinae is not supported by the structure of the spermathecae of females (GOEKE, 1981).

### RANININAE de Haan, 1839

Ranininae de Haan, 1839 : 102 ; Dana, 1852 : 400 ; SERÈNE and UMALI, 1972 : 34 ; SAKAI, 1976 : 47.

#### REMARKS

The nominate subfamily, Ranininae, is defined by SERÈNE and UMALI (1972) as encompassing *Ranina* Lamarck, 1801, *Lyreidus* de Haan, 1841, *Notopoides* Henderson, 1888, *Raninoides* H. Milne-Edwards, 1837, *Notosceles* Bourne, 1922, *Cyrtorhina* Monod, 1956 and *Symethis* Weber, 1795. Since that report *Symethis* has been removed to the subfamily Symethinae Goeke, 1981, and the proposed new genus, *Lysirude*, is grouped within the Ranininae. This subfamily is an amalgam with few genera closely related to each other. As noted by SERÈNE and UMALI (1972 : 34) after their further subdivision of the Ranininae into 4 subgroups, "each of these groups can justify the establishment of distinct sub-families".

*Lyreidus* de Haan, 1841 (sensu stricto).

*Lyreidus* de Haan, 1841 : 138 ; ALCOCK, 1896 : 294 ; SAKAI, 1937 : 168 (in part) ; 1976 : 53 (in part) ; GRIFFIN, 1970 : 93 (in part).

Type species : *Lyreidus tridentatus* de Haan, 1841 ; by monotypy.

## REMARKS

In his recent revision of the genus *Lyreidus* (sensu lato), GRIFFIN (1970) recognized 5 valid species, four of which are distributed in the western Pacific Ocean and adjacent waters. A single species, *Lyreidus nitidus* (A. Milne-Edwards, 1880) (= *Lyreidus bairdii* Smith, 1881) is represented in the western Atlantic. Depths to 770 m are reported by GRIFFIN (1970 : 109) for the western Pacific species of this genus. I have examined specimens of *Lyreidus nitidus* from depths of possibly 820 m.

*Lyreidus tridentatus* de Haan, 1841.

(Fig. 1).

*Lyreidus tridentatus* de Haan, 1841 : 140 ; HENDERSON, 1888 : 33 ; ORTMANN, 1892 : 574 ; SAKAI, 1934 : 283 ; 1937 : 169 ; 1976 : 53 ; GRIFFIN, 1970 : 94 ; SERÈNE et VADON, 1981 : 121.

*Lyreidus elongatus* Miers, 1879 : 46.

*Lyreidus australiensis* Ward, 1933 : 377.

*Lyreidus fossor* Bennett, 1964 : 24.

## MATERIAL

## MUSORSTOM I

St. 9, 180-194 m : 1 ♂, 23.7 mm. — St. 11, 217-230 m : 1 ♂, 25.1 mm. — St. 20, 208-222 m : 1 ♀, 24.0 mm. — St. 24, 208-222 m : 1 ♀, 32.0 mm. — St. 25, 191-200 m : 1 ♂, 3 ♀♀, 35.4-45.6 mm. — St. 26, 189 m : 1 ♀, 26.5 mm. — St. 27, 188-192 m : 1 ♀, 17.9 mm. — St. 30, 177-186 m : 1 ♂, 2 ♀♀, 28.3-31.0 mm. — St. 31, 187-195 m : 1 ♂, 2 ♀♀, 23.0-30.6 mm. — St. 32, 184-193 m : 1 ♂, 1 ♀, 24.2-24.6 mm. — St. 34, 188-191 m : 2 ♂♂, 5 ♀♀, 23.7-48.1 mm. — St. 35, 186-187 m : 1 ♂, 29.9 mm. — St. 36, 187-210 m : 1 ♂, 1 ♀, 31.7-42.5 mm. — St. 40, 265-287 m : 1 ♂, 50.6 mm. — St. 50, 415-510 m : 1 ♂, 30.7 mm. — St. 51, 170-200 m : 1 ♂, 1 ♀, 30.4-44.9 mm. — St. 55, 196-200 m : 1 ♀, 14.5 mm. — St. 61, 184-202 m : 1 ♂, 29.8 mm. — St. 62, 179-194 m : 1 ♂, 14.7 mm. — St. 65, 194-202 m : 2 ♂♂, 43.2-51.2 mm. — St. 68, 183-199 m : 1 ♂, 36.4 mm. — St. 71, 174-204 m : 4 ♂♂, 25.8 mm.

## MUSORSTOM II

St. 1, 188-198 m : 1 ♀, 18.5 mm. — St. 2, 184-186 m : 2 ♂♂, 41.8-49.5 mm. — St. 4, 190-183 m : 1 ♂, 11.3 mm. — St. 10, 188-195 m : 1 ♂, 18.2 mm. — St. 11, 196-194 m : 1 ♂, 2 ♀♀, 11.7-30.8 mm. — St. 12, 197-210 m : 1 ♂, 2 ♀♀, 20.4-30.0 mm. — St. 18, 188-195 m : 9 ♂♂, 3 ♀♀, 11.8-43.0 mm. — St. 20, 185-192 m : 3 ♂♂, 11.8-46.2 mm. — St. 21, 191-192 m : 2 ♂♂, 4 ♀♀, 15.2-50.2 mm. — St. 52, 181-190 m : 5 ♂♂, 17.7-24.5 mm. — St. 62, 186-189 m : 3 ♂♂, 20.3-29.8 mm. — St. 63, 215-230 m : 2 ♀♀, 19.2-25.1 mm. — St. 64, 191-195 m : 7 ♂♂, 4 ♀♀, 14.8-38.9 mm. — St. 66, 192-209 m : 5 ♂♂, 5 ♀♀, (1 ovig.), 14.1-34.3 mm. — St. 67, 193-199 m : 1 ♂, 3 ♀♀, 11.7-18.7 mm. — St. 68, 195-199 m : 6 ♂♂, 5 ♀♀, 11.1-30.4 mm. — St. 72, 182-197 m : 2 ♂♂, 1 ♀, 24.8-48.6 mm. — St. 80, 178-205 m : 1 ♂, 24.8 mm.

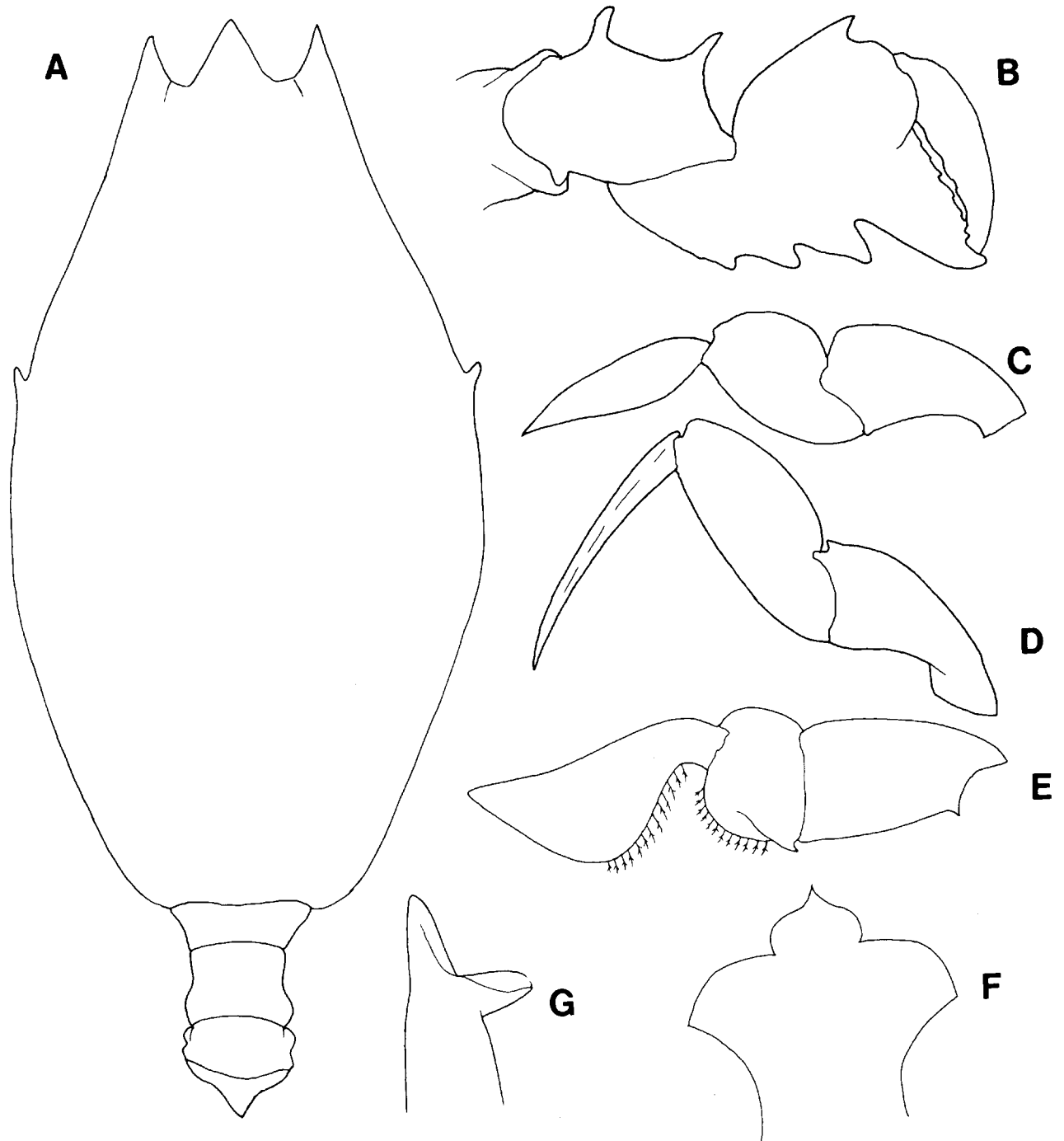


FIG. 1. — *Lyreidus tridentatus* : A, carapace ; B, outer face of cheliped ; C, terminal segments of leg 2 ; D, leg 3 ; E, leg 4 ; F, anterior sternal shield ; G, apex of male gonopod 1.

## REMARKS

*Lyreidus tridentatus* is the most abundant species of frog crab in the MUSORSTOM collection, represented by 127 individuals (72 males, 50 females). This frog crab is one of the most common raninids in the Indo-West Pacific with a geographic range from southeastern Japan, South China Sea, central Australia, Fiji, New Zealand and Hawaii (GRIFFIN, 1970 : 104). The previously reported bathymetric range of 27 to 384 m encompasses the range of 126 to approximately 287 m of the MUSORSTOM specimens.

The considerable morphological variation found in *L. tridentatus* was treated in GRIFFIN'S (1970) statistical analyses for the species. His detailed work dealt with the following features ; carapace length to carapace width, anterolateral margin length, interorbital width, post orbital spine length as well as variations in the cheliped, ambulatory dactyli, abdomen, lateral spines and the sternum. The broad variation exhibited by *L. tridentatus* may explain why this species has been described under three additional names by early authors.

*Lyreidus brevifrons* Sakai, 1937.

(Fig. 2).

*Lyreidus brevifrons* Sakai, 1937 : 171 ; 1965 : 6 ; 1976 : 54 ; GRIFFIN, 1970 : 104 ; SERÈNE and VADON, 1981 : 121.

## MATERIAL

## MUSORSTOM I

St. 50, 415-510 m : 1 ♂, 30.7 mm. — St. 71, 174-204 m : 1 ♂, 11.4 mm.

## MUSORSTOM II

St. 40, 280-340 m : 1 ♂, 1 ♀ (ovig.), 17.9-28.4 mm. — St. 46, 445-520 m : 5 ♀♀ (1 ovig.), 13.8-33.1 mm. — St. 49, 416-425 m : 1 ♂, 18.1 mm. — St. 78, 441-550 m : 1 ♂, 1 ♀, 17.9-28.4 mm.

*Lyreidus brevifrons* is represented in the MUSORSTOM collection by 12 specimens (5 males, 7 females) and range in depth from approximately 174 to 520 m. This species is known from Japan, the South China Sea, west of the Philippines and Das-es-Salaam (SAKAI, 1976). Previous bathymetric records for this species range from 50 to 415 m. Thus, the MUSORSTOM records expand the known bathymetric range by 105 m.

SAKAI (1937) listed many features which were thought to differentiate this species from *L. tridentatus*. GRIFFIN'S analysis of the wide variation found in *L. tridentatus* shows several of these features to be of little diagnostic value. GRIFFIN (1970 : 106) lists the characters he considers of use in separating these closely related species. The wide range of morphological variation of *L. tridentatus* and the sibling species nature of *L. brevifrons* makes identification of juveniles often tedious.

*Lyreidus stenops* Wood-Mason, 1887.

(Fig. 3).

*Lyreidus inermis* H. Mine-Edwards (*nomen nudum*).

*Lyreidus stenops* Wood-Mason, 1887 : 209 ; GRIFFIN, 1970 : 106 ; SAKAI, 1976 : 54 ; SERÈNE and VADON, 1981 : 121.

*Lyreidus integra* Terazaki, 1902 : 217 ; SAKAI, 1965 : 5.

*Lyreidus politus* Parisi, 1914 : 311 ; SAKAI, 1934 : 283 ; 1937 : 172.

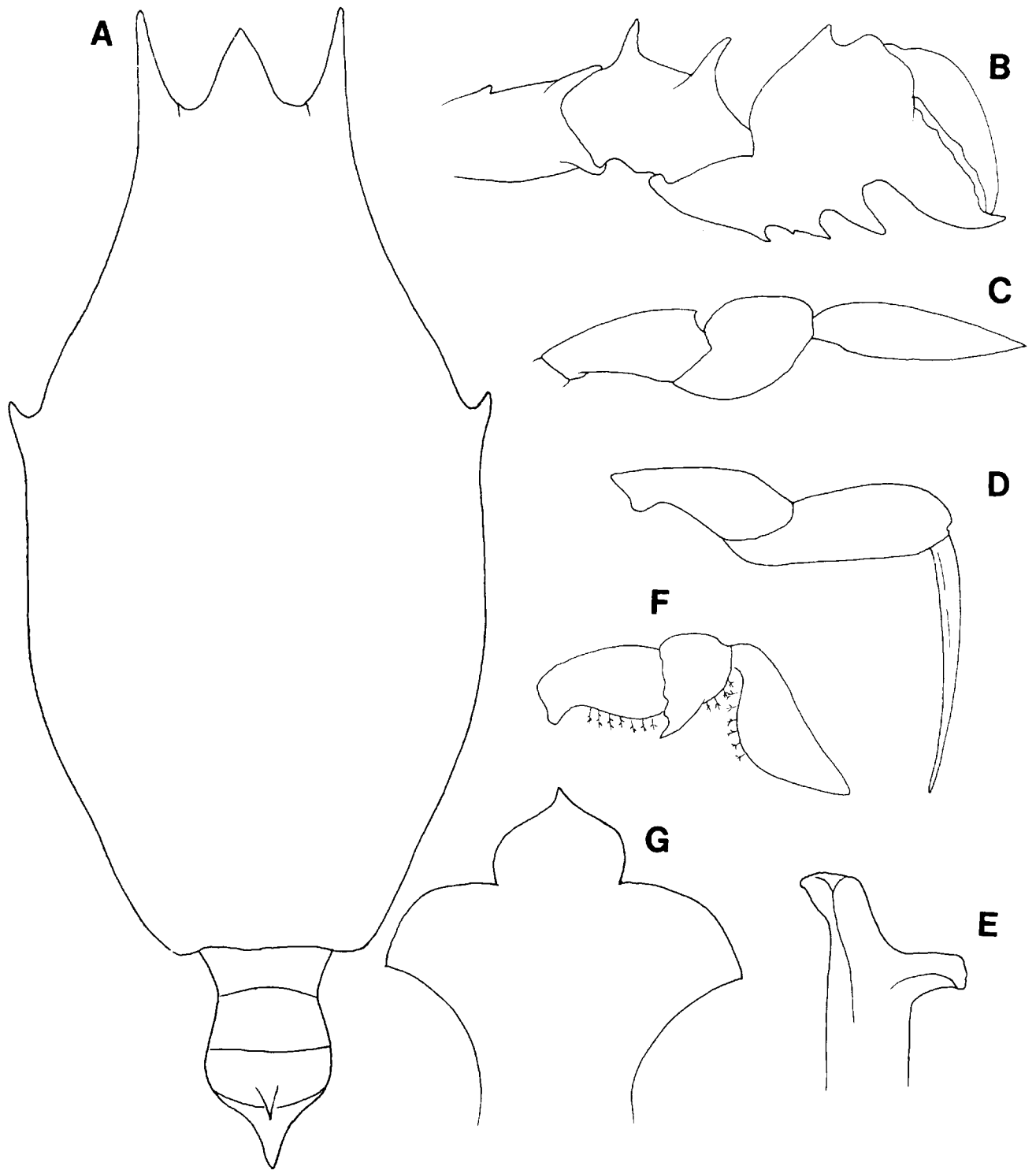


FIG. 2. — *Lyreidus brevifrons* : A, carapace ; B, outer face of cheliped ; C, terminal segments of leg 2 ; D, leg 3 ; E, apex of male gonopod 1 ; F, leg 4 ; G, anterior sternal shield.



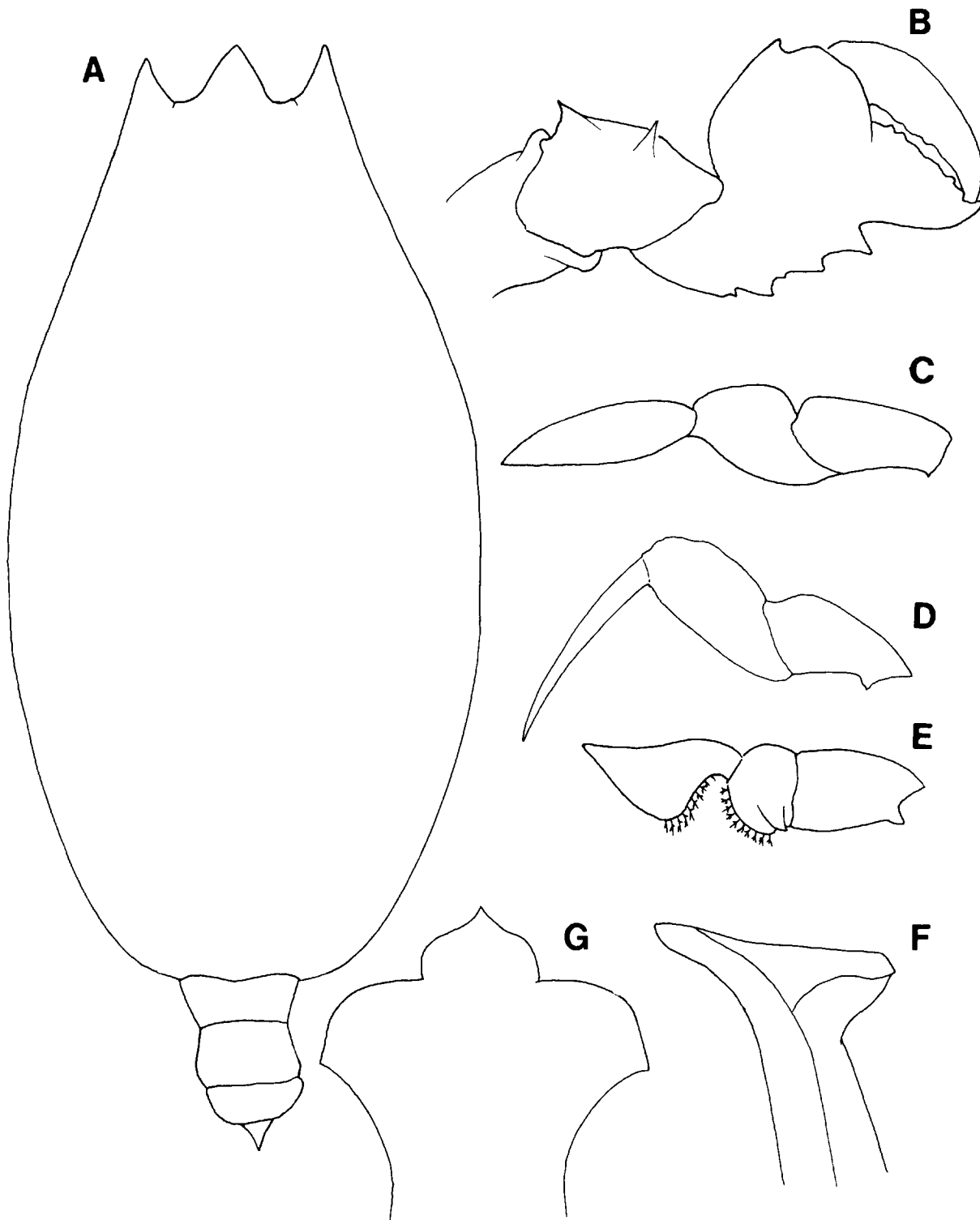


FIG. 3. — *Lyreidus stenops* : A, carapace ; B, outer face of cheliped ; C, terminal segments of leg 2 ; D, leg 3 ; E, leg 4 ; F, apex of male gonopod 1 ; G, anterior sternal shield.

## MATERIAL

## MUSORSTOM I

St. 16, 150-164 m : 3 ♂♂, 1 ♀, 43.5-61.8 mm. — St. 31, 187-195 m : 1 ♀, 36.6 mm. — St. 61, 184-202 m : 1 ♂, 26.2 mm. — St. 69, 187-199 m : 1 ♂, 1 ♀, 26.9-32.2 mm. — St. 71, 174-204 m : 1 ♂, 1 ♀, 15.6-13.1 mm. — St. 72, 122-127 m : 2 ♂♂, 10.3-13.9 mm.

## MUSORSTOM II

St. 4, 183-190 m : 1 ♂, 17.3 mm. — St. 51, 170-187 m : 1 ♂, broken. — St. 52, 181-190 m : 1 ♀, 11.3 mm. — St. 72, 182-197 m : 1 ♀, 13.9 mm.

## CORINDON II

St. 273, 220-180 m : 1 ♀, 28.3 mm.

## REMARKS

Seventeen specimens (10 males, 7 females) of *Lyreidus stenops* were collected during the MUSORSTOM expedition to the Philippines. The only previous record for this species from this region is GRIFFIN'S (1970 : 106) report of a juvenile female off Bohol, south of Panglao Island. The bathymetric range listed by GRIFFIN for *L. stenops* is from 60-140 m. The depth of the MUSORSTOM specimens (122-202 m) represents a small extension of that range.

The material at hand agrees well with previous descriptions and illustrations with the exception of the dactyl of leg three. GRIFFIN (1970 : fig. 6 H) illustrates the dactyl as moderately broad in relation to length. This dactyl of the material at hand is much narrower, more nearly the shape of the dactyl attributed by GRIFFIN to *L. tridentatus*. Otherwise the laterally unarmed specimens are assignable to *L. stenops*.

*Lysirude* gen. nov.

Diagnosis. — Orbital region tridentate, rostral spine longer than wide ; anterolateral margin of carapace granular with obsolete tooth ; posterolateral spines 1/3 distance to posterior margin ; antenna peduncle segment two stout, nearly as wide as long, segment 3 subequal in length to 2 ; sternal shield anterolaterally acute ; dactyl and propodus of leg 4 deeply lobate posteriorly.

Type-species. — *Raninoides nitidus* A Milne-Edwards, 1880 : 34.

Etymology. — *Lysirude* is an anagram of *Lyreidus* de Haan, 1841.

## REMARKS

*Lysirude* is most closely related to *Lyreidus* and three species are herein assigned to the proposed new genus ; *Raninoides nitidus* A. Milne Edwards, 1880 (= *Lyreidus bairdii* Smith, 1881) ; *Lyreidus channeri* Wood-Mason, 1885 (= *L. gracilis* Wood-Mason, 1880) ; and *Lysirude griffini*, new species.

SERÈNE and UMALI (1972 : 36) first suggested the close affinities between *Lyreidus channeri* and *Raninoides nitidus* of the western Atlantic. They stated "that the two species (may) belong to another new genus closer to *Lyreidus* than to *Raninoides*" and listed two morphological features which they thought may aid in their separation. Only one of the two features detailed by SERÈNE and UMALI is of value and, in concert with the above listed characters, define the new genus *Lysirude*.

Three of the features which most easily distinguish members of *Lysirude* are the deeply lobate dactyl and propodus of pereopod 4 (shallowly lobate and a strong spine in *Lyreidus*) and the obsolete spine on the anterolateral margin of the carapace. This spine is represented by a distinctly irregular marginal shape and often a small tubercle. Only occasionally, however, are these tubercles present as well developed spines. The anterolateral margin of *Lyreidus* (sensu stricto) is smoothly curved with only small granules in some specimens.

*Lysirude griffini* sp. nov.  
(Fig. 4 and 5).

## MATERIAL

## MUSORSTOM I

St. 11, 217-230 m : Holotype ♂.

## MUSORSTOM II

St. 26, 299-320 m : Paratypes, 1 ♂, 2 ♀♀.

Diagnosis. — Carapace generally smooth, minutely pitted, length 1.9 times width, rostral spine longer than wide, ocular spines slightly shorter than rostrum, anterolateral margin sinuous with small granules, lateral spines moderate, anteriorly curved, posterior margin subparallel, then converging with posterolateral beaded rim. Abdominal segment 3 with medial spine, segment 4 with medial boss. Pereopod 1, merus with few proximal tubercles, wrist with single dorsal spine, palm with 1 dorsal and 3 ventral spines, finger simple. Pereopod 2, carpus cristate distally, dactyl attenuate-spatulate. Pereopod 4, propodus strongly lobate posteriorly, dactyl deeply lobate. Pereopod 5 reduced. Anterolateral margins of sternal shield oblique, acute. Gonopod 1 of male apically blunt.

## REMARKS

Four specimens (2 males, 2 females) of *Lysirude griffini* were collected during the MUSORSTOM expeditions to the Philippines from depths of 217 to possibly 320 m. The proposed new species is most closely related to the Atlantic species *L. nitidus* (A. Milne-Edwards, 1880) with which it shares the small posterolateral spine, raised lateral margin of sternum between bases of pereopods 1 and 2, and similar structure of spermatheca of female. *Lysirude griffini* may be separated from *L. nitidus* by the single dorsal spine of the carpus of the cheliped (2 spines in *L. nitidus*), no proximal dorsal tubercle on arm of leg 1, longer dactyli of pereopods 2 and 3, straight upper margin of dactyl of pereopod 4 (sinuous in *L. nitidus*), single abdominal spine of segment 3 (on segment 4 in *L. nitidus*) and differences in the apex of pleopod 1. *Lysirude griffini* is easily separated from *L. channeri* by the short lateral spines.

Etymology. — It is my pleasure to name the proposed new species for D. J. G. GRIFFIN (The Australian Museum, Sydney) in recognition of his work on the genus *Lyreidus*.

*Lysirude channeri* (Wood-Mason, 1885), n. comb.  
(Fig. 6).

*Lyreidus channeri* Wood-Mason, 1885 : 294 ; ALCOCK, 1896 : 294 ; GRIFFIN, 1970 : 107.  
*Lyreidus gracilis* Wood-Mason, 1888 : 376.

## MATERIAL

## MUSORSTOM II

St. 25, 520-550 m : 1 ♂, 19.7 mm. — St. 36, 569-595 m : 16 ♂♂, 16 ♀♀, 12.7-36.3 mm. — St. 39, 1 030-1 190 m : 1 ♂, 1 ♀, 19.2-32 mm. — St. 44, 760-820 m : 2 ♂♂, 21.8-23.6 mm. — St. 46, 445-520 m : 5 ♂♂, 18.1-29.7 mm. — St. 49, 416-425 m : 9 ♂♂, 16 ♀♀, 14.0-24.6 mm. — St. 50, 810-

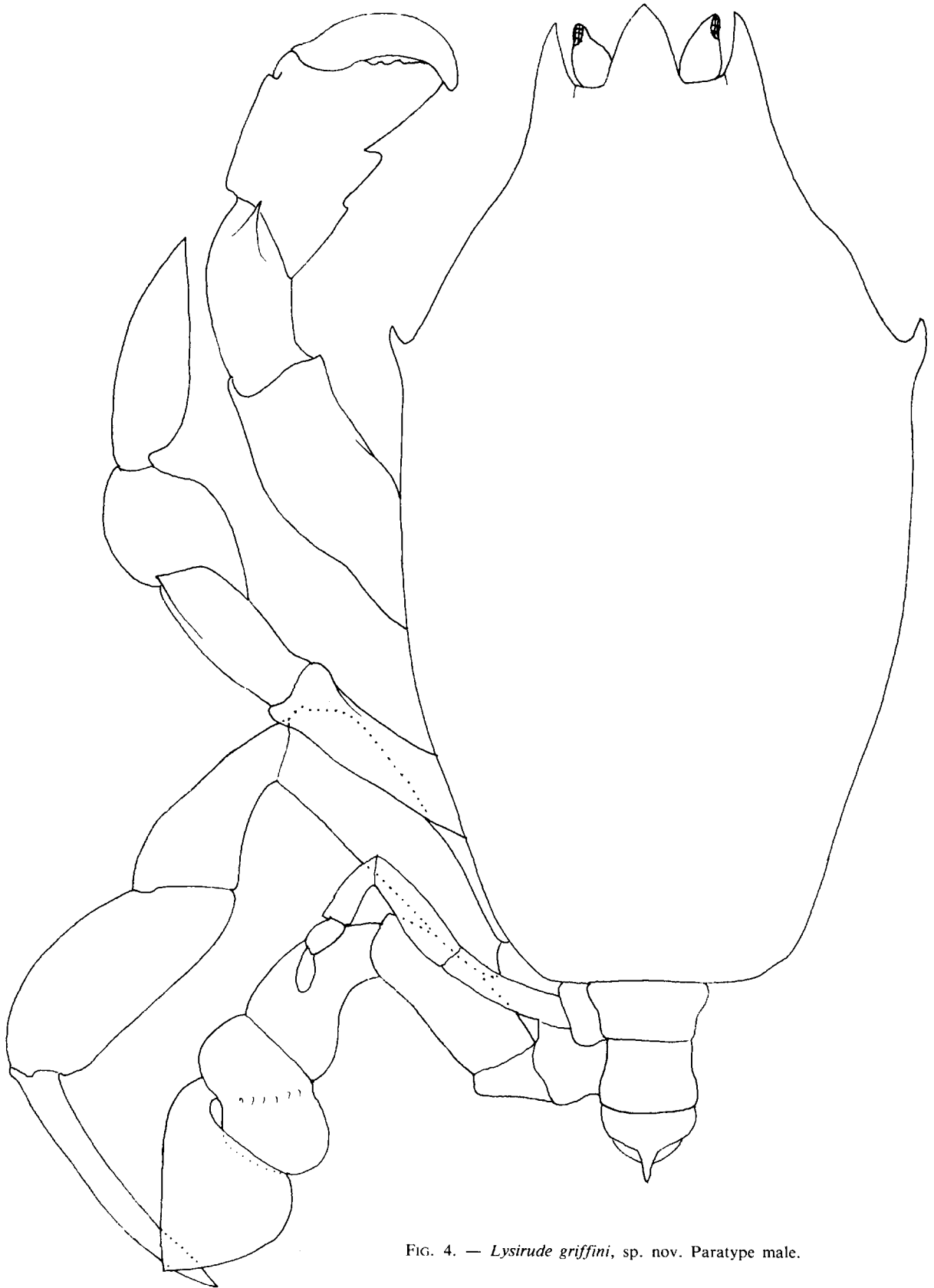


FIG. 4. — *Lysirude griffini*, sp. nov. Paratype male.

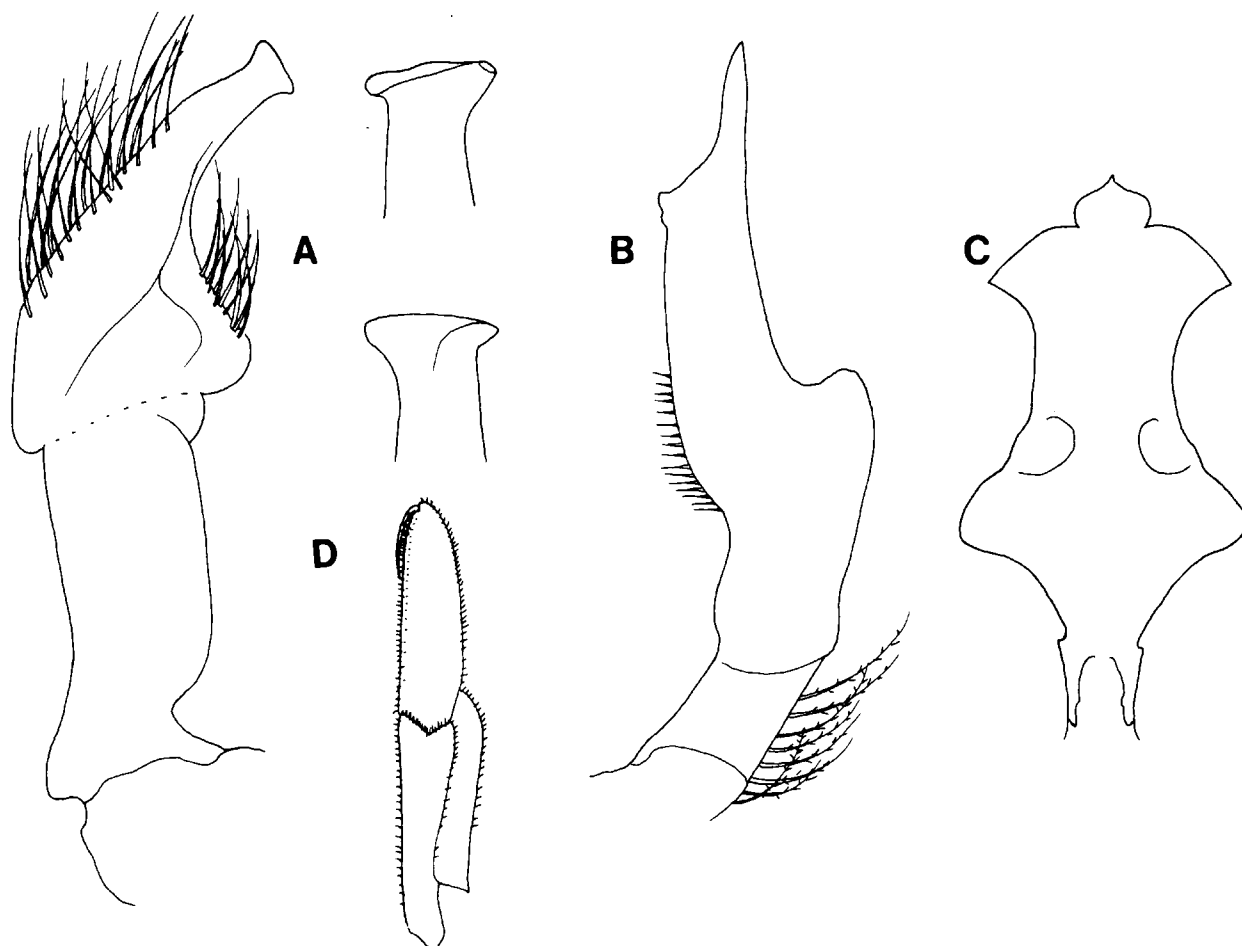


FIG. 5. — *Lysirude griffini*, sp. nov. : A, gonopod 1 of male ; 2, gonopod 2 of male ; C, sternal shield ; D, maxilliped.

820 m : 1 ♀, 18.6 mm. — St. 78, 441-550 m : 3 ♂♂, 1 ♀♀, 13.8-23.2 mm. — St. 82, 550 m : 1 ♀, 17.8 mm.

#### CORINDON II

St. 276, 08.11.1980, 450-395 m : 1 ♂, 1 ♀, 26.2-34.2 mm.

#### REMARKS

*Lysirude channeri* is represented in the MUSORSTOM collection by 75 specimens (38 males, 37 females) from depths of 410 to at least 1 030 m. This species was previously known from the northern Indian Ocean and west of the Philippines in depths to 740 m.

Morphological variation in *L. channeri* is exhibited in the form of the postorbital spines, spination of the cheliped and the occasional presence of a spine between the posterolateral spine and the postorbital spines. One male (st. 276, 8 November 1980, fig. 6 B) illustrates this variation. It possesses well developed intermediate spines on the anterolateral borders, 4 dorsal spines on the carpus of pereopod 1, two well developed spines on abdominal segments 3 and 4, and several tubercles on the proximal dorsal surface of the merus of the first leg. The presence of the intermediate anterolateral spine is also rarely seen among juveniles in the Atlantic species *L. nitidus* (GOEKE, unpublished data).

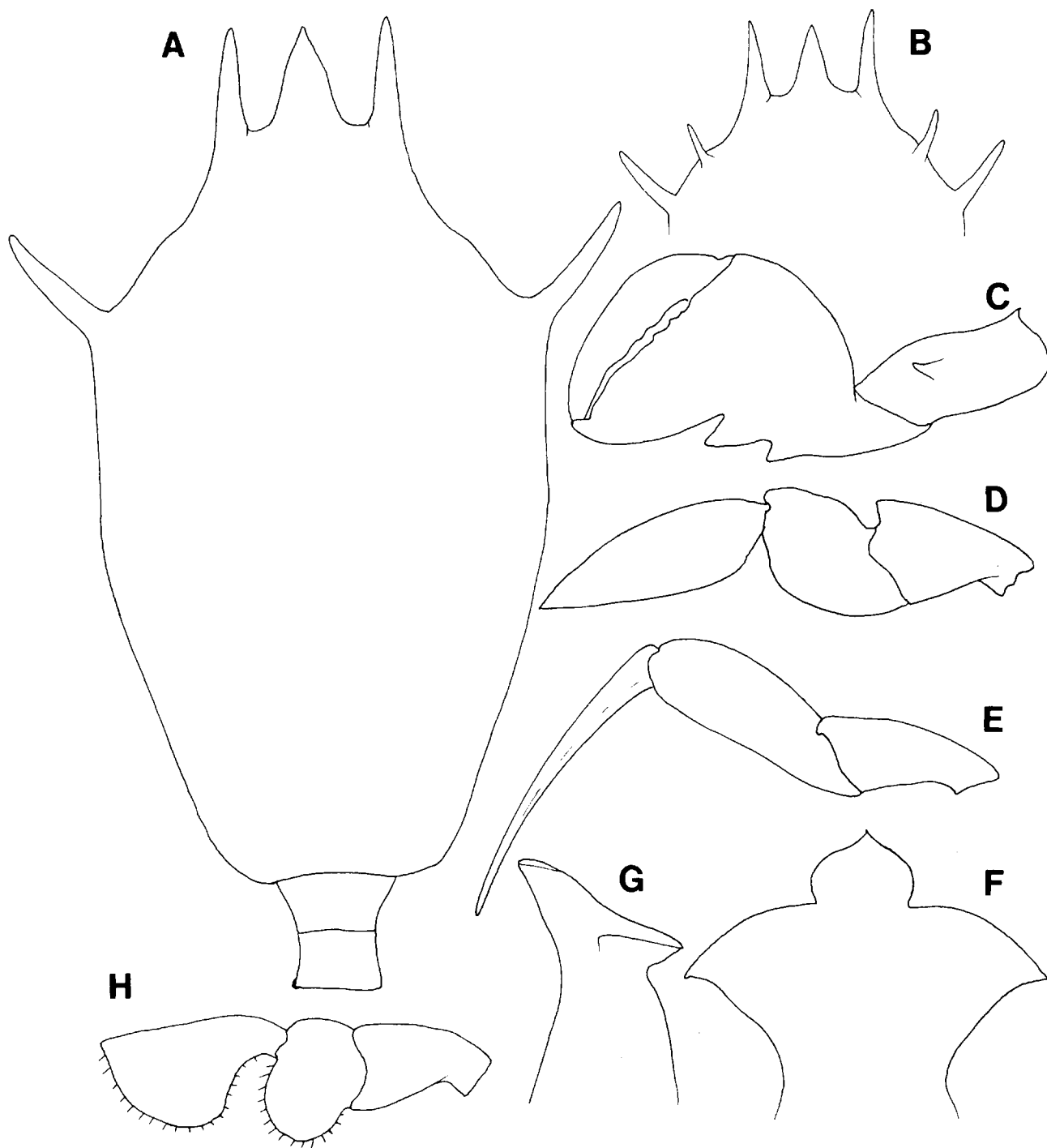


FIG. 6. — *Lysirude channeri* : A, carapace (typical) ; B, anterior of atypical carapace ; C, outer face of cheliped ; D, terminal segment of leg 2 ; E, leg 3 ; F, anterior sternal shield ; G, apex of male gonopod 1 ; H, leg 4.

As in *L. nitidus*, this intermediate spine is most often represented by a slight swelling or tubercle on the anterolateral border.

*Raninoides* Milne-Edwards, 1837.

*Raninoides* Milne-Edwards, 1837 : 196 ; ALCOCK, 1896 : 292 ; BOURNE, 1922 : 25 ; RATHBUN, 1937 : 7 ; HOLTUIS, 1959 : 184 ; GLAESSNER, 1969 : 2502 ; SERÈNE and UMALI, 1972 : 34 ; SAKAI, 1976 : 49 ; GOEKE, 1980 : 146 ; 1981 : 975.

REMARKS

Eight species of frog crabs are currently classified within the genus *Raninoides* with four additional species recently removed or shown to be junior synonyms (MANNING, 1975 ; GOEKE, 1980 ; 1981 ; 1984). Based on published descriptions, one additional species, *Raninoides barnardi* Sakai, 1974, should probably be removed to the closely related genus *Notosceles* Bourne, 1922. Recent authors (SERÈNE and UMALI, 1972 ; GOEKE, 1981) have defined the morphological characters which separate the two closely related genera. Among these features are the double crested carina on the palm of the cheliped, blunt anterolateral processes between the bases of pereopods one and two, roughly granulate anterior surface of carapace and lack of spine on ischium of cheliped in *Notosceles*. Although some disagreement persists (SAKAI 1977 : 50), I view *Notosceles* to be composed of four species : *N. chimmonis* Bourne, 1922, *N. ecuadorensis* (Rathbun, 1935), *N. serratifrons* (Henderson, 1888) and *N. viaderi* Ward, 1942. The genus *Raninoides* is viewed by me as currently containing four Atlantic, one eastern Pacific and three Indo-West Pacific species.

*Raninoides hendersoni* Chopra, 1933.

(Fig. 7).

*Raninoides hendersoni* Chopra, 1933 : 81 ; SERÈNE and UMALI, 1972 : 37.  
*Raninoides personatus*, SERÈNE and VADON, 1981 : 121 (in part).

MATERIAL

MUSORSTOM I

St. 1, 36-37 m : 1 ♂, 22.3 mm. — St. 43, 448-484 m : 2 ♀♀, 17.3-28.5 mm. — St. 45, 100-180 m : 1 ♂, 1 ♀, 23.9-27.3 mm. — St. 56, 129-134 m : 10 ♂♂, 7 ♀♀, 11.6-30.2 mm. — St. 72, 122-127 m : 2 ♂♂, 20.1-28.4 mm.

REMARKS

These specimens (12 ♂♂, 10 ♀♀) of *Raninoides hendersoni* represent one of the largest reported collections. This species was originally described from a single female gathered from the Andaman Sea (CHOPRA, 1933 : 84). The first gonopod of the male was illustrated by SERÈNE and UMALI (1972 : figs. 20-22). Their record was based on 2 specimens gathered in the Sulu Sea, a range extension of approximately 3 500 km. The MUSORSTOM material from the Philippines does not appreciably extend the geographic range for this species. However, the bathymetric range of this material (31 to at least 448 m) eclipses the previous depths of 82 to 100 m.

Specimens examined agree well with the original description of CHOPRA (1933) and the figures of SERÈNE and UMALI (1972). A minor discrepancy is noted in the condition of the anterolateral sternal shield between pereopods one and two on this species. CHOPRA (1933 : 84, text-fig. 1 b) stated the process "is distinctly seen in this species also, though it is not acutely pointed as in *R. personatus*". CHOPRA'S figure shows a broadly rounded process at that location. Our material

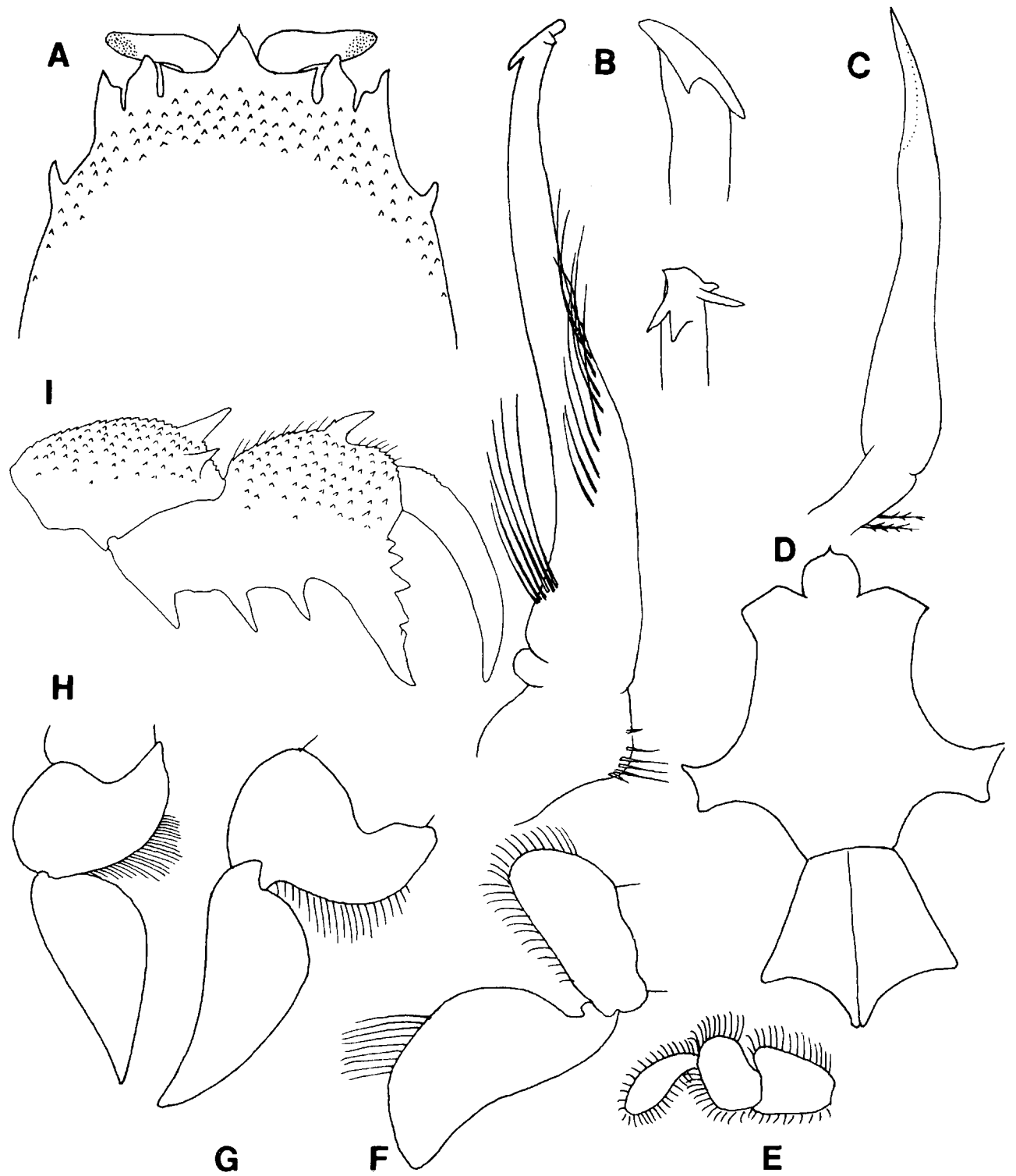


FIG. 7. — *Raninoides hendersoni* : A, anterior portion of carapace ; B, male gonopod 1 ; C, male gonopod 2 ; D, sternal shield ; E, terminal segments of leg 5 ; F, leg 4 ; G, leg 3 ; H, leg 2 ; I, outer face of cheliped.



possesses a distinctly acute process and, as has been noted, this spine is a generic character for the separation of *Raninoides* and *Notosceles* (SERÈNE and UMALI, 1972 ; GOEKE, 1981).

The morphological characters used in the identification of *R. hendersoni* were detailed by SERÈNE and UMALI (1972 : 35). These features are all well developed on the MUSORSTOM material and allow for the separation of this species from *R. personatus*.

*Raninoides personatus* Henderson, 1888.

(Fig. 8).

*Raninoides personatus* White MS : Henderson, 1888 : 27 ; ALCOCK, 1896 : 293 ; IHLE, 1918 : 317 ; BOURNE, 1922 : 73 ; CHOPRA, 1933 : 84 ; SERÈNE and UMALI, 1972 : 37 ; SERÈNE and VADON, 1981 : 121.

MATERIAL

MUSORSTOM I

St. 1, 36-37 m : 1 ♂, 1 ♀ (broken), 29.3 mm. — St. 2, 182-187 m : 1 ♂ (broken). — St. 5, 200-215 m : 1 ♂, 1 ♀, 15.2-20.6 mm. — St. 11, 217-230 m : 8 ♀♀, 24.1-27.5 mm. — St. 21, 174-223 m : 1 ♀, 31.8 mm. — St. 25, 191-200 m : 4 ♂♂, 1 ♀, 15.1-29.7 mm. — St. 36, 187-210 m : 2 ♂♂, 2 ♀♀, 22.1-31.9 mm. — St. 45, 100-180 m.

MUSORSTOM II

St. 41, 166-172 m : 9 ♂♂, ♀♀, 15.7-28.6 mm. — St. 66, 192-209 m : 4 ♂♂, 19.3-28.5 mm.

CORINDON II

St. 267, 134-186 m : 1 ♀, 21.3 mm. — St. 271, 215-252 m : 1 ♂, 3 ♀♀, 18.2-24.8 mm. — St. 273, 220-180 m : 4 ♂♂, 2 ♀♀, 1 broken, 15.0-33.7 mm.

REMARKS

*Raninoides personatus* Henderson, 1888 is a widely distributed frog crab in the Indo-West Pacific and is represented in the MUSORSTOM collection by 48 individuals (27 males and 21 females). SAKAI (1976) listed the geographic distribution of this taxon as Japan, Amboina, Bay of Bengal, western Australia and Indonesia. SERÈNE and UMALI (1972) reported this species from the Philippines based on material gathered in 93 m. Specimens gathered by the MUSORSTOM expeditions come from depths of 31 to possibly 252 m.

*Notopoides* Henderson, 1888.

*Notopoides latus* Henderson, 1888.

(Fig. 9).

*Notopoides latus* Henderson, 1888 ; GORDON, 1963 : 53 ; 1966 : 346 ; BRUCE and SERÈNE, 1972 : 76 ; SERÈNE and VADON, 1981 : 121.

MATERIAL

MUSORSTOM I

St. 69, 27.03.1976, 13°58,8' N, 120°17,3' E, 187-199 m : 1 ♂, 39.4 mm.

MUSORSTOM II

St. 57, 28.11.1980, 13°51,9' N, 120°03,6' E, 156-182 m : 1 ♂, 1 ♀ (ovig.), 25.1-29.2 mm.

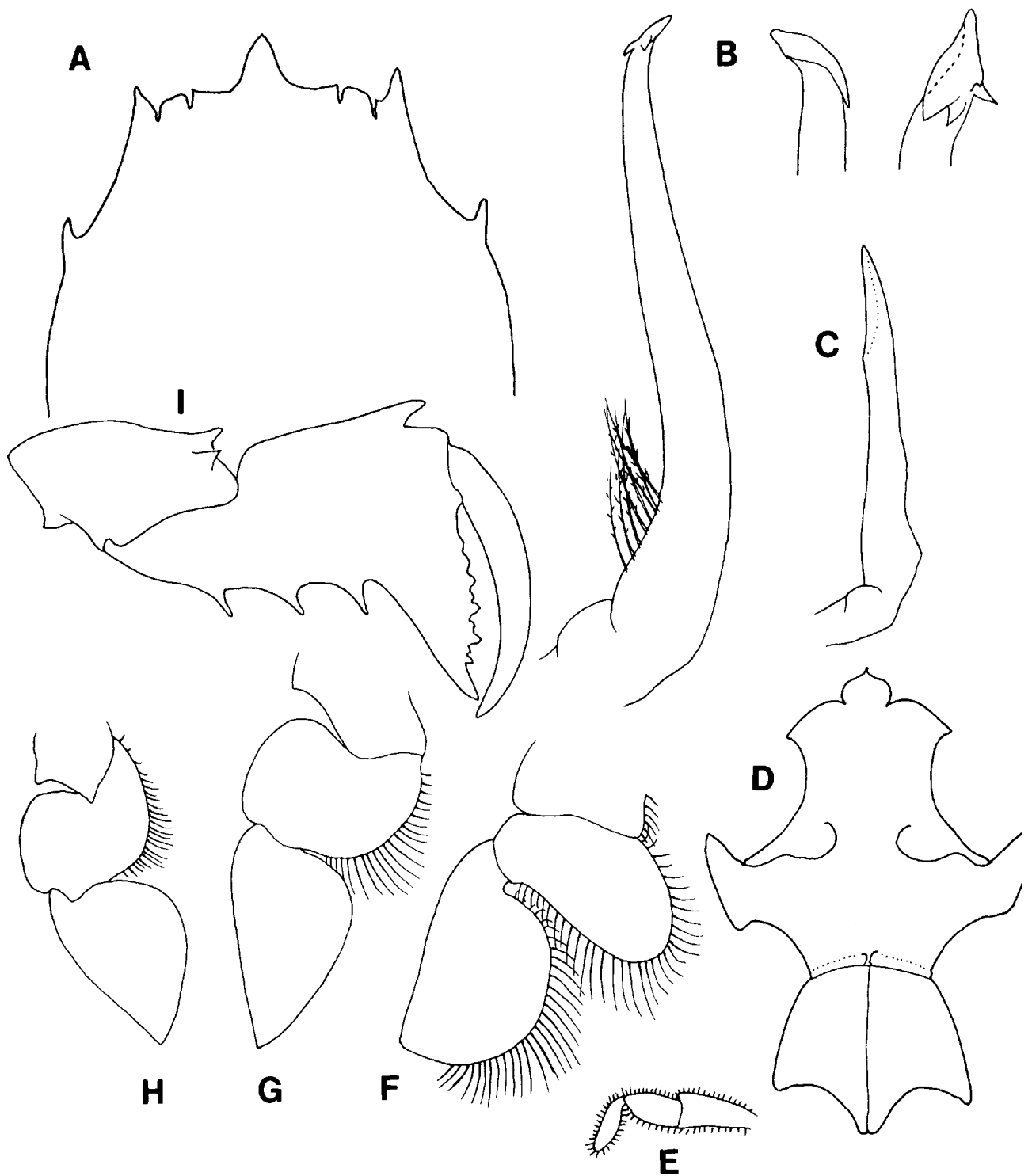


FIG. 8. — *Raninoides personatus* : A, anterior portion of carapace ; B, male gonopod 1 ; C, male gonopod 2 ; D, sternal shield ; E, terminal segment of leg 5 ; F, leg 4 ; G, leg 3 ; H, leg 2 ; I, outer face of cheliped.

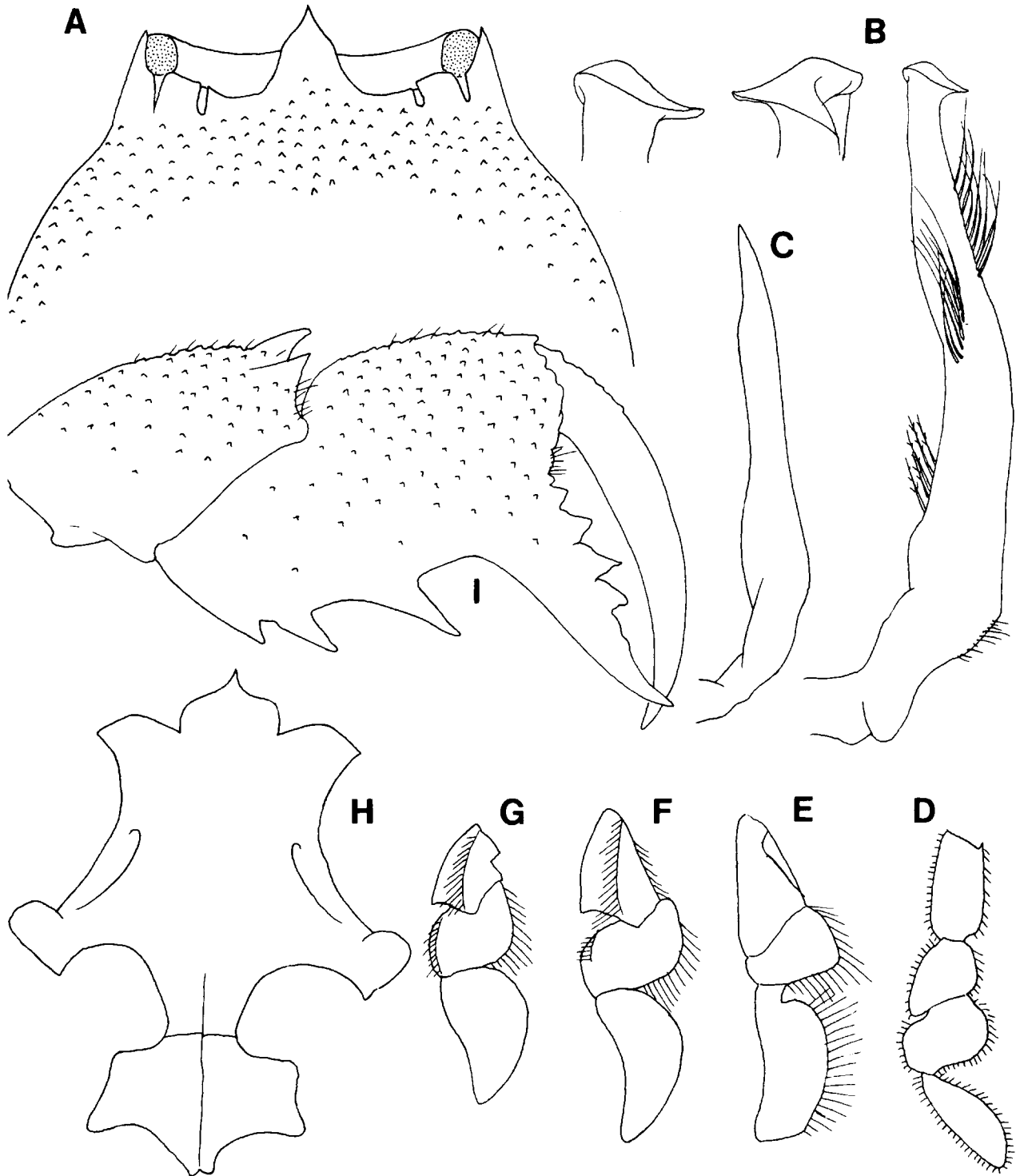


FIG. 9. — *Notopoides latus* : A, anterior portion of carapace ; B, male gonopod 1 ; C, male gonopod 2 ; D, terminal segments of leg 5 ; E, leg 4 ; F, leg 3 ; G, leg 2 ; H, sternal shield ; I, outer face of cheliped.

## REMARKS

Three specimens of the rare frog crab *Notopoides latus* Henderson, 1888 were collected during the MUSORSTOM expeditions. The 2 males and ovigerous female represent only the third reported collection of this species. BRUCE and SERÈNE (1972) noted this species off the east coast of Africa, from Kenya and Tanganyika. That record extended the known geographic range from the original collection by the "Challenger" off Little Kei Islands, Indonesia (HENDERSON, 1888). These specimens come from depths within the bathymetric ranges for *N. latus* (BRUCE and SERÈNE, 1972). Depths of 156-199 m are recorded for the MUSORSTOM specimens with previous authors recording depths of 148-255 m for their material.

The specimens examined herein conform well in all important features with the original description of HENDERSON and exhibit some of the minor variation detailed by BRUCE and SERÈNE (1972). As they stated (p. 76), "the few small morphological differences noted can probably be ascribed to growth changes". The structure of the male gonopods correspond with the illustrations of GORDON (1966).

## NOTOPODINAE Serène and Umali, 1972.

Notopinae [sic] Serène and Umali, 1972 : 29 ; SAKAI, 1976 : 54 ; GOEKE, 1981 : 975.

A single species of frog crab assignable to the subfamily Notopodinae was collected by the MUSORSTOM expeditions. The genus *Cosmonotus* Adams and White, 1848, is most closely related to *Notopus* de Haan, 1841, and *Ranilia* H. Milne-Edwards, 1837. This subfamily is defined by the downward and backward folded eye peduncle, cheliped shape, short fixed finger, and the male pleopods 1 and 2 about equal in length.

*Cosmonotus* Adams and White, 1848.*Cosmonotus grayi* Adams and White, 1848.

(Fig. 10).

*Cosmonotus grayi* Adams and White, 1848 : 60.

## MATERIAL

## MUSORSTOM I

St. 25, 191-200 m : 1 ♂, 9.7 mm. — St. 26, 189 m : 1 ♂, 8.1 mm. — St. 56, 129-134 m : 1 ♂, 5.2 mm. — St. 64, 194-195 m : 1 ♂, 6.4 mm. — St. 71, 174-204 m : 1 ♂, 1 ♀, 7.1-7.9 mm.

## CORINDON II

St. 267, 134-186 m : 1 ♀, 8.5 mm.

## REMARKS

Seven specimens, 5 males and 2 females, of the diminutive frog crab *Cosmonotus grayi* were collected during the MUSORSTOM expedition. One of the above females is from the ORSTOM collections. Depths of the material examined range from 134 to 204 m, within the range given by TAKEDA

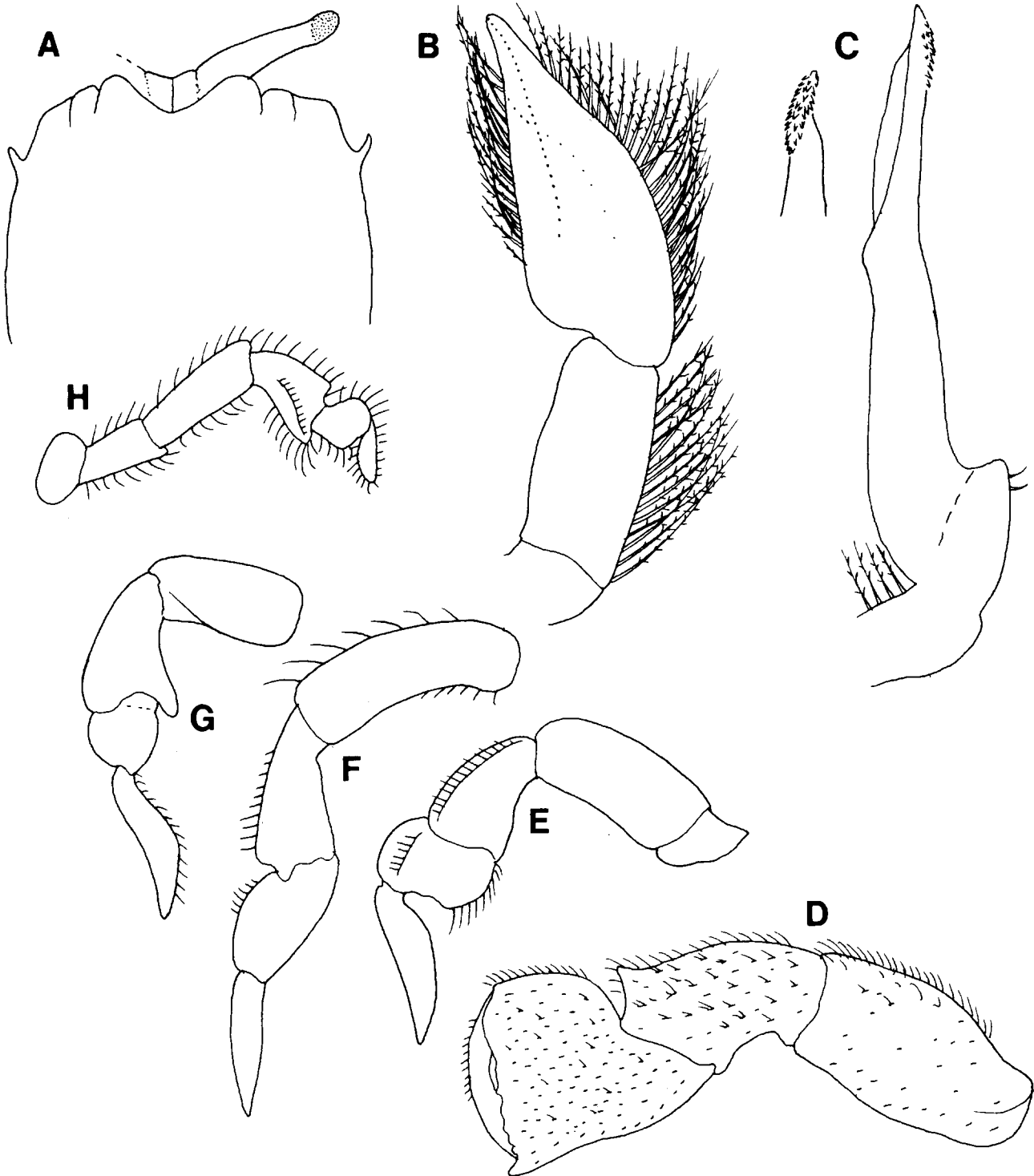


FIG. 10. — *Cosmonotus grayi* : A, anterior portion of carapace ; B, male gonopod 1 ; C, male gonopod 2 ; D, outer face of cheliped ; E, terminal segments of leg 2 ; F, leg 3 ; G, leg 4 ; H, leg 5.

(1973) of 30 to 212 m. The geographic range for this species is from Japan, Formosa, east of India, Persian Gulf, east coast of Africa to Australia (SAKAI, 1976). The possibility exists that some of these records have been based on the closely allied *C. genkaie* Takeda and Miyake, 1970. The specimens examined by me agree well with previous descriptions and illustrations.

## OBSERVATIONS

Few records of parasitism by rhizocephalans have been reported for raninid crabs. BOSCHMA (1933) described *Sacculina teres* from the type series of *Notopoides latus*, and subsequently (1970) described *Sacculina globularis* from the western Atlantic species *Raninoides lamarcki* A. Milne-Edwards and Bouvier. He stated that prior to the description of *S. globularis*, *S. teres* is "the only species that has previously become known as a parasite of a Raninid crab". Three specimens of *Lyreidus tridentatus* from the MUSORSTOM collection were noted with rhizocephalans. Preliminary identification have shown the parasite to be *S. teres*, or a closely related species. These specimens (1 ♀, cl 31.5 mm, St. 36, 23-3-1976; 1 ♂, cl 39.0 mm, 1 ♀, 29.9 mm, St. 64, 29-11-1980) were collected from depths of 177-210 m.

## KEY TO INDO-WEST PACIFIC GENERA AND SPECIES.

Nineteen species of frog crabs are reported from the Philippines and adjacent waters representing ten genera. The following key is provided for future workers and encompasses the known raninid crabs of the Indo-West Pacific.

1. Eye peduncle folding obliquely backward and downward; male pleopod 2 with long chitinous apical process extending little beyond tip of pleopod 1..... Notopodinae, Serène and Umali, 1972 2
- Eye peduncle folding longitudinally or transversely; male pleopod 2 acuminate distally and shorter than pleopod 1 which is usually ornamented apically..... Ranininae, de Haan, 1839 6
2. Carapace broadened anteriorly, regularly convex from side to side, no median dorsal carina; frontal region with spines or teeth on each side of rostrum..... 3
- Carapace narrowed anteriorly, strongly constricted with distinct median dorsal carina; a V-shaped incision in place of the rostrum; carapace with single lateral spine..... *Cosmonotus* Adams and White, 1848  
*Cosmonotus grayi* Adams and White, 1848
3. Transverse ridge of spinules between anterolateral spines; fronto-orbital border with one suture and three spines on each side of rostrum..... *Notopus* de Haan, 1841  
*Notopus dorsipes* (Fabricius, 1793)
- No transverse ridge of spinules between anterolateral spines; fronto-orbital border with two sutures and four spines on each side of rostrum..... *Ranilia* H. Milne-Edwards, 1837 4
4. Dactylus of third ambulatory legs elongate quadrangular in shape..... 5
- Dactylus of third ambulatory legs sickle-like in shape. Carapace longitudinally ovoid and its dorsal surface covered uniformly with granules..... *R. ovalis* (Henderson, 1888)
5. Carapace broader, the breadth being more than 3/4 the total length of carapace. Dorsal surface covered uniformly with granules..... *R. misakiensis* (Sakai, 1937)
- Carapace narrower, the breadth being less than 3/4 the total length of carapace. Distance between external orbital spines more than one half the breadth of carapace. Dorsal surface covered with transverse or oblique rows of granules..... *R. orientalis* Sakai, 1963
6. Carapace broad, length width ratio 6 : 5, fifth pair of legs not strongly reduced, eye stalk 3 segmented.....  
*Ranina* Lamarck, 1801  
*Ranina ranina* Linnaeus, 1758
- Carapace elliptical, fifth pair of legs reduced in size, eye stalk one segmented..... 7
7. Carapace fronto-orbital region of 3 teeth, abdomen with spines or tubercles on segments 3 or 4; abdomen with sternal locking mechanism..... 8
- Carapace with 5 fronto-orbital spines, abdomen without medial spines, no locking mechanism..... 12
8. Posterior margin of propodus of pereopod 4 armed with spine, lobe of dactyl of pereopod 4 width c 1/2 length, anterolateral margin of carapace with smooth contour, no tubercle, rostral tooth wider at base than long..... *Lyreidus* de Haan, 1841 9

- Posterior margin of propodus of pereopod 4 lobate, lobe of dactylus of pereopod 4 width  $> 1/2$  length, anterolateral margin of carapace with distinct lump or tubercle, rostral tooth longer than wide.....  
*Lysirude* n. gen. 11
9. Lateral borders of carapace armed with a sharp spinule in front of the junction of anterolateral and posterolateral borders. Wrist of chelipeds with two spines.
- There is no spine on the anterolateral borders. Wrist of chelipeds usually armed with one spine.....  
*L. stenops* Wood-Mason, 1887
10. Carapace has no postorbital constriction. External orbital angles are not projecting beyond the tip of frontal tooth, and are less markedly acuminate, the distance between tips less than one third the extreme width of carapace. .... *L. tridentatus* de Haan, 1841
- Carapace is somewhat constricted immediately behind the external orbital angles, which are prominent and projecting beyond the tip of front, the distance between their tips being more than one third the extreme width of carapace..... *L. brevifrons* Sakai, 1937
11. Lateral spines of carapace well developed, abdomen with 2 spines, dorsum of propodus of cheliped smooth distally..... *Lysirude channeri* (Wood-Mason, 1885)
- Lateral spines of carapace small ; abdomen with single spine, dorsodistal spine on propodus of cheliped.....  
*Lysirude griffini* sp. nov.
12. Bases of pereopods 1-4 closely appressed to midline of sternal shield ; dactyli of legs 3-5 strongly sickle shaped ; cheliped with spiniform teeth on fixed and movable fingers..... *Cyrtorhina* Monod, 1956  
*Cyrtorhina balabacensis* Serène and Umali, 1972
- Bases of pereopods 3 and sometimes 2 appressed to midline, (but not 1) ; dactyli of legs 3-5 not all sickle shaped ; cheliped with stout spines or tubercles..... 13
13. Fronto-orbital region narrow ; anterolateral (extraorbital) spines absent ; dorsum of propodus of cheliped without spines or carinae ; fifth leg little reduced..... *Notopoides* Henderson, 1888  
*Notopoides latus* Henderson, 1888
- Fronto-orbital region broad ; anterolateral (extraorbital) spines present ; dorsum of propodus of cheliped with spine or double carinae ; fifth leg noticeably reduced..... 14
14. Propodus of cheliped with double crested carina dorsally ; sternal shield not acute laterally between bases of pereopods 1 and 2 ; 1st abdominal tergum approximately width of posterior margin of carapace.....  
*Notosceles* Bourne, 1922 15
- Propodus of cheliped with single dorsal carina ; sternal shield laterally acute between bases of legs 1 and 2 ; 1st abdominal terga much narrower than posterior margin of carapace.....  
*Raninoides* H. Milne-Edwards, 1837 16
15. Carapace length 1.5 times width ; propodus of cheliped with dorsodistal spine ; carpus with 2 distal spines ; dactylus of leg 3 straight..... *Notosceles viaderi* Ward, 1942
- Carapace length 1.8 times width ; propodus of cheliped without dorsodistal spine ; carpus with sharp tubercles and pair of distal spines ; dactylus of leg 3 slightly sickle shaped. *Notosceles serratifrons* (Henderson, 1893)
16. Carpus of cheliped spinulose with pair of distal spines ; merus of cheliped with distomedial spine ; anterior margin of carapace roughly granulate ; upper margin of dactylus of leg 4 concave.....  
*Raninoides hendersoni* Chopra, 1933
- Carpus of cheliped smooth with pair of distal spines ; merus of cheliped without spine ; anterior margin of carapace nearly smooth ; dactylus of leg 4 straight..... *Raninoides personatus* Henderson, 1888

## ACKNOWLEDGMENTS.

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