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## Stomatopod Crustacea

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### ABSTRACT

Thirty seven species representing four superfamilies of Stomatopoda have been collected in the Philippines by the missions MUSORSTOM I and MUSORSTOM II carried out in 1976 and 1980 respectively. A new genus, *Anchisquilopsis*, and six new species are herewith described. Sixteen described species are for the first time recorded in the Philippines.

### RÉSUMÉ

Au cours des campagnes MUSORSTOM I et II aux Philippines (1976 et 1980) ont été recueillies trente-sept espèces de Stomatopodes appartenant aux quatre super-familles. Un nouveau genre, *Anchisquilopsis*, et six nouvelles espèces sont décrites. Seize espèces sont signalées pour la première fois des Philippines.

### INTRODUCTION

The stomatopoda collected by the missions MUSORSTOM I (1976) and MUSORSTOM II (1980) in the Philippines comprising of 37 species of which six species are undescribed. All the four subfamilies of the recent stomatopoda are represented in the collection. The two known species of the deep water genus *Bathysquilla*, *B. crassispinosa* and *B. microps*, for the first time were recorded from nearby localities and the record of the latter species in the Philippines shows its wide distribution in the deep water of the Indo-West Pacific. *Eurysquilla foresti* sp. nov. is the third known species of the genus *Eurysquilla*, an Atlanto-East Pacific genus, occurring in the Indo-West Pacific. *Eurysquilloides sibogae*, which so far was only known from two specimens — one type specimen from Timor Sea, Indonesia and one specimen from Tonkin Bay, Vietnam — is represented by 170 specimens and this very rare species proved to be one of the commonest species in the Philippines, off Mindoro Island.

A series of specimens of *Chorisquilla excavata* (Miers) collected from one station reveals that two closely related species, *C. pococki* Manning, 1975 and *C. andamanica* Manning, 1975, are conspecific with *C. excavata*. The figures (fig. 4) show that *C. excavata* exhibits polymorphic telson in its development. Two species of *Heterosquilloides* of which *H. philippinensis* is new and *H. insignis* (Kemp) is for the first time recorded outside the Indian Ocean. *Anchisquilopsis* gen. nov. is erected

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with *A. clevai* as type species, this genus is close to *Alimopsis* Manning and *Anchisquilloides* Manning of which the latter is represented by *A. michelae* sp. nov. in the Philippines. *Clorida gaillardi* sp. nov., a species closely related to *C. latreillei*, is described and two other species of *Clorida*, *C. malaccensis* and *C. merguiensis*, are for the first time recorded in the Philippines. Two species of *Kempina*, *K. mikado* and *K. stridulans*, are for the first time recorded at the same locality. *K. mikado* is represented by a good series of specimens exhibiting intermediate forms which leads to the conclusion that *K. zanzibarica* (Chopra) is an immature form of *K. mikado* and herewith the two are synonymized. A good series of specimens also reveals that *Lenisquilla espinosa* (Blumstein) is a juvenile form of *Lenisquilla spinosa* (Blumstein). The genus *Oratosquilla* is represented by six species of which *O. fossulata* is new and three other, *O. gonypetes*, *O. gravieri* and *O. imperialis*, are for the first time recorded in the Philippines.

All measurements are made in millimeters, indices mentioned following the system used by MANNING (1969b). Abbreviations MNHN-P means Muséum National d'Histoire Naturelle, Paris ; LON means Lembaga Oseanologi Nasional (National Institute of Oceanology), Jakarta, Indonesia.

I would like to acknowledge my gratefulness to Prof. J. FOREST in allowing me to study this interesting collection, to Drs. A. CROSNIER, D. GUINOT and M. DE SAINT LAURENT for giving me free access to use their private library. My sincere thank is forwarded to Dr. R. B. MANNING of the U. S. National Museum, Smithsonian Institution, for his comments and correction of the manuscript. I also would like to express my thank to Mme. J. SEMBIAT, librarian, of helping me in finding the literatures ; to Mr. R. CLEVA and Mlle. D. DONDON for their technical help ; and to Mr. M. GAILLARD for his excellent drawings and to Mr. J. REBIERE for preparing the photos.

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### List of Stations.

#### MUSORSTOM I

- Station 1. — 18.03.1976, 14°28.0' N, 120°42.0' E — 14°27.0' N, 120°40.8' E, 36-37 m : *Harpiosquilla harpax*, *Anchisquilla fasciata*, *Clorida gaillardi* sp. nov., *C. malaccensis*, *C. merguiensis*, *Lophosquilla tiwarii*, *Oratosquilla gravieri*, *O. nepa*.
- Station 2. — 19.03.1976, 14°02.8' N, 120°18.8' E — 14°02.0' N, 120°17.8' E, 187-182 m : *Harpiosquilla harpax*, *Lophosquilla tiwarii*, *Oratosquilla gravieri*
- Station 7. — 19.03.1976, 14°01.0' N, 120°20.0' E — 14°00.2' N, 120°18.2' E, 200-185 m : *Eurysquilloides sibogae*, *Squilloides leptosquilla*
- Station 9. — 19.03.1976, 14°01.8' N, 120°17.6' E — 13°59.5' N, 120°17.6' E, 194-180 m : *Eurysquilloides sibogae*, *Faughnia serenei*, *Heterosquilloides philippinensis* sp. nov., *Kempina mikado*, *Squilloides leptosquilla*
- Station 10. — 19.03.1976, 13°59.8' N, 120°18.2' E — 14°00.2' N, 120°20.3' E, 187-205 m : *Eurysquilloides sibogae*, *Faughnia serenei*, *Kempina mikado*, *Squilloides leptosquilla*
- Station 11. — 20.03.1976, 13°59.8' N, 120°23.7' E — 14°00.9' N, 120°21.5' E, 230-217 m : *Squilloides leptosquilla*
- Station 13. — 20.03.1976, 14°00.5' N, 120°17.0' E, 190 m : *Eurysquilloides sibogae*
- Station 15. — 20.03.1976, 14°00.3' N, 120°18.0' E, 192-188 m : *Eurysquilloides sibogae*
- Station 16. — 20.03.1976, 13°59.0' N, 120°10.5' E — 13°59.0' N, 120°12.3' E, 164-150 m : *Anchisquilloides michelae* sp. nov., *Oratosquilla fossulata* sp. nov.
- Station 17. — 21.03.1976, 13°53.7' N, 120°17.7' E, 17 m : *Gonodactylus affinis*
- Station 19. — 21.03.1976, 13°57.8' N, 120°18.2' E — 13°59.0' N, 120°19.4' E, 167-187 m : *Kempina mikado*
- Station 20. — 21.03.1976, 13°59.2' N, 120°20.3' E — 14°00.0' N, 120°22.3' E, 208-222 m : *Heterosquilloides philippinensis* sp. nov., *Kempina mikado*, *Squilloides leptosquilla*
- Station 21. — 21.03.1976, 14°01.0' N, 120°22.8' E — 14°02.8' N, 120°24.3' E, 223-174 m : *Heterosquilloides philippinensis* sp. nov., *Squilloides leptosquilla*
- Station 24. — 22.03.1976, 14°00.0' N, 120°18.0' E — 14°01.7' N, 120°20.2' E, 189-209 m : *Eurysquilloides sibogae*, *Heterosquilloides philippinensis* sp. nov., *Kempina mikado*, *Squilloides leptosquilla*
- Station 25. — 22.03.1976, 14°02.7' N, 120°20.3' E — 14°02.0' N, 120°18.0' E, 200-191 m : *Eurysquilla foresti* sp. nov., *Eurysquilloides sibogae*, *Lenisquilla spinosa*, *Squilloides leptosquilla*

- Station 26. — 22.03.1976, 14°00.9' N, 120°16.8' E — 13°59.5' N, 120°18.2' E, 189 m : *Eurysquilloides sibogae*, *Kempina mikado*, *Oratosquilla fossulata* sp. nov.
- Station 27. — 22.03.1976, 13°59.8' N, 120°18.6' E — 14°00.5' N, 120°15.7' E, 192-188 m : *Eurysquilloides sibogae*
- Station 30. — 22.03.1976, 14°01.3' N, 120°18.7' E — 13°59.7' N, 120°16.7' E, 186-177 m : *Eurysquilla foresti* sp. nov., *Eurysquilloides sibogae*, *Faughnia serenei*, *Kempina mikado*, *Squilloides leptosquilla*
- Station 31. — 22.03.1976, 14°00.0' N, 120°16.0' E — 14°00.3' N, 120°19.0' E, 187-195 m : *Eurysquilloides sibogae*, *Faughnia serenei*, *Kempina mikado*, *Squilloides leptosquilla*
- Station 32. — 23.03.1976, 14°02.2' N, 120°17.7' E — 13°59.4' N, 120°18.0' E, 193-184 m : *Eurysquilloides sibogae*, *Oratosquilla imperialis*
- Station 34. — 23.03.1976, 14°01.0' N, 120°15.8' E — 13°59.2' N, 120°18.8' E, 191-188 m : *Eurysquilla foresti* sp. nov., *Eurysquilloides sibogae*, *Sinosquilla sinica*
- Station 35. — 23.03.1976, 13°59.0' N, 120°18.5' E — 14°08.0' N, 120°16.5' E, 186-187 m : *Eurysquilloides sibogae*, *Kempina mikado*
- Station 36. — 23.03.1976, 14°01.2' N, 120°20.2' E — 14°00.3' N, 120°17.0' E, 210-187 m : *Harpiosquilla harpax*
- Station 40. — 24.03.1976, 13°57.4' N, 120°27.8' E — 13°58.3' N, 120°29.4' E, 287-265 m : *Anchisquillopsis clevai* gen. nov. sp. nov., *Squilloides leptosquilla*
- Station 42. — 24.03.1976, 13°55.1' N, 120°28.6' E — 13°54.1' N, 120°29.1' E, 379-407 m : *Squilloides leptosquilla*
- Station 43. — 24.03.1976, 13°50.5' N, 120°28.0' E — 13°52.3' N, 120°28.6' E, 484-448 m : *Squilloides leptosquilla*
- Station 45. — 24.03.1976, 13°46.0' N, 120°23.8' E — 13°45.5' N, 120°23.5' E, 100-180 m : *Oratosquilla gonypetes*
- Station 46. — 25.03.1976, 13°45.6' N, 120°23.0' E, 22-40 m : *Eurysquilloides sibogae*
- Station 49. — 25.03.1976, 13°49.1' N, 119°59.8' E — 13°48.6' N, 120°00.9' E, 925-750 m : *Bathysquilla microps*
- Station 50. — 25.03.1976, 13°49.2' N, 120°01.8' E — 13°48.2' N, 120°02.5' E, 415-510 m : *Heterosquilloides insignis*
- Station 51. — 25.03.1976, 13°49.4' N, 120°04.2' E — 13°50.8' N, 120°03.2' E, 200-170 m : *Bathysquilla crassispinosa*, *Eurysquilla foresti* sp. nov., *Eurysquilloides sibogae*, *Faughnia serenei*, *Heterosquilloides philippinensis* sp. nov., *Kempina mikado*, *K. stridulans*, *Squilloides leptosquilla*
- Station 55. — 26.03.1976, 13°55.0' N, 120°12.5' E — 13°54.8' N, 120°10.5' E, 200-194 m : *Eurysquilloides sibogae*, *Kempina mikado*
- Station 56. — 26.03.1976, 13°53.1' N, 120°08.9' E — 13°53.3' N, 120°10.7' E, 134-129 m : *Acanthosquilla wilsoni*, *Kempina mikado*, *Oratosquilla gonypetes*, *O. imperialis*
- Station 57. — 26.03.1976, 13°53.1' N, 120°13.2' E — 13°52.7' N, 120°13.5' E, 107-96 m : *Gonodactyloideus craccens*, *Odontodactylus brevirostris*
- Station 58. — 26.03.1976, 13°58.0' N, 120°13.7' E — 13°59.5' N, 120°15.2' E, 143-178 m : *Anchisquilloides michelae* sp. nov., *Oratosquilla fossulata* sp. nov.
- Station 61. — 27.03.1976, 14°02.2' N, 120°18.1' E — 13°59.7' N, 120°16.8' E, 202-184 m : *Eurysquilloides sibogae*
- Station 62. — 27.03.1976, 13°59.5' N, 120°15.6' E — 14°00.6' N, 120°13.7' E, 179-194 m : *Eurysquilloides sibogae*, *Kempina mikado*
- Station 63. — 27.03.1976, 14°00.8' N, 120°15.8' E — 14°00.5' N, 120°16.3' E, 191-195 m : *Eurysquilloides sibogae*
- Station 64. — 27.03.1976, 14°00.5' N, 120°16.3' E — 13°59.5' N, 120°18.6' E, 194-195 m : *Kempina mikado*
- Station 65. — 27.03.1976, 14°00.0' N, 120°19.2' E — 14°00.8' N, 120°16.2' E, 202-194 m : *Bathysquilla crassispinosa*
- Station 68. — 27.03.1976, 14°00.8' N, 120°17.4' E — 13°58.8' N, 120°19.0' E, 199-183 m : *Faughnia serenei*, *Kempina mikado*, *Squilloides leptosquilla*
- Station 69. — 27.03.1976, 13°58.8' N, 120°17.3' E — 14°00.9' N, 120°19.0' E, 187-199 m : *Faughnia serenei*, *Kempina mikado*, *Anchisquilloides michelae* sp. nov.
- Station 71. — 28.03.1976, 14°09.3' N, 120°26.2' E — 14°10.0' N, 120°26.8' E, 174-204 m : *Eurysquilloides sibogae*, *Kempina mikado*
- Station 72. — 28.03.1976, 14°11.8' N, 120°28.7' E — 14°13.1' N, 120°28.8' E, 127-122 m : *Harpiosquilla harpax*, *Anchisquilla fasciata*, *Kempina mikado*, *Lenisquilla spinosa*, *Oratosquilla gonypetes*, *O. imperialis*
- Station 73. — 28.03.1976, 14°15.0' N, 120°31.2' E — 14°16.6' N, 120°31.8' E, 76-70 m : *Coronidopsis serenei*, *Odontodactylus cultrifer*, *Lenisquilla spinosa*

## SHORE STATIONS

- Fishmarket, Manila, 17.03.1976 : *Oratosquilla nepa*  
Singapore, light fishing, 1.03.1976 : *Oratosquilla woodmasoni*

## MUSORSTOM II

- Station 1. — 20.11.1980, 14°00.3' N, 120°19.3' E — 14°00.4' N, 120°17.6' E, 198-188 m : *Eurysquilloides sibogae*  
Station 2. — 20.11.1980, 14°01.0' N, 120°17.1' E — 13°59.9' N, 120°17.5' E, 186-184 m : *Eurysquilloides sibogae*  
Station 4. — 20.11.1980, 14°01.2' N, 120°18.4' E — 13°59.4' N, 120°18.4' E, 190-183 m : *Eurysquilloides sibogae*

- Station 6. - 20.11.1980, 13°56.5' N, 120°20.7' E — 13°56.4' N, 120°22.3' E, 136-152 m : *Oratosquilla fossulata* sp. nov.
- Station 10. — 21.11.1980 14°00.1' N, 120°18.5' E — 14°01.2' N, 120°17.9' E, 188-195 m : *Eurysquilloides sibogae*
- Station 11. — 21.11.1980, 14°00.4' N, 120°19.7' E — 14°00.1' N, 120°18.9' E, 196-194 m : *Eurysquilloides sibogae*
- Station 12. — 21.11.1980, 14°01.0' N, 120°19.7' E — 14°02.0' N, 120°21.0' E, 197-210 m : *Eurysquilloides sibogae*, *Heterosquilloides philippinensis* sp. nov., *Kempina mikado*, *Squilloides leptosquilla*
- Station 13. — 22.11.1980, 14°00.5' N, 120°20.7' E — 13°59.7' N, 120°19.2' E, 200-193 m : *Eurysquilloides sibogae*, *Kempina mikado*, *Squilloides leptosquilla*
- Station 18. — 22.11.1980, 14°00.0' N, 120°18.6' E — 14°00.2' N, 120°17.2' E, 195-188 m : *Eurysquilloides sibogae*, *Heterosquilloides philippinensis* sp. nov.
- Station 20. - 22.11.1980, 14°00.9' N, 120°18.1' E — 13°59.5' N, 120°18.2' E, 192-185 m : *Eurysquilla foresti* sp. nov., *Squilloides leptosquilla*
- Station 21. — 22.11.1980, 14°00.2' N, 120°17.8' E — 14°02.2' N, 120°17.4' E, 191-192 m : *Eurysquilloides sibogae*, *Heterosquilloides philippinensis* sp. nov., *Squilloides leptosquilla*
- Station 31. — 24.11.1980, 13°40.5' N, 120°53.7' E — 13°40.0' N, 120°55.0' E, 230-204 m : *Faughnia serenei*
- Station 35. — 24.11.1980, 13°27.9' N, 121°11.6' E — 13°28.1' N, 121°12.5' E, 160-198 m : *Eurysquilloides sibogae*, *Heterosquilloides philippinensis* sp. nov.
- Station 41. — 25.11.1980, 13°15.3' N, 122°45.9' E — 13°16.9' N, 122°46.6' E, 166-172 m : *Kempina stridulans*, *Lenisquilla spinosa*
- Station 51. — 27.11.1980, 13°59.3' N, 120°16.4' E — 14°00.4' N, 120°17.6' E, 170-187 m : *Sinosquilla sinica*, *Lenisquilla spinosa*
- Station 52. — 27.11.1980, 14°00.7' N, 120°18.7' E — 13°59.1' N, 120°18.8' E, 190-181 m : *Eurysquilloides sibogae*
- Station 55. — 27.11.1980, 13°53.7' N, 119°58.5' E — 13°53.1' N, 119°57.0' E, 865-866 m : *Bathysquilla microps*
- Station 61. — 29.11.1980, 14°00.0' N, 120°16.4' E — 14°00.1' N, 120°16.7' E, 178-180 m : *Kempina mikado*
- Station 62. — 29.11.1980, 14°00.4' N, 120°17.0' E — 14°00.3' N, 120°18.4' E, 186-189 m : *Eurysquilloides sibogae*, *Sinosquilla sinica*, *Kempina mikado*, *K. stridulans*, *Lenisquilla spinosa*
- Station 63. — 29.11.1980, 14°07.3' N, 120°15.0' E — 14°07.2' N, 120°16.0' E, 230-215 m : *Anchisquillopsis clevai* gen. nov. sp. nov.
- Station 64. — 29.11.1980, 14°01.5' N, 120°18.9' E — 14°00.1' N, 120°18.2' E, 195-191 m : *Kempina mikado*, *Squilloides leptosquilla*
- Station 66. — 29.11.1980, 14°00.6' N, 120°20.3' E — 14°00.1' N, 120°18.7' E, 209-192 m : *Eurysquilloides sibogae*, *Squilloides leptosquilla*, *Heterosquilloides philippinensis* sp. nov.
- Station 67. — 29.11.1980, 14°00.1' N, 120°18.5' E — 14°01.8' N, 120°19.3' E, 193-199 m : *Eurysquilla foresti* sp. nov., *Eurysquilloides sibogae*, *Heterosquilloides philippinensis* sp. nov., *Squilloides leptosquilla*
- Station 68. — 29.11.1980, 14°01.9' N, 120°18.8' E — 14°00.5' N, 120°17.5' E, 199-195 m : *Eurysquilloides sibogae*, *Squilloides leptosquilla*
- Station 71. — 30.11.1980, 14°00.1' N, 120°17.8' E — 14°01.2' N, 120°19.1' E, 189-197 m : *Eurysquilloides sibogae*, *Heterosquilloides philippinensis* sp. nov.
- Station 72. — 30.11.1980, 14°00.7' N, 120°19.4' E — 14°00.1' N, 120°17.8' E, 197-182 m : *Heterosquilloides philippinensis* sp. nov.
- Station 73. — 30.11.1980, 13°55.5' N, 120°22.3' E, 20-21 m : *Chorisquilla excavata*, *Gonodactylus affinis*
- Station 75. — 1.12.1980, 13°50.5' N, 120°30.3' E — 13°52.8' N, 120°29.8' E, 300-330 m : *Squilloides leptosquilla*
- Station 80. — 1.12.1980, 13°45.1' N, 120°37.7' E — 13°45.2' N, 120°37.3' E, 178-205 m : *Eurysquilloides sibogae*, *Kempina mikado*
- Station 83. — 2.12.1980, 13°55.2' N, 120°30.5' E — 13°56.6' N, 120°30.5' E, 320-318 m : *Squilloides leptosquilla*

## SHORE STATIONS

- In front of Mactan Marine Station, reef flat, low tide, 9.12.1980 : *Gonodactylus viridis*
- Reefs of Ayutala Cagayan de Oro, reef flat, low tide, 12.12.1980 : *Gonodactylus chiragra*, *Pseudosquilla ciliata*
- Reefs of Olange, in front of Mactan Marine Station, open reef flat, 14.12.1980 : *Gonodactylus chiragra*
- Mangrove at Silot Bay (Marine Station) close to Cebu City, 15.12.1980 : *Gonodactylus viridis*
- Silot Bay, reef flat, 15.12.1980 : *Gonodactylus chiragra*



Superfamily **BATHYSQUILLOIDEA** Manning, 1967Family **BATHYSQUILLIDAE** Manning, 1967**Bathysquilla crassispinosa** (Fukuda, 1910)

(Pl. 1, fig. A, B)

*Lysiosquilla crassispinosa* Fukuda, 1910 : 146-149, pl. IV, figs. 4, 4a.*Bathysquilla crassispinosa*, MANNING, 1969 b : 95, 98. — INGLE and MERRETT, 1971 : 197. — MANNING and STRUHSAKER, 1976 : 440-443, figs. 1 a-c, 2.

## MATERIAL

## MUSORSTOM I

Station 51, 200-170 m : 1 ♂ 127 mm (LON. Cat. no. S 2502)

Station 65, 202-194 m : 1 ♀ 260 mm (MNHN-P St 1006).

## REMARKS

The Philippines specimens agree with the published descriptions and figures. Antennal protopod with two papillae. Dactylus of raptorial claw armed with 10 teeth ; propodus with 3-4 movable spines (one of the two proximal spines can become fixed) and 8-11 fixed spines ; carpus with 2 dorsal spines. Lateral process of sixth thoracic somite armed with a posterior spine. Lateral process of seventh thoracic somite armed with a sharp spine, which is less sharp in the small specimen, situated at the middle edge. Seventh and eighth thoracic somites with intermediate carinae. Abdomen with submedian carinae on the sixth somite only ; intermediate carinae seen on the first three somites (in the small specimen trace of this carina is seen on the fourth somite). Abdominal carinae spined as follows : submedian 6, lateral 5, marginal 1-5. Outer margin of proximal segment of uropod with 11-12 movable spines, ventral surface with 2-3 fixed spines on distal margin.

## DISTRIBUTION

*Bathysquilla crassispinosa* has not been reported before from the Philippines, the present record is new for the region. The species has been reported from Japan (FUKUDA, 1910 ; KOMAI, 1938 ; INGLE and MERRETT, 1971 ; MANNING and STRUHSAKER, 1976), Madagascar, 280-310 m (MANNING and STRUHSAKER, 1976), South Africa, 230-295 m (BARNARD, 1950 ; INGLE and MERRETT, 1971).

**Bathysquilla microps** (Manning, 1961)

(Fig. 1)

*Lysiosquilla microps* Manning, 1961 : 693-696, fig. 5, pls. 10-11.*Bathysquilla microps*, MANNING, 1969 b : 95-99, figs. 26-28. — MANNING and STRUHSAKER, 1976 : 443-448, figs. 1d-f, 2.

## MATERIAL

## MUSORSTOM I

Station 49, 925-750 m : 1 ♂ 53 mm (LON. Cat. no. S 2517).

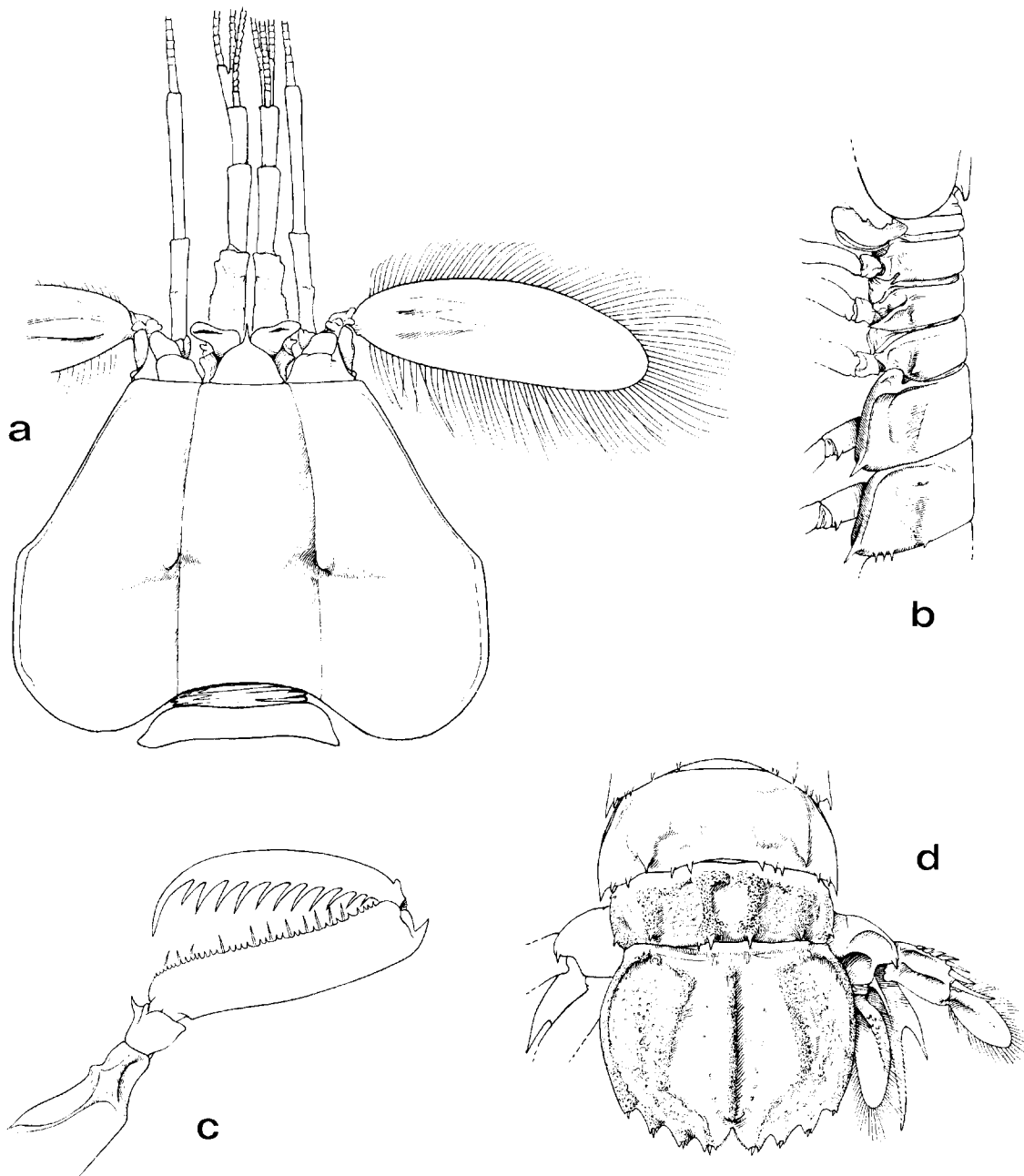


FIG. 1. — *Bathysquilla microps* (Manning, 1961), male, TL 141 mm : a. anterior part of body ; b. exposed thoracic somites and first two abdominal somites, lateral view ; c. raptorial claw ; d. fourth to sixth abdominal somites, telson, and uropod.

## MUSORSTOM II

Station 55, 865-866 m : 1 ♂ 141 mm (MNHN-P St 1008)

## REMARKS

The Philippines specimens agree with the descriptions of MANNING (1961, 1969 b). The small specimen has more globular eyes than the larger one. Antennal protopod with two papillae. Dactylus of raptorial claw armed with 13 teeth in the large specimen and 14 in the small specimen. Dorsal margin of propodus with 4 movable spines and 11 fixed spines. Carpus with one spine on dorsal surface. Intermediate carinae on seventh and eighth thoracic somites each with posterior spinule. Lateral process of sixth and seventh thoracic somites with sharp spine ; that of the eighth pointed but not spined, blunt in the small specimen. First five abdominal somites without submedian carinae, intermediate carinae present on all somites. The abdominal carinae spined as follows : submedian 6, intermediate 2-6, lateral 6, marginal 1-5. Spines present on posterior margin of second to fifth abdominal somites between submedian and intermediate carinae, and between intermediate and marginal carinae in varying number from 1-4 in the first site and 1-3 in the latter. Telson with median and submedian dorsal carinae, post-anal keel present. Proximal segment of uropod with 7 movable spines.

The Philippines specimens share characters with both Atlantic and Hawaiian specimens : the number of dactylar teeth of the raptorial claw 13-15 in Atlantic specimens and 14 in Hawaiian specimens (MANNING and STRUHSACKER 1976) which is 13 in the large Philippines specimens and 14 in the smaller one. It appears that the present specimens are closer to the Atlantic specimens in having unarmed intermediate carinae on the first abdominal somite and in having 7 movable spines on the proximal segment of uropod ; and differ from both Atlantic and Hawaiian specimens in having 4 movable proximal spines, instead of 3, on the propodus of the dactylus.

## DISTRIBUTION

*Bathysquilla microps* has not been reported before from the Philippines. In the Indo-West Pacific this species was only known from near Maui, Hawaii, 731-786 m (MANNING and STRUHSACKER, 1976). The presence of *B. microps*, once known only as a Caribbean species, in the Hawaiian and Philippines waters indicates that probably this species has a very wide distribution in the deeper water of both Atlantic and Pacific oceans.

Superfamily **GONODACTYLOIDEA** Giesbrecht, 1910

Family **EURYSQUILLIDAE** Manning, 1977

***Coronidopsis serenei*** Moosa, 1973

*Coronidopsis serenei* Moosa, 1973 : 5-7, fig 1. — MANNING and GARCIA, 1982 : figs. 1 c,f ; 2-3 (synonymy).

## MATERIAL

## MUSORSTOM I

Station 73, 76-70 m : 1 ♂ 26 mm (MNHN-P St 991).

## REMARKS

The present specimen has fewer spines on the ventral surface of telson than the type. As men-

tioned and figured by MANNING and GARCIA (1982), in *C. serenei* the pattern of spination as well as number of spines on the ventral surface of telson is variable.

#### DISTRIBUTION

*Coronidopsis serenei* has been previously recorded from off Elat Bay, Moluccas, Indonesia (MOOSA, 1973), Tonkin Bay, Vietnam (BLUMSTEIN, 1974 ; MAKAROV, 1978 ; MANNING and GARCIA, 1982), South China Sea (MAKAROV, 1978), and various localities in the Philippines (MANNING and GARCIA, 1982). The depth range of this species is 16-89 m.

#### **Eurysquilla foresti** sp. nov.

(Fig. 2)

#### MATERIAL

##### MUSORSTOM I

- Station 25, 200-191 m : 1 ♀ 48 mm (Paratype) (LON. Cat. no. S 2506).  
 Station 30, 186-177 m : 1 ♂ 49 mm (Paratype) (MNHN-P St 967).  
 Station 34, 191-188 m : 1 ♂ 54 mm (Paratype) (MNHN-P St 968).  
 Station 51, 200-170 m : 1 ♂ 58 mm (Holotype) (MNHN-P St 966).

##### MUSORSTOM II

- Station 20, 192-185 m : 1 ♀ 42 mm (Paratype) (MNHN-P St 978).  
 Station 67, 193-199 m : 1 ♂ 37 mm (Paratype) (MNHN-P St 931).

#### DESCRIPTION

Body smooth and polished.

Eye large, cornea bilobed, set obliquely on stalk. Corneal indices 264-303. Eyes extending beyond end of first segment of antennular peduncle. Ocular scales broad, separate. Anterior margin of ophthalmic somite triangular.

Antennular peduncle shorter than carapace. Dorsal processes of antennular somite, each forming a broad triangular spine, directed anterolaterally.

Antennal scale short, less than half as long as carapace length. Antennal protopod with one ventral papilla.

Rostral plate as long as broad, triangular, margin curved, apex with a sharp spine.

Carapace smooth, narrowed anteriorly, without dorsal carinae except the reflected marginal carinae on posterior plates ; anterolateral part not exceeding base of rostral plate.

Carpus of raptorial claw with a dorsal ridge ending as an anterior lobe ; propodus fully pectinate, inner proximal margin with three movable spines ; dactylus armed with seven teeth, outer margin with triangular basal notch.

Mandibular palp and five epipods present.

Last three thoracic somites with intermediate carinae. Lateral process of fifth somite rounded, that of sixth and seventh somites inflated posterolaterally.

Abdomen without submedian carinae on first five somites ; traces of intermediate carinae seen on first to second somites, more pronounced as low carinae on the third and fourth somites, markedly seen on fifth somite where interrupted medially and posteriorly ending in spine ; lateral carina absent on first four somites, on the fifth and sixth terminated in spine posteriorly ; marginal carina armed on

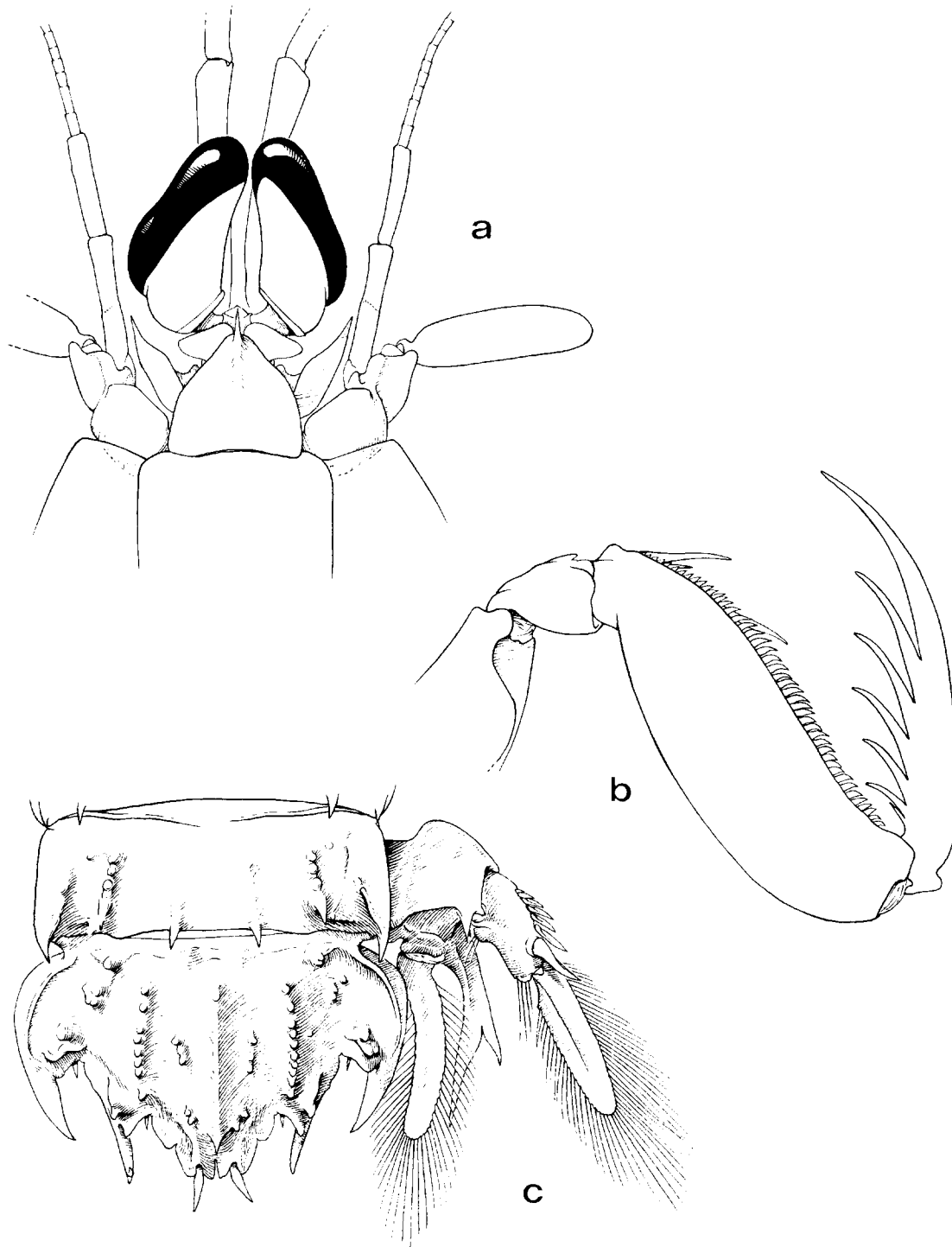


FIG. 2. — *Eurysquilla foresti* sp. nov., male holotype, TL 58 mm : a. anterior part of body ; b. raptorial claw ; c. sixth abdominal somite, telson, and uropod.

third and fourth somites only ; sixth abdominal somite with normal complement of dorsal carinae each terminating in posterior spine ; sharp spine present in front of each articulation of uropod.

Telson much broader than long, width about twice median length ; dorsal median carina well defined, terminating posteriorly in spine ; accessory median and dorsal submedian carinae comprised of tubercles, not as an entire line ; tubercles are also seen anterior to intermediate marginal teeth, anterior to lateral fissure and posterior to normal anterior tubercles. Three pairs of marginal teeth present, prelateral lobe absent ; submedian teeth with movable apices ; intermediate teeth long, marginals longest ; submedian denticles absent ; two intermediate and one lateral denticles present. Ventral surface of telson smooth, post-anal keel absent.

Proximal segment of uropodal exopod shorter than distal segment, with seven movable spines on outer margin, last not extending to middle of distal segment. Basal prolongation of uropodal endopod with inner spine longer which sparsely tuberculate at its inner margin.

#### COLOR

The general coloration of the preserved specimens is creamy without any marked pigmentation observable.

#### SIZE RANGES

Males 37-58 mm, females 42-48 mm.

#### REMARKS

*Eurysquilla foresti* sp. nov. is the third known species of the genus existing in the Indo-West Pacific. The present species has close resemblances with *E. sewelli* (known from the Gulf of Aden), *E. galatheae* (an eastern Atlantic species) and *E. delsolari* (an eastern Pacific species) in having a sharp spine on rostral plate, seven dactylar teeth on the raptorial claw, and almost similar form of telson. *E. foresti* differs from *E. galatheae* in the absence of a median carina on the rostral plate and in the spinulation of the fifth abdominal somite ; from *E. delsolari* and *E. sewelli* it differs in the spinulation of the abdominal carinae and the morphological arrangements as well as numbers of dorsal tubercles on the telson.

#### ETYMOLOGY

The epithet "*foresti*" is dedicated to Prof. Jacques FOREST of the Muséum National d'Histoire Naturelle, Paris who has given me access to study the present material he collected during the MUSORSTOM expeditions in the Philippines.

#### TYPES DEPOSITORY

The male holotype (MNHN-P St 966), three male paratypes (MNHN-P St 967, MNHN-P St 968, MNHN-P St 931) and one female paratype (MNHN-P St 978) are deposited in the Muséum National d'Histoire Naturelle Paris ; one female paratype is deposited in the National Institute of Oceanology, Jakarta (LON. Cat. no. S 2506).

#### DISTRIBUTION

Known only from the type locality, the Philippines, taken from 170-200 m depths.

**Eurysquilloides sibogae** (Hansen, 1926)

*Squilla sibogae* Hansen, 1926 : 15-17, pl. I, fig. 6 a-e.  
*Eurysquilloides sibogae*, MAKAROV, 1978 : 185.

## MATERIAL

## MUSORSTOM I

- Station 7, 200-185 m : 2 ♂♂ 31-49 mm, 4 ♀♀ 33-43 mm (MNHN-P St 1109).  
 Station 9, 194-180 m : 4 ♂♂ 41-55mm, 7 ♀♀ 40-51 mm (MNHN-P St 1101).  
 Station 10, 187-205 m : 7 ♂♂ 37-51 mm, 4 ♀♀ 40-52 mm (MNHN-P St 1077).  
 Station 13, 190 m : 1 ♂ 47 mm (MNHN-P St 1115).  
 Station 15, 192-188 m : 1 ♀ 33 mm (MNHN-P St 1116).  
 Station 24, 189-209 m : 6 ♂♂ 32-53 mm, 7 ♀♀ 31-55 mm (MNHN-P St 1107).  
 Station 25, 200-191 m : 10 ♂♂ 34-49 mm, 15 ♀♀ 34-55 mm (MNHN-P St 1098).  
 Station 26, 189 m : 3 ♂♂ 35-48 mm, 2 ♀♀ 48-53 mm (MNHN-P St 1100).  
 Station 27, 192-188 m : 3 ♂♂ 39-41 mm, 1 ♂ (juv.) 18 mm, 1 ♀ 46 mm (MNHN-P St 1110).  
 Station 30, 186-177 m : 3 ♂♂ 34-51 mm, 4 ♀♀ 41-46 mm (MNHN-P St 1106).  
 Station 31, 187-195 m : 1 ♂ 50 mm (MNHN-P St 1105).  
 Station 32, 193-184 m : 4 ♂♂ 49-51 mm, 1 ♀ 35 mm (MNHN-P St 1103).  
 Station 34, 191-188 m : 5 ♂♂ 49-54 mm, 6 ♀♀ 39-56 mm (LON. Cat. no. S 2515).  
 Station 35, 186-187 m : 2 ♂♂ 49-50 mm (MNHN-P St 1112).  
 Station 46, 22-40 m : 1 ♀ 49 mm (MNHN-P St 1102).  
 Station 51, 200-170 m : 1 ♂ 42 mm, 3 ♀♀ 41-54 mm (MNHN-P St 1104).  
 Station 55, 200-194 m : 1 ♂ 47 mm, 1 ♀ 43 mm (MNHN-P St 1114).  
 Station 61, 202-184 m : 2 ♂♂ 41-45 mm (MNHN-P St 1108).  
 Station 62, 179-194 m : 1 ♀ 49 mm (MNHN-P St 1117).  
 Station 63, 191-195 m : 2 ♀♀ 40-41 mm (MNHN-P St 1111).  
 Station 71, 174-204 m : 3 ♂♂ 30-53 mm (MNHN-P St 1113).

## MUSORSTOM II

- Station 1, 198-188 m : 1 ♂ 48 mm (MNHN-P St 1118).  
 Station 2, 186-184 m : 1 ♂ 49 mm (MNHN-P St 1127).  
 Station 4, 190-183 m : 1 ♂ 53 mm (MNHN-P St 1120).  
 Station 10, 188-195 m : 2 ♂♂ 47-51 mm, 1 ♀ 42 mm (MNHN-P St 1129).  
 Station 11, 196-194 m : 2 ♂♂ 44-47 mm (MNHN-P St 1121).  
 Station 12, 197-210 m : 3 ♀♀ 41-54 mm (MNHN-P St 1094).  
 Station 13, 200-193 m : 1 ♂ 49 mm (MNHN-P St 1096).  
 Station 18, 195-188 m : 3 ♂♂ 40-56 mm, 1 ♀ 44 mm (MNHN-P St 1123).  
 Station 21, 191-192 m : 7 ♂♂ 37-51 mm, 6 ♀♀ 39-50 mm (MNHN-P St 1083).  
 Station 35, 160-198 m : 1 ♂ 50 mm, 2 ♀♀ 43-45 mm (MNHN-P St 1125).  
 Station 52, 190-181 m : 1 ♂ 49 mm (MNHN-P St 1130).  
 Station 62, 186-189 m : 1 ♂ 48 mm, 2 ♀♀ 50-54 mm (MNHN-P St 1126).  
 Station 66, 209-192 m : 1 ♂ 44 mm, 2 ♀♀ 44-45 mm (MNHN-P St 1122).  
 Station 67, 193-199 m : 4 ♂♂ 32-49 mm, 5 ♀♀ 41-50 mm (MNHN-P St 1097).  
 Station 68, 199-195 m : 1 ♂ 51 mm, 2 ♀♀ 43-44 mm (MNHN-P St 1119).  
 Station 71, 189-197 m : 1 ♀ 40 mm (MNHN-P St 1124).  
 Station 80, 178-205 m : 1 ♂ 54 mm (MNHN-P St 1099).

## DIAGNOSIS

Size moderate, body smooth and polished. Cornea expanded, compressed, not bilobed. Ocular scales separate, triangular, directed anterolaterally. Antennular somite extremely elongate, about half as long as carapace length. Antennal scale short, slender, length less than carapace length. Rostral plate as long as broad, apex rounded. Carapace smooth, carinae completely absent, anterolateral angle almost straight; anterior one-third narrowed, anterior width about one-third of posterior width; cervical groove seen lateral to gastric groove. Raptorial claw slender; propodus almost fully pectinate, pectinations denser on the proximal portion becoming spaced distally, most distal portion without pectination; dactylus armed with 9-10 teeth (8-9 in Hansen's type). Mandibular palp absent, three epipods present. Exposed thoracic somites without submedian carinae, intermediate carinae well developed.

Lateral process of fifth thoracic somite forming a blunt, laterally directed lobe. Lateral process of sixth and seventh thoracic somites with posterolateral spine. First five abdominal somites without submedian carinae; abdominal carinae spined as: submedian 6, intermediate (4), 5-6, lateral (3), 4-6, marginal 1-5. Telson with three pairs of marginal teeth, submedian teeth with movable apices; denticles slender, sharp, formulation: 11-14, 2, 1. Dorsal surface of telson with well developed median carina terminating in a sharp posterior spine; intermediate carina present, comprising a row of tubercles. Proximal segment of uropod with 6-7 movable spines. Basal prolongation of uropod bifurcate, inner spine longer than outer.

## SIZE RANGES

Males and females 31-56 mm.

## REMARKS

*Eurysquilloides sibogae* was described by HANSEN (1926) from a single male specimen collected in the Timor Sea, Indonesia. The other available record is a specimen collected from the Tonkin Bay, Vietnam reported by MAKAROV (1978). The male of *E. sibogae* reaches maturity at a size slightly exceeding 30 mm. HANSEN (1926) mentioned that his specimen had 8 and 9 teeth on the raptorial dactylus; the Philippines specimens have 9-10 teeth. The propodus of raptorial dactylus is almost entirely pectinated, denser on the proximal portion and becoming more spaced distally and absent at the most distal portion. The intermediate carinae of telson never forming an entire line; they are composed of 4-6 tubercles or broken carinae.

## DISTRIBUTION

*Eurysquilloides sibogae* was only known from two localities: Timor Sea, Indonesia, 112 m on mud, sand shell bottom (HANSEN, 1926) and Tonkin Bay, Vietnam, 180 m (MAKAROV, 1978). The present record, new for the Philippines, is the third available. This species was taken from depths of 22 to 209 m.

**Sinosquilla sinica** Liu and Wang, 1978

*Sinosquilla sinica* Liu and Wang, 1978 : 90-91, 93-94, figs. 1-6; pl. 1, figs. 1-3.  
*Eurysquillopsis angustirostris* Makarov, 1978 : 185-188, figs. 5-6.

## MATERIAL

## MUSORSTOM I

Station 34, 191-188 m : 1 ♀ (very badly damaged)



## MUSORSTOM II

Station 51, 170-187 m : 1 ♀ 77 mm (MNHN-P St 973)

Station 62, 186-189 m : 1 ♀ 70 mm (LON.Cat. no. S 2519).

## REMARKS

*Sinosquilla sinica* was described by LIU and WANG (1978) from specimens collected in the South China Sea and one month later MAKAROV (1978) described *Eurysquillopsis angustirostris* from one female specimen collected in Tonkin Bay, Vietnam. Both species are identical. The specimens from the Philippines show no differences with the descriptions and figures of LIU and WANG (1978) and MAKAROV (1978).

## DISTRIBUTION

Previously, *Sinosquilla sinica* was only known from South China Sea, 21°00' N, 113°30' E — 21°00' N, 114° E, 58-89 m, sandy mud bottom (LIU and WANG, 1978) and Tonkin Bay, Vietnam, 18°00' N, 110°08' E, 95 m (MAKAROV, 1978). The present record, new for the Philippines, extends its distribution eastwardly and to deeper water (170-191 m).

## Family GONODACTYLIDAE Giesbrecht, 1910

**Gonodactyloideus cracens** Manning, 1984

(Fig. 3)

*Gonodactyloideus cracens* Manning, 1984 : 84-86, fig. 1.

## MATERIAL

## MUSORSTOM I

Station 57, 107-96 m : 1 ♀ 42 mm (MNHN-P St 937), 1 ♀ 36 mm (MNHN-P St 1010), 1 ♀ 29 mm (LON. Cat. no. S 2503).

## REMARKS

The present specimens agree with the description and figure of MANNING (1984, fig. 1) for *Gonodactyloideus cracens*. This species has compressed and broadened cornea which distinguish it from all other members of *Gonodactylus* although it has close resemblances with the *falcatus*-group of *Gonodactylus* in having five dorsal carinae on telson.

## DISTRIBUTION

This species was only known from its type locality, north of Dampier Archipelago, Western Australia. The present record, new for the Philippines, shows that this species has wide geographical and deeper bathymetrical distribution.

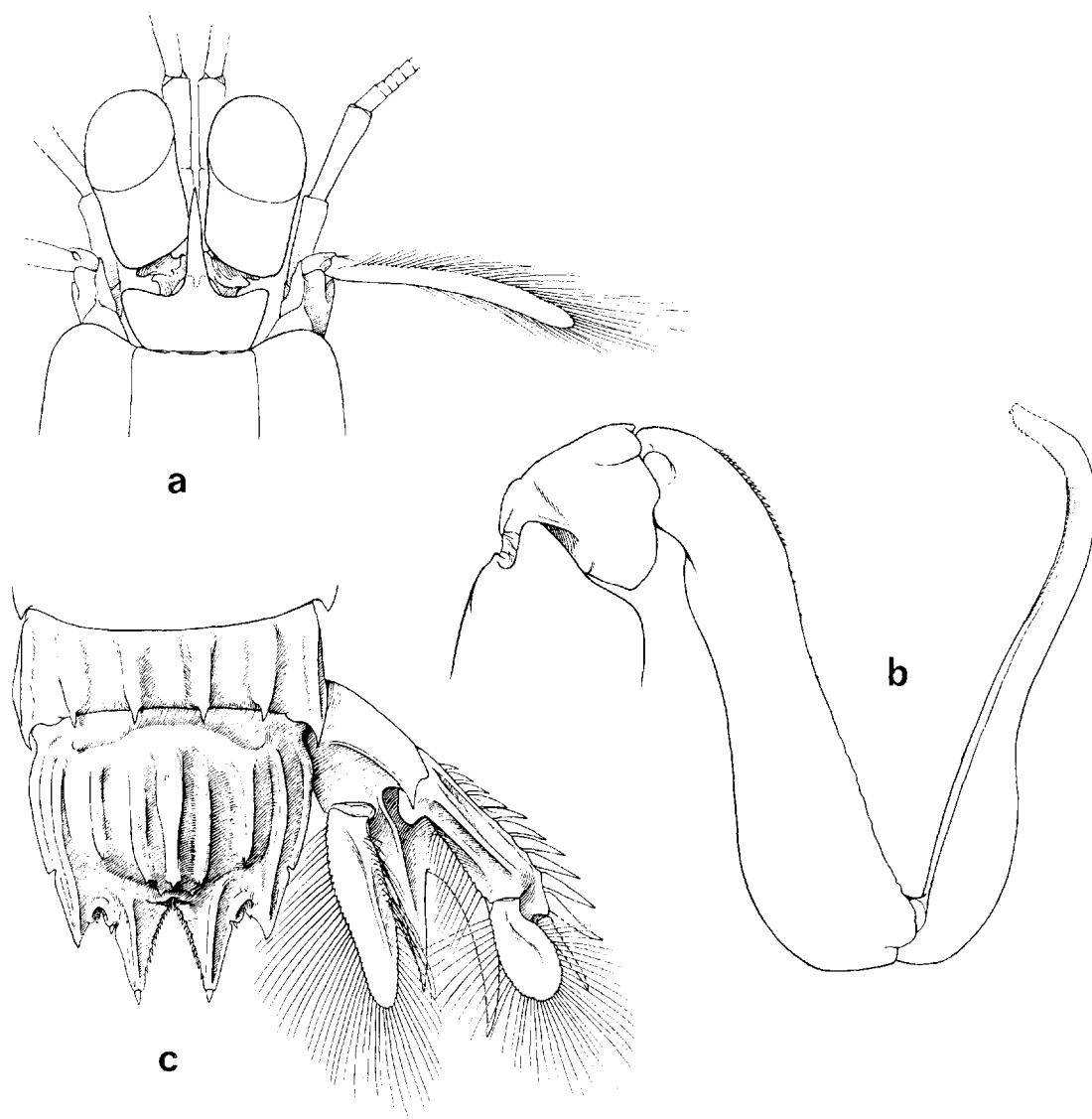


FIG. 3. — *Gonodactyloideus cracens* Manning, 1984, TL 42 mm : a. anterior part of body ; b. raptorial claw ; c. sixth abdominal somite, telson, and uropod.

### *Gonodactylus affinis* de Man, 1902

*Gonodactylus chiragra* var. *affinis* de Man, 1902 : 912.

*Gonodactylus chiragra* form H (= *affinis*), KEMP, 1915 : 179-180 (discussion).

*Gonodactylus affinis*, DINGLE *et al.*, 1977 : 15-16, fig. 9 d. — MANNING, 1978 a : 2-4, fig. 1 (synonymy).

#### MATERIAL

#### MUSORSTOM I

Station 17, 17 m : 1 ♀ 19 mm (MNHN-P St 938).

## MUSORSTOM II

Station 73, 20-21 m : 8 ♂♂ 10-23 mm, 2 ♂♂ juv., 3 ♀♀ 15-23 mm, 2 ♀♀ juv. (MNHN-P St 964).

## REMARKS

All the female and small male specimens possess morphologically the same median carina of telson which is straight or slightly enlarged anteriorly (*affinis*-type) (see MANNING, 1978 a, fig. 1a). The larger males possess more anteriorly inflated median carina with marked posterior accessory median carinae ; the median and accessory median carinae end posteriorly in spinule. In the small specimens (males and females) the posterior accessory median carinae are separated from the median carina ; the carinae are fused in the large male specimens.

## DISTRIBUTION

*Gonodactylus affinis* has been previously reported from Port Galera, Mindoro, Philippines, 9-63 m (KEMP, 1915 as *Gonodactylus chiragra* form H (= *affinis*)). This species has wide distribution in the western part of Indo-West Pacific.

***Gonodactylus chiragra* (Fabricius, 1781)**

*Gonodactylus chiragra*, KEMP, 1915 : 179-180. — GARCIA, 1981 : 4-5.

## MATERIAL

## MUSORSTOM II

Silot Bay, reef flat, 15.12.1980 : 1 ♀ 39 mm (MNHN-P St 929).

Reefs of Ayutala, Cagayan de Oro, reef flat, low tide, 12.12.1980 : 1 ♂ 65 mm (MNHN-P St 943).

Reefs of Olange, in front of Mactan Marine Station, open reef flat, 14.12.1980 : 2 ♀♀ 79-91 mm (MNHN-P St 934).

## DISTRIBUTION

This species has a wide distribution in the Indo-West Pacific. In the Philippines it was recorded from various localities (KEMP, 1915 ; ROXAS and ESTAMPADOR, 1930).

***Gonodactylus viridis* Serène, 1954**

*Gonodactylus chiragra* var. *viridis* Serène, 1954 : 6, 7, 10, 74-76, figs. 13-3.

*Gonodactylus viridis*, DINGLE *et al.*, 1977 : 16-17, fig. 9a-c. — MANNING, 1978 a : 4-6, fig. 2a-c.

## MATERIAL

## MUSORSTOM II

Mangrove at Silot Bay (Marine Station), close to Cebu City, 15.12.1980 : 1 ♂ 36 mm with *Caledoniella montrouzieri* (Souverbie, 1869) (MNHN-P St 930).

In front of Mactan Marine Station, reef flat, low tide, 9.12.1980 : 1 ♂ 28 mm, 3 ♀♀ 24-39 mm (MNHN-P St 956).

## REMARKS

One of the male specimens (TL 30 mm) has a remarkable median carina of the telson which is eroded on its anterior half leaving a flat space. The posterior end has the typical anchor-like carina ; no other differences are observable compared to the rest of the specimens. One of the specimens has a gastropod, *Caledoniella montrouzieri* (Souverbie, 1869), which was attached to the ventral surface of the thoracic somite and detached during the observations. Sacs of gastropod eggs are seen attached to the pleopods.

## DISTRIBUTION

*Gonodactylus viridis* has not been previously reported from the Philippines, the present record is new for the region. The species, for certainty, was known from Bay of Nhatrang, Vietnam (SERÉNE, 1954 ; MANNING, 1978 a) and Kho Phuket Island, Thailand (DINGLE *et al.*, 1977 ; MANNING, 1978 a).

## Family ODONTODACTYLIDAE Manning, 1980

**Odontodactylus brevirostris** (Miers, 1884)

*Odontodactylus brevirostris*, MANNING, 1967 : 22-29, figs. 6-8 (synonymy).

## MATERIAL

## MUSORSTOM I

Station 57, 107-96 m : 1 ♂ 25 mm, 1 ♀ 53 mm (MNHN-P St 985).

## DISTRIBUTION

Widely distributed in the Indo-West Pacific. In the Philippines it was recorded from several localities (MANNING, 1967).

**Odontodactylus cultrifer** (White, 1850)

*Odontodactylus cultrifer*, MANNING, 1967 : 18-22 fig. 5 (synonymy).

## MATERIAL

## MUSORSTOM I

Station 73, 76-70 m : 1 ♂ 40 mm (MNHN-P St 900).

## DISTRIBUTION

Widely distributed in the Western Pacific Ocean including several localities in the Philippines (MANNING, 1967).

## Family PROTOSQUILLIDAE Brooks, 1886

**Chorisquilla excavata** (Miers, 1880)

(Fig. 4)

*Gonodactylus excavatus* Miers, 1880 : 45-46 (123-124), pl. III, figs. 11, 12. — POCOCK, 1893 : 476. — KEMP, 1913 : 187-189, pl. X, figs. 122-123. — ODHNER, 1923 : 15. — HANSEN, 1926 : 36-37, pl. II, fig. 4a.

*Protosquilla excavata*, BROOKS, 1886 : 78.

*Chorisquilla excavata*, MANNING, 1975 : 254-255, fig. 1a, c.

*Chorisquilla pococki* Manning, 1975 : 256-258, figs. 1b, 2.

? *Chorisquilla andamanica* Manning, 1975 : 258-260, fig. 3.

## MATERIAL

## MUSORSTOM II

Station 73, 20-21 m : 1 ♂ 23 mm, 8 ♀♀ 13-31 mm (MNHN-P St 965), 3 ♂♂ 21-27 mm (LON. Cat. no. S 2511).

## REMARKS

MANNING (1975) studied specimens identified by various authors as *Gonodactylus excavatus* or *Protosquilla excavata* and arrived at a conclusion that they comprised of more than one species and thence described two new species : *Chorisquilla andamanica* and *C. pococki*. *Chorisquilla excavata* (sensu MANNING, 1975) has very uncertain distribution since the type specimen does not bear any information and was probably collected from southwestern Pacific Ocean (Manning, 1975). The Philippines material comprising of 12 specimens of various length sizes shows remarkable gradual morphological differences. Two males specimens (TL 21 and 23 mm) show resemblances with *C. excavata* (fig. 4b) in the form of the telson : a relatively narrow intermediate fissure which is armed with two denticles ; intermediate and submedian teeth are approximately at the same level ; median boss of telson relatively long, margins corroded, extending almost to anterior margin of median fissure ; lateral bosses with corroded margins on latero-posterior portion only. Two female (TL 28 and 31 mm) and one male (TL 27 mm) specimens have the following characters : median boss of telson relatively short, not extending to anterior margin of median fissure, resembling figure 3 of MANNING (1975) for *C. andamanica* ; corrugation on the lateral bosses marked ; intermediate fissure bearing two denticles. In the smallest specimens (TL 12-15 mm), the median and lateral bosses of telson are markedly corrugated and the lateral bosses are retracted anteriorly, resembling figures 1b and 2b of MANNING (1975) for *C. pococki* ; dorsal surface of submedian teeth carinate. Gradual changes on the lateral margin of telson are seen : in large specimens the lateral margins are more curved (fig. 4c), resembling *C. andamanica* then becoming less curved in the smaller specimens (fig. 4b) which resemble *C. excavata* and become almost straight in the smallest specimens (fig. 4a) which resemble *C. pococki*. The lateral bosses of telson not extending to posterior margin, dorsal surface of submedian teeth with carinae ; these bosses gradually enlarged and advancing posteriorly and in large specimens dorsal carinae on dorsal surface of submedian median teeth no longer exist. The number of submedian denticles varied : 6 to 8 in large specimens, 7 to 10 in the small ones. Intermediate fissures of telson relatively wide and deep in small specimens (fig. 4a) and become relatively narrow and shallow in the large specimens. The variations existing in the Philippines specimens, collected from one locality, lead to doubtful validity of *C. pococki* Manning, 1975 as a distinct species out of *C. excavata* (Miers, 1880). Also, it is doubtful to accept *C. andamanica* Manning, 1975 as a distinct species since the characters shown by the Philippines specimens represent all forms of "excavata-complex" including *C. andamanica*. The only difference between *C. andamanica* is the absence of posterolateral spine on sixth abdominal somite in the latter

while the number of submedian denticles is variable. One of the specimens of the present series bearing a gastropod eggs-sacs which resemble the eggs-sacs of *Caledoniella montrouzieri* (Souverbie, 1869) but no gastropod specimen attached.

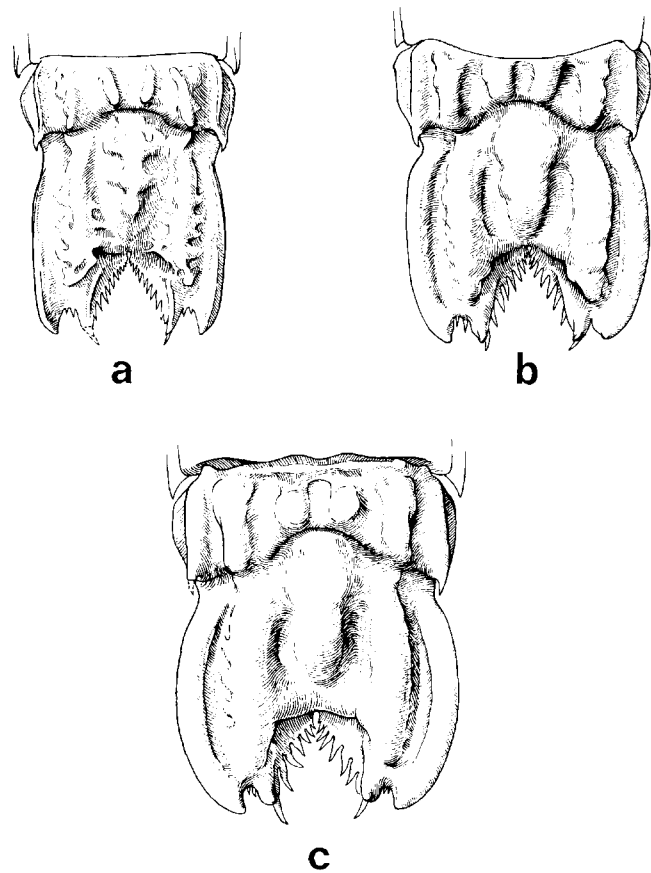


FIG. 4. — *Chorisquilla excavata* (Miers, 1880), sixth abdominal somite and telson of : a. female, TL 13 mm ; b. male, TL 23 mm ; c. female, TL 31 mm.

#### DISTRIBUTION

*Chorisquilla excavata* has not been previously reported from the Philippines. This species has been reported from Indonesia (HANSEN, 1926 ; MANNING, 1975), South China Sea (POCOCK, 1893 ; MANNING, 1975), Bonin Islands (ODHNER, 1923), Andamans (KEMP, 1913 ; MANNING, 1975), and now from the Philippines. The specimens from Vietnam reported by GRAVIER (1937), SERÈNE (1939, 1954), and DAWYDOFF (1952) which are preserved in the Paris Museum comprised of two species ; *Haptosquilla glyptocercus* (specimens from Poulo Condor collected during March-April 1931 and specimens from Nhatrang Bay collected in September 1934) and *H. lenzi* (specimen collected from Poulo Condor during March-April 1934) ; none represents *C. excavata*.

## Family PSEUDOSQUILLIDAE Manning, 1977

**Faughnia serenei** Moosa, 1982

*Faughnia serenei* Moosa, 1982 : 600-603, figs. 1-5 (synonymy).

## MATERIAL

## MUSORSTOM I

Station 9, 194-180 m : 1 ♀ 122 mm (MNHN-P St 952).

Station 10, 187-205 m : 1 ♂ 100 mm (MNHN-P St 950).

Station 30, 186-177 m : 1 ♂ 97 mm, 2 ♀♀ 89-140 mm (LON. Cat. no. S. 2521).

Station 31, 187-195 m : 1 ♂ 119 mm, 1 ♀ 137 mm (MNHN-P St 954).

Station 51, 200-170 m : 1 ♀ 106 mm (MNHN-P St 947).

Station 68, 199-183 m : 3 ♂♂ 93-122 mm, 2 ♀♀ 116-126 mm (MNHN-P St 948).

Station 69, 187-199 m : 1 ♂ 113 mm, 1 ♀ 99 mm (MNHN-P St 953).

## MUSORSTOM II

Station 31, 230-204 m : 1 ♀ 100 mm (MNHN-P St 951).

## DISTRIBUTION

Taiwan (?), South China Sea, and the Philippines, 73-316 m ; shell detritus, sand and dark green mud (MOOSA, 1982).

**Pseudosquilla ciliata** (Fabricius, 1787)

*Pseudosquilla ciliata*, KEMP, 1913 : 96-100, 196 (for older synonymy). — 1915 : 172.

## MATERIAL

## MUSORSTOM II

Reef flat of Ayutala, Cagayan de Oro, low tide, 12.12.1980 : 1 ♂ 32 mm, 1 ♀ 32 mm, 1 ♀ 66 mm (MNHN-P St 942).

## DISTRIBUTION

Widely distributed in the Indo-West Pacific. In the Philippines it was reported from Port Galera, Mindoro (KEMP, 1915).

Superfamily **LYSIOSQUILLOIDEA** Giesbrecht, 1910Family **LYSIOSQUILLIDAE** Giesbrecht, 1910**Heterosquilloides insignis** (Kemp, 1911)

(Pl. I, fig. C)

*Lysiosquilla insignis* Kemp, 1911 : 94-95. — 1913 : 126-128, pl. IX, figs. 99-102. — BARNARD, 1950 : 858-859, fig. 3c.

## MATERIAL

## MUSORSTOM I

Station 50, 415-510 m : 1 ♀ 91 mm (MNHN-P St 955)

## REMARKS

The specimen, a female of 91 mm, is the third known of this species. It agrees in almost all details with the description of KEMP (1911, 1913) and BARNARD (1950). Since the present specimen is the largest ever known, some minor morphological differences are seen, those are : 1. KEMP (1913) mentioned that in his specimen the cervical groove is absent, this groove is seen in the Philippines specimen as a shallow depression on both sides of each gastric groove ; 2. Telson with more tubercles than as figured by KEMP (1913, pl. IX, fig. 101) and BARNARD (1950, fig. 3, c) ; 3. Outer margin of proximal segment of uropodal exopod with five movable spines of which the distal two are very large ; 4. Raptorial dactylus with 7 instead of 7-8 as mentioned by KEMP (1911, 1913) and BARNARD (1950). Antennal protopod with two ventral papillae.

## DISTRIBUTION

*Heterosquilloides insignis* was only known from two localities : off Andamans, 14°27' N, 93°50' E, in 423 m depth (KEMP, 1911, 1913) ; north of Durban, South Africa, 270 m (BARNARD, 1950). The presence of this species in the Philippines is a new record for this area and is an eastward extension of its geographical distribution in a deeper water (415-510 m).

**Heterosquilloides philippinensis** sp. nov.

(Fig. 5)

## MATERIAL

## MUSORSTOM I

- Station 9, 194-180 m : 1 ♀ 29 mm (Paratype) (MNHN-P St 961).  
Station 20, 208-222 m : 1 ♂ 40 mm (Paratype) (MNHN-P St 958).  
Station 21, 223-174 m : 1 ♀ 42 mm (Paratype) (MNHN-P St 959).  
Station 24, 189-209 m : 1 ♂ 36 mm (Paratype) (MNHN-P St 957).  
Station 51, 200-170 m : 1 ♂ 37 mm (Paratype) (MNHN-P St 960).



## MUSORSTOM II

Station 12, 197-210 m : 1 ♀ 40 mm (Paratype) (MNHN-P St 975).

Station 18, 195-188 m : 1 ♂ 38 mm, 1 ♀ 31 mm (both claws missing) (Paratypes) (MNHN-P St 977).

Station 21, 191-192 m : 1 ♂ 36 mm, 1 ♀ 32 mm (Paratypes) (LON. Cat. no. S 2507).

Station 35, 160-198 m : 1 ♂ 40 mm (Paratype), 1 ♀ (damaged) (MNHN-P St 970).

Station 66, 209-192 m : 1 ♂ 37 mm (Holotype) (MNHN-P St 969).

Station 67, 193-199 m : 1 ♀ 33 mm (Paratype) (MNHN-P St 976).

Station 71, 189-197 m : 1 ♂ 36 mm (Paratype) (MNHN-P St 971).

Station 72, 197-182 m : 1 ♂ 35 mm (Paratype) (MNHN-P St 972).

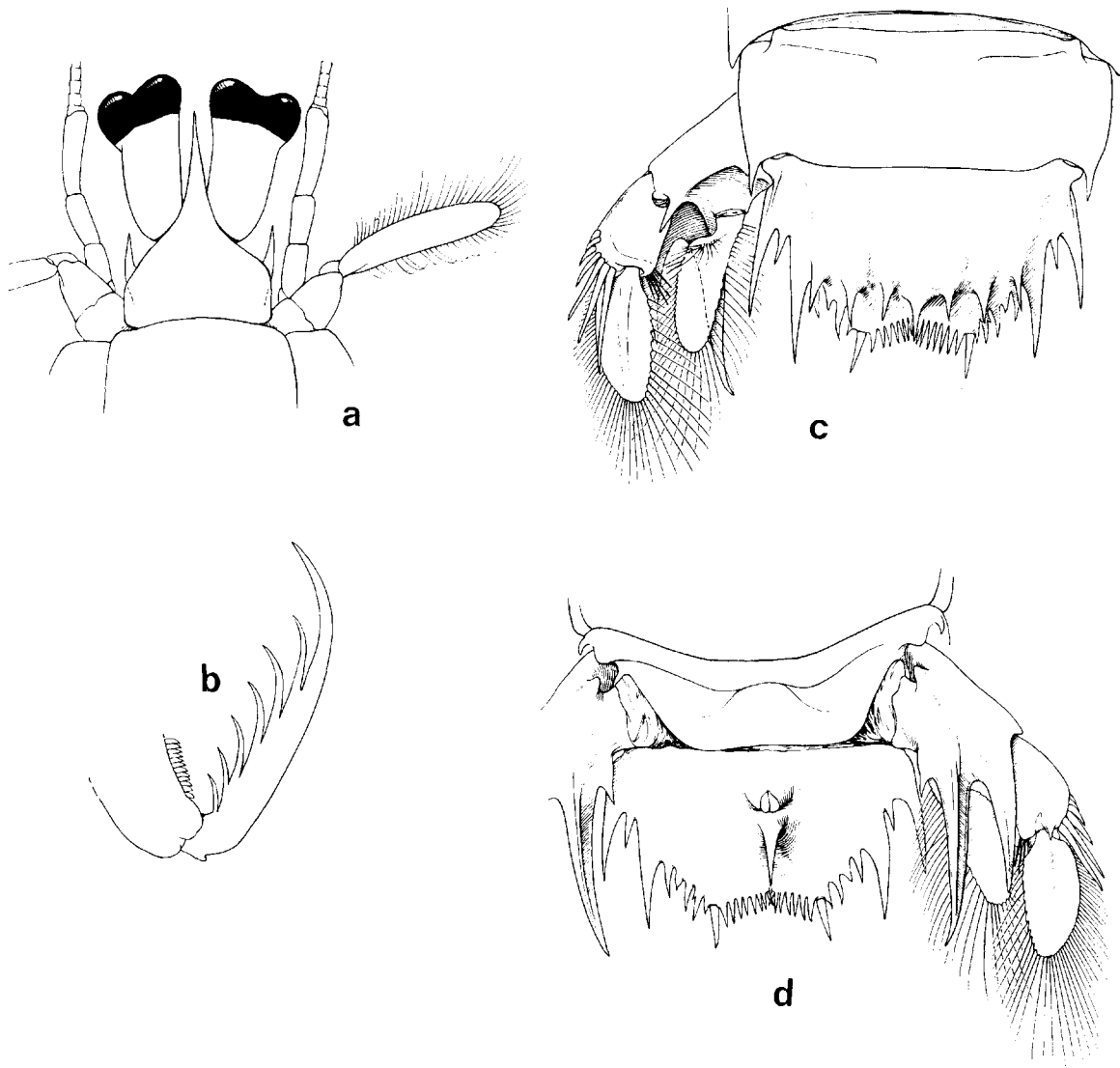


FIG. 5. — *Heterosquilloides philippinensis* sp. nov., male holotype, TL 37 mm : a. anterior part of body ; b. raptorial dactylus ; c. sixth abdominal somite, telson, and uropod (dorsal view) ; d. sixth abdominal somite, telson, and uropod (ventral view).

## DESCRIPTION

Size small. Body smooth and polished.

Eye large, cornea bilobed, set transversely on stalk. Eyes extending beyond second segment of antennular peduncle. Ocular scales small, fused medially.

Antennular peduncle short, slightly more than half as long as carapace length ; each antennular process visible lateral to rostral plate as a sharp, anteriorly directed spine.

Antennal scale small, less than half as long as carapace ; antennal protopod without papilla.

Rostral plate with broad basal portion, lateral margins rounded, apex with long spine extending to middle of cornea, ventral margin of apical spine carinate.

Carapace smooth, without carinae, narrowed anteriorly ; anterolateral angle almost straight, not reaching base of rostral plate.

Raptorial dactylus armed with seven teeth, outer margin with a basal notch ; propodus fully pectinate, inner proximal portion with four movable spines ; carpus with a long entire dorsal ridge terminating anteriorly into an acute tooth.

Mandibular palp present, three-segmented. Five epipods present.

Exposed thoracic somites without carinae. Lateral process of sixth and seventh somites rounded posterolaterally. Basal segment of walking legs each with ventrally directed spine ; endopod of walking leg two segmented, distal segment subcircular on the first leg, ovate on the second leg, and elongate ovate on the third leg.

Abdomen without submedian, intermediate, and lateral carinae on the first five somites and no spine present on these somites ; sixth somite without dorsal carinae, only lateral spine present.

Telson much broader than long, width about twice the length in median line ; dorsal carinae absent ; posterior fan armed with three pairs of spines lateral to median spine which in turn is the largest. Three pairs of median teeth present, submedian with submedian apices ; denticles sharp, submedian denticles arranged in almost straight line ; denticle formulation : 8-10, 3-4, 1. Ventral surface of telson smooth, a long upraised spine situated posterior to anal pore.

Proximal segment of uropodal exopod shorter than distal segment, outer-lateral margin with seven movable spines of which the last extending beyond middle of distal segment, inner distal margin with 5-6 stiff setae. Basal prolongation of uropodal endopod with inner spine longer than outer, inner basal edge with a sharp tooth.

## COLOR

The general coloration of the preserved specimens is creamy. No marked pigmentation is observable.

## SIZE RANGES

Males 35-40 mm, females 29-42 mm.

## REMARKS

*Heterosquilloides philippinensis* sp. nov. resembles *H. insueta* Manning, 1970 and two closely related species : *H. brazieri* (Miers, 1880) and *H. latifrons* (de Haan, 1844) in the form of rostral plate, eye shape, and the presence of post-anal spine. MANNING (1966) mentioned that both *H. brazieri* and *H. latifrons* possess bifurcated rostral spine which distinguished them from all the then known species of Indo-Pacific *Heterosquilloides*. *H. insueta* and *H. philippinensis* do not possess bifurcated rostral spine, the two can be separated by : the absence of submedian and intermediate spines on dorsal surface of sixth abdominal somite in *H. philippinensis* ; the absence of dorsal carination on the dorsal surface of telson of *H. philippinensis* which also has less numerous submedian and intermediate denticles on the telson ; and the absence of carinae lateral to the post-anal keel on *H. philippinensis*.

## ETYMOLOGY

The epithet "*philippinensis*" is derived from the type locality, the Philippines.

## TYPE DEPOSITORY

The male holotype and the paratypes are deposited in the Muséum National d'Histoire Naturelle Paris, two paratypes are deposited in the National Institute of Oceanology, Jakarta (LON. Cat. no. S 2507).

## DISTRIBUTION

Known only from the type locality, the Philippines.

## Family NANNOSQUILLIDAE Manning, 1980

***Acanthosquilla wilsoni* Moosa, 1973**

(Fig. 6)

*Acanthosquilla wilsoni* Moosa, 1973 : 15-17, fig. 2.

## MATERIAL

## MUSORSTOM I

Station 56, 134-129 m : 1 ♀ 23 mm (raptorial claws missing) (MNHN-P St 988), 1 ♀ 21 mm (only one claw exists) (LON. Cat. no. S. 2512).

## REMARKS

*Acanthosquilla wilsoni* Moosa, 1973 was described from a male without raptorial claws. Only one of the two Philippines specimens has one raptorial claw which is armed with 6 teeth, outer margin of dactylus with 2 notches (fig. 6). Antennal protopod with only one ventral papilla, mesial papilla absent.

## DISTRIBUTION

The type was collected from Aru Island, Indonesia, 72-75 m, on muddy bottom. The species has not been recorded from the Philippines ; the present record is new for the region where it was collected in 134-129 m depth.

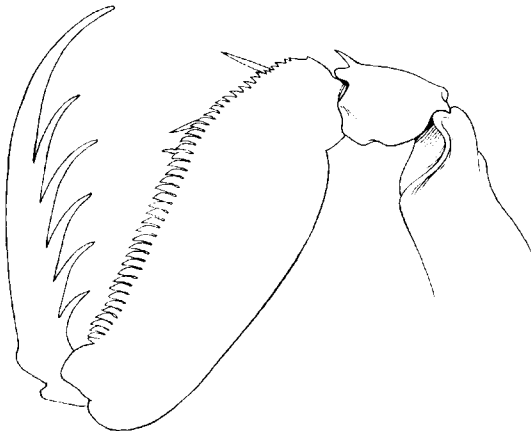


FIG. 6. — *Acanthosquilla wilsoni* Moosa, 1973, female, TL mm : raptorial claw.

Superfamily **SQUILLOIDEA** Latreille, 1803Family **HARPIOSQUILLIDAE** Manning, 1980**Harpiosquilla harpax** (de Haan, 1844)

*Squilla harpax* de Haan, 1844, atlas, pl. LI, fig. 1 ; 1849, text : 222-223.

*Harpiosquilla harpax*, MANNING, 1969 c : 25-33, figs. 28-28 (for synonymy). — GARCIA, 1981 : 12, 16-17.

## MATERIAL

## MUSORSTOM I

Station 1, 36-37 m : 9 ♂♂ 69-113 mm, 7 ♀♀ 78-136 mm (MNHN-P St 981).

Station 2, 187-182 m : 1 ♂ 95 mm, 2 ♀♀ 92-168 mm (MNHN-P St 984).

Station 56, 134-129 m : 1 ♀ (juv.) (MNHN-P St 983).

Station 72, 127-122 m : 1 ♂ (juv.) (MNHN-P St 982).

## DISTRIBUTION

*Harpiosquilla harpax* is widely distributed in the Indo-West Pacific. This species has been previously recorded from the Philippines (see MANNING, 1969 ; GARCIA, 1981).

Family **SQUILLIDAE** Latreille, 1803**Anchisquilla fasciata** (de Haan, 1844)

*Squilla fasciata* de Haan, 1844, atlas, pl. LI, fig. 4 ; 1849, text : 224. — BROOKS, 1886 : 37-40, pl. II, fig. 8 ; pl. III, figs. 4, 5. — KEMP, 1913 : 34-36, pl. I, figs. 21-23.

## MATERIAL

## MUSORSTOM I

Station 1, 36-37 m : 2 ♂♂ 71-72 mm, 1 ♀ 59 mm (all specimens without raptorial claws except one male with only one claw) (MNHN-P St 946).

Station 72, 127-122 m : 1 ♂ 31 mm, 1 ♀ 29 mm (MNHN-P St 992).

## DISTRIBUTION.

*Anchisquilla fasciata* has not been previously reported from the Philippines ; the present record is a new one. This species has been recorded from Japan (DE HAAN, 1844 ; BROOKS, 1886 ; FUKUDA, 1910 ; KOMAI, 1927 ; HOLTHUIS, 1941), China (POCOCK, 1893 ; SCHMITT, 1929), Vietnam (GRAVIER 1930, 1937 ; DAWYDOFF, 1952 ; SERÈNE, 1954 ; BLUMSTEIN, 1974), Singapore (TWEEDIE, 1934), Indo-

nesia (HANSEN, 1926 ; HOLTHUIS, 1941 ; MOOSA, 1973, 1975), Andamans and Mergui Archipelago (KEMP, 1913), Maldives (CHOPRA, 1939), and Red Sea (HOLTHUIS, 1967) in depths ranging from below 10 m to 100 m, in various kinds of habitat : mud, muddy sand, hard sand, foraminiferal sand, and coral and stones.

*Anchisquilloides michelae* sp. nov.

(Fig. 7)

MATERIAL

MUSORSTOM 1

Station 16, 164-150 m : 2 ♂♂ 86-111 mm (Paratypes) (LON. Cat. no. S 2505).

Station 58, 143-178 m : 1 ♂ 92 mm, 2 ♀♀ 88-101 mm (Paratypes) (MNHN-P St 941).

Station 69, 187-199 m : 1 ♀ 115 mm (Holotype) (MNHN-P St 935).

DESCRIPTION

Dorsal surface of body appearing smooth and polished.

Eye small, cornea bilobed, set obliquely on stalk. Eyes not extending to the end of first segment of antennular peduncle. Corneal indices 586-628.

Antennular peduncle shorter than carapace length. Ocular scales subquadrate, separate. Dorsal process of antennular somite forming a sharp spine, directed anterolaterally. Anterior margin of ophthalmic somite trilobated.

Rostral plate triangular, lateral margins converging anteriorly to form sharp pointed apex ; median carina present, running from anterior almost to base of rostral plate.

Carapace slightly narrowed anteriorly, length about 1.8 of anterior width which is in turn about 0.68 as broad as posterior width ; median carina very low with anterior portion obsolete ; intermediate carinae absent ; lateral and reflected marginal carinae only seen on posterior plate ; anterolateral angle with spine, not extending to base of rostral plate.

Mandibular palp present, three segmented. Four epipods present.

Raptorial claw robust, inferodistal angle of outer face of merus unarmed ; carpus with dorsal ridge terminating in a tubercle and an anteriorly situated tubercle ; propodus fully pectinate, with three movable spines on inner proximal portion, PI = 988-1085 ; dactylus armed with six teeth, outer margin with a basal notch.

Exposed thoracic somites with submedian and intermediate carinae ; seventh somite with trace of median carina, eighth somite with median carina. Lateral process of fifth somite with sharp spine directed anterolaterally ; ventral spine absent, replaced by tubercle. Lateral process of sixth and seventh thoracic somites single, posterolateral angle spinous. Lateral process of eighth thoracic somite with low, blunt anterior lobe.

Abdomen with median carina on the first five somites ; abdominal carinae spined as follows : submedian 6, intermediate 3-6, lateral 1-6, marginal 1-5.

Telson broader than long, dorsal surface without carinae lateral to median carina which terminates posteriorly in a spine ; dorsal surface pitted ; three pairs of marginal teeth present, prelateral lobe present ; submedians with movable apices, dorsal surface with carina ; submedian and lateral denticle sharp, intermediate denticles broad, formulation : submedian 10-14, intermediate 6-7, lateral 1. Ventral surface of telson smooth, post-anal keel absent.

Uropod of moderate size ; proximal segment of exopod shorter than distal segment, outer margin with eight movable spines, the last of which is crescent shaped extending to only about one-third of distal segment. Basal prolongation of uropodal endopod with inner spine longer than outer ; outer margin of inner longer spine with one rounded lobe, inner margin crenulate.

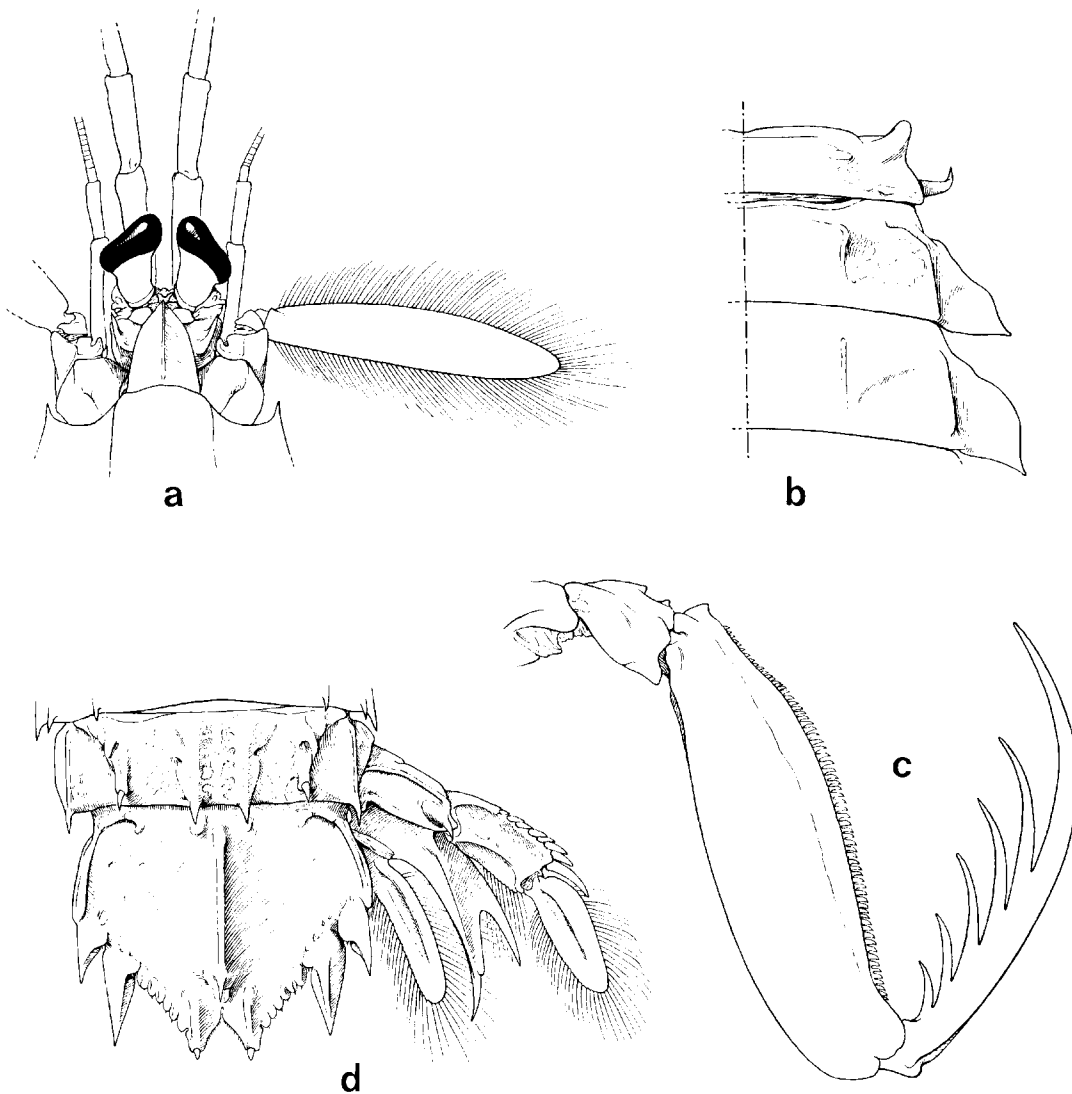


FIG. 7. — *Anchisquilloides michelae* sp. nov., female holotype, TL 115 mm : a. anterior part of body ; b. fifth to seventh thoracic somites ; c. raptorial claw ; d. sixth abdominal somite, telson, and uropod.

#### COLOR

The general coloration of the preserved specimens is greyish-brown. Dark brown outline is seen on gastric grooves, posterior margin of carapace, outer margin of antennal protopod, posterior margin of last three thoracic somites and first five abdominal somites ; of the latter the coloration is more pronounced between the submedians of the first and second somites, uropodal endopod and inner margin of proximal segment of uropodal exopod. Dark brown spot is seen on distal portion of raptorial merus, lateral portion of fifth and sixth thoracic somites and lateral portion of fifth and sixth abdominal somites.

#### SIZE RANGES

Males 86-111 mm, females 88-115 mm.

## REMARKS

*Anchisquilloides michelae* sp. nov. is the second known species of the genus. It differs from *A. mcneilli*, the type species, in the following morphological characters : 1. *A. michelae* has fewer abdominal spines than *A. mcneilli* ; 2. *A. michelae* has a broader carapace than *A. mcneilli* (anterior width of *A. michelae* always more than half of its posterior width while *A. mcneilli* with anterior width always less than half of its posterior width) ; 3. *A. michelae* has lesser number of intermediate denticles. The coloration of these species are based on prolonged preserved specimens. The coloration in the form of black patches on lateral portion of the fifth and sixth thoracic and fifth and sixth abdominal somites is not mentioned by STEPHENSON (1953) and therefore it is probable that they have different color patterns.

## ETYMOLOGY

The epithet "*michelae*" is dedicated to Mme Michèle DE SAINT LAURENT who participated in the both missions.

## TYPE DEPOSITORY

The male holotype (MNHN-P St 935), one male and two females paratypes (MNHN-P St 941) are deposited in the Muséum National d'Histoire Naturelle Paris ; two males paratypes (LON. Cat. no. S 2505) are deposited in the National Institute of Oceanology, Jakarta.

## DISTRIBUTION

Known only from the type locality, the Philippines, in 143 to 199 m depth.

**Anchisquillopsis gen. nov.**

## DEFINITION

Eye of moderate size, cornea bilobed, inner margin of eye longer. Ocular scales separate. Carapace with median carina. Mandibular palp and two epipods present. Dactylus of raptorial claw with eight teeth. Lateral process of fifth thoracic somite single. Lateral process of sixth and seventh thoracic somites single, with posterior spine. First five abdominal somites with median carina. Submedian teeth of telson with movable apices. Inner margin of basal prolongation of uropodal endopod crenulate.

## TYPE SPECIES

*Anchisquillopsis clevai* sp. nov. by monotypy.

## ETYMOLOGY

The name is derived from Greek -opsis-, like, in combination with the generic name *Anchisquilla*. The gender is feminine.

## REMARKS

*Anchisquillopsis* gen. nov. has close affinity with *Anchisquilloides* Manning, 1977 and *Alimopsis* Manning, 1977 sharing the presence of median carina on the first five abdominal somites. It differs

from both genera in the number of dactylar teeth : 5 in *Alimopsis*, 5-6 in *Anchisquilloides*, and 8 in *Anchisquillopsis*. *Anchisquillopsis* resembles *Alimopsis* in the number of epipods and the presence of median carina on the carapace but differs in the form of lateral process of thoracic somites and the form of submedian teeth of telson. *Anchisquillopsis* resembles *Anchisquilloides* in the form of lateral process of thoracic somites and the form of submedian teeth of telson but differs in the carination of carapace and the number of epipods.

***Anchisquillopsis clevai* sp. nov.**

(fig. 8)

MATERIAL

MUSORSTOM I

Station 40, 287-265 m : 1 ♀ 48 mm (Paratype) (MNHN-P St 1011).

MUSORSTOM II

Station 63, 230-215 m : 1 ♂ 137 mm (Holotype) (MNHN-P St 944), 1 ♀ 125 mm (Paratype) (LON. Cat. no. S 2504).

DESCRIPTION

Body relatively slim and elongate. Dorsal surface of body smooth and polished.

Eye of moderate size, cornea bilobed, set obliquely on stalk. Eyes not extending to the end of first segment of antennular peduncle. Corneal indices 486-520 in adult and 369 in juvenile specimens.

Antennular peduncle shorter than carapace length. Ocular scales separate, triangular with rounded apex. Dorsal process of antennular somite forming a sharp spine, directed anterolaterally. Anterior margin of ophthalmic somite straight.

Rostral plate triangular, longer than broad, margins converging into a pointed apex, median carina almost as long as rostral plate.

Carapace narrowed anteriorly, length about 3 times anterior width ; median carina without anterior bifurcation, anterior portion obsolete for about one-third of its length ; lateral carinae present ; reflected portion of marginal carinae present on posterior plate ; anterior width 0.57 as broad as posterior width ; antero-lateral angle produced into a sharp spine, not extending to base of rostral plate ; cervical groove present, extending between the intermediate carinae.

Mandibular palp present, three segmented. Two epipods present.

Raptorial claw strong, inferodistal angle on outer face of merus unarmed ; carpus with two tubercles on dorsal ridge ; propodus long, fully pectinate, with three movable spines on inner proximal portion, PI = 936-966 (in adult specimens) ; dactylus armed with eight teeth, outer margin smooth.

Exposed thoracic somites with submedian and intermediate carinae ; seventh somite with trace of median carina ; eighth somite with median carina. Lateral process of fifth somite with a sharp spine, directed anterolaterally, ventral spine replaced by small tubercle. Lateral process of sixth and seventh thoracic somites single, posterolateral margin spinous. Eighth thoracic somite with blunt spine, directed laterally.

Abdomen with median carina on first five somites ; abdominal carinae spined as follows : submedian 6 ; intermediate 1-6 ; lateral 1-6, marginal 1-5.

Telson as long as broad, without carinae lateral to dorsal median carina which terminates posteriorly in spine ; dorsal surface pitted ; three pairs of marginal teeth present ; prelateral lobe present. Submedian teeth of telson with movable apices, dorsal surface with short carina. Submedian and lateral denticles sharp, intermediate denticles broad ; denticle formulation is as follows : submedian 10-13 in adults, 15-16 in juvenile ; intermediate 7-8 ; lateral 1. Submedian fissure forming an anterior slit which may be wide. Ventral surface of telson without post-anal keel.



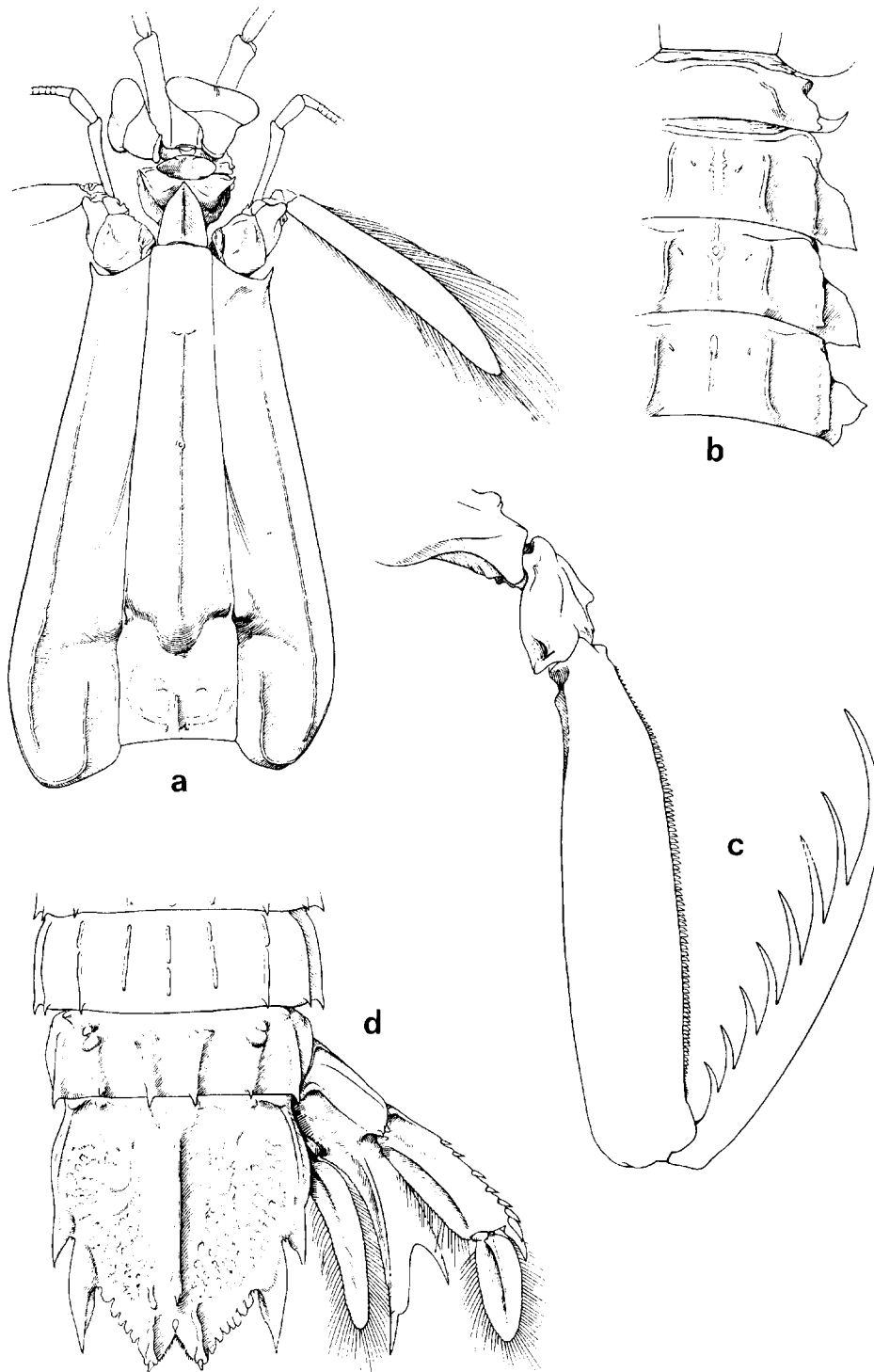


FIG. 8. — *Anchisquilopsis clevai* gen. nov., sp. nov., male holotype, TL 137 mm : a. anterior part of body ; b. fifth to eighth thoracic somites ; c. raptorial claw ; d. fourth to sixth abdominal somites, telson, and uropod.

Uropod of moderate size ; proximal segment of exopod longer than distal segment, outer margin with eight movable spines, last not extending to middle of distal segment. Basal prolongation of uropodal endopod with inner spine longer than outer ; outer margin of inner longer spine with a broad lobe, inner margin crenulate.

#### COLOR

The preserved specimens show the presence of a brownish spot between the intermediate and lateral carinae of the first abdominal somite. Posterior margin of last three thoracic and first four abdominal somites with brownish band between the intermediate carinae which is less conspicuous on the second abdominal somite and more pronounced on the first abdominal somite. A large brownish spot is seen on the lateral part of the sixth abdominal somite. Brownish coloration is also seen on distal part of uropodal endopod. This coloration, except for the brownish spot on the lateral part of sixth abdominal somite, is not seen in the juvenile specimen.

#### SIZE RANGES

Male 137 mm, females 48-125 mm.

#### REMARKS

*Anchisquilloides clevai* differs from all the described species of Squillidae. The three other species having the median carina on the first five abdominal somites, one of which is described in the present study, belong to two different genera.

#### ETYMOLOGY

The epithet "*clevai*" is dedicated to Mr. Regis CLEVA of the Muséum National d'Histoire Naturelle, who has given a lot of help during the preparation of this work.

#### TYPE DEPOSITORY

The male holotype (MNHN-P St 944) and the juvenile paratype (MNHN-P St 1011) are deposited in the Muséum National d'Histoire Naturelle Paris, the female paratype is deposited in the National Institute of Oceanology, Jakarta (LON. Cat. no. S 2504).

#### DISTRIBUTION

Known only from the type locality, the Philippines, in the depth ranging from 215 to 287 m.

### ***Clorida gaillardii* sp. nov.**

(Fig. 9)

#### MATERIAL

##### MUSORSTOM I

Station 1, 36-37 m : 1 ♂ 81 mm (Holotype) (MNHN-P St 1003) ; 1 ♂ 66 mm (Paratype) (LON. Cat. no. S. 2501) ; 1 ♀ 56 mm (Paratype) (MNHN-P St 1007).

## DESCRIPTION

Eye small, extending to only one fourth of the first segment of antennular peduncle. Cornea small, bilobed, set obliquely on stalk, width about one-third of eye length. Eye stalk about 0.6-0.7 of eye length. Ocular scales fused into inconspicuously bilobed plate.

Antennular peduncle about 0.75 as long as carapace length.

Rostral plate short, triangular with rounded apex, much broader than long, without dorsal carina.

Carapace strongly narrowed anteriorly, anterior width a little more than half posterior width ; antero-lateral tooth present, sharp, not extending to base of rostral plate. Dorsal surface of carapace smooth, lacking carinae except for the reflected marginal carinae on posterior part of lateral plates.

Mandibular palp present, three segmented. Four epipods present.

Raptorial claw of moderate size ; dactylus armed with five teeth, proximal tooth smallest, outer margin with one small notch ; propodus rather large, propodal index 83-88, fully pectinate, with three movable spines proximally ; carpus with undivided dorsal ridge.

Exposed thoracic somites with submedian and intermediate carinae on the last three somites. Lateral process of fifth thoracic somite with a long, anterolaterally directed spine ; ventral spine present, small and acute. Lateral process of sixth and seventh thoracic somites truncated posteriorly. Eighth thoracic somite with a marked, blunt anterior lobe.

Abdomen broad, strongly depressed, submedian carinae present on all somites. Abdominal carinae spines as follows : submedian 6 ; intermediate 4-6 ; lateral 4-6 ; marginal (3), 4-5. Sixth abdominal somite corrugated between the submedian and intermediate carinae.

Telson broader than long, margin with three pairs of teeth, submedians with movable apices, prelateral lobe present. Lateral margin of the intermediate and lateral teeth smooth or slightly tuberculated in large specimens. Dorsal surface of telson with numerous tubercles. Dorsal carinae of the submedian, intermediate and lateral teeth swollen in males ; dorsal surface of the prelateral lobe not swollen. Denticles sharp, formulation : submedian 3, intermediate 7, lateral 1. Ventral surface of telson smooth, post-anal keel present, short.

Uropod of moderate size ; proximal segment of exopod shorter than distal segment, outer margin with 8-9 movable spines, last not extending to middle of distal segment. Inner longer spine of basal prolongation of uropod with a rounded lobe on outer margin and with 7-10 spines on inner margin.

## COLOR

The preserved specimens show traces of a black band outlining the carapace, rostral plate and antennal protopod. Last three thoracic and first five abdominal somites with black band on posterior margin which is only existing between the intermediate carinae on the fifth somite. Proximal segment of uropodal exopod is black on its inner half and with a small, black patch on distal part of the outer half which is seen only on large specimens.

## SIZE RANGES

Males 66-81 mm, female 56 mm.

## REMARKS

*Clorida gaillardi* sp. nov. closely resembles *C. latreillei* Eydoux et Souleyet. Both species share common morphological characters but differ in the following respects : 1. *C. gaillardi* has a slimmer and longer propodus than *C. latreillei* (PI = 83-88, PLDI = 315-357 in *C. gaillardi* ; PI = 102, PLDI = 286 in *C. latreillei* based on a specimen ♂ 60 mm, preserved in the Paris Muséum (MNHN-P St 724) identified by MANNING) ; 2. Lateral process of fifth thoracic somite is a large, antero-laterally

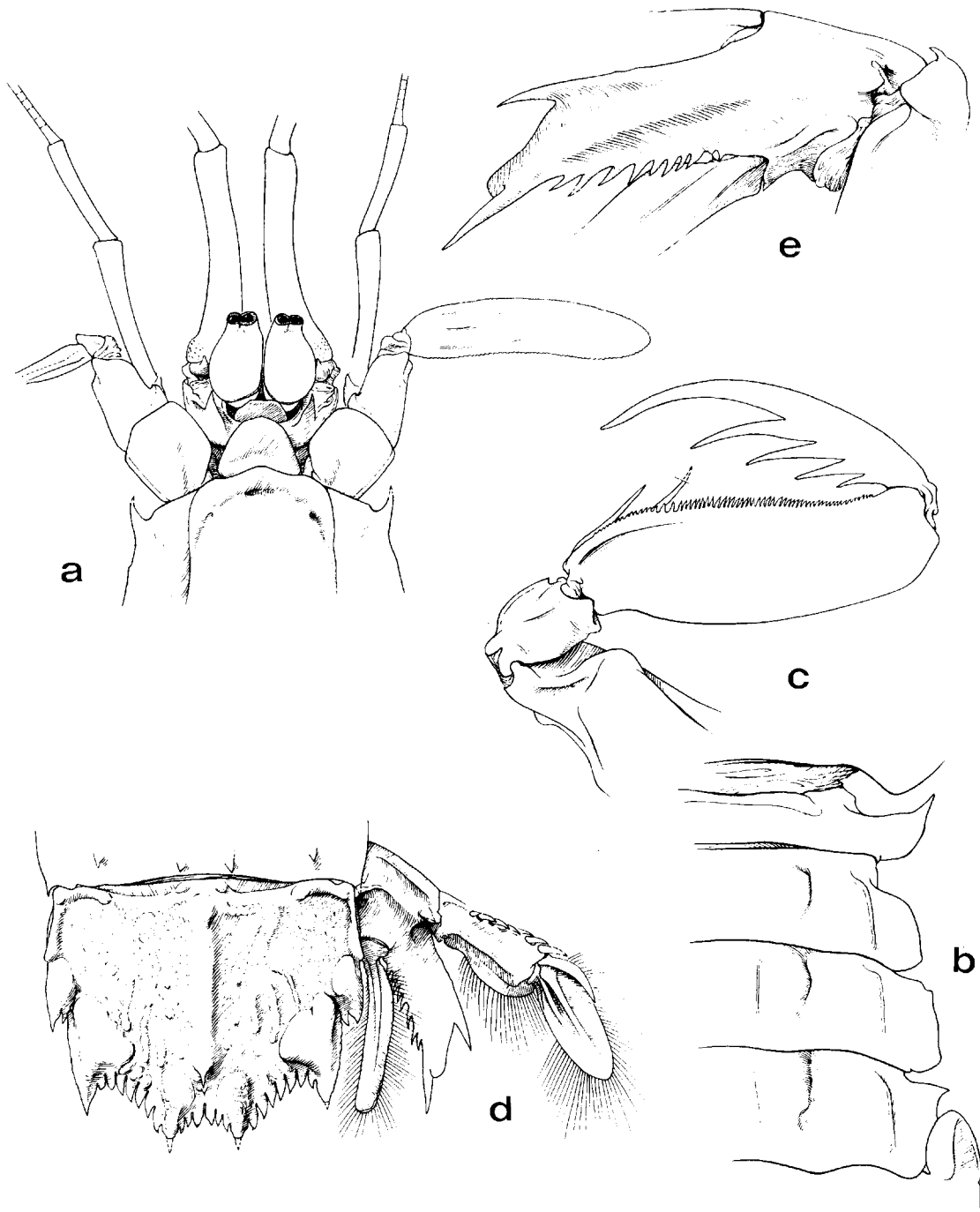


FIG. 9. — *Clorida gaillardii* sp. nov., male holotype, TL 81 mm : a, anterior part of body ; b, fifth to eighth thoracic somites ; c, raptorial claw ; d, sixth abdominal somite, telson, and uropod ; e, basal prolongation of uropod, ventral view.

*C. gaillardi* which is small and laterally directed spine in *C. latreillei*; 3. More spines present on the abdominal carinae of *C. gaillardi* than in *C. latreillei* (Table 1).

TABLE 1. Spine formulation on the abdominal carinae of *Clorida gaillardi* n. sp. and *C. latreillei*.

	SM	I	L	M
<i>C. gaillardi</i>	6	4-6	4-6	(3), 4-5
<i>C. latreillei</i> (MNHN-P)	6	5-6	5-6	3-5
<i>C. latreillei</i> (Kemp, 1913)	6	5-6	5-6	(2) (3), 4-5
<i>C. latreillei</i> (Manning, 1969a)	6	5-6	5-6	5

#### ETYMOLOGY

The epithet "*gaillardi*" is in honour of Mr. Maurice GAILLARD, the artist of the Paris Muséum, who prepared all the drawings for this study.

#### TYPE DEPOSITORY

The male holotype (MNHN-P St 1003) and a female paratype (MNHN-P St 1007) are deposited in Muséum National d'Histoire Naturelle Paris, one female paratype is deposited in the National Institute of Oceanology, Jakarta (LON. Cat. no. S 2501).

#### DISTRIBUTION

Known only from the type locality, the Philippines, 36-37 m.

#### *Clorida malaccensis* Manning, 1968

*Clorida malaccensis* Manning, 1968 : 244-247; fig. 2. — 1978 a : 26-27.

?*Clorida malaccensis* var. *moluccensis* Moosa, 1973 : 19-22, fig. 3.

#### MATERIAL

##### MUSORSTOM I

Station 1, 36-37 m : 1 ♂ 39 mm (raptorial claws missing) (MNHN-P St 1004) ; 1 ♂ 38 mm (raptorial claws missing) (LON. Cat. no. S 2510).

#### REMARKS

The Philippines specimens agree in most detail with the description and figure of MANNING (1968, fig. 2). Ocular scales clearly bilobed, fused medially to form a sulcus. Raptorial claws missing. Ventral surface of telson smooth and with a long post-anal keel which is interrupted at distal part. MOOSA (1973) described var. *moluccensis* based on two male specimens which differ from the typical species in : 1. having broad, pentagonal ocular scale which is hardly seen as bilobed and is seen as an entire plate ; 2. ventral surface of telson with a post-anal keel surrounded by a U-shaped carina comprising of tubercles and a line of tubercles exteriorly at one side and irregular tubercles at the other side. MANNING (1978) synonymized var. *moluccensis* with the typical *malaccensis*. Comparison of the two type materials is important to confirm their taxonomical status.

## DISTRIBUTION

*Clorida malaccensis* has never been reported from the Philippines, the present record is a new one. The species has been recorded from Strait of Malacca (MANNING, 1968), Moluccas, Indonesia, 54-90 m (MOOSA, 1973), Madagascar, 42 m (MANNING, 1978 a), and now from the Philippines, 36-37 m (present record).

**Clorida merguiensis** (Tiwari and Biswas, 1952)

*Squilla merguiensis* Tiwari and Biswas, 1952 : 350-351, fig. 1a.

*Clorida merguiensis*, BLUMSTEIN, 1974 : 116, fig. 4. — MANNING, 1976 : 8-10, fig. 4. — MAKAROV, 1979 : 44-47, fig. 3.

## MATERIAL

## MUSORSTOM I

Station 1, 36-37 m : 1 ♂ 41 mm (MNHN-P St 1005)

## REMARKS

The present specimen shows only traces of submedian carinae on the fifth abdominal somite. The abdominal carinae has fewer spines with the formulation as follows : submedian 6 ; intermediate 5-6 ; lateral 5-6 ; marginal 3-5. This is close to the characters of the specimens from Tonkin Bay, Vietnam, studied by MAKAROV (1979) who also compared his specimens of *C. merguiensis* with *C. verrucosa*, two species closely related. MAKAROV stated that large specimens of *C. merguiensis* may develop a distal carina on the rostral plate, a character which is existing both in *C. verrucosa* and the present specimen studied. The Philippines specimen is closer to *merguiensis* in the following characters : 1. having lesser number of intermediate denticles on telson (6-7) ; 2. having lesser number of movable spines on outer margin of proximal segment of uropodal exopod (6) of which the last extends almost to middle of distal segment ; 3. basal prolongation with 7 to 8 spines. Mandibular palp present. Ventral surface of fifth thoracic somite with small, sharp spine. Post-anal keel present, short.

## DISTRIBUTION

*Clorida merguiensis* has never been previously reported from the Philippines. It has been recorded from Indonesia, 13-31 m (HANSEN, 1926, as part of *Squilla verrucosa* Hansen, 1926 ; MANNING, 1976), Mergui Archipelago, 59 m (TIWARI and BISWAS, 1952), Bay of Tonkin, Vietnam, 18-75 m (BLUMSTEIN, 1974 ; MAKAROV, 1979), and the Philippines 35-36 m (present record).

**Kempina mikado** (Kemp and Chopra, 1921)

(Fig. 10)

*Squilla stridulans*, KEMP, 1913 : 78-80 (part, Japanese specimen only) (non *Squilla stridulans* Wood-Mason, 1894).

*Squilla mikado* Kemp and Chopra, 1921 : 301-303, fig. 2. — KOMAI, 1927 : 320-321. — KOMAI and TUNG, 1930 : 13-14. — MANNING, 1965 : 257-259, pl. XII, fig. a.

*Squilla zanzibarica* Chopra, 1939 : 143-148, text-figs. 2, 4.

*Oratosquilla mikado*, BLUMSTEIN, 1974 : 119.

*Kempina zanzibarica*, MANNING, 1981 : 298-299, fig. 1.

## MATERIAL

## MUSORSTOM I

- Station 9, 194-180 m : 1 ♂ 63 mm, 1 ♀ (moulted, poor condition) (MNHN-P St 1073).  
 Station 10, 187-205 m : 5 ♂♂ 51-119 mm, 3 ♀♀ 49-142 mm (MNHN-P St 1085).  
 Station 19, 167-187 m : 1 ♂ 50 mm (MNHN-P St 1091).  
 Station 20, 208-222 m : 1 ♀ 63 mm (MNHN-P St 1088).  
 Station 24, 189-209 m : 1 ♀ 54 mm (MNHN-P St 1071).  
 Station 26, 189 m : 2 ♂♂ 50-117 mm, 1 ♀ 114 mm (MNHN-P St 1075).  
 Station 30, 186-177 m : 5 ♂♂ 50-62 mm, 5 ♀♀ 50-125 mm (MNHN-P St 1080).  
 Station 31, 187-195 m : 2 ♂♂ 52-59 mm, 4 ♀♀ 52-124 mm (LON. Cat. no. S 2516).  
 Station 35, 186-187 m : 1 ♂ 91 mm (MNHN-P St 1070).  
 Station 51, 200-170 m : 6 ♂♂ 49-120 mm, 12 ♀♀ 49-114 mm (MNHN-P St 1067).  
 Station 55, 200-194 m : 1 ♀ 50 mm (MNHN-P St 1069).  
 Station 56, 134-129 m : 3 ♂♂ 49-60 mm, 6 ♀♀ 50-59 mm (MNHN-P St 1079).  
 Station 62, 179-194 m : 1 ♂ 50 mm (MNHN-P St 1087).  
 Station 64, 194-195 m : 1 ♀ 48 mm (MNHN-P St 1090).  
 Station 68, 199-183 m : 4 ♂♂ 62-125 mm, 2 ♀♀ 80-120 mm (MNHN-P St 1064).  
 Station 69, 187-199 m : 2 ♂♂ 115-123 mm (MNHN-P St 1058).  
 Station 71, 174-204 m : 2 ♂♂ 48-61 mm 2 ♀♀ 50-59 mm (MNHN-P St 1082).  
 Station 72, 127-122 m : 3 ♂♂ 52-63 mm, 3 ♀♀ 50-62 mm (MNHN-P St 1078).

## MUSORSTOM II

- Station 12, 197-210 m : 3 ♀♀ 67-139 mm (MNHN-P St 1066).  
 Station 21, 191-192 m : 1 ♂ 135 mm (MNHN-P St 1065).  
 Station 61, 178-180 m : 1 ♂ 90 mm (MNHN-P St 1086).  
 Station 62, 186-189 m : 1 ♂ 140 mm (MNHN-P St 1075).  
 Station 64, 195-191 m : 1 ♀ 46 mm (MNHN-P St 1089).  
 Station 80, 178-205 m : 2 ♀♀ 96-118 mm (MNHN-P St 1072).

## REMARKS

*Kempina mikado* is a large species, the male reaching maturity at a total length of at least 60 mm. All the specimens have bicarinated lateral carinae on the first five abdominal somites and the rostral plate ornamented with a marked dorsal carina. The spine on the lateral process of the fifth thoracic somite in the juvenile specimens is sometimes recurved posteriorly. Corneal indices vary from 412 to 685. The lobe on inner margin of basal prolongation of uropodal endopod is well developed in the juveniles and small specimens and becomes less marked in the large specimens. MANNING (1965, 1971) synonymized *K. zanzibarica* with *K. mikado* but in his later work (MANNING, 1981), he accepted it as a distinct species and separated the two by the form of rostral apex which is subtruncate in *mikado* and rounded in *zanzibarica*. This is true in the case of large specimens of *mikado*, the small specimens and the juveniles of this species also decorated with rounded rostral apex. The corneal indices of *K. zanzibarica* in MANNING'S (1981) material varying from 346 to 357 showing that his specimens have relatively larger cornea than the Philippines specimens (Corneal Indices 412-685); this is due mostly to the size of material treated. Almost all of MANNING'S specimens are juveniles, therefore have relatively larger corneal indices. The bifurcate portion of the median dorsal carina on carapace anterior to median pitch of the specimens measuring less than 60 mm (for comparison with the size of CHOPRA'S type and MANNING'S specimens) varies from 0.63 to 0.77. Furthermore, the pattern of black patches on the fifth abdominal somite of *K. zanzibarica* as figured by CHOPRA (1939, fig. 4a) coincided with some of the small or immature Philippines specimens. These patches become more pronounced in larger specimen. All these characters justify to regard *K. zanzibarica* as conspecific with *K. mikado* and the former as the young form of the latter.

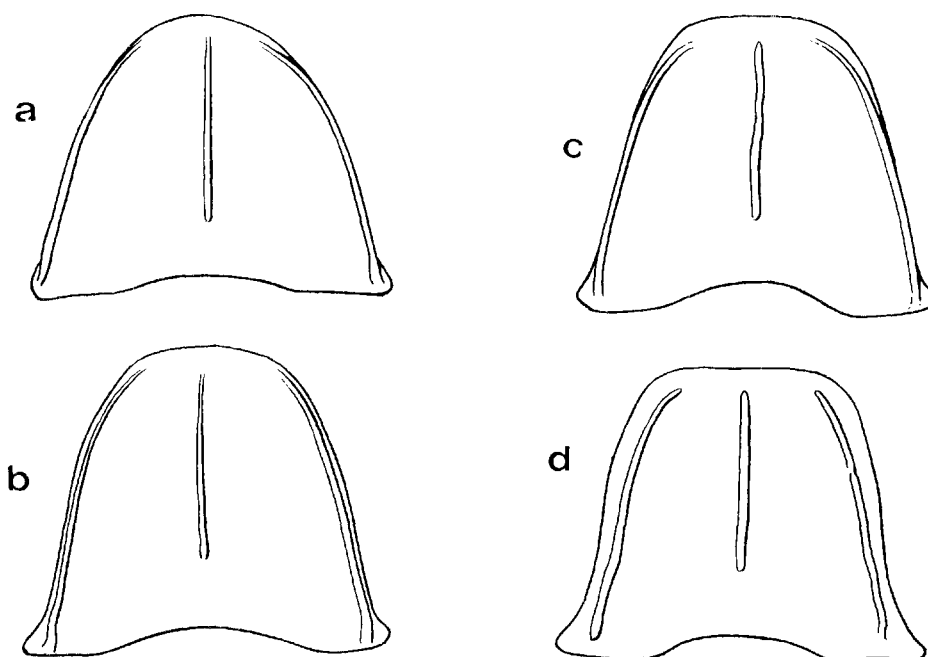


FIG. 10. — *Kempina mikado* (Kemp and Chopra, 1921), rostral plate of : a. female, TL 48 mm ; b. female, TL 64 mm ; c. Male, TL 91 mm ; d, male TL 124 mm.

#### COLOR

The black patches on the second and fifth abdominal somites which are typical of *Kempina mikado* do not exist in the juveniles and begin to appear in the specimens exceeding 56 mm in the form of chromatophoric concentration.

#### SIZE RANGES

Males 48-148 mm, females 46-142 mm.

#### DISTRIBUTION

*K. mikado* was known from Japan in the depths ranging from 58 to 136 m (KEMP, 1913 ; KOMAI, 1927 ; KOMAI and TUNG, 1939 ; MANNING, 1965) ; off Zanzibar, 212 m (CHOPRA, 1939) ; Mozambique (BARNARD, 1950 as Portuguese East Africa) ; off Durban, South Africa, 118 m (MANNING, 1969 a) ; Red Sea, 490-804 m (MANNING, 1981), and the Tonkin Bay, Vietnam (BLUMSTEIN, 1974). This species has never been reported before from the Philippines ; the present record is new for the region where it was collected from depths of 122 to 222 m.

#### ***Kempina stridulans* (Wood-Mason, 1894)**

*Squilla stridulans* Wood-Mason (In : Alcock, 1894) : 409. — 1895 : 5-6, pl. II, fig. 8 ; pl. III, fig. 1. — KEMP, 1913 : 78-80, pl. V, fig. 66 (part, not specimen from Japan = *Kempina mikado*). — KEMP and CHOPRA, 1921 : 301-303, fig. 1 (discussion).



## MATERIAL

## MUSORSTOM I

Station 51, 200-170 m : 1 ♂ 85 mm (LON. Cat. no. S 2518).

## MUSORSTOM II

Station 41, 166-172 m : 2 ♀♀ 62-97 mm (MNHN-P St 1081)

Station 62, 186-189 m : 1 ♂ 55 mm (MNHN-P St 1076)

## REMARKS

*Kempina stridulans*, like *K. mikado*, possesses bicarinated lateral carinae on the first five abdominal somites. *K. stridulans* differs from *K. mikado* by :

1. the absence of a carina on the rostral plate ; 2. the shorter undivided portion of the median carina of the carapace anterior to the dorsal pit ; 3. the relatively larger eyes (Corneal Indices varying from 330 to 351). *K. stridulans* is a smaller species compared to *K. mikado* and male reaches maturity at about 55 mm total length. The lobe on inner margin of basal prolongation of uropod is small, becoming obscure in larger specimen (TL 85 mm) and almost disappearing in the largest (TL 97 mm).

## COLOR

*K. stridulans* is lacking the black patches on the second and fifth abdominal somites. In the smallest specimen (TL 55 mm), indication of chromatophoric concentration is seen on the second somite and on the fifth abdominal somite lateral to intermediate carinae. Posterior margin of sixth to eighth thoracic somites and first to sixth abdominal somites with dark band which is less marked between the intermediate carinae of sixth abdominal somite.

## DISTRIBUTION

*Kempina stridulans* was only known from off India where it was collected from several localities in the depths ranging from 122 to 432 m (WOOD-MASON in ALCOCK, 1894 ; KEMP, 1913). The present record, a new record for the Philippines, extends its distribution eastwardly in the depths ranging from 166 to 200 m.

***Lenisquilla spinosa* (Blumstein, 1970)**

*Squilla lata*, KEMP, 1913 : 37-39, pl. II, fig. 24 (non *Squilla lata* Brooks, 1886)

*Squilloides latus spinosus* Blumstein, 1970 : 223-224, figs. 4, 5

*Squilloides spinosus* BLUMSTEIN, 1974 : 121-122, fig. 7

## MATERIAL

## MUSORSTOM I

Station 25, 200-191 m : 2 ♀♀ 45-87 mm (MNHN-P St 986)

Station 72, 127-122 m : 1 ♂ (juv.) 31 mm, 1 ♀ 71 mm (LON. Cat. no. S 2513)

Station 73, 76-70 m : 1 ♂ (juv.) 33 mm (MNHN-P St 989)

## MUSORSTOM II

Station 41, 166-172 m : 8 ♂♂ 40-76 mm, 1 ♂ (juv.) 34 mm, 7 ♀♀ 40-51 mm, 3 ♀♀ (juv.) 27-32 mm (MNHN-P St 980)

Station 51, 170-187 m : 1 ♀ 75 mm (MNHN-P St 974)

Station 62, 186-189 m : 1 ♀ 89 mm (MNHN-P St 940)

## REMARKS

The specimens agree in most detail with the description of BLUMSTEIN (1970), except that the majority of the adult specimens have only one submedian lobe instead of two at each side of the median fissure of telson. Some of the juvenile specimens bear bilobed submedian denticles and in one specimen (TL 27 mm), the submedian denticles are armed with 10-11 spinules resembling that of *Lenisquilla espinosa* (BLUMSTEIN, 1974, as *Squilloides espinosus*). *Lenisquilla espinosa* is described from a single specimen which is, I believe, a juvenile (TL 29 mm) sharing almost all characters of *Lenisquilla spinosa*. The spinules on the submedian denticles of telson disappear in the larger specimens but traces can still be seen as a corrugated margin which is almost totally absent in large adults. The ventral surface of the telson has a post-anal keel which is well developed in adult specimens and less developed in the juveniles. Spine formulation of the abdominal carinae varies, general formulation is : submedian 6 ; intermediate (3), 4-6 ; lateral (2), 3-6 ; marginal 1-5. This formula agrees with KEMP's (1913) specimens from India. Abnormal spine formulation is seen on two juvenile specimens (TL 31 and 33 mm) : marginal carinae spined as 4-5 (in both specimens) and lateral carinae spines as 5-6 (in one specimen only). Lobe on inner margin of the longer spine of basal prolongation of uropodal endopod is broad in the juveniles and small adults and gradually becomes smaller in the large specimens. The small specimens and the juveniles bear a median elevation on the dorsal part of rostrum resembling a carina ; this elevation is not seen in the large specimens. Raptorial dactylus always armed with six teeth.

## SIZE RANGES

Males 40-76 mm, females 40-87 mm.

## DISTRIBUTION

*Lenisquilla spinosa* has never been reported before from the Philippines. The present record is new for the region. This species has been reported from the Gulf of Martaban, Burma, 95 m (KEMP, 1913) and Tonkin Bay, Vietnam, 76-102 m, in mud and muddy sand bottom (BLUMSTEIN, 1970, 1974). The Philippines record is the deepest known (70-200 m).

**Lophosquilla tiwarii** Blumstein, 1974

*Squilla costata*, KEMP, 1913 : 84-86, pl. IV, figs. 70-72 (specimen from Burmese coast, non *Squilla costata* de Haan, 1844).

*Squilla* sp. prox. *costata*, TIWARI and BISWAS, 1952 : 354-355, fig. 2b, e, g, j.

*Lophosquilla tiwarii* Blumstein, 1974 : 123-124, fig. 8.

*Lophosquilla costata*, GARCIA, 1981 : 19-22.

## MATERIAL

## MUSORSTOM I

Station 1, 36-37 m : 31 ♂♂ 44-66 mm (MNHN-P St 994).

Station 2, 187-182 m : 1 ♂ 54 mm (MNHN-P St 933).

## REMARKS

All the specimens agree with the description of BLUMSTEIN (1974) for *Lophosquilla tiwarii*, the remarks of TIWARI and BISWAS (1952) for *Squilla* sp. prox. *costata*, and the figures of KEMP (1913, pl. IV, figs. 70-72) for the Burmese specimen of *Squilla costata*. The material which is identified as *Lophosquilla costata* by GARCIA (1981) undoubtedly belongs to *L. tiwarii*. The specimens of *Squilla costata* mentioned by GRAVIER (1933) from Poulo Dama, Gulf of Siam, which are available in this study (MNHN-P St 932) belong to other species : *Carinosquilla lirata* (KEMP and CHOPRA, 1921). The raptorial dactyli of the Philippines specimens herewith studied are armed with 6-7 teeth seen on two specimens (six teeth at one side and seven teeth at the other side).

## DISTRIBUTION

*Lophosquilla tiwarii* has been recorded from Burma (KEMP, 1913 ; KEMP and CHOPRA, 1921 ; TIWARI and BISWAS, 1952), Tonkin Bay, Vietnam (BLUMSTEIN, 1974), and the Philippines (GARCIA, 1981 and present record).

***Oratosquilla fossulata* sp. nov.**

(Fig. 11)

## MATERIAL

## MUSORSTOM I

Station 16, 164-150 m : 1 ♀ 94 mm (Holotype) (MNHN-P St 962), 8 ♂♂ 45-88 mm, 9 ♀♀ 39-102 mm (Paratypes) (MNHN-P St 999), 2 ♀♀ 80-94 mm (Paratypes) (LON. Cat. no. S 2508).

Station 26, 189 m : 1 ♂ (juv.) 28 mm, 1 ♀ 40 mm (Paratypes) (MNHN-P St 1002).

Station 58, 143-178 m : 2 ♀♀ 38-81 mm (Paratypes) (MNHN-P St 997).

## MUSORSTOM II

Station 6, 136-152 m : 2 ♂♂ 57-81 mm (Paratypes) (MNHN-P St 936).

## DESCRIPTION

Body appearing rough and pitted under magnification. Eyes small, cornea bilobed, set obliquely on stalk. Eyes not extending to end of first segment of antennular peduncle. Anterior margin of ophthalmic somite truncate. Corneal indices 430-602.

Antennular peduncle as long or slightly longer than carapace length. Dorsal process of antennular somite produced into triangular lobe with sharp apex, directed anterolaterally.

Rostral plate as long as broad, margins converging into a subtruncate apex, median carina absent.

Carapace narrowed anteriorly, anterior width less than half median length and about 0.6 as wide as posterior width ; anterolateral spine not extending to base of rostral plate. Dorsal carinae on carapace well developed ; median carina interrupted at base of anterior bifurcation, branches of bifurcation well marked ; intermediate carinae parallel to gastric grooves, length less than 0.4 as long as carapace length. Cervical groove extending between the lateral carinae ; posterior portion of carapace behind the cervical groove and in between the gastric grooves is roughly pitted.

Raptorial claw of moderate size ; inferodistal angle on outer face of merus unarmed ; carpus with an entire dorsal ridge ; propodus fully pectinate, armed with three movable spines on inner proximal margin ; dactylus with six teeth, outer margin with a small, low basal notch.

Exposed thoracic somites with well developed submedian and intermediate carinae ; submedian

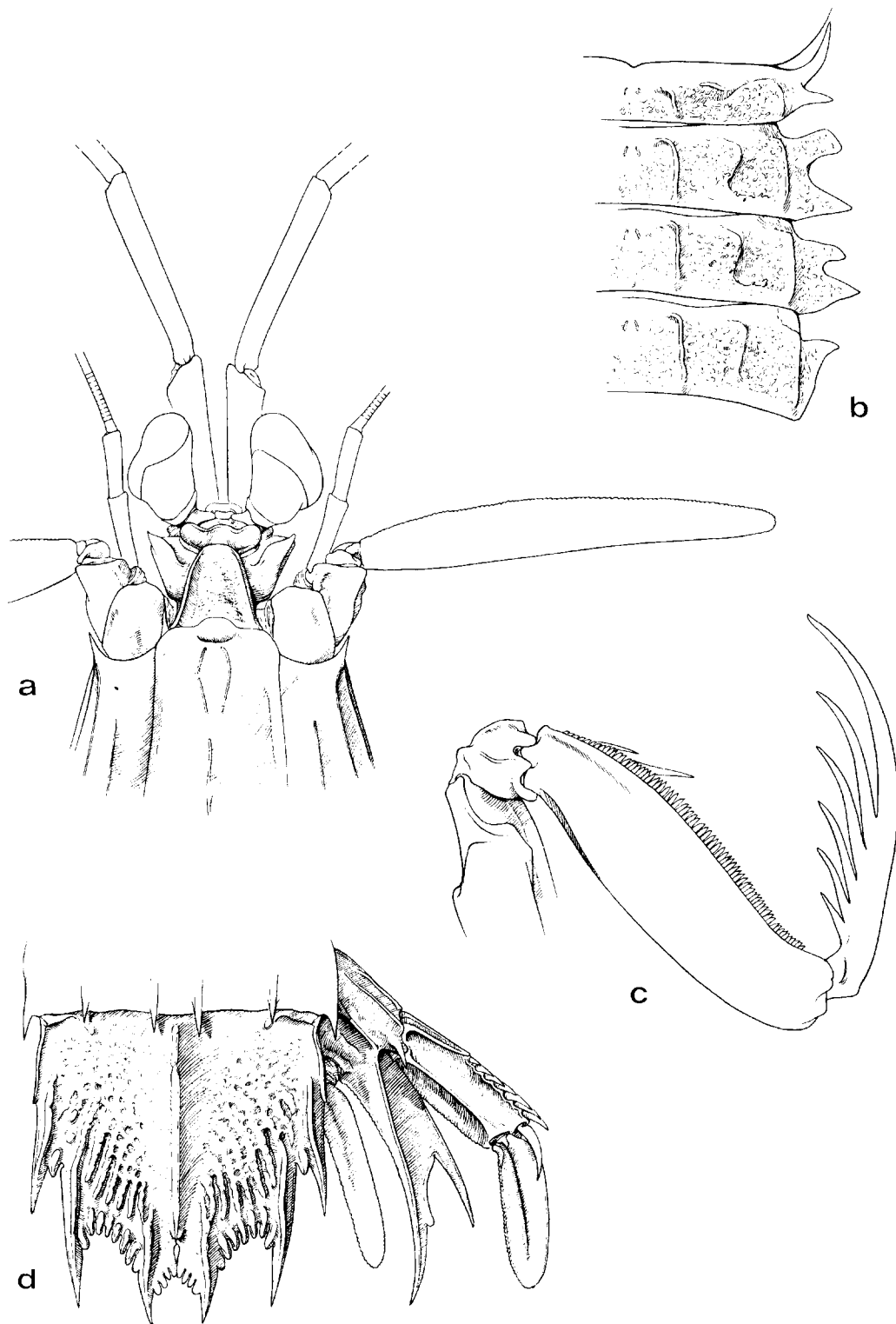


FIG. 11. — *Oratosquilla fossulata* sp. nov., female holotype, TL 94 mm : a. anterior part of body ; b. fifth to eighth thoracic somites ; c. raptorial claw ; d. sixth abdominal somite, telson and uropod.

carinae on the fifth somite short. Lateral process of fifth somite bilobed, anterior lobe a long, curved, anterolaterally directed spine; posterior lobe a large spine directed laterally. Lateral process of sixth somite bilobed, anterior lobe large, subrectangular; posterior lobe about the same size as the anterior lobe, triangular, apex pointed; incision between anterior and posterior lobe very wide. Lateral process of seventh somite bilobed, anterior lobe much smaller than posterior lobe, both are triangular in form. Eighth somite with triangular, sharp anterior lobe.

Abdominal somites with well developed dorsal carinae, second to fourth somites with two median tubercles; abdominal carinae spined as follows: submedian 5-6, intermediate 3-6, lateral 1-6, marginal 1-5.

Telson as long as broad, dorsal surface lateral to median carina ornamented with deep pitches which are sparsely situated at the interior portion then become closely packed to form fossae bordered by subparallel carinae running outwardly. Three marginal teeth present, each with well marked dorsal carina; prelateral lobe present; denticles rounded, some with spinule, formulation: 4, 7-8, 1. Two pairs of short carinae present on anterior part of telson of which one pair is situated lateral to anterior end of median carina and the other pair below the intermediate teeth of the sixth abdominal somite. Ventral surface with a short, post-anal keel.

Proximal segment of uropodal exopod longer than distal segment, outer margin with eight movable spines of which the last not extending to middle of distal segment. Inner longer spine of basal prolongation of uropodal endopod with outer margin concave and a rounded lobe, inner margin tuberculate.

#### COLOR

The general coloration of the preserved specimens is light brown with dark impression due to the presence of dark brown outlines. Dark outline is seen on: lateral portion of rostral base, gastric grooves, lateral margin of antennal protopod, posterior margin of last three thoracic and abdominal somites, lateral margin of telson, and abdominal spines. A black band is seen on dorsal surface of the second abdominal somite extending lateral to submedian carinae. This band is less marked in some specimens. Dark brown patch is seen on: median portion of carapace anterior to cervical groove between the median carina and gastric grooves, anterodistal portion of raptorial merus, base of raptorial dactylus, depressions between submedian and intermediate carinae of the last three thoracic somites, between the intermediate and lateral lobes of the sixth and seventh thoracic somites, lateral portion of the sixth abdominal somite, outer portion of uropod, half distal portion of uropodal endopod, and half dorsal surface of the inner longer spine of basal prolongation of uropodal endopod.

#### SIZE RANGES

Males 45-88 mm, females 38-102 mm.

#### REMARKS

*Oratosquilla fossulata* sp. nov. belongs to the *gonypetes*-group of the *imperialis* complex characterized by having unarmed inferodistal angle on outer face of the merus and the presence of six teeth on raptorial dactylus. *O. fossulata* is the second known species of the *imperialis* complex having the dorsal surface of telson ornamented with numerous carinae, therefore it has very close resemblances with *O. striata*, a smaller species, sharing all the common morphological characters and differing only in the form of lateral lobulation of the exposed thoracic somites and dorsal carination of telson. Comparing the specimens of *O. fossulata* with a female paratype of *O. striata* preserved in the Paris Muséum (MNHN-P St 753, erroneously labelled as *Oratosquilla strigosa*, bearing the hand writing of R. B. Manning), the two can be distinguished by the different form of lateral thoracic lobes and telson ornamentation. *O. striata* bears accessory carinae first and second median of which the latter comprising of broken lines of carinae; these are absent in *O. fossulata* and the accessory median is

replaced by row of pits. In one of the juvenile specimens a small median elevation, resembling a carina, is seen on the dorsal surface of rostral plate but all other characters are the same as for the rest of the specimens.

#### ETYMOLOGY

The epithet "*fossulata*" is derived from the Latin — fossula — ditch or moat, indicating the present ditch-like impression on the dorsal surface of telson.

#### TYPE DEPOSITORY

The female holotype (MNHN-P St 962) and males and females paratypes are deposited in the Muséum National d'Histoire Naturelle Paris, two females paratypes are deposited in the National Institute of Oceanology, Jakarta (LON. Cat. no. S 2508).

#### DISTRIBUTION

Known only from the type locality, the Philippines, taken in 143 to 189 m depths.

#### ***Oratosquilla gonypetes* (Kemp, 1911)**

*Squilla gonypetes* Kemp, 1911 : 96-97. — 1913 : 54-55, pl. IV, figs. 42-44.

*Oratosquilla gonypetes*, MANNING, 1978 b : 12-14, fig. 5 (synonymy).

#### MATERIAL

##### MUSORSTOM I

Station 45, 100-180 m : 1 ♂ 32 mm (MNHN-P St 1036).

Station 56, 134-129 m : 1 ♀ 34 mm (MNHN-P St 1092).

Station 72, 127-122 m : 1 ♂ 72 mm, 1 ♀ 26 mm (MNHN-P St 996).

#### REMARKS

MANNING (1978 b) redescribed *Oratosquilla gonypetes* (Kemp, 1911) based on the type material which consists of two different species : *O. gonypetes* and *O. subtilis* Manning, 1978, and selected a lectotype for *gonypetes*. The Philippines specimens agree with the description of MANNING except that the large male specimen (TL 72 mm) has the fourth abdominal segment with armed submedian carinae. The corneal indices of the small specimens are 353 to 408 and the large male has smaller cornea (CI 436).

#### COLOR

The black band is seen on dorsal surface of the second and fifth abdominal somites. Teeth of telson with dark dorsal carinae.

#### DISTRIBUTION

*Oratosquilla gonypetes* has not been previously reported from the Philippines. The present record is a new record for the area.

**Oratosquilla gravieri** Manning, 1978

*Oratosquilla gravieri* Manning, 1978 b : 14-15, fig. 6.

## MATERIAL

## MUSORSTOM I

Station 1, 36-37 m 17 ♂♂ 43-105 mm, 9 ♀♀ 90-112 mm (MNHN-P St 998) ; 2 ♂♂ 99-104 mm, 2 ♀♀ 91-103 mm (LON. Cat. no. S 2509).

Station 2, 187-182 m : 1 ♂ 99 mm (MNHN-P St 995)

## REMARKS

The Philippines specimens have some minor differences compared to the holotype of *O. gravieri* preserved in Paris Muséum (MNHN-P St 716), these are : 1. rostral plate is less tapering in some specimens and is relatively shorter ; 2. several specimens bear spined submedian carinae on third abdominal somite ; 3. telson with denticles formulation as : 4, 7, 1 ; 4. outer margin of proximal segment of uropodal exopod bears eight movable spines. One of the specimens has raptorial dactyli armed with six and seven teeth. Corneal indices 369-396.

## DISTRIBUTION

*Oratosquilla gravieri* was only known from the type specimen collected in the Along Bay, Vietnam. The presence of this species in the Philippines is a new record for the region.

**Oratosquilla imperialis** (Manning, 1965)

*Squilla imperialis* Manning, 1965 : 253-255, fig. 1 ; pl. XIII, fig. b.

## MATERIAL

## MUSORSTOM I

Station 32, 193-184 m : 1 ♀ 36 mm (LON. Cat. no. S 2520).

Station 56, 134-129 m : 1 ♂ 29 mm, 2 ♀♀ 27-32 mm (MNHN-P St 1038).

Station 72, 127-122 m : 2 ♂♂ 30-31 mm (MNHN-P St 1093).

## MUSORSTOM II

Station 64, 181-177 m : 1 ♂ 44 mm (MNHN-P St 1035).

## REMARKS

The specimens agree in most detail with the description of MANNING (1965) for *Squilla imperialis*. Telson is flattened and appearing elongate, denticle formulation : 3-4, 8-9, 1 ; ventral surface with a short, marked post-anal keel. Outer margin of proximal segment of uropod with 8-9 movable spines of which the last not extending to midlength of distal segment. The outer margin of the inner longer spine of the basal prolongation of uropod is concave, the lobe large and rounded. Abdominal carinae spined as follows : submedian 5-6 ; intermediate 3-6 ; lateral (1), 2-6 ; marginal 1-5. Corneal indices of the Philippines specimens varying from 400 to 489. The coloration eventhough is fading but traces of chromatophores can be clearly seen. Color pattern is as that described by MANNING.

## DISTRIBUTION

*Oratosquilla imperialis* previously was only known from Sagami Bay, Japan, 18-110 m (MANNING, 1965). MANNING (1978 b) suspects that *O. simulans* (Holthuis, 1967) from Red Sea is conspecific with *O. imperialis*. The presence of this species in the Philippines, a new record for this region, extends its distribution southwardly in the deeper water (177-181 m).

***Oratosquilla nepa* (Latreille, 1825)**

*Squilla nepa*, KEMP, 1913 : 60-64, pl. IV, fig. 41 (for older synonymy). — 1915 : 172.  
*Oratosquilla nepa*, GARCIA, 1981 : 23-24.

## MATERIAL

## MUSORSTOM I

Station 1, 36-37 m : 1 ♂ 143 mm (MNHN-P St 1001).  
 Fish market, Manila, 17.03.1980 : 1 ♂ 122 mm, 2 ♀♀ 133-141 mm (MNHN-P St 945).

## DISTRIBUTION

This species has wide distribution in the Indo-West Pacific. It has been previously reported from the Philippines (KEMP, 1915 ; ROXAS and ESTAMPADOR, 1930 ; GARCIA, 1981).

***Oratosquilla woodmasoni* (Kemp, 1911)**

*Squilla wood-masoni* Kemp, 1911 : 99. — 1913 : 74-76, pl. V, figs. 63-65.  
*Squilla woodmasoni*, MANNING, 1966 : 100-101, fig. 5.  
*Oratosquilla tweediei* Manning, 1971 : 12-14, fig. 4. — MOOSA, 1975 : 18.  
*Oratosquilla woodmasoni*, MOOSA, 1975 : 18. — MANNING, 1978 b : 36-39, figs. 21-22.

## MATERIAL

## MUSORSTOM I

Singapore, light fishing, 1.03.1976 : 1 ♀ 95 mm (MNHN-P St 979).

## DISTRIBUTION.

This species is widely distributed in the western part of the Indo-West Pacific.

***Squilloides leptosquilla* (Brooks, 1886)**

(plate I, fig. D, E)

*Squilla leptosquilla* Brooks, 1886 : 30-34, pl. I, figs. 1-2. — JURICH, 1904 : 370-372, pl. XXV (I), fig. 1-1b. — KEMP, 1913 : 46-48. — HANSEN, 1926 : 10.  
*Squilla leptosquilla* var. *dentata* Jurich, 1904 : 372, pl. XXV (I), fig. 2.

## MATERIAL

## MUSORSTOM I

Station 7, 200-185 m : 1 ♂ 55 mm, 1 ♀ 63 mm, 4 (juv.) (MNHN-P St 1056).  
 Station 9, 194-180 m : 1 ♂ 68 mm, 1 (juv.) (MNHN-P St 1054).



- Station 10, 187-205 m : 1 ♂ 75 mm, 2 ♀♀ 38-71 mm (MNHN-P St 1042).  
 Station 11, 230-217 m : 3 ♂♂ 79-90 mm, 3 ♀♀ 58-92 mm (LON. Cat. no. S 2514).  
 Station 20, 208-222 m : 2 ♂♂ 60-62 mm, 1 ♀ 73 mm (MNHN-P St 1046).  
 Station 21, 223-174 m : 1 ♂ 51 mm, 1 ♀ 84 mm (MNHN-P St 1055).  
 Station 24, 189-209 m : 3 ♂♂ 34-85 mm, 1 ♀ 65 mm (MNHN-P St 1047).  
 Station 25, 200-191 m : 4 ♂♂ 47-61 mm, 7 ♀♀ 39-67 mm (MNHN-P St 1039).  
 Station 30, 186-177 m : 1 ♂ 74 mm, 1 ♀ 54 mm (MNHN-P St 1044).  
 Station 31, 187-195 m : 1 ♂ 73 mm, 1 ♀ 74 mm (MNHN-P St 1051).  
 Station 40, 287-265 m : 5 ♂♂ 56-118 mm, 4 ♀♀ 56-68 mm (MNHN-P St 1040).  
 Station 42, 379-407 m : 1 ♂ 39 mm (MNHN-P St 1059).  
 Station 43, 484-448 m : 1 ♀ 47 mm (MNHN-P St 1060).  
 Station 51, 200-170 m : 5 ♂♂ 60-85 mm, 6 ♀♀ 56-69 mm (MNHN-P St 1053).  
 Station 68, 199-183 m : 1 ♂ 72 mm (MNHN-P St 1052).

## MUSORSTOM II

- Station 12, 197-210 m : 3 ♂♂ 45-75 mm, 2 ♀♀ 51-61 mm (MNHN-P St 1049).  
 Station 13, 200-193 m : 1 ♂ 81 mm, 1 ♀♀ 77 mm (MNHN-P St 1043).  
 Station 20, 192-185 m : 1 ♂ 79 mm, 1 ♀ 81 mm (MNHN-P St 1057).  
 Station 21, 191-192 m : 3 ♂♂ 39-52 mm, 2 ♀♀ 53-57 mm (MNHN-P St 1050).  
 Station 64, 195-191 m : 1 ♂ 57 mm, 2 ♀♀ 58-59 mm (MNHN-P St 1062).  
 Station 66, 209-192 m : 1 ♂ 40 mm, 1 ♀ 48 mm (MNHN-P St 1128).  
 Station 67, 193-199 m : 1 ♀ 72 mm (MNHN-P St 1048).  
 Station 68, 199-195 m : 1 ♂ 83 mm, 1 ♀ 39 mm (MNHN-P St 1061).  
 Station 75, 300-330 m : 1 ♂ 42 mm (MNHN-P St 1063).  
 Station 83, 320-318 m : 2 ♂♂ 71-86 mm, 3 ♀♀ 41-78 mm (MNHN-P St 1045).

## SIZE RANGES

Males 34-118 mm, females 38-84 mm.

## REMARKS

*Squilloides leptosquilla* was described from a single male specimen showing short, rounded lateral teeth on the telson (BROOKS, 1886 pl. 1, fig. 1). JURICH (1904) mentioned that his specimens of *Squilla leptosquilla* consisted of three males (TL 131-148 mm) and figured one of them (pl. XXV, fig. 1). At the same time he described var. *dentata* based on male (TL 107-110 mm) and female (TL 111-128 mm) specimens and figured one female (pl. XXV, fig. 2). KEMP (1913) synonymized var. *dentata* with the typical *leptosquilla*. The series of specimens from the Philippines shows that the two forms exist together with the intermediates. The typical form of *leptosquilla*, with deformed lateral teeth of telson, always exist in the large males. This character is not seen in the small male specimens (up to TL 57 mm), begins to appear in the larger males (TL 60 mm or more), and is markedly pronounced in large males (TL 71-90 mm). Among the series only one large male specimen (TL 118 mm) does not exhibit this character. I believe that the deformed telson form is a secondary sexual character which begins to manifest in adult males after reaching a total size of 60 mm. The Philippines specimens agree with the description of BROOKS (1886) and KEMP (1913). Two of the specimens (a male and a female) have anomalous dactyli which are armed with 4 teeth at one side and 5 teeth at the other side.

## DISTRIBUTION

*Squilloides leptosquilla* has been recorded from Celebes Sea, near Philippines, 207 m in green mud bottom (BROOKS, 1886), off Nicobar, 296 m (JURICH, 1904), Andamans, 323-754 m (KEMP, 1913), Banda Sea, Indonesia (HANSEN, 1926), and Philippines, 170-484 m (present record). The position given by BROOKS, 12°46' N, 122°10' E is within the northern part of Sulu Sea, not Celebes Sea.

## REFERENCES

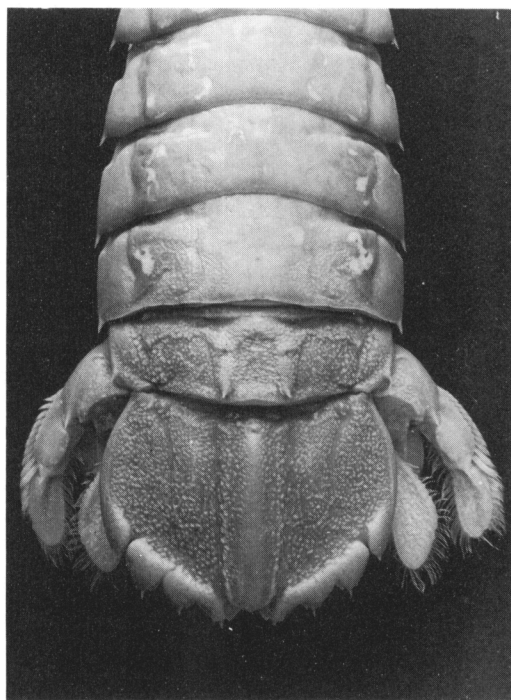
- ALCOCK, A., 1894. — On the Results of the Deep-Sea Dredging during the Season 1890-91 (concluded). *In* : Natural History Notes from H. M. Indian Marine Survey Steamer "Investigator", Commander R. F. Hoskyn, R. N., late commanding, Series II, No. 1. *Ann. Mag. nat. Hist.*, (6) **13** : 400-411, 1 fig.
- BARNARD, K. H., 1950. — Descriptive list of South African stomatopod Crustacea (mantis shrimps). *Ann. S. Afr. Mus.*, **43** (1) : 1-107, figs. 1-4.
- BLUMSTEIN, R., 1970. — New stomatopod crustaceans from the Gulf of Tonkin, South China Sea. *Crustaceana*, **18** (2) : 218-224, figs. 1-5.
- BLUMSTEIN, R., 1974. — Stomatopod crustaceans from Gulf of Tonkin with description of a new species. *Crustaceana*, **26** (2) : 113-126, figs. 1-10.
- BROOKS, W. K., 1886. — Report on the Stomatopoda collected by H. M. S. Challenger during the years 1875-1876. *Rep. Sci. Res. Challenger (Zool.)*, **16** : 1-116, pls. I-XVI.
- CHOPRA, B., 1939. — Stomatopoda. *In* : The John Murray Expedition. *Sci. Rep.*, **6** (3) : 137-181, figs. 1-13.
- DAWYDOFF, C., 1952. — Contribution à l'étude des invertébrés de la faune marine benthique de l'Indochine. *Bull. biol. Franc. Belg.*, Suppl. 37 : 1-158.
- DINGLE, H., R. L. CALDWALL and R. B. MANNING, 1977. — Stomatopods of Phuket Island, Thailand. *Phuket Mar. Biol. Centr. Res. Bull.*, **20** : 1-20, figs. 1-11.
- FOREST, J., 1981. — Compte rendu et remarques générales / Report and general comments. *In* : Rés. Camp. MUSORSTOM. I. Philippines (18-28 mars 1976), **1**, 1. *Mém. ORSTOM*, **93** : 9-50, fig. 1-5.
- FOREST, J., 1985. — La campagne MUSORSTOM II (1980). Compte rendu et liste des stations / The MUSORSTOM II Expedition (1980). Report and list of stations. *In* : Rés. Camp. MUSORSTOM. I et II. Philippines, **2**, 1. *Mém. Mus. natn. Hist. nat.*, Paris, sér. A, Zool., **133** : 7-30, fig. 1-2.
- FUKUDA, T., 1910. — Report on Japanese Stomatopoda with Descriptions of Two New Species. *Annot. Zool. Japon.*, **7** (12) : 139-152, pl. IV.
- GARCIA, R. G., 1981. — Inventory of the littoral fauna of Tayabas Bay. *Nat. Mus. Manila, Philippines, Nat. Pap.*, **6** : 1-33.
- GRAVIER, C., 1930. — Crustacés (Stomatopodes) provenant de l'Institut océanographique de Nha-Trang (Annam). *Bull. Mus. nat. Hist. Nat.*, **2** (5) : 524-526.
- GRAVIER, C., 1933. — Sur une petite collection de Stomatopodes recueillis par M. Dawydoff dans les eaux indo-chinoises. *Bull. Mus. nat. Hist. Nat.*, 2<sup>e</sup> ser., **5** (1) : 77-82.
- GRAVIER, C., 1937. — Stomatopodes des côtes d'Indo-Chine. *Ann. Inst. Oceanogr.*, **17** (3) : 175-211, figs. 1-23.
- DE HAAN, W., 1833-1850. — Crustacea. *In* : von Siebold, Ph. Fr. (ed.) Fauna Japonica sive Descriptio Animalium, Quae in Itinere per Japoniam, Jussu et Auspiciis Superiorum, qui Summum in India Batavia Imperium Tenent, Suscepto, Annis 1823-1830 Collegit, notis Observationibus et Adumbrationibus Illustravit : 243 pp., Atlas (1844), text (1849).
- HANSEN, H. J. 1926. — The Stomatopoda of the Siboga Expedition. *Siboga Exped., monogr.* **35** : 1-48, pls. I-II.
- HOLTHUIS, L. B., 1941. — Biological Results of the Snellius Expedition. XII. The Stomatopoda of the Snellius Expedition. *Temminckia*, **6** : 241-294, figs. 1-9.
- HOLTHUIS, L. B., 1967. — The stomatopod Crustacea collected by the 1962 and 1965 Israel South Red Sea Expeditions. The Second Israel South Red Sea Expedition, Report No. 1. *Israel J. Zool.*, **16** : 1-45, figs. 1-7.
- INGLE, R. W. and N. R. MERRETT, 1971. — A stomatopod crustacean from the Indian Ocean, *Indosquilla manihinei* gen. et sp. nov. (family Bathysquillidae) with remarks on *Bathysquilla crassispinosa* (Fukuda, 1910). *Crustaceana*, **20** (2) : 192-198, figs. 1-9, pl. I.
- JURICH, B., 1904. — Die Stomatopoden der Deutsche Tiefsee-Expedition. *Wiss. Ergeb. Deutsch. Tiefsee-Exped. "Valdivia"*, **7** : 361-408, pl. XXVI (II).
- KEMP, S., 1911. — Preliminary descriptions of new species and varieties of Crustacea Stomatopoda in the Indian Museum. *Rec. Indian Mus.*, (2) **6** (9) : 93-100.
- KEMP, S., 1913. — An account of the Crustacea Stomatopoda of the Indo-Pacific region based on the collection in the Indian Museum. *Mem. Indian Mus.*, **4** (1) : 1-217, text-figs. 1-5, figs. 1-2, pls. I-X.

- KEMP, S., 1915. — On a collection of stomatopod Crustacea from the Philippines Islands. *Philippines J. Sci.*, **10** (3) : 169-186, pl. I.
- KEMP, S. and B. CHOPRA, 1921. — Notes on Stomatopoda. *Rec. Indian Mus.*, (4) **22** (22) : 297-311, text-figs. 1-4.
- KOMAI, T., 1927. — Stomatopoda of Japan and adjacent localities. *Mem. Coll. Sci., Kyoto Imp. Univ., ser. B*, **3** (3) : 307-354, text-figs 1-2, pls. XIII, XIV.
- KOMAI, T., 1938. — Stomatopoda occurring in the vicinity of Kii Peninsula. *Annot. Zool. Japon*, **17** (3-4) : 13-19.
- KOMAI, T. and Y. M. TUNG, 1930. — Report on the Stomatopoda collected by the surveying ships of the Imperial Fisheries Experimental Station on the continental shelf bordering Japan. *Annot. Zool. Japon*, **13** (1) : 13-19, figs. 1-3.
- LIU, J. Y. and Yongliang WANG, 1978. — Description of a new genus and two new species of stomatopod Crustacea from the South China Sea. *Oceanol. Limnol. Sinica*, **9** (1) : 89-94, text-figs. 1-2, pl. I (in chinese and english).
- MAKAROV, R. R., 1978. — New data on crustaceans of the families Lysiosquillidae and Gonodactylidae (Crustacea, Stomatopoda) from the Tonkin Bay (Vietnam). *Zool. Zhur.*, **57** (2) : 176-189, figs. 1-6 (in russian with english summary).
- MAKAROV, R. R., 1979. — A collection of stomatopod crustaceans of the genus *Clorida* Eydoux & Souleyet, 1842, from Tonkin Bay, Vietnam. *Crustaceana*, **37** (1) : 39-56, figs. 1-5.
- DE MAN, J. G., 1902. — Die von Herrn Professor Kükenthal im Indischen Archipel gesammelten Decapoden und Stomatopoden. *Abh. Senckenb. Naturf. Ges.*, **25** : 467-929, pl. XIX-XXVII.
- MANNING, R. B., 1961. — A new deep-water species of *Lysiosquilla* (Crustacea, Stomatopoda) from the Gulf of Mexico. *Ann. Mag. nat. Hist.*, (13) **3** : 693-697, fig. 5, pl. X, figs. 1-2, pl. XI, figs. 3-4.
- MANNING, R. B., 1965. — Stomatopoda from the collection of His Majesty the Emperor of Japan. *Crustaceana*, **9** (3) : 249-262, figs. 1-2, pls. XI-XII.
- MANNING, R. B., 1966. — Notes on some Australian and New Zealand stomatopod Crustacea, with an account of the species collected by the Fisheries Investigation Ship *Endeavour*. *Rec. Australian Mus.*, **27** (4) : 79-137, figs. 1-10.
- MANNING, R. B., 1967. — Review of the genus *Odontodactylus* (Crustacea : Stomatopoda). *Proc. U. S. Nat. Mus.*, **123** (3606) : 1-35, figs 1-8.
- MANNING, R. B., 1968. — Three new stomatopod Crustaceans from the Indo-Malayan Area. *Proc. biol. Soc. Wash.*, **81** (28) : 241-250, figs. 1-3.
- MANNING, R. B., 1969 a. — Notes on Some Stomatopod Crustacea from Southern Africa. *Smithson. Contr. Zool.*, **1** : 1-17, figs. 1-4.
- MANNING, R. B., 1969 b. — Stomatopod Crustacea from the Western Atlantic. *Stud. Trop. Oceanogr., Univ. Miami*, **8** : i-viii, 1-380, figs. 1-91.
- MANNING, R. B., 1969 c. — A review of the genus *Harpisquilla* (Crustacea, Stomatopoda), with descriptions of three new species. *Smithson. Contr. Zool.*, **36** : 1-41, figs 1-43.
- MANNING, R. B., 1970. — Two new stomatopod Crustaceans from Australia. *Rec. Australian Mus.*, **28** (4) : 77-85, figs. 1-2.
- MANNING, R. B., 1971. — Keys to the species of *Oratosquilla* (Crustacea : Stomatopoda), with descriptions of two new species. *Smithson. Contr. Zool.*, **71** : 1-16, figs. 1-4.
- MANNING, R. B., 1975. — Two new species of the Indo-West Pacific genus *Chorisquilla* (Crustacea, Stomatopoda), with notes on *C. excavata* (Miers). *Proc. biol. Soc. Wash.*, **88** (24) : 253-262, figs. 1-3.
- MANNING, R. B., 1976. — Redescriptions of *Oratosquilla indica* (Hansen) and *Clorida verrucosa* (Hansen), with accounts of a new genus and two new species (Crustacea, Stomatopoda). *Beaufortia*, **25** (318) : 1-13, figs. 1-5.
- MANNING, R. B., 1977. — Preliminary accounts of five new genera of stomatopod crustaceans. *Proc. biol. Soc. Wash.*, **90** (2) : 420-423.
- MANNING, R. B., 1978 a. — New and rare stomatopod Crustacea from the Indo-West-Pacific Region. *Smithson. Contr. Zool.*, **264** : 1-36, figs. 1-16.
- MANNING, R. B., 1978 b. — Further observations on *Oratosquilla*, with accounts of two new genera and nine new species (Crustacea : Stomatopoda : Squillidae). *Smithson. Contr. Zool.*, **272** : 1-44, figs. 1-25.
- MANNING, R. B., 1981. — First record of *Kempina zanzibarica* (Chopra, 1939) from the Red Sea, with notes on *Lenisquilla gilesi* (Kemp, 1911). (Crustacea : Stomatopoda). *Senckenb. biol.*, **61** (3/4) : 297-303, figs. 1-2.
- MANNING, R. B., 1984. — *Gonodactyloideus cracens* n. gen., n. sp., a new stomatopod crustacean from Western Australia. *The Beagle, Occ. Pap. Northern Territory Mus. Arts Sci.*, **1** (9) : 83-86, fig. 1.

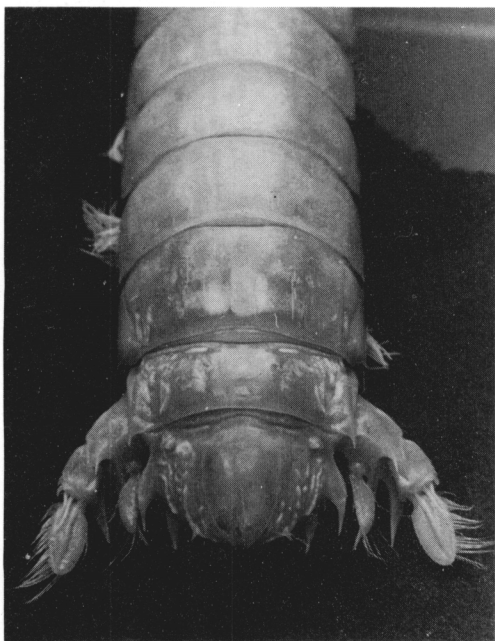
- MANNING, R. B., and R. G. GARCIA, 1982. — Notes on species of the genus *Coronidopsis* (Crustacea, Stomatopoda, Eurysquillidae). *J. Crust. Biol.*, **2** (4) : 593-599, figs. 1-3.
- MANNING, R. B. and P. STRUHSAKER, 1976. — Occurrence of the Caribbean stomatopod, *Bathysquilla microps*, off Hawaii, with additional records for *B. microps* and *B. crassispinosa*. *Proc. biol. Soc. Wash.*, **89** (38) : 439-450, figs. 1-2.
- MIERS, E. J., 1880. — On the Squillidae. *Ann. Mag. Nat. Hist.*, (5) **25** : 1-30, 108-127, pls. I-III.
- MOOSA, M. K., 1973. — The stomatopod Crustacea collected by the Mariel King Memorial Expedition in Maluku waters in 1970. *Mar. Res. Indonesia*, **13** : 3-30, figs. 1-4.
- MOOSA, M. K., 1975. — Notes on stomatopod Crustacea from Seribu Islands and adjacent waters with a description of a new species. *Mar. Res. Indonesia*, **15** : 1-20, fig. 1.
- MOOSA, M. K., 1982. — *Faughnia serenei*, new species, a stomatopod from the South China Sea (Crustacea, Stomatopoda). *J. Crust. Biol.*, **2** (4) : 600-604, figs. 1-5.
- ODHNER, T., 1923. — Indopazifische Stomatopoden. *Medd. Gotb. Mus. zool. Avd.*, **30** : 3-16, 1 pl., figs. 1-10.
- POCOCK, R. I., 1893. — Report upon the stomatopod crustaceans obtained by P. W. Basset-Smith, Esq., surgeon R. N. during the cruise, in the Australian and China Sea, of H. M. S. "Penguin", commander W. V. Moore. *Ann. Mag. nat. Hist.*, **11** (6) : 473-479, pl. XXB.
- ROXAS, H. A. and E. P. ESTAMPADOR, 1930. — Stomatopoda of the Philippines. *Nat. App. Sci. Bull.*, **1** : 93-131, 6 pls. (not seen).
- SCHMITT, W. L., 1929. — Chinese stomatopods collected by S. F. Light. *Lingnan Sci. J.*, **8** : 127-148, pls. 16-19.
- SERÈNE, R., 1939. — Note sur les Stomatopodes des eaux indochinoises. *Bull. Soc. Zool. France*, **64** : 343-349.
- SERÈNE, R., 1954. — Observations biologiques sur les Stomatopodes. *Mem. Inst. Oceanogr. Nhatrang*, **8** : 1-93, figs. 1-15, pls. 1-9.
- STEPHENSON, W., 1953. — Three new Stomatopoda (Crustacea) from eastern Australia. *Australian J. Mar. Freshw. Res.*, **4** : 201-218, figs. 1-4.
- TIWARI, K. K. and S. BISWAS, 1952. — On two new species of the genus *Squilla* Fabr., with notes on other stomatopods in the collections of the Zoological Survey of India. *Rec. Indian Mus.*, **49** (3-4) : 349-363, text-figs. 1-5.
- TWEEDIE, M. W. F., 1934. — Notes on Stomatopoda in the Raffles Museum. *Bull. Raffles Mus., Singapore*, **9** : 33-41.
- WOOD-MASON, J., 1895. — Figures and descriptions of nine species of Squillidae from the collection in the Indian Museum. Calcutta, 1895 : 1-11, pls. I-IV.



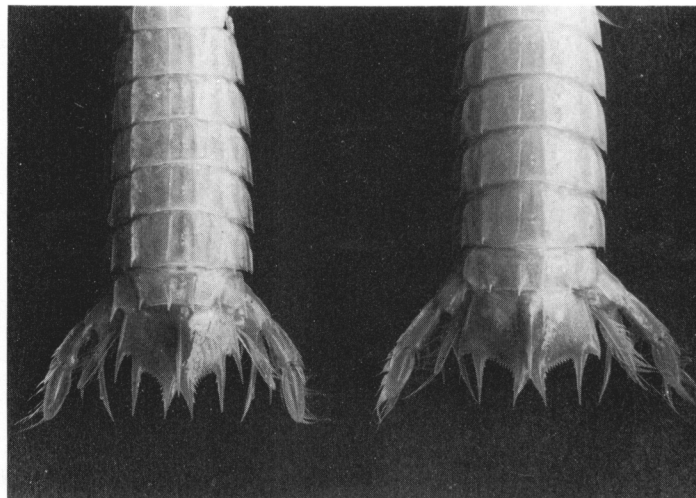
a



b



c



d

e

## PLATE I

Figure A-B : *Bathysquilla crassispinosa* (Fukuda, 1909), female, TL 260 mm ; A. anterior part of body ; B. second to sixth abdominal somites, telson, and uropods ; C : *Heterosquilloides insignis* (Kemp, 1911), female, TL 91 mm, fifth to sixth abdominal somites, telson, and uropods ; D-E : *Squilloides leptosquilla* (Brooks, 1886), first to sixth abdominal somites, telson, and uropods of D = female, TL 67 mm, E = male, TL 73 mm.