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Expédition Rumphius II (1975)
Crustacés parasites, commensaux, etc.
(Th. Monod et R. Serène, éd.)
V. Porcellanidae (Crustacea, Decapoda, Anomura)

by Janet HAIG *

Résumé. — Quinze espèces de Porcellanidés furent recueillies pendant l'expédition Rumphius II ; six d'entre elles sont mentionnées aux Moluques pour la première fois. Sept espèces de plus, connues antérieurement des Moluques, ne furent pas trouvées pendant cette expédition ; celles-ci incluses, on connaît maintenant 22 espèces de la région.

Abstract. — Fifteen species of Porcellanidae were collected during the Rumphius II Expedition ; six of them are reported from the Moluccas for the first time. Seven additional species, previously known from the Moluccas but not found during this expedition, bring the total number known from the area to 22.

INTRODUCTION

The vast literature on the Porcellanidae contains only a few reports of the family in the Moluccas. In 1885, J. BROCK collected four species at Ambon (DE MAN, 1888). C. PICTET and M. BEDOT collected four species, also at Ambon, in 1890 (ZEHNTNER, 1894). In 1893-1894, W. KÜKENTHAL found seven species at Ternate (DE MAN, 1902). T. BARBOUR collected one species at Ambon in 1906 or 1907 (RATHBUN, 1910). In 1922, Th. MORTENSEN took numerous porcellanids at various localities in the Moluccas, and 41 species have been reported on so far (HAIG, 1964). The voyage of T.R.H. the Prince and Princess Leopold of Belgium to the Netherlands East Indies (1928-1929) yielded four species from the Aru Islands (GORDON, 1935).

Porcellanidae collected during the "Siboga" Expedition (1899-1900) are currently under study ; one species from the Moluccas has been reported on as the host of a bopyrid (NIERSTRASZ and BRENDER-À-BRANDIS, 1923). Although the porcellanids of the Snellius Expedition (1929-30) are unrecorded, five Moluccan species are cited as hosts in the report on the Rhizocephala (VAN BAAL, 1937).

The present paper is a report upon the Porcellanidae which were collected during the Rumphius II Expedition to the Moluccas in January 1975. Fifteen species, six of which are recorded from the Moluccas for the first time, were taken at the following localities :

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Marsegu Island, off the west coast of Seram Island.

Seleman Bay, north coast of Seram Island.

Lilinta Bay, Misool Island.

Gorong Island (Goram Laoet), Gorong Islands.

Banda Besar Island, Banda Islands.

Bay of Amboina, Ambon Island.

Except where otherwise noted, all measurements in this report refer to the length of the carapace.

Acknowledgements

I am grateful to Dr. Th. MONOD for the opportunity to examine and report on this interesting collection, and for various information. Dr. D. L. MEYER kindly identified the crinoid with which two species of porcellanids were associated. The illustrations were prepared by Cathy CARSON.

Petrolisthes scabriculus (Dana)

(Fig. 1)

Porcellana scabricula Dana, 1852 : 424 ; DANA, 1855 : pl. 28 fig. 13.

Petrolisthes scabriculus — STIMPSON, 1858 : 227 ; DE MAN, 1902 : 697 ; VAN BAAL, 1937 : 81 ; HAIG, 1964 : 358, text-fig. 2 ; NAKASONE and MIYAKE, 1968 : 107, text-fig. 6 ; NAKASONE and MIYAKE, 1971 : 6.

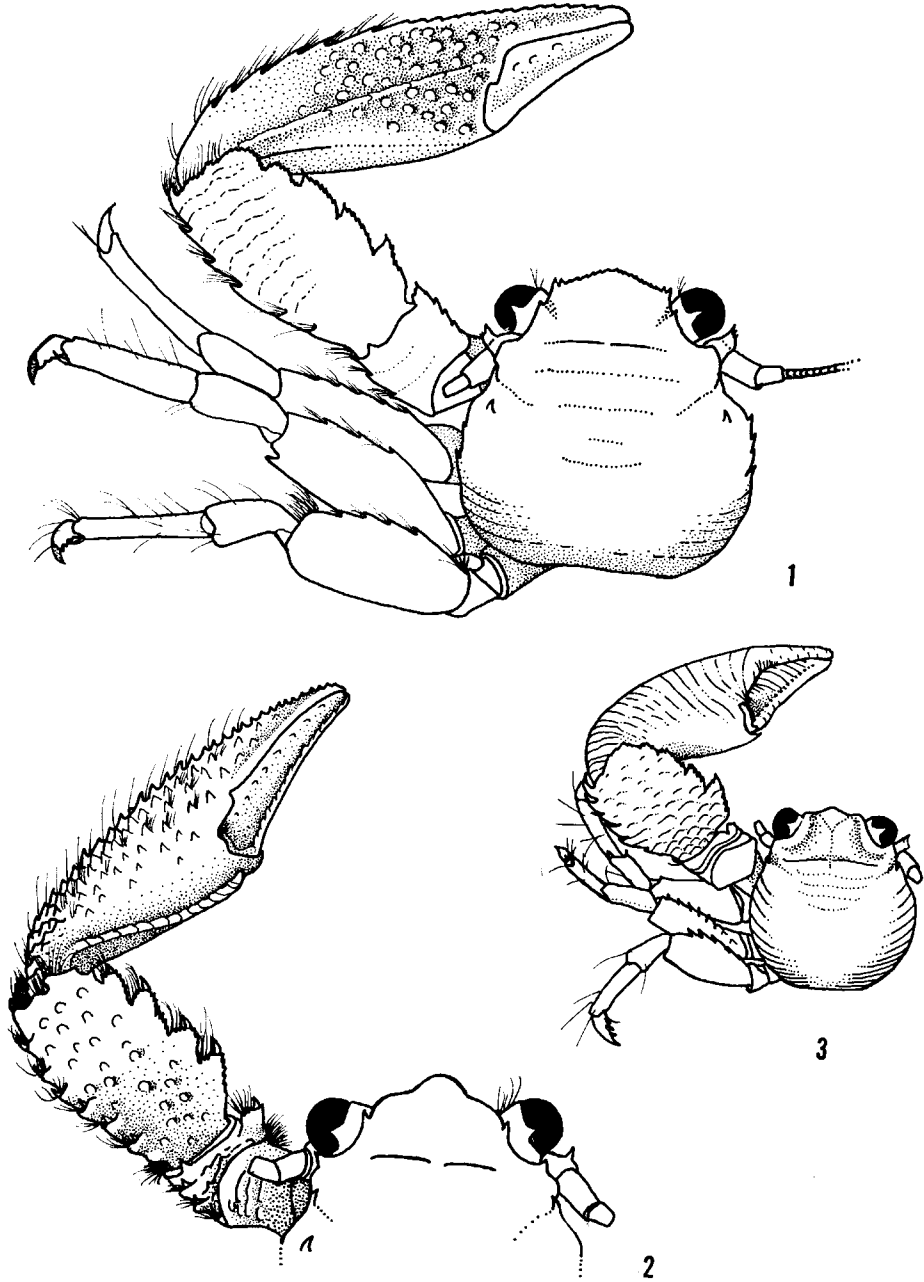
Porcellana (Petrolisthes) scabricula — DE MAN, 1888 : 411.

MATERIAL EXAMINED. — East coast of Marsegu Island ; on coral ; 18 January 1975 ; Th. MONOD and R. SERÈNE ; 12 ♂♂ (3.2 — 4.0 mm), 11 ♀♀ (2.9 — 4.2 mm). Seleman Bay ; on crinoid, *Comanthus parvicirrus* (J. Müller) ; 19 January 1975 ; D. L. MEYER ; 1 ♂ (4.8 mm). Seleman Bay ; 19 January 1975 ; Sapri ; 1 juv. Gorong Island ; on coral ; 25 and 26 January 1975 ; R. SERÈNE and Th. MONOD ; 1 ♂ (3.0 mm), 2 juv. Gorong Island ; in coral ; 27 January 1975 ; R. SERÈNE and Th. MONOD ; 10 ♂♂ (2.3 — 4.7 mm), 5 ♀♀ (2.8 — 3.9 mm).

REMARKS. — The parasitizing of male porcellanids by Rhizocephala results sometimes in the development of female as well as male pleopods, and sometimes in the failure of any pleopods to develop (HAIG, 1964 : 381-383). Among parasitized males of *Petrolisthes scabriculus* in the present collection, three from Gorong Island (cl 2.9, 3.0, and 3.7 mm) have both male and female pleopods ; while in four from Marsegu Island (3.4, 3.5, 3.8, and 4.0 mm) all pleopods are completely lacking. A 4.0 mm specimen from Marsegu Island had a bopyrid in one gill chamber.

The color pattern in freshly preserved material is similar to the live color of *Petrolisthes scabriculus* as described by NAKASONE and MIYAKE (1968 : 109).

DISTRIBUTION. — Recorded from Ternate (DE MAN, 1902), Obi Islands (VAN BAAL, 1937), Ambon (DE MAN, 1888), Banda Islands, and Kei Islands (HAIG, 1964). Also New Guinea, Philippine Islands, western and eastern Australia, Ryukyu Islands, and New Caledonia. Shallow water to about 55 m, frequently in association with corals.



FIGS 1-3. — 1, *Petrolisthes scabriculus* (Dana), $\times 8$; 2, *Petrolisthes militaris* (Heller), $\times 8$; 3, *Petrolisthes moluccensis* (De Man), $\times 4$.

Petrolisthes militaris (Heller)

(Fig. 2)

Porcellana militaris Heller, 1862 : 523.

Petrolisthes annulipes Miers, 1884 : 270, 558, pl. 29 fig. B.

Petrolisthes militaris — ORTMANN, 1892 : 259, 265 ; MIYAKE, 1943 : 54, 56, text-figs. 1, 2 ; HAIG, 1964 : 357, text-fig. 1 ; BOURDON, 1976 : 172, 241.

MATERIAL EXAMINED. — East coast of Marsegu Island ; on coral ; 18 January 1975 ; Th. MONOD and R. SERÈNE ; 13 ♂♂ (4.6 — 5.9 mm), 14 ♀♀ (4.1 — 6.3 mm), 5 juv. Gorong Island ; in coral ; 27 January 1975 ; R. SERÈNE and Th. MONOD ; 4 ♂♂ (3.3 — 5.0 mm), 4 ♀♀ (3.3 — 4.8 mm).

REMARKS. — This species is closely related to *Petrolisthes scabriculus* and frequently occurs with it ; *P. militaris* is most easily distinguished by the lack of a well developed spinule at each inner orbital angle. In most of the individuals in the present collection, the median longitudinal crest of the chelae is poorly developed and the dorsal ornamentation of the chelae takes the form of series of small, sharp granules instead of transverse striae. The illustrated specimen (fig. 2) is abnormal in having a single epibranchial spine on one side of the carapace.

DISTRIBUTION. — Ambon, Banda Islands, and Kei Islands (HAIG, 1964) ; Ambon (BOURDON, 1976). Thence westward through Malay Archipelago and Indian Ocean to Red Sea and Mozambique Channel ; New Guinea, tropical Australia, Philippine Islands, and northward to Tsugaru Strait, Japan. To about 180 m ; often associated with corals at shallower depths.

Petrolisthes moluccensis (De Man)

(Fig. 3)

Porcellana (Petrolisthes) moluccensis De Man, 1888 : 411.

Porcellana moluccensis — DE MAN, 1888 : pl. 18 fig. 15.

Petrolisthes moluccensis — ORTMANN, 1894 : 26 ; MIYAKE, 1943 : 56, 97, text-fig. 28 ; LEWINSOHN, 1969 : 136, text-fig. 28.

[?] *Petrolisthes molukkensis* ? — VAN BAAL, 1937 : 70.

MATERIAL EXAMINED. — East coast of Marsegu Island ; on coral ; 18 January 1975 ; Th. MONOD and R. SERÈNE ; 2 ♂♂ (4.1 and 5.4 mm), 1 ♀ (5.5 mm), 1 juv.

REMARKS. — This is only the third record of the species from the Malay Archipelago.

DISTRIBUTION. — Ambon (the type-locality : DE MAN, 1888) and an uncertain record from Misool Group (VAN BAAL, 1937). Red Sea, Gulf of Iran, Seychelles, Mauritius, Western Australia, Palau Islands, and Ryukyu Islands. In shallow water on coral reefs.

***Petrolisthes haswelli* Miers**

(Fig. 4)

Petrolisthes haswelli Miers, 1884 : 269, pl. 29 fig. A ; HAIG, 1965 : 98, 100.

MATERIAL EXAMINED. — Gorong Island, in front of the village of Kotasirih ; 25 January 1975 ; Kasijan ROMIMOHBARBO ; 1 ♂ (15.5 mm).

REMARKS. — The large male collected at Gorong Island establishes the first confirmed record of *Petrolisthes haswelli* from outside Australia. MIERS (1884 : 270) cited a specimen from Koo-Keang-San (Majico-Shima or Sakishima Islands in the southern Ryukyus), but HAIG (1965 : 100) compared it with type and other Australian material and concluded that it should probably be referred to *P. lamarckii* (Leach). WHITELEGGE (1897 : 144) reported *P. haswelli* from Funafuti, Ellice Islands ; McNEILL (1968 : 35) saw a portion of this material and noted that it had been reidentified as *P. lamarckii*.

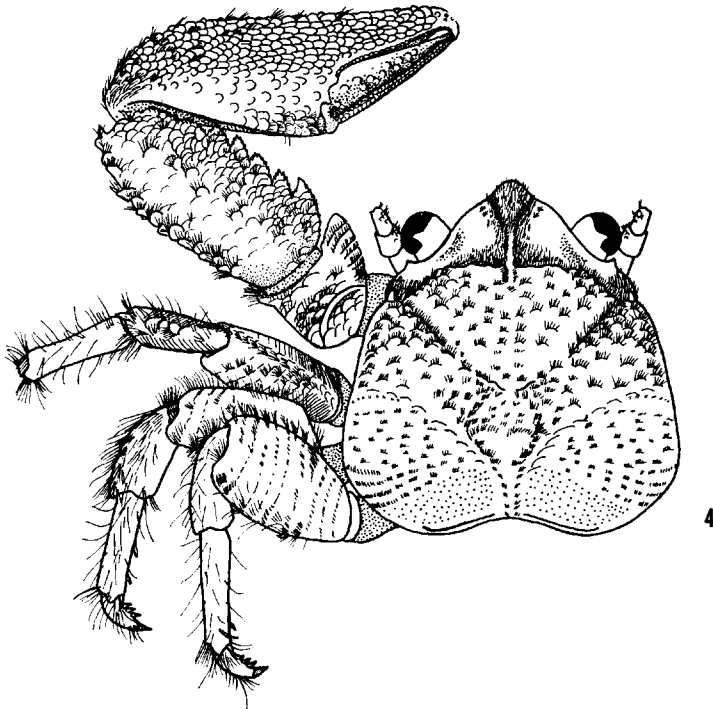


FIG. 4. — *Petrolisthes haswelli* Miers, $\times 2.8$.

Several authors have considered *P. haswelli* to be synonymous with *P. lamarckii*, but it seems to fall outside the limits of variation of the latter species. *P. haswelli* differs in the structure of the carpus of the chelipeds ; and the interrupted but distinct striae on the

carapace, and the strong granulation of the chelae, are unlike the faint rugosities and granulations that frequently occur in *P. lamarckii*.

DISTRIBUTION. — Tropical Australia (Western Australia, Northern Territory, and Queensland); now Moluccas. Intertidal, under stones.

***Petrolisthes lamarckii* (Leach)**

Pisidia lamarckii Leach, 1820 : 54.

Porcellana dentata H. Milne Edwards, 1837 : 251.

Porcellana pulchripes White, 1847 : 129.

Porcellana speciosa Dana, 1852 : 417; DANA, 1855 : pl. 26 fig. 8.

Petrolisthes lamarckii — STIMPSON, 1858 : 227; VAN BAAL, 1937 : 56, 70, 84; MIYAKE, 1943 : 56, 98, text-fig. 29.

Porcellana bellis Heller, 1865 : 76, pl. 6 fig. 4.

Petrolisthes dentatus — RATHBUN, 1910 : 314.

Petrolisthes obtusifrons Miyake, 1937b : 155, 1 text-fig.

MATERIAL EXAMINED. — Seleman Bay; in mangrove east of the bay; 20 January 1975; Th. MONOD; 1 ♂ (5.6 mm).

REMARKS. — Although it is very common in some parts of the Indo-West Pacific, *Petrolisthes lamarckii* seems to have been rarely collected in the Malay Archipelago. In the specimen from Seleman Bay, which is small but with well developed male pleopods, the walking legs are unusually slender in proportion to their length and most of the teeth on the anterior margin of the carpus of the chelipeds are poorly developed.

DISTRIBUTION. — Ambon (RATHBUN, 1910, as *Petrolisthes dentatus*); Sula Islands, Misool Group, Haroekoe, Leti Islands, and Tenimbar Islands (VAN BAAL, 1937). Occurs throughout the tropical Indo-West Pacific, westward to African coast and eastward to Line and Tuamotu Islands. Intertidal, usually under rocks.

***Petrolisthes hastatus* Stimpson**

(Fig. 5)

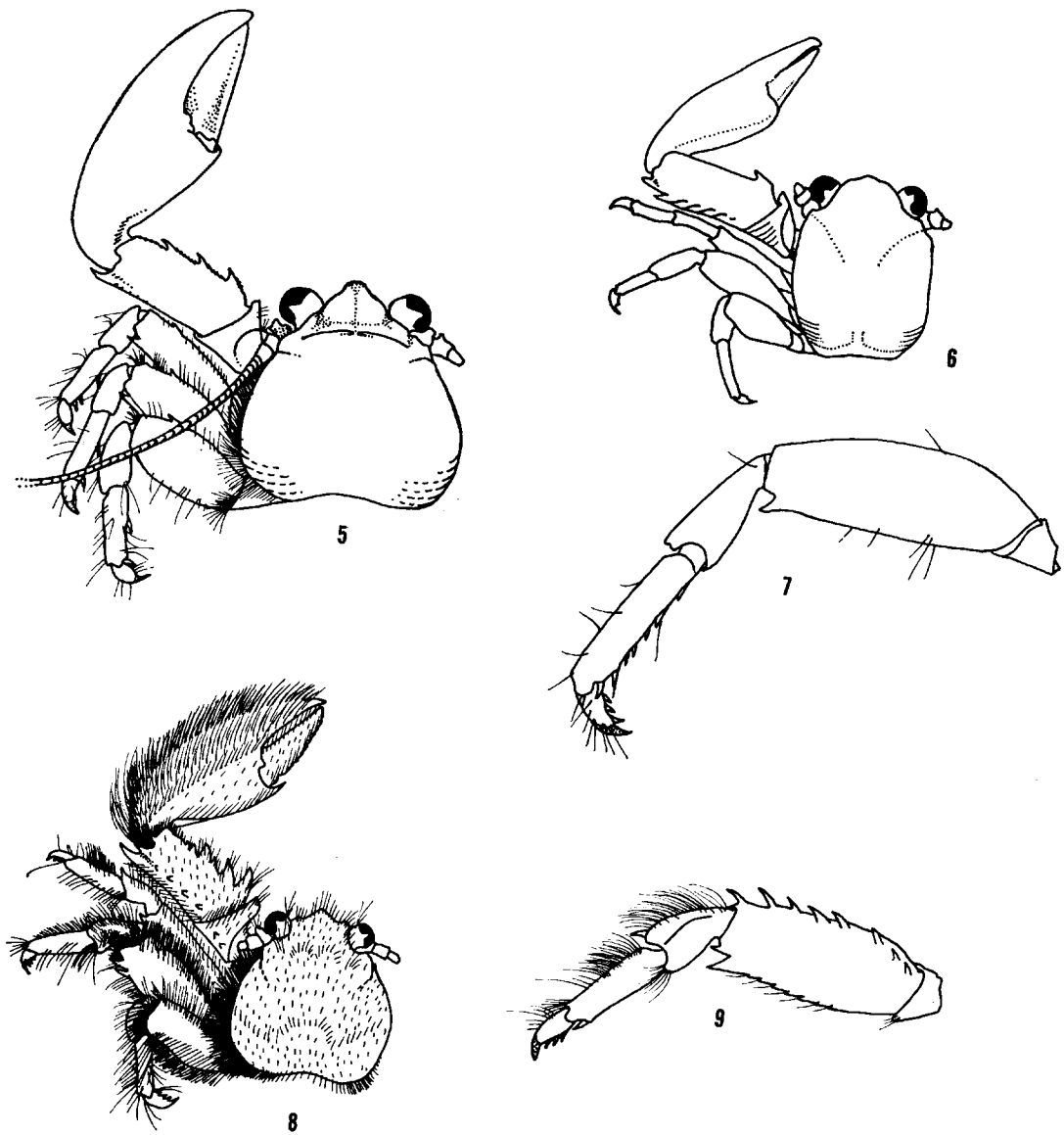
Petrolisthes hastatus Stimpson, 1858 : 228, 241; STIMPSON, 1907 : 184, pl. 22 fig. 4; VAN BAAL, 1937 : 56, 70, 84; MIYAKE, 1943 : 54, 62, text-figs. 5, 6; HAIG, 1964 : 360; JOHNSON, 1970 : 9, 13; NAKASONE and MIYAKE, 1971 : 5, figs. A-D.

Porcellana inermis Heller, 1862 : 524.

Petrolisthes inermis — DE MAN, 1902 : 691, pl. 23 fig. 36, 36 a-d.

Petrolisthes n. sp. ? — DE MAN, 1902 : 692, pl. 23 fig. 37, 37 a-c.

MATERIAL EXAMINED. — Bay of Amboina, Platier de Galala; low tide; 12 January 1975; Th. MONOD; 23 ♂♂ (3.3 — 6.8 mm), 20 ♀♀ (3.5 — 6.0 mm). Island in Lilinta Bay; littoral; 24 January 1975; Th. MONOD; 1 ♂ (7.2 mm), 1 ♀ (7.9 mm).



FIGS 5-9. — 5, *Petrolisthes hastatus* Stimpson $\times 3$; 6, *Petrolisthes kranjiensis* Johnson, $\times 3$; 7, *id.*, left walking leg, $\times 6$; 8, *Petrolisthes pubescens* Stimpson, $\times 3$; 9, *id.*, left walking leg, $\times 6$.

REMARKS. — The considerable variability which occurs in this species has been discussed by several authors (e.g. HAIG, 1964 : 360-361 ; NAKASONE and MIYAKE, 1971 : 6). Specimens collected during the Rumphius II Expedition vary in the length-width ratio of the merus of the chelipeds and in the number of spines on the anterior margin of the merus of the walking legs. Individuals from Lilinta Bay have a short pubescence in the

gape of the fingers, while in those from the Bay of Amboina this pubescence is produced into a long tuft. Specimens with stronger setation in the gape of the fingers also have a heavier pubescence on the epimera of the carapace. Some of them have a small red spot at the base and another at the tip of the dactyl of the chelipeds; this color marking was noted by JOHNSON (1970 : 14) on live specimens from Singapore.

A 5.6 mm female from the Bay of Amboina had a bopyrid in one gill chamber.

DISTRIBUTION. — Ternate (DE MAN, 1902, as *Petrolisthes inermis* and *Petrolisthes* n. sp. ?). Morotai, Ternate, Tidore, Obi Islands, Sula Islands, Misool Group, Ambon, and Haroekoe (VAN BAAL, 1937). Kei Islands (HAIG, 1964). Thence westward through Malay Archipelago to east coast of India; Singapore northward to Tokara Islands, Japan; New Guinea eastward to New Caledonia, Fiji, and Samoa. Intertidal, under rocks.

***Petrolisthes kranjiensis* Johnson**

(Figs 6, 7)

[?] *Petrolisthes japonicus* — DE MAN, 1896 : 373 (in part); VAN BAAL, 1937 : 70, pl. 3 fig. 5.
Petrolisthes kranjiensis Johnson, 1970 : 9, 16, text-fig. 2h-k.

MATERIAL EXAMINED. — Lilinta Bay; rocky coast, under stones; 23 January 1975; Th. MONOD; 4♂♂ (6.2 — 8.8 mm), 2♀♀ (6.5 and 9.0 mm).

REMARKS. — The specimens of *Petrolisthes kranjiensis* collected during the Rumphius II Expedition are the first to be reported outside of Singapore. However, records of *P. japonicus* (de Haan) from localities south of Hong Kong are probably based on either *P. kranjiensis* or its close relative, *P. teres* Melin. VAN BAAL's record (1937 : 70) of *P. japonicus* from the Aru Islands in the Moluccas may be based on material of *P. kranjiensis*; unfortunately, the identifying characters are not visible in his photograph (pl. 3 fig. 5), which was taken in ventral view to show the attached rhizocephalan. DE MAN's brief description (1896 : 373) of an individual of "*P. japonicus*" from Malacca suggests that it belongs to *P. kranjiensis*, but a second specimen, collected in Borneo, is probably *P. teres*. For the distinguishing characters of *P. japonicus*, *P. teres*, and *P. kranjiensis*, see JOHNSON (1970 : 15-18).

DISTRIBUTION. — Possibly Apu Islands (VAN BAAL, 1937, as *Petrolisthes japonicus*); now Misool Group. Otherwise recorded only from Singapore. Inhabits holes in stiff mud above mid tide level on the seaward edge of mangrove swamps; occasionally found under stones (JOHNSON, 1970).

***Petrolisthes pubescens* Stimpson**

(Figs 8, 9)

Petrolisthes pubescens Stimpson, 1858 : 228, 241; STIMPSON, 1907 : 183, pl. 22 fig. 3; LEWINSOHN, 1969 : 146.

Petrolisthes tomentosus — ORTMANN, 1897 : 287, 288; MIYAKE, 1943 : 55, 85, text-figs. 19-21.
Not *P. tomentosus* (Dana) = *P. penicillatus*, auth.

MATERIAL EXAMINED. — North coast of Banda Besar Island; littoral; 30 January 1975; Th. MONOD; 2 ♂♂ (6.2 and 6.4 mm), 1 ♀ (6.5 mm).

REMARKS. — ORTMANN (1897 : 288) placed *Petrolisthes pubescens* in synonymy with *P. tomentosus* (Dana), and the species has been known by the latter name ever since. However, as LEWINSOHN (1969 : 147) pointed out, the original description and illustration of *Porcellana tomentosa* (DANA, 1852 : 420; 1855 : pl. 26 fig. 10) suggest that it is a senior synonym of *Petrolisthes penicillatus* (Heller), rather than *P. pubescens*. The name *Petrolisthes pubescens*, therefore, should be used for the species generally known as *P. tomentosus*, and the latter name should be transferred to the species usually recorded as *P. penicillatus*.

Petrolisthes pubescens is now reported for the first time from the Malay Archipelago.

DISTRIBUTION. — Red Sea, Mauritius, southern Japan, Ryukyu Islands, Taiwan, Queensland, and New Caledonia (usually as *Petrolisthes tomentosus*); now Moluccas. Intertidal, under stones and corals.

***Neopetrolisthes maculatus* (H. Milne Edwards), comb. nov.**

Porcellana maculata H. Milne Edwards, 1837 : 253.

Petrolisthes maculatus — STIMPSON, 1858 : 227.

Neopetrolisthes ohshimai Miyake, 1937a : 35, 1 text-fig.; MIYAKE, 1943 : 101, text-fig. 31.

Petrolisthes ohshimai — JOHNSON, 1960 : 164; HAIG, 1965 : 98, 101; SANKARANKUTTY and BWATHONDI, 1974 : 888, text-fig. 1.

MATERIAL EXAMINED. — East coast of Marsegu Island; on actinian, *Radianthus* sp.; D. F. DUNN; 1 ♀ (8.7 mm).

REMARKS. — MIYAKE (1937 a) established a new genus, *Neopetrolisthes*, for his new species *N. ohshimai* from the Ryukyu Islands. Subsequently, *N. ohshimai* has been reported several times from various localities in the Pacific Ocean. JOHNSON (1960) believed that *Neopetrolisthes* was not distinct enough to warrant generic status, and he placed it in synonymy with *Petrolisthes*. In the combination *Petrolisthes ohshimai* the species has been reported a number of times from the Indian Ocean. I now agree with MIYAKE that *Neopetrolisthes* is a valid genus. This opinion is based on current studies of the Porcellanidae at the generic level, and is supported to some extent by the discovery of distinctive characters in the first larval stage (SANKARANKUTTY and BWATHONDI, 1974).

In an earlier paper (HAIG, 1965 : 101) I noted that *Neopetrolisthes ohshimai* Miyake is a junior synonym of *Porcellana maculata* H. Milne Edwards; but, through misinterpretation of ICZN Article 23 b, I erroneously considered H. MILNE EDWARDS' name to be invalid. The species, originally described from material collected in the Bismarck Archipelago, has been recorded (as *Petrolisthes maculatus*) from a few localities in the Indian Ocean.

This porcellanid is a commensal with anemones (usually *Stoichactis* spp). It is easily recognized by its coloration, which consists of red spots on a white background. In the

Indian Ocean population of the species, the carapace and legs are covered with small, round, evenly distributed spots; in the Pacific Ocean the color pattern takes the form of large, uneven blotches. At present, nothing is known about the pattern found in individuals from the Malay Archipelago. Unfortunately the specimen collected at Marsegu Island provides no information on this point: it is soft-shelled and without a trace of coloration.

DISTRIBUTION. — Indian Ocean, from east coast of Africa to Christmas Island and Western Australia; Bismarck Archipelago; Queensland; Palau, Ryukyu, Marshall, and Fiji Islands; now Moluccas. Shallow water, with anemones.

***Pisidia dispar* (Stimpson)**
(Figs 10, 11)

Porcellana dispar Stimpson, 1858 : 229, 242; MIERS, 1884 : 275, pl. 30 fig. C; STIMPSON, 1907 : 190, pl. 23 fig. 3.

Porcellana rostrata Baker, 1905 : 260, pl. 35 figs. 1, 1a, b.

Pisidia dispar — HAIG, 1965 : 105, 107; NAKASONE and MIYAKE, 1968 : 97, text-fig. 1; NAKASONE and MIYAKE, 1971 : 9.

MATERIAL EXAMINED. — Gorong Island; on coral; 25 and 26 January 1975; R. SERÈNE and Th. MONOD; 2 ♂♂ (2.1 and 2.6 mm). Gorong Island; in coral; 27 January 1975; R. SERÈNE and Th. MONOD; 1 ♂ (2.0 mm), 1 ♀ (2.2 mm).

REMARKS. — The specimens collected during the Rumphius II Expedition are the first of this species to be reported from the Malay Archipelago.

DISTRIBUTION. — Japan, Ryukyu Islands, temperate and tropical Australia, and New Caledonia; now Moluccas. Littoral to about 55 m, under stones and in coral crevices, mussel clumps, and other sheltered places.

***Pisidia spinuligera* (Dana)**
(Fig. 12)

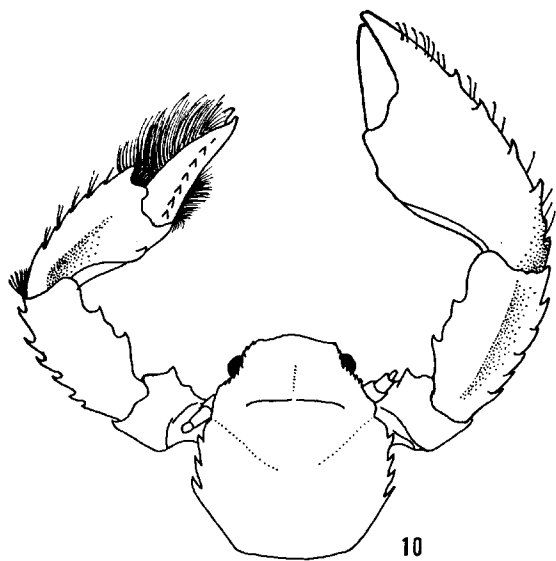
Porcellana armata Dana, 1852 : 426; MIYAKE, 1943 : 117, 127, text-fig. 48.

Porcellana spinuligera Dana, 1853 : 1593 (new name for *P. armata* Dana 1852, preoccupied); DANA, 1855 : pl. 26 fig. 14.

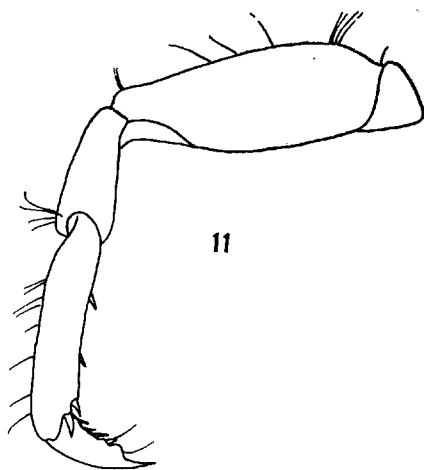
Porcellana latifrons Stimpson, 1858 : 229, 243; STIMPSON, 1907 : 190, pl. 23 fig. 4.

Pisidia spinuligera — HAIG, 1960 : 208; NAKASONE and MIYAKE, 1968 : 101, text-fig. 2.

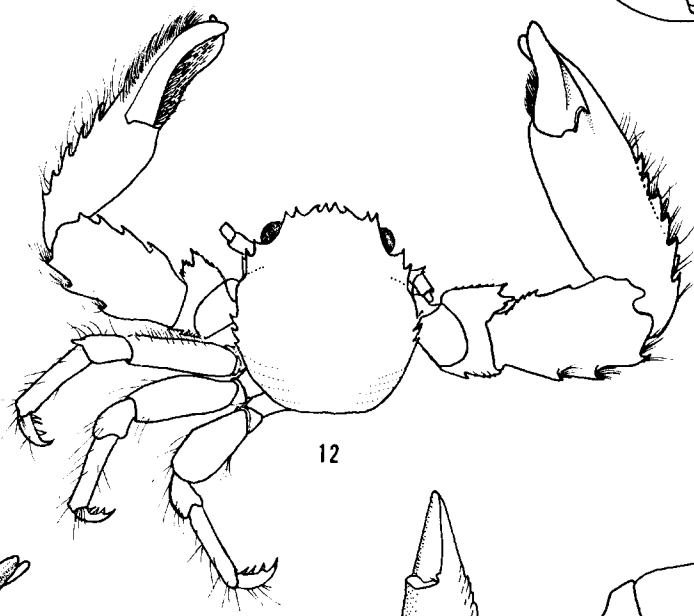
MATERIAL EXAMINED. — East coast of Marsegu Island; on coral, *Porites* sp.; 16 January 1975; R. SERÈNE; 4 ♂♂ (1.9 — 3.8 mm), 1 ♀ (3.5 mm). Seleman Bay; on crinoid, *Comanthus parvicirrus* (J. Müller); 19 January 1975; D. L. MEYER; 2 ♂♂ (2.4 and 3.0 mm), 2 ♀♀ (2.8 and 2.9 mm). Seleman Bay; 19 January 1975; SAPRI; 2 ♀♀ (2.6 and 2.8 mm).



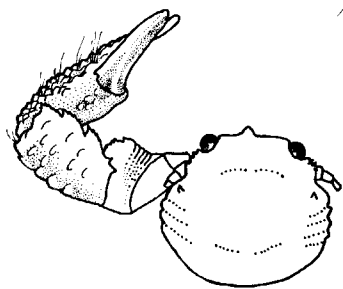
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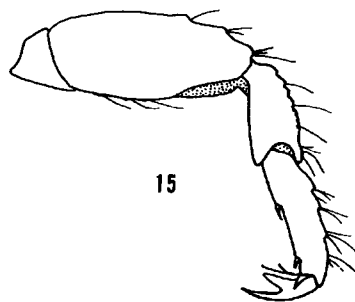
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FIGS 10-15. — 10, *Pisidia dispar* (Stimpson), $\times 12.5$; 11, *id.*, left walking leg, $\times 25$; 12, *Pisidia spinuligera* (Dana), $\times 6$; 13, *Aliaporcellana pygmaea* (De Man), ♂, $\times 6$; 14, *id.*, right cheliped of same specimen, $\times 6$; 15, *id.*, right walking leg, $\times 12.5$.

REMARKS. — A 2.4 mm male specimen from Seleman Bay had a bopyrid in one gill chamber.

This species was not reported previously from the eastern part of the Malay Archipelago.

DISTRIBUTION. — Ryukyu Islands, Hong Kong, Singapore, Palau Islands, Western Australia, Java, north of Borneo; now Moluccas. Shallow water, frequently among corals.

***Aliaporcellana pygmaea* (De Man)**

(Figs 13-15)

Porcellana pygmaea De Man, 1902 : 698, pl. 23 figs. 38, 38a-e.

Polyonyx pugilator Nobili, 1905 : 161.

Polyonyx pygmaeus — HAIG, 1964 : 372; LEWINSOHN, 1969 : 161, text-fig. 36.

Aliaporcellana pygmaea — NAKASONE and MIYAKE, 1969 : 19.

MATERIAL EXAMINED. — Southeast coast of Marsegu Island; 17 January 1975; Kasijan ROMIMONBARBO; 1 ♀ (2.0 mm). Gorong Island; on coral; 25 January 1975; R. SERÈNE and Th. MONOD; 1 ♀ (2.1 mm). Gorong Island; in coral; 27 January 1975; R. SERÈNE and Th. MONOD; 1 ♂ (2.9 mm), 1 ♀ (2.0 mm).

REMARKS. — LEWINSOHN (1969 : 163-165) discussed the variations that occur in this species according to sex and increase in the size of individuals. The 2.9 mm male specimen from Gorong Island (figs 13-15) has a form intermediate between the “*pygmaeus*” condition seen in juveniles and females, and the “*pugilator*” condition typical of adult males and old females. One cheliped has become larger than the other, although the difference in size is not great as yet; low, blunt granules and a few scattered setae remain on the chela and carpus of the larger cheliped; the granulations and setae on the dorsal surface of the carapace have already disappeared.

DISTRIBUTION. — Ternate (the type-locality : DE MAN, 1902); Ambon and Banda Islands (HAIG, 1964). Thence westward through Malay Archipelago to Red Sea and Madagascar. Shallow water to about 55 m, frequently among corals.

***Polyonyx biunguiculatus* (Dana)**

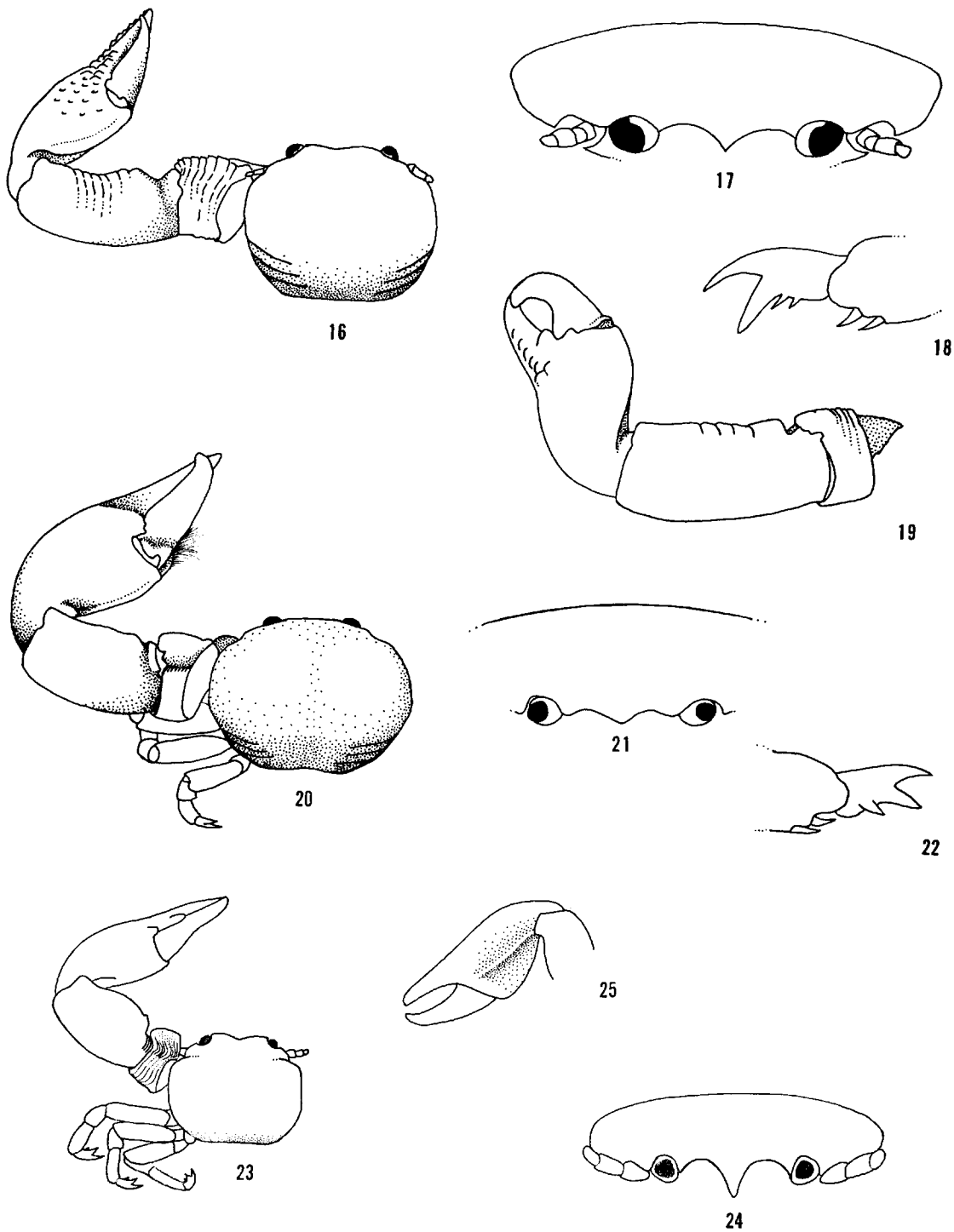
(Figs 16-19)

Porcellana biunguiculata Dana, 1852 : 411; DANA, 1855 : pl. 26 figs. 1 a-d.

Polyonyx biunguiculatus — STIMPSON, 1858 : 229; GORDON, 1935 : 10, text-fig. 5b, d; JOHNSON, 1958 : 100, 105, text-fig. 3; HAIG, 1964 : 377.

Polyonyx tuberosus — ZEHNTNER, 1894 : 184; DE MAN, 1902 : 706.

MATERIAL EXAMINED. — East coast of Marsegu Island; on coral; 17 and 18 January 1975; Th. MONOD and R. SERÈNE; 2 ♂♂ (3.2 by 3.6 and 3.5 by 3.9 mm), 4 ♀♀ (2.8 by 3.1



FIGS 16-25. — 16, *Polyonyx biunguiculatus* (Dana), ♀, × 6; 17, *id.*, frontal view of carapace, × 12,5; 18, *id.*, dactyl of left walking leg, × 25; 19, *id.*, left cheliped of ♂, × 6; 20, *Polyonyx obesulus* Miers, ♂, × 3; 21, *id.*, frontal view of carapace, × 6; 22, *id.*, dactyl of right walking leg, × 12,5; 23, *Polyonyx triunguiculatus* Zehntner, ♂, × 6; 24, *id.*, frontal view of carapace, × 12,5; 25, *id.*, ventral view of left chela, × 6.

— 3.6 by 4.5 mm). Gorong Island ; in coral ; 27 January 1975 ; R. SERÈNE and Th. MONOD ; 2 ♀♀ (2.7 by 3.2 and 3.2 by 4.0 mm). (The second measurement for each specimen refers to the carapace width.)

REMARKS. — This species is closely related to *Polyonyx obesulus* Miers, from which it can always be distinguished by the presence of two small spines on the lower surface of the dactyl of the walking legs (fig. 18) and the absence of pleopods in males. The shape of the rostrum is somewhat variable, and thus a less reliable distinguishing character.

DISTRIBUTION. — Ternate (DE MAN, 1902, as *Polyonyx tuberculosus*) ; Ambon (ZEHNTNER, 1894, as *P. tuberculosus*) ; Ambon, Saparoea, Banda Islands, and Kei Islands (HAIG, 1964) ; Aru Islands (GORDON, 1935). Thence westward through Malay Archipelago to western Indian Ocean, southward to western and eastern Australia, and northward to Formosa Strait. Shallow water to about 110 m, on hard substrates.

***Polyonyx obesulus* Miers**

(Figs 20-22)

Polyonyx obesulus Miers, 1884 : 272, pl. 29 fig. D ; DE MAN, 1902 : 704, pl. 23 fig. 39a-d ; GORDON, 1935 : 11, text-fig. 5a, c ; JOHNSON, 1958 : 99, 108, text-fig. 4 ; HAIG, 1964 : 378.

Porcellana (Polyonyx) obesula — DE MAN, 1888 : 423.

Porcellana (Polyonyx) sp. — DE MAN, 1888 : 424, pl. 19 fig. 1.

Porcellana (Polyonyx) tuberculosa De Man, 1888 : 424.

Polyonyx parvidens Nobili, 1905 : 161.

MATERIAL EXAMINED. — East coast of Marsegu Island ; in sponge ; 16 January 1975 ; R. SERÈNE ; 5 ♂♂ (5.6 by 7.6 — 6.8 by 9.7 mm), 7 ♀♀ (3.1 by 4.2 — 8.2 by 11.8 mm), 1 juv. East coast of Marsegu Island ; on coral ; 18 January 1975 ; Th. MONOD and R. SERÈNE ; 1 ♀ (3.4 by 4.9 mm). Seleman Bay ; in sponge ; 21 January 1975 ; Th. MONOD and R. SERÈNE ; 3 ♂♂ (5.2 by 6.7 — 7.5 by 10.2 mm), 1 ♀ (8.1 by 11.3 mm). (The second measurement for each specimen refers to the carapace width.)

REMARKS. — *Polyonyx obesulus* may be identified by the presence of a single, well developed spine on the lower surface of the dactyl of the walking legs (fig. 22). For a discussion of the complicated synonymies of this species, *Polyonyx biunguiculatus*, and *P. triunguiculatus*, see JOHNSON (1958).

DISTRIBUTION. — Ternate (DE MAN, 1902) ; Ambon (the type-locality of *Porcellana [Polyonyx] tuberculosa* : DE MAN, 1888) ; Ambon, Banda Islands, and Kei Islands (HAIG, 1964) ; Aru Islands (GORDON, 1935). Thence westward through Malay Archipelago to Gulf of Iran, southward to tropical Australia, and northward to Philippine Islands. Littoral to about 55 m, frequently in sponges and crevices of corals.

Polyonyx triunguiculatus Zehntner
(Figs 23-25)

Porcellana (Polyonyx) biunguiculata — DE MAN, 1888 : 421.

Polyonyx triunguiculatus Zehntner, 1894 : 185 ; JOHNSON, 1958 : 99, 110.

Polyonyx acutifrons De Man, 1896 : 384 ; DE MAN, 1898 : pl. 32 figs. 49, 49a-d.

MATERIAL EXAMINED. — East coast of Marsegu Island ; on coral ; 18 January 1975 ; Th. MONOD and R. SERÈNE ; 1 ♂ (2.5 by 2.9 mm). (The second measurement refers to the carapace width.)

REMARKS. — Distinguishing characters of this species include the long rostral lobe, the well developed lobe on the dorsal margin of the merus of the chelipeds, and the raised longitudinal ridge on the lower margin of the chela.

DISTRIBUTION. — Ambon (the type-locality : ZEHNTNER, 1894 ; also DE MAN, 1888, as *Porcellana [Polyonyx] biunguiculata*). Atjeh, Sumatra (the type-locality of *Polyonyx acutifrons*) ; Singapore ; common in Indian Ocean, from Western Australia to Red Sea and Madagascar. Shallow water to about 145 m, often on coral reefs.

DISCUSSION

Twenty-two species of Porcellanidae are now known to occur in the Moluccas. These include the 15 species reported upon in this paper, and the following seven species which were not collected during the Rumphius II Expedition :

Petrolisthes asiaticus (Leach). Ternate (DE MAN, 1902).

Petrolisthes indicus De Man. Ambon (HAIG, 1964).

Pachycheles sculptus (H. Milne Edwards). Ternate (DE MAN, 1902). Kei Islands (HAIG, 1964). Aru Islands (NIERSTRASZ and BRENDER-À-BRANDIS, 1930 ; GORDON, 1935 ; BOURDON, 1976).

Aliaporcellana suluensis (Dana). Ambon (ZEHNTNER, 1894 ; HAIG, 1964 ; BOURDON, 1976). Banda Islands (HAIG, 1964). Kei Islands (HAIG, 1964 ; BOURDON, 1976). Aru Islands (GORDON, 1935).

Aliaporcellana telestophila (Johnson). Ambon (HAIG, 1964).

Polyonyx pedalis Nobili. Kei Islands (HAIG, 1964 ; BOURDON, 1976).

Porcellanella triloba White. Ambon (ZEHNTNER, 1894 ; NIERSTRASZ and BRENDER-À-BRANDIS, 1923 ; BOURDON, 1976).

Further surveys of the Moluccas should be expected to yield several additions to the porcellanid fauna of the area.

Only two porcellanids now known from the Moluccas, *Neopetrolisthes maculatus* (H. Milne Edwards) and *Porcellanella triloba* White, are true commensals : the hosts of

Neopetrolisthes are anemones and those of *Porcellanella* are sea pens (Pennatulacea). JOHNSON (1970 : 34) found *Aliaporcellana telestophila* to be "a strict commensal of the alcyonarian *Telesto*" around Singapore; however, no evidence of this relationship exists for *A. telestophila* from other areas.

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