Enoplometopus daumi new species, oblique lateral view.

Enoplometopus daumi new species, oblique frontal view.

small, and instead of the fifth (= anterior) median spine there is a slight median elevation with two long setae. The rest of the carapace is as in *E. occidentalis*.

Also the abdomen is much like that of *E. occidentalis*.

The propodus of the third maxilliped is almost twice as long as the dactylus. The carpus has no spine. The spines of merus and ischium are as in *E. occidentalis*.

In both first chelipeds the fingers are distinctly longer than the palm. The chela is 4 times as long as wide. The dactylus has a spinulation similar to that found in *E. occidentalis*. The lower margin of the palm and the fixed finger has a single row of well developed spines, intermingled with a few tubercles. The upper margin of the palm has a row of 5 pairs of strong spines. The palm shows on either surface a single or double median row of tubercles and some scattered tubercles. The spinulation of the cheliped is similar to that in *E. occidentalis*.

The dactylus of the second pereiopod bears a few (about 3) spines on the outer surface and none on the inner. The third pereiopod reaches slightly less far forward than the second. The dactylus is similar to that of *E. occidentalis* but the spines on the outer surface are much longer, the longest reaching almost to the apex of the dactylus; the inner surface bears two spines. The posterior margin of the propodus carries two distinct spines in the distal part; the propodus itself is about 6.5 times as long as wide.

The fourth pereiopod reaches to the end of the scaphocerite and attains the middle of the propodus of the second pereiopod. The dactylus ends in 2 claws behind which there is a row of minute spinules; two slender spines are placed on the inner surface and about 5 on the outer. The fixed finger ends in two strong spines with a third near their base. The propodus has 5 spines distributed over the posterior margin, the distal of these is double. The propodus is 7 times as long as wide.

The dactylus of the fifth leg ends in two teeth, the inner surface shows a single spine and a spoon-shaped process, which with a small process of the propodus (at the place of the fixed finger) which bears a few blunt spines, forms a kind of primitive chela. The outer surface of the dactylus has 5 spines.

The sternite of the first pereiopod has the central process ending in two small submedian spines followed by a very small median spinule. The sternite of the second pereiopod resembles that of *E. occidentalis*. The receptaculum seminis is similar to that of *E. occidentalis* having on each side an anterolateral ridge with one and a posterolateral ridge with two low blunt teeth.

No male specimen has been examined.

Colour. — The ground colour of the body is very pale brownish or purplish, almost whitish, darker dorsally than ventrally. On this background there is a colour pattern of brown and purple. The purplish colour is most distinct on the first chelipeds, the rostrum and the dorsal part of the carapace. The lower half of the carapace and the abdomen give a more brown impression. The lateral surface of the carapace shows a distinct pattern of vertical brownish or reddish brown bands, which are continuous in the extreme lateral part, but interrupted in the

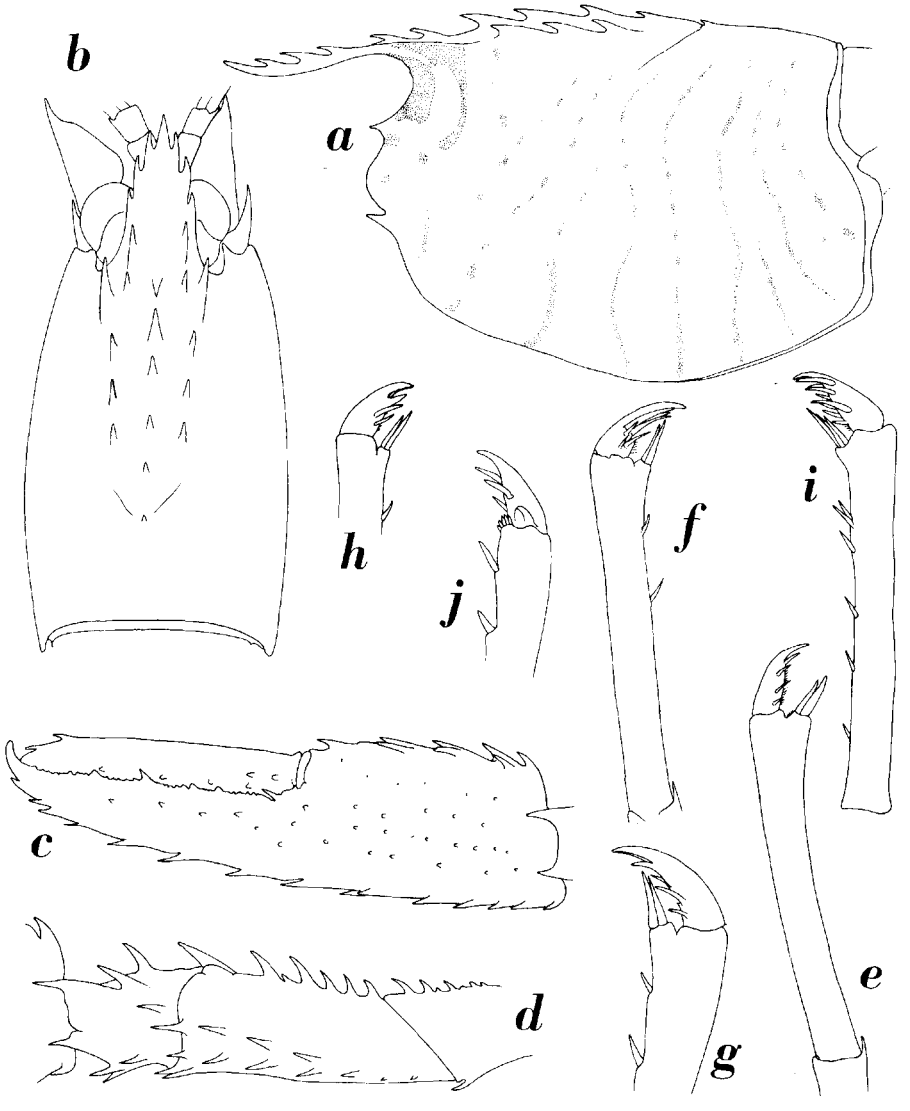

Fig. 3. *Enoplometopus daumi* new species, female holotype. a, carapace in lateral view, showing colour pattern; b, carapace in dorsal view; c, chela of first cheliped; d, carpus, merus, and ischium of first cheliped; e, propodus and dactylus of second leg, outside; f, propodus and dactylus of third leg, outside; g, propodus and dactylus of third leg, inside; h, propodus and dactylus of fourth leg, outside; i, propodus and dactylus of fourth leg, inside; j, propodus and dactylus of fifth leg, outside. a-d, × 3; e-g, × 9; h-j, × 10.

rest of their length. A large dark purple spot is present immediately behind the orbit, and a similar one on the supra-ocular spine; the latter continues down in an interrupted band. The other interrupted bands, about 9 in number, are most distinct laterally (ventrally). The rostrum is dark purple with the distal part of the spines bright white. On the abdomen there are several eyespots consisting of a white central spot surrounded by a brown or reddish brown ring. The first somite shows three large eyespots dorsally: one in the middle and 2 lateral. The pleura of the following somites have an irregular pattern of eyespots and reddish brown dots and lines. Before the posterior margin of the tergites of the second to fifth abdominal somites there are 4 smaller eyespots: 2 submedian and 2 lateral. A small median eyespot is present in the anterior half of the second somite. The sixth somite shows some irregularly arranged eyespots over the entire dorsal surface. The antennulae and antennae are uniformly brownish, only the flagella of the antennulae show a paler colour in the distal part. The third maxilliped is pale with orange-brown bands near the articulations. The large chelipeds are purple, the chela is quite pale purple with the spines and spinules strikingly darker; the tips of the spines are white. The surface of the palm is of a uniform pale purple (except for the darker spinules), the fingers, however, show about 3 reddish brown bands. The carpus and the distal part of the merus are dark purple, the spines being dark reddish purple with white tips. The following pereiopods are pale brownish with white spots on ischium and basis. The pleopods have longitudinal white and brown streaks and brown setae. The uropods are marbled with darker and paler brown; behind the diaeresis of the exopod there is a striking large purplish blue spot.

This colour description is based on colour slides placed at my disposal by Mr. H. Debelius. Some of Mr. Debelius's colour photographs have been published, under the name *E. pictus*, by Daum (1982: 267, 268).

Remarks. — The present species, like *E. debelius*, is very close to *E. occidentalis*, but differs in minor, but important details. Especially the colour of the three species, or rather their colour patterns, makes their distinction in the field quite easy. *E. daumi* and *E. debelius* do not seem to attain the length of *E. occidentalis*. Fully adult specimens of the former two species reach a carapace length of 21 to 24 mm, while of *E. occidentalis* I have examined specimens with the carapace length of 40 to 60 mm.

The present new species is named for Mr. Wolfgang Daum, who was the first to publish on it, providing excellent colour photographs and interesting information on the biology. Mr. Daum's (1982) paper made the importance of the colour as a distinguishing character in the genus *Enoplometopus* amply clear, and provided an impetus for the further study of the taxonomy of these animals.

As to the behaviour of the species, Daum (1982: 267, 268) described it as shy, tolerant towards other invertebrates, but aggressive towards rival specimens of its own species, so that it is impossible to keep more than a single pair in an aquarium. The animals hide in rock cavities, often with only the chelae sticking out.

Distribution. — Daum (1982) reported the species from Indonesia and the Philippines. The type locality is Naira Island, Banda Archipelago, Moluccas, Indonesia.

Enoplometopus (Enoplometopus) occidentalis (Randall, 1840) (fig. 4b)

Nephrops occidentalis Randall, 1840: 139.

Enoplometopus occidentalis - Edmondson, 1933: 222; Edmondson, 1946: 257; Holthuis, 1946: 74, pl. 5 figs. a, c, f, i (here also older references); Barnard, 1947: 382; Barnard, 1950: 532, fig. 100; Matthews, 1954: 115, figs. 1-7; Tinker, 1965: 40, pl. 8; Gordon, 1968: 93, figs. 11, 12; Healy & Yaldwyn, 1970: 56, 58, pl. 26; Intès & Le Loeuff, 1970: 1442, 1445; Burukovsky, 1972: 185, 188 (as *E. occindentslis* in key on p. 188); Burukovsky, 1974: 109; Michel, 1974: 255; DeLuca & DeLuca, 1976: 48, fig.; Smale, 1976: 20, fig.; Crosnier, 1977: 237; Johnson, 1979: 326, 327, fig.; Daum, 1982: 265-268, 2 figs.

not *Enoplometopus occidentalis* - Kubo, 1952: 97, text fig. 3, pl. 6; George & George, 1979: 78, pl. 70 fig. 5.

Material examined: S.E. of South Island, Amirante Islands, western Indian Ocean; depth 0-15 feet; 2 March 1964; leg. J. Böhlke, D. Dockins, R. Rosenblatt, W. Starck and J. Tyler, IIOE Sta. F-75. — 1 ♀ (U.S. National Museum, Washington,D.C.).

Amboina, Moluccas, Indonesia; 1863-1869; D. S. Hoedt. — 1 ♂ (Museum Leiden).

Honolulu fish market, Oahu, Hawaiian Islands; 1902; Albatross Expedition. — 1 ♂ (U.S. National Museum, Washington, D.C.).

Maui, Hawaiian Islands; leg. Dr. Winslow, don. J. S. Kingsley. — 3 ♀ (U.S. National Museum, Washington, D.C.).

Puako, Hawaii, Hawaiian Islands; 1982; leg. S. Johnson. — 1 sp. (Bishop Museum, Honolulu).

This seems to be the most common species of the genus in the Indo-West Pacific region. With *E. pictus* it is the largest species of the nominotypical subgenus.

Colour. — *Enoplometopus occidentalis* can at once be distinghuished from the other species of the genus by its colour and colour pattern.

The entire animal is of a brilliantly red colour, which extends rather uniformly over the whole body. The spines are red, but most have a brilliantly white or pale tip. There are about 4 bright white spots on the lateral surface of the carapace; these are usually surrounded by a dark red ring. One of these spots is placed in the center of the lateral surface of the carapace, the second some distance below it; the other two are placed near the anterior margin: one behind the antennal spine, the other farther down. Some very small white spots, about 9 in number, are placed on the posterior margin of the carapace. Behind the postcervical spine there is usually a white spot, which may take the shape of a very short transverse white band. Some white or whitish spots may also be present in the median part of the rostrum.

A large white spot is present on the pleuron of the first somite, it is ocellate by the presence of a red ring around the white; a similar but somewhat smaller spot is found on the base of each of the pleura of the following somites. The pleura also have a white ocellate spot on the distal margin, and sometimes additional

smaller and less distinct spots, usually on the margins. The posterior margin of the tergum of the first abdominal somite has a median, and at either side 2 or 3 smaller white spots; all these spots are very similar to those on the posterior margin of the carapace and are much smaller than the spots on the pleura. The terga of the second to fifth abdominal somites show 4 white spots at or somewhat before the posterior margin: two are submedian, two are more lateral; the two submedian of the second somite sometimes are partly fused. Where these spots are placed some distance before the posterior margin, some very small pale spots may be visible on the margin itself. Spots maybe present on the telson.

The flagella of the antennula are red with the distal end somewhat paler; the antennal flagella are uniformly red. The antennular peduncle is red, sometimes with pale spots. The antennal peduncle, including the scaphocerite usually has some white or pale spots on a red background; the final tooth of the scaphocerite is white.

The third maxillipeds are with some white or pale bands. The large chelae are evenly red, with the tips of the spines white; some faint darker and lighter bands may be observed on the fingers. The carpus and merus of the large chelipeds have the same colour as the chela, but the merus may show some irregular pale spots or areas. The following pereiopods are red with several narrow white bands.

The uropods are red; the spines have white tips; some irregular pale or white spots may be present.

Many (or all?) of the long hairs of the body have the distal part iridescent.

Fig. 4a. *Enoplometopus daumi* new species, female holotype, thoracic sternum. 4b. *Enoplometopus occidentalis* (Randall), male from Amboina, anterior part of body in dorsal view. a, × 5; b, × 3.

The above colour description is based mainly on the published coloured photographs of this species (Healy & Yaldwyn, 1970; Johnson, 1979; Daum, 1982), on published black and white photographs of living or fresh specimens (Rathbun, 1906; Tinker, 1965; Smale, 1976), on colour slides of a living specimen from Mombasa, Kenya (kindly placed at my disposal by Dr. Isabella Gordon) and such colour slides of specimens from the Hawaiian Islands (for which I have to thank Dr. J. C. Yaldwyn and Mr. S. W. Tinker). More or less extensive remarks on the colour of the species have been published by Rathbun (1906), Bouvier (1915), Barnard (1950), Tinker (1965), Gordon (1968), and Daum (1982).

Remarks. — As discussed above (p. 290), the specimen reported from Japan by Kubo (1952) under the name *E. occidentalis*, is not that species but more likely *E. debelius*.

George & George (1979) published a coloured picture of an *Enoplometopus* which they identified as *E. occidentalis*. The colour pattern of the animal, however, shows it to be *E. holthuisi* Gordon (q.v.).

The habitat of the present species was described by Edmondson (1933, 1946) as follows: "on the reefs and at depths of a few fathoms". Tinker (1965), however, characterized the species as rare "in shallow shore-line waters. It appears to live most commonly at depths of one hundred feet or more on the outer side of the reef". Healy & Yaldwyn (1970) also reported it from "the reef edge". Crosnier's (1977) specimens were obtained at a depth of 100 m. Daum (1982) described the animals as shy, hiding in cavities in the rocks in daytime, coming out at night; the species does attack and eat small fishes, but, when well fed, leaves other invertebrates in peace. Matthews (1954) extensively dealt with the spermatophoric mass of this species.

Vernacular names. — Several vernacular names have been published for the species, all of them are artificial: Western Lobster (Tinker, 1965), Reef Lobster (Healy & Yaldwyn, 1970), Hawaiian true Lobster (Johnson, 1979), Hawaiian Lobster (Daum, 1982).

Distribution. — The species has a wide range in the Indo-West Pacific region. It is known with certainty from the following localities: Natal, South Africa (Barnard, 1925, 1934, 1947, 1950; C. von Bonde & Marchand, 1935; ? Smale, 1976), Mombasa, Kenya (Gordon, 1968), Mauritius (Bouvier, 1910, 1914, 1915; Gordon, 1968; Michel, 1974), Amirante Archipelago (present paper), Amboina, Moluccas, Indonesia (Miers, 1880; De Man, 1888, 1924; Ortmann, 1894; Holthuis, 1946; Gordon, 1968; present paper), Sydney Harbour, Australia (Daum, 1982), Heron Island, Great Barrier Reef, Queensland, Australia (Healy & Yaldwyn, 1970), Hawaiian Islands (Kingsley, 1883; Rathbun, 1906; Edmondson, 1933; 1946; Matthews, 1954; Tinker, 1965; DeLuca & DeLuca, 1976; Johnson, 1979; Daum, 1982; present paper). The species has also been reported from Banda, Moluccas, Indonesia (Balss, 1933) and from Reunion and N. of Madagascar (26°05′S 44°50′E) (Crosnier, 1977); however, no morphological details have been provide of these specimens, so that

their identity is not quite certain. Daum (1982) reported that he had received material of this species from dealers in East Africa, Ceylon and the Philippines, indicating that the species in all probability is found in those areas. The type locality indication "from the west coast of North America" obviously is incorrect and should be corrected to Hawaiian Islands. The Hawaiian Islands, namely is the only part of the known range of the species visited by the collector of the type material, Thomas Nuttall. The type material has been discussed by Randall (1840), Gibbes (1850, 1852), Stimpson (1857), Ortmann (1897), Kingsley (1899), and Rathbun (1906).

Enoplometopus (Hoplometopus) holthuisi Gordon, 1968

Enoplometopus antillensis - Holthuis, 1946: 79, pl. 5 figs. b, d, e, g, h, j, k. l, pl. 6 figs. a-e, pl. 7 figs. a, b (not *Enoplometopus antillensis* Lütken, 1865).

Enoplometopus holthuisi Gordon, 1968: 81, 90, figs. 2, 8-10; Intès & Le Loeuff, 1970: 1442, 1447; Burukovsky, 1972: 185, 188; Burukovsky, 1974: 109; Daum, 1982: 265-267, 2 figs.

Enoplometopus occidentalis - George & George, 1979: 78, pl. 70 fig. 5 (not *E. occidentalis* (Randall)).

Material examined: Enewetak Atoll, Marshall Islands; mooring buoy pinnacle, in ledge, 20 m deep; February 1982; S. Johnson. — fragments (Bishop Museum, Honolulu).

Puako, Hawaii, Hawaiian Islands; S. Johnson. — 2 specimens (Bishop Museum, Honolulu).

Colour. — The species is of a predominantly red or orange red colour. The lateral surface of the carapace shows a distinct pale circle in its central part; within the circle one or two small pale spots may be seen. The lateral surface of the carapace outside the circle often is provided with an irregular pattern of pale lines. Some (or all) of the abdominal somites bear a large median white spot on the dorsal surface and an ocellate white red-ringed spot at the base of the pleura. The antennae and antennulae are red with white spots on both the antennal and antennular peduncles. The third maxilliped is banded red and white. The large chelipeds are red with the spines white. The fingers are banded; the palm is red with lighter and darker bands, which may be inconspicuous. The following pereiopods are banded red and white; the white bands being the narrower. This description is based on the published coloured figures of the species (by Daum, 1982, and George & George, 1979).

Remarks. — The species which until recently was only known from the type material, has now been reported from a rather large area and even is imported to Europe by the aquarium trade. Its habits are stated by Daum (1982) to be similar to those of *E. occidentalis*, but it is less shy and like the other species of the genus it can be kept in the aquarium without too many difficulties.

The specimen figured by George & George (1979) under the name *E. occidentalis*, judging by its colour pattern belongs to *E. holthuisi*.

Distribution. — The type locality is Banda Island, Moluccas, Indonesia. George & George (1979) reported their animal from "deeper parts of reefs in the Indo-Pacific". Daum (1982) received the species from the Philippines and stated that "inzwischen wurde sie auch schon um Hawaii fotografiert".

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