Hermit Crabs from Eastern New Guinea[1]

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ABSTRACT: This report is based on 19 species of hermit crabs collected in eastern New Guinea in 1969. One, *Clibanarius englaucus*, is a new species and several others were not previously recorded from the area. Detailed observations on color in life were made for most of these forms. The report includes all published records of hermit crabs from the Territory of Papua and New Guinea. Identifications are given for associated organisms in the following groups: Cnidaria (Anthozoa), Mollusca (Gastropoda), Acarina (Mesostigmata), Cirripedia (Rhizocephala), and Isopoda (Epicaridea and Flabellifera).

THE HERMIT CRABS treated in this paper were collected from September through December of 1969, when one of the authors (E. Ball) had the privilege of participating in Program C of the Alpha Helix Expedition to New Guinea under the leadership of Dr. John Buck. This expedition, which was concerned principally with the investigation of bioluminescence, was headquartered at Maiwara about 16 miles north of Madang on the northeastern coast of New Guinea. Sek Island, Wongat Island, and Ottilien Pass, three of the localities mentioned in the text, are in the Madang area; others are shown in Fig. 1. All mileages given from Maiwara are along the coast road in a general northerly direction.

The coast near Madang consists mainly of raised coral reefs. There are many areas of living reef close inshore, with a sharp drop into very deep water just offshore. In the vicinity of Port Moresby there is a very extensive area of shallow water covering a bottom of coral and coral rubble within the main barrier reef.

Hermit crabs were obtained intertidally and/or by SCUBA diving whenever the opportunity presented itself; most of the collecting was done in the Madang area. Notes on color in life were made for most species, as well as some observations on habitat, behavior, and commensals. Nineteen species of hermit crabs were collected; one of these is described as new in this report. Several others were previously unreported from eastern New Guinea.

For each species collected, we give the reference to its original description and to those of its junior synonyms, and to the work which first cited the name in its currently accepted combination; we also include references to certain other works which have important descriptive material or notes on color or behavior. Because such information is widely scattered in the literature, we include all published records of hermit crabs from the territory of Papua and New Guinea, i.e., the area comprising the eastern half of the island of New Guinea and its offshore islands, the Bismarck Archipelago, and the islands of Bougainville and Buka in the Solomon Islands.

Except where otherwise indicated, all measurements of the crabs refer to carapace length in the midline. The material is deposited in the Crustacea collections of the Allan Hancock Foundation.

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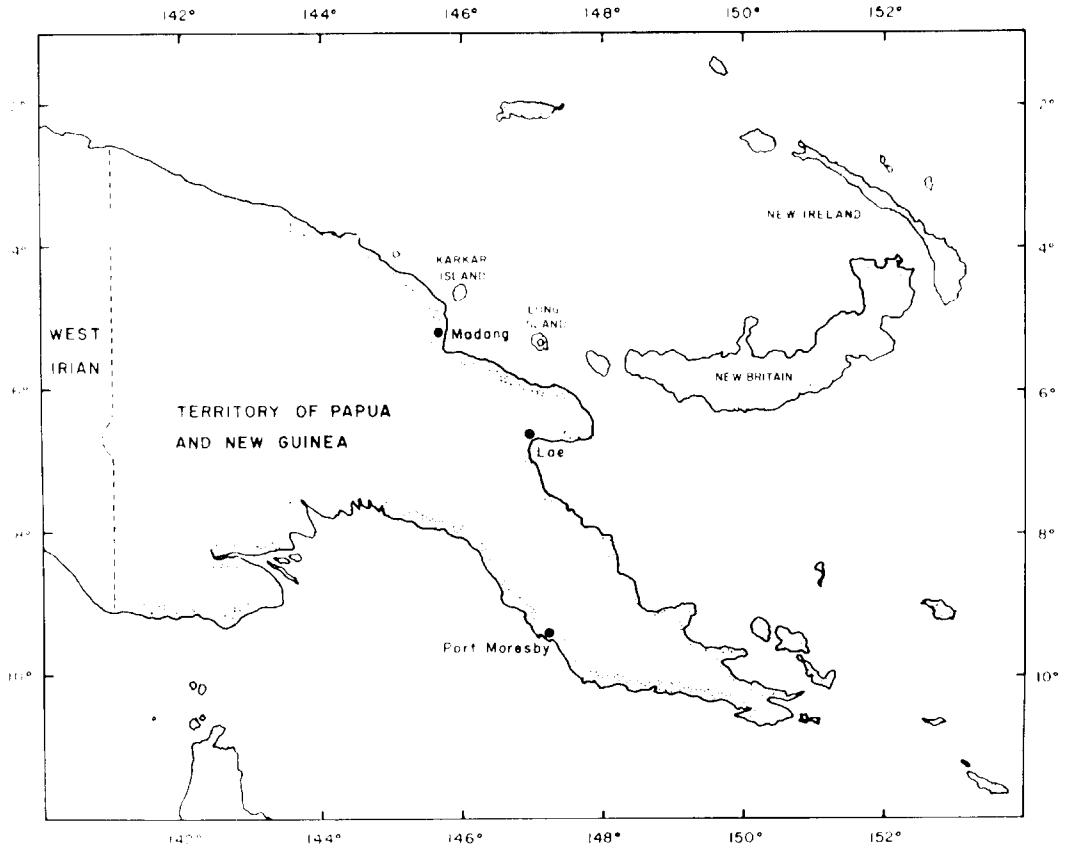

FIG. 1. Map of eastern New Guinea, showing some of the localities mentioned in the text.

MATERIAL COLLECTED

COENOBITIDAE

Coenobita brevimanus Dana, 1852

Cenobita clypeata var. *brevimanus* Dana, 1852: 473.

Coenobita clypeata—Henderson, 1888: 51; Fize and Serène, 1955: 5, 7, pl. 1 fig. 1, text fig. 1. Not *C. clypeatus* (Herbst, 1791).

Coenobita clypeatus Studer, 1889: 240; Ortmann, 1892: 316, pl. 12 fig. 20; Alcock, 1905: 141, 142, pl. 15 figs. 1, 1*a*; Nobili, 1905: 483.

Coenobita brevimanus—Rathbun, 1910: 314.

Coenobita hilgendorfi Terao, 1913: 388.

Material

Twenty-one miles north of Maiwara, 21 November 1969, coll. E. Ball: two females 18.7 and 25.2 mm; 21 miles north of Maiwara, 25 November 1969, coll. E. Ball: one female 28.4 mm.

Color in Life

These crabs in life are purplish pink.

Remarks

The specimens collected on 21 November were two of about six that were found feeding on the meat inside a large coconut.

Distribution

From east coast of Africa to the Line Islands and Tuamotu Archipelago. Northeast coast of New Guinea: Friedrich-Wilhelmshafen (= Madang) and Berlinhafen (= Aitape) (Nobili, 1905). Bismarck Archipelago: Wild Island, Admiralty Islands (Henderson, 1888);

New Hanover (= Lavongai) (Studer, 1889; Ortmann, 1892).

Coenobita rugosus H. Milne Edwards, 1837

Cenobita rugosa H. Milne Edwards, 1837: 241.

Coenobita rugosa—Henderson, 1888: 51; Studer, 1889: 240; Nobili, 1899: 248; Fize and Serène, 1955: 5, 12, pl. 1 figs. 3, 5, 7–10, text figs. 2, 3*A*.

Coenobita rugosus Ortmann, 1892: 316, 317, pl. 12 fig. 22; Ortmann, 1894: 33; Alcock, 1905: 141, 143, pl. 14 figs. 3, 3*a*; Nobili, 1905: 483; Holthuis, 1954: 16, text fig. 4 *c*, *d*; Lewinsohn, 1969: 94, text fig. 17.

Material

Lae, 18 September 1969, coll. E. Ball: two males 8.5 and 13.5 mm, one female 10.3 mm, one juvenile; mainland side of Ottilien Pass near Maiwara, beneath rubbish on coral rubble beach, 10 October 1969, coll. E. Ball: one male 8.8 mm, two females 7.7 and 7.9 mm, one juvenile; lagoon about 22 miles north of Maiwara, 11 October 1969, coll. J.-M. Bassot: one male 7.4 mm, three females 9.3 to 10.5 mm, one juvenile; near Matafuma Point, Long Island, on beach of black lava sand, 17 November 1969, coll. J.-M. Bassot and E. Ball: about 150 specimens (incl. a few ovigerous females) 5.5 to 10.3 mm; 21 miles north of Maiwara, on beach of coral fragments, 25 November 1969, coll. E. Ball: four males 11.5 to 13.7 mm.

Color in Life

Ground color pale. Eyestalks brown. Dark areas on body, in shades of brown and black: shield with a broad transverse patch anteriorly and two longitudinal stripes in posterior portion; merus of chelipeds with a broad distal ring, outer surface of carpus with a longitudinal stripe, large chela with a conspicuous patch on ventral part of outer surface; carpus of walking legs longitudinally striped, other articles with broad transverse bands.

Remarks

Several authors, in particular Fize and Serène (1955: 18, 19), have discussed the variations in color that may occur in living specimens. All the material in the present collection is marked essentially as noted above.

At the locality on the mainland side of Ottilien Pass, a number of these crabs were seen in small holes in the low cliff at the back of the beach. Near Maiwara on 19 or 20 September several specimens were seen at least 6 feet up in trees a minimum of an eighth of a mile from the nearest arm of the sea. On 25 November, 21 miles north of Maiwara, many were observed walking around on the beach of coral rubble 30 to 45 minutes after dark.

Many individuals from the vicinity of Matafuma Point were infested by the mite *Aspidilaelaps mirabilis* Trägårdh. Hundreds of these parasites were found crawling on and inside the shells after the crabs had been removed.

Distribution

From east coast of Africa to the Line Islands and Tuamotu Archipelago; Red Sea records should be referred to *C. scaevola* (Forskål) (Lewinsohn, 1969: 94) and eastern Pacific records to *C. compressus* H. Milne Edwards (Holthuis, 1954: 16). Northeast coast of New Guinea: Berlinhafen (= Aitape) (Nobili, 1905). Southeast coast of New Guinea: no locality specified (Ortmann, 1894); Katau, near mouths of the Fly River (Nobili, 1899). Bismarck Archipelago: Tracy and Wild islands, Admiralty Islands (Henderson, 1888); New Hanover (= Lavongai) (Studer, 1889; Ortmann, 1892).

DIOGENIDAE

Diogenes pallescens Whitelegge, 1897

Fig. 2

Diogenes pallescens Whitelegge, 1897: 141, pl. 6 figs. 2, 2*a–c*.

Material

Inside Sek Island, 5–10 feet, on fine coral rubble between extensive growths of living coral, 4 October 1969, coll. E. Ball and R. Lynch: two males 3.7 and 7.6 mm; large lagoon about 35 miles north of Maiwara, to 25 feet, on fine sandy mud among alcyonarians and corals, 19 October 1969, coll. E. Ball: two females 3.1 and 6.1 mm.

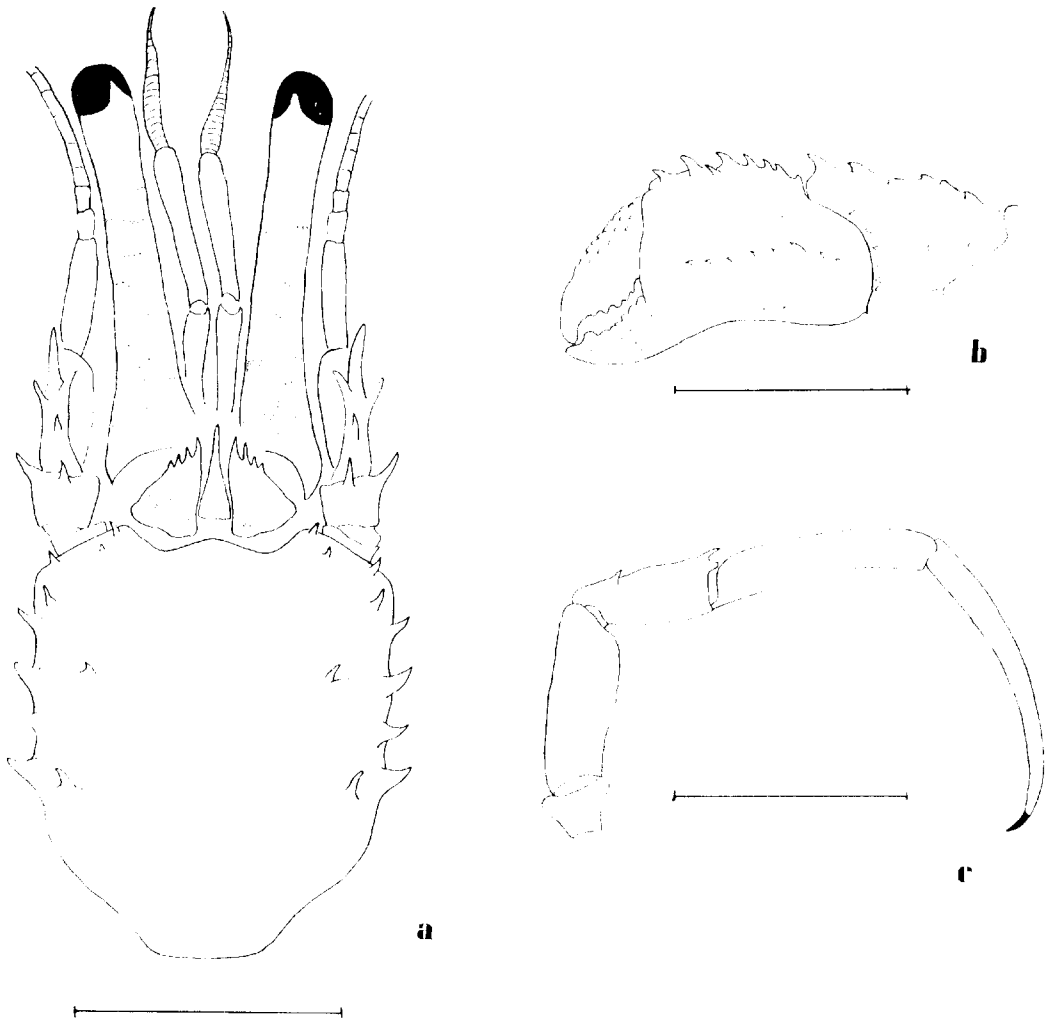

FIG. 2. *Diogenes pallescens* (Whitelegge). Male from off Sek Island. *a*, Anterior carapace and appendages; *b*, carpus and chela of left cheliped; *c*, left second pereiopod, inner surface. Scale of *a* = 2 mm; scales of *b* and *c* = 1 mm.

Color in Life

Carapace, eyescales, and rostriform process mottled greenish brown and white. Eyestalks with pure white background; a broad brown ring at base; fine lines of brown, in a netted or ringed pattern, over rest of stalk; cornea silvery. Antennular peduncles with narrow brown rings on a white to transparent background; flagellum with a row of brown spots along base of hairs. Antennae essentially transparent but with a pale brown ring on each segment of flagellum. Chelipeds mostly brown, fingers white. Walking legs mottled pale brown on a white background; the color tends to be concentrated into broad bands, the most prominent one occurring about midway along propodus.

Remarks

D. pallescens is one of several Indo-West-Pacific *Diogenes* in which the outer antennae are slender with the peduncle shorter than the eyestalks. This small group of species was dis-

cussed by Forest (1957: 530–532), who remarked (p. 531) that *D. pallescens* appears to differ from its allies in the extreme slenderness of the walking legs (length of propodus of third pereiopods six times its maximum height) and in the very wide-set eyescales. Both these characters are shown in the illustration of one of the types.

Diogenes pallescens was described from seven specimens collected at Funafuti, Ellice Islands. They are deposited in the Australian Museum with register number G.14402. Through the courtesy of Miss Elizabeth C. Pope, acting curator of Crustacea during 1970, one of us (Janet Haig) was able to borrow three of the syntypes: a male with carapace length of 6.0 mm and two females 4.6 and 4.0 mm. Examination of these types showed that the eyescales are inaccurately depicted in Whitelegge's illustration; they are differently shaped and not nearly so wide set as indicated by that author. The rostriform process between the eyescales and the rostral lobe of the carapace shield are also inaccurately shown. For the actual form of these structures see Fig. 2*a* in this paper. Furthermore, in Whitelegge's illustration the slenderness of the walking legs is a little exaggerated; in the three syntypes examined the propodus is about five, rather than six, times as long as high.

The four specimens reported herein as *Diogenes pallescens* agree closely with the syntypes and, except for the features just mentioned, with the original account of the species. In the larger specimens the antennular peduncles, when fully extended, reach the base of the corneas, while in the smaller ones they extend almost to the end of the eyestalks. (Because of the position in which they were drawn, the antennular peduncles of the 7.6-mm male depicted in Fig. 2*a* appear to be much shorter than the eyestalks.) The spinulation of the chelipeds is a little stronger in females than in males. In the 6.1-mm female the large (left) chela is slightly less elongate than is the same article in the illustrated male, and its lower margin is nearly straight instead of distinctly concave.

None of the specimens from Funafuti and New Guinea have a spine arising from the ventral side of the rostriform process.

Distribution

Reported only from Funafuti, Ellice Islands. The known range of the species is now extended westward to northeast New Guinea.

Diogenes gardineri Alcock, 1905

Diogenes gardineri Alcock, 1905: 73, pl. 7 fig. 3; Forest, 1957: 530, text fig. 16; Lewinsohn, 1969: 45.

Material

Large lagoon approximately 35 miles north of Maiwara, to 25 feet, on fine sandy mud among alcyonarians and corals, 19 October 1969, coll. E. Ball: one female 4.0 mm.

Remarks

This specimen differs from earlier accounts of *Diogenes gardineri* only in the length of the antennular peduncles, which barely reach the end of the eyestalks. In the material examined by Alcock (1905), Forest (1957), and Lewinsohn (1969), the antennular peduncles are longer than the eyestalks. In our specimen there is no spine on the ventral side of the rostriform process.

Distribution

Red Sea, Maldive Islands, and Tuamotu Archipelago. Now reported from eastern New Guinea.

Diogenes serenei Forest, 1957

Diogenes serenei Forest, 1957: 530, text figs. 12–15.

Material

Inside Sek Island, 5–10 feet, on fine coral rubble between extensive growths of living coral, 4 October 1969, coll. E. Ball and R. Lynch: one male 4.0 mm, two females 3.9 and 4.6 mm; large lagoon approximately 35 miles north of Maiwara, to 25 feet, on fine sandy mud among alcyonarians and corals, 19 October 1969, coll. E. Ball: one nonovigerous female 4.7 mm, one ovigerous female 3.7 mm; Port Moresby, just inside the outer reef, 3–8 feet, mostly coral rubble, 17 December 1969, coll. E. Ball: three males 3.2 to 3.7 mm, one female 2.8 mm.

Remarks

These specimens correspond with the original description of *Diogenes serenei* except that the dactyl of the walking legs is proportionately a little more slender than the one shown in Fig. 15. All of them have a strong spine on the underside of the rostriform process. This spine is characteristic of *D. serenei*, although Forest (1957: 530) also found it in specimens of *D. gardineri* Alcock from the Tuamotu Archipelago.

Distribution

Reported only from the Gulf of Oman and from Vietnam. The known range is now extended eastward to eastern New Guinea.

Dardanus lagopodes (Forskål, 1775)

Cancer lagopodes Forskål, 1775: 93.

Pagurus sanguinolentus Quoy & Gaimard, 1824: 532, pl. 79 fig. 2 (colored); Fize and Serène, 1955: 159, 166, pl. 4 figs. 4, 5, text fig. 25.

Pagurus affinis H. Milne Edwards, 1836: 274.

Pagurus europsis Dana, 1852: 452; Dana, 1855: pl. 28 fig. 6 *a–c*; Borradaile, 1900: 396, 425; Alcock, 1905: 80, 86, pl. 9 fig. 2.

Pagurus depressus Heller, 1861 *a*: 22; Heller, 1861 *b*: 248.

Dardanus hellerii Paulson, 1875: 90, pl. 12 figs. 4, 4 *a–c*.

Dardanus lagopodes– Lewinsohn, 1969: 32, pl. 12.

Material

Inside Sek Island, 5–10 feet, on fine coral rubble between extensive growths of living coral, 4 October 1969, coll. E. Ball: one male 13.4 mm, one female 13.8 mm, one juvenile 7.7 mm; mainland side of Ottilien Pass, 4 feet, on coral rubble and sand, 11 October 1969, coll. E. Ball: one female 21.5 mm; inside middle of Sek Island, about 4 feet, on fine rubble among extensive areas of live coral, 14 October 1969, coll. E. Ball: one juvenile 7.9 mm; lagoon about 35 miles north of Maiwara, about 25 feet on mud along alcyonarians below coral zone, and about 10 feet on coral rubble, 19 October 1969, coll. E. Ball: two females (juvenile) 8.2 and 9.0 mm, two juveniles; off Kurum, Karkar Island, 5–10 feet, on coral rubble, 29 October 1969, coll. E. Ball: three males (one juvenile) 8.7 to 15.2 mm, one female 15.0 mm; Port Moresby, just inside the outer reef, 3–8 feet, mostly coral rubble, 17 December 1969, coll. E. Ball: four males 10.9 to 17.1 mm; Port Moresby, approximately 3 feet, from an area of aquatic grass growing on sand and/or from a rocky area with some coral, 17 December 1969, coll. E. Ball: one male 14.4 mm, one female 17.6 mm.

Color in Life

BLACK VARIETY: Carapace shield purple in central portion, purple and reddish brown toward lateral margins; a large, deep brown patch just behind frontal margin. Posterior carapace reddish brown with white spots, and with a broad, longitudinal, whitish patch at midline. Eyestalks pale violet, with a broad yellow ring next to the black cornea. Antennular peduncles olive green, with a light brown streak on outer side; flagellum bright orange. Antennal peduncles light brown, sides of basal segment slightly darker; flagellum light brown. Chelipeds mottled reddish brown and white; hairs deep red with white tips, each springing from a bright reddish purple spot. Walking legs mottled deep reddish brown and white, with hairs similar to those of chelipeds; carpus with a large patch of dark reddish brown to nearly black, this patch sometimes forming a nearly complete ring; a less sharply defined reddish brown area on merus. Pereiopods 4 and 5 mottled reddish brown and white. Abdomen dorsally reddish brown with white spots; ventrally a translucent white.

RED VARIETY: Carapace shield light brown mottled with dark brown; anterior portion with a few small bluish purple spots; an orange patch behind each anterolateral angle. Posterior carapace light brown with mottlings of dark brown and irregular longitudinal rows of white spots. Eyestalks uniform purplish brown, with a yellowish area just proximal to the silvery black cornea. Antennules and antennae transparent yellow. Chelipeds mottled brown and white, hairs red with white tips; carpus with a bright

orange patch on outer surface. Walking legs mottled reddish brown and white, the mottlings forming a series of rings on the dactyl; carpus with a bright red patch. Pereiopods 4 and 5 mottled reddish brown and white. Abdomen transparent light brown with white spots.

Remarks

This species has been described under several names because of variations in color and in certain morphological features; Fize and Serène (1955) discussed these variations in detail. We observed many of them in the material from New Guinea. The two color varieties were found together at Karkar Island and at Port Moresby. Different degrees of flattening and broadening of the propodus of the left third pereiopod frequently occurred among specimens collected at a single locality. Individuals with a markedly flattened carapace were removed from shells with a narrow aperture, including *Strombus luhuanus* Linnaeus and *Conus eburneus* Bruguière.

Isopods (suborder Flabellifera) were associated with several specimens of *Dardanus lagopodes* collected at Port Moresby. They were found near the apices of shells cracked to remove the crabs. These isopods have been identified as *Cirolana* and probably belong to an undescribed species.

Distribution

From the Red Sea and east coast of Africa to the Marshall and Gilbert islands in the northern hemisphere and to the Tuamotu Archipelago in the southern hemisphere. In Eastern New Guinea it is found in the Conflict Group, Louisiade Archipelago (Borradaile, 1900).

Dardanus deformis (H. Milne Edwards, 1836)

Pagurus deformis H. Milne Edwards, 1836: 272, pl. 13 figs. 4, 4*a* (not pl. 14 fig. 2 as stated in text); Borradaile, 1900: 396, 424; Alcock, 1905: 81, 88, pl. 9 fig. 4; Cowles, 1919: 83, pl. 1; Cowles, 1920: 40; Fize and Serène, 1955: 159, 199, pl. 4 fig. 6, text figs. 31, 33 *E, F;* Gillett and McNeill, 1959: 118, pl. 117 (colored).

Pagurus cavipes White, 1847*a*: 60 (*nom. nud.*); White, 1847*b*: 122.

Pagurus cultratus White, 1847*a*: 60 (*nom. nud.*).

Pagurus (s.s.) *deformis*—Hilgendorf, 1879: 818, pl. 3 figs. 6, 7.

Pagurus difformis—Studer, 1889: 235.

Pagurus near *difformis*—Studer, 1889: 248.

Dardanus deformis Edmondson, 1925: 24; Gillett and McNeill, 1967: 118, pl. 117 (colored).

Material

Lagoon approximately 35 miles north of Maiwara, 3 feet, under a large chunk of dead coral on muddy sand bottom, 19 October 1969, coll. E. Ball: one male 25.8 mm; Kurum, Karkar Island, about 5 feet, on coarse black lava sand, 29 October 1969, coll. E. Ball: one female 14.0 mm.

Color in Life

Shield gray with a few brown markings. Posterior carapace uniform gray with fine brown branching lines. Eyestalks white in median portion; a broad dark brown band at base and a pale brown area distally. Cornea yellowish. Antennules transparent gray; penultimate segment of peduncle with a broad median brown ring. Antennae transparent gray. Carpus of left cheliped gray-brown; chela very pale brown, almost white. Right chela pale gray with many short, fine, longitudinal, brown streaks. Hairs of right cheliped yellow. First walking legs off-white, with many fine brown longitudinal streaks on carpus, propodus, and dactyl. Second walking legs darker brown, with similar longitudinal streaks. Abdomen transparent pale brown.

Remarks

There is very little published information on the color of this species in life. Fize and Serène (1955: 205) gave brief color notes made from one small specimen. Gillett and McNeill (1959, 1967) had a color photograph of a living specimen with anemones on its shell.

The individual from 35 miles north of Maiwara was living in a turban shell, *Turbo argyrostomus* Linnaeus, on the outside of which were attached several limpets, *Hipponix* (*Sabia*) *conicus* (Schumacher), and two large anemones, *Calliactis polypus* (Forskål). A much smaller

anemone, *Sagartiomorphe paguri* (Verrill), was attached to the columella of the *Turbo* shell. The hermit crab from Karkar Island, with a length of only 33.8 mm including the abdomen, occupied an 81-mm auger shell, *Terebra maculata* (Linnaeus); there were two individuals of *Calliactis polypus* on the outside of the shell.

Cowles (1919: 83–87; 1920: 40) discussed in some detail the association of *Dardanus deformis* with two species of anemone which he did not name, but which have since been identified as *Calliactis polypus* and *Sagartiomorphe paguri* (Cutress and Ross, 1969: 226).

Distribution

From east coast of Africa to the Hawaiian Islands and Tuamotu Archipelago. Eastern New Guinea: Conflict Group, Louisiade Archipelago (Borradaile, 1900). Bismarck Archipelago: Anchoreten (= Hermit Islands) and New Ireland (Hilgendorf, 1879; Studer, 1889); Pigeon Island, New Britain (Borradaile, 1900).

Trizopagurus strigatus (Herbst, 1804)

Cancer strigatus Herbst, 1804: 25, pl. 61 fig. 3.

Pagurus annulipes H. Milne Edwards, 1848: 63.

Trizopagurus strigatus Forest, 1952*a*: 2; Forest, 1952*b*: 6, 19, text figs. 5, 1-f, 21; Lewinsohn, 1969: 52, text fig. 7.

Material

Lagoon 22 miles north of Maiwara, less than 10 feet, on living coral or coral rubble, 21 September 1969, coll. E. Ball, K. Kirk, and I. Richards: one female 8.7 mm.

Color in Life

Carapace completely white without any markings. Eyescales mottled red and orange. Eyestalks, including cornea, uniform bright red-orange. Antennules solid bright reddish orange. Antennal scale and peduncle bright reddish orange; flagellum transparent. Chelipeds and walking legs with alternating red and orange rings; each scute of those appendages with red distally and orange proximally. Pereiopods 4 and 5 mottled red and orange. Abdomen with some red on each calcified plate. Uropods red with small white spots.

Distribution

From Red Sea and east coast of Africa to Hawaiian and Society islands. New Guinea: no locality specified (H. Milne Edwards, 1848).

Clibanarius sp., aff. *longitarsus* (De Haan)

Fig. 3

Material

Near Maiwara, on mangrove roots above fine mud and on coarse rubble, some in water and some out, 26 October 1969, coll. E. Ball: two males 5.5 and 12.5 mm, five females 7.2 to 9.0 mm; Port Moresby, on mangrove roots or in rocky intertidal, 17 December 1969, coll. E. Ball: one male 8.0 mm.

Color in Life

Shield with large areas of brown on an olive-drab background; some have a definite streak on each lateral margin but there is no indication of real stripes. Posterior portion of carapace olive drab. Eyescales mostly brownish green, brown at base. Eyestalks brownish green dorsally, paling almost to white on lateral and ventral surfaces. Cornea black. Antennular peduncles pale to almost white dorsally, brownish green laterally; flagellum pale green, each segment with a brown stripe running across it; a band of bright orange across base of hairs. Antennae mostly brown; a longitudinal white stripe dorsally. Chelipeds olive drab with blue tubercles. Merus of walking legs olive drab, without distinct stripes; lateral surface with a few small pale spots, and sometimes a pale longitudinal streak toward dorsal margin. Carpus olive drab, with a broad, sharply defined,

FIG. 3. *Clibanarius* aff. *longitarsus* (De Haan). Left third pereiopod of specimen from Maiwara. Scale = 4 mm.

median longitudinal blue-green stripe. Propodus and dactyl with two narrow, well-defined, longitudinal, olive-drab stripes on a blue-green background.

Remarks

Fize and Serène (1955) discussed *Clibanarius longitarsus* (De Haan) and two species closely related to it, which they designated as *Clibanarius 1* and *Clibanarius 2*. The three forms, which live together in the muddy sand of estuaries in Vietnam, can readily be separated in life by differences in color and color pattern. The pattern of our New Guinean material resembles that of *Clibanarius 2* (Fize and Serène, 1955: pl. 3 fig. 9, text fig. 12). Except on the walking legs, the color also agrees quite closely with that of *Clibanarius 2* as described by those authors on pages 92 and 94. They described the second and third pereiopods as having longitudinal stripes alternately "vert-jaune clair" and "vert foncé"; in our material the corresponding areas are blue-green and olive drab. Thus, for example, in Vietnam specimens the propodus has two narrow stripes of dark green on a pale yellow-green background, while in our material the propodus has two narrow stripes of olive drab on a blue-green background. Because of these differences we hesitate to place the New Guinea specimens with *Clibanarius 2:* possibly they belong to still another undescribed species.

One male and two females collected near Maiwara were each parasitized by a pair of bopyrids, *Pseudione* sp., in the right gill chamber. The *Pseudione* is an undescribed species.

Clibanarius padavensis De Man, 1888
Fig. 4

Clibanarius padavensis De Man, 1888*a*: 242, pl. 16 figs. 1–5; Alcock, 1905: 42, 44, pl. 4 fig. 2; McCulloch, 1913: 349, 352; Dechancé, 1964: 32, text fig. 5.

Clibanarius striolatus McNeill, 1968: 28 (in part).

Material

Near Maiwara, on mangrove roots above fine mud and on coarse rubble, some in water and some out, 26 October 1969, coll. E. Ball: four males 5.6 to 6.5 mm, three females 5.0 to 6.7 mm; Port Moresby, on mangrove roots and/or in rocky intertidal, 17 December 1969, coll. E. Ball: one male 5.8 mm, two females 5.0 and 5.7 mm.

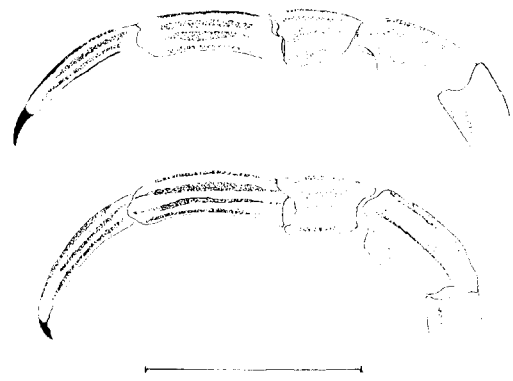

Fig. 4. *Clibanarius padavensis* De Man. Left third pereiopod of two specimens from Port Moresby. Scale = 4 mm.

Color In Alcohol

Shield pale orange to white, with brownish longitudinal markings tending toward broad, much diffused stripes; in some specimens there are two distinct longitudinal stripes. Eyescales mostly reddish brown. Eyestalks orange-brown to pale orange dorsally, pale on outer and ventral surfaces; a distinct, narrow, longitudinal stripe on mesial surface. Basal segment of antennule white mottled with orange-brown; rest of peduncle orange-brown; flagellum white. Antennal scale and basal segment of peduncle mostly orange-brown; distal segment pale, with a brown longitudinal stripe on each lateral surface; flagellum pale for about half its length, orange-brown in distal half. Chelipeds mottled dark brown and pale orange; two distinct longitudinal stripes on each movable finger. Tubercles on chelae blue to white. Ground color of walking legs pale orange to nearly white; propodus and dactyl with a broad band of white at each end of segment. Merus, carpus, propodus, and dactyl with longitudinal stripes of dark brown or dark orange-red; in some specimens these stripes extend to the ends of the segments, in others they do not cross the white band at either end of the propodus and dactyl.

Remarks

This species was found living with *Clibanarius* aff. *longitarsus*. The two forms were not distinguished in the field, and no color notes were made on live *C. padavensis*. The preceding notes were prepared after the specimens had been preserved in alcohol for 3 months.

Morphologically our specimens agree with *Clibanarius padavensis*, except that the eyestalks are proportionately shorter and stouter than indicated in the published descriptions and illustrations. This can undoubtedly be explained by the small size of the New Guinea specimens, the largest of which has a carapace length of only 6.7 mm. De Man (1888*a*: 246) gave a carapace length of 23 mm for a type-specimen, and Alcock (1905: 45) cited an individual of 27 mm. Because in hermit crabs the shape of the eyestalks changes with growth, it is of little value as a taxonomic character except in fully developed individuals (Provenzano and Rice, 1966: 61).

Several writers have distinguished *Clibanarius padavensis* from *C. striolatus* Dana, on the basis of both morphological and color differences. McNeill (1968: 28–29) concluded that the two forms belong to a single, variable species and synonymized them under the name *C. striolatus*. This question needs further study; for the present we prefer to cite our material under De Man's name, because it agrees with published descriptions of *C. padavensis* but not with those of *C. striolatus*.

Three specimens collected near Maiwara had a sacculinid, *Septosaccus snelliusi* Van Baal, attached to the abdomen.

Distribution

From east coast of Africa to northeast Australia and New Caledonia. Southeast coast of New Guinea: Hood Bay (McCulloch, 1913; the McNeill, 1968, record of *C. striolatus* from New Guinea is probably based on the same material).

Clibanarius corallinus (H. Milne Edwards, 1848)

Pagurus corallinus H. Milne Edwards, 1848: 63.

Pagurus globoso-manus Dana, 1851: 271.

Clibanarius corallinus?—Dana, 1852: 468; Dana, 1855: pl. 29 figs. 8 *a–e*.

Clibanarius obeso-manus Dana, 1852: 468.

Clibanarius corallinus—Alcock, 1905: 43, 48, pl. 5 fig. 1; Balss, 1913: 41, 43, text fig. 29; Fize and Serène, 1955: 77, 132, text fig. 20; Lee, 1969: 41, 43.

Material

Lagoon 22 miles north of Maiwara, 10–30 feet, coral or coral rubble, 21 September 1969, coll. E. Ball, K. Kirk, and I. Richards: one male 12.0 mm.

Color in Life

Shield fairly uniform dark brown. Posterior carapace brown with numerous small white tubercles, arranged in three longitudinal rows. Eyestalks light brown with a dark brown longitudinal stripe dorsally; cornea bright blue. Antennules brownish orange. Antennae uniform orange except for basal segment of peduncle, which is brown. Chelipeds brown, teeth and tubercles white; hairs transparent yellow. Walking legs mostly uniform brown, with a few white spots; hairs transparent yellow. Abdomen brown; white tubercles on calcified areas.

Remarks

A note on the color of living *Clibanarius corallinus* appears in Fize and Serène (1955: 136) and in Lee (1969: 43).

Distribution

From eastern Indian Ocean (Andaman Islands, Nicobar Islands, Cocos-Keelings, Christmas Island) to the Line Islands and Tuamotu Archipelago. New Guinea: no locality specified (H. Milne Edwards, 1848). Bismarck Archipelago: Wirbelwindriff (= Whirlwind Reefs) (Balss, 1913).

Clibanarius snelliusi Buitendijk, 1937

Clibanarius snelliusi Buitendijk, 1937: 259, 267, text figs. 7–9; Fize and Serène, 1955: 76, 128, text fig. 19.

Material

Port Moresby, approximately 3 feet, from an area of aquatic grass growing on sand, and on

from a rocky area with some coral, 17 December 1969, coll. E. Ball: seven males 3.1 to 4.1 mm, one nonovigerous female 2.9 mm, four ovigerous females 3.9 to 6.2 mm, one juvenile.

Color in Alcohol

Carapace shield white, with large blotches and streaks of dark brown. Eyescales dark brown across base, white in terminal half. Eyestalks olive drab with a few very small white punctae; a narrow white band next to cornea. Antennular peduncles olive drab except for distal half of terminal segment, which is bright blue; flagellum yellow. Acicle and proximal segments of antennal peduncles mottled olive drab and white; distal segment and flagellum orange. Chelipeds dark chocolate-brown with many white spots; spines and teeth white. Ground color of walking legs dark chocolate-brown. Merus with white spots on outer surface; in some specimens these are run together to form a median longitudinal stripe. Carpus and propodus with white spots, those along median portion of outer surface coalesced to form a broad longitudinal stripe, white with a bluish tinge. Dactyl with a broad, bluish longitudinal stripe; a few small white spots near dorsal margin.

Remarks

The color in life as noted by Fize and Serène (1955: 130) differs in a few details from that found in the New Guinea material after 3 months' preservation in alcohol. In living specimens the carapace shield is dark blue-green, with yellow spots; the spots on the chelipeds and walking legs are yellow; and the median longitudinal stripe on the dactyl of pereiopods 2 and 3 is brilliant blue.

According to Fize and Serène (p. 130), the outer surface of the propodus of the third pereiopod is convex. In our specimens the outer side of the propodus of the left third pereiopod is distinctly flattened.

Distribution

Reported only from Vietnam and from Flores in the East Indian Archipelago. The known range of the species is now extended eastward to southeast New Guinea.

Clibanarius englaucus new species

Fig. 5

Material

Kurum, Karkar Island, 4–10 feet, probably on black lava sand, 29 October 1969, coll. E. Ball: one male, holotype (Allan Hancock Foundation catalog no. 693).

Measurements

Length of carapace 7.5 mm; length of shield 3.6 mm; maximum width of shield 3.4 mm.

Diagnosis

Shield nearly as broad as long; chelipeds subequal, less than twice as long as broad; dactyl of walking legs shorter than propodus; propodus and dactyl of left third pereiopod with outer surface distinctly flattened. Eyestalks orange, with a broad brown longitudinal stripe; proximal segments of antennular peduncle brown, distal segment blue, flagellum orange; antennae orange; no longitudinal stripes on carapace or chelipeds; merus, carpus, and propodus of walking legs dark brown, latter article with a white patch distally; dactyl with a broad white band proximally, a narrower one distally, median portion of outer and inner surfaces blue, dorsal and ventral margins brown except in proximal white area.

Description

Carapace smooth, punctate. Shield subquadrate, only slightly longer than broad. Rostrum triangular, a little in advance of lateral projections. Anterolateral corners rounded. Eyescales approximated at base, inner margins convex; anterior margin with five teeth decreasing in size outwards, the outer three minute. Eyestalks shorter than frontal margin. Antennular and antennal peduncles, when fully extended, falling just short of end of corneas. Acicle with a few blunt spines, obscured by setae and extending no farther than base of terminal segment of antennal peduncle. Long setae on lateral margins of shield, acicles, and antennal peduncles except for terminal segment; a few short setae on anterior margin of eyescales and inner side of eyestalks.

Chelipeds subequal. Merus with two spiniform teeth, directed anteriorly, at lower distal

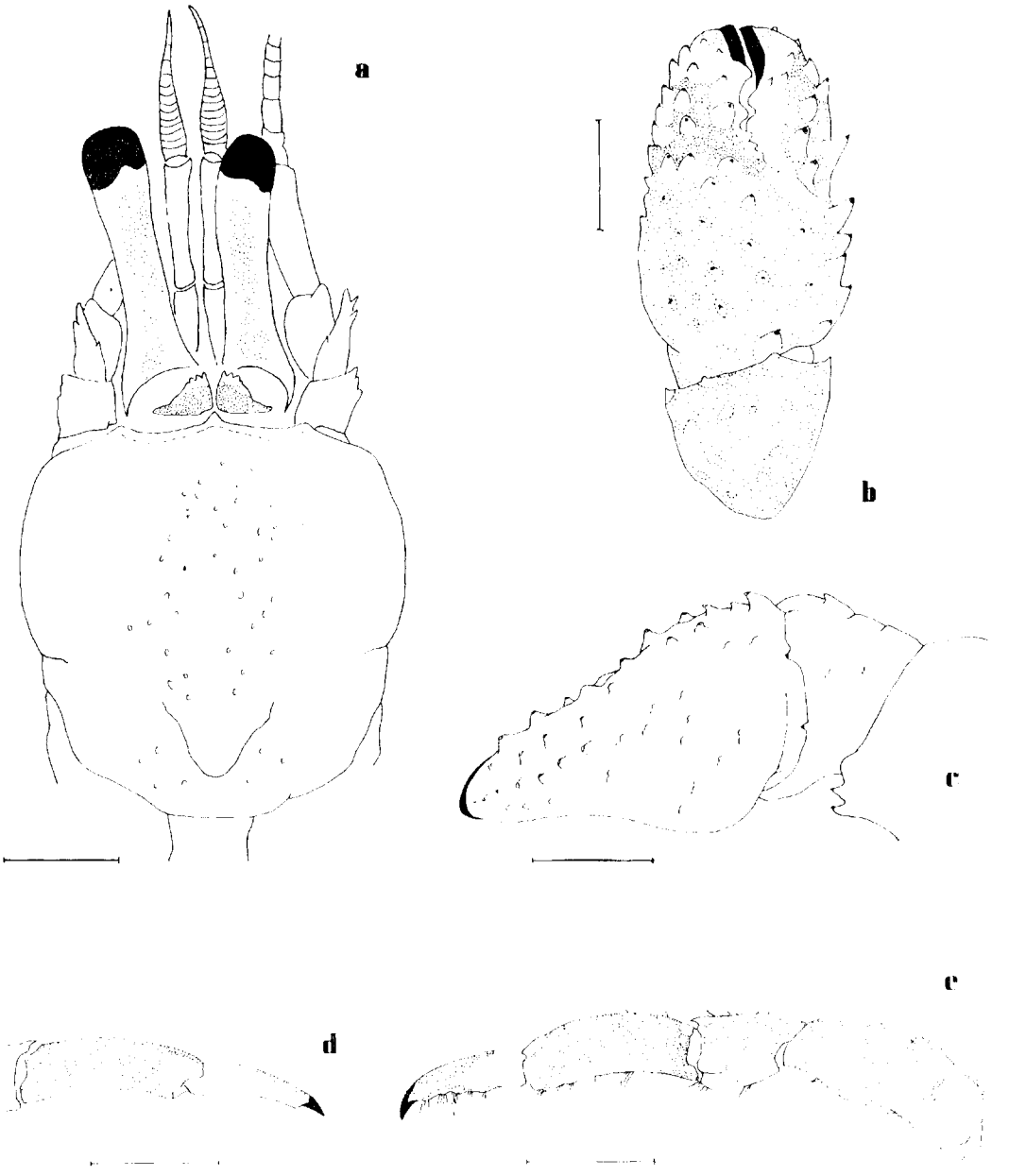

FIG. 5. *Clibanarius englaucus*, n. sp. Holotype. *a*, Anterior carapace and appendages; *b*, carpus and chela of left cheliped, upper surface; *c*, same, outer surface; *d*, propodus and dactyl of left third pereiopod, inner surface; *e*, left third pereiopod, outer surface. Scales of *a*, *c* = 1 mm; scales of *d* and *e* = 2 mm.

corner of outer surface, and with a row of seven or eight small conical tubercles along lower margin of inner surface. Upper margin of carpus with a blunt tooth distally; outer surface with a few small pointed tubercles on distal margin. Chelae rather stout, less than twice as long as broad; upper surface of palm covered with conical tubercles each with a corneous tip, the largest of these tubercles being the most distal of a row of five along inner margin,

one at articulation with carpus, and a few at base of fixed finger; outer surface with a few small, flattened, scalelike tubercles, inner surface nearly smooth. Upper and outer surfaces of fingers with prominent corneous-tipped tubercles, larger than most of those on palm; on outer surface of fixed finger these arranged in three more or less regular, longitudinal rows. Both fingers strongly toothed on cutting edge. All articles of chelipeds with tufts of long and short setae, most prominent along upper and lower margins.

Merus of walking legs unarmed on upper margin. Carpus with a spinule at distal end of upper margin. Dactyl distinctly shorter than propodus, its lower margin with a row of minute spiniform hairs. Propodus and dactyl of second pereiopods and of right third pereiopod somewhat convex on outer surface; on left third pereiopod, those articles distinctly flattened on outer surface which is margined dorsally by a sharp ridge. All walking legs with tufts of long setae, especially along upper and lower margins.

Color in Life

Shield mottled pale gray-green and white. Eyestalks brown with hints of orange; a narrow blue band next to cornea, which is black speckled with white. Proximal segments of antennular peduncle brown; distal segment deep blue; flagellum orange. Antennae reddish orange. Ground color of chelipeds dark brown; teeth and tubercles white. Merus and carpus of walking legs uniform brownish black except for scattered small white spots. Propodus brownish black, with an irregular white patch at distal end. Dactyl white with a broad median blue band; claw black. Abdomen transparent.

Color in Alcohol (additional observations made after the specimen had been preserved for three months)

Eyescales dark orange with anterior margin white. Eyestalks orange with a broad, dusky stripe dorsally. Ground color of chelipeds dark orange; teeth and tubercles white. Fingers dark purple on outer and upper surfaces, with bluish tints on upper surface toward cutting edges; pale yellow-orange distally, next to the dark corneous tip. Merus and carpus of walking legs dark purple-brown with scattered small white spots. Propodus same except at distal end, which has an irregular white patch tinged with blue. Lateral surfaces of dactyl white with a broad, median blue band; distal two-thirds to three-fourths of upper and lower margins each with a broad, purple-brown longitudinal stripe which tends to obscure the ringlike form of the median blue area, especially on the outer surface of the article (Fig. 5*e*). The blue band is particularly distinct on the inner surface of the dactyl of the third pereiopods, where the marginal brown streaks scarcely show and the distal white area is broader (Fig. 5*d*). The marginal streaks do not extend onto the broad, proximal white band, and that area (together with the white patch at the distal end of the propodus) forms the most distinctive marking on the walking legs, contrasting sharply with the dark coloration of the more proximal articles.

Remarks

Among Indo-West-Pacific species, *Clibanarius englaucus* is perhaps most closely related to *C. boschmai* Buitendijk, *C. merguiensis* De Man, *C. pacificus* Stimpson, and *C. ransoni* Forest. These forms share with *C. englaucus* the following combination of characters: the chelipeds are subequal; the dactyl of the walking legs is shorter than the propodus; there are no longitudinal stripes on the carapace and chelipeds; and there is a pale area at the distal end of the propodus of the walking legs, while the pattern of those legs, in general, takes the form of transverse bands rather than prominent pale spots or dark longitudinal stripes. Morphological comparisons are difficult to make as long as only one specimen is available; but the new species may be readily distinguished from its relatives by its coloration.

The color of live *Clibanarius boschmai* is unknown. Its color in preservative resembles that of *C. englaucus* in that there is some blue on the dactyl of the walking legs and a brown streak on the dorsal and ventral margins of that article, but it differs from our species in having a longitudinal brown stripe on each lateral surface of the dactyl and a pale ring at the proximal,

as well as distal, end of the propodus (Buitendijk, 1937: 261, text figs. 10–12).

In *Clibanarius merguiensis* the pale distal propodal band is much broader on the third pair of pereiopods than on the second (De Man, 1888*a*: 250; Forest, 1953: 448, text fig. 7), and the color of live specimens differs in many respects from that of *C. englaucus* (Fize and Serène, 1955: 148).

Clibanarius pacificus was described as being ". . . of a very dark bluish-olive color; ambulatory feet bright yellow; fingers of the hand red" (Stimpson, 1907: 211). Stimpson did not specify whether this color was of live or preserved material, but in either case it does not agree with what is known of *C. englaucus*. Balss (1913: 43) believed *C. pacificus* to be identical with *C. merguiensis*.

Clibanarius englaucus may be closest morphologically to *C. ransoni*, but in the latter species the live coloration and color pattern are strikingly different (Forest, 1953: 446, text figs. 2, 6; Fize and Serène, 1955: 151–154, text fig. 23).

Clibanarius virescens (Krauss) and *C. nathi* Chopra & Das lack a pale band at the distal end of the propodus of the walking legs, but resemble *C. englaucus* in having the dactyl pale with a darker median ring. The live coloration of *C. virescens* was discussed by several writers, notably Fize and Serène (1955: 142–143); it is quite unlike that of *C. englaucus*. Only the color in preservative has been described for *C. nathi* (Chopra and Das, 1940: 145, text figs. 1, 2) and it differs in several details from the color pattern of preserved *C. englaucus*.

Derivation of Name

Greek *eglaukos*, bluish, in reference to the color of the dactyls.

Calcinus laevimanus (Randall, 1839)

Pagurus laevimanus Randall, 1839: 135.

Pagurus lividus H. Milne Edwards, 1848: 63.

Calcinus tibicen—Dana, 1852: 457. Not *C. tibicen* (Herbst, 1791).

Calcinus herbstii De Man, 1888*b*: 437; Alcock, 1905: 53, pl. 5 fig. 4; Balss, 1913: 44; Forest, 1951: 89, text figs. 2, 5, 6, 9.

Calcinus laevimanus—Rathbun *in* Stimpson, 1907: 208 (footnote); Miyake, 1956: 323, text figs. 14, 15.

Calcinus herbsti—Fize and Serène, 1955: 40, 41, pl. 2 figs. 1–4, text fig. 6.

Material

Lagoon 22 miles north of Maiwara, 0–2 feet, broken coral rubble, 21 September 1969, coll. E. Ball, K. Kirk, and I. Richards: three males 6.4 to 13.1 mm, four females 7.0 to 10.5 mm; Wongat Island, near Madang, 1 November 1969, coll. J. Womersley: one male 13.3 mm.

Color in Life

Carapace pale gray-green. Eyestalks pale blue in proximal and orange in distal half; cornea silver. Antennular peduncles blue, with an orange band across articulation of the two distal segments; flagellum orange. Basal segment and scale of antennal peduncles brown; distal segments and flagellum bright orange. Merus and carpus of large cheliped dark gray; outer surface of chela dark gray and white, the amount of white varying greatly: in some specimens it is confined to the tips of the fingers, in others it covers all but a small dorsoproximal area of the palm. Small cheliped dark gray, fingers white at tips and along cutting edges. Merus, carpus, and propodus of walking legs light brown; merus with a submedian longitudinal dark brown stripe, carpus with one submedian and one ventral stripe. Dactyl white with a subdistal dark brown ring and with a small dark brown spot on proximal half of outer surface. Abdomen gray-brown.

Remarks

The distinctive color pattern of this species, as it occurs in both live and preserved specimens, has been noted by many writers, among them De Man (1888*b*), Alcock (1905), Forest (1951), Fize and Serène (1955), and Miyake (1956).

The 10.5-mm female specimen from 22 miles north of Maiwara had a pair of bopyrids attached to the abdomen. They have been identified as *Parathelges weberi* Nierstrasz & Brender à Brandis.

Distribution

From the east coast of Africa to the Hawaiian Islands and Tuamotu Archipelago. Bismarck Archipelago: Wirbelwindriff (= Whirlwind Reefs) (Balss, 1913).

Calcinus gaimardii (H. Milne Edwards, 1848)
Pagurus gaimardii H. Milne Edwards, 1848: 63.
Calcinus gaimardii—Dana, 1852: 457; Dana, 1855: pl. 28 fig. 9; Alcock, 1905: 53, 56, pl. 5 fig. 3.
Calcinus gaimardi—Fize and Serène, 1955: 40, 49, pl. 2 figs. 5–8, text figs. 7, 8; Miyake, 1956: 326, text figs. 16, 17; Lee, 1969: 53, 54, text fig. 11.

Material

Lagoon 22 miles north of Maiwara, 0–2 feet, broken coral rubble, 21 September 1969, coll. E. Ball, K. Kirk, and I. Richards: three females 9.4 to 12.4 mm; large lagoon about 35 miles north of Maiwara, 4 feet, from a large lump of dead coral on bottom of fine sand and mud, 19 October 1969, coll. E. Ball: one male 7.5 mm; off Kurum, Karkar Island, 5–10 feet, coral rubble, 29 October 1969, coll. E. Ball: one male 16.5 mm, two females 8.5 and 8.9 mm; Port Moresby, just inside the outer reef, 3–8 feet, mostly coral rubble, 17 December 1969, coll. E. Ball: three males 3.9 to 13.5 mm, one female 7.2 mm.

Color in Life

Carapace shield gray with tones of pink; cardiac area reddish, rest of posterior carapace pale green. Proximal portion of eyestalks light yellow-brown on lateral surfaces and dark brown dorsally, distal portion blue; in some specimens the blue color occupies nearly half the stalk, in others it is restricted to a broad band next to the cornea. Cornea black or blackish silver. Antennular peduncles olive drab, distal segment slightly greener; flagellum bright orange. Basal segment of antennal peduncles brownish; other segments and flagellum bright orange. Chelipeds reddish purple, shading more toward red on chelae; fingers white at tips and along cutting edges. Walking legs reddish purple or deep brown, sometimes with scattered paler mottlings. Abdomen pale with a few pale red and white spots.

Remarks

The coloration of this species in life was described in considerable detail by Fize and Serène (1955: 50–52) and more briefly by Miyake (1956: 328) and Lee (1969: 55).

A commensal yellow flatworm was living in the shell with one specimen collected 22 miles north of Maiwara. Unfortunately it was lost and its identity is not known.

Distribution

From east coast of Africa to Hawaiian and Society islands. Not reported from eastern New Guinea.

Calcinus latens (Randall, 1839)
Pagurus latens Randall, 1839: 135.
Pagurus cristimanus H. Milne Edwards, 1848: 64.
Calcinus latens—Dana, 1852: 459; Dana, 1855: pl. 28 fig. 11; Alcock, 1905: 53, 58, pl. 5 fig. 5; Forest, 1951: 94, text figs. 14–18; Fize and Serène, 1955: 40, 58, pl. 2 figs. 9–11, text fig. 9; Miyake, 1956: 331, text figs. 20, 21; Lee, 1969: 53, 55, text fig. 12.
Calcinus intermedius De Man, 1881: 102.
Calcinus terrae-reginae Haswell, 1882: 760; Alcock, 1905: 53, 57, pl. 5 fig. 7; Miyake, 1956: 328, text figs. 18, 19.

Material

Inside Sek Island, 5–10 feet, on fine coral rubble between extensive growths of living coral, 4 October 1969, coll. E. Ball and R. Lynch: one juvenile; inside middle of Sek Island, approximately 4 feet, on fine rubble among extensive areas of live coral, 14 October 1969, coll. E. Ball: one male 5.7 mm; large lagoon approximately 35 miles north of Maiwara, approximately 3 feet, on large rocks and dead coral on bottom of muddy sand, 19 October 1969, coll. E. Ball: 10 males 4.0 to 9.9 mm, one nonovigerous female 4.1 mm, one ovigerous female 5.9 mm; Kurum, Karkar Island, 3–10 feet, on coral rubble and on coarse black lava sand, 29 October 1969, coll. E. Ball:

eight males 3.3 to 9.2 mm, one nonovigerous female 3.2 mm, one ovigerous female 3.2 mm; Port Moresby, 3–8 feet on mostly coral rubble bottom, approximately 3 feet from an area of aquatic grass growing on sand, and approximately 3 feet from a rocky area with some coral, 17 December 1969, coll. E. Ball: 19 males 5.0 to 12.0 mm, five nonovigerous females 4.1 to 9.1 mm, six ovigerous females 5.0 to 11.0 mm.

Color in Life

Carapace uniform gray-green with white spots. Eyestalks uniform brownish purple; cornea black with white flecks. Antennular peduncles light blue, with a patch of dark green at the proximal end of each segment; flagellum orange. Proximal segments of antennal peduncles dark green, distal segment greenish yellow; flagellum transparent yellow. Chelipeds gray-green; fingers white. Merus and carpus of walking legs gray-green with white spots; propodus with pale shades of purple and green; dactyl white, with a broad purple band at proximal end. Abdomen semitransparent gray-green; white spots on calcified areas.

Remarks

Fize and Serène (1955: 60, 61) discussed at some length the color of this species in life with its variations. Briefer notes on the color in life were provided by Dana (1852: 459), Miyake (1956: 330, 331), and Lee (1969: 56).

Distribution

From Red Sea and east coast of Africa to Hawaiian and Gambier islands. Not reported from eastern New Guinea.

Calcinus minutus Buitendijk, 1937

Calcinus minutus Buitendijk, 1937: 269, text figs. 13–15; Forest, 1958: 185, text figs. 1, 6–8, 14, 18.

Material

Off Kurum, Karkar Island, 4–10 feet, on coral rubble, 29 October 1969, coll. E. Ball: one female 5.9 mm.

Color in Life

Carapace shield white; posterior carapace bluish purple, with white on calcified areas. Eyescales black; stalks pure white; cornea black with white spots. Antennular peduncles greenish black proximally, distal two-thirds of the terminal segment white; flagellum with brownish rings. Basal segments of antennal peduncles black; terminal segment and flagellum transparent gray. Chelipeds almost entirely white; merus, carpus, and chela each with a small brown spot on mesial surface. Merus, carpus, and most of propodus of walking legs white with scattered brown punctae; dactyl and distal part of propodus intense orange. Fourth and fifth pereiopods white with brown punctae. Abdomen with shades of brown to purple.

Remarks

The color of this species in life was previously noted by Forest (1958: 188).

Distribution

Reported only from Vietnam and the eastern part of the East Indian Archipelago (Timor; Obi; Talaud Islands). The known range is now extended eastward to northeast New Guinea.

Paguristes sp.

Material

Inside Sek Island, 5–10 feet, on fine coral rubble between extensive growths of living coral, 4 October 1969, coll. E. Ball and R. Lynch: one female 3.0 mm.

Remarks

The specimen is soft-shelled and in poor condition, and only a few characters could be made out. The rostrum is broad and triangular, prominent but not extending beyond the base of the eyescales. The eyescales are triangular with a prominent terminal spine. The antennal flagella are shorter than the carapace. There are abundant plumose hairs on the carapace and pereiopods.

Apparently the only *Paguristes* recorded from New Guinea is *P. setosus* (H. Milne Edwards), which has not been adequately described. In view of its condition, our specimen probably

could not be definitely identified with or excluded from *P. setosus* even by direct comparison with type-material of that species.

PAGURIDAE

Pagurus (*Pagurixus*) sp.

Material

Large lagoon about 35 miles north of Maiwara, to 25 feet, on sandy mud among alcyonarians and corals, 19 October 1969, coll. E. Ball: one female approximately 2.4 mm.

Remarks

This species was collected with juvenile *Dardanus lagopodes* and three species of *Diogenes*. It does not agree completely with the descriptions of any of the species of the *Pagurixus* group in genus *Pagurus;* but because of the limited nature of the material it does not seem advisable to attempt a definition at this time. All of the species belonging to *Pagurixus*—*Pagurus laevimanus* (Ortmann), *P. maorus* (Nobili), *P. boninensis* (Melin), *P. anceps* (Forest), *P. tweedlei* (Forest), and a form believed to be new but not assigned a name (Dechancé, 1964: 37)—are known from one or a few specimens only, and not a great deal is known about the group as a whole.

A CHECKLIST OF OTHER PAGURIDS REPORTED FROM THE TERRITORY OF PAPUA AND NEW GUINEA

COENOBITIDAE

Birgus latro (Linnaeus, 1767). Bismarck Archipelago: New Ireland (Reyne, 1939: 312). Reyne also cited an earlier record from Purdy Islands. Regarding the occurrence of the species in eastern New Guinea, he had no data but wrote ". . . it is almost certain that *Birgus* occurs along the N. coast, as it is generally distributed along the N. coast of Dutch New Guinea." However, the latter part of this statement was disputed by Holthuis (1959: 305), who presented evidence that along the northwest coast *Birgus* occurs only on offshore islands, and apparently not as far eastward as the border of Territory of New Guinea.

Coenobita cavipes Stimpson, 1858. Southeast coast of New Guinea: locality not specified (Ortmann, 1894: 33, as *Coenobita compressus*). Bismarck Archipelago: Palakuvur, New Britain (Borradaile, 1900: 396, 425, as *Coenobita compressus*); Carteret Bay, New Ireland (Studer, 1889: 245, as *Coenobita compressus*).

Coenobita sp. Bismarck Archipelago: New Hanover (= Lavongai); Carteret Bay, New Ireland (Studer, 1889: 240, 245, as *Coenobita diogenes*). *C. diogenes* is an Atlantic species; the identity of the material on which the present record is based is unknown.

DIOGENIDAE

Dardanus megistos (Herbst, 1804). Northeast coast of New Guinea: Selco Island, Berlinhafen (= Aitape) (Nobili, 1905: 483, as *Pagurus spinimanus*. Bismarck Archipelago: Anchoreten (= Hermit Islands) (Studer, 1889: 235, as *Pagurus punctulatus*); Duke of York Island (Miers, 1877: 138, as *Pagurus punctulatus*).

Dardanus setifer (H. Milne Edwards, 1836). New Guinea: Conflict Group, Louisiade Archipelago (Borradaile, 1900: 396, 425, as *Pagurus setifer*).

Dardanus gemmatus (H. Milne Edwards, 1848). Bismark Archipelago: New Britain (Borradaile, 1900: 396, 424, as *Pagurus gemmatus*).

Dardanus dearmatus (Henderson, 1888). Bismarck Archipelago: Admiralty Islands, 16–25 fathoms (Henderson, 1888: 58, as *Pagurus dearmatus*).

Dardanus pedunculatus (Herbst, 1804). Bismarck Archipelago: Blanche Bay, New Britain (Borradaile, 1900: 396, as *Pagurus asper*). For a recent discussion of the synonymy of this species see Lewinsohn (1969: 29).

Calcinus elegans (H. Milne Edwards, 1836). Bismarck Archipelago: New Ireland (H. Milne Edwards, 1836: 278, as *Pagurus elegans*).

Paguristes setosus (H. Milne Edwards, 1848).

New Guinea: locality not specified (H. Milne Edwards, 1848: 64, as *Pagurus setosus*). This may have been collected in western New Guinea.

PAGURIDAE

Spiropagurus spiriger (De Haan, 1849). Bismarck Archipelago: Admiralty Islands, 16–25 fathoms (Henderson, 1888: 72).

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To Miss Elizabeth Pope, Australian Museum, Sydney, we are indebted for the loan of three types of *Diogenes pallescens* Whitelegge.

We are also pleased to acknowledge the help of those specialists who identified organisms associated with the hermit crabs: Dr. Charles E. Cutress, University of Puerto Rico (sea anemones), Dr. James H. McLean, Los Angeles County Museum of Natural History (molluscs), Dr. Michael Costa, Kibbutz Mishmar Haemek, Israel (mites), Dr. H. Boschma, Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands (Rhizocephala), Dr. Charles G. Danforth, Los Angeles (epicarid isopods), and Dr. Milton A. Miller, University of California at Davis (flabelliferan isopods). Some of this material is of considerable interest and will be reported upon elsewhere by the specialists concerned.

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