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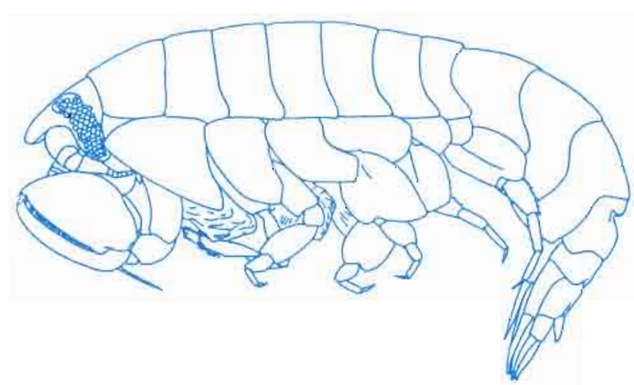
Résultats des Campagnes MUSORSTOM

Volume 10



Coordonné par

Alain CROSNIER

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Ce volume des Résultats des Campagnes MUSORSTOM *est dédié à Mme* DE SAINT LAURENT, *Maître de Conférences au Laboratoire de Zoologie (Arthropodes) du Muséum national d'Histoire naturelle, à Paris, qui a participé à plusieurs des campagnes dont le matériel est étudié dans cette série et qui a toujours accepté de mettre ses vastes connaissances sur les Crustacés au service de la critique des articles soumis pour publication. Ce volume, en particulier, lui doit beaucoup.*

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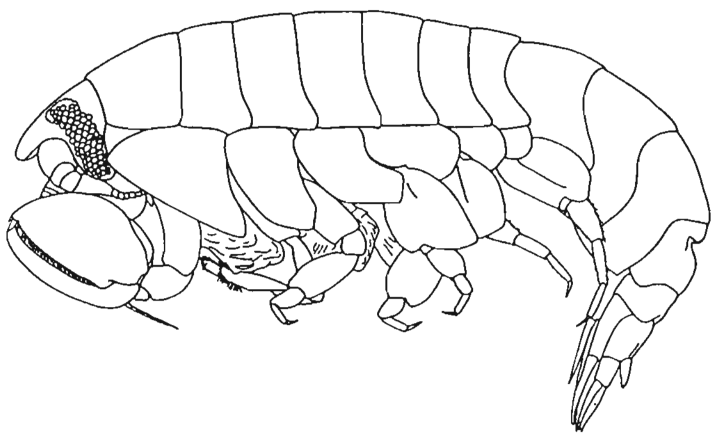

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La campagne MUSORSTOM 7 dans la zone économique des îles Wallis et Futuna Compte rendu et liste des stations

Bertrand RICHER DE FORGES & Jean-Louis MENOU

ORSTOM
B. P. A5, Nouméa Cedex
Nouvelle-Calédonie

RÉSUMÉ

La campagne MUSORSTOM 7 s'est déroulée du 5 mai au 4 juin 1992, dans la zone économique des îles Wallis et Futuna. 142 opérations de dragages et de chalutages ont eu lieu dans la zone bathyale supérieure, sur les pentes des îles de Futuna, Alofi et Wallis, et sur les pentes des nombreux monts sous-marins qui parsèment cette région. Des organismes, décrits de Nouvelle-Calédonie, sont retrouvés pour la première fois sur la plaque Pacifique (Sphinctozoaires, *Gymnocrinus*, *Amalda*).

ABSTRACT

The MUSORSTOM 7 Cruise in the Wallis and Futuna economic zone. Report and list of stations.
The MUSORSTOM 7 cruise took place from the 5th of May to the 4th of June 1992 in the Wallis and Futuna economic zone. The 142 dredgings and trawlings were realized in the upper bathyal zone, on the slopes of Futuna, Alofi and Wallis Islands and on the slopes of the numerous seamounts laying in this area. The deep sea fauna collected was quite poor but diverse. Some animals described formerly from New Caledonian's waters are now rediscovered on the Pacific plate (Sphinctozoa, *Gymnocrinus*, *Amalda*).

INTRODUCTION

Depuis 1976, une collaboration entre l'ORSTOM (Institut Français de Recherche Scientifique pour le Développement en Coopération) et le Muséum national d'Histoire naturelle s'est établie autour du thème : description de la faune bathyale de l'Indo-Ouest-Pacifique. Les trois premières campagnes se sont déroulées aux Philippines (FOREST, 1976, 1985, 1989). Les trois campagnes suivantes, MUSORSTOM 4, 5 et 6, ont eu lieu dans les eaux de la Nouvelle-Calédonie (RICHER DE FORGES, 1990). Le très riche matériel zoologique récolté,

RICHER DE FORGES, B., 1993. — La campagne MUSORSTOM 7 dans la zone économique de Wallis et Futuna. Compte rendu et liste des stations. *In* : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, Volume 10. *Mém. Mus. natn. Hist. nat.*, **156** : 9-25. Paris ISBN : 2-85653-206-3.

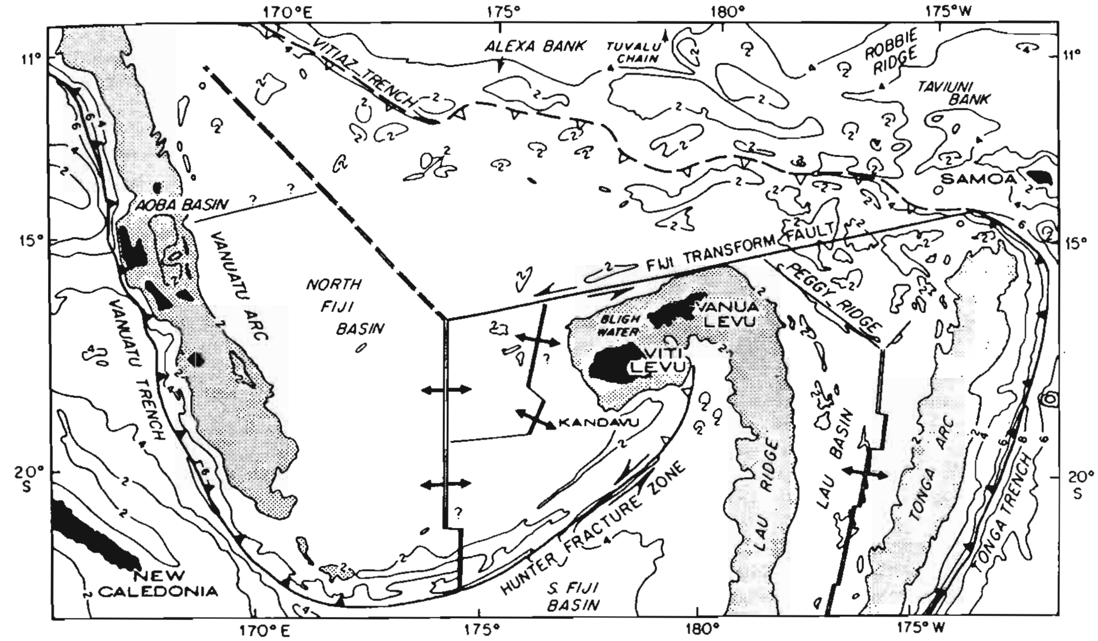


FIG. 1. — Carte géomorphologique : fosse du Vitiaz, en tireté ; en grisé, les vestiges des reliefs d'arrière arc (Vanuatu, Fidji et ride de Lau, Tonga), d'après BROCHER (1985).

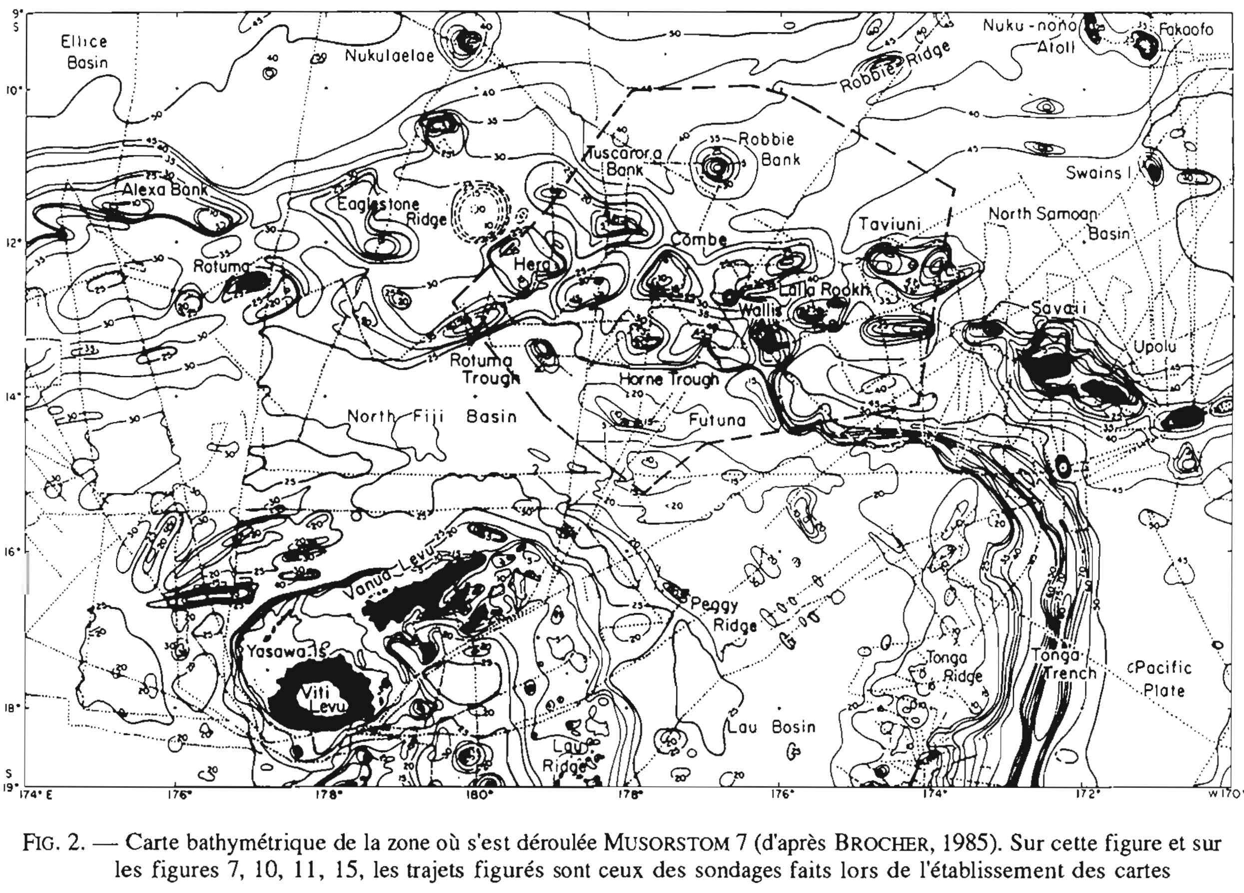


FIG. 2. — Carte bathymétrique de la zone où s'est déroulée MUSORSTOM 7 (d'après BROCHER, 1985). Sur cette figure et sur les figures 7, 10, 11, 15, les trajets figurés sont ceux des sondages faits lors de l'établissement des cartes

en partie étudié, à fait l'objet de nombreuses publications qui se trouvent principalement dans la série "Résultats des Campagnes MUSORSTOM". Les neufs volumes déjà parus représentent plus de 3600 pages dans lesquelles plus de 500 espèces nouvelles sont décrites, rénovant totalement les connaissances dans plusieurs groupes.

L'exploration de la zone économique des îles Wallis et Futuna, située sur la plaque Pacifique, au cours de la septième Campagne MUSORSTOM, permet d'étendre vers l'est la description de ces faunes, de mieux comprendre l'origine et la répartition des espèces et d'en découvrir encore de nouvelles.

Les îles Futuna et Alofi ont été découvertes en 1616 par les navigateurs hollandais VAN SCHOUTEN et LEMAIRE, les îles Wallis par le capitaine WALLIS en 1767 (île principale : Uvea).

La zone économique exclusive (ZEE) des îles Wallis et Futuna s'étend sur environ 300.000 km^2, pour seulement 250 km^2 de terres émergées (ANTHEAUME & BONNEMAISON, 1988). Elle est bordée par les zones économiques de Tuvalu au nord-ouest, Fidji au sud-ouest, Tokelau au nord-est, Samoa occidentales à l'est et Tonga au sud.

Les travaux scientifiques sur le milieu marin concernant les îles Wallis et Futuna sont très peu nombreux et ne concernent que la zone littorale (RICHARD *et al.*, 1981, 1982 ; RICHARD, 1983).

Une campagne de géophysique, réalisée dans cette région en 1982, a permis de dresser des cartes bathymétriques approximatives et de dater les roches des principaux monts sous-marins (BROCHER, 1985 ; DUNCAN, 1985).

GÉNÉRALITÉS

TECTONIQUE. — La région explorée a une histoire géologique très complexe ; elle se situe le long de la fosse du Vitiaz qui correspond à une ancienne limite entre les plaques Pacifique et Australo-Indienne. A l'Éocène, cette zone de subduction était bordée par un arc d'îles constituant les archipels des Nouvelles-Hébrides (Vanuatu) et des Fidji, la ride de Lau, l'arc des Tonga (BROCHER & HOLMES, 1985).

La collision de l'arc du Vitiaz avec le plateau d'Ontong-Java (au nord des îles Salomon), à la fin du Miocène (7-10 M. A.), aurait provoqué une inversion du sens de la subduction et la fragmentation de l'arc du Vitiaz (Fig. 1).

Par ailleurs, le mouvement, vers le nord-ouest, de la plaque Pacifique (75 + ou - 25 mm/an), au dessus d'un point chaud, actuellement situé dans l'est des îles Samoa, a provoqué la formation d'un alignement de monts sous-marins sur plus de 1700 km (BROCHER, 1985).

Les cartes bathymétriques montrent une quantité de monts sous-marins dans le prolongement des îles Samoa. Cet alignement a recoupé celui, plus ancien, du Tuvalu (anciennes îles Ellice) dont font partie le banc Tuscarora et les îles Wallis (Fig. 2).

LES MONTS SOUS-MARINS. — Les monts sous-marins sont d'origine volcanique et peuvent se classer en deux grandes catégories : les volcans liés aux zones de subduction ou volcans d'arrière-arc ; les volcans formés au-dessus des "hot spots".

Leur abondance a été estimée par plusieurs méthodes avec des résultats très différents. Des comptages réalisés selon un trajet cartographié au sondeur multifaisceau SEABEAM donnent une moyenne de 9000 monts sous-marins par million de km^2. Ce qui, extrapolé à l'ensemble du Pacifique, donnerait environ 1,5. 10^6 monts sous-marins avec des répartitions variables de 0 à 66.000/10^6 km^2 (FORNARI *et al.*, 1987). CRAIG et SANDWELL (1988), utilisant l'altimétrie satellitaire (SEASAT), évaluent leurs nombre à 8500 seulement pour les trois océans. En zone tropicale, si ces monts sous-marins ont atteint la surface, ils ont été colonisés par des formations coralliennes et présentent un aspect tabulaire remarquable et souvent une cuvette vestige d'un ancien lagon, ce sont alors des guyots (MENARD, 1984 ; SCOTT & ROTONDO, 1983). Les roches calcaires d'origine corallienne, qui recouvrent le substrat volcanique, peuvent atteindre plusieurs centaines de mètres d'épaisseur et conservent une grande porosité (COLLOT *et al.*, 1991). Ces récentes observations confortent la théorie de l'existence, au sein de la masse calcaire des atolls et des guyots, d'une remontée d'eau profonde qualifiée d'"endo-upwelling géothermique" (ROUGERIE & WAUTHY, 1986).

Ces innombrables reliefs constituent des "oasis" de faune bathyale séparées par des profondeurs abyssales.

BOEHLERT et GENIN (1987) ont recensé les caractéristiques des peuplements des monts sous-marins et guyots (seamounts), l'influence des courants, l'origine des nutriants. La formation d'upwellings le long de leurs pentes et l'existence (controversée) d'un phénomène hydrologique baptisé "colonne de TAYLOR" seraient à l'origine de la relative richesse faunistique des monts sous-marins et, plus particulièrement, des guyots (KAUFMANN *et al.*, 1989).

Dans la zone économique de Wallis et Futuna, on rencontre un mélange des deux types de volcanisme sous-marin, les guyots ont leur plateau vers 30 m de profondeur, colonisé par des madrépores et des algues calcaires, alors que les autres monts sous-marins, purement volcaniques, sont généralement plus profonds.

Les âges des guyots de l'alignement des îles Samoa, sur lesquels la campagne MUSORSTOM 7 a travaillé, vont de 5,4 M. A. pour le banc Field à 13,5 M. A. pour le banc Combe. Les âges obtenus et les distances qui séparent actuellement ces bancs permettent d'estimer la vitesse de déplacement de la plaque Pacifique dans cette zone à 7,7 + ou - 2,5 cm / an (DUNCAN, 1985).

L'île de Futuna a été datée de 4,9 + ou - 0,4 M. A. et faisait sans doute partie de la ride de Lau. Une étude récente de la partie émergée des îles de Horn (îles Futuna et Alofi) indique "deux épisodes magmatiques au Pliocène supérieur" (GRZESCZYK *et al.*, 1991).

NIVEAUX MARINS. — Au cours des temps géologiques, et plus particulièrement au Pléistocène, le niveau marin a subi d'importantes variations liées principalement à des fluctuations climatiques planétaires (Fig. 3). Tous les auteurs s'accordent pour trouver un niveau situé 120 m plus bas que l'actuel il y a environ 18.000 ans (HOPLEY, 1982). A cette époque, relativement proche, l'ensemble des monts sous-marins des alignements de Samoa et de Tuvalu devait donc former un ensemble d'îles dont certaines de dimensions bien supérieures aux îles actuelles de Wallis, Futuna et Alofi. Sur plusieurs monts sous-marins éloignés, de plus de 150 km, de toutes terres émergées (banc Field), ont été récoltées des coquilles de Mollusques Gastéropodes appartenant à des familles qui ne vivent qu'en zone littorale (strictement intertidales : Littorinidae, Siphonariidae) ou émergée (supralittorales : Ellobiidae ; terrestres : Charopidae).

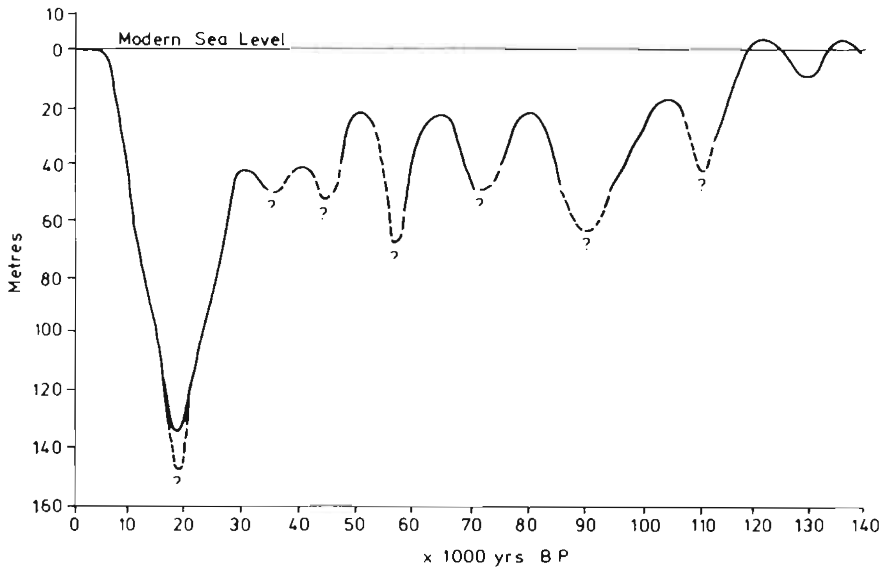


FIG. 3. — Schéma des variations d'amplitudes du niveau marin au cours des derniers 140.000 ans (d'après HOPLEY, 1982).

La partie sommitale de ces guyots a conservé la forme caractéristique des atolls avec une dépression correspondant à l'ancien lagon. Ainsi les bancs Pasco et Field étaient encore des atolls au Pléistocène. Les quelques dragages sur ces sommets (stations DW 543, DW 596), entre 30 et 50 m de profondeur, montrent des peuplements de madrépores et d'algues calcaires (*Halimeda* et Lithothamniées). Sur les pentes de ces guyots, le substrat est composé de débris coralliens et d'articles d'*Halimeda*, jusqu'à près de 700 m de profondeur.

DÉROULEMENT DE LA CAMPAGNE MUSORSTOM 7

ITINÉRAIRE (Fig. 4). — La campagne a eu lieu à partir de Nouméa, du 5 mai au 4 juin 1992, à bord du N. O. "*Alis*" (liste des stations en annexe 1).

Les cartes utilisées au cours de cette campagnes sont :
— les cartes de détails des bancs extraites de BROCHER (1985) ;
— la carte du CCOP/SOPAC (KROENKE *et al.*, 1983) ;
— les cartes marines du Service Hydrographique de la Marine n° 6817, 6876, 7234.

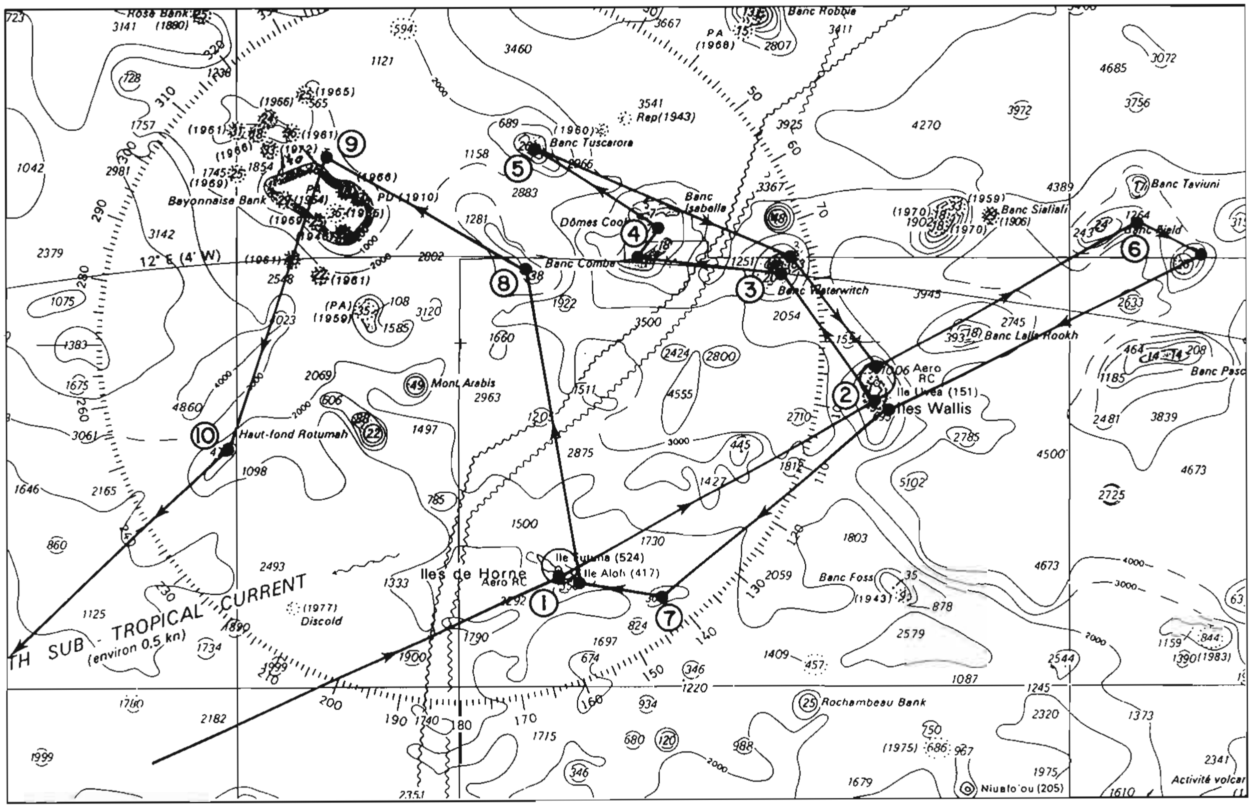


FIG. 4. — Itinéraire de la campagne MUSORSTOM 7 (carte SH n°6817) : **1**, Futuna du 10 au 12 mai (st. 494-519). — **2**, NW de Wallis le 13 mai (st. 520-528) ; lagon de Wallis le 15 mai (st. lagon 1-2). — **3**, Banc Waterwitch le 16 mai (st. 529-538). — **4**, Banc Combe les 17 et18 mai (st. 539-554). — **5**, Banc Tuscarora les 19 et 20 mai (st. 555-568) ; banc Waterwitch le 21 mai (st. 569-576) ; N de Wallis le 22 mai (st. 577-586). — **6**, Banc Field les 23 et 24 mai (st. 587-600) ; lagon de Wallis le 25 mai (st. lagon 3-4) ; SE de Wallis les 25 et 26 mai (st. 601-612). — **7**, Banc dans le SE d'Alofi le 27 mai (st. 613-616) ; E et SE d'Alofi le 27 mai (st. 617-619). — **8**, Banc à 1300 m de profondeur dans le SW du banc Combe le 28 mai (st. 620-624). — **9**, Banc Bayonnaise le 29 mai (st. 625-632). — **10**, Banc dans le SW du banc Rotumah le 30 mai (st. 633-638).

MATÉRIEL ET MÉTHODES. — Les engins de prélèvements utilisés furent : une drague de type Waren, un chalut à perche de 4 m, un chalut à crevettes de 14 m de corde de dos, une drague épibenthique. Les caractéristiques de l'utilisation de ce matériel sont les mêmes que pour les campagnes MUSORSTOM précédentes (RICHER de FORGES, 1990, 1991). Au cours de MUSORSTOM 7, ces engins ont été utilisés dans une région non hydrographiée, généralement sur des pentes d'îles ou de monts sous-marins et sur des fonds durs. Lorsque les fonds le permettaient, les traits de dragues duraient 15 mn et ceux de chalut à perche 30 mn.

Les prélèvements étaient tamisés dans l'eau ; les refus de tamis supérieurs à 3 mm étaient triés à bord pour en extraire la faune. Des prises de vues en couleurs des récoltes ont été réalisées à bord.

Certains organismes, parmi les Mollusques et les Échinodermes, ont fait l'objet d'une conservation à l'azote liquide en vue d'études phylogénétiques par séquençage d'ARN.

Mis à part les trois dragages sur le sommet des guyots et les quatres stations du lagon de Wallis, les profondeurs explorées se situent entre 100 et 1300 m.

FIG. 5 (à gauche). — Remontée de la drague Waren sous l'œil vigilant de B. RICHER DE FORGES. Remarquer la forte cotte de mailles métalliques qui protège le sac en filet (Photo J.-L. MENOU, ORSTOM).

FIG. 6 (à droite). — Résultat d'un dragage sur un mont sous-marin : fonds durs volcaniques. A. CROSNIER examine les blocs ; en arrière plan A. LE CROM prépare la drague pour le trait suivant (Photo J.-L. MENOU, ORSTOM).

COMMENTAIRES SUR LES ZONES PROSPECTÉES ET LA FAUNE RÉCOLTÉE

LES ILES FUTUNA ET ALOFI (ILES DE HORN). — Les îles Futuna et Alofi sont des îles hautes volcaniques (GRZESCZYK *et al.*, 1988) bordées d'un récif frangeant (RICHARD *et al.*, 1981), séparées par un chenal (Chenal

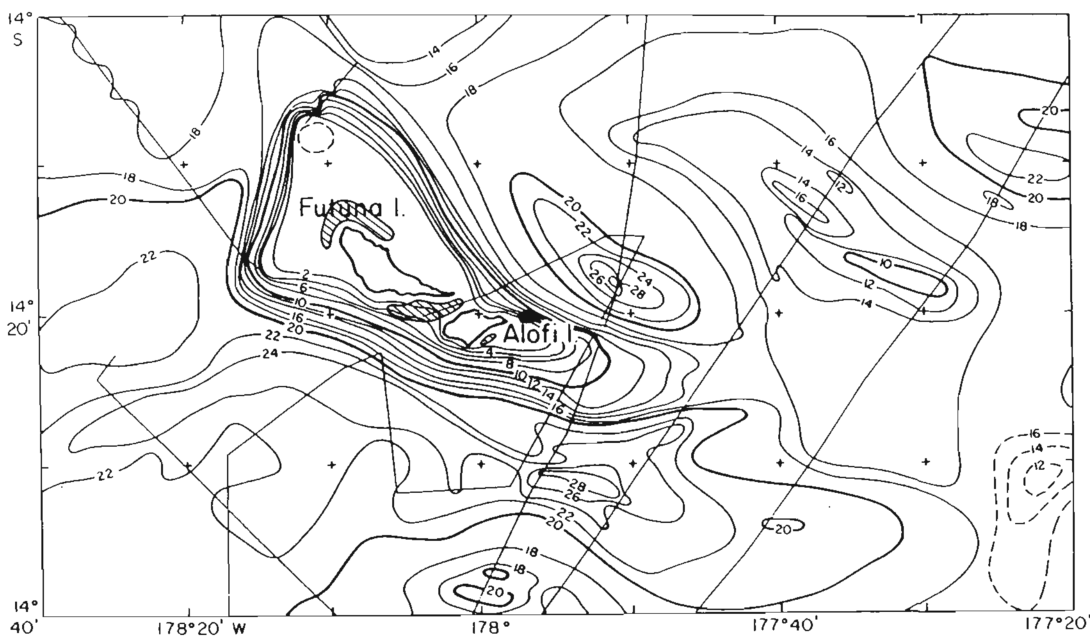


Fig. 7. — Carte bathymétrique des abords des îles de Horn avec, en hachures, les sites de récolte (d'après SINTON *et al.*, 1985).

Vasia) de 0,5 mille de largeur et environ 100 m de profondeur. Les stations 494 à 508 ont eu lieu sur la pente ouest de ce chenal ; les stations 509 à 519 au nord nord-ouest de Futuna et les stations 617 à 619 dans l'est-sud-est d'Alofi (Fig. 7).

De 100 à 200 m de profondeur, des fonds de sables coralliens grossiers à Foraminifères et *Heteropsammia* sont colonisées par des Gorgones et des Alcyonaires (Nephtheidae).

De 200 à 400 m, la pente est constituée de blocs et graviers d'origine corallienne et de vases indurées sur lesquels on trouve des peuplements de Crustacés (Galatheidae, Brachyoures, crevettes), d'Échinodermes (Ophiures) et de Mollusques (Conidae).

De 400 à 600 m, le substrat est composé de blocs décimétriques de roches volcaniques avec, parfois, des pierres ponce et des scories.

FIG. 8 (à gauche). — Tri de la drague : tamisage dans l'eau. De gauche à droite, B. MÉTIVIER, P. BOUCHET, J.-L. MENOU (Photo B. RICHER DE FORGES, ORSTOM).

FIG. 9 (à droite). — Autour de la table de tri. De gauche à droite, A. CROSNIER, P. BOUCHET, B. MÉTIVIER ; en arrière plan N. COMINARDI et B. RICHER DE FORGES (Photo J.-L. MENOU, ORSTOM).

LES PENTES EXTERNES DE WALLIS (Fig. 10). — Comme l'ont décrit RICHARD *et al.* (1982), les îles Wallis se composent d'une île principale (Uvea), volcanique, et de 19 petits îlots, coralliens ; l'ensemble est entouré par un récif barrière coupé de 5 passes. Cette île n'est pas issue du "hot-spot" responsable de la formation de l'alignement des îles Samoa et semble ancienne. Un volcanisme très récent, sans doute Quaternaire, y a été étudié (PRICE *et al.*, 1991). Cependant sa morphologie d'île haute, entourée d'une barrière corallienne très développée, indique un stade avancé dans l'évolution du processus de subsidence. Les stations 520 à 526 et 581 à 586 ont eu lieu sur la pente nord-ouest du récif barrière des Wallis, les stations 577 à 580 sur un haut-fond situé à 6 milles dans le nord-ouest, les stations 602 à 611 dans le sud-est qui a une pente plus modérée et la station 527 devant la passe du sud.

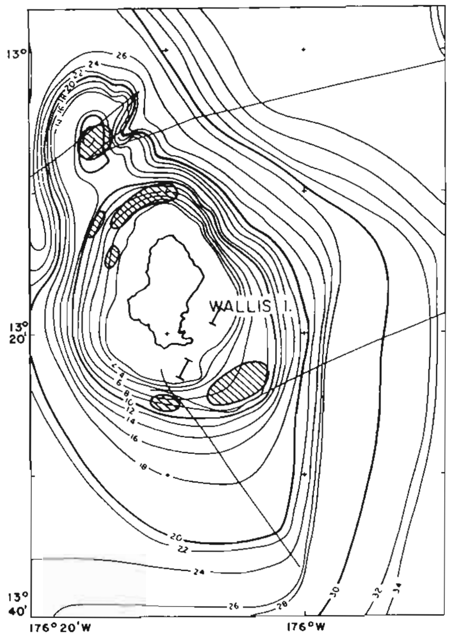
Jusqu'à 400 m de profondeur, les fonds sont composés de sables grossiers et de grès coralliens ; entre 400 et 500 m, de sables grossiers détritiques (nombreux articles de Crinoïdes pédonculés dont *Gymnocrinus*).

A partir de 500 m, on rencontre des substrats volcaniques, vases rouges indurées, tufs, blocs basaltiques.

A la station 522, par 650 m de profondeur, a été trouvé un spécimen vivant de l'espèce *Gymnocrinus richeri* Bourseau, Améziane-Cominardi et Roux, 1987, décrite de Nouvelle-Calédonie et considérée comme le seul représentant actuel de la famille Jurassique des Hemicrinidae (BOURSEAU *et al.*, 1991).

LAGON DE WALLIS. — Deux dragages et deux traits de chalut à perche (non numérotés) ont eu lieu dans le lagon Est de l'île d'Uvea (Wallis). Les prélèvements sont situés dans les bassins de Mata Utu, à l'est, et de Mua, au sud, et montrent des fonds plats composés de sables blancs très fins et de vases carbonatées. La faune y est très pauvre, par comparaison à celle des fonds équivalents des lagons de Nouvelle-Calédonie (RICHER DE FORGES, 1991) : Sipuncles, Holothuries, Ophiures, crabes (Hexapodinae, Portunidae, Xanthidae), crevettes Pénéides (*Metapenaeopsis*), Mollusques (Turitelles, bivalves). Dans les chaluts, on a récolté de nombreux Antipathaires avec des crevettes associées (*Tozeuma*) et de petits poissons plats.

LES GUYOTS. — La zone économique de Wallis et Futuna contient de nombreux monts sous-marins d'âges et d'origines différents (JOHNSON *et al.*, 1986). Seuls les plus vastes et les plus élevés figurent sur les cartes bathymétriques. Au cours de MUSORSTOM 7, les pentes des bancs Waterwitch, Combe, Tuscarora, Field et Bayonnaise, ont été échantillonnées. D'autres monts sous-marins, sans nom, ont également fait l'objet de dragages et de chalutages.



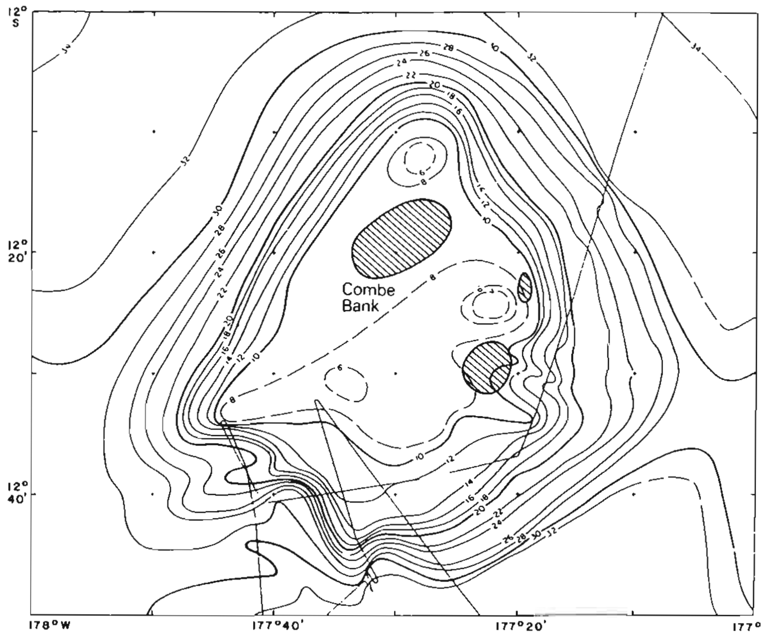


FIG. 10 (à gauche). — Carte bathymétrique de Wallis avec, en hachures, les sites de récoltes (d'après SINTON *et al.*, 1985).

FIG. 11 (à droite). — Carte bathymétrique du banc Combe, avec, en hachures, les sites de récoltes (d'après SINTON *et al.*, 1985).

Les flancs sont raides et constitués, jusqu'à 500 m de profondeur, d'articles d'*Halimeda* et de foraminifères. Cette intrusion de bioclastes superficiels dans la zone bathyale supérieure avait déjà été observée au cours de plongées en submersible sur des pentes d'atolls (COLIN *et al.*, 1986 ; SARANO & PICHON, 1988 ; RIO *et al.*, 1991). L'accumulation des articles d'*Halimeda* sur les pentes ne semble pas en relation directe avec les peuplements actuels de ces algues sur le plateau supérieur. Il est probable que ces bioclastes se sont déposés sur de longues périodes et sont donc, en grande partie, fossiles. Dans le lagon de la Grande Barrière australienne, DREW (1983) a estimé l'apport sédimentaire des *Halimeda* à environ 1 m pour 1.900 ans.

Le **banc Waterwitch**, situé à 80 milles dans le nord-ouest des îles Wallis, a fait l'objet des stations 529-538 et 569-576. Il s'agit d'un guyot dont le plateau sommital se présente vers 30 m de profondeur (la sonde à -20 m de la carte marine n'a pas été retrouvée). Le dragage 536, entre 27 et 37 m, a rapporté des blocs coralliens morts et des encroûtements d'algues calcaires avec une faune vagile pauvre (Comatules, Brachyoures, Pagures, Stomatopodes).

Sur le côté ouest du banc, il a été trouvé un Mollusque Volutidae du genre *Teramachia*, ce qui constitue la capture la plus à l'est de ce groupe à développement larvaire court et non planctotrophe.

Sur une bosse située à flanc de pente entre 350 et 450 m, des *Gymnocrinus* vivants ont été récoltés (stations 572-575).

En dessous de 600 m, on retrouve des fonds rocheux basaltiques avec un peu de faune fixée (Serpules, Hydraires, Actinies, Cirripèdes).

Le **banc Combe** (Fig. 11) est un très vaste banc (18 x 23 milles) situé à 140 milles dans le nord-ouest de Wallis, et séparé du banc Isabella par un ensellement de 800 à 1000 m de profondeur ; l'ensemble de ces deux bancs constitue les "Dômes Cook" (stations 539-554).

Le dragage sur le plateau (st. 543) par 27-30 m de profondeur montre un fond de blocs d'algues calcaires couverts d'algues vertes, rouges et brunes, sans madrépores, très pauvre en faune vagile.

De 300 à 400 m, on observe des fonds de sables et graviers coralliens, avec une faune rare mais diversifiée, notamment en Crustacés (*Platymaia, Mursia, Munida*) et en Mollusques (Trochidae, Turridae).

De 400 à 500 m, on trouve le même substrat d'éboulis, assez pauvre.

De 500 à 700 m de profondeur, on récolte des blocs et débris coralliens et du sable à articles d'*Halimeda*. Parmi les Crustacés, d'assez nombreux crabes de la famille des Tymolidae s'observent ; chez les Mollusques, prédominance des Pectinidae (*Propeamusium*), des Seguenziidae et des Scaphopodes.

De 700 à 900 m, sur l'ensellement, des fonds graveleux suffisament plats permettent le chalutage (st. 550-554). Ces fonds présentent des peuplement à Pennatulaires et Gorgones avec des Crustacés associés (Chirostylidae) et les crevettes habituelles à ces profondeurs (*Hymenopenaeus, Benthesicymus, Nematocarcinus, Heterocarpus, Plesionika, Glyphocrangon*), ainsi que des Mollusques de la famille des Xenophoridae.

Le **banc Tuscarora** (Fig. 14), situé à 220 milles dans le nord-ouest de Wallis, présente un plateau entre 30 et 20 m de profondeur et mesure 35 milles d'est en ouest ; sa face ouest est en pente douce mais couverte de blocs coralliens jusqu'à plus de 650 m.

Les stations 555 à 568 ont rapporté une faune assez riche en Crustacés, en particulier les quelques traits de chaluts entre 700 et 1100 m de profondeur : crabes (Tymolidae, Majidae, Homolidae, Ethusinae), Nephropidae, crevettes diverses. Une vaste zone chalutable a été relevée entre 900 et 1100 m.

Le **banc Field** (Fig. 15), situé à 150 milles dans l'est-nord-est de Wallis, s'allonge d'est en ouest sur environ 12 milles. Les stations 587-589 ont échantillonné la pente nord-est, composée de sédiments à articles d'*Halimeda*.

Un autre banc, sans nom, situé à 25 milles dans le sud-est et culminant également à 30 m de profondeur à fait l'objet des stations 590 à 600, entre 300 et 800 m de profondeur.

A la station 591, il a été récolté des coquilles de Mollusques terrestres, bien que les terres émergées les plus proches soient les îles Savai'i (Western Samoa), à plus de 180 milles vers le sud-est et Wallis à 200 milles au sud-ouest.

FIG. 12 (à gauche). — Arrivée du chalut à perche, sous la pluie (Photo J.-L. MENOU, ORSTOM).

FIG. 13 (à droite). — Tri du chalut. De gauche à droite : P. BOUCHET, A. DANIGO, second mécanicien du N. O. *Alis*, B. MÉTIVIER, A. CROSNIER, B. RICHER DE FORGES (Photo J.-L. MENOU, ORSTOM).

AUTRES MONTS SOUS-MARINS. — Des monts sous-marins ne faisant pas partie de l'alignement de guyots des Samoa ont également été échantillonnés :

— Stations 613-616, dans l'est d'Alofi, sur un mont culminant vers 400 m. Ces dragages entre 580 et 750 m n'ont ramené que des blocs basaltiques et des encroûtements de manganèse avec quelques organismes fixés (Hydraires, Gorgones).

— Stations 620-624, sur le sommet tabulaire d'un "guyot" situé par 1300 m de profondeur, entre le banc Combe et le banc Bayonnaise. Ces fonds vaseux, très plats, ont permis de bonnes récoltes par chalutages : crevettes Pénéides et Carides, Nephropidae, crabes Homolidae, Mollusques (*Propeamusium*, Turridae), Échinodermes (Ophiures, Astéries, Holothuries, Comatules, Échinides), Poissons (Macrouridae, Apodes).

— Stations 633-638, sur un mont situé par 130 milles dans le sud du banc Bayonnaise par 500 à 800 m de profondeur. Il s'agit d'un substrat volcanique de blocs de taille décimétrique et de scories. La faune récoltée y est rare ; vers 800 m les grands spicules d'Éponges sont abondants.

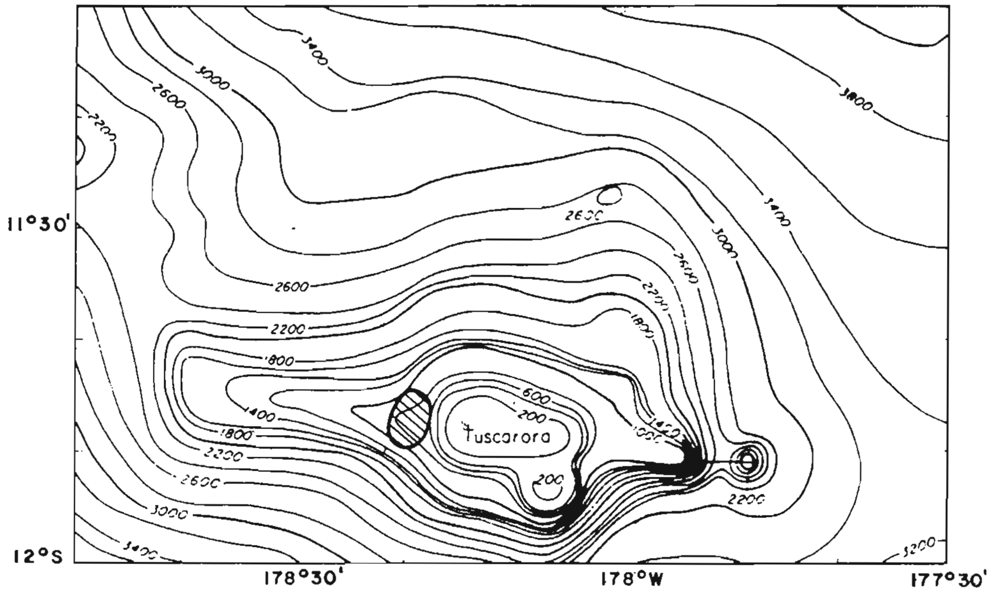


FIG. 14. — Carte bathymétrique du banc Tuscarora avec, en hachures, les sites de récoltes (d'après BROCHER, 1985).

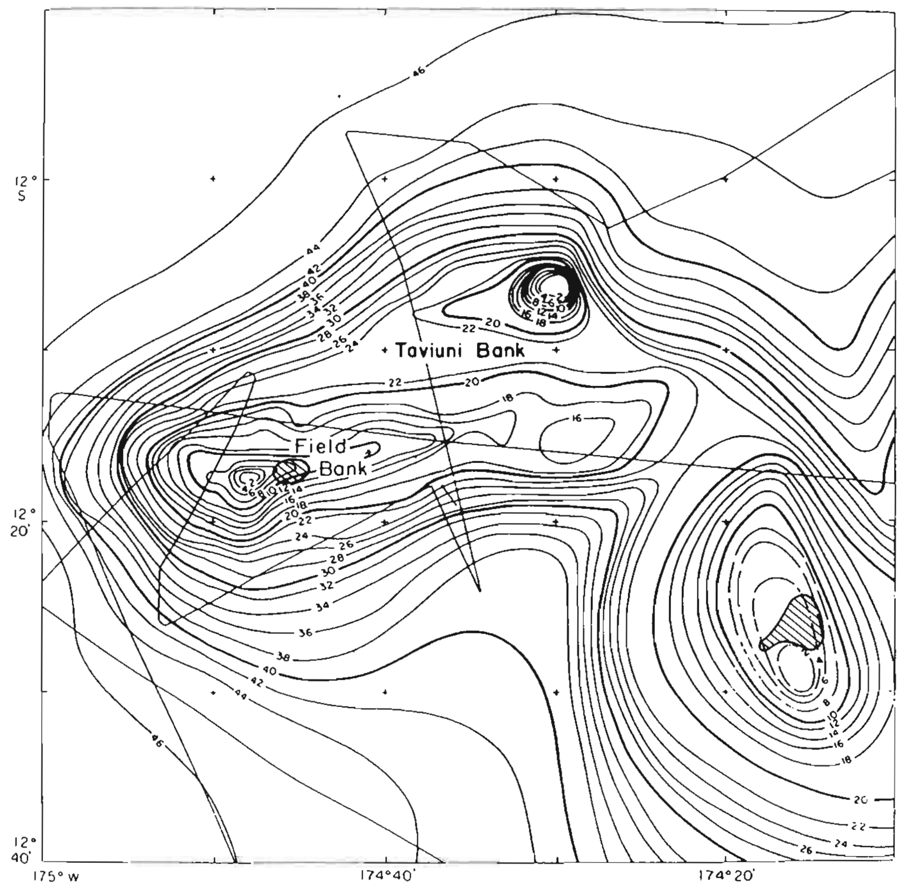


FIG. 15. — Carte bathymétrique du banc Field avec, en hachures, les sites de récoltes (d'après SINTON *et al.*, 1985).

FIG. 16 (à gauche). — Conditionnement des échantillons dans le laboratoire humide du N. O. *Alis*. De gauche à droite B. RICHER DE FORGES, P. BOUCHET, en arrière plan A. CROSNIER (Photo J.-L. MENOU, ORSTOM).

FIG. 17 (à droite). — Détente au carré. De gauche à droite : P. BOUCHET, A. CROSNIER, A. DANIGO, second mécanicien de l'*Alis*, N. COMINARDI, M. LE BOULC'H, commandant de l'*Alis*, B. RICHER DE FORGES (caché) et J.-L. MENOU (Photo ORSTOM).

CONCLUSIONS

La faune bathyale de la zone économique de Wallis et Futuna semble quantitativement beaucoup plus pauvre que celle de Nouvelle-Calédonie, en particulier pour les pentes des monts sous-marins. Cependant, la diversité spécifique est assez élevée chez les Crustacés, Mollusques et Échinodermes. On observe très peu de Scléractiniaires et une quasi-absence de Stylastérides, alors qu'ils sont très diversifiés en Nouvelle-Calédonie.

La découverte de *Gymnocrinus* remet en question l'hypothèse avancée pour expliquer la richesse de la zone bathyale de Nouvelle-Calédonie en "fossiles vivants". A savoir qu'une faune ancienne, proche de celle de la Mésogée mésozoïque, aurait été préservée sur la ride de Norfolk parce qu'il s'agit d'un vestige de l'ancienne marge continentale du Gondwana (STEVENS, 1977 ; AMÉZIANE-COMINARDI *et al.*, 1987). Par ailleurs, cela indique qu'il faut rester prudent dans les corrélations entre la tectonique des plaques et la biogéographie de la faune de profondeur. Les îles Wallis sont sur la plaque Pacifique et on y trouve cependant plusieurs organismes découverts sur la plaque Australo-Indienne : Crinoïdes, Spongiaires du groupe des Sphinctozoaires (VACELET *et al.*, 1992), Mollusques de la famille des Volutidae.

La présence, sur les pentes de guyots éloignés de toutes terres émergées, de Mollusques intertidaux et mêmes d'espèces terrestres, confirment une phase d'émersion de ces reliefs. La datation des coquilles devrait permettre de préciser si ce sont des reliques de la dernière période glaciaire.

A l'époque où l'étude de la "biodiversité" devient une des priorités de la recherche internationale, on se doit de constater que l'on est loin d'avoir achevé l'inventaire de la faune marine. L'exploration des archipels et monts sous-marins de l'Indo-Pacifique et la description de la faune restent d'actualité et sont des préalables à la biogéographie et aux reconstitutions des paléoenvironnements.

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Nous avons plaisir à remercier ici les personnes qui ont facilité la réalisation de cette campagne : l'équipage du N. O. "*Alis*" qui, sous le commandement de M. LE BOULC'H, a accompli un travail souvent difficile dans des conditions parfois pénibles et, en particulier, A. LE CROM pour l'énergie avec laquelle il a, durant toute la campagne, remis en état les engins de pêche dans des temps records ; les autorités administratives et coutumières du Territoire de Wallis et Futuna qui nous ont aidé aux escales.

La campagne MUSORSTOM 7 a été rendue possible grâce aux crédits du Département Terre Océan Atmosphère de l'ORSTOM, de la Direction de la Recherche et des Études Doctorales du Ministère de l'Éducation Nationale et du Muséum national d'Histoire naturelle (Bonus Qualité Recherche -1991).

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ANNEXE

LISTE DES PARTICIPANTS À LA CAMPAGNE MUSORSTOM 7

Chef de mission : B. RICHER DE FORGES.
Autres participants : P. BOUCHET, N. COMINARDI, A. CROSNIER, J.-L. MENOU, B. MÉTIVIER.

LISTE DES STATIONS DE LA CAMPAGNE MUSORSTOM 7

(DW : drague Waren ; CP : chalut à perche ; CC : chalut à crevettes ; DE : drague épibenthique)

Station	Date	Profondeur (m)	Latitude S	Longitude
DW 494	10.05.92	100-110	14°18,9'	178°03,0' W
DW 495	" "	180-210	14°19,2'	178°04,3' W
DW 496	" "	250-330	14°19,6'	178°04,3' W
DW497	" "	369-355	14°19,6'	178°04,8' W
CP 498	" "	105-160	14°18,9'	178°03,1' W
DW 499	" "	290-395	14°19,6'	178°04,6' W
DW 500	11.05.92	350-394	14°19,5'	178°04,1' W
DW 501	" "	500-530	14°19,8'	178°06,1' W
DW 502	" "	535-516	14°19,8'	178°06,5' W
DW 503	" "	730-710	14°20,2'	178°07,4' W
DW 504	" "	300-390	14°19,6'	178°04,5' W
CP 505	" "	245-400	14°19,5'	178°04,3' W
CP 506	" "	400	14°19,8'	178°05,0' W
DW 507	" "	419-425	14°19,6'	178°06,7' W
CP 508	" "	245-440	14°19,5'	178°04,5' W
DW 509	12.05.92	200-240	14°14,8'	178°11,5' W
DW 510	" "	280-370	14°14,5'	178°11,5' W
DW 511	" "	400-450	14°14,0'	178°11,5' W
DW 512	" "	210-245	14°13,5'	178°10,3' W
DW 513	" "	260-300	14°13,5'	178°10,8' W
DW 514	" "	349-355	14°13,3'	178°10,7' W
CP 515	" "	224-252	14°13,5'	178°10,3' W
DW 516	" "	441-550	14°13,5'	178°11,6' W
CP 517	" "	233-235	14°13,4'	178°10,4' W
DW 518	" "	350-330	14°13,8'	178°09,1' W
DW 519	" "	500	14°13,4'	178°09,3' W
DW 520	13.05.92	930-920	14°10,6'	176°16,7' W

CP 521	" "	890-915	14°11,0'	176°17,3' W
DW 522	" "	650-765	13°10,7'	176°15,0' W
DW 523	" "	515-455	13°12,0'	176°15,6' W
DW 524	" "	300	13°11,8'	176°15,6' W
DW 525	" "	500-600	13°10,6'	176°14,7' W
DW 526	" "	360-355	13°13,4'	176°15,5' W
DW 527	14.05.92	540-560	13°24,1'	176°14,6' W
DW 528	" "	515-435	13°24,4'	176°13,3' W
DW 529	16.05.92	500	12°31,4'	176°39,6' W
DW 530	" "	580-600	12°32,7'	176°39,3' W
CP 531	" "	580-600	12°31,6'	176°39,3' W
DW 532	" "	530-516	12°28,9'	176°41,0' W
DW 533	" "	700-670	12°25,3'	176°43,0' W
DW 534	" "	500-440	12°23,3'	176°42,0' W
DW 535	" "	470-340	12°29,6'	176°41,3' W
DW 536	" "	37-27	12°30,8'	176°41,0' W
DW 537	" "	400-325	12°30,0'	176°41,0' W
DW 538	" "	295-275	12°30,8'	176°40,3' W
DW 539	17.05.92	700	12°27,3'	177°27,3' W
DW 540	" "	600	12°26,7'	177°28,4' W
DW 541	" "	500-505	12°26,7'	177°28,0' W
DW 542	" "	370	12°26,4'	177°28,2' W
DW 543	" "	30-27	12°25,6'	177°28,2' W
CP 544	" "	580	12°26,4	177°28,9' W
DW 545	" "	658-652	12°27,6'	177°27,7' W
DW 546	" "	552-550	12°26,9'	177°29,1' W
DW 547	" "	455	12°26,2'	177°25,6' W
DW 548	" "	700-740	12°23,3'	177°24,4' W
DW 549	18.05.92	791-794	12°15,5'	177°28,1' W
CP 550	" "	800-810	12°14,8'	177°28,0' W
CP 551	" "	791-795	12°15,3'	177°28,1' W
CP 552	" "	786-800	12°15,7'	177°27,8' W
CC 553	" "	780-794	12°16,8'	177°28,1' W
CC 554	" "	820-795	12°13,8'	177°28,0' W
DW 555	19.05.92	540-542	11°47,5'	178°19,2' W
DW 556	" "	440	11°48,7'	178°18,0' W
DW 557	" "	608-600	11°48,1'	178°18,2' W
DW 558	" "	635	11°49,9'	178°18,9' W
CP 559	" "	552-547	11°47,8'	178°19,1' W
DW 560	" "	697-702	11°47,0'	178°20,0' W
DW 561	" "	775-777	11°46,4'	178°22,4' W
CP 562	" "	775-777	11°48,1'	178°22,1' W
DW 563	20.05.92	1025-1035	11°46,4'	178°27,6' W
CP 564	" "	1015-1020	11°46,1'	178°27,4' W
CP 565	" "	900	11°47,4'	178°25,3' W
CC 566	" "	1000-1005	11°44,6'	178°28,0' W
CP 567	" "	1010-1020	11°47,0'	178°27,3' W

DE 568	" "	1011	11°46,2'	178°27,3' W
DW 569	21.05.92	300-305	12°30,0'	176°51,2' W
DW 570	" "	439-420	12°30,9'	176°51,4' W
DW 571	" "	502-508	12°31,3'	176°51,7' W
DW 572	" "	500-560	12°31,8'	176°52,2' W
DW 573	" "	364	12°31,0'	176°52,4' W
DW 574	" "	105	12°30,9'	176°52,3' W
DW 575	" "	425	12°30,9'	176°52,3' W
DW 576	" "	680-685	12°31,0'	176°52,9' W
DW 577	22.05.92	630-645	13°08,4'	176°15,5' W
DW 578	" "	640-730	13°08,2'	176°15,6' W
DW 579	" "	490	13°08,1'	176°14,0' W
DW 580	" "	535-465	13°08,2'	176°14,4' W
DW 581	" "	461-550	13°09,9'	176°13,9' W
DW 582	" "	360	13°10,5'	176°14,1' W
DW 583	" "	330-365	13°11,1'	176°14,2' W
DW 584	" "	360-400	13°11,2'	176°14,3' W
DW 585	" "	415-475	13°10,2'	176°12,6' W
DW 586	" "	510-600	13°10,7'	176°13,1' W
DW 587	23.05.92	715-720	12°17,5'	174°44,8' W
DW 588	" "	490-500	12°17,3'	174°44,6' W
DW 589	" "	400	12°16,2'	174°41,4' W
DW 590	" "	400	12°31,4'	174°18,7' W
DW 591	" "	320	12°31,1'	174°19,4' W
CP 592	24.05.92	775-730	12°32,4'	174°22,0' W
CP 593	" "	705-711	12°30,5'	174°19,5' W
DW 594	" "	495-505	12°31,0'	174°19,9' W
DW 595	" "	580-566	12°30,9'	174°18,9' W
DW 596	" "	32	12°31,8'	174°18,9' W
DW 597	" "	469-475	12°31,4'	174°18,6' W
DW 598	" "	702-708	12°30,5'	174°18,4' W
DW 599	" "	760-814	12°30,0'	174°19,2' W
CP 600	" "	500	12°31,8'	174°18,2' W
DW 601	25.05.92	350	13°18,7'	176°17,2' W
DW 602	26.05.92	627-660	13°22,3'	176°07,5' W
DW 603	" "	510-520	13°21,3'	176°07,7' W
DW 604	" "	415-420	13°21,4'	176°08,3' W
DW 605	" "	335-340	13°21,3'	176°08,4' W
CP 606	" "	420-430	13°21,4'	176°08,3' W
CP 607	" "	420-400	13°22,2'	176°09,1' W
DW 608	" "	458-440	13°21,7'	176°08,5' W
CP 609	" "	430	13°21,5'	176°08,5' W
DW 610	" "	286	13°21,5'	176°08,9' W
DW 611	" "	500	13°22,5'	176°08,3' W
DW 612	" "	255	13°21,4'	176°08,9' W
DW 613	27.05.92	610-620	14°27,4'	177°26,2' W
DW 614	" "	680-694	14°27,0'	177°26,8' W

DW 615	" "	700-750	14°27,0'	177°25,7' W
DW 616	" "	550	14°27,5'	177°26,0' W
DW 617	" "	350	14°19,0'	177°58,6' W
DW 618	" "	435-420	14°21,7'	178°00.5' W
DW 619	" "	455	14°21,8'	178°00,4' W
DW 620	28.05.92	1280	12°34,4'	178°11,0' W
CP 621	" "	1300-1280	12°35,0'	178°11,5' W
CP 622	" "	1280-1300	12°34,5'	178°10,9' W
CP 623	" "	1300-1280	12°34,2'	178°15,1' W
DE 624	" "	1300	12°34,4'	178°10,5' W
DW 625	29.05.92	430-425	11°52,4'	179°33,8' W
DW 626	" "	597-600	11°53,6'	179°32,0' W
CP 627	" "	597-600	11°54,2'	179°31,4' W
CP 628	" "	650-625	11°53,4'	179°32,0' W
CP 629	" "	420-400	11°53,7'	179°32,3' W
CP 630	" "	500	11°53,7'	179°32,2' W
CP 631	" "	600	11°54,0'	179°31,6' W
CP 632	" "	600-595	11°54,0'	179°31,5' W
DW 633	30.05.92	580-595	13°42,6'	179°56,3' E
DW 634	" "	550-570	13°42,0'	179°56,3' E
DW 635	" "	715-700	13°49,0'	179°56,0' E
DW 636	" "	650-700	13°39,4'	179°55,5' E
DW 637	" "	820-830	13°37,2'	179°56,0' E
CP 638	" "	820-840	13°37,4'	179°56,0' E

LAGON WALLIS

1	15.05.92	46	13°18,0'	176°08,1' W
2	" "	55-52	13°22,3'	176°11,2' W
3	25.05.92	45	13°17,9'	176°08,4' W
4	" "	45	13°22,3'	176°11,3' W

2

Campagnes d'exploration de la faune bathyale faites depuis mai 1989 dans la zone économique de la Nouvelle-Calédonie. Listes des stations

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RÉSUMÉ

Les listes des stations de six campagnes françaises, faites dans la zone bathyale de la Nouvelle-Calédonie depuis mai 1989, sont publiées. Cette publication fait suite à celle parue en 1990, qui donnait les listes des campagnes similaires faites entre avril 1978 et mai 1989.

ABSTRACT

Exploratory cruises for bathyal fauna in the New Caledonian economic zone since May 1989. Lists of stations.

Lists of the collecting stations of the six french exploratory cruises carried out in the bathyal zone of New Caledonia since May 1989, are published. This paper follows that published in 1990, which listed similar cruises carried out between April 1978 and May 1989.

Dans le volume 6 des "Résultats des Campagnes MUSORSTOM" nous avons publié les listes des stations des campagnes françaises dans la zone bathyale de la Nouvelle-Calédonie faites jusqu'en mai 1990 (B. RICHER DE FORGES, 1990).

Depuis lors, d'autres campagnes ont eu lieu dans la même zone : VOLSMAR, faite autour des îles Matthew et Hunter, du 29 mai au 9 juin 1989 ; GEMINI qui a couvert les volcans situés au sud du Vanuatu, du 3 au 7 juillet 1989 ; SMIB 5, sur le banc Aztèque, du 6 au 15 septembre 1989 ; SMIB 6, au nord de la Nouvelle-Calédonie, du 28 février au 12 mars 1990 ; AZTÈQUE sur la ride de Norfolk, du 12 au 16 février ; BERYX 2 sur les rides de Norfolk et des îles Loyauté, du 22 au 31 octobre 1991.

RICHER DE FORGES, B., 1993. — Campagnes d'exploration de la faune bathyale faites depuis mai 1989 dans la zone économique de la Nouvelle-Calédonie. Listes des stations. *In* : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, Volume 10. *Mém. Mus. natn. Hist. nat.*, **156** : 27-32. Paris ISBN : 2-85653-206-3.

La plupart de ces campagnes ont fait l'objet d'un rapport (voir références en fin d'article), mais ces rapports, publiés dans la série "Rapports de missions" du Centre ORSTOM de Nouméa, tirés à peu d'exemplaires, sont difficiles à se procurer.

La faune bathyale, récoltée lors de ces campagnes, étant essentiellement étudié dans les "Résultats des Campagnes MUSORSTOM", il nous semble donc utile de publier ici les listes des stations de ces campagnes, bien que certaines d'entre elles puissent déjà se trouver dans le volume consacré au benthos des fonds meubles des lagons de Nouvelle-Calédonie (B. RICHER DE FORGES, 1991).

Dans ces listes, les sigles utilisés pour désigner les engins de prélèvements sont : **DW** : drague Waren ; **DE** : drague épibenthique ; **DR** : drague à roche ; **DC** : drague Charcot ; **CP** : chalut à perche ; **CC** : chalut à crevettes ; **CH** : chalut à panneaux de 14 m ; **P** : plongée en scaphandre autonome ; **CAS** : casier ; **PAL** : palangre de fond.

CAMPAGNE VOLSMAR (ÎLES MATTHEW ET HUNTER)
29 mai au 9 juin 1989

Station	Date	Profondeur (m)	Latitude S	Longitude E
P 1	31.05.89	45	22°24,00'	171°49,00'
P 2	" "	45	22°24,00'	171°49,00'
CAS 3	" "	800	22°24,00'	171°49,30'
DW 4	1.06.89	850	22°24,70'	171°49,00'
DW 5	" "	700	22°25,90'	171°46,50'
DW 6	" "	480	22°27,20'	171°44,50'
DW 7	" "	400	22°26,00'	171°44,10'
DW 8	" "	630	22°24,90'	171°43,00'
DW 9	" "	300	22°22,70'	171°41,80'
CAS 10	" "	290	22°23,10'	171°41,10'
DR 11	2.06.89	1000	22°23,30'	171°43,60'
DR 12	" "	680	22°24,00'	171°42,30'
PAL 13	" "	660	22°24,00'	171°42,50'
DR 14	" "	920	22°24,10'	171°37,20'
CAS 15	" "	500	22°25,30'	171°40,10'
DW 16	3.06.89	500	22°25,10'	171°40,70'
DW 17	" "	300	22°23,20'	171°41,70'
DR 18	" "	920	22°23,90'	171°37,20'
DR 19	" "	850	22°20,00'	171°24,50'
DW 20	" "	500	22°20,50'	171°23,50'
P 21	" "	40	22°20,00'	171°23,00'
DR 22	4.06.89	440	22°20,20'	171°23,70'
DW 23	" "	140	22°20,10'	171°23,30'
P 24	" "	50	22°22,00'	171°21,00'
DW 25	" "	940	22°22,80'	171°21,50'
CP 26	" "	980	22°22,80'	171°21,40'
P 27	5.06.84	50	22°22,00'	171°21,00'
DR 28	" "	1030	22°16,00'	171°17,20'
DR 29	" "	800	22°16,70'	171°17,20'
DW 30	" "	550	22°17,00'	171°17,70'
DW 31	" "	440	22°16,90'	171°17,40'
DR 32	6.06.89	2400	22°17,60'	171°03,50'
CP 33	" "	1325	22°18,70'	171°06,60'
DR 34	7.06.89	1600	22°18,20'	171°06,60'
DR 35	" "	1500	21°59,30'	170°44,50'

DR 36	" "	1700	21°30,10'	170°10,10'
DW 37	8.06.89	550	22°22,30'	168°42,50'
DW 38	" "	420	22°21,60'	168°43,10'
DW 39	" "	305	22°20,50'	168°43,50'
DW 40	" "	295	22°20,00'	168°42,20'
DW 41	" "	250	22°17,70'	168°41,20'
DW 42	" "	400	22°17,00'	168°41,50'
DW 43	" "	540	22°12,00'	168°37,60'

CAMPAGNE GEMINI (VOLCANS SUD VANUATU)
3 au 7 juillet 1989

Station	Date	Profondeur (m)	Latitude S	Longitude W
DW 48	4.07.89	200	21°00,10'	170°03,30'
DW 49	" "	285	20°59,80'	170°03,50'
DW 50	" "	425	20°59,10'	170°03,50'
DW 51	" "	450	20°58,50'	170°03,40'
DR 52	" "	510	20°59,10'	170°02,70'
CAS 53	5.07.89	620	20°59,50'	170°03,30'
P 54	" "	40	21°00,70'	170°03,20'
DW 55	" "	710	20°59,20'	170°01,90'
DR 56	" "	630	20°59,10'	170°15,70'
PAL 57	" "	350	21°00,90'	170°16,80'
CAS 58	" "	180	20°59,60'	170°17,40'
DW 59	6.07.89	190-320	20°59,90'	170°16,90'
DW 60	" "	80-190	20°59,90'	170°16,60'
PAL 61	" "	650	21°00,60'	170°02,10'
P 62	" "	40	21°00,70'	170°03,20'

CAMPAGNE SMIB 5 (BANC AZTÈQUE)
6 au 15 septembre 1989

Station	Date	Profondeur (m)	Latitude S	Longitude E
DW 70	7.09.89	270	23°40,60'	168°01,10'
DW 71	" "	265	23°41,30'	168°00,70'
DW 72	" "	400	23°42,00'	168°00,80'
DW 73	" "	240	23°41,40'	168°00,60'
DW 74	" "	245	23°40,20'	168°00,90'
DW 75	" "	270	23°40,90'	168°00,80'
DW 76	" "	280	23°41,20'	168°00,50'
DW 77	" "	270	23°40,80'	168°01,10'
DW 78	" "	245	23°40,80'	168°00,20'
DW 79	" "	285	23°41,30'	168°01,10'
DW 80	" "	300	23°41,90'	168°00,40'
DW 81	9.09.89	110	22°38,20'	167°34,80'
DW 82	" "	155	22°31,70'	167°32,40'
DW 83	" "	200	21°41,70'	167°33,90'
DW 84	11.09.89	290	22°20,80'	168°43,10'
DW 85	" "	260	22°20,00'	168°42,90'
DW 86	" "	320	22°19,80'	168°42,80'
DW 87	" "	370	22°18,70'	168°41,30'
DW 88	" "	350	22°18,60'	168°40,20'

DW 89	" "	295	22°18,80'	168°41,00'
DW 90	" "	340	22°19,10'	168°41,60'
DW 91	" "	340	22°18,40'	168°41,10'
DW 92	" "	280	22°19,90'	168°41,30'
DW 93	" "	255	22°20,00'	168°42,30'
DW 94	" "	275	22°19,60'	168°42,80'
DW 95	14.09.89	200	22°59,70'	168°19,80'
DW 96	" "	245	23°00,00'	168°18,70'
DW 97	" "	300	23°01,10'	168°18,00'
DW 98	" "	335	23°01,70'	168°16,10'
DW 99	" "	58	23°24,70'	168°05,40'
DW 100	" "	80-120	23°22,90	168°05,20'
DW 101	" "	270	23°21,20'	168°04,90'
DW 102	" "	305	23°19,60'	168°04,70'
DW 103	" "	315	23°17,40'	168°04,80'
DW 104	" "	335	23°15,70'	168°04,40'
DW 105	" "	310	23°14,30'	168°04,50'

CAMPAGNE SMIB 6 (NORD DE LA NOUVELLE-CALÉDONIE, GRAND PASSAGE)
28 février au 12 mars 1990

Station	Date	Profondeur (m)	Latitude S	Longitude E
DW 106	2.03.90	195	19°08,10'	163°30,70'
DW 107	" "	205	19°07,60'	163°30,20'
DW 108	" "	220	19°06,90'	163°30,10'
DW 109	" "	225	19°05,70'	163°29,70'
DW 110	" "	225	19°04,70'	163°29,80'
DW 111	" "	245	19°03,90'	163°29,70'
DW 112	" "	225	19°05,60'	163°30,20'
DW 113	" "	250	19°02,90'	163°29,90'
DW 114	" "	265	19°01,20'	163°28,80'
DW 115	" "	285	19°00,10'	163°27,50'
DW 116	" "	300	18°59,30'	163°26,20'
DW 117	" "	290	18°59,40'	163°25,40'
DW 118	3.03.90	300	18°58,50'	163°26,30'
DW 119	" "	305	18°58,70'	163°26,20'
DW 120	" "	325	18°58,50'	163°25,60'
DW 121	" "	315	18°57,80'	163°25,60'
DW 122	" "	330	18°58,00'	163°25,00'
DW 123	" "	360	18°56,60'	163°25,00'
DW 124	" "	405	18°56,00'	163°24,50'
DW 125	" "	350	18°57,40'	163°23,50'
DW 126	" "	330	18°59,10'	163°22,70'
DW 127	4.03.90	205	19°06,80'	163°22,60'
DW 128	" "	215	19°06,20'	163°22,40'
DW 129	" "	225	19°05,50'	163°22,10'
DW 130	" "	230	19°04,90'	163°21,00'
DW 131	" "	230	19°04,20'	163°20,20'
DW 132	" "	240	19°03,50'	163°19,30'
DW 133	" "	250	19°02,80'	163°19,00'
DW 134	" "	280	19°02,60'	163°17,50'
DW 135	" "	260	19°02,80'	163°18,70'
DW 136	" "	320	19°01,00'	163°18,30'
DW 137	" "	330	19°00,30'	163°18,30'

CAMPAGNE AZTÈQUE SUR LA RIDE DE NORFOLK
12 au 16 février 1990

Station	Date	Profondeur (m)	Latitude S	Longitude E
CH 1	12.02.90	375	23°16,7'	168°04,7'
CH 2	13.02.90	320	23°40,3'	167°59,7'
CH 3	" "	345	23°39,2'	168°01,3'
CH 4	" "	318	23°39,0'	168°00,0'
CH 5	14.02.90	298	23°38,9'	168°00,0'
CH 6	" "	448	23°37,9'	167°42,5'
CH 7	" "	463	23°37,5'	167°42,1'
CH 8	" "	455	23°40,0'	167°43,0'
CH 9	15.02.90	360	22°52,8'	167°33,0'
CH 10	" "	355	22°52,8'	167°33,5'
CH 11	" "	350	22°52,3'	167°32,4'

CAMPAGNE BERYX 2 (RIDES DE NORFOLK ET DES LOYAUTÉ)
22 au 31 octobre 1991

Station	Date	Profondeur (m)	Latitude S	Longitude E
CH 1	23.10.91	585	24°55,6'	168°21,7'
CH 2	" "	800	24°51,3'	168°22,2'
CH 3	24.10.91	675	24°54,5'	168°21,2'
CH 4	" "	700	24°54,5'	168°22,7'
CH 5	" "	545	24°54,4	168°21,6
CH 6	25.10.91	780	24°41,8'	170°09,2'
CH 7	" "	820	24°41,7'	170°06,8'
CH 8	26.10.91	825	24°43,6'	170°06,1'
CH 9	" "	825	24°44,5'	170°07,0'
CH 10	" "	850	24°43,9'	170°09,9'
CH 11	27.10.91	670	23°34,1'	169°36,7'
CH 12	" "	675	23°36,0'	169°36,7'
CH 13	28.10.91	670	23°34,9'	169°36,7'
CH 14	" "	660	23°35,9'	169°36,8'
CH 15	" "	700	23°34,0'	169°36,8'
CH 16	29.10.91	675	23°35,6'	169°36,5'
CH 17	" "	625	24°55,6'	168°20,9'
CH 18	30.10.91	575	24°54,5'	168°21,3'
CH 19	" "	700	24°54,7'	168°21,4'

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3

Crustacea Mysidacea : Les Mysidacés Lophogastrida et Mysida (Petalophthalmidae) de la région néo-calédonienne

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RÉSUMÉ

De nombreux dragages et chalutages effectués dans la région néo-calédonienne, lors de différentes campagnes (MUSORSTOM 4, 5 et 6, notamment), ont permis la récolte de 11 espèces de Mysidacés, parmi lesquelles 3 sont nouvelles. Neuf appartiennent au sous-ordre des Lophogastrida : *Gnathophausia ingens, G. elegans fagei, Lophogaster manilae, L. neocaledonensis* sp. nov., *Paralophogaster glaber, P. foresti, P. philippinensis, P. boucheti* sp. nov. et *Eucopia australis*. Deux autres relèvent des Mysida : *Petalophthalmus armiger* et *Hansenomysis carinata* sp. nov. Des compléments morphologiques inédits sont fournis pour plusieurs de celles déjà connues (description des femelles de *L. manilae*, par exemple), de même que la répartition bathymétrique des espèces des genres *Lophogaster* et *Paralophogaster*.

ABSTRACT

Crustacea Mysidacea : Mysidaceans Lophogastrida and Mysida (Petalophthalmidae) from New Caledonian area.

In numerous samples dredged in the New Caledonian area during many cruises (MUSORSTOM 4, 5 and 6, in particular), 11 species of mysidaceans were caught, 3 of which new to science. Nine belong to the sub-order Lophogastrida : *Gnathophausia ingens, G. elegans fagei, Lophogaster manilae, L. neocaledonensis* sp. nov., *Paralophogaster glaber, P. foresti, P. philippinensis, P. boucheti* sp. nov., and *Eucopia australis*. Two others belong to Mysida : *Petalophthalmus armiger* and *Hansenomysis carinata* sp. nov. Some original morphological features are provided for a few already known species (such as the description of females of *L. manilae*), as well as the bathymetric distribution of species of *Lophogaster* and *Paralophogaster*.

CASANOVA, J.-P., 1993. — Crustacea Mysidacea : Les Mysidacés Lophogastrida et Mysida (Petalophthalmidae) de la région néo-calédonienne. *In* : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, Volume 10. *Mém. Mus. natn. Hist. nat.*, **156** : 33-53. Paris ISBN 2-85653-206-3.

Les Mysidacés faisant l'objet de ce travail proviennent de 84 stations de dragages et chalutages effectuées dans les parages de la Nouvelle-Calédonie (Sud-Ouest Pacifique), lors de différentes campagnes organisées conjointement par le Muséum national d'Histoire naturelle et l'ORSTOM, à savoir, essentiellement (fig. 1) :

— BIOCAL (9 août - 10 septembre 1985) : 8 stations,
— MUSORSTOM 4 (12 septembre - 5 octobre 1985) : 20 stations,
— MUSORSTOM 5 (5 - 24 octobre 1986) : 28 stations,
— CHALCAL 2 (26 octobre - 1er novembre 1986) : 5 stations,
— MUSORSTOM 6 (12 - 26 février 1989) : 19 stations.

On trouvera des informations complètes sur ces campagnes dans le travail de RICHER DE FORGES (1990). Enfin, quelques prélèvements isolés proviennent d'autres campagnes dans les mêmes parages : îles Loyauté (BIOGEOCAL : 1), Chesterfield (CORAIL 2 : 1), Hunter et Matthew (VOLSMAR : 2).

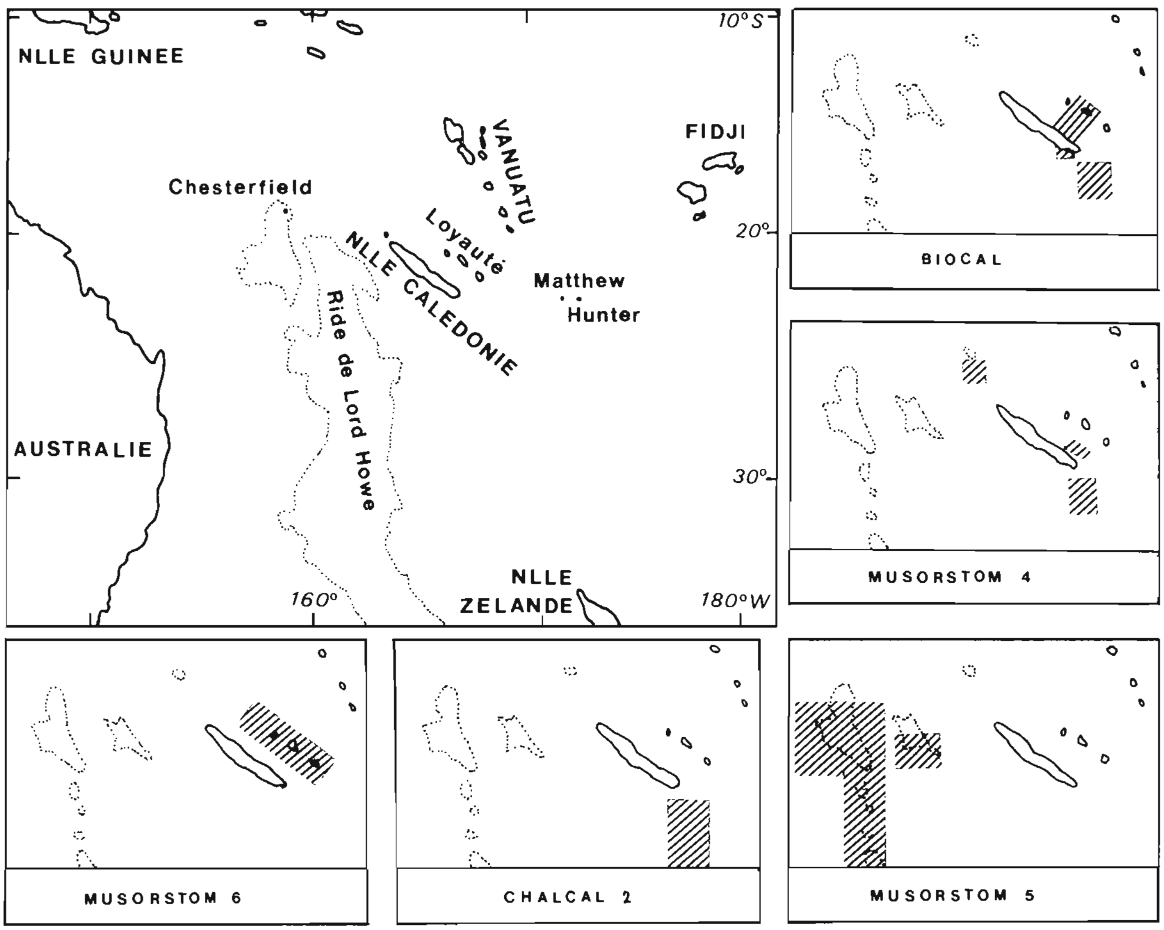

FIG. 1. — Emplacement des zones de dragages et chalutages effectués lors des différentes campagnes étudiées (adapté d'après RICHER DE FORGES, 1990).

LISTE DES STATIONS

Pour toutes les campagnes, les heures (heure locale) et les positions des stations sont celles de début d'opération. Les deux lettres avant le numéro des stations indiquent le type d'engin utilisé : CC = chalut à panneaux (crevettes), CP = chalut à perche, DC = drague Charcot, DE = drague épibenthique, DW = drague Waren.

BIOCAL. **Nouvelle-Calédonie.**
St. CP 05. — 11.08.85, 21h41, 21°16,49'S-166°43,56'E, 2340 m : *Petalophthalmus armiger.*
St. CP 40. — 12.08.85, 7h19, 22°55,32'S-167°23,30'E, 650 m : *Lophogaster manilae.*
St. CP 42. — 12.08.85, 12h21, 22°45,14'S-167°12,12'E, 380 m : *L. manilae, Paralophogaster glaber, P. philippinensis.*
St. DW 44. — 12.08.85, 15h33, 22°47,30'S-167°14,30'E, 440-450 m : *L. manilae, P. glaber.*
St. CP 54. — 1.09.85, 4h48, 23°10,30'S-167°42,98'E, 1000-950 m : *P. boucheti, Hansenomysis carinata.*
St. CP 60. — 2.09.85, 9h00, 24°01,45'S-167°08,43'E, 1530-1480 m : *Eucopia australis.*
St. DW 65. — 3.09.85, 6h15, 24°47,90'S-168°09,09'E, 275-245 m : *L. neocaledonensis.*
St. CP 109. — 9.09.85, 6h05, 22°10,03'S-167°15,22'E, 495-515 m : *P. boucheti.*

MUSORSTOM 4. **Nouvelle-Calédonie.**
St. DW 151. — 14.09.85, 13h30, 19°07,00'S-163°22,00'E, 200 m : *L. neocaledonensis.*
St. CP 152. — 14.09.85, 14h14, 19°04,70'S-163°21,60'E, 228 m : *L. neocaledonensis, P. foresti, P. philippinensis.*
St. CP 153. — 14.09.85, 15h34, 19°04,20'S-163°21,20'E, 235 m : *P. glaber.*
St. DW 161. — 15.09.85, 17h00, 18°38,80'S-163°10,60'E, 565 m : *P. boucheti.*
St. CP 171. — 17.09.85 , 9h23, 18°57,80'S-163°14,00'E, 435 m : *L. neocaledonensis.*
St. CC 173. — 17.09.85, 13h05, 19°02,50'S-163°18,80'E, 250-290 m : *L. neocaledonensis, P. glaber.*
St. CP 178. — 18.09.85, 9h18, 18°56,30'S-163°12,90'E, 520 m : *L. neocaledonensis , P. glaber.*
St. DW 183.— 18.09.85, 15h20, 19°01,80'S-163°25,80'E, 280 m : *P. glaber, P. philippinensis.*
St. DW 184. — 18.09.85, 16h10, 19°04,00'S-163°27,50'E, 260 m : *P. foresti, P. philippinensis.*
St. DW 185. — 18.09.85, 17h00, 19°06,20'S-163°29,50'E, 235 m : *P. philippinensis.*
St. DW 209. — 28.09.85, 7h55, 22°41,80'S-167°09,10'E, 310-315 m : *P. glaber, P. philippinensis.*
St. DW 210. — 28.09.85, 9h05, 22°43,70'S-167°09,30'E, 340-345 m : *P. glaber.*
St. DW 212. — 28.09.85, 10h37, 22°47,40'S-167°10,50'E, 375-380 m : *L. manilae.*
St. CP 213. — 28.09.85, 13h10, 22°51,30'S-167°12,00'E, 405-430 m : *L. manilae.*
St. DW 220. — 29.09.85, 16h05, 22°58,50'S-167°38,30'E, 505-550 m : *P. glaber.*
St. DW 222. — 30.09.85, 6h35, 22°57,60'S-167°33,00'E, 410-440 m : *L. manilae, P. glaber, P. boucheti.*
St. DW 226. — 30.09.85,12h45, 22°47,20'S-167°21,60'E, 395 m : *L. manilae.*
St. CP 236. — 2.10.85, 10h15, 22°11,30'S-167°15,00'E, 495-550 m : *P. boucheti.*
St. CP 240. — 2.10.85, 17h22, 22°16,50'S-167°16,50'E, 475-500 m : *P. glaber.*
St. CP 241. — 3.10.85, 7h00, 22°09,00'S-167°12,20'E, 470-480 m : *P. boucheti.*

MUSORSTOM 5. **Iles Chesterfield.**
St. DW 258. — 8.10.86, 6h42, 25°32,80'S-159°46,10'E, 300 m : *L. neocaledonensis.*
St. CP 268. — 9.10.86, 6h37, 24°44,70'S-159°39,20'E, 280 m : *L. neocaledonensis.*
St. CP 269. — 9.10.86, 7h51, 24°47,00'S-159°37,30'E, 270-250 m : *L. neocaledonensis.*
St. DW 274. — 9.10.86, 15h31, 24°44,83'S-159°41,00'E, 285 m : *L. neocaledonensis.*
St. CP 276. — 9.10.86, 17h44, 24°48,90'S-159°40,90'E, 269-258 m : *L. neocaledonensis.*
St. CP 279. — 10.10.86, 9h25, 24°08,72'S-159°37,76'E, 160-270 m : *L. neocaledonensis.*
St. DW 280. — 10.10.86, 10h28, 24°09,99'S-159°35,75'E, 270 m : *L. neocaledonensis.*
St. CP 287. — 10.10.86, 16h01, 24°05,40'S-159°36,30'E, 270 m : *L. neocaledonensis.*
St. CP 288. — 10.10.86, 17h21, 24°04,80'S-159°36,80'E, 270 m : *L. neocaledonensis, P. foresti.*
St. DW 298. — 11.10.86, 18h20, 22°44,00'S-159°22,00'E, 320 m : *L. neocaledonensis.*
St. DW 301. — 12.10.86, 6h30, 22°06,90'S-159°24,60'E, 487-610 m : *P. glaber.*
St. DW 303. — 12.10.86, 8h54, 22°11,93'S-159°23,17'E, 332 m : *L. neocaledonensis.*
St. CP 320. — 13.10.86, 19h08, 22°25,40'S-159°12,60'E, 315 m : *L. neocaledonensis.*
St. CC 327. — 14.10.86, 17h38, 21°05,20'S-157°50,00'E, 1010 m : *Gnathophausia ingens.*
St. DW 328. — 15.10.86, 6h31, 20°22,80'S-158°43,60'E, 355-340 m : *L. neocaledonensis.*
St. DW 330. — 15.10.86, 8h37, 20°19,80'S-158°48,42'E, 360-365 m : *L. neocaledonensis, P. glaber.*
St. DW 334. — 15.10.86,13h47, 20°06,27'S-158°47,62'E, 315-320 m : *L. neocaledonensis.*
St. DW 339. — 16.10.86, 6h24, 19°53,40'S-158°37,90'E, 380-395 m : *P. glaber.*
St. DW 341. — 16.10.86, 9h19, 19°45,90'S-158°43,37'E, 630-620 m : *L. manilae.*
St. DC 345. — 16.10.86, 16h15, 19°39,70'S-158°32,40'E, 305-310 m : *P. glaber, P. philippinensis.*

St. DW 353. — 18.10.86, 6h39, 19°26,50'S-158°40,40'E, 290 m : *L. neocaledonensis.*
St. DC 357. — 18.10.86, 13h35, 19°37,39'S-158°45,69'E, 630 m : *L. manilae.*
St. DC 358. — 18.10.86, 15h11, 19°38,39'S-158°47,17'E, 680-700 m : *L. manilae.*
St. DC 375. — 20.10.86, 15h19, 19°52,20'S-158°29,70'E, 300 m : *P. philippinensis.*
St. CP 386. — 22.10.86, 9h15, 20°56,21'S-160°51,12'E, 770-755 m : *L. manilae.*
St. CP 387. — 22.10.86, 11h53, 20°53,41'S-160°52,14'E, 650-660 m : *L. manilae, P. boucheti.*
St. DC 388. — 22.10.86, 13h40, 20°45,35'S-160°53,69'E, 500-510 m : *L. manilae.*
St. CP 389. — 22.10.86, 14h45, 20°44,95'S-160°53,67'E, 500 m : *L. manilae, P. glaber.*

CHALCAL 2. **Nouvelle-Calédonie.**
St. DW 69. — 27.10.86, 5h30, 24°43,70'S-168°07,90'E, 260 m : *P. foresti.*
St. DW 70. — 27.10.86, 6h29, 24°46,00'S-168°09,00'E, 232 m : *L. neocaledonensis.*
St. CP 18. — 27.10.86, 13h15, 24°47,00'S-168°09,43'E, 274 m : *P. foresti.*
St. CP 19. — 27.10.86, 14h27, 24°42,85'S-168°09,73'E, 271 m : *P. foresti.*
St. DW 81. — 31.10.86, 8h02, 23°19,60'S-168°03,40'E, 311 m : *P. glaber.*

MUSORSTOM 6. **Iles Loyauté.**
St. DW 391. — 13.02.89, 6h13, 20°47,35'S-167°05,70'E, 390 m : *L. neocaledonensis.*
St. DW 392. — 13.02.89, 7h02, 20°47,32'S-167°04,60'E, 340 m : *L. neocaledonensis.*
St. DW 397. — 13.02.89, 17h05, 20°47,35'S-167°05,17'E, 380 m : *L. neocaledonensis.*
St. DW 398. — 13.02.89, 17h55, 20°47,19'S-167°05,65'E, 370 m : *L. neocaledonensis.*
St. DW 411. — 15.02.89, 12h48, 20°40,65'S-167°03,35'E, 424 m : *L. neocaledonensis.*
St. DW 412. — 15.02.89, 13h47, 20°40,60'S-167°03,75'E, 437 m : *L. neocaledonensis.*
St. CP 419. — 16.02.89, 10h17, 20°41,65'S-167°03,70'E, 283 m : *L. neocaledonensis.*
St. DW 428. — 17.02.89, 14h11, 20°23,54'S-166°12,57'E, 420 m : *L. neocaledonensis.*
St. DW 439. — 19.02.89, 7h58, 20°46,40'S-167°17,40'E, 288 m : *L. neocaledonensis.*
St. DW 453. — 20.02.89, 9h33, 21°00,50'S-167°26,90'E, 250 m : *L. neocaledonensis.*
St. DW 457. — 20.02.89, 13h15, 21°00,42'S-167°28,71'E, 353 m : *L. neocaledonensis.*
St. DW 459. — 20.02.89, 15h37, 21°01,39'S-167°31,47'E, 425 m : *L. neocaledonensis.*
St. DW 462. — 21.02.89, 6h30, 21°05,10'S-167°26,85'E, 200 m : *L. neocaledonensis, P. foresti.*
St. CP 464. — 21.02.89, 7h40, 21°02,30'S-167°31,60'E, 430 m : *L. neocaledonensis.*
St. DW 474. — 22.02.89, 10h37, 21°08,80'S-167°55,50'E, 260 m : *L. neocaledonensis.*
St. DW 479. — 22.02.89, 15h23, 21°09,13'S-167°54,95'E, 310 m : *L. neocaledonensis.*
St. DW 480. — 22.02.89, 15h49, 21°08,50'S-167°55,98'E, 380 m : *L. neocaledonensis.*
St. CP 481. — 23.02.89, 6h30, 21°21,85'S-167°50,30'E, 300 m : *P. glaber* .
St. DW 485. — 23.02.89, 12h14, 21°23,48'S-167°59,33'E, 350 m : *L. neocaledonensis.*

BIOGEOCAL. **Nouvelle-Calédonie et îles Loyauté.**
St. CP 297. — 28.04.87, 14h49, 20°38,64'S-167°10,77'E, 1230-1240 m : *Gnathophausia elegans fagei.*

CORAIL 2. **Iles Chesterfield.**
St. DE 13. — 21.07.88, 21°02,77'S-160°55,00'E, 700-705 m : *L. manilae.*

VOLSMAR. **Iles Hunter et Matthew.**
St. DW 9. — 1.06.89, 22°22,7'S-171°41,8'E, 300 m : *L. neocaledonensis.*
St. DW 41. — 8.06.89, 22°17,7'S-168°41,2'E, 250 m : *L. neocaledonensis.*

ÉTUDE TAXONOMIQUE ET ÉCOLOGIQUE

Parmi les onze espèces présentes dans ce matériel, trois sont nouvelles. Neuf appartiennent au sous-ordre des Lophogastrida et deux à celui des Mysida. En réalité, le déséquilibre entre ces taxons est encore plus marqué si l'on considère l'abondance numérique, puisque le premier compte 460 spécimens contre 2 seulement pour le second. La sélectivité des engins de récoltes utilisés (dragues et chaluts) en est vraisemblablement la cause. En effet, les spécimens capturés ont tous des tailles égales ou supérieures à 14 mm, ce qui exclut la plupart des Mysida benthiques.

Sous-ordre LOPHOGASTRIDA

Famille LOPHOGASTRIDAE

Genre *GNATHOPHAUSIA* Willemoës-Suhm, 1875

Gnathophausia ingens (Dohrn, 1870)

MATÉRIEL EXAMINÉ. — **Iles Chesterfield.** MUSORSTOM 5 : st. CC 327, 1010 m : 1 ♂, 1 ♀.

REMARQUES. — Les 2 spécimens, adultes, correspondent exactement à la description de cette espèce bien connue qui, présente dans les trois océans, déborde rarement la zone tropicale.

Gnathophausia elegans (G.O. Sars, 1885)

MATÉRIEL EXAMINÉ. — **Iles Loyauté.** BIOGEOCAL : st. CP 297, 1230-1240 m : 1 ♀.

REMARQUES. — Cette femelle appartient à la sous-espèce *Gnathophausia elegans fagei,* décrite par BACESCU (1991), qui se distingue essentiellement de la description originale par la position de l'épine épimérale du sixième segment abdominal ; celle-ci est située en avant de la pseudo-articulation divisant le segment en deux parties, au lieu d'être à la verticale de cette limite. Sa capture à l'est de la Nouvelle-Calédonie s'inscrit bien dans les limites étroites de l'aire de répartition de cette espèce qui, selon FAGE (1941), coïncident avec des températures supérieures à 9° à partir de 400 m de profondeur.

Genre *LOPHOGASTER* M. Sars, 1856

Deux espèces sont présentes dans ce matériel. L'une correspond sans aucun doute à *Lophogaster manilae.* L'autre, sujette à des variations individuelles notables dans ces collections, ne peut être rapportée à aucune des espèces du Pacifique connues jusqu'à présent, mais rappellerait plutôt une espèce de l'Atlantique occidental ; elle est décrite sous le nom de *L. neocaledonensis.*

Lophogaster manilae Bacescu, 1985
Fig. 2

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie.** BIOCAL : st. CP 40, 650 m : 2 ♂. — St. 42, 380 m : 24 ♂, 10 ♀. — St. DW 44, 440-450 m : 2 ♂.

MUSORSTOM 4 : st. DW 212, 375-380 m : 1 ♀. — St. CP 213, 405-430 m : 1 ♂. — St. DW 222, 410-440 m : 2 ♂. — St. DW 226, 395 m : 1 ♂.

Iles Chesterfield. MUSORSTOM 5 : st. DW 341, 630-620 m : 1 ♂. — St. DC 357, 630 m : 1 ♂. — St. DC 358, 680-700 m : 1 ♀. — St. CP 386, 770-755 m : 6 ♂, 4 ♀. — St. CP 387, 650-660 m : 56 ♂, 29 ♀. — St. DC 388, 500-510 m : 1 ♀. — St. CP 389, 500 m : 1 ♂, 4 ♀.

CORAIL 2 : st. DE 13, 700-705 m : 1 ♂.

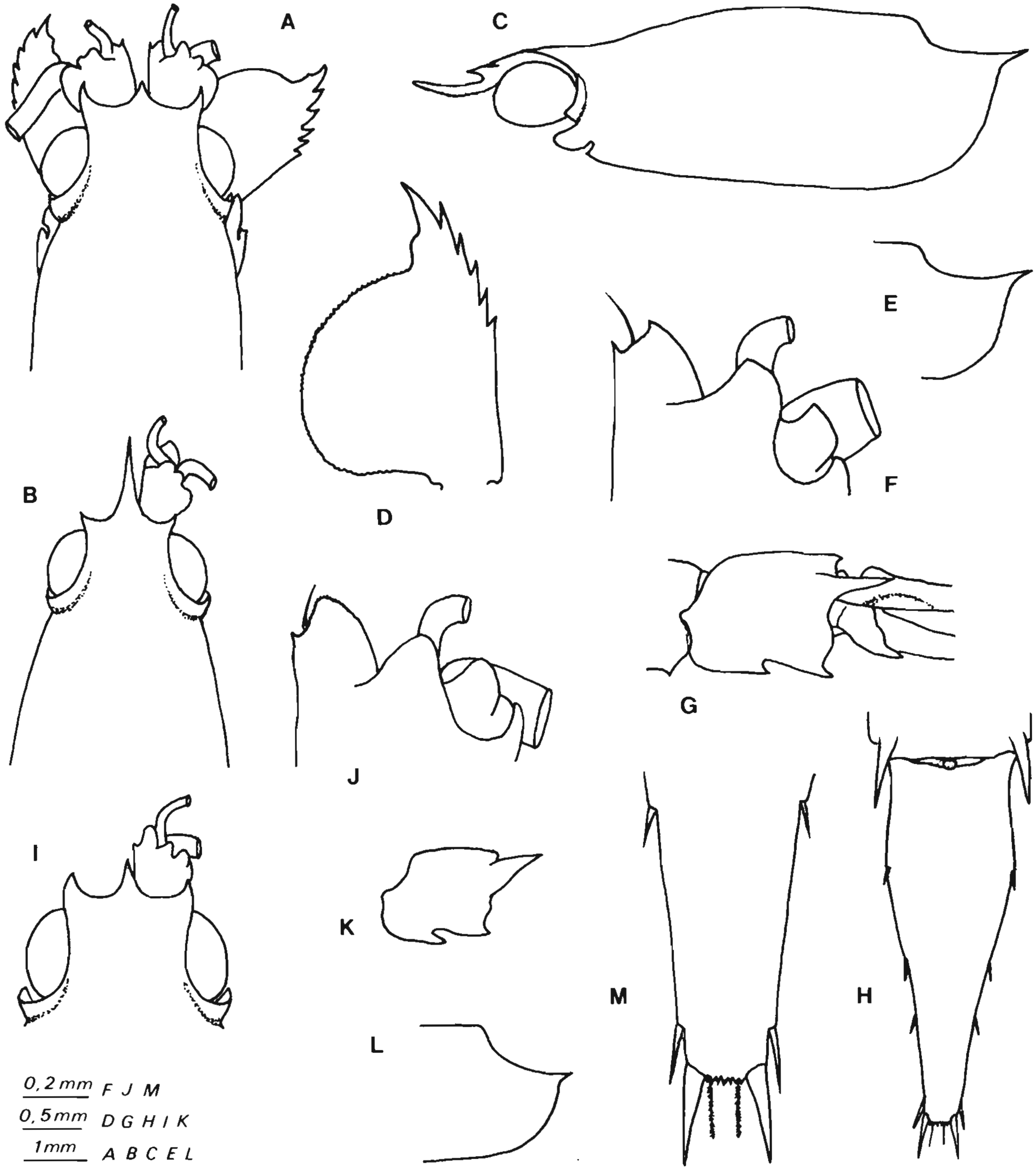

FIG. 2. — *Lophogaster manilae* : vues dorsales (**A**, mâle ; **B** et **I**, femelle) et latérales (**C** et **L**, femelle ; **E**, mâle) de la carapace ; écaille antennaire (**D**) ; lamina de l'antennule (**F**, **J**) ; sixième pléonite en vue latérale (**G**, **K**) et telson (**H**, **M**). A- H : spécimens de la station CP 387 (MUSORSTOM 5), I-M : spécimens de la station CP 42 (BIOCAL).

DESCRIPTION. — Connue par un seul mâle récolté dans les eaux des Philippines lors de la campagne MUSORSTOM 2, cette espèce est la plus abondante de ces collections, avec 148 spécimens, parmi lesquels 98 mâles et 50 femelles (sex-ratio = 1,9). Il est donc à présent possible de préciser quelques points de la morphologie des mâles, notamment de souligner les différences avec l'holotype, et de décrire les femelles, en ne retenant que les caractères unanimement reconnus par les spécialistes comme spécifiques chez ces Mysidacés.

L'épine médiane (rostre) de la plaque frontale des mâles est bien aussi courte que les deux latérales (épines supra-orbitaires), ainsi que le supposait BACESCU, son spécimen étant légèrement abîmé ; par contre, les dernières sont convexes (fig. 2 A) et non pas droites, comme il le figure. La lamina de l'antennule, petite lame terminant la région interne de l'extrémité du troisième segment du pédoncule antennulaire, est tenue comme spécifique (FAGE, 1942 ; BACESCU, 1981) ; or, elle peut affecter différents aspects selon l'origine des spécimens (fig. 2 F, J).

Le telson présente souvent 3 paires d'épines latérales (fig. 2 H) mais il en existe parfois 4, la dernière étant dans tous les cas plus forte que ne l'a représentée BACESCU. Mais deux différences importantes distinguent la population calédonienne de l'exemplaire philippin : d'une part, le bord externe de l'écaille antennaire porte 4 à 6 dents au lieu de 3 (fig. 2 D) ; d'autre part, l'épine alaire pointue prolongeant le bord postérieur de la carapace n'est pas dirigée ventralement, mais est au contraire légèrement orientée vers le haut (fig. 2 E).

Plus petites que les mâles (taille maximale, mesurée du fond de l'orbite à l'extrémité du telson = 17,5 mm contre 23,5 mm), les femelles s'en distinguent aussi par la longueur du rostre. En effet, celui-ci est beaucoup plus long que les épines supra-orbitaires et dépasse nettement l'extrémité antérieure de la lamina antennulaire ; il est nettement recourbé vers le haut (fig. 2 B-C). Chez elles aussi, l'épine alaire de la carapace est plus marquée, de même que les épines latéro-dorsales du dernier segment abdominal qui surplombent la base du telson. Bien que FAGE (1942) souligne que le rostre des femelles est généralement plus développé que celui des mâles et des jeunes, il ne semble pas qu'on ait déjà signalé de telles différences sexuelles dans les dimensions du rostre. En outre, la remarque du même auteur concernant le peu de variations qu'il offrirait au sein d'une même espèce est contredite par ce qui s'observe chez *L. manilae*, et plus particulièrement pour les femelles. En effet, les descriptions des mâles et femelles qui précèdent ont été faites sur les nombreux échantillons récoltés lors de la campagne MUSORSTOM 5, dans les parages des Chesterfield et sur la ride de Lord Howe, entre la Nouvelle-Calédonie et l'Australie. Or, la quarantaine de spécimens capturés sur deux stations lors de la campagne BIOCAL à l'est de la Nouvelle-Calédonie, en diffèrent. Les dix femelles observées montrent un rostre à peine plus long que celui des mâles (fig. 2 I), n'atteignant au maximum que la base de la lamina antennulaire. Par ailleurs, et ces caractères concernent à la fois les mâles et les femelles :

— la plaque frontale est en forme de gouttière marquée ;

— les épines alaires de la carapace sont plus discrètes (fig. 2 L) ;

— celles terminant latéro-dorsalement le sixième pléonite sont relevées, de sorte qu'en vue latérale elles sont au même niveau que la partie tergale du segment (fig. 2 K) et la surmontent parfois ;

— enfin, les épines latérales du telson sont bien développées, de même que les épines sub-apicales qui sont en outre plus éloignées de la paire apicale (fig. 2 M).

REMARQUES. — Comme le note BACESCU, le mâle décrit par O. S. TATTERSALL (1960) du sud du Japon sous le nom de *Lophogaster* sp. A est sans aucun doute un mâle de *L. manilae* ; par la forme convexe des épines supra-orbitaires de la plaque rostrale, il se rapproche davantage des exemplaires néo-calédoniens que de l'holotype philippin, mais c'est le contraire pour celle de l'épine alaire de la carapace, dirigée vers le bas. Quant à la femelle qu'elle décrit sous le nom de *Lophogaster* sp. B, récoltée dans les eaux hawaïennes, il se pourrait bien qu'il s'agisse aussi de *L. manilae*, différant simplement de la population néo-calédonienne par l'écaille antennaire un peu plus allongée et les épines latéro-dorsales du sixième pléonite moins prononcées.

Lophogaster neocaledonensis sp. nov.

Fig. 3, 7 K

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie**. BIOCAL : st. DW 65, 275-245 m : 4 ♂, 5 ♀.

MUSORSTOM 4 : st. DW 151, 200 m : 2 ♂, 1 ♀. — St. CP 152, 228 m : 2 ♂, 1 ♀. — St. CP 171, 435 m : 3 ♂. — St. CC 173, 250-290 m : 1 ♂, 1 ♀. — St. CP 178, 520 m : 1 ♂.

CHALCAL 2 : st. DW 70, 232 m : 1 ♂.

Iles Chesterfield. MUSORSTOM 5 : st. DW 258, 300 m : 3 ♂. — St. CP 268, 280 m : 1 ♂. — St. CP 269, 270-250 m : 2 ♂, 1 ♀. — St. DW 274, 285 m : 6 ♂, 3 ♀. — St. CP 276, 269-258 m : 2 ♂. — St. CP 279, 160-270 m : 1 ♂. — St. DW 280, 270 m : 1 ♂. — St. CP 287, 270 m : 2 ♂. — St. CP 288, 270 m : 11 ♂, 2 ♀. — St. DW 298, 320 m : 1 ♂, 1 ♀. — St. DW 303, 332 m : 1 ♀. — St. CP 320, 315 m : 1 ♂. — St. DW 328, 355-340 m : 4 ♂, 2 ♀. — St. DW 330, 360-365 m : 3 ♂. — St. DW 334, 315-320 m : 1 ♀. — St. DW 353, 290 m : 2 ♂, 1 ♀.

Iles Loyauté. MUSORSTOM 6 : st. DW 391, 390 m : 1 ♂. — St. DW 392, 340 m : 2 ♂. — St. DW 397, 380 m : 2 ♂. — St. DW 398, 370 m : 1 ♂. — St. DW 411, 424 m : 1 ♂. — St. DW 412, 437 m : 1 ♂. — St. CP 419, 283 m : 4 ♂. — St. DW 428, 420 m : 1 ♀. — St. DW 439, 288 m : 1 ♂. — St. DW 453, 250 m : 2 ♀. — St. DW 457, 353 m : 2 ♂. — St. DW 459, 425 m : 1 ♂. — St. DW 462, 200 m : 1 ♀. — St. CP 464, 430 m : 3 ♂. — St. DW 474, 260 m : 2 ♀. — St. DW 479, 310 m : 1 ♂. — St. DW 480, 380 m : 2 ♂. — St. DW 485, 350 m : 1 ♂.

Iles Hunter et Matthew. VOLSMAR : st. DW 9, 300 m : 2 ♂, 1 ♀. — St. DW 41, 250 m : 1 ♀.

TYPES. — L'holotype et l'allotype sont un mâle et une femelle de la station DW 65 (BIOCAL). Les paratypes sont 3 mâles de la station DW 258 (MUSORSTOM 5). Ils sont déposés au MNHN sous les n° My 473, My 474 et My 475, respectivement.

DESCRIPTION. — Il s'agit d'une espèce bien représentée dans ces récoltes, avec 107 spécimens, soit 79 mâles et 28 femelles (sex-ratio = 2,8). La taille maximale observée est de 25,7 mm pour les premiers et 23,6 mm pour les secondes. Les yeux de couleur brun clair permettent de distinguer immédiatement cette espèce de *L. manilae*, aux yeux noirs malgré un long séjour dans l'alcool.

L'importance du rostre varie considérablement dans les deux sexes. Sa longueur maximale s'observe chez les mâles à l'est de la Nouvelle-Calédonie (campagnes BIOCAL et MUSORSTOM 6) où il dépasse toujours nettement la lamina antennulaire, atteignant fréquemment l'extrémité de l'écaille antennaire ; celui des femelles ne dépasse jamais la lamina (fig. 3 A-B). Des rostres courts, atteignant seulement une distance comprise entre la base de la lamina et la moitié du troisième segment antennulaire (fig. 3 I), caractérisent les spécimens des deux sexes peuplant la ride de Lord Howe (MUSORSTOM 5). Autour des Chesterfield, durant la même campagne, et lors de la première partie de MUSORSTOM 4, au nord-ouest de la Nouvelle-Calédonie, c'est-à-dire, dans les deux cas, au nord de 20°S, la longueur des rostres est intermédiaire, entre la base et le sommet de la lamina, sans différences sexuelles bien nettes là non plus.

La carapace est plus ou moins finement chagrinée à la partie antérieure et dépourvue d'épines post-orbitaires ; elle est lisse ailleurs. Les deux expansions aliformes qui la terminent postéro-latéralement, ainsi que la longueur de l'épine alaire qui les prolonge, diffèrent selon le lieu et le sexe. Leur importance varie dans le même sens que celle du rostre. Chez les mâles de l'est et du sud de la Nouvelle-Calédonie à long rostre (campagnes BIOCAL et MUSORSTOM 6), les ailes de la carapace sont allongées et se terminent par une longue épine dirigée vers le haut (fig. 3 D). Chez les femelles du même secteur, les ailes sont arrondies et se terminent par une épine courte et horizontale (fig. 3 C). Chez les spécimens capturés au sud de 20° S lors de MUSORSTOM 5, caractérisés par un rostre court, les ailes se terminent par une épine à peine marquée dans les deux sexes (fig. 3 J).

Le bord externe de la lamina antennulaire est arrondi et lisse, tandis que le bord interne, droit, se termine en une pointe plus ou moins forte ; une soie plumeuse est insérée au fond de l'encoche réalisée par la jonction entre les deux bords ; cette encoche, plus ou moins marquée (fig. 3 H, L), arrive parfois à disparaître.

L'écaille antennaire, plus longue que large (rapport longueur/largeur = 1,50 à 1,85), est munie de 5 à 7 dents sur le bord externe et se termine par une forte pointe droite. Il existe un rapport entre la longueur de cette écaille et celle du rostre, les écailles les plus longues s'observant chez les spécimens à rostre très développé (fig. 3 A, I).

Les deux épines tergales prolongeant le bord postérieur du sixième segment abdominal, une de chaque côté, sont petites (fig. 3 F-G). Le telson est assez large puisque le rapport longueur/largeur avoisine 2,50 ; il est caractérisé (fig. 3 G, 7 K) par :

— 2 à 3 paires d'épines latérales dont la taille augmente de l'avant vers l'arrière ;

— 1 paire d'épines sub-apicales de longueur au moins égale à la moitié de celle des épines apicales ;

— 1 paire d'épines apicales dont la longueur représente parfois le quart de celle du telson ;

— une petite languette terminale, étranglée à la base, munie distalement de 5 à 7 denticulations et de deux soies plumeuses, ce qui est assez original puisque chez la plupart des espèces ces dents et soies s'insèrent au même niveau que les épines apicales, c'est-à-dire sur la ligne joignant les points d'insertion de ces épines.

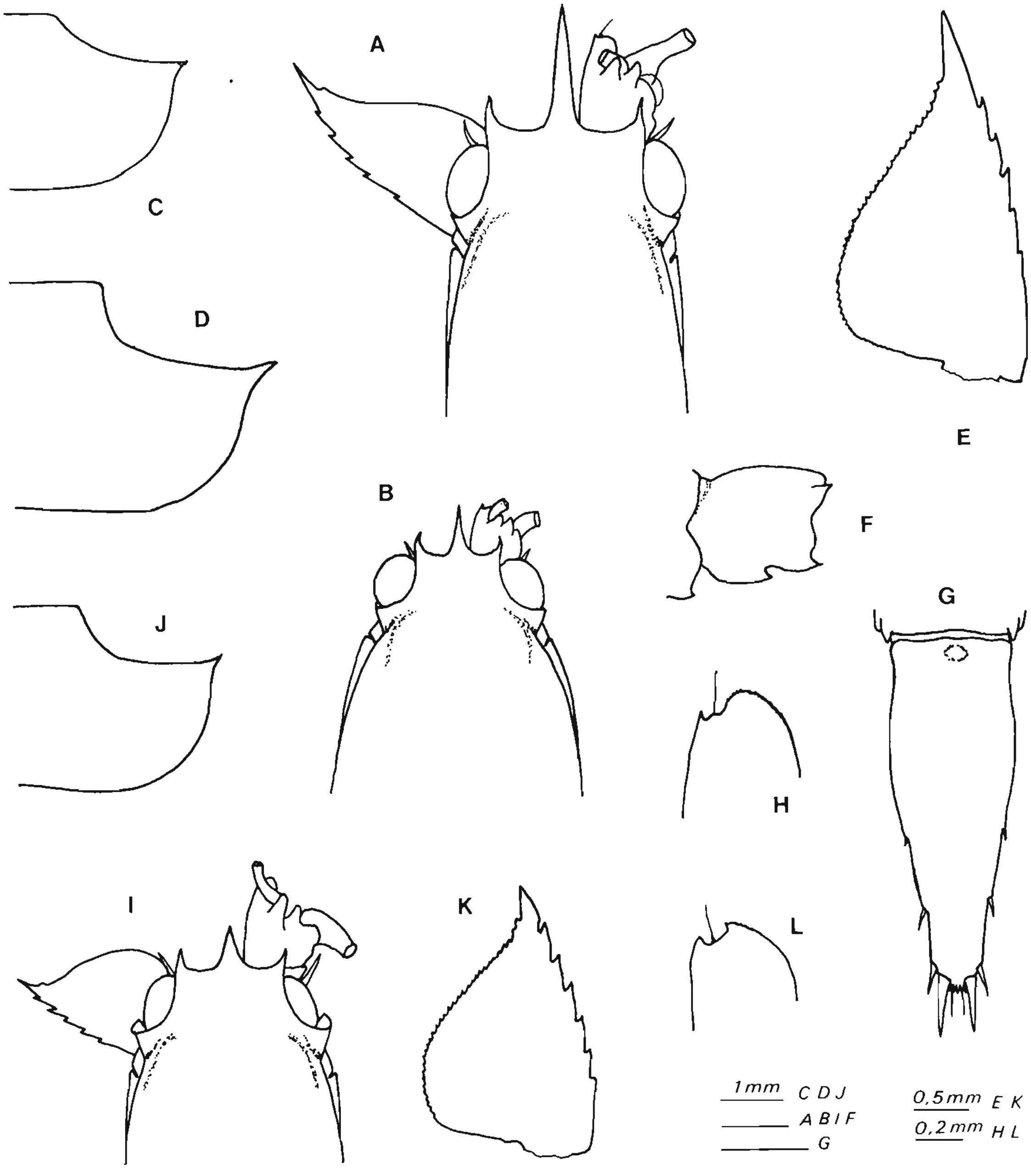

FIG. 3. — *Lophogaster neocaledonensis* sp. nov. : vues dorsales (**A** et **I**, mâle ; **B**, femelle) et latérales (**C**, femelle ; **D** et **J**, mâle) de la carapace; écaille antennaire (**E**, **K**); lamina de l'antennule (**H**, **L**); sixième pléonite en vue latérale (**F**) et telson (**G**). A - H : spécimens de la station DW 9 (VOLSMAR), I- L : spécimen de la station DW 274 (MUSORSTOM 5).

COMPARAISON AVEC LES AUTRES ESPÈCES

Par l'absence de tubercules sur la carapace, *Lophogaster neocaledonensis* se distingue d'emblée de deux espèces du Pacifique, *L. pacificus* Fage, 1940, et *L. japonicus* W. M. Tattersall, 1951, cette dernière récemment validée (MURANO, 1970) après avoir été mise en synonymie avec la précédente (O. S. TATTERSALL, 1960). Les autres caractères morphologiques qui viennent d'être décrits permettent de rapprocher *Lophogaster neocaledonensis* de deux espèces du Pacifique occidental et, davantage encore, de l'une de l'Atlantique centraméricain, auxquelles se limiteront donc les comparaisons et dont on peut rapidement rappeler les caractéristiques.

Lophogaster intermedius Hansen, 1910 a été sommairement décrit à partir de quelques spécimens de l'ouest de la Nouvelle-Guinée. Des précisions à sa diagnose ont été apportées depuis sur des spécimens provenant du sud des côtes birmanes (O. S. TATTERSALL, 1960) et des Philippines (BACESCU, 1985). Malgré quelques légères différences, les trois descriptions concordent et diffèrent de celle de *L. neocaledonensis*. On note en effet que :

— l'écaille antennaire est 2 à 2,5 fois plus longue que large (au lieu de 1,50 à 1,85);

— le telson ne porte qu'une paire d'épines latérales (au lieu de 2 ou 3) et la longueur des épines sub-apicales n'atteint jamais la moitié de celle des épines apicales, qui, elles-mêmes, sont toujours inférieures au cinquième de la longueur du telson (au lieu du quart);

— aucun auteur ne signale de différences sexuelles, tant dans le développement du rostre que dans celui des ailes de la carapace.

Lophogaster hawaiensis Fage, 1940 a été décrit par ORTMANN (1905) sous le nom de *L. typicus* M. Sars, 1856 (*pro parte*) ; O. S. TATTERSALL (1960) en a confirmé la description. Il se distingue de *L. neocaledonensis* par les caractères suivants :

— un rostre plus long chez les femelles que chez les mâles, dépassant nettement la pédoncule antennulaire chez les premières et n'atteignant que l'extrémité de la lamina chez les seconds ;

— l'écaille antennaire ne portant que 4 dents sur la moitié distale du bord externe et terminée par une pointe recourbée vers l'intérieur ;

— l'absence d'épines tergales sur le dernier pléonite ;

— la présence d'une seule paire d'épines latérales sur le telson dont les épines sub-apicales sont beaucoup plus courtes que les apicales.

Lophogaster longirostris Faxon, 1896, est, semble-t-il, l'espèce ayant le plus de caractères communs avec *L. neocaledonensis*, à savoir :

— la longueur du rostre, celui-ci pouvant atteindre l'extrémité de l'écaille antennaire;

— la forme et l'ornementation de l'écaille antennaire ;

— le développement de l'épine alaire de la carapace ;

— l'ornementation du telson, enfin, qui porte le plus souvent 3 paires d'épines latérales (jusqu'à 6 paires), une paire d'épines apicales très longues, puisque TATTERSALL souligne qu'elles peuvent atteindre le quart de la longueur du telson, et une languette apicale portant 5 à 8 denticulations. Elle s'en distingue en revanche par le rostre souvent plus long chez les femelles que chez les mâles (O. S. TATTERSALL, 1960), le grand développement des épines tergales du sixième pléonite et la forme de la lamina de l'antennule.

REMARQUES SUR LE GENRE *LOPHOGASTER*

L'étude des variations de *L. manilae* et *L. neocaledonensis* d'une part, des relations de *L. neocaledonensis* avec trois espèces voisines d'autre part, permet de vérifier ou d'amender les conclusions de FAGE (1942) au terme de son étude sur les *Lophogaster* récoltés par le "*Dana*" dans les trois océans. Il se confirme, comme on vient de le voir, que ce genre est très homogène et que la distinction de la quinzaine d'espèces qu'il rassemble, difficile. FAGE écrit même : "c'est l'un des problèmes de systématique les plus ardus qu'il m'ait été donné de rencontrer " et, quelques années plus tard, O. S. TATTERSALL (1960) ajoute : "the separation of its species has always presented great difficulty to the taxonomist because of the slight differences in their specific characters and of individual variation that may occur". En effet, ce sont les mêmes organes qui varient, mais en plus ou en moins (écaille antennaire ou rostre plus ou moins longs, par exemple) ; les espèces sont donc définies par une combinaison de ces caractères et c'est ainsi que *L. neocaledonensis* a plus de caractères communs avec une espèce de l'Atlantique qu'avec les deux du Pacifique dont elle est la plus proche. En revanche, la remarque de FAGE selon laquelle les espèces diffèrent les unes des autres par des caractères souvent mineurs mais constants, en raison de leur isolement géographique, est à nuancer. Vraie pour la longueur du rostre de *L. typicus* M. Sars, 1856, en Méditerranée et dans l'Atlantique nord-oriental, elle est inexacte pour ce même caractère (parmi d'autres) chez *L. neocaledonensis* et les femelles de *L. manilae* de la ride de Lord Howe et des côtes de Nouvelle-Calédonie. Et s'il n'y avait pas des spécimens de

L. neocaledonensis aux caractères intermédiaires dans les parages des îles Chesterfield, on aurait pu conclure à l'existence de deux espèces voisines pour les deux populations séparées par le bassin de Nouvelle-Calédonie ; il est vrai cependant que l'ornementation originale du telson (qui ne se retrouve que chez l'espèce atlantique *L. longirostris*) aurait plaidé contre cette hypothèse.

Conscient de ce problème, FAGE ajoutait aussi que, tant par souci d'uniformité avec les travaux antérieurs que pour la commodité de l'exposé, il élevait au rang d'espèces certaines formes, sans rien préjuger de leur rang taxonomique. FAGE pressentait donc le concept de l'espèce polytypique, développé par MAYR (1942), mais sans l'appliquer à son étude qu'il maintenait dans la lignée des travaux de systématique classique. Or, on sait maintenant, d'une part, que certaines espèces offrent des variations notables dans des secteurs peu éloignés comme on vient de le voir, d'autre part, que leur aire de répartition peut être assez vaste (cas de *L. manilae*). Il est donc probable que des espèces comme *L. intermedius* et *L. hawaiensis*, dont FAGE avait déjà souligné les grandes affinités, constituent une seule espèce. Il pourrait en être de même pour *L. multispinosus* et *L. schmidti*, également décrits par FAGE (1940), l'une des îles Fidji et Samoa, l'autre de la Nouvelle-Guinée. Selon l'auteur lui-même, ces deux espèces ne se distinguent que par des différences dans la longueur du rostre et des épines alaires, le nombre d'épines latérales du telson et, surtout, la forme de la lamina de l'antennule. Or, O. S. TATTERSALL (1960) a décrit des îles Hawaï des spécimens qu'elle attribue à une race géographique de *L. schmidti* en raison précisément de la forme de la lamina qui tend, mais l'auteur ne le relève pas, vers celle de *L. multispinosus*.

La prise en compte de critères écologiques comme le comportement bathymétrique pourrait aider à résoudre certains de ces problèmes. En effet, il a été difficile jusqu'à présent de comparer la distribution verticale des espèces à partir des données antérieures, souvent imprécises (cas de celles du "*Dana*", où la profondeur des récoltes est calculée d'après la longueur de câble filé). Or, il s'avère que celle-ci est différente selon l'espèce considérée dans les récoltes étudiées ici (tabl. 1) : *Lophogaster manilae*, la plus profonde, s'observe entre 375 et 770 m de profondeur, avec un maximum au-delà de 500 m, tandis que *L. neocaledonensis* apparaît à partir de 160 m et ne dépasse pas 520 m, avec un maximum entre 250 et 300 m.

Profondeur (en m)	150-200	200-250	250-300	300-350	350-400	400-450	450-500	> 500
L. manilae								
M					25	5	1	67
V					11		4	35
Total					**36**	**5**	**5**	**102**
L. neocaledonensis								
M	1	5	37	10	16	9		1
V		3	18	4	2	1		
Total	**1**	**8**	**55**	**14**	**18**	**10**		**1**
P. glaber								
M		1	13	4	4	1	1	1
V		1	30	2		3	1	9
Total		**2**	**43**	**6**	**4**	**4**	**1**	**10**
P. foresti								
M		1	22					
V		3	43					
Total		**4**	**65**					
P. philippinensis								
M		2	8	5	6			
V		2	14	3	5			
Total		**4**	**22**	**8**	**11**			
P. boucheti								
M						1		7
V							1	7
Total						**1**	**1**	**14**

TABLEAU 1. — Nombre de spécimens (mâles, femelles, total) des différentes espèces de *Lophogaster* et *Paralophogaster* capturés à différentes profondeurs.

Genre *PARALOPHOGASTER* Hansen, 1910

Ce genre différant notablement des autres Lophogastridés n'a pas été reconnu comme tel lors du tri des nombreux Mysidacés rapportés par les expéditions danoises. C'est pour cela qu'il ne figure pas dans l'étude exhaustive de FAGE sur les Lophogastridés du "*Dana*".

Il comptait sept espèces jusqu'en 1981, année où BACESCU en décrivit deux nouvelles sur les trois vivant dans les eaux des Philippines (campagne MUSORSTOM 1, mars 1976). Celles-ci, à savoir *Paralophogaster philippinensis*, *P. foresti* et *P. glaber*, se retrouvent dans ce matériel, en compagnie d'une espèce nouvelle, *P. boucheti*.

Paralophogaster glaber Hansen, 1910

Fig. 7 A-B

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie.** BIOCAL : st. CP 42, 380 m : 1 ♂. — St. DW 44, 440-450 m : 1 ♂, 2 ♀.

MUSORSTOM 4 : st. CP 153, 235 m : 1 ♂, 1 ♀. — St. CC 173, 250-290 m : 12 ♂, 26 ♀. — St. CP 178, 520 m : 1 ♂, 7 ♀. — St. DW 183, 280 m : 1 ♂, 4 ♀. — St. DW 209, 310-315 m : 2 ♂. — St. DW 210, 340-345 m : 1 ♂. — St. DW 220, 505-550 m : 1 ♀. — St. DW 222, 410-440 m : 1 ♀. — St. CP 240, 475-500 m : 1 ♀.

CHALCAL 2 : st. DW 81, 311 m : 1 ♀.

Iles Chesterfield. MUSORSTOM 5 : st. DW 301, 487-610 m : 1 ♀. — St. DW 330, 360-365 m : 1 ♂. — St. DW 339, 380-395 m : 2 ♂. — St. DC 345, 305-310 m : 1 ♀. — St. CP 389, 500 m : 1 ♂.

Iles Loyauté. MUSORSTOM 6 : st. CP 481, 300 m : 1 ♂.

REMARQUES. — BACESCU (1981) a donné des compléments à la description originale, les exemplaires philippins différant légèrement de ceux de HANSEN provenant du sud de la Nouvelle-Guinée. C'est dire qu'il y a peu à ajouter à la connaissance de cette espèce, la première décrite. C'est l'une des plus abondantes dans ces récoltes, avec 71 spécimens (25 mâles, 46 femelles, sex-ratio = 0,54). La taille maximale observée, du rostre à l'extrémité du telson, est de 23 mm, supérieure à celle relevée dans les secteurs ci-dessus (18 à 20 mm). Les yeux aussi sont plus grands, le rapport O/R (diamètre de l'oeil / largeur de la plaque rostrale) = 1,65 à 1,75, contre 1,3 à 1,5. Quant à l'épine située à la partie proximale inférieure de l'endopodite de l'uropode, elle est tout juste égale à la largeur de cet article au niveau de son insertion (fig. 7 A) et non pas plus longue, comme l'indique BACESCU.

Paralophogaster foresti Bacescu, 1981

Fig. 4 A-B, 7 C-D

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie.** MUSORSTOM 4 : st. CP 152, 228 m : 3 ♀. — St. DW 184, 260 m : 8 ♂, 13 ♀.

CHALCAL 2 : st. DW 69, 260 m : 1 ♀. — St. CP 18, 274 m : 7 ♂, 13 ♀. — St. CP 19, 271 m : 6 ♂, 15 ♀.

Iles Chesterfield. MUSORSTOM 5 : st. CP 288, 270 m : 1 ♂, 1 ♀.

Iles Loyauté. MUSORSTOM 6 : st. DW 462, 200 m : 1 ♂.

REMARQUES. — Avec 69 spécimens (23 mâles, 46 femelles, sex-ratio = 0,5), cette espèce est également bien représentée dans ces collections. Elle se caractérise par la présence d'un prolongement digitiforme transparent à la limite entre la cornée, de couleur brun rougeâtre, et le pédoncule oculaire. Mais il existe quelques différences avec la description originale, basée il est vrai sur 3 spécimens seulement. Il s'agit bien d'une petite espèce, mais elle atteint ici 16,5 mm contre 13,5 mm à peine aux Philippines. En vue dorsale (fig. 4 A), la plaque rostrale est nettement arrondie, ressemblant à celle de *P. glaber*, au lieu de former un angle de 145° entre le rostre et les épines latérales, qui sont situées ici plus près de la base de la plaque ; par ailleurs, en vue de profil (fig. 4 B), celle-ci est horizontale et non pas inclinée à 30° comme la figure BACESCU. Les épines latérales du telson aussi sont légèrement moins nombreuses (fig. 7 D).

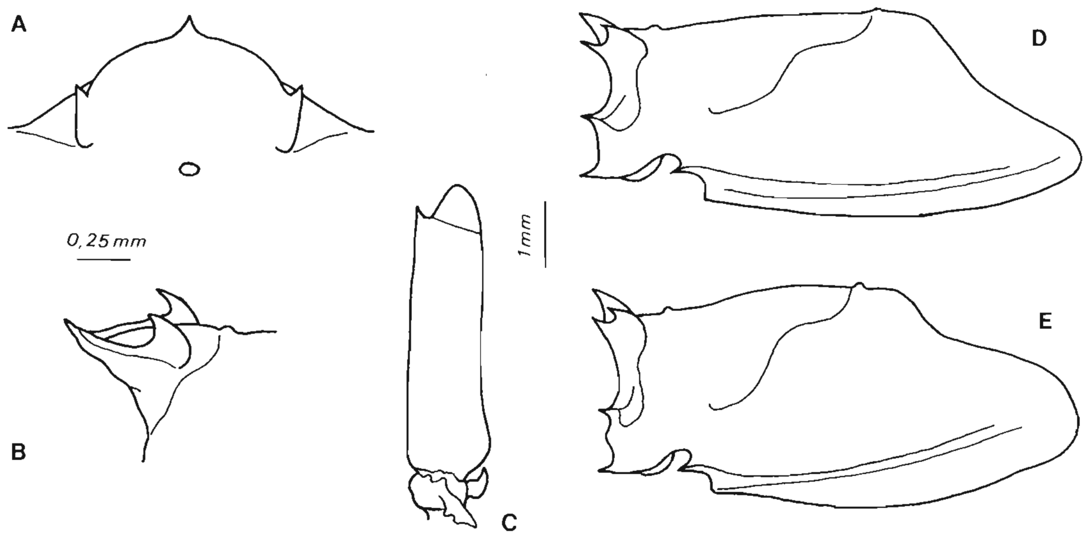

FIG. 4. — *Paralophogaster foresti* : vue dorsale (**A**) et latérale (**B**) de la plaque rostrale d'un mâle de la station DW 184 (MUSORSTOM 4).

Paralophogaster philippinensis : écaille antennaire (C) et vue latérale de la carapace d'une femelle (**D**) et d'un mâle (**E**) de la station CP 42 (BIOCAL).

Paralophogaster philippinensis Bacescu, 1981

Fig. 4 C-E, 7 E-F

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie**. BIOCAL : st. CP 42, 380 m : 6 ♂, 5 ♀.

MUSORSTOM 4 : st. CP 152, 228 m : 2 ♂. — St. DW 183, 280 m : 3 ♂, 7 ♀. — St. DW 184, 260 m : 5 ♂, 7 ♀. — St. DW 185, 235 m : 2 ♀. — St. DW 209, 310 -315 m : 4 ♂.

Iles Chesterfield. MUSORSTOM 5 : st. DC 345, 305-310 m : 1 ♂. — St. DC 375, 300 m : 3 ♀.

REMARQUES. — Cette espèce arrive bien après les deux précédentes dans l'ordre d'abondance décroissante, avec 45 spécimens (21 mâles, 24 femelles, sex-ratio = 0,87). On la reconnaît facilement à la forme et à l'étroitesse de sa plaque rostrale, qui donne un rapport O/R élevé : 1,6 à 1,75, moins élevé cependant que ne l'indique BACESCU pour les exemplaires philippins : 1,8 à 1,9. La taille est légèrement inférieure aussi : 23 mm contre 25. En revanche, les deux épines situées à la partie proximale inférieure de l'endopodite de l'uropode sont plus importantes : elles représentent un tiers de la largeur de cet appendice au lieu de moins du cinquième, et sont bien séparées l'une de l'autre (fig. 7 E). Quant au bord externe de l'écaille antennaire, il est rectiligne au lieu d'être légèrement convexe (fig. 4 C). Enfin, il y a un dimorphisme sexuel dans la morphologie des ailes latérales terminant la carapace, jamais signalé dans ce genre, celles-ci étant plus effilées chez les femelles que chez les mâles (fig. 4 D, E).

Paralophogaster boucheti sp. nov.

Fig. 5, 7 G-H

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie**. BIOCAL : st. CP 54, 1000-950 m : 1 ♂. — St. CP 109, 495-515 m : 1 ♀.

MUSORSTOM 4 : st. DW 161, 565 m : 1 ♀. — St. DW 222, 410-440 m : 1 ♂. — St. CP 236, 495-550 m : 2 ♂, 4 ♀. — St. CP 241, 470-480 m : 1 ♀.

Iles Chesterfield. MUSORSTOM 5 : st. CP 387, 650-660 m : 4 ♂, 1 ♀.

TYPES. — L'holotype est la femelle de la station CP 109 (BIOCAL). Les paratypes sont 2 mâles de la station CP 387 (MUSORSTOM 5). Ils sont déposés au MNHN sous les n° My 476 et My 477, respectivement.

DESCRIPTION. — Elle porte sur 16 spécimens où mâles et femelles figurent à égalité (8 et 8). Il s'agit de la plus grande espèce de ce genre connue à ce jour, puisque l'holotype atteint 31 mm. Comme pour les *Lophogaster*, je ne décrirai que les caractères permettant de la distinguer, sans ambiguïté, des autres espèces du genre.

Les yeux, réniformes, sont volumineux, mesurant jusqu'à 3 mm dans leur plus grand axe, soit près du dixième de la taille des grands spécimens. Mais cela n'apparaît pas dans le rapport O/R, compris entre 1,3 et 1,5, eu égard à la largeur relativement importante de la plaque rostrale (fig. 5 A-B). Celle-ci est caractéristique : en vue de profil, la pointe rostrale est dans le prolongement de la carapace et les épines latérales, situées bien au-dessus, terminent deux grandes ailes surélevées ; en vue dorsale, la plaque affecte la forme d'un trident, avec le rostre nettement en avant des épines latérales. Celui-ci présente deux aspects selon la provenance des spécimens : terminé par une pointe chez ceux des parages néo-calédoniens (campagnes BIOCAL et MUSORSTOM 4), il est arrondi (fig. 5 C) chez ceux des îles Chesterfield (campagne MUSORSTOM 5).

Les antennes sont munies d'une grande écaille dont le bord extérieur, glabre, est rectiligne (fig. 5 D) ; à la base de celle-ci, sur la partie externe du sympodite, existe une épine acérée. Il y a également une épine sur la partie inféro-interne du pédoncule.

La carapace est parfois chagrinée à la partie antérieure. L'encoche antéro-latérale dans laquelle vient s'appliquer le maxillipède I est assez profonde (fig. 5 A). Le tubercule post-rostral est peu marqué ; le postérieur est à peine indiqué ou absent. Les ailes qui la terminent postérieurement sont plus effilées chez les femelles que chez les mâles.

Le dernier pléonite, égal au telson, est légèrement plus long que les deux précédents réunis. Il est au moins deux fois plus long que haut (L/H = 2 à 2,3). L'exopodite de l'uropode est caractéristique du genre (fig. 5 E) : il est formé de deux articles dont le premier est muni de 4 épines sur son bord distal externe. Sur la face interne de la base de l'endopodite, existent 1 à 4 épines situées sur une carène, la plus longue étant la plus distale (fig. 5 F, 7 G-H). Le telson est linguiforme (fig. 5 G) ; à partir du tiers proximal, s'observent 4 à 6 paires d'épines latérales, puis une paire plus longue, suivie de 3 à 5 autres paires de taille allant croissant jusqu'à la paire apicale. Entre ces dernières, la plaque apicale du telson porte 5 denticulations et 4 longues soies plumeuses (fig. 5 H).

ÉTYMOLOGIE. — Cette espèce est dédiée au Dr Philippe BOUCHET, du Muséum national d'Histoire naturelle, qui a participé à la plupart des campagnes MUSORSTOM avec enthousiasme et a toujours fait preuve d'une détermination sans faille pour les tris des récoltes, quel que soit l'état de la mer.

COMPARAISON AVEC LES AUTRES ESPÈCES ET DISCUSSION

Le genre *Paralophogaster* compte à présent dix espèces décrites, l'existence d'un *Paralophogaster* sp. s'appliquant à un spécimen en mauvais état, signalé par BACESCU (1981) dans les eaux philippines, et qui serait une espèce nouvelle, doit être en effet confirmée. D'après l'ornementation du telson, on peut ranger ces espèces en deux groupes :

— Groupe "*glaber*", dont le telson linguiforme présente une constriction marquée au niveau d'une paire de très longues épines latérales, aussi longues que la paire apicale, leur extrémité dépassant parfois le milieu de ces dernières (fig. 7 B) ; on y range *P. glaber* Hansen, 1910, *P. microps* Colosi, 1930, *P. macrops* Colosi, 1934, *P. intermedius* Coifmann, 1936, *P. atlanticus* W. M. Tattersall, 1937, et *P. indicus* Pillai, 1973.

— Groupe "*sanzoi*", dont le telson linguiforme ne présente pas de rétrécissement au niveau de la paire de grandes épines latérales, qui ne sont pas très longues et n'arrivent jamais au niveau de l'implantation des épines apicales, elles-mêmes peu importantes (fig. 7 D, F) ; il rassemble *P. sanzoi* Colosi, 1930, *P. philippinensis* Bacescu, 1981, *P. foresti* Bacescu, 1981, et *P. boucheti* sp. nov.

Selon BACESCU (1981), certaines espèces du premier groupe (*P. macrops*, *P. atlanticus* et *P. indicus*) devraient être mises en synonymie avec *P. glaber*, s'il s'avérait qu'elles possèdent la très forte épine caractéristique à la partie proximale de l'endopodite de l'uropode. Or, d'une part, cette éventualité était déjà envisagée par W. M. TATTERSALL (1937) lors de la description de *P. atlanticus* et, d'autre part, dans celle de *P. indicus*, PILLAI (1973) mentionne cette épine bien qu'il ne la figure pas.

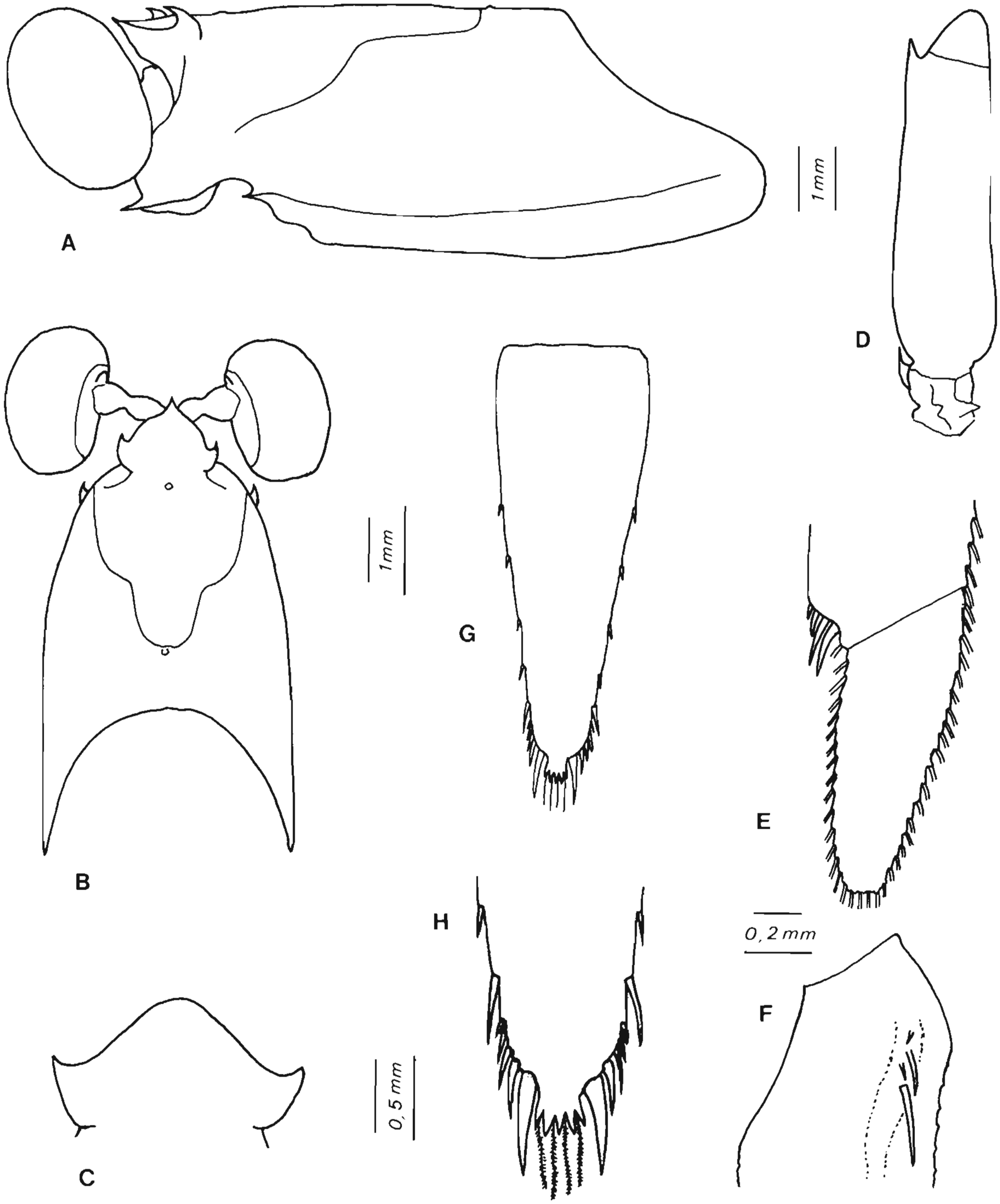

FIG. 5. — *Paralophogaster boucheti* sp. nov. : vue latérale (**A**) et dorsale (**B**) de la carapace et des yeux; autre aspect de la plaque rostrale (**C**); écaille antennaire (**D**); extrémité de l'exopodite (**E**) et partie proximale de l'endopodite (**F**) de l'uropode; telson (**G** et **H**). A-H = femelle de la station CP 236 (MUSORSTOM 4), sauf C = mâle de la station CP 387 (MUSORSTOM 5).

Il en va autrement pour les espèces du second groupe où la forme particulière du rostre différencie sans aucun doute *P. philippinensis* et *P. boucheti* et la présence d'une papille oculaire digitiforme, *P. foresti*. Seules la première et *P. sanzoi* ne se distinguent que par des différences quantitatives (rapport O/R = 1,6 à 1,9 contre 1, respectivement). Or, on vient de voir que ce rapport varie chez *P. philippinensis* des eaux philippines (1,8 à 1,9) et des eaux néo-calédoniennes (1,6 à 1,75) et, par ailleurs, des variations oculaires ont été signalées entre les populations de plusieurs espèces de Crustacés, notamment d'un autre Lophogastridé, *Eucopia hanseni* Nouvel, 1942 [= *E. unguiculata* (Willemoës-Suhm, 1875)] (CASANOVA, 1977). Ce caractère n'est peut-être pas suffisant. Celui de la différence écologique, *P. sanzoi* étant une espèce pélagique de mer Rouge et *P. philippinensis* étant benthique, souligné par BACESCU (1981), semble en revanche plus convaincant. L'examen de la répartition bathymétrique des espèces présentes dans ces récoltes en atteste.

A l'instar des *Lophogaster*, les *Paralophogaster* manifestent en effet des comportements bathymétriques spécifiques (tabl. 1). *Paralophogaster glaber*, qui a semble-t-il la plus vaste répartition géographique, est aussi l'espèce ayant la plus large distribution verticale puisqu'elle s'observe entre 200 et 610 m de profondeur. Celle des trois autres est plus restreinte : entre 200 et 300 m pour *P. foresti*, entre 200 et 400 m pour *P. philippinensis* et entre 400 et 1000 m pour *P. boucheti*, qui apparaît ainsi comme étant la plus profonde.

Famille EUCOPIIDAE G. O. Sars

Genre *EUCOPIA* Dana, 1852

Eucopia australis Dana, 1852

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie.** BIOCAL : st. CP 60, 1530-1480 m : 1 ♀.

REMARQUES. — La morphologie de ce spécimen correspond exactement aux descriptions de FAGE (1942). Il s'agit d'une espèce véritablement ubiquiste, puisque présente dans tous les océans et, dans le Pacifique en particulier, du détroit de Behring à l'ouest de la Nouvelle-Zélande et des eaux indonésiennes à celles de Panama.

Sous-ordre MYSIDA

Famille PETALOPHTHALMIDAE

Genre *PETALOPHTHALMUS* Willemoës-Suhm, 1875

Petalophthalmus armiger Willemoës-Suhm, 1875

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie.** BIOCAL : st. CP 05, 2340 m : 1 ♀.

REMARQUES. — Ce spécimen mesure 46 mm et est conforme aux descriptions antérieures. Il est remarquable qu'il n'existe aucune variation morphologique apparente chez cette espèce à vaste répartition, puisque trouvée dans les trois océans.

Genre *HANSENOMYSIS* Stebbing, 1893

Hansenomysis carinata sp. nov.

Fig. 6, 7 I-J

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie.** BIOCAL : st. CP 54, 1000-950 m : 1 ♂ (holotype déposé au MNHN, sous le n° My 472).

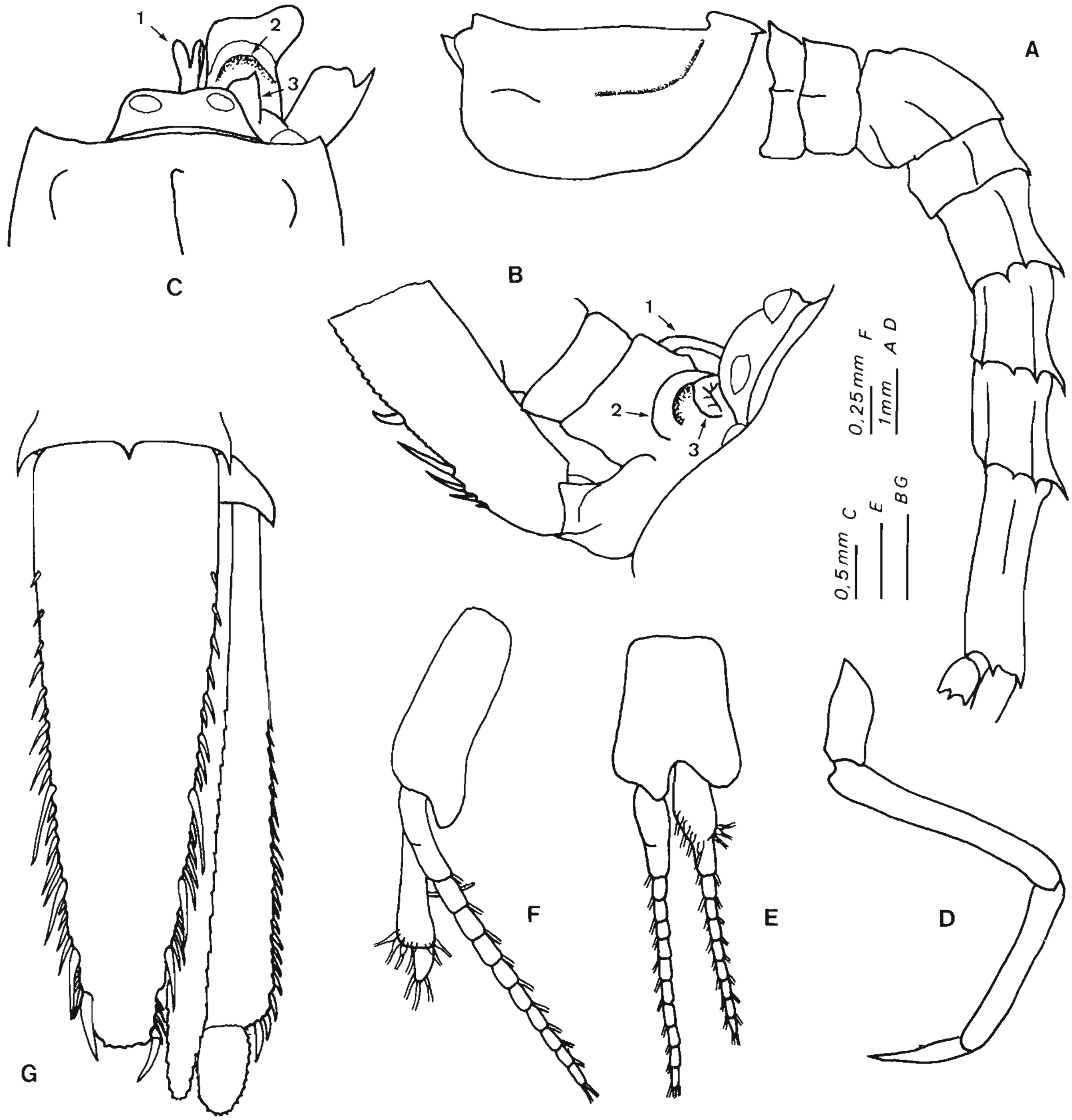

FIG. 6. — *Hansenomysis carinata* sp. nov. : vue latérale de la carapace, des deux derniers segments thoraciques et des pléonites (**A**) ; partie antérieure du corps en vue dorso-latérale (**B**) et dorsale (**C**) ; endopodite du septième thoracopode droit (**D**) ; deuxième (**E**) et cinquième (**F**) pléopode gauche ; telson et uropode droit en vue dorsale (**G**). En B et C, les cuillerons prolongeant la plaque oculaire, l'organe de TATTERSALL et la languette qui le surmonte sont indiqués par les flèches 1 à 3, respectivement.

DESCRIPTION. — Cette espèce, représentée par un seul mâle, est originale par la présence de carènes latérales sur les deux derniers segments thoraciques et sur tous les segments abdominaux (fig. 6 A). Bien que cet exemplaire soit légèrement abîmé comme le sont la plupart des spécimens de ces espèces fragiles, une description complète peut en être donnée.

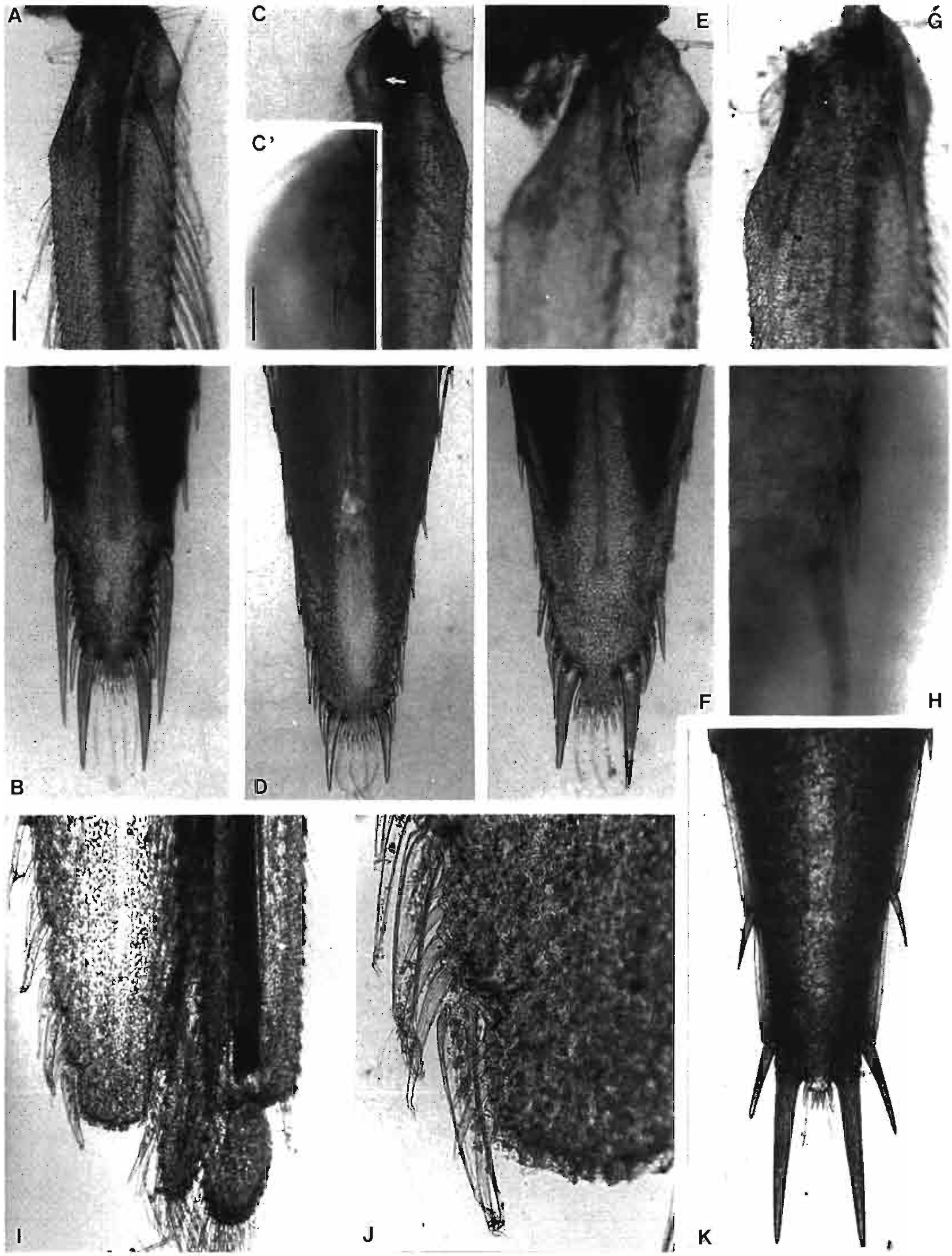

FIG. 7. — *Paralophogaster glaber* (A, B), *P. foresti* (C, C', D), *P. philippinensis* (E, F) et *P. boucheti* sp. nov. (G, H) : partie basale inférieure de l'endopodite de l'uropode (**A**, **C**, **E**, **G**) ; extrémité du telson (**B**, **D**, **F**) et détail de la région d'implantation des épines caractéristiques (**C'**, **H**).
Hansenomysis carinata sp. nov. : partie distale du telson et de l'uropode (**I**) et détails du telson (**J**).
Lophogaster neocaledonensis sp. nov. : extrémité du telson d'une femelle de la campagne MUSORSTOM 5 (**K**).
Échelles : C', H et J = 0,1 mm ; autres = 0,25 mm.

La plaque oculaire est bien développée ; son bord antérieur, arrondi, émet deux prolongements en forme de cuillerons symétriques, situés entre les deux pédoncules antennulaires, en contact par leur bord convexe. On y observe deux cavités symétriques au sommet d'une sorte de tronc de cône surbaissé, comme si deux pédoncules oculaires avaient été arrachés (fig. 6 B-C).

Le bord antérieur de la carapace, arrondi, est nettement relevé (fig. 6 C, A). Les angles antéro-latéraux sont émoussés. Sur la ligne médio-dorsale s'observent deux crêtes grossièrement triangulaires, plus hautes antérieurement : l'une à l'avant, s'élevant à une courte distance du bord antérieur de la carapace ; l'autre à l'arrière, atteignant le bord postérieur de celle-ci. Deux crêtes latérales moins importantes sont situées de part et d'autre de la crête dorsale antérieure. Enfin, débutant au tiers postérieur des côtés de la carapace, deux sillons bien marqués convergent vers la base de la crête dorsale postérieure.

La carapace ne recouvre pas les deux derniers segments thoraciques qui, tous deux, portent une courte carène latérale débutant au bord antérieur ; le dernier segment recouvre légèrement le précédent.

Le sixième segment abdominal est aussi long (3 mm) que les deux précédents réunis. Tous les segments abdominaux portent des carènes latérales : une seule sur les premier, second, troisième et sixième segments ; deux sur les quatrième et cinquième. Celles des troisième, quatrième et cinquième segments se prolongent par des épines postéro-latérales. En effet, hormis le premier segment, tous portent des processus épineux postérieurs :

— dorsaux, du deuxième au sixième, dont la taille va régulièrement croissant jusqu'au cinquième ;
— médio-latéraux, du troisième au sixième ;
— supéro-latéraux, du troisième au cinquième ;
— inféro-latéraux, sur les quatrième et cinquième.

Je ne décrirai pas en détail tous les appendices l'un après l'autre lorsqu'ils sont caractéristiques du genre et ne sont pas un élément de diagnose déterminant ; en effet, leur arrachage en vue de les dessiner détériorerait davantage le spécimen.

Sur le premier article de chaque pédoncule antennulaire s'observe l'organe de TATTERSALL, en forme de large dépression circulaire peu profonde, sur le bord proximal de laquelle se dresse une languette foliacée plus petite que l'organe lui-même (fig. 6 B-C).

Les antennes sont abîmées ; seule subsiste la partie proximale de l'écaille antennaire gauche. Elle porte, sur son bord externe et près de sa base, 4 épines dont la taille va croissant, une douzaine de soies plumeuses et une autre épine (fig. 6 B). Le sympodite porte, sur son bord distal externe, une épine acérée.

Les endopodites des deux dernières paires de pattes thoraciques sont forts, avec le dactyle en forme de griffe épaisse (fig. 6 D). Ceux de la sixième paire, qui ont la même morphologie (caractère générique), manquent. Tous les pléopodes sont biramés. Il n'y a pas de soies spiniformes modifiées sur le bord interne du premier article de l'exopodite du deuxième pléopode (fig. 6 E). L'endopodite de la cinquième paire, qui paraît biarticulé, est plus court que l'exopodite (fig. 6 F). L'exopodite des uropodes est formé de deux articles (fig. 6 G, 7 I). Sur les deux tiers distaux du bord externe de l'article proximal sont implantées 20 épines dont la taille va régulièrement croissant d'avant en arrière, les deux dernières, les plus grandes, étant situées près de l'article distal qui, beaucoup plus étroit que l'article proximal, n'occupe pas toute la place d'insertion disponible sur celui-ci.

Le telson, aussi long que l'article proximal de la rame externe des uropodes (fig. 6 G, 7 I), est trois fois moins large à son extrémité qu'à sa base. Il porte de chaque côté une dizaine d'épines, puis 4 longues épines entre lesquelles s'insèrent des séries de 4 à 5 épines plus faibles au sein desquelles la taille augmente régulièrement d'avant en arrière. Ces épines sont plus ou moins serrulées sur leur bord interne (fig. 7 J). Celles de la partie apicale manquent, mais la trace de leur implantation indique qu'il y en avait probablement 2 petites, encadrées par 2 plus grandes.

COMPARAISON AVEC LES AUTRES ESPÈCES ET GENRES DE LA FAMILLE DES PETALOPHTHALMIDAE

Le genre *Hansenomysis* comprend à présent quatorze espèces puisque, en 1985, MURANO et KRYGIER en ont séparé cinq pour les rattacher à un nouveau genre, *Bacescomysis*, qui s'en distingue essentiellement par la rame externe de l'uropode constituée par un seul article, mais aussi par la plaque oculaire ornée de deux épines et la coloration violette de la partie antérieure du céphalothorax chez les animaux récemment capturés.

Seules deux des treize espèces précédemment décrites portent des prolongements épineux postérieurs sur les segments abdominaux, où ils se limitent à une paire d'épines latérales par segment : sur tous les segments chez *Hansenomysis menziesi* Bacescu, 1971, et sur les cinq derniers chez *H. nouveli* Lagardère, 1983. La présence, d'une part, de carènes latérales sur les deux derniers segments thoraciques et sur tous ceux de l'abdomen, d'autre part, d'épines postérieures dorsales sur les cinq derniers segments abdominaux distingue *H. carinata* sans confusion possible. Il est curieux de constater en revanche que l'armature épineuse de ses quatre derniers segments abdominaux ressemble davantage à celle des deux espèces du quatrième genre composant la famille des Petalophthalmidae, *Ceratomysis spinosa* Faxon, 1893, et *C. egregia* Hansen, 1910.

Les mâles des genres *Hansenomysis* et *Bacescomysis* étant rares, l'examen du mâle d'*H. carinata* révèle peut-être d'autres différences génériques que celles mentionnées plus haut. Il n'y a pas de soies spinulées modifiées sur la face interne du premier segment de l'exopodite du deuxième pléopode, ce qui confirmerait l'hypothèse de MURANO et KRYGIER (1985) selon laquelle ce caractère distinguerait *Bacescomysis* d'*Hansenomysis*. Par ailleurs, la morphologie du cinquième pléopode pourrait avoir la même valeur. En effet, chez les espèces d'*Hansenomysis* où il a été décrit, l'endopodite est plus court (*H. fyllae* Stebbing, 1893, et *S. carinata* sp. nov.) ou légèrement plus long (*H. antarctica* Holt & W. M. Tattersall, 1906, et *H. falklandica* O. S. Tattersall, 1957) que l'exopodite ; chez les espèces de *Bacescomysis* (*B. peruvianus* Bacescu, 1971, *B. abyssalis* Lagardère, 1983, et *B. pacifica* Murano & Krygier, 1985), il est deux fois plus long.

Enfin, il faut souligner la grande diversité spécifique des genres *Hansenomysis* (14 espèces) et *Bacescomysis* (5 espèces), s'opposant au petit nombre d'espèces des genres *Petalophthalmus* et *Ceratomysis*. Elle était qualifiée d'étonnante par LAGARDÈRE (1983) qui, décrivant quatre espèces nouvelles dans l'aire géographique restreinte du golfe de Gascogne, parlait même d'"évolution vigoureuse de ce genre [*Bacescomysis* n'était pas encore séparé d'*Hansenomysis*] dans la zone abyssale". Venant après la description de sept autres espèces nouvelles sur les huit récoltées dans la seule fosse du Pérou par BACESCU (1971), ces remarques sont parfaitement justifiées.

Les espèces d'*Hansenomysis* vivent sous toutes les latitudes, de l'Antarctique au Groenland et à la fosse des Kouriles, mais généralement moins profondément dans les régions polaires que sous les tropiques, puisqu'on les capture à partir de 100 m de profondeur dans la mer de Ross, 185 m dans le détroit de Magellan, 650 m au large de la Nouvelle-Angleterre, 1280 m dans la fosse du Pérou et 950 à 1000 m dans les parages de la Nouvelle-Calédonie.

REMARQUES SUR LES MYSIDACÉS DE LA RÉGION NÉO-CALÉDONIENNE

La découverte de trois espèces nouvelles dans ces collections montre, si besoin en était encore, que l'on est loin d'avoir terminé les inventaires faunistiques dans l'ouest-Pacifique où n'ont été faits, jusqu'à présent, que quelques prélèvements lors des grandes campagnes océanographiques, surtout lorsqu'il s'agit d'organismes benthiques à répartition moins uniforme que ceux du plancton. Il est bon de rappeler, en ce qui concerne les seuls Lophogastrida, que BACESCU (1981, 1985 et 1991) dans des prélèvements similaires dans les eaux des Philippines a décrit cinq espèces nouvelles : deux *Lophogaster*, deux *Paralophogaster* et une *Eucopia*. Pour l'ensemble des campagnes organisées par le Muséum national d'Histoire naturelle et l'ORSTOM dans l'Ouest-Pacifique, cela fait donc huit Mysidacés nouveaux, parmi lesquels trois *Lophogaster* et trois *Paralophogaster*. Et lorsqu'on sait que seules les espèces du premier genre ont été étudiées dans les récoltes du "*Dana*" (FAGE, 1942) ou ont fait l'objet de monographies (O. S. TATTERSALL, 1960), on peut imaginer qu'on est loin de connaître toutes celles du second restant à découvrir dans l'ensemble des océans. Il en va de même pour les genres *Hansenomysis* et *Bacescomysis* dont on connaît le grand pouvoir de spéciation.

Avant ces campagnes, on dénombrait cinq espèces de *Lophogaster* dans le Pacifique et cinq dans l'Atlantique, dont la faune est mieux connue. Il en existe maintenant huit dans le Pacifique, où il est intéressant de constater que six d'entre elles ont été trouvées sur la bordure occidentale. La prospection du versant américain reste donc à faire. On peut maintenant mieux cerner les limites géographiques de trois de ces espèces. Absent dans le matériel néo-calédonien, *Lophogaster pacificus* Fage, 1940, s'étend donc de la moitié méridionale des côtes orientales du Japon à la mer de Chine et aux Philippines. *Lophogaster intermedius* semble limité aux archipels philippin et indonésien. Quant à *Lophogaster manilae*, on l'observe du sud des Philippines à la Nouvelle-Calédonie.

Le genre *Paralophogaster* est représenté dans l'Ouest-Pacifique par quatre espèces ; il en existerait peut-être une cinquième dans le secteur des Philippines, selon BACESCU (1981), qui soulignait que la diversité spécifique de ce genre y égalait celle qu'il offre en mer Rouge où ont été décrites aussi quatre espèces (COLOSI, 1930 et 1934 ; COIFMANN, 1936). Mais leur écologie est différente dans ces deux aires marines : benthiques dans le Pacifique puisque toujours capturées dans des dragages, elles sont toutes planctoniques en mer Rouge où elle sont souvent récoltées à proximité de la surface, au-dessus des grands fonds (observations non publiées).

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4

Crustacea Amphipoda : Lysianassoids from Philippine and Indonesian waters

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ABSTRACT

Ten genera and fourteen species of lysianassoid amphipods are reported from Philippine and Indonesian waters. Nine of these are new species (*Aristias coriolis, A. verdensis, Eucallisoma barnardi, Figorella corindon, Onesimoides castellatus, O. mindoro, Paracentromedon pacificus, Pseudamaryllis andresi* and *Trischizostoma crosnieri*). Five of the genera (*Eucallisoma, Figorella, Paracentromedon, Pseudamaryllis* and *Trischizostoma*) are new records for the south-east Asian area. Only four species (*Cyphocaris anonyx* Boeck, 1871, *Ichnopus wardi* Lowry & Stoddart, 1992, *Onesimoides castellatus* and *O. mindoro*) are recorded from both areas.

RÉSUMÉ

Crustacea Amphipoda : Lysianassoides des Philippines et d'Indonésie.

Dix genres et 14 espèces d'Amphipodes Lysianassoides sont signalés des Philippines et d'Indonésie. Neuf de ces espèces sont nouvelles (*Aristias coriolis, A. verdensis, Eucallisoma barnardi, Figorella corindon, Onesimoides castellatus, O. mindoro, Paracentromedon pacificus, Pseudamaryllis andresi* and *Trischizostoma crosnieri*). Cinq genres (*Eucallisoma, Figorella, Paracentromedon, Pseudamaryllis* and *Trischizostoma*) sont signalés pour la première fois du Sud-Est asiatique. Seules quatre espèces ont été récoltées aussi bien aux Philippines qu'en Indonésie.

INTRODUCTION

There have been few records of lysianassoid amphipods from the Philippine area. DAHL (1959), BIRSTEIN & VINOGRADOV (1963) and HESSLER *et al.* (1978) have recorded four species from the Philippine Trench, and LOWRY & STODDART (1992) recently recorded *Ichnopus wardi* from Mindanao. The Indonesian area is slightly better known with sixteen species recorded, mainly from the reports of the *Siboga* Expedition (PIRLOT, 1933, 1936).

LOWRY, J. K., & STODDART, H. E., 1993. — Crustacea Amphipoda : Lysianassoids from Philippine and Indonesian waters. *In* : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, Volume 10. *Mém. Mus. natn. Hist. nat.*, **156** : 55-109. Paris ISBN 2-85653-206-3.

The French expeditions (MUSORSTOM 1 in 1976, MUSORSTOM 2 in 1980 and MUSORSTOM 3 in 1985) to the Philippines (see reports of FOREST, 1981, 1985 and 1989) and the French-Indonesian expedition CORINDON 2 to Indonesia were searching mainly for the glypheid decapod *Neoglyphea inopinata* Forest & de Saint Laurent. However they also produced a small, but very interesting collection of lysianassoid amphipods. Based on these collections we add seven new species to the Philippine fauna and six new species and two new records to the Indonesian fauna. There are now twelve species known from the Philippines and twenty two species from Indonesia (see list).

Five of the genera are new records for the south-east Asian area. *Eucallisoma* was previously recorded only from the eastern South Atlantic Ocean, *Figorella corindon* sp. nov. is the first record of a pachynid from the tropics, *Paracentromedon pacificus* sp. nov. is the first confirmed record of that genus outside the Atlantic Ocean, *Pseudamaryllis* was previously recorded from the Red Sea and the south-western Indian Ocean and *Trischizostoma*, although widespread, has not been previously recorded from the western Pacific Ocean.

Most of the new species are large and live in specialized habitats. *Aristias* is usually considered to be associated with sedentary invertebrates such as sponges and ascidians (VADER, 1970, 1985). Both species of *Eucallisoma* have a highly modified gnathopod 1 which indicates some kind of predatory life style. Species of *Onesimoides* are generally considered to be associated with dead plant material on the sea floor (PIRLOT, 1933; J. L. BARNARD, 1961; BELLAN-SANTINI, 1974; WOLFF, 1979). Species in *Trischizostoma* are mainly considered to be ectoparasites on fish (VADER & ROMPPAINEN, 1985). *Figorella corindon* sp. nov. and *Paracentromedon pacificus* sp. nov. are the only representatives of benthic infaunal lysianassoids. There are no representatives of algal-dwelling lysianassoids or the very diverse scavenging group. Overall it must be considered that this is only a fraction of a largely unknown lysianassoid fauna and indicates a general lack of knowledge about the amphipods of the Indo-Pacific area, a point also made several times by J. L. BARNARD (1965, 1976).

In this paper we introduce a modified scheme for delineating setae on the mandibular palp. KARAMAN (1969) originally used letters to distinguish setae at different positions on the third article of the mandibular palp.

There are two problems associated with the definitions of these setae, both of which have caused confusion among subsequent users of the scheme. KARAMAN (1969 : 196) described the A-setae as being on the outer edge ("Aussenrande") of the third article. KARAMAN (1971 : 23) changed the description of A-setae so that they occur on the outer surface ("Aussenfläche"). KARAMAN (*in litt.*, 1992) confirmed that this was his original intention - he had never seen setae on the anterior margin and suggested that such setae would need a new letter designation.

The second problem concerns B- and C-setae. There is a discrepancy between the text on page 196 and figure 3 on page 197 of KARAMAN (1969). The text places both B- and C-setae on the inner face, but the figure shows them on opposing faces. However, figure 35 on page 203 of the same paper shows B- and C-setae on the same face, as stated in the text. Unfortunately KARAMAN's figure 3 has been used as the standard in major works such as BARNARD & BARNARD (1983) and WILLIAMS & BARNARD (1990). KARAMAN (*in litt.*, 1992) confirmed that both B- and C-setae are on the inner surface as originally published.

We expand the original scheme by introducing one new letter designation and extending the scheme to mandibular palp articles 1 and 2. For example the setae on the posterior margin of mandibular palp article 3 are referred to as D3-setae. We think the most important areas to identify are the anterior and posterior margins, the inner and outer surfaces and the apex. The location of setae on any surface or margin can be described with qualifiers, for example "one proximal A3-seta" or "a vertical row of 4 B2-setae". Consequently the C-setae are simply submarginal B-setae. In the expanded scheme (fig. 1) :

A = setae on the lateral surface;
B = setae on medial surface, usually in horizontal or vertical rows (C = submarginal B-setae);
D = setae on posterior margin;
E = apical or terminal setae, usually longer than D-setae;
F = setae on anterior margin.

The main difference from previous schemes is that the medial and lateral surfaces and the anterior and posterior margins are each designated by a letter and each designation is followed by a number representing the article being discussed.

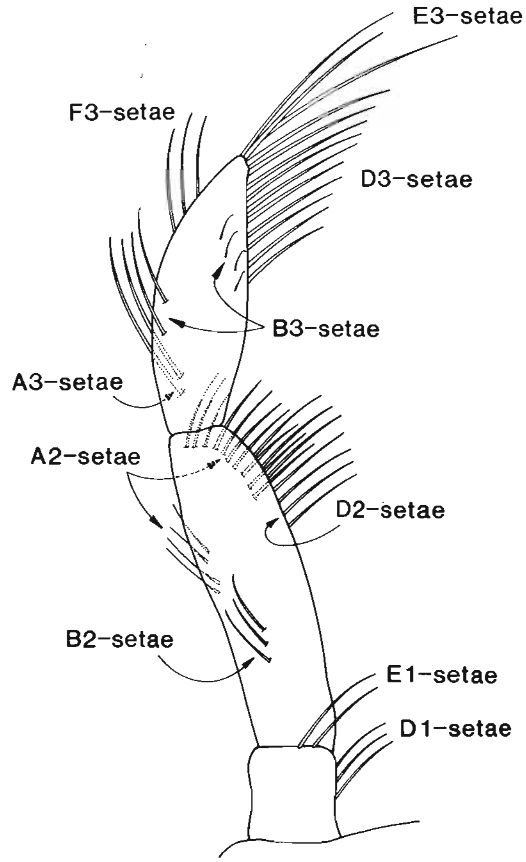

FIG. 1. — Mandibular palp setal designations (medial view) for lysianassoid amphipods.

The individual spine-teeth on the outer plate of maxilla 1 are designated by an ST code. The primitive arrangement of the spine-teeth (known as a 7/4 arrangement) is one in which eleven distal spine-teeth occur in two rows, an apical or outer row of seven spine-teeth (ST1 to ST7) and a subapical or inner row of four spine-teeth (STA to STD). In other lysianassoid groups this arrangement is modified in various ways, but by using this coding system it is usually possible to identify homologous spine-teeth in most arrangements. Examples of the 7/4 arrangement in this paper occur in *Eucallisoma* and *Figorella*. In many lysianassoids the outer plate is slightly narrowed and the ST1 is displaced onto the inner row, displacing in turn the STA. This is known as a 6/5 arrangement and in this paper it occurs in the genera *Onesimoides*, *Paracentromedon* and *Pseudamaryllis*. Another arrangement, known as the 7/4 crown, occurs in the uristid group and is discussed by LOWRY & STODDART (1992). The aristiid spine-tooth arrangement differs from other lysianassoids in such a way that, although the spine-teeth occur in two subparallel rows, we cannot yet trace their homologies. Consequently the aristiid spine-teeth are not coded.

Because of pending changes to the familial classification of this group all species are reported here in the superfamily Lysianassoidea. Descriptions have been generated from the taxonomic data base program DELTA (DALLWITZ & PAINE, 1986). Material is lodged in the Muséum national d'Histoire naturelle, Paris (**MNHN**), the Australian Museum, Sydney (**AM**), the Queensland Museum, Brisbane (**QM**) and the Zoologisk Museum, Copenhagen (**ZMC**). Material from the KARUBAR cruise in 1991 will be lodged in the Pusat Penelitian dan Pengembangan Oseanologi, Djakarta (**PPPO**), the Muséum national d'Histoire naturelle and the Australian Museum

The following abbreviations are used on the plates : **A**, antenna; **E**, epistome and upper lip; **EP**, epimeron; **G**, gnathopod; **H**, head; **MD**, mandible; **MDP**, mandibular palp; **MP**, maxilliped; **MPIP**, maxilliped inner plate; **MPOP**, maxilliped outer plate; **MPP**, maxilliped palp; **MX**, maxilla; **MX1IP**, maxilla 1 inner plate; **MX1OP**, maxilla 1 outer pate; **MX1P**, maxilla 1 palp; **P**, peraeopod; **ST**, spine-tooth; **T**, telson; **U**, uropod; **UR**, urosome; **l**, left; **r**, right; **lat**, lateral.

LIST OF RECORDED SPECIES

Philippines.

Aristias coriolis sp. nov.
Aristias verdensis sp. nov.
Crybelocephalus barnardi Birstein & Vinogradov, 1963.
Cyphocaris anonyx Boeck, 1871 (recorded by BIRSTEIN & VINOGRADOV, 1963).
Eucallisoma barnardi sp. nov.
Hirondellea gigas (Birstein & Vinogradov, 1955) (recorded by DAHL, 1959; HESSLER, *et al.*, 1978).
Ichnopus wardi Lowry & Stoddart, 1992.
Onesimoides castellatus sp. nov.
Onesimoides mindoro sp. nov.
Paracyphocaris distinctus Birstein & Vinogradov, 1963.
Pseudamaryllis andresi sp. nov.
Trischizostoma crosnieri sp. nov.

Indonesia.

Arugella heterodonta Pirlot, 1936.
Bathyamaryllis perezii Pirlot, 1933.
Cyphocaris anonyx Boeck, 1871 (recorded by PIRLOT, 1933).
Cyphocaris challengeri Stebbing, 1888 (recorded by PIRLOT, 1933).
Cyphocaris faurei K. H. Barnard, 1916 (recorded by PIRLOT, 1933).
Euonyx coecus Pirlot, 1933.
Eurythenes gryllus (Lichtenstein, 1822).
Figorella corindon sp. nov.
Hippomedon bandae Pirlot, 1933.
Ichnopus annasona Lowry & Stoddart, 1992.
Ichnopus wardi Lowry & Stoddart, 1992 (recorded as *Glycerina tenuicornis* by PIRLOT, 1936).
Onesimoides carinatus Stebbing, 1888 (recorded as *O. cavimanus* by PIRLOT, 1933).
Onesimoides castellatus sp. nov.
Onesimoides chelatus Pirlot, 1933.
Onesimoides mindoro sp. nov. (recorded as *O. cavimanus* by DAHL, 1959 and *O. chelatus* by J. L. BARNARD, 1961).
Paronesimoides lignivorous Pirlot, 1933.
Paracentromedon pacificus sp. nov.
Pseudambasia sp. (recorded as *Lysianassa* sp. by LEDOYER, 1979).
Tryphosella mucronata (Pirlot, 1936).
Waldeckia crenulata Pirlot, 1936.
Waldeckia enoei Stephensen, 1931.
Waldeckia kroyeri (White, 1847) (recorded by PIRLOT, 1936).

SYSTEMATICS

Genus *ARISTIAS* Boeck, 1871

Aristias coriolis sp. nov.

Figs 2-4

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 2 : stn CP 38, 12°53.5'N, 122°26.6'E, Sibuyan Sea, south-east of Marinduque, 1650-1660 m, 25 November 1980 : 1 ♀, 6.5 mm, with non-setose oostegites (MNHN-Am 4453).

TYPES. — The unique specimen is the holotype.

DIAGNOSIS. — Eyes apparently absent. Antenna 1 : accessory flagellum 4-articulate. Mandible : incisors symmetrical, margins smooth; left lacinia mobilis a small spine. Maxilla 1 : outer plate with 12 spine-teeth; inner plate with 7 plumose setae along inner margin. Peraeopods 5 and 6 : coxae strongly lobate posteriorly. Peraeopods 3 to 7 : propodus without distal spurs. Epimeron 3 : posteroventral corner subquadrate. Uropod 3 : outer ramus with short article 2. Telson deeply cleft.

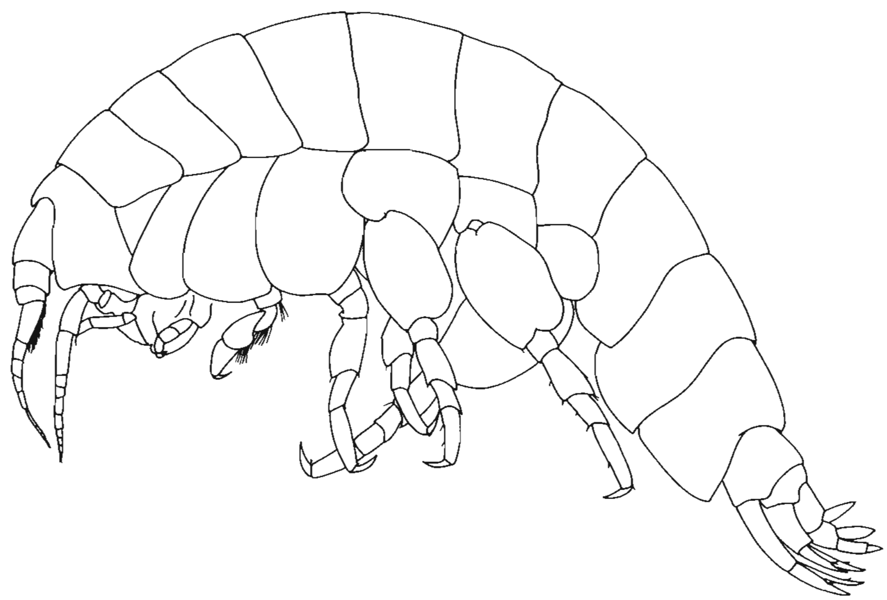

FIG. 2. — *Aristias coriolis* sp. nov., holotype female, 6.5 mm (MNHN-Am 4453), south-east of Marinduque, Sibuyan Sea, Philippine Islands.

DESCRIPTION. — Based on holotype female, 6.5 mm; male not known. *Head* : exposed, deeper than long; lateral cephalic lobe large, broad, subacute; rostrum absent; eyes apparently absent. *Antenna 1* : medium length, 0.25 times body; peduncular article 1 short, length 1.4 times breadth; peduncular article 2 short, 0.37 times article 1; peduncular article 3 short, 0.17 times article 1; accessory flagellum medium length, 0.41 times primary flagellum, 4-articulate, article 1 long, 1.6 times article 2, not forming cap; flagellum 7-articulate, callynophore strong 2-field in female, without posterodistal setae or spines, without flagellar spines, calceoli absent in female. *Antenna 2* : subequal in length to antenna 1; peduncle without brush setae in female, weakly geniculate, article 3 short, 0.5 times article 4, articles 4 and 5 not enlarged in female; flagellum 7-articulate, calceoli absent in female.

Mouthpart bundle : subquadrate. *Epistome* and *upper lip* : fused, with central notch. *Mandible* : incisors symmetrical, large, with straight margins; left lacinia mobilis present, a small spine; accessory spine row without distal setal tuft or accessory spines, with a row of simple fine setae; molar a reduced smooth flap with setose margins; mandibular palp attached midway, article 1 short, length 0.9 times breadth; article 2 elongate, slender, length 2.9 times breadth, 1.1 times article 3, with 4 posterodistal A2-setae, without D2-setae; article 3 falcate, long, length 3.9 times breadth, without A3-setae, with 9 D3-setae along most of posterior margin and 2 apical E3-setae. *Maxilla 1* : inner plate tapering distally, at least half of inner margin setose, with 7 large plumose setae;

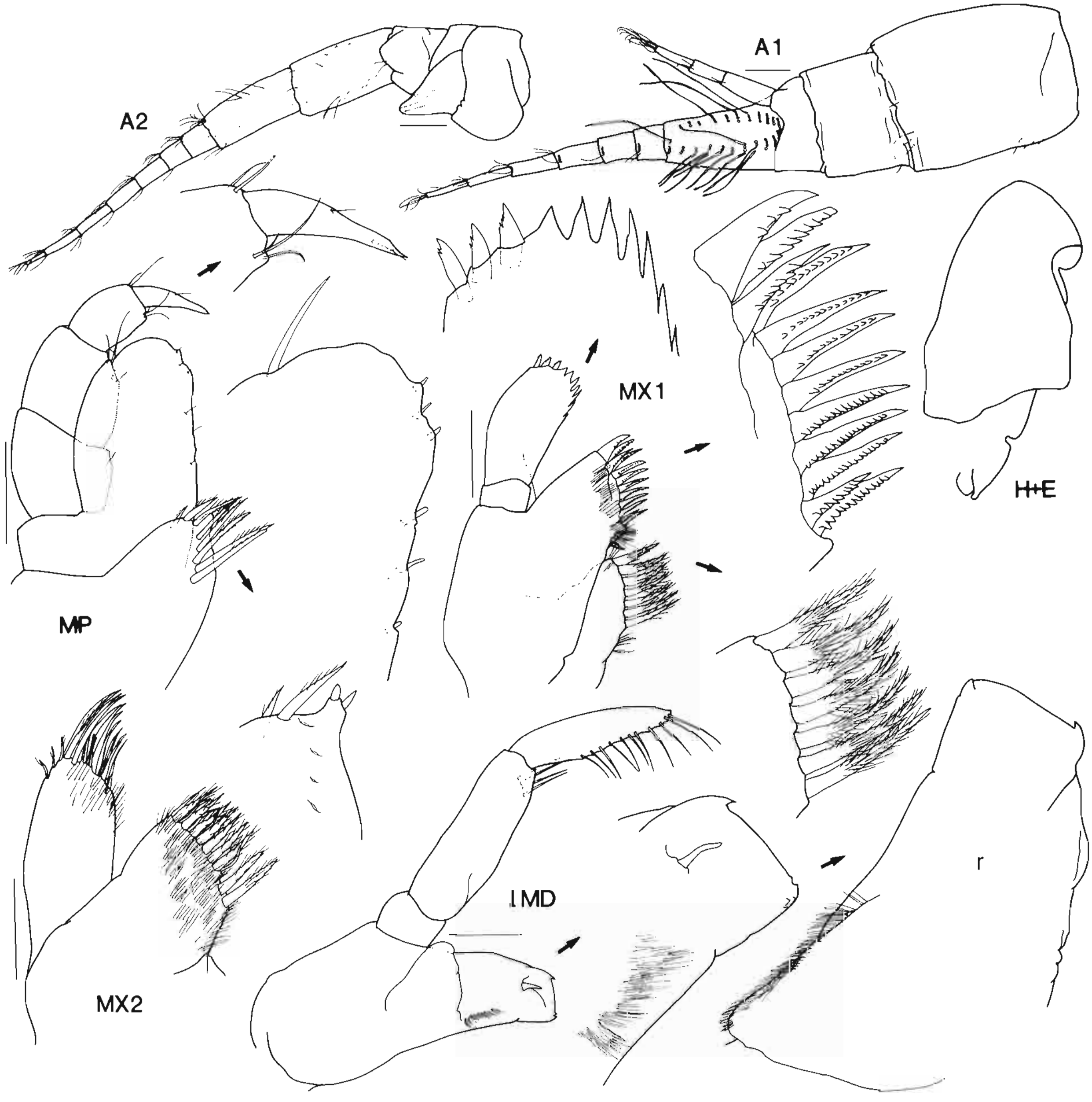

FIG. 3. — *Aristias coriolis* sp. nov., holotype female, 6.5 mm (MNHN-Am 4453), south-east of Marinduque, Sibuyan Sea, Philippine Islands. Scales represent 0.1 mm.

outer plate extremely broad with 12 spine-teeth in two rows, outer row with 10 large, slender, multicuspidate spine-teeth; inner row with 2 spine-teeth, one large, slender, multicuspidate, one short, slender, multicuspidate; palp large, 2-articulate, with serrate apical margin and 2 short terminal spines, without subterminal setae, flag spine present on distolateral corner, distomedial margin serrate. *Maxilla 2* : inner plate broad, outer plate narrow, subequal in length. *Maxilliped* : inner plate small, subrectangular, with 2 apical nodular spines, oblique setal row strong with 8 plumose setae; outer plate medium size, subovate, without subapical notch, with 1 apical simple seta, without apical spines, medial spines present, small, without submarginal setae; palp large, 4-articulate, article 2 very broad, length 1 times breadth, 1.3 times article 3; article 3 short, broad, length 1.4 times breadth; dactylus well developed, with 2 subterminal setae, unguis absent.

Gnathopod 1 : parachelate; coxa vestigial; basis long, slender, length 3.6 times breadth, anterior margin smooth, with simple setae; ischium short, length 1 times breadth; merus, posterior margin lined with long simple setae; carpus wedge-shaped, produced anteriorly, short, length 1.4 times breadth, subequal in length to propodus, with patch of very fine setae near posterior margin; propodus large, subtriangular, length 1.6 times breadth, tapering distally, posterior margin serrate, slightly concave, with 1 spine, without denticulate patch near posterior margin, palm slightly acute, margin jagged, serrate, posterodistal corner with 1 medial spine; dactylus simple, without subterminal teeth or spines. *Gnathopod 2* : minutely chelate; coxa large, subequal in size to coxa 3; ischium long, length 2.8 times breadth; carpus long, length 3.8 times breadth, posterior margin straight; propodus subrectangular, long, length 2.6 times breadth, palm obtuse, with straight, serrate margin, posterodistal corner with 1 medial spine; dactylus reaching corner of palm; posterior margin smooth.

Peraeopod 3 : coxa large; merus weakly expanded anteriorly, female merus-carpus without plumose setae; propodus without distal spur, with 2 spines along posterior margin and 2 distal locking spines; dactylus short, slender. *Peraeopod 4* : coxa deeper than wide, with weak posteroventral lobe, anterior margin slightly rounded, posterior margin slightly sloping anteriorly; merus weakly expanded anteriorly, female merus-carpus without plumose setae; propodus without distal spur, with 2 spines along posterior margin and 2 distal locking spines; dactylus short, slender. *Peraeopod 5* : coxa bilobate, posterior lobe strongly produced ventrally; basis expanded with posterior margin smooth; merus not expanded posteriorly; propodus with weak minutely denticulate surface, without distal spur, with 2 spines along anterior margin and 2 distal locking spines; dactylus short, slender. *Peraeopod 6* : coxa small, strongly lobate posteriorly; basis expanded posteriorly with smooth posterior margin; merus slightly expanded posteriorly; propodus with weak minutely denticulate surface, without distal spur, with 3 spines along anterior margin and 2 distal locking spines; dactylus short, slender. *Peraeopod 7* : basis expanded posteriorly, posterior margin almost straight, minutely crenate, posteroventral corner rounded, posteroventral margin rounded; merus slightly expanded, convex posterior margin with 2 spines; propodus with minutely denticulate surface, without distal spur, with 4 spines along anterior margin and 2 distal locking spines; dactylus short, slender.

Oostegites from gnathopod 2 to peraeopod 5. *Gills* from gnathopod 2 to peraeopod 7, not pleated.

Pleonites 1 to 3 dorsally smooth. *Epimeron 1* : anteroventral corner rounded. *Epimeron 3* : posteroventral corner subquadrate. *Urosomites* : 1 to 3 dorsally smooth; urosomite 3 with small dorsolateral spine. *Uropod 1* : peduncle with 4 dorsolateral, 1 apicolateral, 1 dorsomedial and 1 apicomedial spines, without spines along distal margin; rami subequal in length; outer ramus with 1 lateral spine; inner ramus with 1 medial and 4 lateral spines. *Uropod 2* : peduncle without dorsolateral flange, with 3 dorsolateral, 1 apicolateral and 1 apicomedial spines, without spines along distal margin; outer ramus 0.8 times as long as inner ramus, outer ramus with 1 lateral spine in weak acclivity; inner ramus with 1 medial and 3 lateral spines, without constriction. *Uropod 3* : peduncle short, length 1.2 times breadth, without dorsolateral flange, with 1 apicolateral and 1 apicomedial spines, without midlateral spines or setae, with 2 distoventral spines, without plumose setae; rami lanceolate, inner ramus reduced, about 0.8 times outer ramus, outer ramus 2-articulate, article 2 short, article 1 with 1 lateral spine; inner ramus without spines; plumose setae absent in female. *Telson* : as long as broad, deeply cleft (64%), with 1 dorsal spine on each lobe, without dorsal simple setae; distal margins incised, without marginal penicillate setae, with 1 simple marginal seta and 1 marginal spine on each lobe.

ETYMOLOGY. — The specific name refers to the R.V. "*Coriolis*".

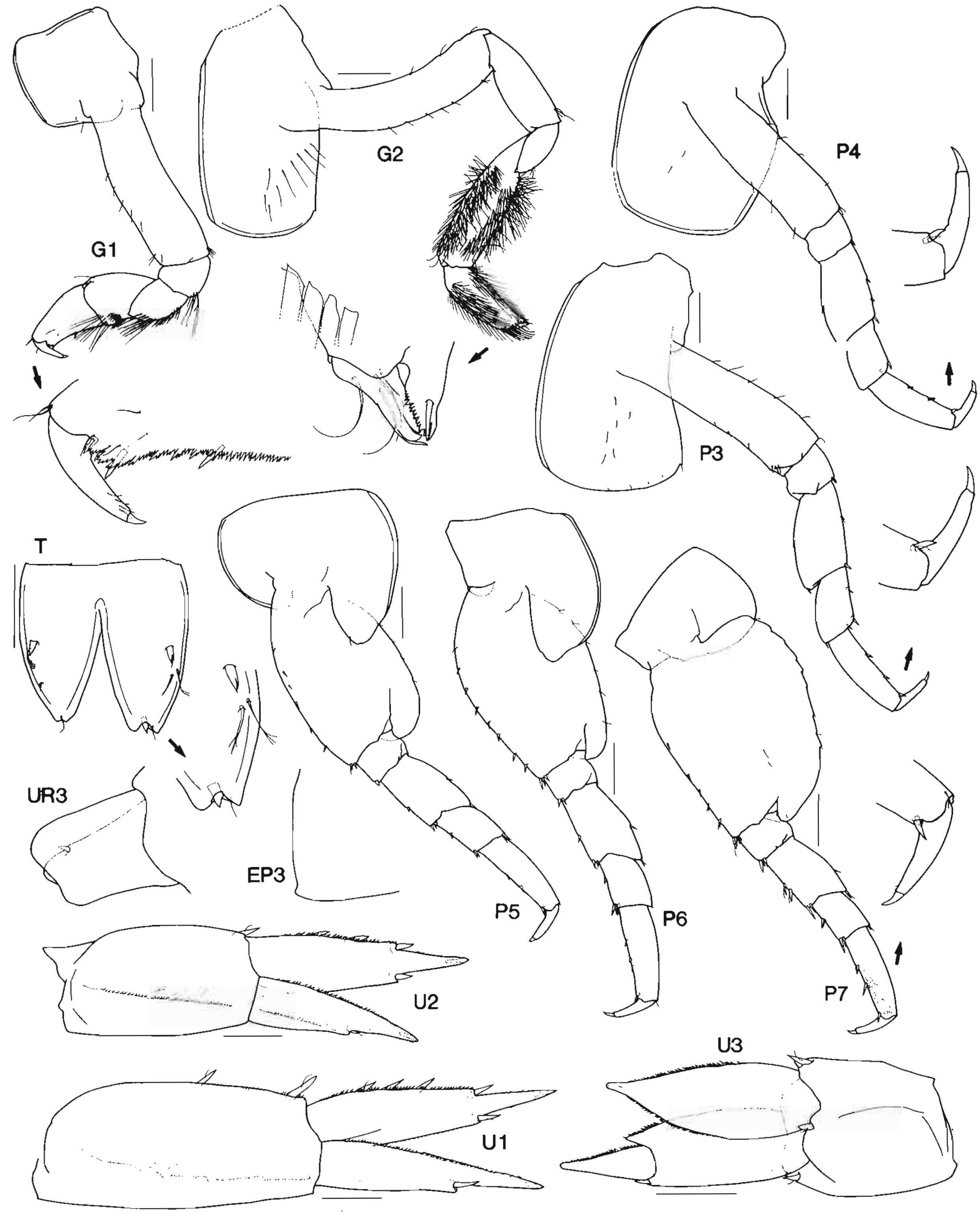

FIG. 4. — *Aristias coriolis* sp. nov., holotype female, 6.5 mm (MNHN-Am 4453), south-east of Marinduque, Sibuyan Sea, Philippine Islands. Scales for U1-3, T represent 0.1 mm, remainder represent 0.2 mm.

REMARKS. — According to BARNARD & KARAMAN (1991) there are 21 species of *Aristias*. The differences between them appear to be subtle. From material we have examined there are good differences in mouthpart morphology, particularly in the number of spine-teeth on maxilla 1, but this is not well documented in the literature. Only five species of *Aristias* do not have eyes : *A. adrogans* J.L. Barnard, 1964, *A. expers* J. L. Barnard, 1967, *A. falcatus* Stephensen, 1923, *A. stenopodus* Ledoyer, 1986 and *A. topsenti* Chevreux, 1900. Four of these species, *A. adrogans*, *A. falcatus*, *A. stenopodus* and *A. topsenti* have a well developed spur on the propodus of peraeopods 3 to 7. Only *A. expers* and *A. coriolis* do not have spurs. *Aristias expers* differs from *A. coriolis* in having four plumose setae on the inner plate of maxilla 1, a narrowly rounded posteroventral corner on epimeron 3 and a slightly cleft telson.

DISTRIBUTION. — *Aristias coriolis* is known only from the Sibuyan Sea, Philippine Islands, in 1650 to 1680 m depth.

Aristias verdensis sp. nov.

Figs 5-7

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 2 : stn DR 33, 13°32.3'N, 121°07.5'E, Verde Island Passage, off the western side of Verde Island, 130-137 m, 24 November 1980 : 1 ♀, 2 mm, ovigerous (2 large eggs) (MNHN-Am 4451).

TYPES. — The unique specimen is the holotype.

DIAGNOSIS. — Eyes large, oval. Antenna 1 : accessory flagellum 2-articulate. Mandible : incisors asymmetrical, left margin minutely serrate; left lacinia mobilis a short, smooth peg. Maxilla 1 : outer plate with 8 spine-teeth; inner plate with 4 plumose setae along inner margin. Peraeopods 5 and 6 : coxae strongly lobate posteriorly. Peraeopods 3 to 6 (peraeopod 7 not known) : propodus with distal spurs. Epimeron 3 : posteroventral corner narrowly rounded. Uropod 3 : outer ramus with short article 2. Telson deeply cleft.

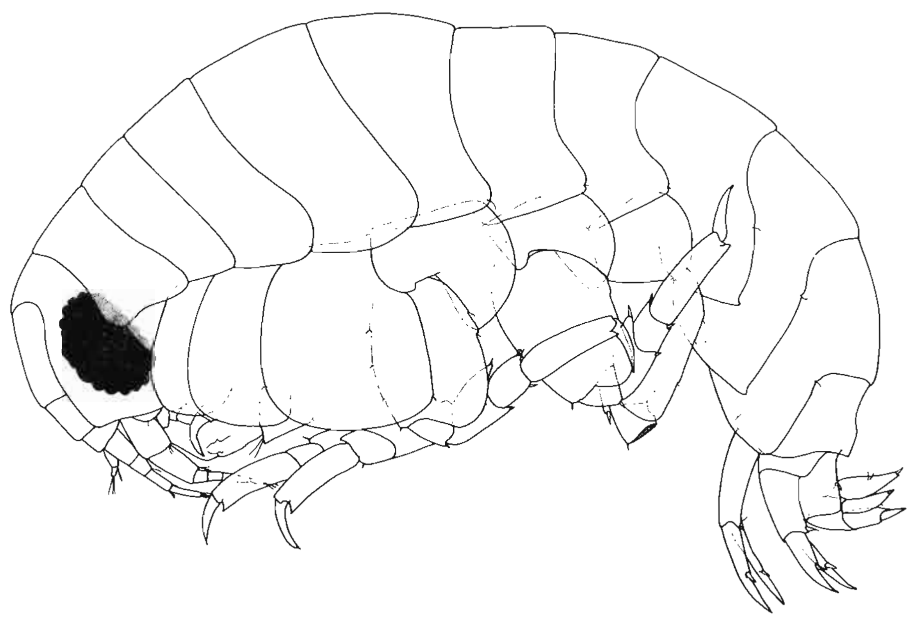

FIG. 5. — *Aristias verdensis* sp. nov., holotype female, 2 mm (MNHN-Am 4451), off western side of Verde Island, Verde Island Passage, Philippine Islands.

DESCRIPTION. — Based on holotype female, 2 mm; male not known. *Head* : exposed, deeper than long; lateral cephalic lobe large, broad, subacute; rostrum absent; eyes oval (brown in alcohol). *Antenna 1* : medium length, 0.23 times body; peduncular article 1 short, length 1.4 times breadth; peduncular article 2 short, 0.39 times

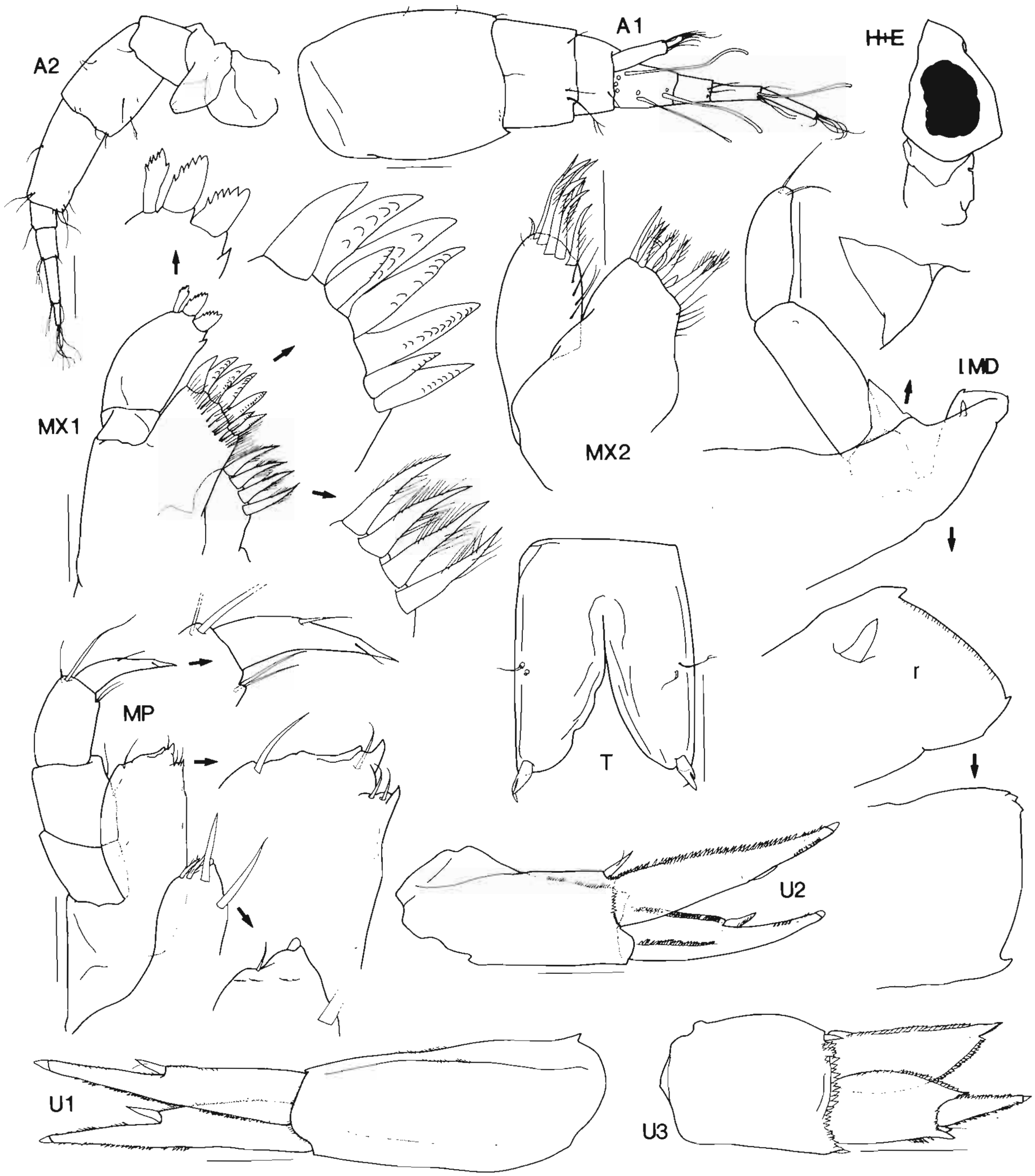

FIG. 6. — *Aristias verdensis* sp. nov., holotype female, 2 mm (MNHN-Am 4451), off western side of Verde Island, Verde Island Passage, Philippine Islands. Scales represent 0.05 mm.

article 1; peduncular article 3 long, 0.23 times article 1; accessory flagellum medium length, 0.37 times primary flagellum, 2-articulate, article 1 long, 3.2 times article 2, not forming cap; flagellum 4-articulate, callynophore weak 1-field in female, without posterodistal setae or spines, without flagellar spines, calceoli absent in female. *Antenna 2* : slightly longer than antenna 1; peduncle without brush setae in female, weakly geniculate, article 3 short, 0.55 times article 4, peduncular articles 4 and 5 not enlarged in female; flagellum 4-articulate, calceoli absent in female.

Mouthpart bundle : subquadrate. *Epistome* and *upper lip* : fused, with central notch. *Mandible* : incisors asymmetrical, large with straight margins, left margin minutely serrate, left lacinia mobilis present, a short smooth peg, accessory spine row absent; molar a reduced smooth flap without setose margins; mandibular palp attached midway; article 1 short, length 1 times breadth; article 2 elongate, slender, length 2.5 times breadth, 1.2 times article 3, with 1 posterodistal A2-seta (broken on left mandible), without D2-setae; article 3 falcate, long, length 2.9 times breadth, without A3- or D3-setae, with 2 apical E3-setae. *Maxilla 1* : inner plate tapering distally, at least half of inner margin setose, with 4 large plumose setae; outer plate extremely broad with 8 spine-teeth in two rows; outer row with 6 spine-teeth, first 3 large, stout, weakly to multicuspidate, remainder large, slender, multicuspidate; inner row with 2 spine-teeth, both large, slender, 5-cuspidate; palp large, 2-articulate, with 2 long terminal spines, without subterminal setae, flag spine present on distolateral corner, distomedial margin serrate (one cusp). *Maxilla 2* : inner plate broad, outer plate narrow, subequal in length. *Maxilliped* : inner plate small, subrectangular, with 1 apical nodular spine, oblique setal row reduced with 4 plumose setae; outer plate small, subrectangular, without subapical notch, with 1 apical simple seta, without apical or medial spines, submarginal setae short, simple; palp large, 4-articulate, article 2 very broad, length 1.1 times breadth, 0.9 times article 3, article 3 short, broad, length 1.7 times breadth, dactylus well developed, with 2 subterminal setae, unguis absent.

Gnathopod 1 : parachelate; coxa vestigial; basis long, slender, length 3.3 times breadth, anterior margin smooth, without setae; ischium short, length 1.3 times breadth; merus, posterior margin with patch of short setae; carpus wedge-shaped, produced anteriorly, short, length 1.1 times breadth, shorter than (0.73 times) propodus, with long simple setae along posterior margin; propodus large, subtriangular, length 1.7 times breadth, tapering distally, posterior margin serrate, slightly concave, with 2 spines, without denticulate patch near posterior margin, palm slightly acute, margin straight, serrate, posterodistal corner without spines; dactylus simple, without subterminal teeth or spines. *Gnathopod 2* : minutely chelate; coxa large, subequal in size to coxa 3; ischium long, length 2.7 times breadth; carpus long, length 2.8 times breadth, posterior margin straight; propodus subrectangular, long, length 2.1 times breadth, palm obtuse, with straight, serrate margin, posterodistal corner with 2 medial spines; dactylus reaching corner of palm, posterior margin smooth.

Peraeopod 3 : coxa large; merus weakly expanded anteriorly, female merus-carpus without plumose setae; propodus with small posterodistal spur, without spines along anterior margin; dactylus short, slender. *Peraeopod 4* : coxa deeper than wide, with weak posteroventral lobe, anterior and posterior margins subparallel; merus weakly expanded anteriorly, female merus-carpus without plumose setae; propodus with small posterodistal spur, without spines along anterior margin; dactylus short, slender. *Peraeopod 5* : coxa bilobate, posterior lobe strongly produced ventrally; basis expanded with posterior margin smooth, slightly expanded posteriorly; propodus without minutely denticulate surface, with small anterodistal spur, without spines along anterior margin; dactylus short, slender. *Peraeopod 6* : coxa small, strongly lobate posteriorly; basis expanded posteriorly with smooth posterior margin; merus slightly expanded posteriorly; propodus without minutely denticulate surface, with small anterodistal spur, without spines along anterior margin; dactylus short, slender. *Peraeopod 7* : basis expanded posteriorly, posterior margin slightly rounded proximally, straight distally, minutely crenate, posteroventral corner rounded, posteroventral margin rounded; merus expanded distally with straight posterior margin; propodus and dactylus not known.

Oostegites : from gnathopod 2 to peraeopod 5. *Gills* : from gnathopod 2 to peraeopod 6, not pleated.

Pleonites 1 to 3 : dorsally smooth. *Epimeron 1* : anteroventral corner rounded. *Epimeron 3* : posteroventral corner narrowly rounded. *Urosomites* : 1 to 3 dorsally smooth; urosomite 3 with small dorsolateral spine. *Uropod 1* : peduncle with 1 apicolateral and 1 apicomedial spines, without plumose setae or spines along distal margin; rami subequal in length; outer ramus and inner ramus each with 1 dorsal spine. *Uropod 2* : peduncle

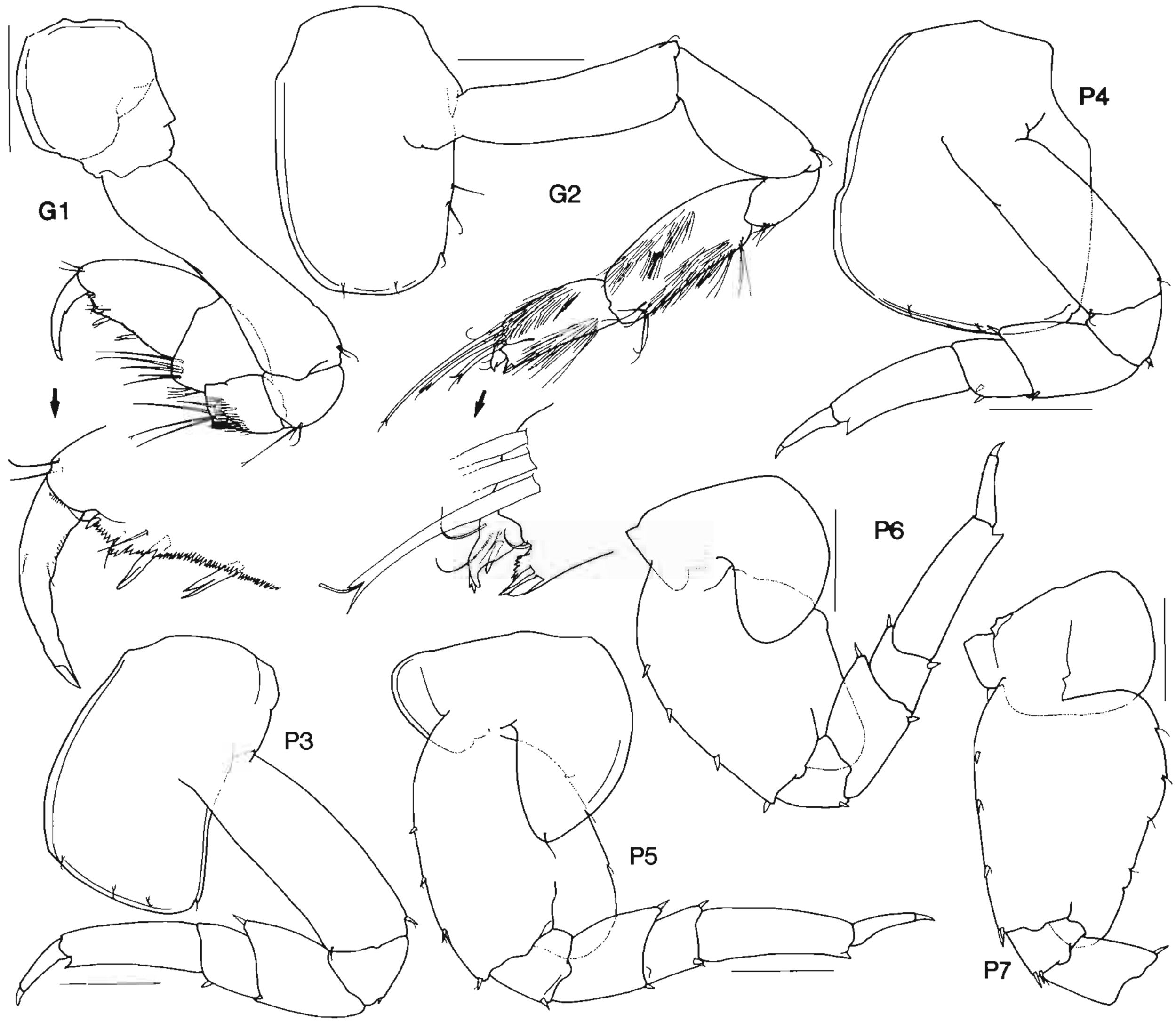

FIG. 7. — *Aristias verdensis* sp. nov., holotype female, 2 mm (MNHN-Am 4451), off western side of Verde Island, Verde Island Passage, Philippine Islands. Scales represent 0.1 mm.

without dorsolateral flange, with 1 apicolateral and 1 apicomedial spines, without plumose setae or spines along distal margin; outer ramus 0.86 times as long as inner ramus, outer and inner ramus each with 1 dorsal spine; inner ramus without constriction. *Uropod 3* : peduncle short, length 1.1 times breadth, without dorsolateral flange, with 1 apicolateral and 1 apicomedial spines, without midlateral spines or setae, without distoventral spines or plumose setae; rami lanceolate, subequal in length, outer ramus 2-articulate, article 2 short; rami without spines; plumose setae absent in female. *Telson* : 1.5 times as long as broad, deeply cleft (67%), without dorsal spines or simple setae; distal margins truncated, without marginal setae, with 1 marginal spine on each lobe.

ETYMOLOGY. — The specific name refers to the type locality.

REMARKS. — LEDOYER'S (1972) table and subsequent descriptions show that only seven species of *Aristias* have a small number of articles in the primary and accessory flagella of antenna 1, and of these species three have no eyes. Of the remaining four species with eyes, two (*A. megalops* Sars, 1891 and *A. microps* Sars, 1891) occur in the north-eastern Atlantic Ocean. *Aristias microps* differs from *A. verdensis* in its very poorly developed eyes and less well developed posterior lobes on coxae 5 and 6. From what is known of *A. megalops* it appears to be very closely related to *A. verdensis*, but nothing is known of its mouthparts. *Aristias megalops* differs from *A. verdensis* in the posterior lobe on coxa 5 which is less well developed, the posteroventral corner of epimeron 3 which is acutely produced and the telson which is shorter. The remaining two species (*A. nonspinus* Hirayama, 1985 and *A. tropicus* Schellenberg, 1938) occur in the Pacific Ocean. *Aristias nonspinus* differs from *A. verdensis* in the left mandible which has no lacinia mobilis, maxilla 1 which has two setae on the inner plate and six spine-teeth on the outer plate, coxa 5 which is equilobate, the posteroventral corner of epimeron 3 which has a minute tooth and the telson which has no terminal spines. Geographically, the closest species is *A. tropicus* from the Bismarck Archipelago off northern New Guinea. This species is not well known, but differs from *A. verdensis* in having the posteroventral corner of epimeron 3 subacute and the second article of the ramus of uropod 3 as long as the first.

DISTRIBUTION. — *Aristias verdensis* is known only from the Verde Island Passage, Philippine Islands in 130-135 m depth.

Genus *CYPHOCARIS* Boeck, 1871

Cyphocaris faurei K. H. Barnard, 1916

Cyphocaris faurei K. H. Barnard, 1916 : 117, pl. 26, fig. 4. — PIRLOT, 1933 : 128. — LOWRY & BULLOCK, 1976 : 88. — LEDOYER, 1986 : 738, fig. 284.

MATERIAL EXAMINED. — **Indonesia.** CORINDON 2 : stn CH 220, 0°14'N, 118°12'E, northern Makassar Strait, 2350 m, 2 November 1980 : 1 ♀, 22 mm, ovigerous (MNHN-Am 4454).
KARUBAR : stn CC 21, 05°14'S, 133°00'E, Kai Islands, 688-694 m, 25 October 1991 : 1 ♀.

REMARKS. — This is the second record of *C. faurei* from Indonesian waters. PIRLOT (1933) recorded it from the Molucca Strait.

DISTRIBUTION. — Cosmopolitan in bathyal and abyssal depths.

Genus *EUCALLISOMA* J. L. Barnard, 1961

Eucallisoma J. L. Barnard, 1961 : 32. — BARNARD & KARAMAN, 1991 : 484.

DIAGNOSIS. — Mandible : left lacinia mobilis present; molar a small articulating flap at base of large excavate corpus mandibularis; palp attached midway. Maxilla 1 : spine-teeth on outer plate in 7/4 arrangement; palp large, 2-articulate. Maxilla 2 : inner plate broad, outer plate narrow. Maxilliped : inner plate with well developed apical nodular spines; outer plate with apical setae and large medial spines. Gnathopod 1 simple; basis swollen, glandular; dactylus reduced. Peraeopod 5 : coxa broader than deep; basis subovate. Uropod 3 short, rami with plumose setae, outer ramus 2-articulate. Telson deeply cleft.

TYPE SPECIES. — *Eucallisoma glandulosa* J.L. Barmard, 1961 by original designation.

REMARKS. — *Eucallisoma* differs from all genera in the scopelocheirid group in having a glandular basis on gnathopod 1. *Eucallisoma* has a similar maxilla 1 spine-tooth arrangement to *Aroui*, *Paracallisoma* and *Scopelocheirus*. *Aroui* and *Scopelocheirus* both differ from *Eucallisoma* in having a triturating molar and *Aroui* has a unique second maxilla. *Paracallisoma* and *Eucallisoma* are very similar. Aside from gnathopod 1, *Paracallisoma* has a better developed lacinia mobilis than does *Eucallisoma*.

DISTRIBUTION. — *Eucallisoma* is known from the South Atlantic Ocean and the south-western Pacific Ocean in 800 to 4000 m depth.

Eucallisoma barnardi sp. nov.

Figs 8-10

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 2 : stn CP 50, 13°36.7-38.1'N, 120°33.7-32.3'E, eastern entrance to Verde Island Passage, 810-820 m, 27 November 1980 : 1 ♀, 40 mm, with non-setose oostegites (MNHN-Am 4449).

TYPES. — The unique specimen is the holotype.

DIAGNOSIS. — Head with lateral cephalic lobe large, broad, subacute. Antenna 1 : accessory flagellum with well developed article 2. Maxilliped : palp article 1 enlarged, articles 2 to 4 reduced. Gnathopod 1 : carpus and propodus very long and slender. Coxa 4 : posteroventral lobe acutely produced. Epimeron 3 : posteroventral corner broadly rounded.

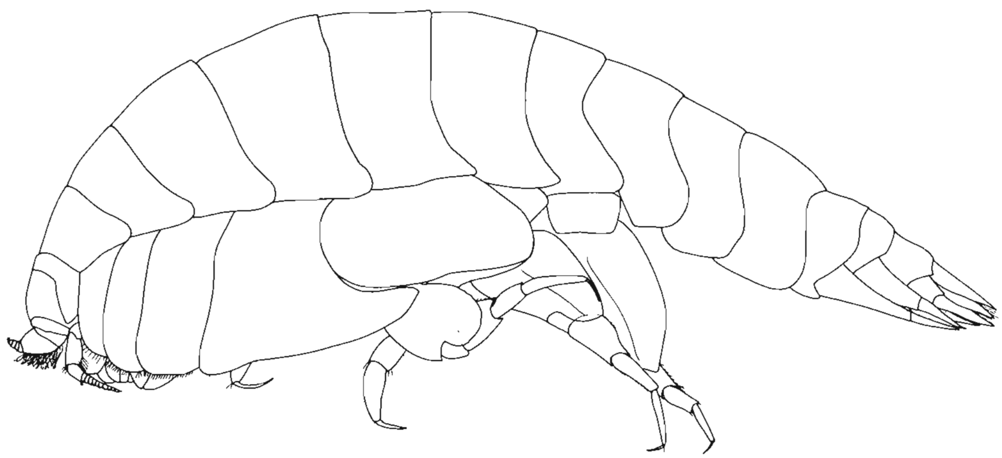

FIG. 8. — *Eucallisoma barnardi* sp. nov., holotype female, 40 mm (MNHN-Am 4449), eastern entrance to Verde Island Passage, Philippine Islands.

DESCRIPTION. — Based on holotype female, 40 mm; male not known. *Head* : exposed, deeper than long; lateral cephalic lobe large, broad, subacute; rostrum absent; eyes apparently absent. *Antenna 1* : short, 0.1 times body; peduncular article 1 short, length 0.8 times breadth, with small midmedial swelling, with short posterodistal tooth; peduncular article 2 short, 0.25 times article 1; peduncular article 3 short, 0.13 times article 1; accessory flagellum medium length, 0.37 times primary flagellum, 2-articulate, article 1 long, 1.5 times article 2, not forming cap; flagellum at least 7-articulate, callynophore strong 2-field in female, without posterodistal setae or spines, without flagellar spines, calceoli absent in female. *Antenna 2* : slightly longer than antenna 1; peduncle without brush setae in female, article 1 greatly enlarged, not covering article 2, peduncle in female weakly geniculate, article 3 short, 0.31 times article 4, articles 4 and 5 not enlarged in female; flagellum 12-articulate, calceoli absent in female.

Mouthpart bundle : subquadrate. *Epistome* and *upper lip* : separate, epistome strongly produced, rounded, upper lip not produced, straight. *Mandible* : incisors symmetrical, large, with straight margins, left lacinia mobilis present, a cuspidate peg; accessory spine row without distal setal tuft, left and right with 3 short, stout, simple spines, without intermediate setae; molar a small articulating flap at base of large excavate corpus mandibularis; mandibular palp attached midway, article 1 short, length 0.8 times breadth; article 2 broadened proximally, length

3.9 times breadth, 1.4 times article 3, without A2-setae, with many D2-setae along most of posterior margin; article 3 broadened medially, long, length 3.6 times breadth, without A3-setae, with 37 distal D3-setae and 3 apical

FIG. 9. — *Eucallisoma barnardi* sp. nov., holotype female, 40 mm (MNHN-Am 4449), eastern entrance to Verde Island Passage, Philippine Islands. Scales represent 0.5 mm.

E3-setae. *Maxilla 1* : inner plate tapering distally, inner margin fully setose, with 26 plumose setae; outer plate broad with 11 spine-teeth in 7/4 arrangement; outer row with ST1 large, slender, without cusps, ST2-ST6, large, slender, 1-cuspidate, ST7 slightly displaced from ST6, large, slender, without cusps; inner row with STA large, slender, displaced from STB-STD, without cusps, STB-STC long, slender, apically bifurcate, STD long, slender, without cusps; palp large, 2-articulate, with 4 short terminal spines, with 1 subterminal seta, flag spine present on distolateral corner, distomedial margin smooth. *Maxilla 2* : inner plate broad, outer plate narrow, inner plate 0.88 times length outer plate. *Maxilliped* : inner plate large, subrectangular, with 3 apical nodular spines and 2 subapical spines, oblique setal row strong with 21 plumose setae; outer plate large, subovate, with 14 apical plumose setae, without apical spines, medial spines present, large, submarginal setae short, simple; palp large, 4-articulate, article 1 enlarged, articles 2 to 4 reduced; article 2 extremely slender, length 3.3 times breadth, 1.9 times article 3, article 3 short, slender, length 2.8 times breadth; dactylus vestigial, with 2 subterminal setae, unguis present.

Coxae 1 to 4 : with setal fringe along ventral margin. *Gnathopod 1* : simple; coxa large, nearly as long as coxa 2, anterior margin slightly convex, anteroventral corner rounded, posterior margin angled towards anterior margin; basis swollen, glandular, length 1.7 times breadth, anterior margin smooth, without setae; ischium long, length 2.2 times breadth; merus, posterior margin without setae; carpus subrectangular, very long, length 4.7 times breadth, longer than (1.8 times) propodus, without denticulate patch near posterodistal margin; propodus large, subrectangular, length 5.3 times breadth, tapering distally, posterior margin smooth, straight, without spines or setae, without denticulate patch near posterior margin, palm absent; dactylus complex, extremely reduced, blunt subterminal tooth with minute aperture. *Gnathopod 2* : minutely subchelate; coxa large, subequal in size to coxa 3; ischium long, length 3.6 times breadth; carpus very long, length 4.4 times breadth, posterior margin straight; propodus subrectangular, long, length 3 times breadth, palm transverse, with convex, rugose margin, posterodistal corner without spines; dactylus overreaching corner of palm, posterior margin serrate.

Peraeopod 3 : coxa large; merus not expanded anteriorly; female merus-carpus without plumose setae; propodus with 15 setae along posterior margin; dactylus long, slender. *Peraeopod 4* : coxa deeper than wide, with acutely produced posteroventral lobe, anterior margin straight, obtusely angled, posterior margin sloping anteriorly; merus not expanded anteriorly; female merus-carpus without plumose setae; propodus with 9 setae along posterior margin; dactylus long, slender. *Peraeopod 5* : coxa equilobate, broader than deep; basis expanded with posterior margin smooth; merus expanded with rounded posteroproximal shoulder and straight posterior margin; propodus with 15 spines along anterior margin; dactylus short, slender. *Peraeopod 6* : coxa small, not lobate posteriorly; basis expanded posteriorly with minutely crenate posterior margin; merus expanded with rounded posteroproximal shoulder, posterior margin straight proximally, excavate distally; propodus with 13 spines along anterior margin, 20 spines along posterior margin; dactylus not known. *Peraeopod 7*: basis expanded posteriorly, posterior margin almost straight, minutely crenate, posteroventral corner subquadrate, posteroventral margin rounded; merus expanded proximally, posterior margin straight, converging distally, with 12 setae; propodus with 15 spines along anterior margin; dactylus short, slender.

Oostegites from gnathopod 2 to peraeopod 5. *Gills* from gnathopod 2 to peraeopod 7, not pleated.

Pleonites 1 to 3 dorsally smooth. *Epimeron 1* : anteroventral corner subquadrate. *Epimeron 3* : posteroventral corner broadly rounded. *Urosomites* : 1 to 3 dorsally smooth. *Urosomite 3* : without dorsolateral spine. *Uropod 1* : peduncle with 17 dorsolateral, 1 apicolateral, 21 dorsomedial and 1 apicomedial spines, without spines along distal margin; rami subequal in length; outer ramus with 17 lateral and 9 medial spines; inner ramus with 18 medial and 10 lateral spines. *Uropod 2* : peduncle without dorsolateral flange, with 1 dorsolateral, 1 apicolateral, 17 dorsomedial and 1 apicomedial spines, without plumose setae, without spines along distal margin; outer ramus 0.9 times as long as inner ramus, outer ramus with 18 lateral and 13 medial spines; inner ramus with 19 medial and 13 lateral spines, without constriction. *Uropod 3* : peduncle short, length 1.2 times breadth, without dorsolateral flange, with 1 apicomedial spine, without midlateral or distoventral spines or setae, without plumose setae; rami lanceolate, inner ramus reduced, about 0.9 times outer ramus; outer ramus 2-articulate, article 2 short (tip broken), article 1 with 8 lateral and 8 medial spines; inner ramus with 3 lateral spines; plumose setae present in female. *Telson* : triangular, length 1.5 times breadth, deeply cleft (67%), without dorsal spines or simple setae; distal margins rounded, without marginal setae, with 1 marginal spine on each lobe.

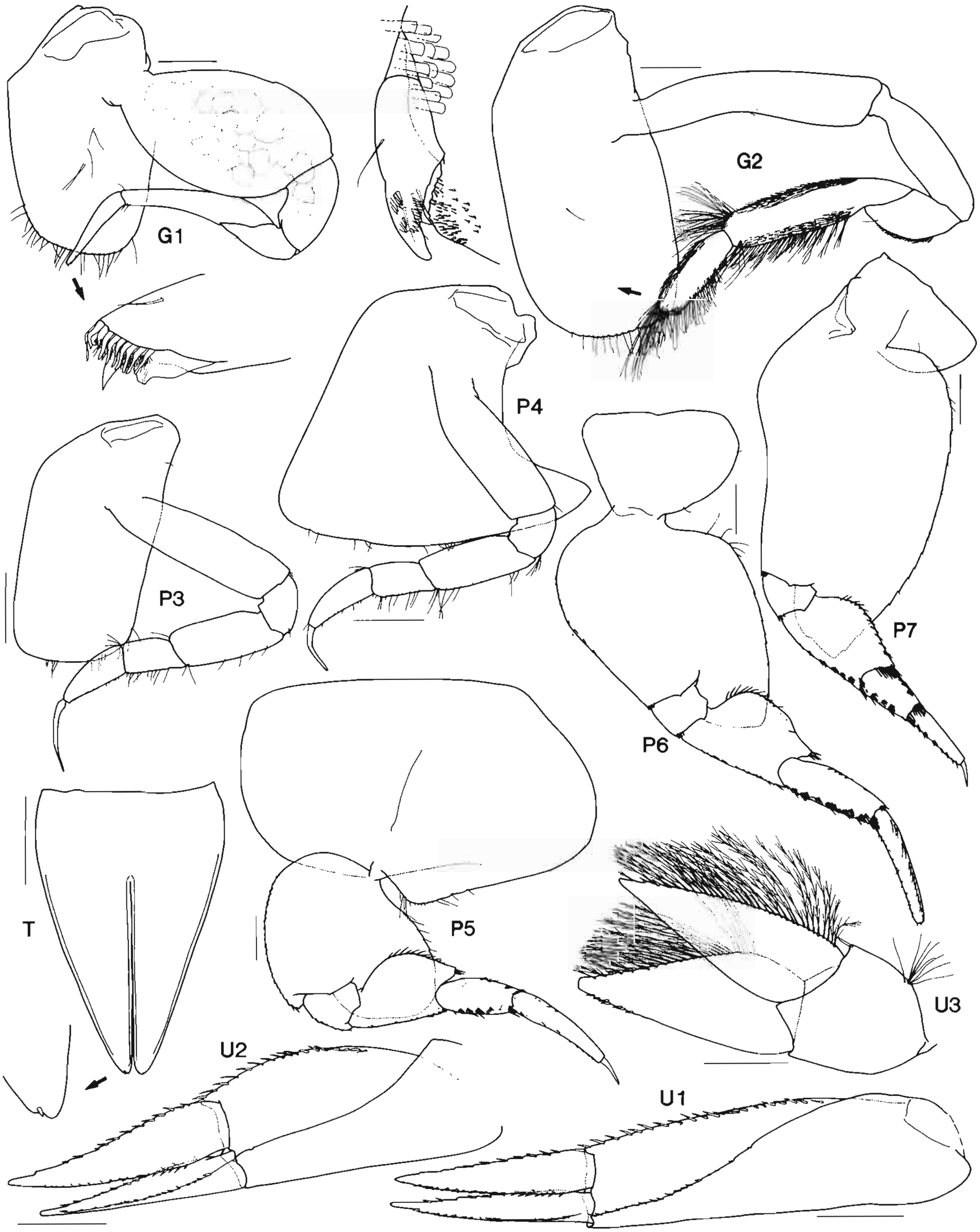

FIG. 10. — *Eucallisoma barnardi* sp. nov., holotype female, 40 mm (MNHN-Am 4449), eastern entrance to Verde Island Passage, Philippine Islands. Scales represent 1.0 mm.

ETYMOLOGY. — This species is named in remembrance of Jerry BARNARD, who, among his many distinguished accomplishments, originally described this extraordinary genus.

REMARKS. — This is only the second species described in the genus *Eucallisoma* and the first record of the genus outside the Atlantic Ocean. Although there is no doubt that this species belongs in *Eucallisoma* it shows strong differences from *E. glandulosa* J. L. Barnard, 1961. *Eucallisoma barnardi* has a much better developed lateral cephalic lobe, the maxilla 1 spine-teeth are less cuspidate, article 1 of the maxillipedal palp is grossly enlarged and article 2 is long and slender, on gnathopod 1 the articulation between the basis and merus is more conventional and the carpus and propodus are longer and more slender, the merus of peraeopods 5 to 7 is more broadly expanded posteriorly, uropod 3 is shorter and more robust and the telson is more triangular.

The basis of gnathopod 1 is large and filled with glandular tissue. It is possible to trace a duct from the distal section of this glandular tissue through the distal articles of the gnathopod. This duct appears to open through a minuscule aperture on the dactylus. The dactylus is greatly reduced, but the aperture appears to be placed on the subterminal tooth, proximal to the tip of the dactylus. *Eucallisoma glandulosa* also has glandular tissue in the basis of gnathopod 1.

DISTRIBUTION. — *Eucallisoma barnardi* is known only from Verde Island Passage, Philippine Islands, in 810 to 820 m depth.

Genus *EURYTHENES* Smith, 1882

Eurythenes gryllus (Lichtenstein, 1822)

Gammarus gryllus Lichtenstein, 1822 : 34. — J. L. BARNARD, 1961 : 35, figs 5-7. — LOWRY & BULLOCK, 1976 : 89.

MATERIAL EXAMINED. — **Indonesia**. KARUBAR : stn CC 57, 08°19'S, 131°53'E, Tanimbar Island, 603-620 m, 31 October 1991 : 1 ♀, 24 mm.

REMARKS. — BIRSTEIN and VINOGRADOV (1960) have reported *E. gryllus* from the Philippine Sea and from the Bougainville Trench, but this is the first record of the species in Indonesian waters.

DISTRIBUTION. — Cosmopolitan in the deep-sea.

Genus *FIGORELLA* J. L. Barnard, 1962

Figorella corindon sp. nov.

Figs 11-12

MATERIAL EXAMINED. — **Indonesia**. CORINDON 2 : stn B 236, 00°6.7'N, 119°45.5'E, south of Manimbaya, northern Makassar Strait, 1730 m, 4 November 1980 : 1 ♀, 3 mm, with oostegite buds (MNHN-Am 4457).

TYPES. — The unique specimen is the holotype.

DIAGNOSIS. — Maxilla 1 outer plate with 9 spine-teeth. Gnathopod 1 : posterodistal corner of propodus projecting with tiny spine. Peraeopod 5 : basis round. Uropod 3 : inner ramus reduced, as long as article 1 of outer ramus. Telson : emarginate with rounded posterior margin with penicillate setae.

DESCRIPTION. — Based on holotype female, 3 mm; male not known. *Head* : exposed, slightly longer than deep, ventrally truncated with straight ventral margin; lateral cephalic lobe large, narrowly rounded; rostrum absent; eyes apparently absent. *Antenna 1* : short, 0.14 times body; peduncular article 1 short, length 1.25 times breadth, without dorsal crest, tooth on distomedial margin, posterodistal tooth or anterodistal projection; peduncular article 2 short, 0.3 times article 1; peduncular article 3 long, 0.25 times article 1; accessory flagellum very short, 0.22 times primary flagellum, 2-articulate, article 1 short, 1.3 times article 2, not forming cap; flagellum 7-articulate, callynophore and calceoli absent in female. *Antenna 2* : subequal in length to antenna 1; peduncle without brush setae, strongly geniculate between peduncular articles 3-4, article 3 long, 0.77 times article 4, peduncular articles 4 and 5 not enlarged; flagellum 7-articulate, without thick setal brush, calceoli absent.

Mouthpart bundle : quadrate, projecting anteriorly. *Epistome* and *upper lip* : fused, straight. *Mandible* : incisors symmetrical, small, with slightly convex margins; left lacinia mobilis present, a short smooth peg; accessory spine row without distal setal tuft, left and right rows each with 3 short, slender, simple spines, without intermediate setae; lamina dentata absent; molar absent; mandibular palp attached midway, article 1 short, length 1 times breadth; article 2 short, broad, length 2 times breadth, 0.9 times article 3, without D2-setae, with 1 posterodistal A2-seta; article 3 slender, distally truncate, long, length 3 times breadth, without A3-setae, with 4 distal D3-setae on posterior margin and 2 apical E3-setae. *Maxilla 1* : inner plate narrow with 1 large and 2-4 small simple apical setae; outer plate narrow with 9 spine-teeth in modified 7/4 arrangement; outer row with ST1-ST3 large, stout, smooth to weakly cuspidate, ST4 small, stout, 1-cuspidate, ST5 small, stout, 3-cuspidate, ST6-ST7 absent; inner row with STA displaced from STB-STD, STA-STD small, slender, without cusps; palp moderate size, 2-articulate, with 2 apical setae, flag spine absent, distomedial margin smooth. *Maxilla 2* : inner and outer plates narrow; inner plate 0.64 times length outer plate. *Maxilliped* : inner plate small, subovate, without apical nodular spines, oblique setal row absent; outer plate large, subovate, without subapical notch, apical setae, apical spines or medial spines, submarginal setae vestigial; palp large, 4-articulate, article 2 broad, length 0.9 times breadth, 0.6 times article 3; article 3 short, slender, length 1.8 times breadth; dactylus well developed, with 2 subterminal setae, unguis absent.

Gnathopod 1 : chelate; coxa large, as long as coxa 2, anterior margin straight, diverging distally from posterior margin; basis short, broad, length 1.7 times breadth, anterior margin smooth, without setae; ischium short, length 1.1 times breadth; merus, posterior margin lined with setae; carpus extremely compressed, hidden by propodus; propodus massive, subrectangular, length 1.8 times breadth, margins subparallel, posterior margin smooth, concave, with setae, palm obtuse, margin convex, smooth, posterodistal corner produced with simple spine; dactylus simple, without subterminal teeth or spines. *Gnathopod 2* : minutely subchelate; coxa large, subequal in size to coxa 3; ischium long, length 2.9 times breadth; carpus long, length 2.7 times breadth, posterior margin straight; propodus subrectangular, long, length 2 times breadth, palm acute, with straight, serrate margin, posterodistal corner without spines; dactylus reaching corner of palm, posterior margin smooth.

Peraeopod 3 : coxa large; female merus-carpus without plumose setae; propodus with 2 small setae and 1 distal spine along posterior margin; dactylus long, slender. *Peraeopod 4* : coxa with large posteroventral lobe, anterior margin rounded, posterior margin sloping anteriorly; female merus-carpus without plumose setae; propodus with 2 small setae and 1 spine along posterior margin; dactylus long, slender. *Peraeopod 5* : coxa equilobate; basis expanded with posterior margin smooth; merus broadly expanded with rounded posteroproximal shoulder and straight posterior margin; propodus with 2 small setae and 1 spine along anterior margin; dactylus long, slender. *Peraeopod 6* : coxa small, slightly lobate posteriorly, basis expanded posteriorly with smooth posterior margin; merus broadly expanded with rounded posteroproximal shoulder and straight posterior margin; propodus with 1 small seta and 1 distal spine along anterior margin; dactylus long, slender. *Peraeopod 7* : basis expanded posteriorly, posterior margin slightly rounded, minutely crenate, posteroventral corner rounded, posteroventral margin rounded; merus distally expanded, slightly convex posterior margin with 2 setae; propodus without minutely denticulate surface, with 1 spine along anterior margin; dactylus long, slender.

Oostegites from gnathopod 2 to peraeopod 5. *Gills* from gnathopod 2 to peraeopod 6, not pleated.

Pleonites 1 to 3 dorsally smooth. *Epimeron 1* : anteroventral corner rounded. *Epimeron 3* : posteroventral corner broadly rounded. *Urosomites* : 1 to 3 dorsally smooth. *Urosomite 3* : without small dorsolateral spine. *Uropod 1* : peduncle with 1 apicolateral and 1 apicomedial spines; outer ramus slightly longer than inner ramus; rami without spines. *Uropod 2* : peduncle without large dorsolateral flange; peduncle with 1 apicolateral and 1 apicomedial spines; rami subequal in length, inner ramus without spines or constriction. *Uropod 3* : peduncle short, length 1.3 times breadth, without dorsolateral flange, without dorsal, midlateral or distoventral spines; rami

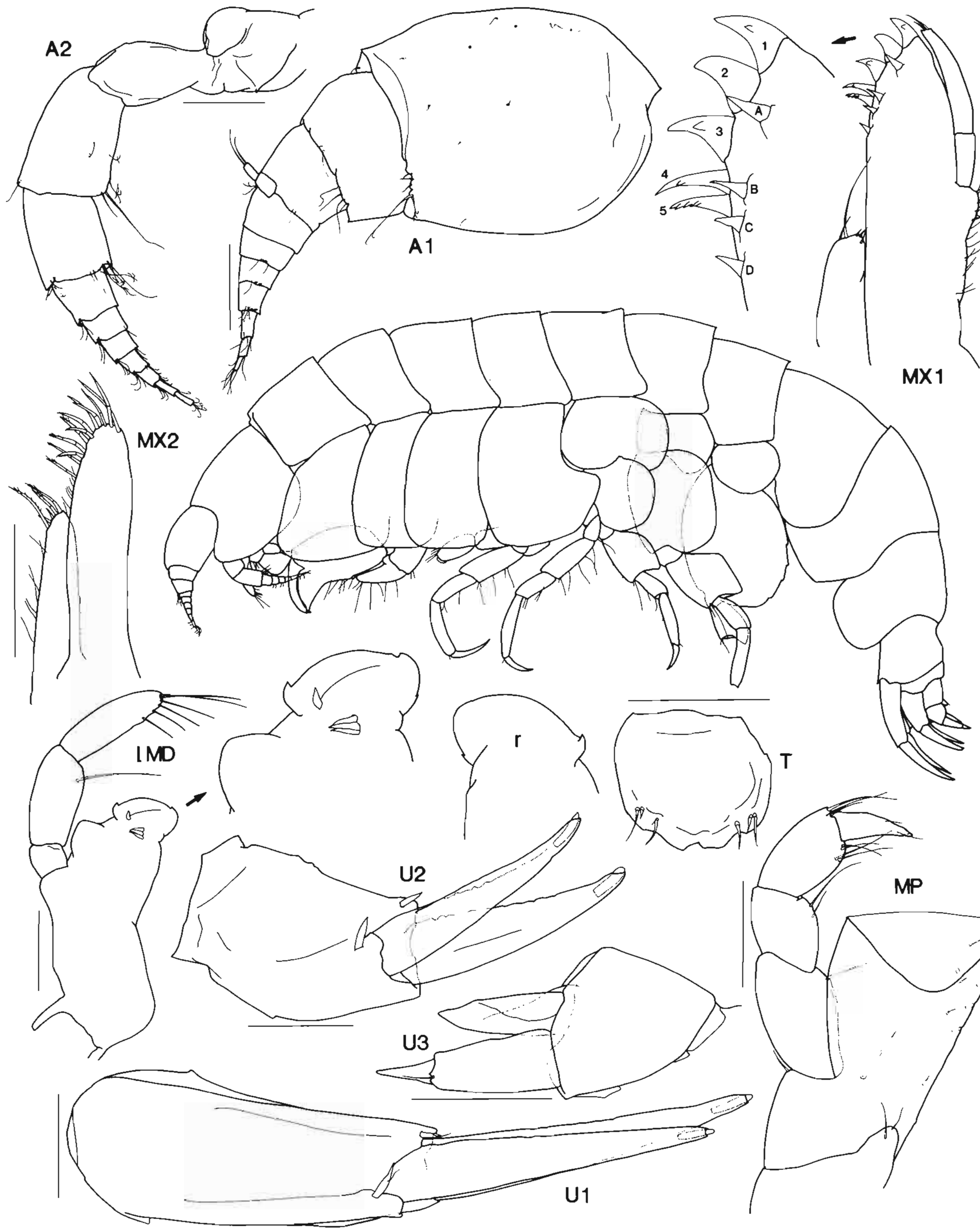

FIG. 11. — *Figorella corindon* sp. nov., holotype female, 3 mm (MNHN-Am 4457), south of Manimbaya, northern Makassar Strait, Indonesia. Scales represent 0.1 mm.

lanceolate, inner ramus reduced, about 0.67 times outer ramus; outer ramus 2-articulate, article 2 short; rami without spines; plumose setae absent. *Telson* : as long as broad, entire, without dorsal spines or simple setae; distal margin rounded, with 6 marginal penicillate setae, without simple marginal setae or spines.

ETYMOLOGY. — This species is named for the CORINDON Expedition which collected the type material.

REMARKS. — *Figorella corindon* is very closely related to *F. tasmanica* Lowry, 1984, but can be distinguished by the number of spine-teeth on maxilla 1, the produced posterodistal corner of gnathopod 1 propodus, and the shape of the basis of peraeopod 5. It is distinguished from *F. tanidea* by the shape of the merus of peraeopod 5 and the length of the posteroventral lobe on peraeopod 6.

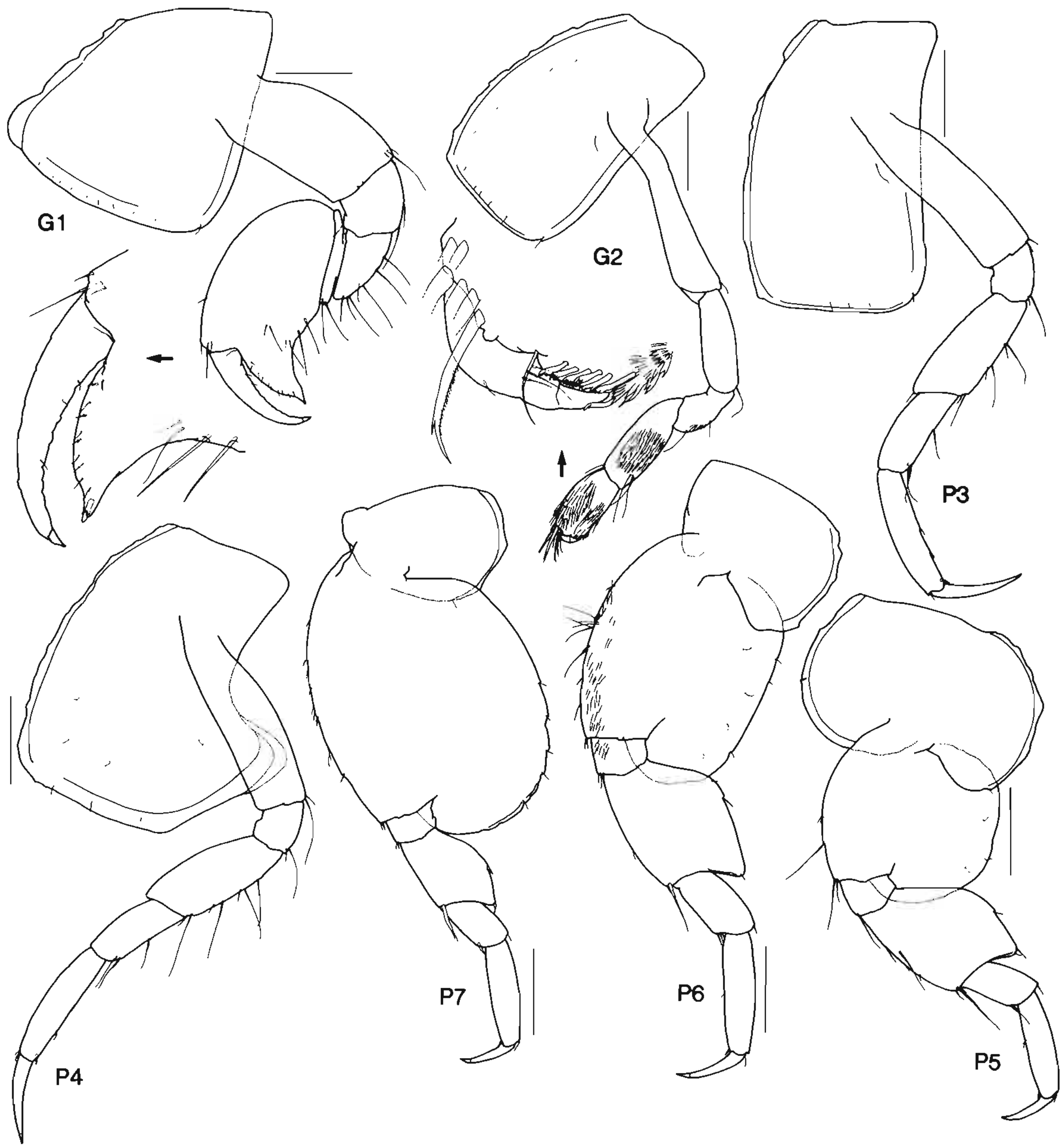

FIG. 12. — *Figorella corindon* sp. nov., holotype female, 3 mm (MNHN-Am 4457), south of Manimbaya, northern Makassar Strait, Indonesia. Scales represent 0.2 mm.

DISTRIBUTION. — *Figorella corindon* is known only from the Makassar Strait, Indonesia, in 1730 m depth.

Genus *ICHNOPUS* Costa, 1853

Ichnopus annasona Lowry & Stoddart, 1992

Ichnopus annasona Lowry & Stoddart, 1992 : 196, figs 4-5.

MATERIAL EXAMINED. — **Indonesia**. KARUBAR : stn DW 22, 05°22'S, 133°01'E, Kai Islands, 85-124 m, 25 October 1991 : 1 ♀, with oostegite buds.

DISTRIBUTION. — *Ichnopus annasona* is known from the Austral Isles, French Polynesia; Tasman Sea; New Caledonia; Kai Islands, Indonesia.

Ichnopus wardi Lowry & Stoddart, 1992

Glycerina tenuicornis - PIRLOT, 1936 : 271, figs 106, 107.
Ichnopus wardi Lowry & Stoddart, 1992 : 235, figs 33-35.

MATERIAL EXAMINED. — **Indonesia.** KARUBAR : stn DW 29, 05°36'S, 132°56'E, Kai Islands, 181-184 m, 26 October 1991 : 1 ♀, with oostegite buds.

REMARKS. — This female confirms LOWRY and STODDART'S (1992) tentative identification of PIRLOT'S (1936) material as *I. wardi*.

DISTRIBUTION. — *Ichnopus wardi* is known from north-western Australia, southern New Guinea, Indonesia and the Philippine Islands.

Genus *ONESIMOIDES* Stebbing, 1888

Onesimoides Stebbing, 1888 : 647. — PIRLOT, 1933 : 128. — BARNARD & KARAMAN, 1991 : 505.

DIAGNOSIS. — Antenna 1 : callynophore present in male and female; article 1 of accessory flagellum forming a cap covering callynophore. Antenna 2 not elongate in male. Mandible : left lacinia mobilis present; molar a reduced column with convex triturating surface; palp attached midway. Maxilla 1 : spine-teeth on outer plate large, robust, in 6/5 arrangement, ST7 slightly displaced from ST6; palp large, 2-articulate. Maxilla 2 : inner plate narrow, outer plate broad, subequal in length. Maxilliped : inner plate with well developed nodular spines; outer plate with small medial spines. Gnathopod 1 sexually dimorphic : female small, subchelate with an obtuse rounded palm; male large with an acute palm. Pleonite 3 with dorsal carina. Telson entire.

TYPE SPECIES. — *Onesimoides carinatus* Stebbing, 1888, by monotypy.

REMARKS. — This genus was based on the species *Onesimoides carinatus* Stebbing, 1888, known only from a single adult male from the Coral Sea. PIRLOT (1933) had limited material of *Onesimoides* from Indonesia. Without the combination of females and adult males he did not recognize the sexual dimorphism of gnathopod 1 and described two new species, *O. cavimanus* (based on a single adult male) and *O. chelatus* (based on a young male and several other small specimens). J.L. BARNARD (1961) first recognized sexual dimorphism in *Onesimoides*. He realized that males developed large subchelate first gnathopods which change with age. BELLAN-SANTINI (1974) also recognized this phenomenon in her material from the Mediterranean Sea.

We have studied relatively large collections of *Onesimoides* from the Philippines, Indonesia, New Caledonia and the Coral Sea. We now know that all females have very similar chelate first gnathopods and that young males look very much like females. We can recognize four distinct male gnathopod 1 transformation series in material from our study area. We believe that these series represent four distinct species. One of these species is *O. carinatus* (which includes *O. cavimanus*), now known from the Coral Sea and Indonesia. We redescribe *O. carinatus* and describe two new species, *O. castellatus* and *O. mindoro*. The fourth species, from New Caledonia, will be described in a later paper. Because *O. chelatus* was originally described from young specimens it cannot be identified with any adult forms, including the two species (*O. carinatus* and *O. mindoro*) known in the area from which it was described. Consequently we consider it to be an unrecognizable species.

There are other unnamed species in the literature. Based on the illustrations in J.L. BARNARD (1961), particularly of gnathopod 1, we think that the material from the south-eastern Atlantic Ocean, attributed to *O. chelatus*, is an undescribed species. The same is true of the material from Madagascar which LEDOYER (1978, 1986) attributed to *O. cavimanus* and *O. chelatus*. In this case there are unusual changes in the distal articles of peraeopods 5 to 7 in addition to the shape of the first gnathopod. WOLFF (1979) mentioned an undescribed species and a related undescribed genus from the western North Atlantic Ocean in his review of plant utilization in the deep sea. We have seen a possible new shallow water species of *Onesimoides* in collections from Namibia.

DISTRIBUTION. — North and South Atlantic Ocean, Mediterranean Sea, western Indian Ocean, south-east Asia and the Coral Sea.

Onesimoides carinatus Stebbing, 1888

Figs 13-16

Onesimoides carinatus Stebbing, 1888 : 648, pl. 14. — DELLA VALLE, 1893 : 796, pl. 60, figs 39-41. — STEBBING, 1906 : 32, fig. 8. — THURSTON & ALLEN, 1969 : 363.
Onesimoides cavimanus Pirlot, 1933 : 129, figs 40-41.
not *Onesimoides cavimanus* - DAHL, 1959 : 214, fig. 3 (= *O. mindoro*).
not *Onesimoides cavimanus* - LEDOYER, 1978 : 375, figs 9-10b; 1986 : 794, fig. 309 (= *Onesimoides* sp.).

MATERIAL EXAMINED. — **Coral Sea**. Stn FNQ 79-33, 11°32'S, 144°10'E, 16-18 km north-east of Raine Island, Great Barrier Reef, trawl, specimen in wood, 900-1000 m, Australian Museum Fish Department, 12 February 1979 : 1 ♂, 8 mm, 1 juvenile, 5.4 mm (AM P41269). — Stn 06/88-11, 11°33.02'S, 145°19.34'E, east of Cape York, Australia, beam trawl, 1611-1584 m, P. HUTCHINGS, *et. al.* on R.V. "*Franklin*", 22 August 1988 : 2 ♀, 10 mm, 3 ♂, 7.4-13.5 mm, 8 juveniles (AM P41270). — Stn 06/88-16, 11°41.55'S, 145°36.6'E, east of Cape York, Australia, beam trawl, specimens in wood, 2006-2053 m, P. HUTCHINGS , *et. al.* on R.V. "*Franklin*", 23 August 1988 : 1 ♂, 9.5 mm, 1 juvenile, 4.5 mm, (AM P41271).

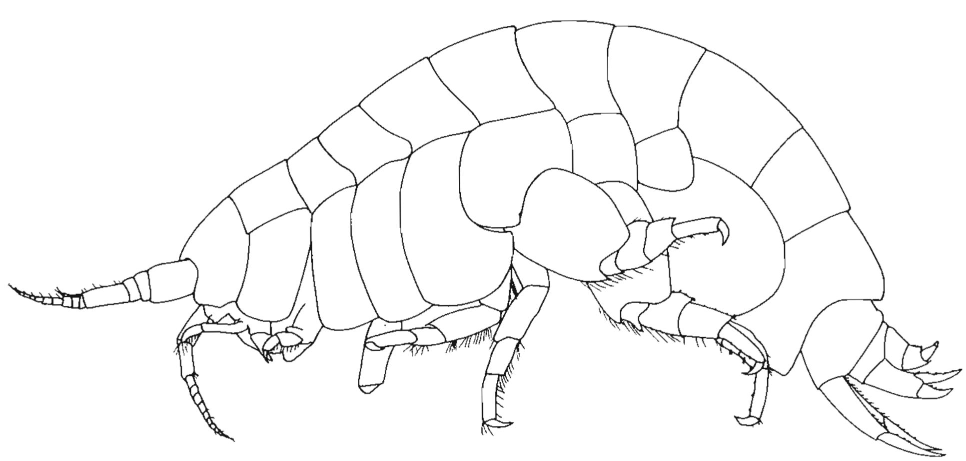

FIG. 13. — *Onesimoides carinatus* Stebbing, male, 8 mm (AM P41269), north-east of Raine Island, Coral Sea.

CIDARIS-1 : stn 35.4, 16°54.4'S, 147°14.35'E, beam trawl, specimens in wood, 1590-1473 m, M. PICHON, P.W. ARNOLD & R.A. BIRTLES on RV "*Franklin*", 14 May 1986 : 2 ♀, 15.5 and 16 mm (QM W17489).

DIAGNOSIS. — Antennae : calceoli present in adult male. Gnathopod 1 in male with large setal patch on merus and propodus, palm changing with age from transverse to obtuse to acute with small midpalmar tooth and posterior cavity. Pleonite 3 with slight to strong dorsal carina. Urosomite 1 without lateral flange. Uropod 3, inner ramus about 0.5 times outer ramus.

DESCRIPTION. — Based on female, 10 mm (AM P41270); male, 8 mm (AM P41269). *Head* : exposed, deeper than long; lateral cephalic lobe large, narrowly rounded; rostrum absent; eyes apparently absent. *Antenna 1* : medium length, 0.2 times body; peduncular article 1 short, length 1.1 times breadth; peduncular article 2 short, 0.4 times article 1; peduncular article 3 long, 0.25 times article 1; accessory flagellum long, 0.74 times primary flagellum, 4-articulate, article 1 long, 6.4 times article 2, (male, long, 6.5 times article 2), forming cap covering callynophore; flagellum 14-articulate (male 11), callynophore, strong 2-field in female and male, without posterodistal setae or spines, without flagellar spines, calceoli absent in female (present in 12.5 mm male). *Antenna 2* : subequal in length to antenna 1, (same in male); peduncle without brush setae in female or male; in female weakly geniculate, article 3 short, 0.4 times article 4 (in male weakly geniculate between peduncular articles 3-4, article 3 short, 0.46 times article 4); peduncular articles 4 and 5 not enlarged in male or female; flagellum 12-articulate (male 11), calceoli absent in female (present in 12.5 mm male).

Mouthpart bundle : subquadrate. *Epistome* and *upper lip* : separate, epistome straight, upper lip slightly produced, rounded. *Mandible*: incisors symmetrical, small, with slightly convex margins; left lacinia mobilis present, a cuspidate peg; accessory spine row without distal setal tuft, left row with 2, right with 3 short, thin, simple spines, without intermediate setae; molar with reduced column and convex triturating surface; mandibular palp attached midway, article 1 short, length 1.1 times breadth; article 2 elongate, slender, length 3.4 times breadth, 1.2 times article 3, with 11 (male 10) distal submarginal A2-setae; article 3 slender, blade-like, long, length 3 times breadth, with 2 (male 1) proximal A3-setae, 14 (male 12) D3-setae along most of posterior margin, and 3 apical E3-setae. *Maxilla 1* : inner plate narrow with 2 plumose apical setae; outer plate with 11 spine-teeth in 6/5 arrangement; outer row with ST1-ST3 large, stout, weakly to multicuspidate, ST4-ST6 large, stout, 5-cuspidate, ST7 slightly displaced from ST6, large, broad, 5-cuspidate; inner row with STA large, slightly displaced from STB-STD, 4-cuspidate, STB-STD large, broad, 4-cuspidate; palp large, 2-articulate, with 8 (male 6) long terminal spines, with 1 subterminal seta, 1 (male 2) flag spine present on distolateral corner, distomedial margin smooth. *Maxilla 2* : inner plate narrow, outer plate broad, subequal in length. *Maxilliped* : inner plate very large, subrectangular, with 3 apical stout spines, with 1 distal spine on lateral face near inner margin, oblique setal row strong with 10 plumose setae; outer plate small, subovate, without subapical notch, with many fine apical setae, with 1 apical spine, medial spines present, small, submarginal setae long, simple; palp large, 4-articulate, article 2 broad, length 1.7 times breadth, 1.4 times article 3; article 3 short, broad, length 1.4 times breadth; dactylus well developed, with 4 subterminal setae, unguis present.

Gnathopod 1 : sexually dimorphic; chelate in female, coxa large, slightly shorter than coxa 2, anterior margin concave, anteroventral corner produced, rounded, posterior margin slightly convex; basis long, slender, length 2.7 times breadth, anterior margin smooth, with simple setae; ischium long, length 1.7 times breadth; merus, posterior margin lined with long simple setae; carpus subtriangular, short, length 1.7 times breadth, shorter than (0.7 times) propodus, without denticulate patch near posterodistal margin; propodus large, subrectangular, length 1.9 times breadth, margins subparallel, posterior margin smooth, strongly sinusoidal, without spines, with setae, without denticulate patch near posterior margin, palm obtuse, margin convex, smooth, posterodistal corner with 1 medial and 1 lateral spines; dactylus simple, with subterminal tooth. Male, 8 mm, gnathopod 1 subchelate; basis long, slender, length 2.3 times breadth; merus with large brush of setae on medial face; carpus subtriangular, short, length 0.8 times breadth, shorter than (0.5 times) propodus; propodus massive, subrectangular, length 1.4 times breadth, margins subparallel, posterior margin smooth, straight, with dense brush of setae on medial face, palm acute, margin irregular with posterior cavity, posterodistal corner with 1 medial and 1 lateral spines; dactylus simple, strongly curved.

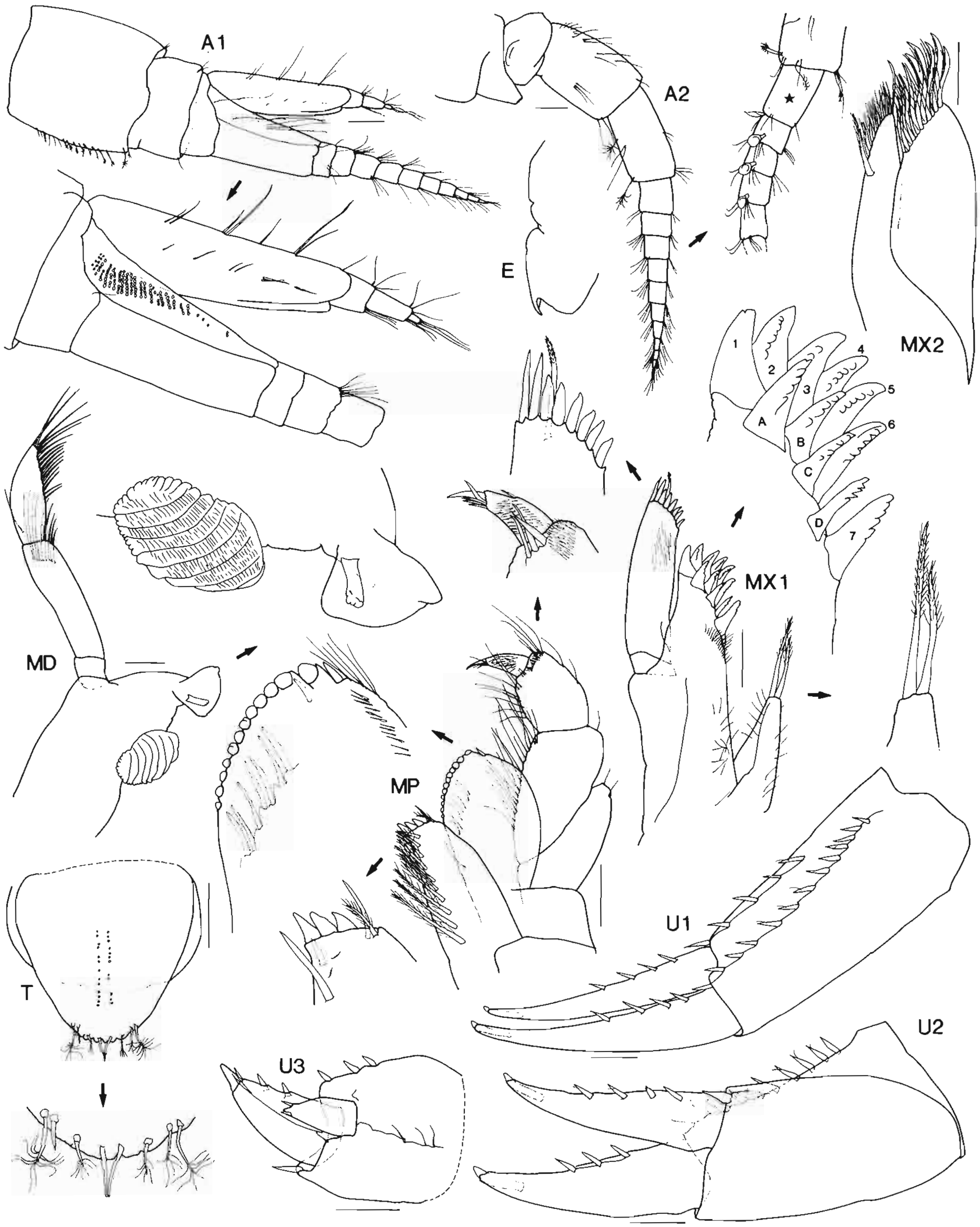

FIG. 14. — *Onesimoides carinatus* Stebbing, male, 8 mm (AM P41269), north-east of Raine Island, Coral Sea. A2 enlargement: male, 13.5 mm (AM P41270), east of Cape York, Coral Sea. Scales represent 0.1 mm.

Gnathopod 2 : minutely subchelate; coxa large, subequal in size to coxa 3; ischium long, length 2.3 times breadth; carpus long, length 2.3 times breadth, posterior margin broadly lobate; propodus subquadrate, short, length 1.4 times breadth, posterior margin without strong distal spines, palm obtuse, with straight, serrate margin, posterodistal corner with 1 (male 1) medial and 1 lateral (male 1) spines; dactylus reaching corner of palm, posterior margin serrate.

Peraeopod 3 : coxa large; merus weakly expanded anteriorly, male and female merus-carpus without plumose setae; propodus with 7 (male 9) spines and 2 distal spines along posterior margin; dactylus short, stocky. *Peraeopod 4* : coxa deeper than wide, with large posteroventral lobe, anterior margin slightly rounded, posterior margin slightly sloping anteriorly; merus weakly expanded anteriorly, merus-carpus without plumose setae; propodus with 8 (male 7) spines and 2 distal spines along posterior margin; dactylus short, stocky. *Peraeopod 5* : coxa equilobate; basis expanded with posterior margin minutely crenate; merus expanded with rounded posterior margin; propodus with 5 (male 5) spines and 2 distal spines along anterior margin, dactylus short, stocky. *Peraeopod 6* : coxa small, slightly lobate posteriorly; basis expanded posteriorly with minutely crenate posterior margin; merus expanded with rounded posterior margin; propodus with 6 (male 6) spines and 2 distal spines along anterior margin; dactylus short, stocky. *Peraeopod 7* : basis expanded posteriorly, posterior margin slightly rounded, minutely crenate, posteroventral corner rounded, posteroventral margin rounded; merus not expanded posteriorly, with 4 spines; propodus with 5 (male 6) spines and 2 distal spines along anterior margin and 2 (male 2) spines and 2 distal spines along posterior margin; dactylus short, stocky.

Oostegites from gnathopod 2 to peraeopod 5. *Gills* from gnathopod 2 to peraeopod 6, not pleated.

Pleonite 3 : with slight dorsal carina. *Epimeron 1* : anteroventral corner rounded. *Epimeron 3* : posteroventral corner subquadrate. *Urosomites* : urosomite 1 with anterodorsal notch and rounded boss with slight dorsal carina, without lateral flange; urosomite 3 without small dorsolateral spine. *Uropod 1* : peduncle with 4 (male 12) dorsolateral, 1 apicolateral, 4 dorsomedial and 1 apicomedial spines, without spines along distal margin; outer ramus slightly longer than inner ramus; outer ramus with 2 (male 4) dorsal spines; inner ramus with 2 (male 4) dorsal spines. *Uropod 2* : peduncle with 6 (male 9) dorsolateral, 1 apicolateral, 1 (male 0) dorsomedial and 1 (male 1) apicomedial spines, without spines along distal margin; rami subequal in length; outer ramus with 3 dorsal spines; inner ramus with 4 dorsal spines, without constriction. *Uropod 3* : peduncle short, length 1.1 times breadth, with dorsolateral flange, with 2 dorsolateral and 1 apicolateral spines, with 4 (male 3) midmedial setae, with 1 distoventral spine, without plumose setae; rami lanceolate, inner ramus reduced, about 0.5 times outer ramus; outer ramus 2-articulate, article 2 short, article 1 with 3 lateral and 1 medial spines; inner ramus with 1 medial and 0 (male 1) lateral spines; plumose setae absent in male and female. *Telson* : length subequal to breadth, entire, without dorsal simple spines; distal margin rounded, with 6 penicillate and 2 simple marginal setae, without marginal spines.

VARIATION. — The shape and size of male gnathopod 1 changes with age, although not as decisively as in other known species. In small males (around 7 mm) the propodus is subrectangular and relatively narrow, as in the female, with a transverse palm with a slightly convex margin (fig. 16A). In slightly larger males (around 8-10 mm) the propodus becomes broader, the palm becomes slightly obtuse and the margin is convex (fig. 16B). In the largest males we have seen (around 13 mm) the propodus continues to broaden, the palm becomes acute with a small midpalmar tooth and a posterior cavity (fig. 16C). As the gnathopod enlarges the basis lengthens to accommodate the larger propodus.

The carpus of peraeopods 6 and 7 in this species (fig. 16) varies from long and narrow to broad and nearly subquadrate. The variation might follow development with age, but we have not been able to confirm this and in several instances (such as illustrated in fig. 16C) the carpus is quite different between the left and right sides.

The dorsal carination is variable; although present in all the specimens examined, it is not as strong as described by STEBBING (1888).

REMARKS. — This is the first record of *O. carinatus* since it was originally described. The new material is from near the type locality in the Coral Sea. Based on the range of material we have studied and PIRLOT's (1933) drawings of the male gnathopod 1 in *O. cavimanus*, it is clear that this species is synonymous with *O. carinatus*. This synonymy extends the range of *O. carinatus* into Indonesian waters.

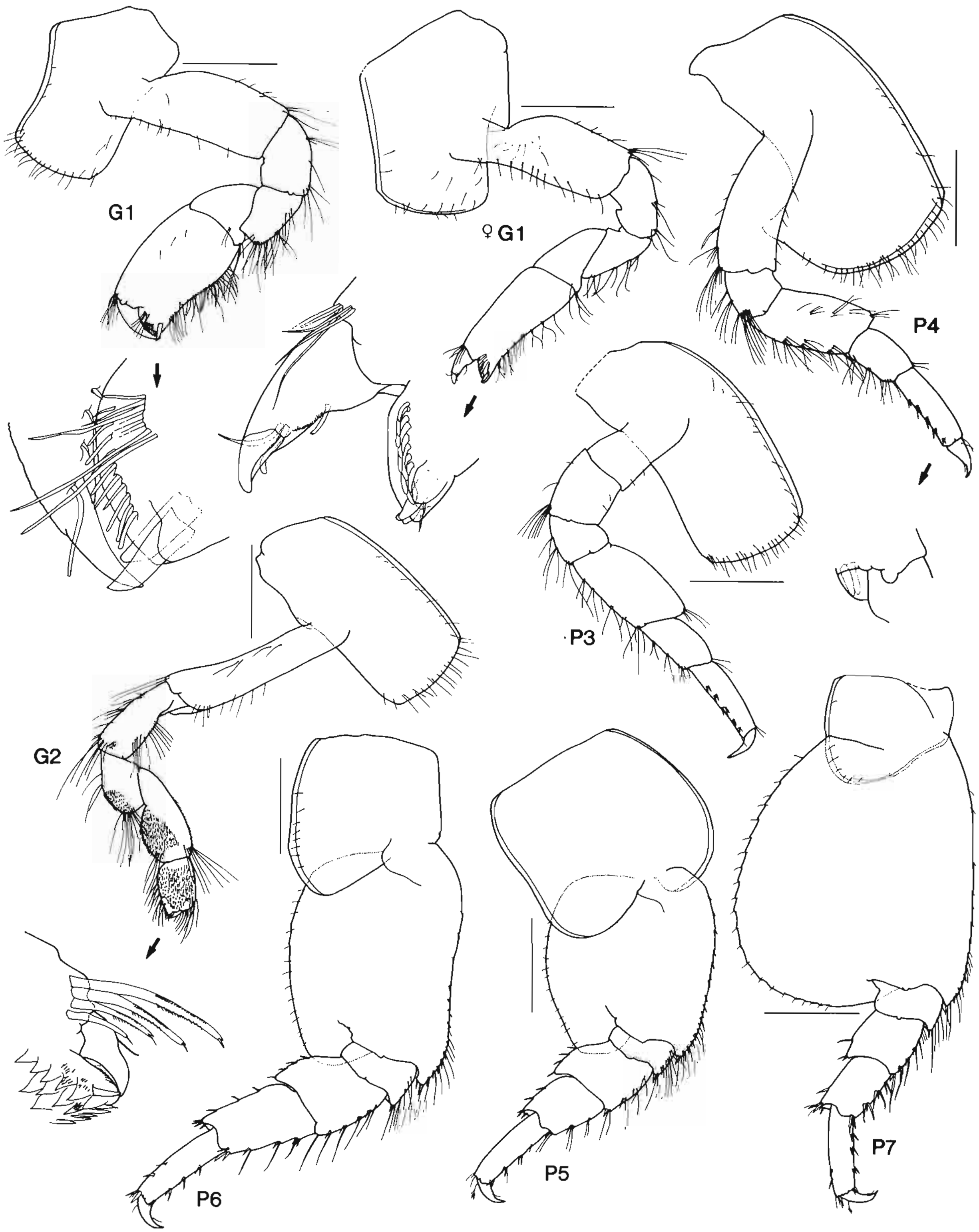

FIG. 15. — *Onesimoides carinatus* Stebbing, male, 8 mm (AM P41269), north-east of Raine Island, Coral Sea. Female, 10 mm (AM P41270), east of Cape York, Coral Sea. Scales represent 0.5 mm.

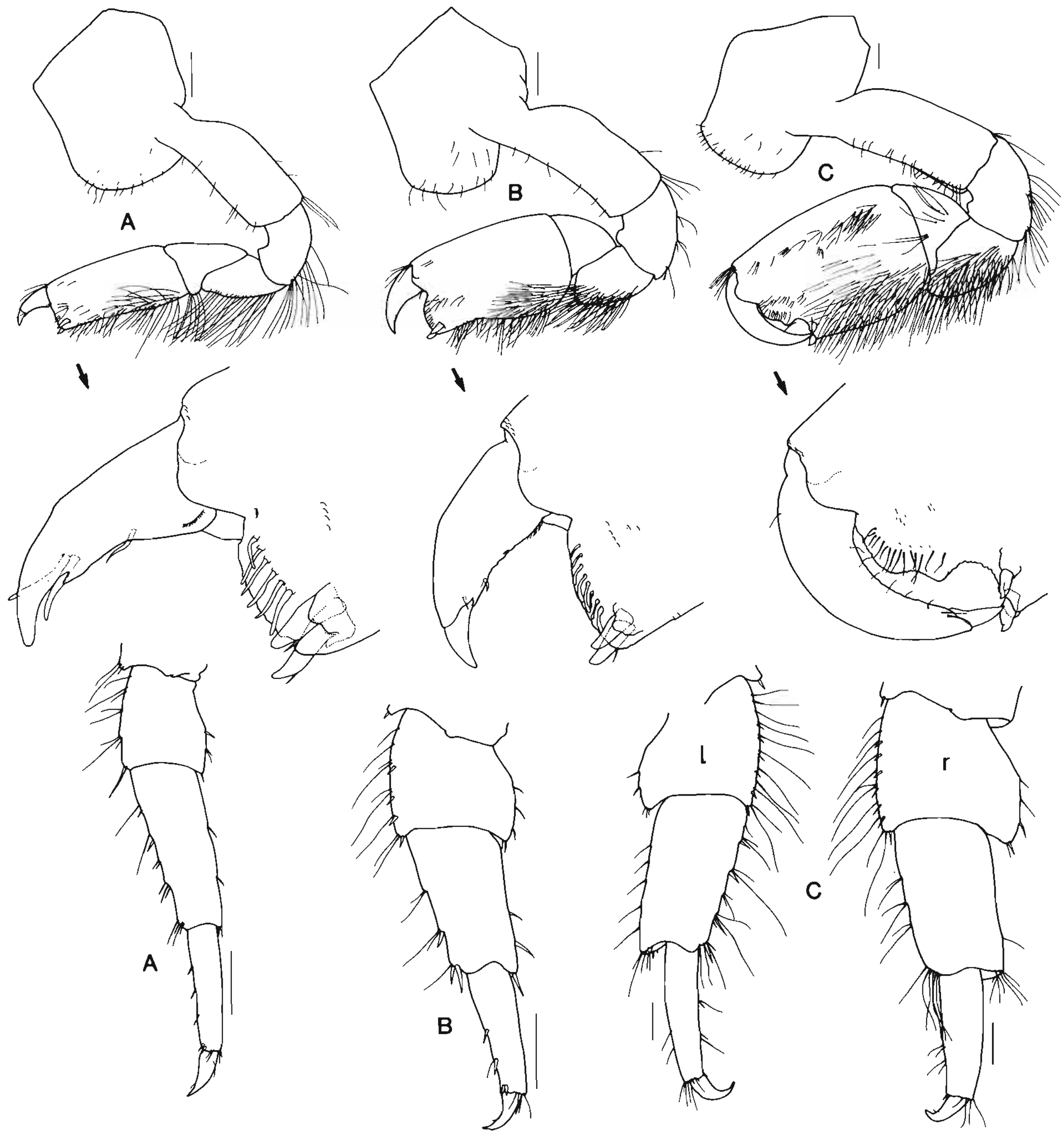

FIG. 16. — *Onesimoides carinatus* Stebbing, gnathopod 1 and distal articles of peraeopod 6 : **A**. male, 7.6 mm (AM P41270), east of Cape York, Coral Sea; **B**. male, 9.5 mm (AM P41271), east of Cape York, Coral Sea; **C**. male, 13.5 mm (AM P41270), east of Cape York, Coral Sea. Scales represent 0.2 mm.

We cannot distinguish females of *O. carinatus* from those of *O. mindoro*. Males are distinguished by the length to breadth ratios of the propodus in gnathopod 1 and the palm which becomes excavate in large males of *O. mindoro*. The palm of a large male of *O. carinatus* (fig. 16C) is similar to that of a small male of *O. mindoro* (fig. 24A), but the length to breadth ratio of the propodus is different and the *O. carinatus* specimen is twice as large as the comparable *O. mindoro* specimen.

DISTRIBUTION. — Coral Sea to Indonesia in 900 to 2560 m depth.

Onesimoides castellatus sp. nov.

Figs 17-20

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 2 : stn CP 17, 14°00'N, 120°18'E, north of Lubang Island, 174-193 m, 22 November 1980 : 1 ♀, 8.5 mm, ovigerous (approximately 22 eggs) (MNHN-Am 4456A); 1 ♂, 7.5 mm (MNHN-Am 4456B) and 1 ♀ (AM P41426).

MUSORSTOM 3 : stn CP 87, 14°00'N, 120°19'E, north of Lubang Island, 191-197 m, 31 May 1985 : 1 ♀ and 1 partial ♀ (MNHN-Am 4384). — Stn CP 101, 14°15'N, 120'19'E, north of Lubang Island, 195 m, 1 June 1985 : 23 ♀ and juveniles; 1 ♂; 1 partial ♀ (MNHN-Am 4452). — Stn 103, 14°00'N, 120°18'E, north of Lubang Island, 193-200 m, 1 June 1985 : 2 ♀ (MNHN-Am 4446); 1 ♂, 7.5 mm (AM P41427). — Stn 135, 11°58'N, 122°02'E, east of Boracay Island, Sibuyan Sea, 486-551 m, 5 June 1985 : 3 ♀ and 1 ♂ (MNHN-Am 4443). — Stn CP 139, 11°53'N, 122°14'E, off the north-west northern coast of Panay, Sibuyan Sea, 240-267 m, 6 June 1985 : 4 ♀ and juveniles; 7 ♂ (MNHN-Am 4437).

T. MORTENSEN EXPEDITION : approx. 6°N, 121°E, Mindanao, 15 miles west of Jolo, Sigsby trawl, soft bottom, 450 m, 27 March 1914 : 2 ♀, 9 and 11 mm; 1 ♂, 15 mm (ZMC).

Indonesia. KARUBAR : stn CC 10, 05°21'S, 132°30'E, Kai Islands, 329-389 m, 23 October 1991 : 1 ♂. — Stn CP 16, 05°17'S, 132°50'E, Kai Islands, 315-349 m, 24 October 1991 : 5 ♀.

TYPES. — The ovigerous female, 8.5 mm (MNHN-Am 4456A) is the holotype. The other specimens are paratypes.

TYPE LOCALITY. — Philippines Islands, north of Lubang Island, 14°00'N, 120°18'E, 174-193 m.

DIAGNOSIS. — Antennae : calceoli absent. Gnathopod 1 in male : without large setal patch on merus or propodus, palm changing with age from transverse to acute, but always with strong castellate margin. Pleonite 3 : with slight dorsal carina. Urosomite 1 with lateral flange. Uropod 3 : inner ramus subequal in length to outer ramus.

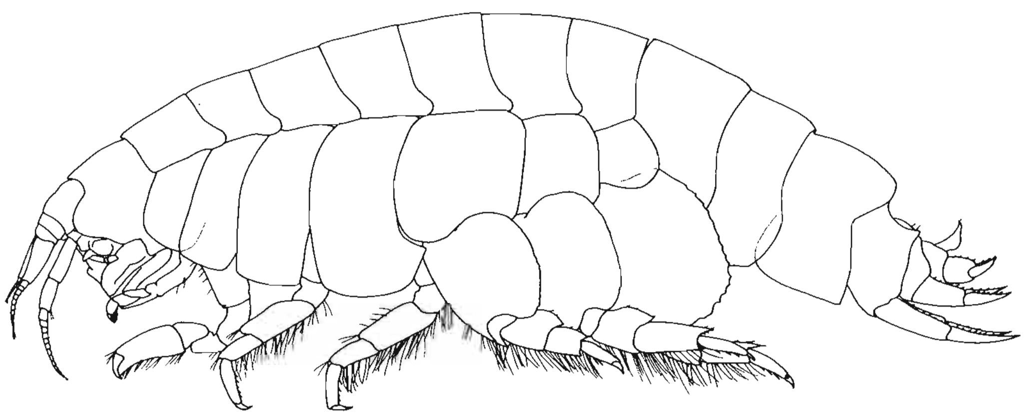

FIG. 17. — *Onesimoides castellatus* sp. nov., holotype female, 8.5 mm (MNHN-Am 4456A), north of Lubang Island, Philippine Islands.

DESCRIPTION. — Based on female holotype, 8.5 mm (MNHN-Am 4456A); male paratype, 7.5 mm (MNHN-Am 4456). *Head* : exposed, deeper than long; lateral cephalic lobe large, broadly rounded; rostrum absent; eyes apparently absent. *Antenna 1* : short, 0.18 times body; peduncular article 1 short, length 1.1 times breadth; peduncular article 2 short, 0.23 times article 1; peduncular article 3 short, 0.17 times article 1; accessory flagellum long, 0.73 times primary flagellum, 5-articulate, article 1 long, 8.5 times article 2, forming cap covering callynophore; flagellum 11-articulate (male 9), callynophore strong 2-field in female and male, without posterodistal setae or spines, without flagellar spines or aesthetascs, calceoli absent. *Antenna 2* : slightly longer than antenna 1, (same in male); peduncle without brush setae in male or female; in female weakly geniculate, article 3 short, 0.4 times article 4, (same in male); peduncular articles 4 and 5 not enlarged in male or female; flagellum 11-articulate (male 7), calceoli absent.

Mouthpart bundle : subquadrate. *Epistome* and *upper lip* : separate, epistome slightly produced, rounded, upper lip slightly produced, straight. *Mandible* : incisors symmetrical, small, with slightly convex margins; left lacinia mobilis present, a cuspidate peg; accessory spine row without distal setal tuft, left and right rows each with 3 short, slender, simple spines, without intermediate setae; molar with reduced column and convex triturating surface; mandibular palp attached midway, article 1 short, length 1.1 times breadth; article 2 elongate, slender, length 3.4 times breadth, 1.4 times article 3, with 12-14 (male 11-12) posterodistal A2-setae, without D2-setae; article 3 slender, blade-like, long, length 3.4 times breadth, with 1-2 (male 1) proximal A3-setae, 12 (male 12) D3-setae along most of posterior margin, and 3 apical E3-setae. *Maxilla 1* : inner plate narrow with 2 plumose apical setae; outer plate with 11 spine-teeth in 6/5 arrangement; outer row with ST1-ST3 large, stout, multicuspidate, ST4-ST5 large, stout, 4- to 5-cuspidate, ST6 large, stout, 8- to 9-cuspidate, ST7 slightly displaced from ST6, large, broad, 8- to 9-cuspidate; inner row with STA large, slightly displaced from STB-STD, 4-cuspidate, STB long, broad, 4-cuspidate, STC large, broad, 3- to 5-cuspidate, STD broad, 5-cuspidate; palp large, 2-articulate, with 8 long terminal spines, with 1 subterminal seta, flag spine present on distolateral corner, distomedial margin smooth. *Maxilla 2* : inner plate narrow, outer plate broad, inner plate 0.83 times length outer plate. *Maxilliped* : inner plate very large, subrectangular, with 3 apical nodular spines and 1 subapical lateral spine, oblique setal row strong with 9 plumose setae; outer plate small, subovate, without subapical notch, with many fine apical setae, with 1 apical spine, medial spines present, small, submarginal setae long, simple; palp large, 4-articulate, article 2 broad, length 2.5 times breadth, 1.6 times article 3; article 3 long, broad, length 2 times breadth; dactylus well developed, with 6 subterminal setae, unguis present.

Gnathopod 1 : sexually dimorphic; female chelate, coxa large, as long as coxa 2, anterior margin slightly concave, anteroventral corner rounded, posterior margin slightly convex; basis long, slender, length 2.5 times breadth, anterior margin smooth, with simple setae; ischium long, length 1.9 times breadth; merus, posterior margin without setae; carpus subtriangular, short, length 1.3 times breadth, 0.65 times as long as propodus, without denticulate patch near posterodistal margin; propodus large, subrectangular, length 1.8 times breadth, tapering distally, posterior margin smooth, strongly sinusoidal with 5 groups of setae, without denticulate patch near posterior margin, palm obtuse, margin convex, smooth, posterodistal corner with 1 medial and 1 lateral spines; dactylus simple, without subterminal teeth or spines. Male (7.5 mm) gnathopod 1 subchelate; basis long, slender, length 2.2 times breadth; merus, posterior margin with a few simple setae; carpus subtriangular, short, length 0.7 times breadth, shorter than (0.3 times) propodus; propodus massive, subrectangular, length 1.3 times breadth, margins subparallel, posterior margin smooth, convex, with few setae, palm acute, margin convex, castellate, posterodistal corner with 1 medial and 1 lateral spines; dactylus simple, strongly curved. *Gnathopod 2* : minutely subchelate; coxa large, subequal in size to coxa 3; ischium long, length 2 times breadth; carpus long, length 2.6 times breadth, posterior margin broadly lobate; propodus subquadrate, short, length 1.3 times breadth, posterior margin without strong distal spines, palm transverse, with convex, serrate margin, posterodistal corner with 1 medial and 2 lateral spines; dactylus reaching corner of palm, posterior margin serrate.

Peraeopod 3 : coxa large; merus weakly expanded anteriorly, male and female merus-carpus without plumose setae; propodus with 7 spines along posterior margin and 2 distal spines; dactylus short, stocky. *Peraeopod 4* : coxa deeper than wide, with large posteroventral lobe, anterior margin slightly rounded, posterior margin slightly sloping anteriorly; merus weakly expanded anteriorly, male and female merus-carpus without plumose setae; propodus with 7 spines along posterior margin and 2 distal spines; dactylus short, stocky. *Peraeopod 5* : coxa equilobate; basis expanded with posterior margin strongly crenate; merus expanded with rounded posterior margin; propodus with 3 spines along anterior margin and 2 distal spines; dactylus short, stocky. *Peraeopod 6* : coxa small, slightly lobate posteriorly; basis expanded posteriorly with crenate posterior margin; merus expanded with rounded posterior margin; propodus with 3 spines and 2 distal spines along anterior margin, with 3 spines on posterodistal margin; dactylus short, stocky. *Peraeopod 7* : basis expanded posteriorly, posterior margin slightly rounded, scalloped, posteroventral corner rounded, posteroventral margin rounded; merus not expanded posteriorly, with 4 spines; propodus with 3 setae and 2 distal spines along anterior margin, with 4 posterodistal spines; dactylus short, stocky.

Oostegites from gnathopod 2 to peraeopod 5. *Gills* from gnathopod 2 to peraeopod 6, not pleated.

FIG. 18.— *Onesimoides castellatus* sp. nov., holotype female, 8.5 mm (MNHN-Am 4456), north of Lubang Island, Philippine Islands. Scales represent 0.2 mm.

Pleonite 3 : with dorsal carina. *Epimeron 1* : anteroventral corner rounded. *Epimeron 3* : posteroventral corner subquadrate. *Urosomites* : urosomite 1 with anterodorsal notch and rounded boss with slight dorsal carina, with lateral flange; urosomite 3 without dorsolateral spine. *Uropod 1* : peduncle with 9 dorsolateral, 2 apicolateral, 7 dorsomedial and 1 apicomedial spines, without spines along distal margin; outer ramus slightly longer than inner ramus; outer ramus with 7 dorsal spines; inner ramus with 5 dorsal spines. *Uropod 2* : peduncle with

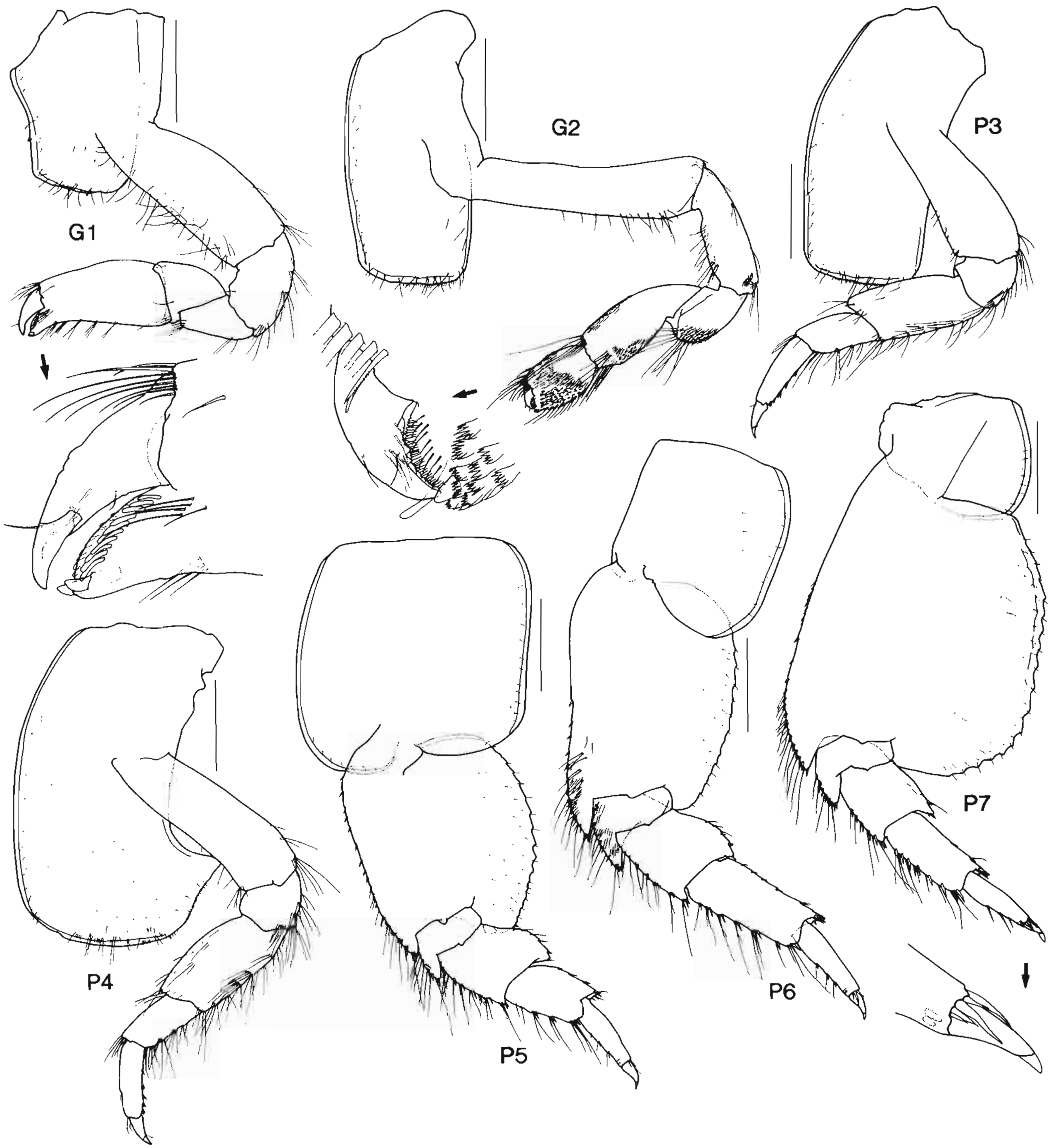

FIG. 19. — *Onesimoides castellatus* sp. nov., holotype female, 8.5 mm, (MNHN-Am 4456A), north of Lubang Island, Philippine Islands. Scales represent 0.5 mm.

7 dorsolateral, 1 apicolateral and 1 apicomedial spines, without spines along distal margin; rami subequal in length; outer ramus with 6 lateral spines; inner ramus with 1 medial and 4 lateral spines, without constriction. *Uropod 3* : peduncle short, length 1.3 times breadth, with dorsolateral flange, with 4 dorsolateral spines, with 1 midlateral setae, with 1 distoventral spine, without plumose setae; rami lanceolate, subequal in length; outer ramus 2-articulate, article 2 short, without spines; inner ramus with 1 lateral spine; plumose setae absent in male and female. *Telson* : length 1.1 times breadth, entire, without dorsal simple spines; distal margin truncated, with 6 penicillate and 2 simple marginal setae, without marginal spines.

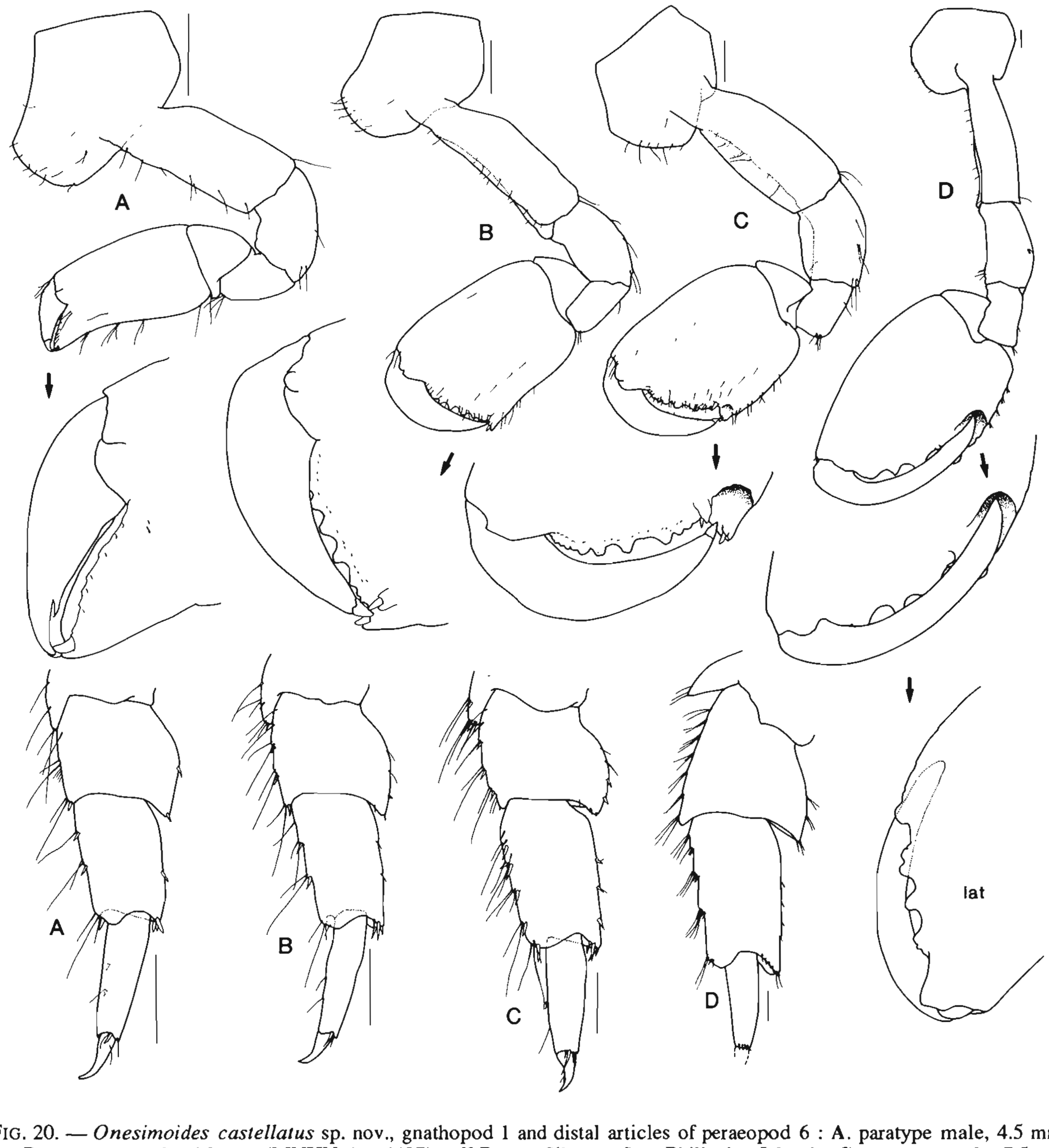

FIG. 20. — *Onesimoides castellatus* sp. nov., gnathopod 1 and distal articles of peraeopod 6 : **A**. paratype male, 4.5 mm, **B**. paratype male, 6.2 mm (MNHN-Am 4437), off Panay, Sibuyan Sea, Philippine Islands; **C**. paratype male, 7.5 mm (MNHN-Am 4456B), north of Lubang Island, Philippine Islands. **D**. paratype male, 15 mm (ZMC), off Mindanao, Philippine Islands. Scales represent 0.2 mm.

VARIATION. — The shape and size of male gnathopod 1 changes significantly with age. In small males around 4.5 mm the propodus is subrectangular and relatively narrow, the palm is obtuse as in a female and not castellate (fig. 20A). In slightly larger males, around 6 mm, the propodus becomes broader, the palm becomes transverse and forms a strongly castellate margin (fig. 20B). In males around 7.5 mm the propodus remains broad, the palm remains castellate and becomes acute with the tip of the dactylus fitting into a small medial posterodistal cavity on the propodus (fig. 20C). In very large males, around 15 mm, the propodus remains broad but lengthens, the palm becomes strongly castellate and extremely acute and the medial posterodistal cavity is enlarged (fig. 20D). The medial surface of the propodus does not develop the strong brush of setae seen in other species of *Onesimoides*. As the gnathopod enlarges the basis lengthens to accommodate the larger propodus.

The carpus of peraeopods 6 and 7 does not change much with size except in very large animals where it becomes longer in relation to its breadth.

ETYMOLOGY. — The specific name refers to the castellations on the palm of gnathopod 1 in the adult male.

REMARKS. — Males and females of *O. castellatus* can be distinguished from other species in the genus by the lateral flange on urosomite 1. Males never develop the large brush of setae on the merus and propodus of gnathopod 1 that is so distinctive in *O. carinatus* and *O. mindoro*, nor do they develop the enlarged carpus of peraeopods 6 and 7 seen in the western Indian Ocean species referred to as *O. cavimanus* by LEDOYER (1978, 1986).

DISTRIBUTION. — *Onesimoides castellatus* is known from the central Philippines in 174 to 551 m depth and the Kai Islands, Indonesia in 315 to 389 m depth.

Onesimoides chelatus Pirlot, 1933

Onesimoides chelatus Pirlot, 1933 : 134, figs 43-45.
not *Onesimoides chelatus* - J. L. BARNARD, 1961 : 43, figs 12-14 (part = *O. mindoro*; part = *Onesimoides* sp.).
not *Onesimoides chelatus* - LEDOYER, 1978 : 381, fig. 10a; 1986 : 796, fig. 310 (= *Onesimoides* sp.).

REMARKS. — PIRLOT (1933) had two lots of material from Indonesia which he attributed to this species. One lot was in bad condition and not used in his description. The other lot contained 9 small specimens from which he described a young (3.5 mm) male. The first gnathopod of this male still has the shape of a female first gnathopod. There are two taxa known from this area, but we can only recognize them by the shape of gnathopod 1 in mature males. Consequently *O. chelatus* must be considered as an unrecognizable species. We consider the Indonesian part of the material which J. L. BARNARD (1961) attributed to *O. chelatus*, to be *O. mindoro* based on his illustrations of male first gnathopods. The other part of this material, an adult male from the Gulf of Guinea, western Africa, is probably an undescribed species for this same reason. Similarly the material from Madagascar which LEDOYER (1978, 1986) attributed to *O. chelatus* may be the female of the undescribed species he attributed to *O. cavimanus*.

Onesimoides mindoro sp. nov.

Figs 21-24

Onesimoides chelatus - J. L. BARNARD, 1961 : 43, figs 12, 14 (in part, part, fig. 13 = *Onesimoides* sp.).

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 2 : stn CP 15, 13°55'N, 120°29'E, between Lubang Island and Matabungkay, 326-330 m, 21 November 1980 : 1 ♀ (MNHN-Am 4455).

MUSORSTOM 3 : stn 105, 13°52'N, 120°30'E, north-east of Lubang Island, 398-417 m, 1 June 1985 : 1 ♀ (MNHN-Am 4439). — Stn CP 116, 12°32'N, 120°47'E, Mindoro Strait, 804-812 m, inside an old piece of wood, 3 June 1985 : 1 ♀, 10 mm (MNHN-Am 4445A); 1 ♂, 12 mm and 2 ♀ (MNHN-Am 4445B); 1 ♀ (AM P41430). — Stn CP 139, 11°53'N, 122°14'E, Sibuyan Sea, off the north-west northern coast of Panay, 240-267 m, 6 June 1985 : 1 ♂ and 4 juveniles (MNHN-Am 4603); 1 ♂ (AM P41431).

T. MORTENSEN EXPEDITION : approx. 6°N, 121°E, Mindanao, 15 miles west of Jolo, Sigsby trawl, soft bottom, 450 m, 27 March, 1914 : 1 ♂, 8 mm (ZMC).

Indonesia. CORINDON 2 : stn CP 231, 0°04.9'N, 119°47.8'E, Makassar Strait, off Manimbaya, Sulawesi, 980-1080 m, 4 November, 1980 : 1 ♂, 20 mm (MNHN-Am 4448).
KARUBAR : stn CP 25, 05°30'S, 132°52'E, Kai Islands, 336-346 m, in a piece of wood, 26 October 1991 : 3 ♂ and 4 ♀.

TYPES. — The female, 10 mm, (MNHN-Am 4445A) is the holotype. The other specimens are paratypes.

TYPE LOCALITY. — Philippine Islands, Mindoro Strait, 12°32'N, 120°47'E, 804-812 m.

DIAGNOSIS. — Antennae : calceoli present in adult male. Gnathopod 1 in male with large setal patch on merus and propodus, propodus longer than broad, becoming proximally bulbous in adult male, palm excavate with small midpalmar tooth. Pleonite 3 with slight dorsal carina. Urosomite 1 without lateral flange. Uropod 3 : inner ramus about 0.7 times outer ramus.

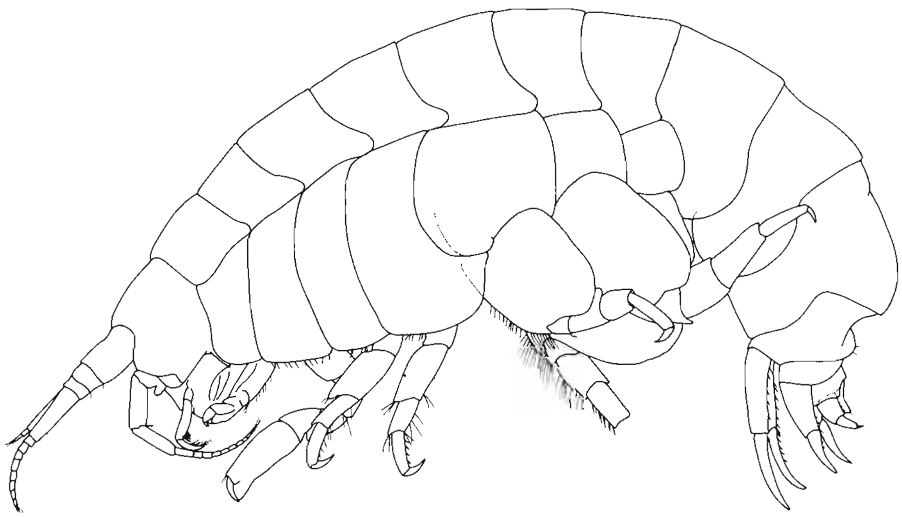

FIG. 21. — *Onesimoides mindoro* sp. nov., holotype female, 10 mm (MNHN-Am 4445A), Mindoro Strait, Philippine Islands.

DESCRIPTION. — Based on holotype female, 10 mm (MNHN-Am 4445A); paratype male, 12 mm (MNHN-Am 4445B). *Head* : exposed, deeper than long; lateral cephalic lobe large, broadly rounded; rostrum absent; eyes apparently absent. *Antenna 1* : medium length, 0.2 times body; peduncular article 1 short, length 1.3 times breadth; peduncular article 2 short, 0.24 times article 1; peduncular article 3 short, 0.18 times article 1; accessory flagellum long, 0.56 times primary flagellum, 4-articulate, article 1 long, 8.1 times article 2, (male long, 8.4 times article 2), forming cap covering callynophore; flagellum 14-articulate (male 11), callynophore strong 2-field in female and male, without posterodistal setae or spines, without flagellar spines, calceoli absent in female (present in 8 mm male). *Antenna 2* : slightly longer than antenna 1, (same in male); peduncle without brush setae in male or female; in female weakly geniculate, article 3 short, 0.3 times article 4, (in male weakly geniculate, article 3 short, 0.4 times article 4); peduncular articles 4 and 5 not enlarged in male or female; flagellum 9-articulate (male 14), calceoli absent in female (present in 8 mm male).

Mouthpart bundle : subquadrate. *Epistome* and *upper lip* : separate, epistome straight, upper lip slightly produced, rounded. *Mandible* : incisors symmetrical, small, with slightly convex margins; left lacinia mobilis present, a cuspidate peg; accessory spine row without distal setal tuft, left and right rows each with 3 short, thin, simple spines, without intermediate setae; molar with reduced column and convex triturating surface; mandibular palp attached midway, article 1 short, length 1.3 times breadth; article 2 elongate, slender, length 3.7 times breadth, 1.2 times article 3, with 15 (male 19) posterodistal A2-setae, without D2-setae; article 3 slender, blade-like, long, length 3.2 times breadth, with 1 (male 2) proximal A3-setae, 13 (male 18) D3-setae along most of posterior margin and 3 apical E3-setae. *Maxilla 1* : inner plate narrow with 2 plumose apical setae; outer plate with 11 spine-teeth in 6/5 arrangement; outer row with ST1-ST3 large, stout, multicuspidate, ST4-ST5 large, stout, 5-cuspidate, ST6 large, stout, 8-cuspidate, ST7 slightly displaced from ST6, large, broad, 8-cuspidate; inner row with STA large, slightly displaced from STB-STD, 3-cuspidate, STB long, broad, 5-cuspidate, STC large,

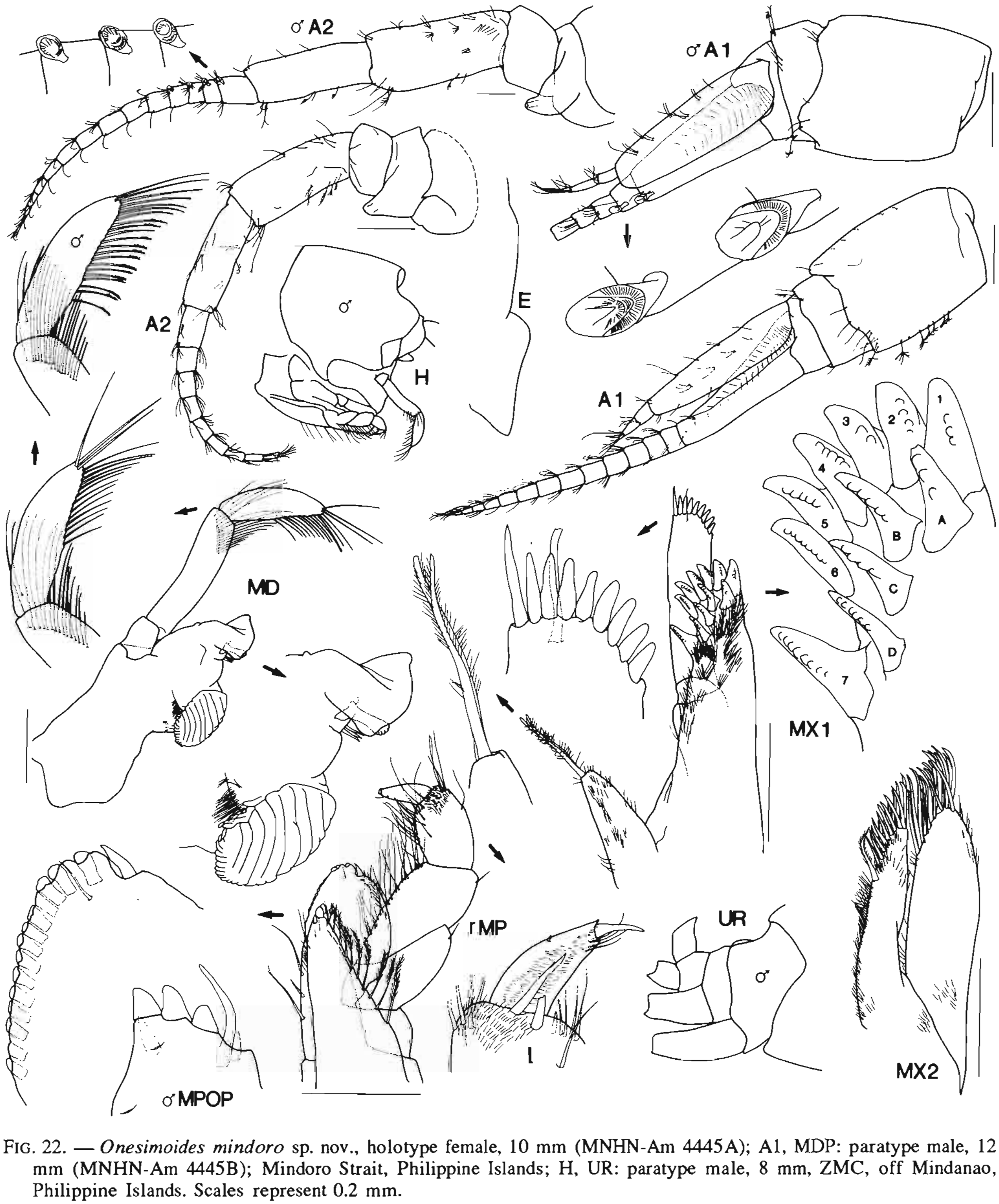

FIG. 22. — *Onesimoides mindoro* sp. nov., holotype female, 10 mm (MNHN-Am 4445A); A1, MDP: paratype male, 12 mm (MNHN-Am 4445B); Mindoro Strait, Philippine Islands; H, UR: paratype male, 8 mm, ZMC, off Mindanao, Philippine Islands. Scales represent 0.2 mm.

broad, 4-cuspidate, STD large, broad, 6-cuspidate; palp large, 2-articulate, with 8 long terminal spines, with 1 subterminal seta, flag spine present on distolateral corner, distomedial margin smooth. *Maxilla 2* : inner plate narrow, outer plate broad, subequal in length. *Maxilliped* : inner plate very large, subrectangular, with 3 apical nodular spines, with 1 apicolateral spine, oblique setal row strong with 10 plumose setae; outer plate small, subovate, without subapical notch, with many fine apical setae, with 1 apical spine, medial spines present, small, submarginal setae long, simple; palp large, 4-articulate, article 2 broad, length 1.7 times breadth, 1.4 times article 3; article 3 short, broad, length 1.6 times breadth; dactylus well developed, with 4 subterminal setae, unguis present.

Gnathopod 1 : sexually dimorphic; female chelate, coxa large, almost as long as coxa 2, anterior margin concave, anteroventral corner produced, rounded, posterior margin slightly concave; basis long, slender, length 2.6 times breadth, anterior margin smooth, with simple setae; ischium long, length 2 times breadth; merus, posterior margin lined with long simple setae; carpus subtriangular, short, length 1.2 times breadth, shorter than (0.62 times) propodus, without denticulate patch near posterodistal margin; propodus large, subrectangular, length 1.8 times breadth, margins slightly converging distally, posterior margin smooth, strongly sinusoidal, with 5 groups of setae, without denticulate patch near posterior margin, palm obtuse, margin convex, smooth, posterodistal corner with 1 medial and 1 lateral spines; dactylus simple, with subterminal tooth. Male gnathopod 1 subchelate; basis long, slender, length 3.1 times breadth; merus with large brush of setae on medial face, carpus subtriangular, short, length 0.9 times breadth, shorter than (0.4 times) propodus; propodus massive, subrectangular, length 1.9 times breadth, margins tapering distally, posterior margin smooth, convex, with dense brush of setae on medial face, palm acute, margin with 2 blunt teeth and slight posterodistal cavity, posterodistal corner with 1 medial and 1 lateral spines; dactylus simple, strongly curved. *Gnathopod 2* : minutely subchelate; coxa large, subequal in size to coxa 3; ischium long, length 3 times breadth; carpus short, length 1.5 times breadth, posterior margin broadly lobate; propodus subquadrate, short, length 1.5 times breadth, posterior margin without strong distal spines, palm obtuse, with straight, serrate margin, posterodistal corner with 1 medial spine (male 1) and 1 lateral spine (male 1); dactylus reaching corner of palm, posterior margin serrate.

Peraeopod 3 : coxa large; merus weakly expanded anteriorly, male and female merus-carpus without plumose setae; propodus with 5 spines along posterior margin and 1 distal spine; dactylus short, stocky. *Peraeopod 4* : coxa deeper than wide, with large posteroventral lobe, anterior margin slightly rounded, posterior margin slightly sloping anteriorly; merus weakly expanded anteriorly, male and female merus-carpus without plumose setae; propodus with 4 spines along posterior margin and 2 distal spines; dactylus short, stocky. *Peraeopod 5* : coxa equilobate; basis expanded with posterior margin minutely crenate; merus expanded with rounded posterior margin; propodus with 5 setae along anterior margin and 2 distal spines; dactylus short, stocky. *Peraeopod 6* : coxa small, slightly lobate posteriorly; basis expanded posteriorly with minutely crenate posterior margin; merus expanded with rounded posterior margin; propodus with 6 setae along anterior margin and 2 distal spines; dactylus short, stocky. *Peraeopod 7* : basis expanded posteriorly, posterior margin slightly rounded, minutely crenate, posteroventral corner rounded, posteroventral margin rounded; merus not expanded posteriorly, with 3 spines; propodus and dactylus not known.

Oostegites from gnathopod 2 to peraeopod 5. *Gills* from gnathopod 2 to peraeopod 6, not pleated.

Pleonite 3 : with slight dorsal carina. *Epimeron 1* : anteroventral corner rounded. *Epimeron 3* : posteroventral corner subquadrate. *Urosomites* : urosomite 1 with anterodorsal notch and low rounded boss with slight dorsal carina, without lateral flange; urosomite 3 without small dorsolateral spine. *Uropod 1* : peduncle with 9 dorsolateral, 1 apicolateral, 7 dorsomedial and 1 apicomedial spines, without spines along distal margin; outer ramus with 6 dorsal spines; inner ramus with 4 dorsal spines. *Uropod 2* : peduncle with 8 dorsolateral, 1 apicolateral, 1 dorsomedial and 1 apicomedial spines, without spines along distal margin; rami subequal in length; outer ramus with 5 dorsal spines; inner ramus with 4 dorsal spines, without constriction. *Uropod 3* : peduncle short, length 1.2 times breadth, with dorsolateral flange, with 5 dorsolateral, 1 apicolateral and 1 distoventral spines, with 4 midlateral setae; without plumose setae; rami lanceolate, inner ramus reduced, about 0.68 times outer ramus; outer ramus 2-articulate, article 2 short, article 1 with 3 lateral and 1 medial spines; inner ramus with 1 lateral spine; plumose setae absent in male and female. *Telson* : length 1 times breadth, entire, without dorsal spines or simple setae; distal margin truncated, with 6 penicillate and 2 simple marginal setae, without marginal spines.

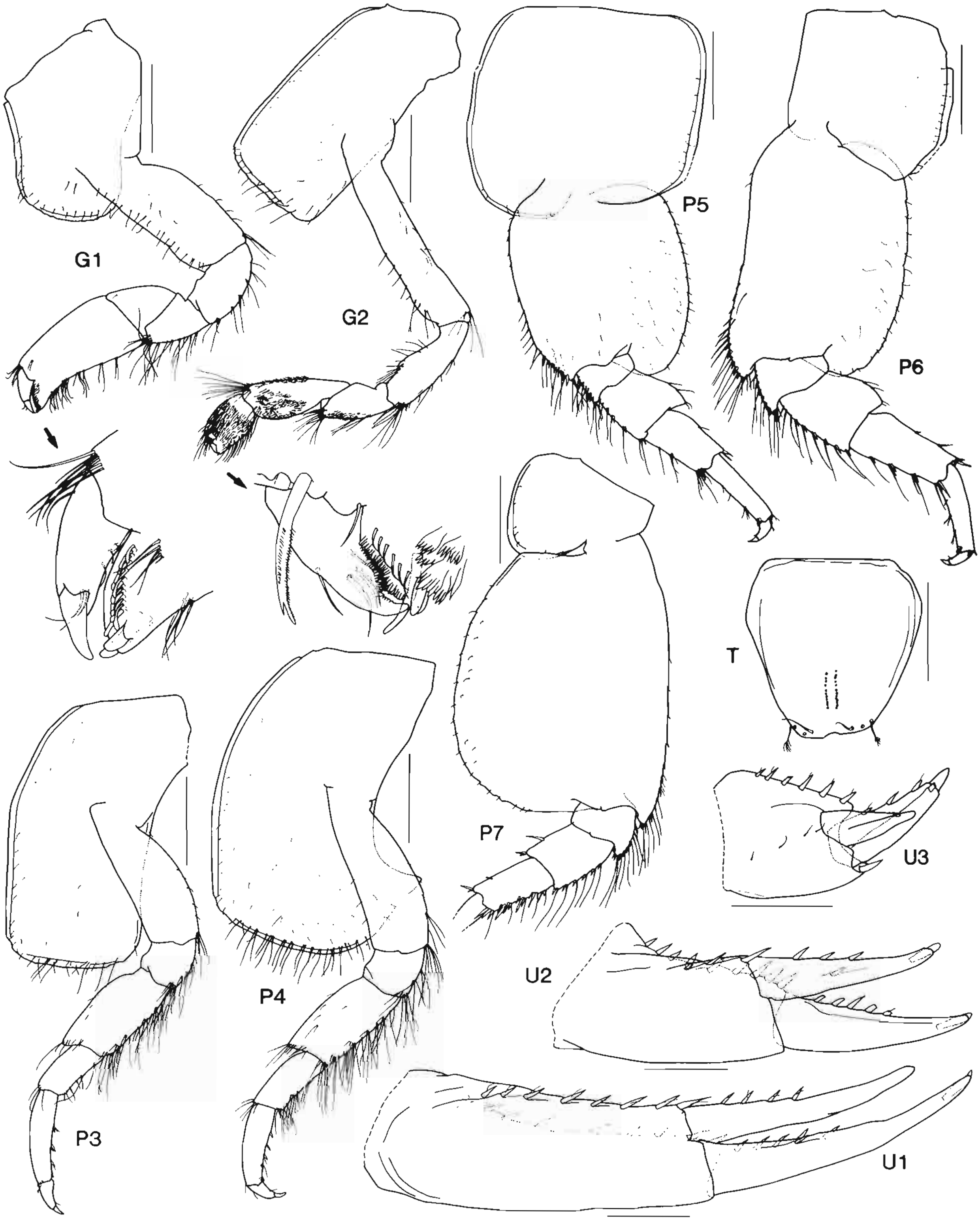

FIG. 23. — *Onesimoides mindoro* sp. nov., holotype female, 10 mm (MNHN-Am 4445A), Mindoro Strait, Philippine Islands. Scales represent 0.5 mm.

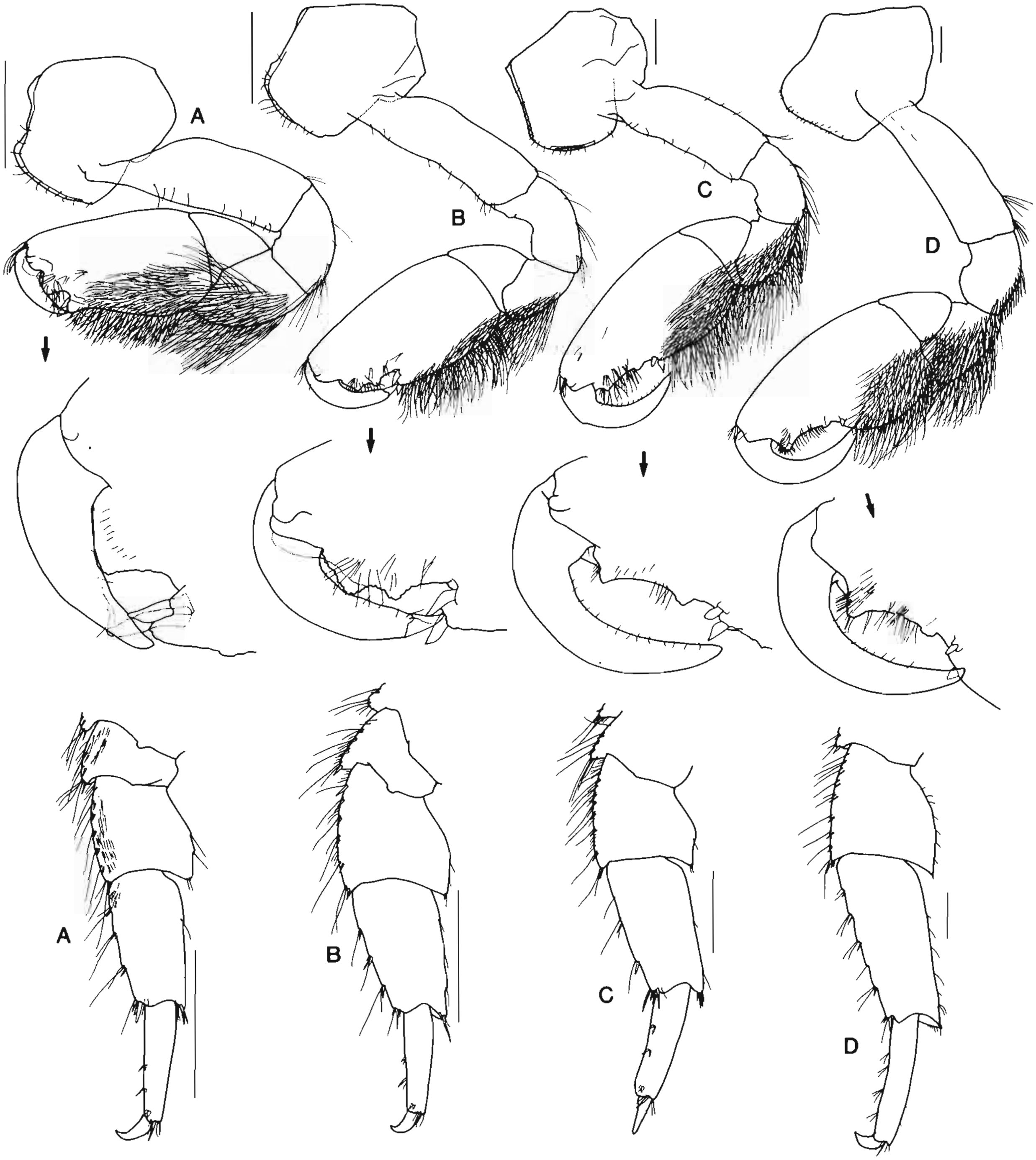

FIG. 24. — *Onesimoides mindoro* sp. nov., gnathopod 1 and distal articles of peraeopod 6 : **A**. paratype male, 7.5 mm (MNHN-Am 4603), Sibuyan Sea, Philippine Islands; **B**. paratype male, 8 mm (ZMC), off Mindanao, Philippine Islands; **C**. paratype male, 12 mm, (MNHN-Am 4445B), Mindoro Strait, Philippine Islands; **D**. paratype male, 20 mm (MNHN-Am 4448), Makassar Strait, Indonesia. Scales represent 0.5 mm.

VARIATION. — As in the two previous species the shape and size of male gnathopod 1 change significantly with age. We have not seen juvenile males in this species, but assume that the propodus is similar in shape to the propodus in the female. In larger males, around 7.5 mm, the propodus is broad, the palm forms a large, broad anterior tooth and a small posterodistal cavity (fig. 24A). In slightly larger males, around 8 mm, the propodus remains broad, but lengthens, the palm becomes acute, the broad anterior tooth and the posterodistal cavity remain and a small midpalmar tooth develops (fig. 24B). The palm then changes only slightly, so that in males of about 12 mm it is longer and slightly concave, the midpalmar tooth moves more towards the posterior corner and the posterodistal cavity is reduced (fig. 24C). In very large animals the palm does not change but the posterior margin becomes convex and the proximal end of the propodus appears bulbous (fig. 24D).

The carpus of peraeopods 6 and 7 does not change much with size except in very large animals where it becomes longer in relation to its breadth.

ETYMOLOGY. — The specific name refers to the type locality.

REMARKS. — *Onesimoides mindoro* is distinguished from *O. castellatus* by the lack of a flange on urosomite 1, the length of the inner ramus on uropod 3, and the large setose brush and the shape of the palm on the propodus of male gnathopod 1. *Onesimoides mindoro* differs from *O. carinatus* in the length to breadth ratio and the shape of the palm on the propodus of male gnathopod 1. *Onesimoides mindoro* appears to be closely related to the *O. cavimanus* of LEDOYER (1978). The main morphological differences between these species occur in the males and appear to be the shape of the palm in gnathopod 1 and the development of the carpus in peraeopods 6 and 7 which becomes greatly enlarged in the species from Madagascar.

DISTRIBUTION. — *Onesimoides mindoro* occurs from Indonesia to the Philippine Islands in depths of 240-812 m.

Genus *PARACENTROMEDON* Chevreux & Fage, 1925

Paracentromedon pacificus sp. nov.

Figs 25-27

MATERIAL EXAMINED. — **Indonesia.** CORINDON 2 : stn B 236, 00°06.7'N, 119°45.5'E, northern Makassar Strait, south of Manimbaya, 1730 m, 4 November 1980 : 1 specimen, sex not known, 7 mm (MNHN-Am 4602).

TYPES. — The unique specimen is the holotype.

DIAGNOSIS. — Maxilla 1 : inner plate with at least half of inner margin setose, with 6 plumose setae. Epimeron 3 with posteroventral corner produced into broad tooth. Telson long, narrow, deeply cleft.

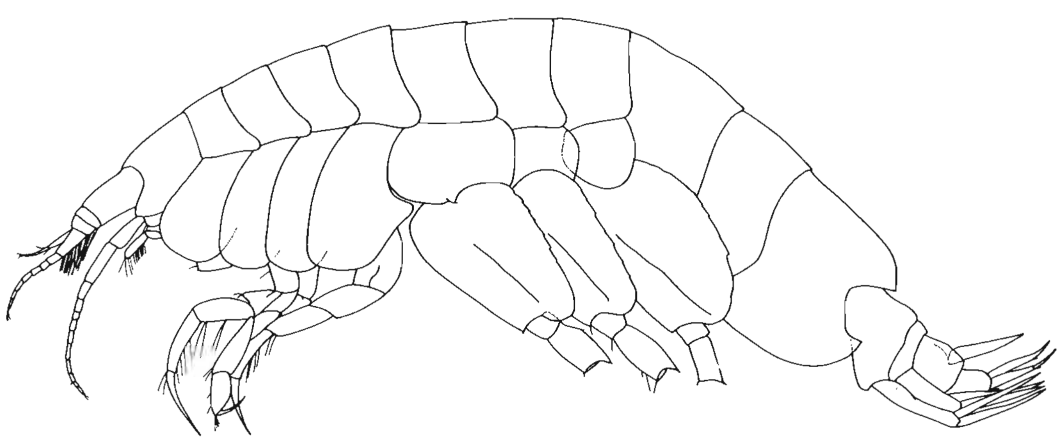

FIG. 25. — *Paracentromedon pacificus* sp. nov., holotype, sex not known, 7 mm (MNHN-Am 4602), south of Manimbaya, northern Makassar Strait, Indonesia.

DESCRIPTION. — Based on holotype, sex not known. *Head* : exposed, deeper than long; lateral cephalic lobe large, acute; rostrum absent; eyes apparently absent. *Antenna 1* : medium length, 0.2 times body; peduncular article 1 short, length 1.3 times breadth, without dorsal crest, tooth on distomedial margin, posterodistal tooth or anterodistal projection; peduncular article 2 short, 0.2 times article 1, with short anterodistal projection; peduncular article 3 short, 0.13 times article 1; accessory flagellum long, 0.54 times primary flagellum, 3-articulate, article 1 long, 2.1 times article 2, not forming cap; flagellum 9-articulate, callynophore strong 2-field, without posterodistal setae or spines, without flagellar spines, calceoli absent. *Antenna 2* : slightly longer than antenna 1; peduncle without brush setae, weakly geniculate, article 3 short, 0.43 times article 4, articles 4 and 5 not enlarged; flagellum 10-articulate, calceoli absent.

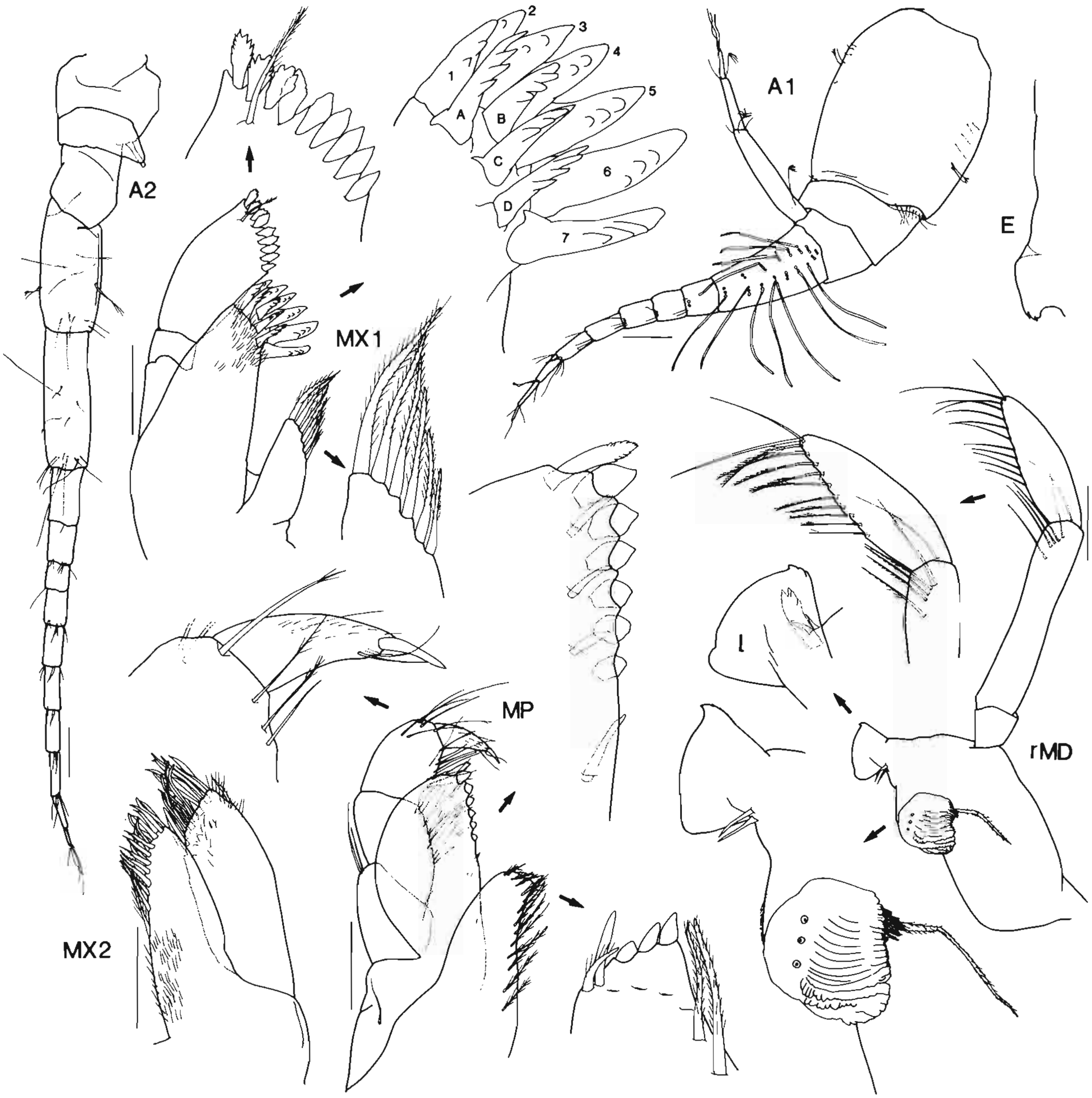

FIG. 26. — *Paracentromedon pacificus* sp. nov., holotype, sex not known, 7 mm (MNHN-Am 4602), south of Manimbaya, northern Makassar Strait, Indonesia. Scales represent 0.1 mm.

Mouthpart bundle : subquadrate. *Epistome* and *upper lip* : separate, epistome straight, upper lip slightly produced, rounded. *Mandible* : incisors symmetrical, small, with slightly convex margins, left lacinia mobilis present, a stemmed distally serrate blade; accessory spine row without distal setal tuft, left and right rows each with 2 short, slender, simple spines, without intermediate setae; molar columnar with fully triturating surface, large plumose seta present on right molar; mandibular palp attached distally, article 1 short, length 0.9 times breadth, without setae; article 2 elongate, slender, length 4.9 times breadth, 1.3 times article 3, with 5 posterodistal submarginal A2-setae, without D2-setae; article 3 falcate, long, length 3.3 times breadth, with 1 proximal A3-seta, with 10 distal D3-setae on posterior margin and 2 apical E3-setae. *Maxilla 1* : inner plate tapering distally, at least half of inner margin setose with 6 plumose setae; outer plate with 11 spine-teeth in 6/5 arrangement; outer row with ST1-ST3 large, stout, weakly cuspidate, ST4 large, stout, 1- to 2-cuspidate, ST5-ST6 large, stout, 2- to 3-cuspidate, ST7 contiguous with ST6, large, broad, 2- to 3-cuspidate; inner row with STA large, slightly displaced from STB-STD, 3-cuspidate, STB-STC large broad, 3-cuspidate, STD large, broad, 2- to 3-cuspidate; palp large, 2-articulate, with 8 short terminal spines and 1 subterminal seta, flag spine present on distolateral corner, distomedial margin smooth. *Maxilla 2* : inner and outer plates narrow, subequal in length. *Maxilliped* : inner plate large, subrectangular, with 3 apical nodular spines, oblique setal row strong with 14 plumose setae; outer plate medium size, subovate, without subapical notch or apical setae, with 1 apical spine, medial spines present, large, submarginal setae short, simple; palp large, 4-articulate, article 2 broad, length 1.6 times breadth, 1.1 times article 3; article 3 short, broad, length 1.6 times breadth; dactylus well developed, with 2 subterminal setae, unguis present.

Gnathopod 1 : subchelate; coxa large with tiny posterodistal hook, anterior margin slightly concave, anteroventral corner produced, rounded, posterior margin slightly convex; basis long, slender, length 4.5 times breadth, anterior margin smooth, with simple setae; ischium short, length 1.3 times breadth; merus, posterior margin with a few simple setae; carpus subrectangular, long, length 2.9 times breadth, longer than (1.4 times) propodus, without denticulate patch near posterodistal margin; propodus large, subrectangular, length 2.2 times breadth, margins subparallel, posterior margin smooth, straight, with setae, without denticulate patch near posterior margin, palm extremely acute, margin convex, serrate, posterodistal corner with 2 medial and 1 lateral spines; dactylus simple, without subterminal teeth or spines. *Gnathopod 2* : minutely subchelate; coxa large, subequal in size to coxa 3, with tiny posterodistal hook; ischium long, length 2.9 times breadth; carpus long, length 3.1 times breadth, posterior margin straight; propodus subrectangular, short, length 1.8 times breadth, posterior margin with strong serrate spines distally, palm transverse, with straight, serrate margin, posterodistal corner with 1 medial spine; dactylus reaching corner of palm, posterior margin smooth.

Peraeopod 3 : coxa large; merus not expanded anteriorly, merus-carpus without plumose setae; propodus with 7 setae along posterior margin; dactylus long, slender, with vestigial apical nail. *Peraeopod 4* : coxa deeper than wide, with large posteroventral lobe, anterior margin rounded, posterior margin sloping anteriorly; merus not expanded anteriorly, merus-carpus without plumose setae; propodus with 5 setae along posterior margin; dactylus long, slender with vestigial apical nail. *Peraeopod 5* : coxa equilobate; basis expanded with posterior margin minutely crenate; merus not expanded posteriorly; propodus and dactylus not known. *Peraeopod 6* : coxa small, not lobate posteriorly; basis expanded posteriorly with minutely crenate posterior margin; merus not expanded posteriorly; propodus and dactylus not known. *Peraeopod 7* : basis expanded posteriorly, posterior margin slightly rounded, minutely crenate, posteroventral corner rounded, posteroventral margin rounded; merus not expanded posteriorly, with 1 spine; propodus and dactylus not known.

Oostegites not known. *Gills* from gnathopod 2 to peraeopod 7, not pleated.

Pleonites 1 to 3 : dorsally smooth. *Epimeron 1* : produced, narrowly rounded. *Epimeron 3* : posteroventral corner produced into strong tooth. *Urosomites* : 1 to 3 dorsally smooth; urosomite 3 with small dorsolateral spine. *Uropod 1* : peduncle with 2 dorsolateral, 1 apicolateral, 2 dorsomedial and 1 apicomedial spines, without spines along distal margin; outer ramus slightly shorter than inner ramus; outer ramus without spines; inner ramus with 3 lateral spines. *Uropod 2* : peduncle without dorsolateral flange, with 1 apicolateral, 5 dorsomedial and 1 apicomedial spines; rami subequal in length; outer ramus with 2 dorsal spines; inner ramus with 5 dorsal spines, without constriction. *Uropod 3* : peduncle short, length 1.7 times breadth, without dorsolateral flange, with 1 apicomedial spine, without midlateral spines or setae, with 3 distoventral spines, without plumose setae;

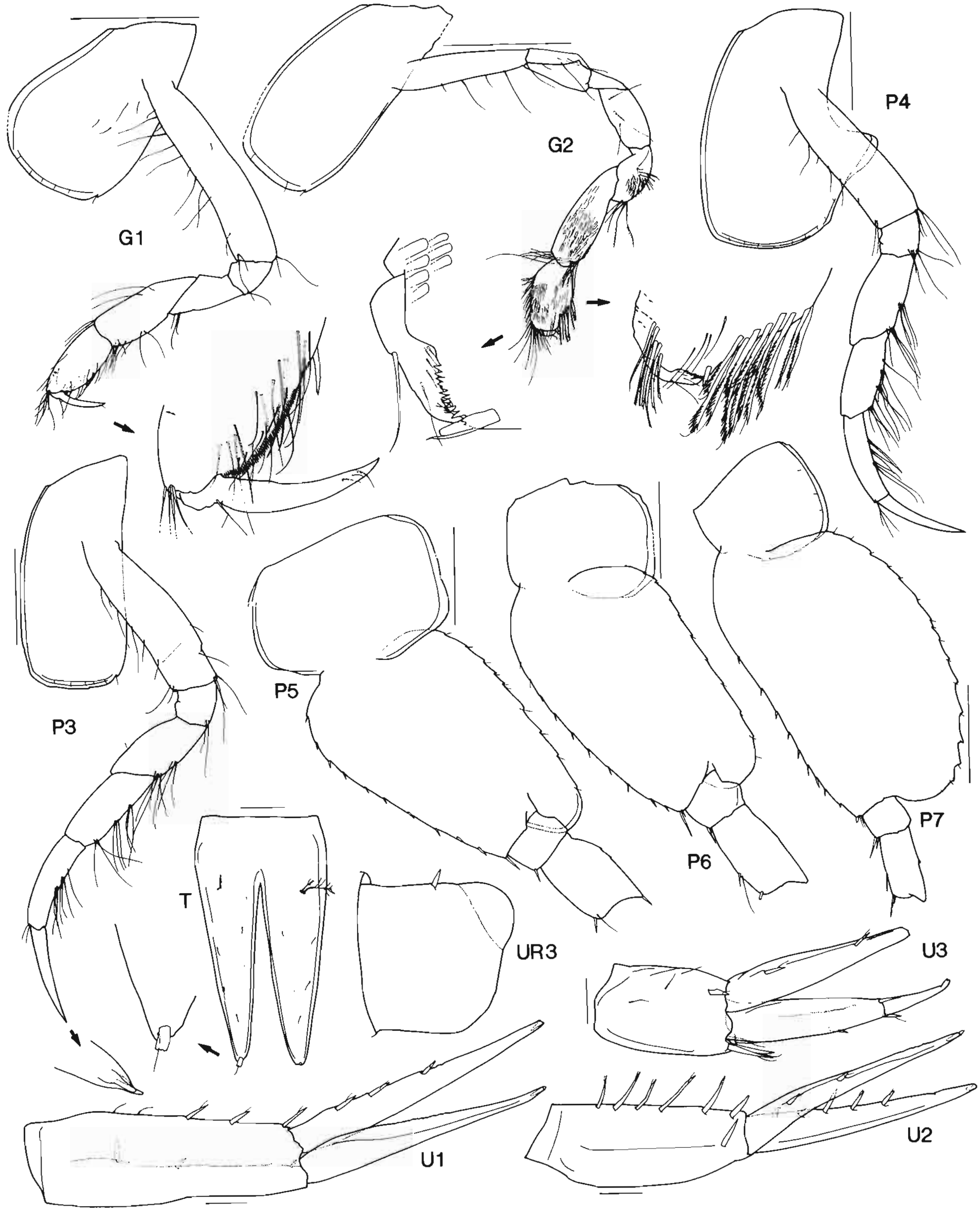

FIG. 27. — *Paracentromedon pacificus* sp. nov., holotype, sex not known, 7 mm (MNHN-Am 4602), south of Manimbaya, northern Makassar Strait, Indonesia. Scales for U1-3, T represent 0.1 mm, remainder represent 0.5 mm.

rami lanceolate, subequal in length; outer ramus 2-articulate, article 2 short, with 2 lateral and 1 medial spines; inner ramus with 2 lateral spines; plumose setae absent. *Telson* : length 1.8 times breadth, deeply cleft (73%), without dorsal spines, with sparse dorsal simple setae; distal margins truncated, without marginal penicillate setae, with 1 simple marginal seta and 1 marginal spine on each lobe.

ETYMOLOGY. — The species is named *pacificus* because of its occurrence in the Pacific Ocean.

REMARKS. — The genera of the hippomedontine lysianassoid group are not well understood. This taxon appears to fit best in *Paracentromedon*, previously known only from the Atlantic Ocean, although BARNARD and KARAMAN (1991) considered that the New Zealand species *Hippomedon manene* Lowry & Stoddart (1983), *H. matikuku* Lowry & Stoddart (1983) and *H. whero* Fenwick (1983) belonged here.

Paracentromedon pacificus shares with *P. crenulatum* Chevreux (1900), a strong group of raker spines on the posterior margin of the propodus of gnathopod 2, but the species differ in the following ways : *P. pacificus* has more plumose setae on the maxilla 1 inner plate; less serrate bases on peraeopods 5 to 7; a broader tooth on epimeron 3; and a longer telson.

Paracentromedon pacificus is also very similar to *Hippomedon bandae* Pirlot, 1933. However *H. bandae* has: a large spine on the posterodistal corner of the callynophore; a broader propodus on gnathopod 1; few, if any, raker spines on the propodus of gnathopod 2; a smaller posteroventral lobe on coxa 4; and a shorter telson.

DISTRIBUTION. — *Paracentromedon pacificus* is known from the northern Makassar Strait, Indonesia, in 1730 m depth.

Genus *PSEUDAMARYLLIS* Andres, 1981

Pseudamaryllis Andres, 1981 : 436. — BARNARD & KARAMAN, 1991 : 521.

DIAGNOSIS. — Head deeper than long with weak midanterior notch, rostrum insignificant. Eyes reniform. Antenna 1 : peduncular article 2 short, 2-field callynophore present in female and male. Antenna 2 slightly longer than antenna 1 in female and male. Mouthpart bundle subquadrate. Mandible : lacinia mobilis broad; molar a setose flap. Maxilla 1 : spine-teeth on outer plate in 6/5 arrangement; palp absent. Maxilliped : inner plate with

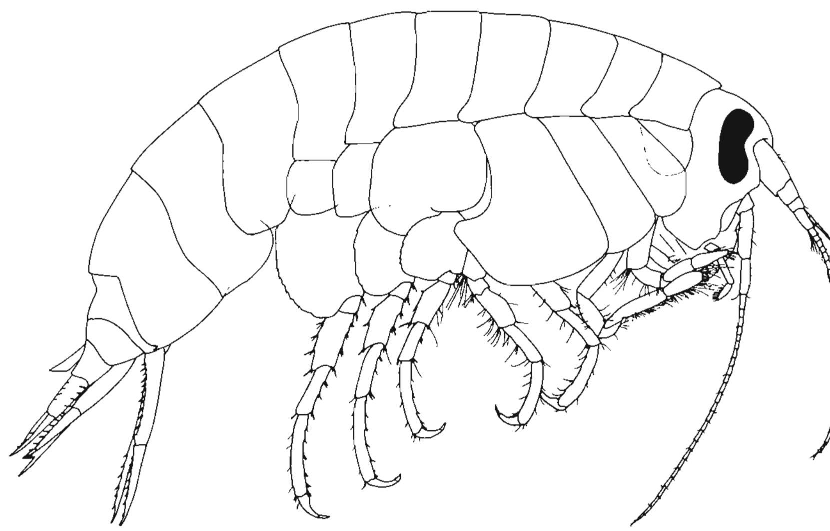

FIG. 28. — *Pseudamaryllis andresi* sp. nov., paratype female, 7 mm (MNHN-Am 4379), off Sablayan, Mindoro, Philippine Islands.

oblique setal row vestigial or absent; palp article 4 reduced with 1 terminal and 1 subterminal seta. Gnathopod 1 : coxa vestigial; propodus with serrate posterior margin and several strong spines. Peraeopods 3 and 4 without plumose setae in male and female. Peraeopod 4 : coxa with large posteroventral lobe, anterior margin straight, posterior margin slightly sloping anteriorly. Epimeron 3 with notch on posteroventral corner. Uropod 3 : plumose setae absent in male and female.

TYPE SPECIES. — *Pseudamaryllis nonconstricta* Andres, 1981, by original designation.

REMARKS. — LEDOYER (1986) considered *Pseudamaryllis* as a subgenus of *Amaryllis*. Species of *Amaryllis* have a strong midanterior head notch extended into a slit, subconical mouthpart bundle and posterior margin of gnathopod 1 without spines. We consider these to be generic level characters. *Pseudamaryllis* appears to be more closely related to *Bathyamaryllis* and *Vijaya*. The main difference is that neither *Bathyamaryllis* nor *Vijaya* has a callynophore in the female. In addition *Vijaya* has a uniquely flared coxa 4.

DISTRIBUTION. — *Pseudamaryllis* is known from the Red Sea, the western Indian Ocean and south-east Asia in 90 to 1544 m depth.

Pseudamaryllis andresi sp. nov.

Figs 28-30

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn CP 72, 14°11.8'N, 120°28.7'E, off Manila Bay, 122-127 m, 28 March 1976 : 1 ♂, 8 mm (MNHN-Am 4377).

MUSORSTOM 2 : stn CP 28, 13°14.3'N, 120°50.5'E, Mindoro, off Sablayan, 90-110 m, on a coconut, 23 November 1980 : 21 specimens (MNHN-Am 4379), 2 specimens (AM P41434).

MUSORSTOM 3: stn CP 131, 11°37'N, 121°43'E, northern Sulu Sea, off Maniquin Island, 120-122 m, 5 June 1985 : 3 juveniles (MNHN-Am 4462).

TYPES. — The male, 8 mm (MNHN-Am 4377), is the holotype. The other specimens are paratypes.

TYPE LOCALITY. — Philippine Islands, off Manila Bay, 14°11.8'N, 120°28.7'E, 122-127 m.

DIAGNOSIS. — Peraeopod 5 : basis with posteroventral corner quadrate. Peraeopod 7 : basis with posteroventral corner rounded. Epimeron 3 : strongly notched. Uropod 2 : inner ramus with weak constriction.

DESCRIPTION. — Based on holotype male, 8 mm; paratype female 7 mm (MNHN-Am 4379). *Head* : exposed, much deeper than long, extending below insertion of antenna 2 with notch at level of insertion; lateral cephalic lobe weak, broadly rounded; rostrum small; eyes reniform, not enlarged in reproductive male. *Antenna 1* : medium length, 0.37 times body; peduncular article 1 short, length 1.3 times breadth, not ball-shaped proximally, with medium sized midmedial tooth; peduncular article 2 short, 0.4 times article 1; peduncular article 3 short, 0.19 times article 1; accessory flagellum very short 0.18 times primary flagellum, 4-articulate, article 1 long, 1.2 times article 2 (male long, 2 times article 2), not forming cap; flagellum 18-articulate (male 22), callynophore weak 2-field in female (strong 2-field in male), without posterodistal setae or spines, without flagellar spines or aesthetascs, calceoli absent in female (about 16 present in reproductive male). *Antenna 2* : slightly longer than antenna 1 (same in male), peduncle without brush setae (weak in male), in female weakly geniculate, article 3 short, 0.35 times article 4 (in male weakly geniculate between peduncular articles 3-4, article 3 short, 0.40 times article 4), article 4 enlarged in male; flagellum 12-articulate (male 43), calceoli absent in female (about 35 present in reproductive male).

Mouthpart bundle : subquadrate. *Epistome* and *upper lip* : fused, bilobate. *Mandible* : incisors symmetrical, small, with slightly convex margins; left lacinia mobilis present, a stemmed smooth blade; accessory spine row with weak distal setal tuft, left and right rows each with 9 short, slender, simple spines, with simple intermediate setae; molar a small, smooth setose flap; mandibular palp attached proximally, article 1 short, length 0.8 times breadth; article 2 elongate, slender, length 4.9 times breadth, 1.5 times article 3, without D2-setae, with 4 (male 21) submarginal A2-setae; article 3 slender, blade-like, long, length 3.1 times breadth, with 1 (male 1) proximal A3-seta, 7 (male 17) D3-setae along most of posterior margin and 2 apical E3-setae. *Maxilla 1* : inner plate broad with 2 plumose apical setae; outer plate broad with 11 spine-teeth in 6/5 arrangement; outer row with ST1-ST3 large, stout, weakly cuspidate, ST4-ST5 large, stout, 3- to 4-cuspidate, ST6 large, stout, 5- to 6-cuspidate, ST7 contiguous with ST6, large, slender, curved, 16-cuspidate medially; inner row with STA large,

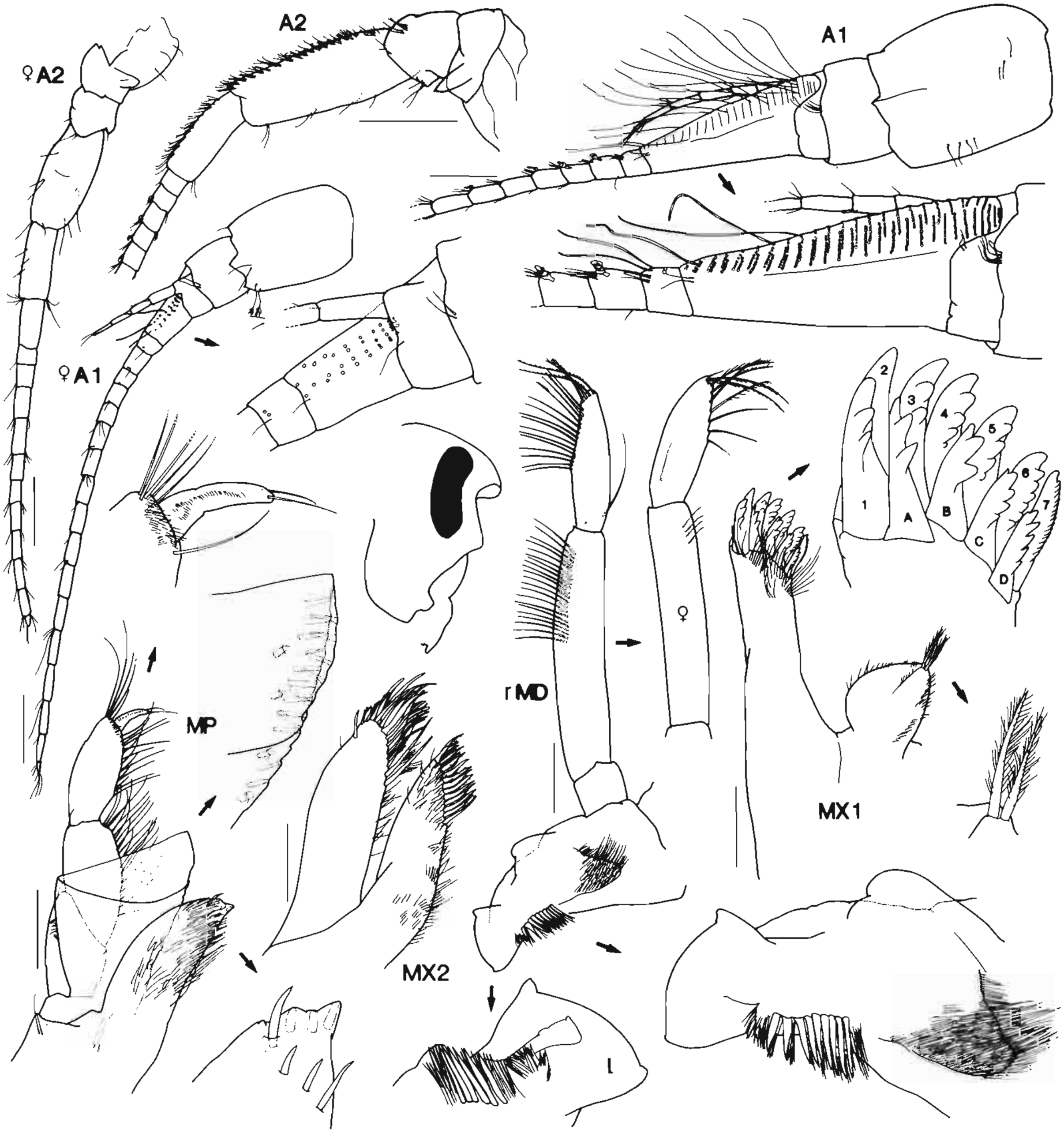

FIG. 29. — *Pseudamaryllis andresi* sp. nov., holotype male, 8 mm (MNHN-Am 4377), off Manila Bay, Philippine Islands; paratype female, 7 mm (MNHN Am 4379), off Sablayan, Mindoro, Philippine Islands. Scales for A1, 2 represent 0.2 mm, remainder represent 0.1 mm.

slightly displaced from STB-STD, 2-cuspidate, STB long, broad, 2-cuspidate, STC large, broad, 4-cuspidate, STD large, broad, 5-cuspidate; palp absent. *Maxilla 2* : inner plate narrow, outer plate broader, subequal in length. *Maxilliped* : inner plate large, subrectangular, with 3 vestigial apical nodular spines, oblique setal row reduced with 4 simple setae; outer plate medium size, subovate, without subapical notch, without apical setae, apical spines or medial spines; submarginal setae vestigial; palp large, 4-articulate; article 2 slender, length 2.2 times breadth, 1.1 times article 3; article 3 long, slender, length 2.6 times breadth; dactylus reduced, with 1 terminal and 1 subterminal seta, unguis absent.

Gnathopod 1 : simple; coxa vestigial; basis long, slender, length 4.9 times breadth, anterior margin smooth, with simple setae; ischium long, length 2 times breadth; merus, posterior margin lined with long simple setae, carpus subrectangular, long, length 2 times breadth, shorter than (0.84 times) propodus, with long simple setae along posterior margin; propodus large, subrectangular, length 2.7 times breadth, margins slightly converging distally, posterior margin serrate, subtly sinusoidal, with 5 spines and 5 groups of setae, without denticulate patch near posterior margin, palm absent; dactylus simple, with subterminal tooth and 2 rows of denticles along posterior margin. *Gnathopod 2* : minutely subchelate; coxa large, subequal in size to coxa 3; ischium long, length 2.8 times breadth; carpus very long, length 4.8 times breadth, posterior margin straight; propodus subrectangular, long, length 2.9 times breadth, palm slightly acute, with convex, minutely serrate margin, posterodistal corner without spines; dactylus reaching corner of palm, posterior margin serrate.

Peraeopod 3 : coxa large; merus weakly expanded anteriorly, male and female merus-carpus without plumose setae; propodus with 1 spine and row of setae along posterior margin and 2 distal locking spines; dactylus short, slender. *Peraeopod 4* : coxa with large posteroventral lobe, anterior margin straight, posterior margin slightly sloping anteriorly; merus weakly expanded anteriorly, male and female merus-carpus without plumose setae; propodus with 1 spine and row of setae along posterior margin and 2 distal locking spines; dactylus short, slender. *Peraeopod 5* : coxa bilobate, posterior lobe produced ventrally; basis expanded with posterior margin crenate; merus slightly expanded posteriorly; propodus with 7 spines along anterior margin and 2 distal locking spines; dactylus short, slender. *Peraeopod 6* : coxa small, not lobate posteriorly; basis expanded posteriorly with crenate posterior margin; merus slightly expanded and rounded posteroproximally, straight posterodistally with 5 setae; propodus and dactylus not known. *Peraeopod 7* : basis expanded posteriorly, posterior margin slightly rounded, crenate, posteroventral corner rounded, posteroventral margin rounded; merus not expanded posteriorly with 9 spines; propodus with 10 spines along anterior margin and 2 distal locking spines; dactylus short, slender.

Oostegites from gnathopod 2 to peraeopod 5. *Gills* from gnathopod 2 to peraeopod 7, not pleated.

Pleonites 1 to 3 dorsally smooth. *Epimeron 1* : anteroventral corner rounded. *Epimeron 3* : posteroventral corner strongly notched. *Urosomites*: urosomites 1 to 3 dorsally smooth; urosomite 3 without small dorsolateral spine. *Uropod 1*: peduncle with 10 dorsolateral (male 19), 1 apicolateral (male 1), 4 dorsomedial (male 5) and 1 apicomedial (male 1) spines, without plumose setae or spines along distal margin; rami subequal in length, male outer ramus with 9 lateral spines, inner ramus with 5 medial and 7 lateral spines (female not known). *Uropod 2* : peduncle with 2 (male 5) dorsolateral, 1 apicolateral and 1 apicomedial spines, without spines along distal margin; outer ramus 0.8 times as long as inner ramus; outer ramus with 4 (male 8) lateral spines; inner ramus with 2 (male 6) medial and 4 (male 8,1) lateral spines, with weak constriction. *Uropod 3* : peduncle long, without dorsolateral flange, with 6 (male 6) dorsomedial, 0 (male 6) dorsolateral and 1 apicomedial spines, without plumose setae; rami lanceolate, subequal in length, with minutely serrate margins; outer ramus 1-articulate, with 3 (male 4) lateral and 1 (male 6) medial spines; inner ramus with 1 (male 4) medial and 4 (male 9) lateral spines; plumose setae absent in male and female. *Telson* : length 1.3 times breadth, slightly cleft (27%), without dorsal spines or simple setae; distal margins truncated, with 1 marginal penicillate and 1 simple seta on each lobe, without marginal spines.

ETYMOLOGY. — This species is named for Hans Georg ANDRES, who originally described the genus *Pseudamaryllis*, in recognition of his fine systematic studies of lysianassoid amphipods.

REMARKS. — Until now *Pseudamaryllis* has been a monotypic genus known from the Red Sea (ANDRES, 1981) and the western Indian Ocean (LEDOYER, 1986). This new species differs significantly from *P. nonconstricta*

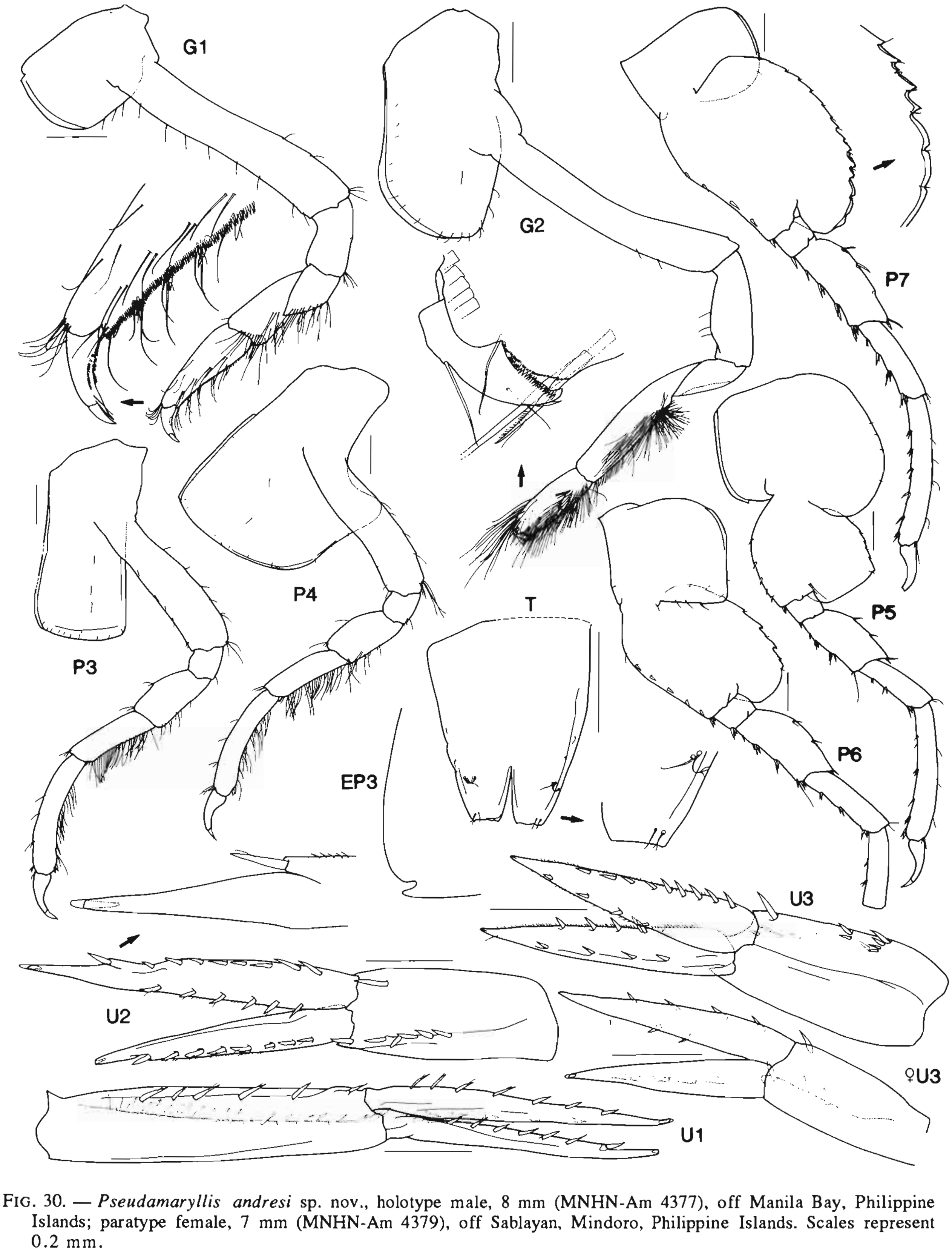

FIG. 30. — *Pseudamaryllis andresi* sp. nov., holotype male, 8 mm (MNHN-Am 4377), off Manila Bay, Philippine Islands; paratype female, 7 mm (MNHN-Am 4379), off Sablayan, Mindoro, Philippine Islands. Scales represent 0.2 mm.

as follows : basis of peraeopod 5 with a subacute corner; basis of peraeopod 7 with evenly rounded posteroventral corner and inner ramus of uropod 2 weakly constricted.

DISTRIBUTION. — *Pseudamaryllis andresi* is known from the waters of south-eastern Luzon and northern Mindoro, Philippine Islands, in 90 to 127 m depth.

Genus *TRISCHIZOSTOMA* Boeck, 1861

Trischizostoma crosnieri sp. nov.

Figs 31-33

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 2 : stn CP 79, 13°44'N, 120°32'E, north-eastern entrance to Verde Island Passage, 682-770 m, 1 December 1980 : 1 ♀, 29 mm, with about 22 young (MNHN-Am 4450).

TYPES. — The unique specimen is the holotype.

DIAGNOSIS. — Maxilliped: palp 4-articulate, much longer than outer plate. Gnathopod 1 : propodus oval, broader than long. Telson slightly cleft (less than one third).

DESCRIPTION. — Based on holotype female, 29 mm; male not known. *Head* : exposed, deeper than long; lateral cephalic lobe absent; rostrum large; eyes covering most of head, expanded dorsally and nearly confluent. *Antenna 1* : short, about 0.14 times body; peduncular article 1 short, length 1 times breadth; peduncular article 2 short, 0.3 times article 1, without anterodistal projection; peduncular article 3 short, 0.15 times article 1; accessory flagellum medium length, 0.42 times primary flagellum, 5-articulate, article 1 long, 13.8 times article 2, forming cap partially covering callynophore; flagellum 11-articulate, callynophore strong 2-field in female, without posterodistal setae or spines, with 1 spine on article 3, calceoli absent in female. *Antenna 2* : length 2 times antenna 1; peduncle with weak brush setae in female, peduncular article 1 greatly enlarged, not covering article 2, in female weakly geniculate, article 3 short, 0.27 times article 4, peduncular articles 4 and 5 not enlarged in female; flagellum 25-articulate, calceoli absent in female.

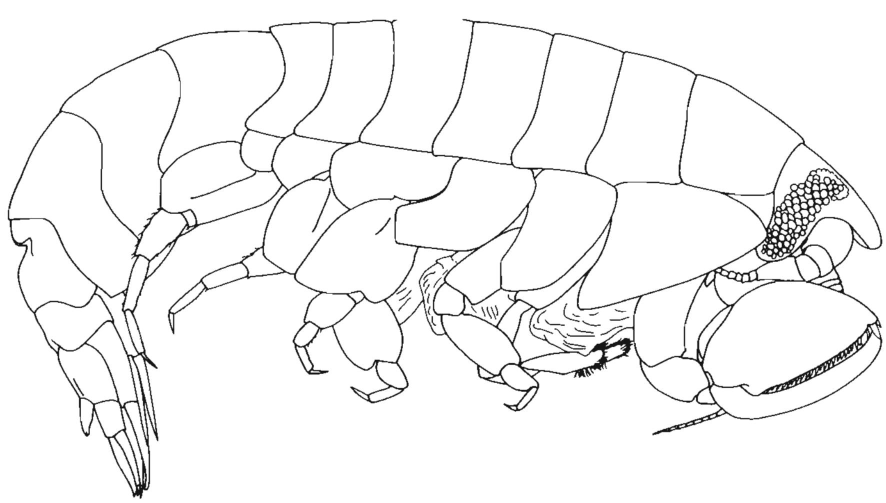

FIG. 31. — *Trischizostoma crosnieri* sp. nov., holotype female, 29 mm (MNHN-Am 4450), north-eastern entrance to Verde Island Passage, Philippine Islands.

Mouthpart bundle : conical. *Epistome* and *upper lip* : fused, sinusoidal. *Mandible* : incisors symmetrical, very small, at tip of styliform projection; laciniae mobilis absent; accessory spine row absent; molar absent; mandibular palp attached proximally, article 1 short, length 0.74 times breadth; article 2 elongate, broad, length 3.1 times breadth, 1 times article 3, with 28 posterodistal A2-setae, with about 10 D2-setae on distal half of posterior margin; article 3 falcate, long, length 3.2 times breadth, without A3-setae, with 16 D3-setae on distal half of posterior margin and 3 apical E3-setae. *Maxilla 1* : inner plate narrow with 1 simple apical seta; outer plate narrow with 8 spine-teeth in modified 8/3 crown arrangement; outer row with 5 large, slender spine-teeth without cusps, hooked distally; inner row with STA absent, STB-STD short, slender, without cusps; palp small, 1-articulate, with 2 apical setae, without subterminal setae, flag spine absent, distomedial margin smooth. *Maxilla 2* : inner and outer plates narrow, subequal in length. *Maxilliped* : inner plate very large, styliform, with 4 subapical vestigial spines, oblique setal row absent; outer plate small, subovate, without subapical notch, apical setae, apical spines or medial spines, submarginal setae vestigial; palp large, 4-articulate, styliform, geniculate between articles 2-3, article 2 broad, length 1.9 times breadth, 1 times article 3; article 3 long, broad, length 2.4 times breadth; dactylus longest of all, slender, lanceolate with minutely serrate anterior margin, with 2 subterminal setae; unguis absent.

Peraeonites : 1 to 7 dorsally smooth. *Gnathopod 1* : subchelate; coxa vestigial; basis long, slender, length 4.1 times breadth, anterior margin smooth, without setae; ischium short, length 1.5 times breadth; merus and carpus rotated, propodus and dactylus inverted in adult; merus, posterior margin without setae, carpus subtriangular, compressed, length 1.8 times breadth, shorter than propodus, without denticulate patch near posterodistal margin; propodus massive, subrectangular, length 0.57 times breadth, margins diverging distally, posterior margin smooth, convex, without spines or setae, without denticulate patch near posterior margin, palm slightly obtuse, margin convex, lined with row of short, thick spines, posterodistal corner with 2 medial and 2 lateral spines; dactylus simple, without subterminal teeth or spines. *Gnathopod 2* : minutely subchelate; coxa large, larger than coxa 3, adze-shaped; ischium very long, length 4 times breadth; carpus long, length 3 times breadth, posterior margin broadly lobate; propodus produced anterodistally beyond dactylus, short, length 1.2 times breadth, posterior margin without strong distal spines, palm slightly acute, with concave, smooth margin, posterodistal corner with at least 1 medial spine; dactylus reaching corner of palm, posterior margin serrate.

Peraeopod 3 : coxa large; merus weakly expanded anteriorly; female merus-carpus without plumose setae; propodus without spines along minutely serrate posterior margin; dactylus short, slender, with minutely serrate posterior margin. *Peraeopod 4* : coxa deeper than wide, with large posteroventral lobe, anterior margin broadly rounded, posterior margin slightly sloping anteriorly; merus expanded anteriorly and posteriorly, female merus-carpus without plumose setae; propodus with 4 spines along minutely serrate posterior margin; dactylus short, slender, with minutely serrate posterior margin. *Peraeopod 5* : coxa bilobate, posterior lobe produced ventrally; basis expanded with posterior margin smooth; merus expanded with rounded posterior margin; propodus with 3 spines along minutely serrate anterior margin; dactylus short, slender, with minute serrations. *Peraeopod 6* : coxa small, slightly lobate posteriorly; basis expanded with broad posteroventral lobe; merus expanded proximally, posterior margin straight, converging distally, with 3 spines; propodus with 3 spines along minutely serrate anterior margin; dactylus short, slender, with minutely serrate anterior margin. *Peraeopod 7* : basis expanded posteriorly, posterior margin slightly rounded, minutely crenate, posteroventral margin rounded; merus slightly expanded proximally with 10 spines along posterior margin; propodus with 3 spines along minutely serrate anterior margin; dactylus long, slender, with minute serrations.

Oostegites from gnathopod 2 to peraeopod 5. *Gills* from gnathopod 2 to peraeopod 7, with strong horizontal pleating.

Pleonites 1 to 3 dorsally smooth. *Epimeron 1* : anteroventral corner narrowly rounded. *Epimeron 3* : posteroventral corner subquadrate. *Urosomites* : urosomite 1 with anterodorsal notch; urosomite 3 without dorsolateral spine. *Uropod 1* : peduncle with 9 dorsomedial and 1 apicomedial spines, without plumose setae or spines along distal margin; outer ramus slightly shorter than inner ramus; outer ramus without lateral or medial spines; inner ramus with 7 lateral spines. *Uropod 2* : peduncle without dorsolateral flange, with 1 apicolateral spine, without plumose setae, without spines along distal margin; rami subequal in length, without spines, inner ramus without constriction. *Uropod 3* : peduncle short, length 0.88 times breadth, without dorsolateral flange,

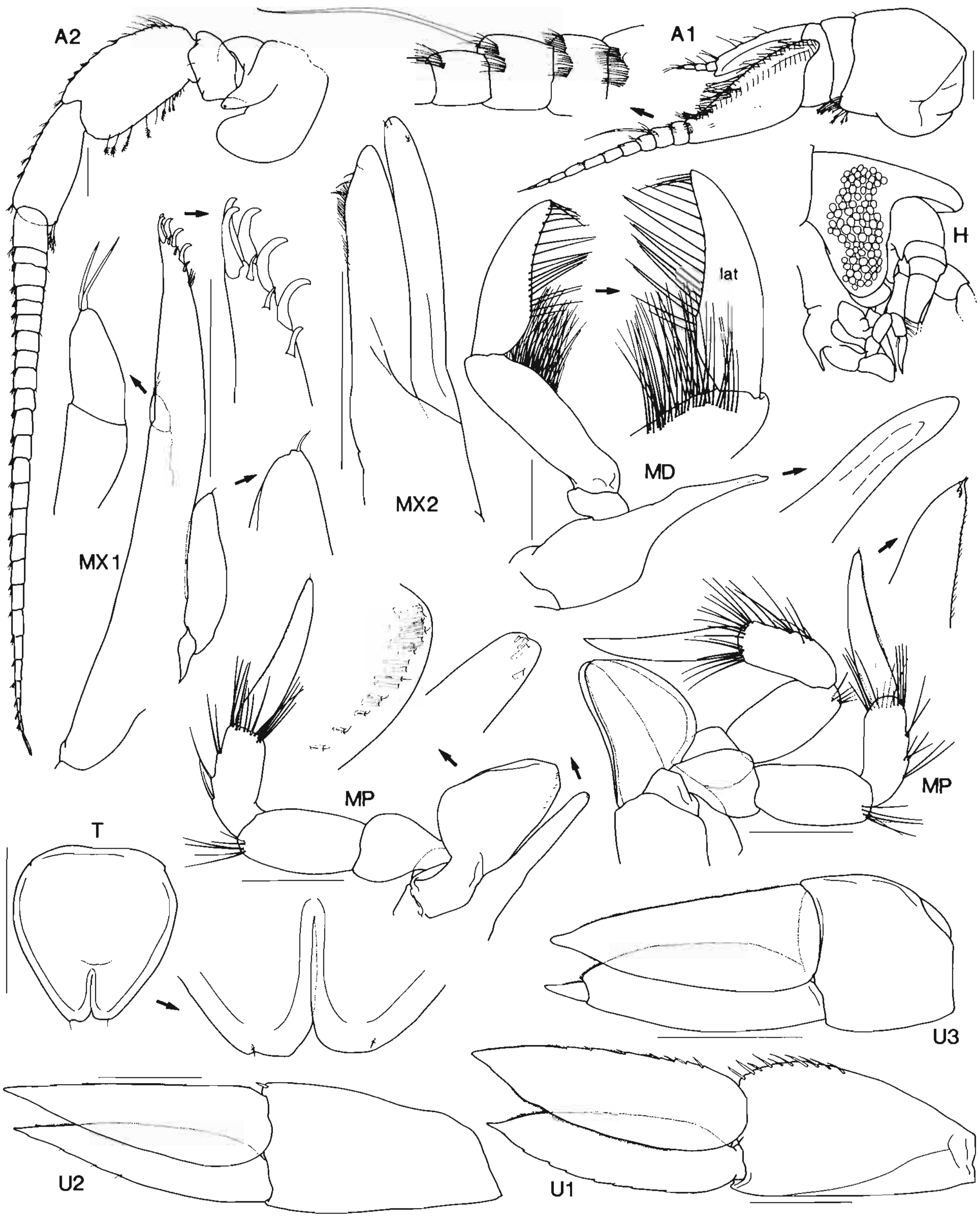

FIG. 32. — *Trischizostoma crosnieri* sp. nov., holotype female, 29 mm (MNHN-Am 4450), north-eastern entrance to Verde Island Passage, Philippine Islands. Scales for U1-3, T represent 1.0 mm, remainder represent 0.5 mm.

without dorsal spines, without midlateral spines or setae, without distoventral spines, without plumose setae; rami lanceolate, subequal in length, with minutely serrate margins, outer ramus 2-articulate, article 2 short, rami without spines, plumose setae absent in female. *Telson* : length 1.1 times breadth, slightly cleft (27%) without dorsal spines or setae, distal margins truncated, without marginal penicillate setae, with 1 simple marginal seta on each lobe.

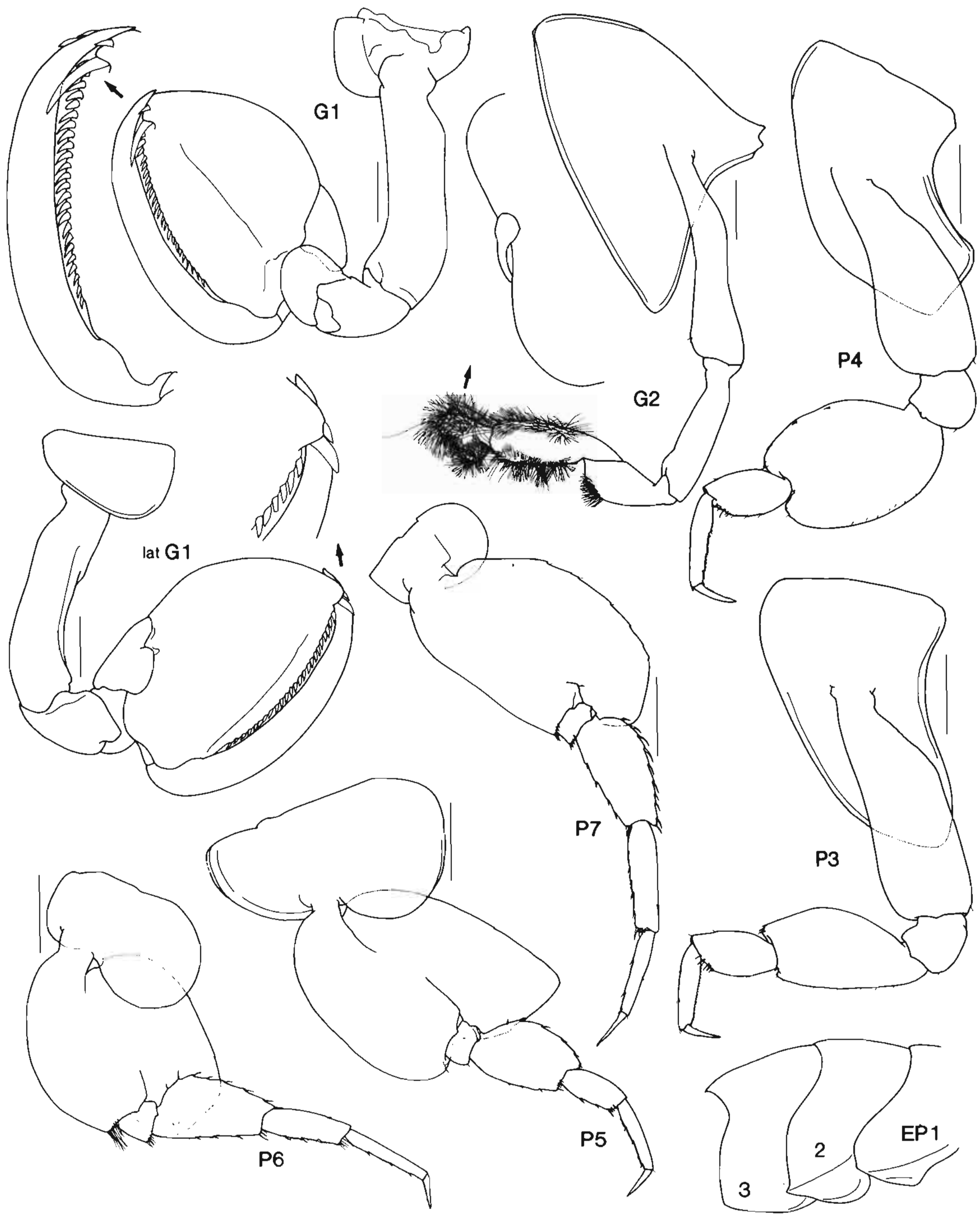

FIG. 33. — *Trischizostoma crosnieri* sp. nov., holotype female, 29 mm (MNHN-Am 4450), north-eastern entrance to Verde Island Passage, Philippine Islands. Scales represent 1.0 mm.

ETYMOLOGY. — This species is named for Alain CROSNIER, who has done so much for the description of the Indo-Pacific marine fauna and encouraged our work on these collections.

REMARKS. — *Trischizostoma crosnieri* and *T. raschi* are closely related. *Trischizostoma crosnieri* differs as follows : gnathopod 1, margin of palm convex with fewer spines guarding palm; peraeopod 6 basis with broad posteroventral lobe; and slightly cleft telson.

Trischizostoma crosnieri confounds the key of VINOGRADOV (1991). Although the telson is slightly cleft it must be considered with the entire-telson group. In this group the shape of the gnathopod 1 propodus in *T. crosnieri* also confounds the key. The oval-shaped propodus splits *T. crosnieri* from the *T. raschi* group and puts it again with species to which it is clearly not closely related. For these reasons we think that *T. crosnieri* is a valid species. However, characters such as the overall shape of the mandible, the spine-tooth arrangement on the outer plate of maxilla 1 and the overall shape of the maxilliped and coxae indicate the close relationship between *T. crosnieri* and *T. raschi*.

DISTRIBUTION. — *Trischizostoma crosnieri* is known only from the Verde Island Passage, Philippine Islands in 682-770 m depth.

ACKNOWLEDGEMENTS

We are particularly grateful to Alain CROSNIER who originally encouraged us to study the amphipods from the MUSORSTOM Expeditions and who arranged for one of us to come to Paris and sort the collections. We thank Hans Georg ANDRES and Mike THURSTON who critically read our manuscript; Stephen KEABLE who illustrated the species and Roger SPRINGTHORPE who composed and inked the plates; the Australian Museum Trust who provided travel money for the project; and the Australian Research Council who funded parts of the study.

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5

Crustacea Decapoda : The Sponge Crabs (Dromiidae) of New Caledonia and the Philippines with a review of the genera

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ABSTRACT

Although this paper concerns a large collection of dromiid crabs from the Philippine Islands and New Caledonia, with a few specimens from Indonesia and Hawaii, the opportunity is taken to review and revise most of the genera of the Dromiidae. The basis of the revision involves a much wider range of characters than have been used before. Excessive emphasis on the nature of the female sternal grooves is abandoned, and more attention is paid to relative dimensions and ornamentation of the carapace, arrangement of spines on and around the dactyli of all the legs, fusion of the last two segments of the abdomen, and size of the uropod plates. A new set of characters describing the second antenna and the male abdominal locking mechanism are also used. The importance of the cheliped epipod character is discussed and is shown to be variable in some genera. A total of 28 genera are defined or redefined and a key to their identification is provided, along with keys to the identification of 99 species in these genera.

The following genera are restricted and/or redefined : *Cryptodromia* Stimpson, 1858, *Cryptodromiopsis* Borradaile, 1903, *Dromia* Weber, 1795, *Dromidia* Stimpson, 1858, *Dromidiopsis* Borradaile, 1900, *Epigodromia* (a replacement name for *Epidromia* Kossmann, 1818, which is preoccupied), *Homalodromia* Miers, 1884, *Paradromia* Balss, 1921, *Petalomera* Stimpson, 1858, and *Pseudodromia* Stimpson, 1858, resulting in the creation of 10 new genera.

Ascidiophilus Richters, 1880, *Conchoecetes* Stimpson, 1858, *Epipedodromia* André, 1932, *Eudromidia* Barnard, 1947, *Exodromidia* Stebbing, 1905, *Hemisphaerodromia* Barnard, 1954, *Hypoconcha* Guérin-Méneville, 1854, *Speodromia* Barnard, 1947, and *Sphaerodromia* Alcock, 1899, remain unmodified. After the elimination of many synonyms and together with the new material described herein, the Dromiidae now includes 29 genera and 109 species. The generic revision has major implications for the dromiid crabs of, not only the Philippines and New Caledonia but also, the rest of the Indo-Pacific region, Australia, South Africa, and the Atlantic.

Until now only six species of dromiid crabs were known from New Caledonia and the Philippine Islands. This number is increased to 29 species belonging to 13 genera. The most common species are *Lauridromia intermedia* (Laurie, 1906) nov. comb., *Petalomera pulchra* Miers, 1884, *Cryptodromia coronata* Stimpson, 1858, *Dromidiopsis dubia* Lewinsohn, 1984, and *Epigodromia areolata* (Ihle, 1913) nov. comb. Most of these dromiids come from shallow water, less than

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100 m, and the maximum number of species occurs in the depth interval of 30-60 m. The greatest depth of 437 m is shown by *Frodromia atypica* (Sakai, 1936) nov. comb. There is a large range of body size from a few millimetres, for *Homalodromia coppingeri*, to around 200 mm CW, for *Dromia dormia*. Egg size ranges from 0.4 mm to 1.1 mm diameter but there is no evidence of direct development amongst these dromiids.

The apparent biogeographic affinities of the dromiids from New Caledonia and the Philippines are, in decreasing order, with Japan, Indian Ocean, Indonesia, and Australia. The apparent affinity with Japan may well be an artifact of more intensive collecting. The most wide ranging species are *Lauridromia intermedia* (Laurie, 1906), *Dromia dormia* (Linnaeus, 1763), *D. wilsoni* (Fulton & Grant, 1902) nov. comb., *Cryptodromiopsis unidentata* (Rüppell, 1830) nov. comb., *Cryptodromia hilgendorfi* De Man, 1888, and *C. fallax* (Lamarck, 1818) nov. comb. These species also represent the most wide ranging genera. The collection of species largely consists of widely distributed species typical of an island fauna.

RÉSUMÉ

Ce travail, qui porte sur une grande collection de Dromiidae des Philippines et de la Nouvelle-Calédonie, a fourni l'occasion de passer en revue et de réviser la plupart des genres de cette famille. Cette révision a pris en compte beaucoup plus de caractères que cela n'avait été fait jusqu'alors. L'importance primordiale accordée aux sillons sternaux des femelles est abandonnée et on a privilégié les dimensions relatives et l'ornementation de la carapace, la disposition des épines associées au dactyle des différentes pattes, la fusion des deux derniers segments de l'abdomen et la taille des uropodes. Un nouvel ensemble de caractères concernant les antennes et le mécanisme, chez le mâle, du blocage de l'abdomen est également utilisé. La valeur, du point de vue de la systématique, de l'épipode des chélipèdes est discutée et il est montré que ce caractère peut varier dans un même genre. Au total, 28 genres sont décrits ou redécrits et une clé pour leur identification est proposée, de même que des clés pour l'identification des 99 espèces comprises dans ces genres.

Les genres suivants sont restreints et/ou redéfinis : *Cryptodromia* Stimpson, 1858, *Cryptodromiopsis* Borradaile, 1903, *Dromia* Weber, 1795, *Dromidia* Stimpson, 1858, *Dromidiopsis* Borradaile, 1900, *Epigodromia* (un nom de remplacement pour *Epidromia* Kossmann, 1878, qui est préemployé), *Homalodromia* Miers, 1884, *Paradromia* Balss, 1921, *Petalomera* Stimpson, 1858, et *Pseudodromia* Stimpson, 1858, tandis que 10 genres nouveaux sont établis.

Ascidiophilus Richters, 1880, *Conchoecetes* Stimpson, 1858, *Epipedodromia* André, 1932, *Eudromidia* Barnard, 1947, *Exodromidia* Stebbing, 1905, *Hemisphaerodromia* Barnard, 1954, *Hypoconcha* Guérin-Méneville, 1854, *Speodromia* Barnard, 1947, et *Sphaerodromia* Alcock, 1899, demeurent inchangés.

Après de nombreuses mises en synonymie et les descriptions d'espèces nouvelles faites ici, les Dromiidae comprennent maintenant 29 genres et 109 espèces. La révision des genres a des conséquences importantes non seulement pour les espèces des Philippines et de la Nouvelle-Calédonie mais également pour le reste de l'Indo-Pacifique, l'Australie, l'Afrique du Sud et l'Atlantique.

Jusqu'à présent, seules six espèces de Dromiidae étaient connues de la Nouvelle-Calédonie et des Philippines. Ce nombre est porté à 29 espèces appartenant à 13 genres. Les espèces les plus communes sont *Lauridromia intermedia* (Laurie, 1906) nov. comb., *Petalomera pulchra* Miers, 1884, *Cryptodromia coronata* Stimpson, 1858, *Dromidiopsis dubia* Lewinsohn, 1984, et *Epigodromia areolata* (Ihle, 1913) nov. comb. Les tailles de ces espèces peuvent varier de quelques millimètres pour *Homalodromia coppingeri* à environ 200 mm (largeur de la carapace) pour *Dromia dormia*. La taille des œufs (diamètre) varie de 0,4 à 1,1 mm, mais il n'y a de mise en évidence d'un développement direct chez les espèces examinées.

Les affinités biogéographiques des espèces de la Nouvelle-Calédonie et des Philippines sont, par ordre décroissant, avec le Japon, l'océan Indien, l'Indonésie et l'Australie. Les espèces ayant les répartitions les plus larges sont *Lauridromia intermedia* (Laurie, 1906), *Dromia dormia* (Linnaeus, 1763), *D. wilsoni* (Fulton & Grant, 1902) nov. comb., *Cryptodromiopsis unidentata* (Rüppell, 1830) nov. comb., *Cryptodromia hilgendorfi* De Man, 1888, et *C. fallax* (Lamarck, 1818) nov. comb. Les genres auxquels appartiennent ces espèces sont ceux dont la répartition géographique est la plus grande. La collection étudiée ici est constituée, en grande partie, d'espèces à large répartition géographique, typiques d'une faune insulaire.

TABLE OF CONTENTS

INTRODUCTION

The Dromiidae De Haan, 1833, is a family of primitive brachyuran crabs whose species occur in tropical and warm temperate seas of all the major oceans. These crabs typically carry pieces of camouflage over their backs, using the last two pairs of legs, and because of some primitive larval and adult features they have sometimes been excluded from the Brachyura Latreille, 1803. Thus an accurate picture of this group is essential to an understanding of the origins and relationships of these crabs to the other Brachyura. It is not within the objectives of this paper, to examine the place of the Dromiidae amongst the primitive brachyuran families or to consider the question of whether these crabs should be excluded from the Brachyura. Within the Dromiidae, generic groupings have grown in a largely *ad hoc* manner with the discovery of new species and there is an urgent need to review the genera. Since the collection, upon which this study is based, contains a diverse array of species, the opportunity is taken to undertake a major revision of the whole family.

Crabs of the family Dromiidae from New Caledonia and the Philippines are very poorly known. Although early collections of Brachyura from New Caledonia, made by M. BALANSA, contained dromiid crabs, now in the collection of Muséum national d'Histoire naturelle, Paris, the papers by A. MILNE EDWARDS (1872, 1873, 1874) did not include them. This old material is included in the present paper. The only published record of a dromiid crab from New Caledonia is *Cryptodromia canaliculata* Stimpson, 1858, from the Ile des Pins, by TAKEDA and NUNOMURA (1976).

ESTAMPADOR (1937) provided a checklist of Philippine decapods, including *Dromia (Cryptodromia) tuberculata* (Stimpson, 1858) and *Cryptodromia lateralis* (Gray, 1831) from the Challenger Expedition (HENDERSON, 1888). But the inclusion of this latter species is based on the synonymy of *Dromia verrucosipes* White, 1847 (a *nomen nudum*) and *Dromia lateralis* Gray, 1831. An examination of WHITE'S type (British Museum) shows that it is not the same species and should be referred to *Stimdromia* gen. nov., probably a new species. WARD (1941) identified *Cryptodromia canaliculata* Stimpson, 1858, *C. tumida* Stimpson, 1858, and *C. bullifera* Alcock, 1899, in a shallow water collection from the Gulf of Davao, Mindanao, held by the American Museum of Natural History, New York. Later, ALCALA (1974) added *Dromia dormia* (Linnaeus, 1763). This makes a total of six species from the Philippines.

This paper is based upon the study of more than 300 specimens from about 200 stations ranging in depth from the intertidal to 437 m. A total of 27 species belonging to 13 genera have been identified.

The paper is organized as follows : a revised definition of the family Dromiidae is given, the genera are reviewed and a key is provided, and then the results are presented by genus with a key to the species in each genus. The scope of this review is defined by the species in the present collection, and the genera to which they belong, as well as closely related species from other genera. In order to provide a complete key to dromiid genera, including those not represented in the collection, it is necessary to indicate which species do not belong in these genera. Only those species bearing a close resemblance to the type species of each genus are retained, while the others are transferred to existing genera or are shown to require new genera. After dealing with the primitive genera, including *Sphaerodromia* Alcock, 1899, the remaining genera are presented in the following order : firstly, large dromiids with a cheliped epipod (including *Dromia* Weber, 1795, and *Dromidiopsis* Borradaile, 1903), secondly, small dromiids with an epipod (including *Petalomera* Stimpson, 1858), thirdly, large dromiids without an epipod (including *Dromidia* Stimpson, 1858), and finally, small dromiids without an epipod (including *Cryptodromia* Stimpson, 1858 and *Homalodromia* Miers, 1884). The division into large and small species is largely arbitrary. This order of presentation begins with the most primitive genera and proceeds to deal with the more advanced genera, reflecting my hypothesis about the pattern of evolution of the Dromiidae.

Particular attention has been paid to verification of the dromiid names in use prior to 1858, when STIMPSON established many new genera. This results in several recently used specific names being replaced by older names which have priority. As well as reorganization and clarification of the relationships amongst dromiid species, an underlying objective is to explore the reproductive strategies of these crabs. Of particular interest are egg size and egg numbers and any evidence of direct development, given that the collections come from an island fauna. Use of camouflage, a distinctive (but not exclusive) feature of dromiids, is also investigated.

MATERIAL EXAMINED

Some of the material used in this study came from the following MUSORSTOM cruises : MUSORSTOM 1, Philippine Islands, Cruise Leader, J. FOREST, April, 1976, R. V. "*Vauban*"; MUSORSTOM 2, Philippine Islands, J. FOREST, November-December, 1980, "*Coriolis*"; MUSORSTOM 3, Philippine Islands, J. FOREST, May-June, 1985, "*Coriolis*"; MUSORSTOM 4, New Caledonia, B. RICHER DE FORGES, September-October, 1985, "*Vauban*"; MUSORSTOM 5, New Caledonia, B. RICHER DE FORGES, October, 1986, "*Coriolis*"; MUSORSTOM 6, Loyalty Islands, B. RICHER DE FORGES, February, 1989, "*Alis*". Other material came from CHALCAL 1, Chesterfield Islands, B. RICHER DE FORGES, July, 1984, "*Coriolis*"; CORAIL 1 & 2, Chesterfield Islands, B. RICHER DE FORGES, July-August, 1988, "*Coriolis*" (see RICHER DE FORGES, 1990, for details). A particularly important source of material was the LAGOON SURVEY, New Caledonia, by B. RICHER DE FORGES, 1984-89, "*Vauban*" and "*Alis*" (see RICHER DE FORGES, 1991, for details), and the reef collections of P. LABOUTE and J.-L. MENOU, taken on SCUBA gear. Other specimens came from the cruises VOLSMAR, Matthew and Hunter Islands, B. RICHER DE FORGES, May-June, 1989, "*Alis*"; SMIB 5, New Caledonia, C. DEBITUS, September, 1989, "*Alis*"; SMIB 6, New Caledonia, C. DEBITUS, February-March, 1990, "*Alis*"; BERYX 4, New Caledonia, R. GRANDPERRIN, January, 1992, "*Alis*"; KARUBAR, Indonesia (Kei and Tanimbar Islands), K. MOOSA and A. CROSNIER, October-November, 1991, "*Baruna Jaya I*" and MUSORSTOM 7, Wallis and Futuna Islands, B. RICHER DE FORGES, May 1992, "*Alis*". In the collection of the Muséum national d'Histoire naturelle are some very old specimens collected along the shores of New Caledonia by M. BALANSA 1861-73, who collected and studied the flora of New Caledonia.

All the specimens dealt with in this paper have been deposited in the Muséum national d'Histoire naturelle, Paris (MNHN). Other specimens mentioned in this paper came from the British Museum (BM), Zoologisches Institut and Museum, Hamburg, Siboga Collection, Zoologisch Museum, Amsterdam, and the National Museum of Natural History, Washington (USNM).

In the lists of "Material Examined" from the above cruises, I have divided the localities into geographic areas (latitude and longitude limits are only approximate) because there are large numbers of islands and it is not easy to associate some localities with particular islands. The areas which I have used are **Philippine Islands**, 5-20°N, 119-127°E, **D'Entrecasteaux Reefs**, 16-18°S, 167-168°E, **Chesterfield Islands**, 18-20°S, 157-161°E, **Bellona Reefs**, 21-23°S, 159-160°E, (both of the latter areas are on the **Bellona Plateau**), **New Caledonia** (including the **Ile des Pins**), 19-23°S, 163-167°E, and the **Loyalty Islands**, 20-22°S, 166-168°E.

The abbreviations of the gears used are : DC = Charcot dredge; DW = Waren dredge; DE = Epibenthic sledge; CP = Beam trawl; CC = Otter trawl (shrimps); CAS = trap.

TERMINOLOGY AND PRESENTATION

Carapace dimensions are given as carapace width (CW) x carapace length (CL) e.g. 1 ♀ 40.6 x 39.7 mm. Measurements, to an accuracy of 0.1 mm, were made using vernier calipers. Carapace width includes any anterolateral teeth and was measured across the widest point, which could vary from the level of the first teeth to the level of the posterolateral teeth. Carapace length includes any rostral teeth and was measured to the posterior carapace margin in the mid-line.

The description of each species is presented according to the following format : cephalothorax, including shape, ornamentation, grooves, then orbit, antenna, epistome, and ventral regions of cephalothorax including female sternal grooves. This is followed by description of the five pairs of pereiopods and the arrangement of spines associated with the dactyli. Finally, the abdomen, telson, abdominal locking mechanism and male pleopods are described (see Fig. 1).

When describing the rostral teeth on the carapace, the length of the median tooth, relative to the lateral teeth, is assessed assuming that the plane of the carapace is horizontal. Teeth around the orbit are treated as being supraorbital, postorbital or suborbital (= infraorbital). The orbital fissure is a narrow slit at the lateral corner which separates the supraorbital and suborbital margins. The anterolateral carapace margin is usually clearly marked, beginning at or above the level of the suborbital margin, and extends as far as the posterolateral tooth which lies behind the branchial groove. Thereafter, the carapace margin is referred to as posterolateral. Anterolateral teeth are sometimes bilobed but they are not counted as being separate unless the indentation extends to the anterolateral margin. In some species the anterolateral teeth are quite variable in size and number, both within and between specimens e. g. *Dromidiopsis lethrinusae* (Takeda & Kurata, 1976) nov. comb. The subhepatic area lies ventrolateral to the orbit and below the anterolateral margin. In some species the subhepatic area is not clearly defined, with the result that any tubercles which may be present can be confused with the anterolateral teeth. Where the anterolateral margin is not clearly evident, I have treated all tubercles which lie below a line extending from the suborbital level to the first anterolateral tooth or to the shoulder of the carapace, as being subhepatic tubercles.

The pereiopods fall naturally into three groups : firstly, the cheliped which is used for feeding as well as cutting out pieces of other living organisms for concealment, secondly, the first two pairs of legs, used for walking, and thirdly, the last two pairs of legs used for carrying the camouflage over the dorsal surface. Rather than referring to "first pereiopod" I use the term "cheliped" and "first two pairs of legs" and "last two pairs of legs" refer to "second and third pereiopods" and "fourth and fifth pereiopods" respectively. This terminology recognizes the functional roles of each group of limbs.

In describing the arrangement of spines associated with the dactyl of each leg I use the terms "inner" and "outer" margins. These terms are necessary because of the differences in orientation of the legs. The legs used for walking have the normal brachyuran orientation so that their margins could be referred to as "dorsal" or "ventral", but the legs used to carry camouflage are oriented dorsally or sub-dorsally to varying degrees so that these terms no longer have a clear meaning. In order to achieve consistency between the two groups of limbs, I use "inner" to refer to the concave margin of the curved dactyl and "outer" for the convex (flexor) margin of the dactyl. Both these margins of the dactyli of the last two pairs of legs may bear small spines. Distal propodal spines opposing the dactyl, forming a prehensile mechanism, are located on the "inner" propodal margin, while other spines occur on the "outer" propodal margin at the base of the dactyl. Thus the terms "inner" and "outer" reflect the way in which the last two pairs of legs are adapted for grasping pieces of camouflage and, for consistency, these terms are applied to the first two pairs of legs as well. On these legs spines are restricted to the "inner" margins of the dactyl and propodus. Reference is also made to the "posterior" and "anterior faces of the dactyli of the first two pairs of legs. These terms have their normal meaning.

The articles of the antenna, which are all mobile, are referred to as "segments" one through four. These segments correspond to coxa (or urinal segment), fused basis-ischium, merus and carpus. The excretory organ opens into a beak-like structure on the medial margin of the first segment and a well developed exopod is fused to the distolateral corner of the second segment. The third segment may be attached terminally, or attached at an angle on a distomedial extension of the second segment.

All of the Dromiidae have phyllobranchiate gills, stacks of leaf-like plates arranged around a central axis. According to GORDON (1950) the maximum number of gills and epipods on each side are 14 + 4, respectively, but may be as few as 9 + 3 in some species. Variation in gill number is greatest in *Pseudodromia*, ranging from 12-9 + 3, and as few as 6 + 3 in *Ascidiophilus*. However, the numbers may be higher in *Sphaerodromia* spp., which can have as many as 20 + 6 (M. DE SAINT LAURENT, pers. comm.). Typically, dromiids have 14 + 3 or 4 gills and epipods respectively.

An important aspect of identifying dromiid specimens is determining whether an epipod is present or absent on the cheliped. This structure is very small and given the small size of some crabs it is easy to understand how problems have arisen in the past through errors. Even if the epipod has been dislodged, as happens in older material, its presence or absence can still be determined by looking closely for the small pit in the coxa, associated with the epipod. Either way, it is necessary to cut away the lateral wall of the gill chamber to allow close inspection.

Female sternal grooves may end apart, with or without tubercles, or end together on a single tubercle. The grooves may end behind the genital openings or as far forward as the cheliped segment. Since this character shows ontogenetic change, the description is based on the state found in the sexually mature female. Sternal grooves of mature females are often plugged with a hardened secretion indicating that they have already mated.

In describing the abdomen, I treat it as consisting of six segments plus the telson. Some species have the joint between the last two segments fused. However, the position of the joint is always marked by a groove which can be seen in the middle of the abdomen and/or at the lateral margins. The dimensions of the telson are expressed as a ratio of maximum length, measured in the mid-line, and maximum width, measured across the base. The posterior margin of the telson may be rounded, bluntly narrowed, divided into lobes, or armed with a sharp spine.

In some species uniramous uropods are inserted at the posterior border of the last abdominal segment and in front of the telson. I have recognized five different states for the uropod character : a) large, visible externally, occluding much of the last abdominal segment from the lateral margin, b) small, visible externally, occluding less than 10% of the last abdominal segment from the lateral margin, c) small, concealed under last abdominal segment, d) vestigial, concealed under last abdominal segment, and e) absent.

The abdominal locking mechanism is the means by which the abdomen is held in place against the thorax of males and immature females. Tubercles or spines on the coxae of the first two pairs of legs are held against the lateral margins of the telson or last two segments to grasp the abdomen. Usually only the coxae of the first pair of legs are involved. The uropods may also be involved by fitting in front of the coxal tubercles and preventing the abdomen from slipping out. Mature females cannot lock their abdomen in place because it is too wide and the coxal tubercles are not present.

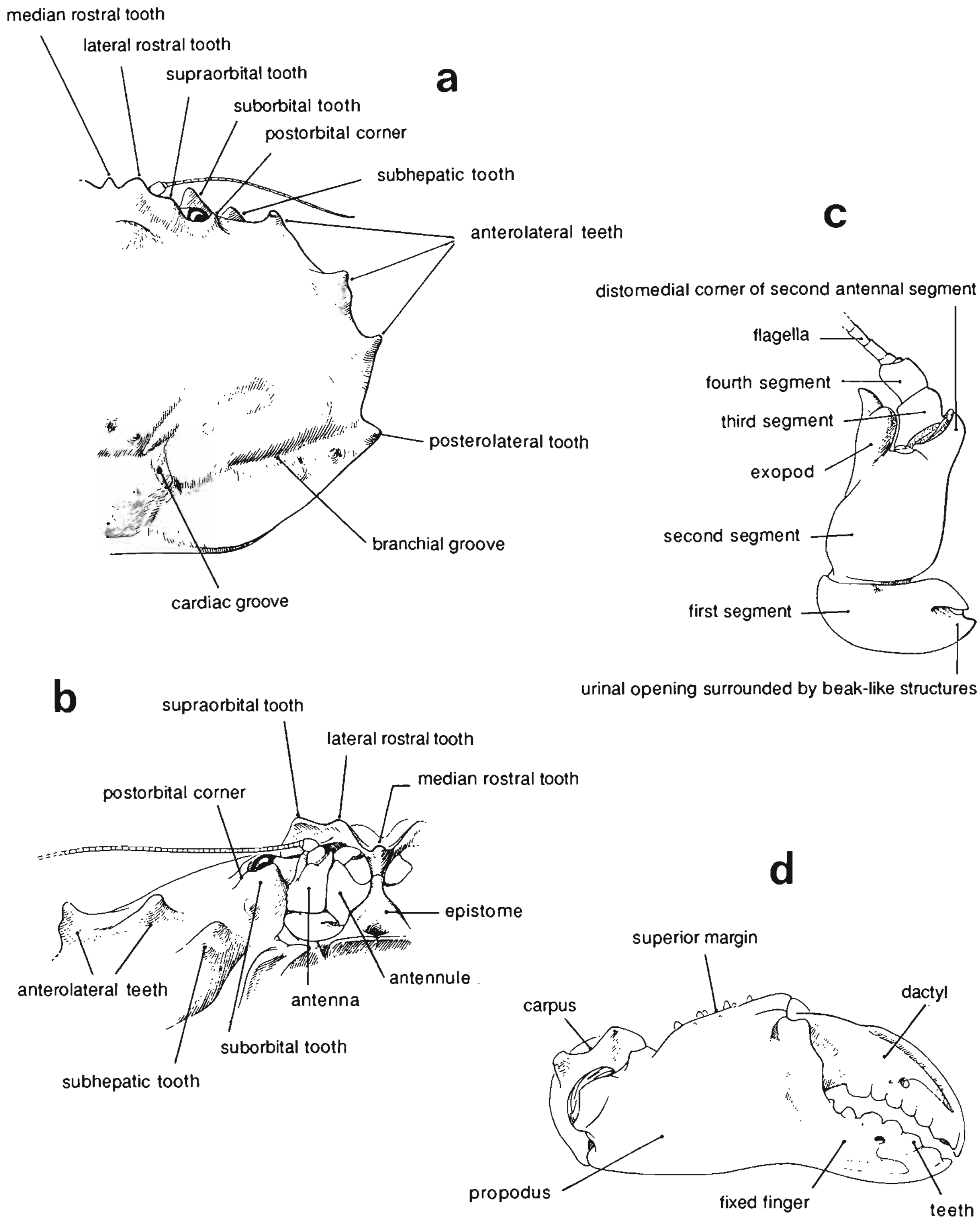
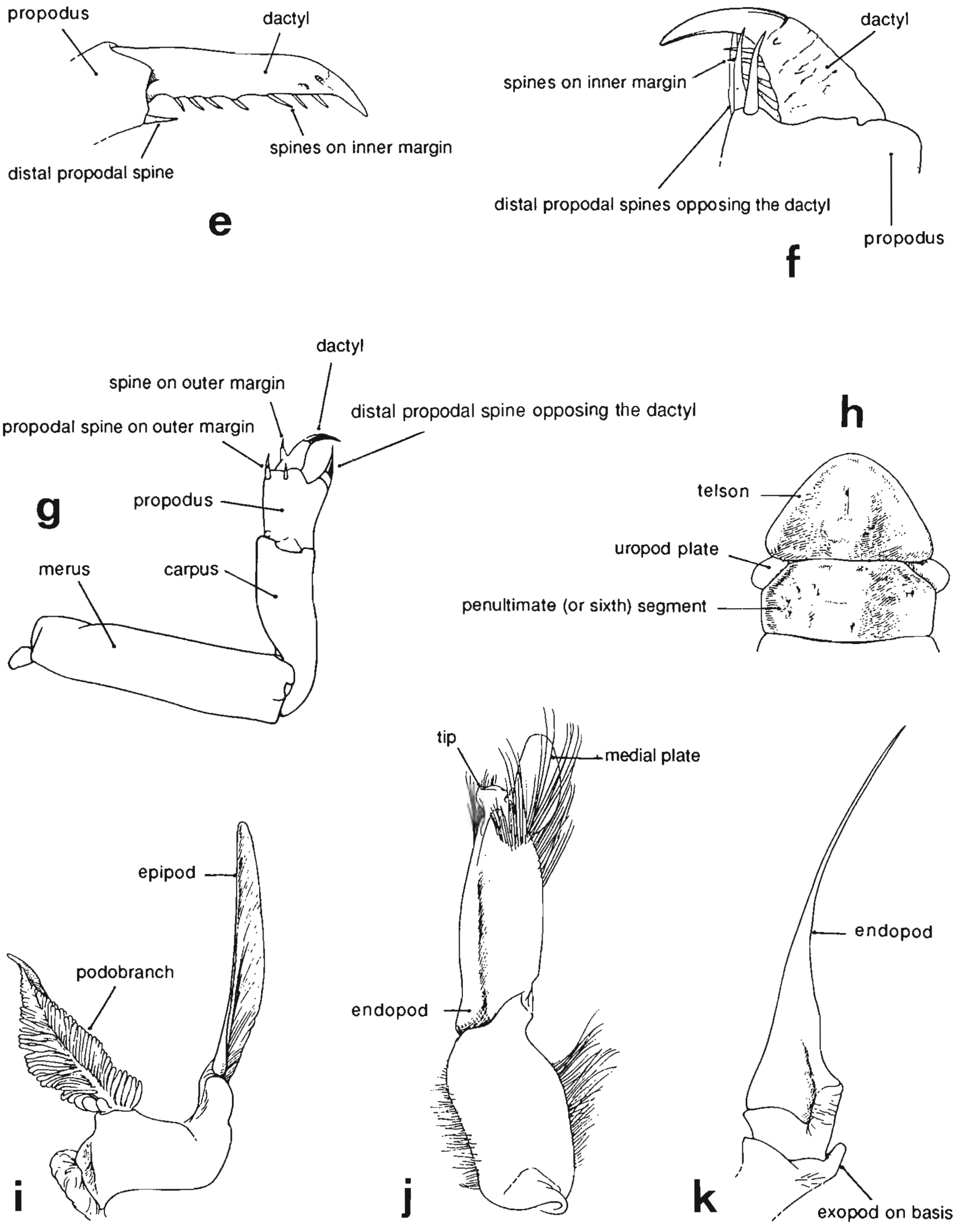


FIG. 1. — Selected figures illustrating the terminology used to describe crabs of the family Dromiidae : 1 a-d, h, based on *Dromia wilsoni* (from McLay, 1991), 1 e-f, based on *Sphaerodromia ducoussoi* (from McLay, 1991), 1 g, based on *Austrodromidia australis* nov. comb. (McLay, unpublished), 1 i-k, based on *Sphaerodromia brizops* (from McLay & Crosnier, 1991). **a**, dorsal view of right half of carapace; **b**, ventral view of right orbit and anterolateral margin;



c, basal segments of right antenna, ventrolateral view; **d**, right cheliped, outer face; **e**, dactylus of second right leg, posterior view; **f**, dactylus of third right leg, anterior view; **g**, right fourth leg, dorsal view; **h**, telson and penultimate segment of abdomen with uropods; **i**, epipod and podobranch from right cheliped; **j**, left first male pleopod, dorsal view; **k**, left second male pleopod, ventral view. Note : Figs 1c, e-g, i-k, are drawn at a higher scale.

In assessing the reproductive strategy of each species, I have focussed on size at maturity, egg size and egg numbers. I have used data about relative size of the female abdomen, development of the sternal grooves and presence of a spermathecal plug to determine the size range over which females reach maturity. Dromiid crabs show a wide range of egg sizes from 0.5 mm diameter for *Lauridromia intermedia* (Laurie, 1906) nov. comb., to 2.8 mm (see HALE, 1941) for *Haledromia bicavernosa* (Zietz, 1887) nov. comb. The eggs of *H. bicavernosa* are amongst the largest known for any brachyuran crab. Similarly, egg numbers also show wide variation, ranging from around 24,000 eggs for *Dromia dormia* (Linnaeus, 1763) to less than 20 eggs for *Epigodromia sculpta* (Haswell, 1882) nov. comb.. Even when the effects of female size are removed, the relationship between egg size and egg numbers is not a simple trade-off. However, for the purposes of this paper, when presenting data about the reproductive biology of each species, I attempt to place it within the range of variation indicated above. One of the most interesting features of dromiid crabs is the occurrence of direct development in some species, whereby the young crabs are carried by the female. These include *Dromidiopsis globosa* (Lamarck, 1818) nov. comb. (until now known as *Dromidiopsis excavata*), *Austrodromidia octodentata* (Haswell, 1882) nov. comb., and *Stimdromia lateralis* (Gray, 1831) nov. comb., all of which come from Australian coasts. Like many other Australian species these all have large eggs (> 1.0 mm). Other species, with smaller eggs, such as *Dromia wilsoni* (Fulton & Grant, 1902) nov. comb., *Cryptodromiopsis antillensis* (Stimpson, 1858), nov. comb. and *Conchoecetes artificiosus* (Fabricius, 1798), have a free-living zoeal stage.

Finally, when giving the authors of species names described by DAI, YANG, SONG, & CHEN (1981, 1986), and DAI & YANG (1991) from China, I have followed the recommendations given by NG (1992) and L. HOLTHUIS (pers. comm.). Species described as being new in the 1991 paper were in fact first described in the 1986 paper and for new species in both the 1981 and 1986 publications, the species are attributed to all of the authors of the publication rather than those simply indicated alongside each name. This course of action follows from a strict interpretation of Art. 50a of the International Code of Zoological Nomenclature.

Family DROMIIDAE De Haan, 1833

Dromiacea De Haan, 1833 : ix.
Dromiidae - ORTMANN, 1892 : 541, 543. — ALCOCK, 1900 : 128; 1901 : 37. — IHLE, 1913 : 4. — RATHBUN, 1923a : 144; 1937 : 30. — BARNARD, 1950 : 306. — WILLIAMS, 1965 : 143. — INGLE, 1980 : 79. — DAI & YANG, 1991 : 16.

Carapace shape variable, width may be greater than or less than length, generally convex in both directions, commonly ovoid or subcircular, may be pentagonal. Lateral carapace margins usually distinctly marked and armed with teeth. Branchial and frontal grooves usually evident. Rostrum usually consists of three teeth, median tooth on a lower plane but may be absent. Eyestalk short, stout, eyes protected by well defined orbits. Sternal grooves of female are variable : they may end either apart or together anywhere between bases of chelipeds or second pair of walking legs.

Antennal flagella shorter than carapace length. First (or urinal) and second segments of antenna movable, exopod firmly fixed to second segment (rarely absent). External maxillipeds typically opercular, completely closing the buccal cavern, basis and ischium of endopod fused but joint always marked by a groove. Bases (coxae) of maxillipeds may fit tightly together or be separated by a gap, and they can be inserted directly under the rounded tip of the sternum or they can be inserted at a lower level on a triangular extension of the sternum. Chelipeds equal, generally much stouter than walking legs. Podobranchs may be present on any of first three pereiopods, and an epipod may be present on cheliped. Gills are phyllobranchiate. First two pairs of legs generally stout, usually not much shorter than chelipeds. Last two pairs of legs usually reduced, third pair usually shortest, both pairs usually subdorsal and prehensile. Grasping mechanism involves distal propodal spines and dactyli. Genital openings coxal.

Abdomen of six segments and telson, folded under thorax. Small uropod plates may be present or absent, and these are often involved in the abdominal locking mechanism.

Five pairs of pleopods present in female, first pair rudimentary. Male may also have five pairs of pleopods, but usually only two pairs. These pleopods are very uniform in structure : first pair, stout semi-rolled, setose, sharply tipped tubes, second pair simple, needle-like.

Body usually protected by a piece of sponge, ascidian or a bivalve shell which is carried over the dorsal surface by the last two pairs of legs.

DISCUSSION. — The above definition of the family Dromiidae is largely based on ALCOCK (1900) with the addition of details about the antennae, uropod plates, and pleopods. Previous concepts of this family have assumed that uniramous uropods are always present in adults, but in fact they are often absent from the abdomen. Uropod plates are absent in *Tunedromia* gen. nov., *Ascidiophilus* Richters, 1880, and *Epipedodromia* André, 1932, and are vestigial and concealed (maybe absent in some species), in *Haledromia* gen. nov., *Pseudodromia* Stimpson, 1858, *Exodromidia* Stebbing, 1905, *Eudromidia* Barnard, 1947, *Dromidia* Stimpson, 1858, *Austrodromidia* gen. nov., *Barnardromia* gen. nov., *Speodromia* Barnard, 1947, and *Hypoconcha* Guérin-Méneville, 1854. In *Frodromia* gen. nov. the uropods are small and concealed in females, but visible externally in males. In all other genera the uropods are small, but visible externally except in *Dromidiopsis globosa* (Lamarck, 1818) nov. comb. where they are visible externally in juveniles but concealed in adults.

Not only is the uropod character variable amongst adults, but it is also variable among dromiid larvae. Well developed uropods (which may be biramous or uniramous) are found in the megalopae of *Cryptodromia tuberculata*, *Cryptodromiopsis antillensis* nov. comb., *Dromia personata*, *D. erythropus*, *Lauridromia dehaani* nov. comb., *Paradromia japonica*, *Conchoecetes artificiosus*, *Hypoconcha arcuata*, and *H. parasitica*, but in *Dromia wilsoni* nov. comb. and *Stimdromia lateralis* nov. comb. (in this case in the juvenile crab stage) they are reduced (see TAN, LIM, & NG, 1986, using the name *C. pileifera*; RICE & PROVENZANO, 1966; RICE, INGLE & ALLEN, 1970; LAUGHLIN, RODRIGUEZ & MARVAL, 1982; HONG & WILLIAMSON, 1986; SANKOLLI & SHENOY, 1968; KIRCHER, 1970; LANG & YOUNG, 1980; WEAR, 1970, 1977, as *Petalomera wilsoni*; MONTGOMERY, 1922, and HALE, 1925, as *Petalomera lateralis*). However, the state of the larval uropods does not always predict the adult state. Whereas in *Dromia wilsoni* and *Stimdromia lateralis* the uropods are reduced in the larvae or juvenile crab stage, respectively, they are well developed in the adults. The reverse is true in *Hypoconcha arcuata* and *H. parasitica* (until recently known as *H. sabulosa*, see HOLTHUIS & MANNING, 1987).

The main characters which have been used to separate the Dromiidae from the other dromioid families, Homolodromiidae Alcock, 1899, and Dynomeniidae Ortmann, 1892, are the presence of uropods, as well as the nature of the last two pairs of legs, and the presence of podobranchs on the pereiopods. For example, the key given by BORRADAILE (1903b) assumes that uropods are absent in the Homolodromiidae, which is clearly not true (see BAEZ & MARTIN, 1989, and MARTIN, 1992), and that only *Hypoconcha*, among the Dromiidae, lack uropods. It is clear that the uropod character is not a reliable way to separate these families. There is a need to clarify the definitions and relationships of these families.

Dromiid Genera

Some twenty six generic names have been used in the family Dromiidae and these have undergone two major revisions : firstly, by STIMPSON (1858), based on specimens collected by the Ringgold and Rodgers expedition in the Pacific, and secondly, by BORRADAILE (1903a), based on his study of a collection from the Maldives, Indian Ocean. Prior to 1858 there were only two generic names in use : *Dromia*, Weber, 1795, and *Hypoconcha*, Guérin-Méneville, 1854, and STIMPSON (1858) proceeded to establish *Dromidia*, *Cryptodromia*, *Pseudodromia*, *Petalomera*, and *Conchoecetes*. Following these came *Epidromia* Kossmann, 1878 which was a significant development but unfortunately it was submerged under *Cryptodromia* by BORRADAILE (1903a). In this paper I separate these two genera again but *Epidromia* being preoccupied I propose the replacement name *Epigodromia*. *Platydromia* Brocchi, 1877, was erected for *P. depressa* which is shown herein to be a synonym for *Dromidia spongiosa* Stimpson, 1858, and therefore this genus is no longer necessary. *Ascidiophilus* Richters, 1880, and *Homalodromia* Miers, 1884, are two monotypic genera based on Indian Ocean specimens. *Eudromia* Henderson, 1888, was based on South African material from the Challenger expedition.

Later, ALCOCK erected *Sphaerodromia* Alcock, 1899, and *Lasiodromia* Alcock, 1901 (a replacement name for *Homalodromia* Miers, 1884). BORRADAILE (1900) established *Dromidiopsis*, and in 1903a, *Dromides* (later absorbed into *Cryptodromia*) and *Cryptodromiopsis*, and he redefined *Dromidia* and *Cryptodromia*. Further genera added were *Exodromidia* Stebbing, 1905, *Paradromia* Balss, 1921, *Epipedodromia* André, 1932 (a replacement name for *Platydromia* Fulton & Grant, 1902, which was preoccupied), *Eudromidia* Barnard, 1947 (erected because *Eudromia* Henderson, 1888, was a preoccupied name), *Speodromia* Barnard, 1947, and *Hemisphaerodromia* Barnard, 1954. *Ascidiophilus* Richters, 1880, was absorbed into *Pseudodromia* by BALSS (1922), and *Paradromia* Balss, 1921, was included in *Petalomera* by SAKAI (1936).

Most recently, the genus *Sphaerodromia* Alcock, 1899, has been reviewed by McLAY and CROSNIER (1991), and McLAY (1991). The genus *Parasphaerodromia* Spiridonov, 1992, was erected for a male specimen collected from an isolated seamount in the western Indian Ocean but it is shown herein to be a synonym of *Dromidia* Stimpson, 1858.

The genus *Conchoedromia* Chopra, 1934, remains enigmatic and obscure, and its position cannot be established until further specimens are collected. The status of *Sternodromia* Forest, 1974, and its relationship with *Dromia* Weber, 1795, are discussed in this paper. The monotypic genus *Genkaia* Miyake & Takeda, 1970, which includes *G. gordonae* Miyake & Takeda, 1970, was placed in the Dromiidae, but belongs in the Tymolidae Alcock, 1896 (M. TAVARES, pers. comm.).

The genera of the Dromiidae have not been reviewed or revised since BORRADAILE (1903a) who recognized 12 genera. The characters which BORRADAILE considered important in generic definition were presence or absence of the cheliped epipod, definition of the regions of the carapace, ratio of carapace width to length, shape of the legs and arrangement of the female sternal grooves. By themselves these features are an inadequate basis for resolution of the species into a series of natural groups.

My generic revision of the Dromiidae uses a wider range of characters than that used by BORRADAILE (1903a), including epipods and podobranchs of the pereiopods, ratio of carapace width to length, texture of the carapace surface, development of the rostrum, sexual dimorphism of chelipeds, tubercles of the first two pairs of legs, arrangement of spines on and around the dactyli of the legs, size of the uropod plates, presence of vestigial pleopods on the male abdomen, fusion of the last two segments of the abdomen and sternal grooves of mature females. HENDERSON (1888) doubted that STIMPSON'S revision had resulted in natural groups because too much reliance had been placed on disposition of the female sternal grooves. By themselves, the sternal grooves are of only limited value because they show ontogenetic change and can only be used for mature females. Later, both LEWINSOHN (1977) and MANNING & HOLTHUIS (1981) questioned the importance which has been placed on the sternal groove character. Variation in the structure of male pleopods, which has been so valuable in the study of other Brachyura, proves to be of little use in the Dromiidae. Apart from some minor differences, the male pleopods of all known members of the Dromiidae are very uniform.

The use of the cheliped epipod character by BORRADAILE (1903a) was perhaps the major innovation which helped to resolve many problems with dromiid taxonomy. Amongst these crabs it has always been assumed that it is a very conservative character and therefore useful for separating large groups of genera within the family. For example, absence of a cheliped epipod seems to separate the species of *Dromidia* from *Dromia* and *Dromidiopsis*. In the same way, species of *Cryptodromia* have been separated from *Petalomera*. However, there are some cases where species, which are very similar in every other respect, differ only in this character. Two examples, involving species assigned to *Petalomera* Stimpson, 1858, because they have an epipod, are firstly, *P. nodosa* Sakai, 1936, which has an areolate carapace and closely resembles species of *Epigodromia* gen. nov., and secondly *Petalomera fukuii* Sakai, 1936, which has a smooth carapace and closely resembles species of *Cryptodromia*. In this paper I allow the cheliped epipod character to be a variable in the genera *Cryptodromia* and *Epigodromia*.

In my approach to this generic revision I have given emphasis to suites of characters rather than treating each character by itself. For example, I have considered the characters of the last two pairs of legs which have to do with the carriage of camouflage as one suite. Other suites of characters include the nature of the carapace surface and the size and shape of uropods in relation to their role in the abdominal locking mechanism. I make the assumption that comparison of these character suites amongst genera will give us an indication of the direction of evolution in the family as a whole.

The genera dealt with in this paper are *Sphaerodromia* Alcock, 1899, *Eodromia* gen. nov., *Tunedromia* gen. nov., *Dromidiopsis* Borradaile, 1903, *Lauridromia* gen. nov., *Dromia* Weber, 1795, *Haledromia* gen. nov., *Hemisphaerodromia* Barnard, 1954, *Fultodromia* gen. nov., *Paradromia* Balss, 1921, *Petalomera* Stimpson, 1858, *Stimdromia* gen. nov., *Frodromia* gen. nov., *Conchoecetes* Stimpson, 1858, *Pseudodromia* Stimpson, 1858, *Ascidiophilus* Richters, 1880, *Exodromidia* Stebbing, 1905, *Eudromidia* Barnard, 1947, *Barnardromia* gen. nov., *Speodromia* Barnard, 1947, *Dromidia* Stimpson, 1858, *Austrodromidia* gen. nov., *Cryptodromiopsis* Borradaile, 1903, *Cryptodromia* Stimpson, 1858, *Takedromia* gen. nov., *Epigodromia* gen. nov., *Epipedodromia* André, 1932, *Homalodromia* Miers, 1884.

The only remaining dromiid genus, not dealt with herein, is *Hypoconcha* Guérin-Méneville, 1854, from American coasts [including *H. arcuata* Stimpson, 1858, *H. californiensis* Bouvier, 1898, *H. lowei* Rathbun, 1933, *H. panamensis* Smith, 1869, *H. parasitica* (Linnaeus, 1763) and *H. spinosissima* Rathbun, 1933]. The question of whether the genus *Hypoconcha* should remain in the family Dromiidae is dealt with in the Discussion (see later).

The generic revision, undertaken here, results in the recognition of twenty nine genera, and has major implications for the dromiid crabs of, not only the Philippines and New Caledonia, but also the rest of the Indo-Pacific region, Australia, South Africa and the Atlantic. After elimination of many synonyms, the total number of known species in the family Dromiidae is one hundred and nine, by far the majority coming from the Indo-Pacific region.

Key to the genera of Dromiidae

The genus *Conchoedromia*, enigmatic and obscure, is not included in this key.
Genera studied in this paper are in bold.

1. Carapace flattened, membranous, hourglass-shaped, frontal and lateral margins expanded, covering the eyes, dactyli of last two pairs of legs short, stout, lunate, used to carry a bivalve shell .... *Hypoconcha* Guérin-Méneville, 1854
— Frontal and lateral margins not as above, dactyli of last two pairs of legs not lunate **2**

2. Carapace flattened, subpentagonal, not membranous, front tridentate, dactyl of penultimate leg large and talon-like, used for carrying a bivalve shell .... ***Conchoecetes*** Stimpson, 1858 (p. 174)
— Carapace variously shaped, usually convex, dactyl of penultimate leg not talon-like and usually opposed or surrounded by one or more propodal spines **3**

3. Cheliped with epipod and podobranch, first two pairs of legs also with epipods, and sometimes podobranchs .... ***Sphaerodromia*** Alcock, 1899 (p. 126)
— Cheliped may have an epipod but no podobranch, first two pairs of legs without podobranchs **4**

4. Cheliped usually with an epipod, last two abdominal segments may be fused or freely movable **5**
— Cheliped usually without an epipod, last two abdominal segments freely movable **16**

5. Carapace surface smooth or at most only finely denticulated **6**
— Carapace surface granular or tuberculate, maybe areolate **12**

6. Uropod plates on the abdomen vestigial or absent, not visible externally **7**
— Uropod plates small, but visible externally **8**

7. Uropod plates vestigial, carapace width much greater than carapace length, deep reniform cavities on front of carapace .... ***Haledromia*** gen. nov. (p. 158)
— Uropod plates absent, carapace as wide as long, no cavities on front of carapace .... ***Tunedromia*** gen. nov. (p. 134)

8. Carapace approximately as long as wide, small spine on outer margin of dactyl of fourth leg, and last two segments of abdomen usually partially or wholly fused; or carapace wider than long, no spine on fourth leg dactyl, and abdomen partially fused; or carapace longer than wide, no spine on fourth leg dactyl, and abdominal segments not fused 9
— Carapace as wide or wider than long, no spine on outer margin of dactyl of fourth leg and all segments of the abdomen freely movable **10**

9. Rostral and anterolateral teeth well developed, acute, superior margin of cheliped carpus and propodus armed with two to four large tubercles, female sternal grooves terminate in well developed tube-like structures, male abdominal locking mechanism does not involve uropods but instead there are serrated flanges on the bases of the first two pairs of legs which grip lateral margins of the abdomen .... ***Lauridromia*** gen. nov. (p. 145)
— Rostral and anterolateral teeth blunt, superior margin of cheliped carpus and propodus without large tubercles, female sternal grooves do not terminate in well developed tubes, male abdominal locking mechanism involves uropods in front of serrated flanges on base of first legs .... ***Dromidiopsis*** Borradaile, 1900 (p. 135)

10. Carapace strongly convex, lateral rostral teeth not developed, anterolateral margin rounded, without teeth .... ***Hemisphaerodromia*** Barnard, 1954 (p. 159)
— Carapace may be convex, but lateral rostral teeth and anterolateral teeth well developed **11**

11. Chelipeds and first two pairs of legs strongly tuberculated and lobed .... ***Stimdromia*** gen. nov. (p. 167)
— Chelipeds and first two pairs of legs smooth .... ***Dromia*** Weber, 1795 (p. 149)

12. Carapace longer than wide **13**
— Carapace as wide or wider than long **15**

13. Carapace sub-globose, a small spine on ventral distal margin of propodi of first two pairs of legs, several small spines on the inner margins of dactyli of last two pairs of legs, vestigial pleopods on male abdomen .... ***Eodromia*** gen. nov. (p. 130)
— Carapace angular, no spines on propodi of first two pairs of legs or on inner margins of dactyli of last two pairs of legs, no vestigial pleopods on male abdomen **14**

14. Petaloid meri on chelipeds and first two pairs of legs .... ***Petalomera*** Stimpson, 1858 (p. 164)
— Meri of chelipeds and first two pairs of legs not petaloid .... ***Fultodromia*** gen. nov. (p. 162)

15. Rostral teeth bluntly rounded, carapace may be areolated .... ***Paradromia*** Balss, 1921 (p. 163)
— Rostral teeth sub-acute, carapace not areolated .... ***Frodromia*** gen. nov. (p. 170)

16. Carapace surface smooth **17**
— Carapace surface granular **25**

17. Uropod plates on abdomen concealed or absent **18**
— Uropod plates on abdomen small, but visible externally **23**

18. Posterior margin of telson sharply pointed **21**
— Telson may be narrowed, but posterior margin not sharply pointed **19**

19. Rostrum bidentate, transverse ridge behind rostrum divided into four lobes, no spines on the outer propodal margins of the last two pairs of legs... .... ***Epipedodromia*** André, 1932 (p. 224)
— Rostrum tridentate or unidentate, no transverse ridge behind rostrum, spines present on the outer propodal margins of the last two pairs of legs **20**

20. Carapace longer than wide, rostrum unidentate, no exopod on antenna, last pair of legs as long or longer than first two pairs, no propodal spines opposing the dactyli of last two pairs of legs, instead there are spines placed on the lateral propodal margins .... ***Ascidiophilus*** Richters, 1880 (p. 177)
— Carapace as wide or wider than long, rostrum tridentate, exopod on antenna well developed, last pair of legs much shorter than either of first two pairs, one or two propodal spines opposing dactyli of last two pairs of legs .... ***Austrodromidia*** gen. nov. (p. 185)

21. Carapace wider than long, rostrum tridentate .... ***Dromidia*** Stimpson, 1858 (p. 183)
— Carapace longer than wide, rostrum unidentate or bi-lobed **22**

22. Rostrum tridentate, not eave-like, last pair of legs as long or longer than first two pairs, no propodal spines opposing the dactyli of last two pairs of legs, instead there are spines placed on the lateral propodal margins .... ***Pseudodromia*** Stimpson, 1858 (p. 175)
— Rostrum bi-lobed, well developed as an overhanging sinuous eave, last pair of legs much shorter than first two pairs, dactyli of last two pairs of legs opposed by single propodal spines .... ***Eudromidia*** Barnard, 1947 (p. 179)

23. Female sternal grooves end close together between chelipeds or first legs, usually a small spine on the outer margin of fourth leg dactyl .... ***Cryptodromiopsis*** Borradaile, 1903 (p. 187)
— Female sternal grooves end apart, no spine on outer margin of fourth leg dactyl **24**

24. Carapace length significantly greater than width, rostrum consists of two widely separated bifid lobes, no median tooth .... ***Homalodromia*** Miers, 1884 (p. 225)
— Carapace approximately as wide or wider than long, rostrum tridentate .... ***Cryptodromia*** Stimpson, 1858 (p. 197)

25. Uropods small but visible externally, telson without a terminal spine **27**
— Uropods absent, or if present, they are not visible externally, telson with a terminal spine **26**

26. Carapace length equal to or greater than carapace width, lateral rostral teeth produced as long spines, no sub-branchial cavity under lateral carapace margin.. ***Exodromidia*** Stebbing, 1905 (p. 178)
— Carapace wider than long, rostrum triangular, deflexed, but not bearing teeth, deep sub-branchial cavity under the lateral carapace margin ... ***Speodromia*** Barnard, 1947 (p. 182)

27. Carapace shape sub-circular, anterolateral teeth well developed, lacinated and tuberculated . ... ***Takedromia*** gen. nov. (p. 211)
— Carapace shape angular, anterolateral teeth often not distinct, may be tuberculated, but not lacinated **28**

28. Last anterolateral tooth strongly developed, projecting laterally, posterior margin of telson rounded .... ***Barnardromia*** gen. nov. (p. 179)
— Last anterolateral tooth not strongly developed, posterior margin of telson may be bilobed .... ***Epigodromia*** gen. nov. (p. 216)

SPECIES LIST OF NEW CALEDONIAN AND PHILIPPINE DROMIIDAE

The following is a list of all the species identified in the collection from both New Caledonia and surrounding areas (NC), and the Philippines (PH) :

Sphaerodromia kendalli (Alcock & Anderson, 1894) (PH).
Eodromia denticulata gen. nov., sp. nov. (NC).
Dromidiopsis dubia Lewinsohn, 1984 (NC).

Dromidiopsis lethrinusae (Takeda & Kurata, 1976) nov. comb. (PH, NC).
Dromidiopsis tridentata Borradaile, 1903 (NC).
Lauridromia intermedia (Laurie, 1906) nov. comb. (PH, NC).
Dromia dormia (Linnaeus, 1763) (NC).
Dromia foresti sp. nov. (NC).
Dromia wilsoni (Fulton & Grant, 1902) nov. comb. (PH, NC).
Petalomera pulchra Miers, 1884 (NC).
Stimdromia angulata (Sakai, 1936) nov. comb. (PH).
Frodromia atypica (Sakai, 1936) nov. comb. (PH).
Cryptodromiopsis bullifera (Alcock, 1900) nov. comb. (NC).
Cryptodromiopsis plumosa (Lewinsohn, 1984) nov. comb. (NC).
Cryptodromiopsis unidentata (Rüppell, 1830) nov. comb. (PH, NC).
Cryptodromia ?coronata Stimpson, 1858 (NC).
Cryptodromia fukuii (Sakai, 1936) nov. comb. (NC).
Cryptodromia amboinensis De Man, 1888 (PH, NC).
Cryptodromia hilgendorfi De Man, 1888 (PH, NC).
Cryptodromia fallax (Lamarck, 1818) (NC).
Cryptodromia longipes sp. nov. (NC).
Takedromia cristatipes (Sakai, 1969) nov. comb. (NC).
Takedromia longispina gen. nov., sp. nov. (NC).
Epigodromia areolata (Ihle, 1913) nov. comb. (NC).
Epigodromia rotunda sp. nov. (NC).
Epigodromia rugosa sp. nov. (NC).
Homalodromia coppingeri (Miers, 1884) (NC).

Genus ***SPHAERODROMIA*** Alcock, 1899

Sphaerodromia Alcock, 1899 : 16; 1900 : 152; 1901 : 38. — BALSS, 1922 : 106. — SAKAI, 1936 : 15. — McLAY, 1991 : 459.

Carapace sub-globose, as wide or wider than long, surface gradually rounded, tomentose. Front broadly triangular, grooved in midline, rostrum not developed, continuous with supraorbital margin. Distomedial corner of second antennal segment not produced. Coxae of third maxillipeds closely approximated and inserted under tip of sternum. Female sternal grooves end wide apart behind genital openings. Cheliped with an epipod and well developed podobranch, first two pairs of legs also have epipods, with or without podobranchs. Chelipeds longer and stouter than first two pairs of legs, which are not nodose. Usually a small propodal spine on inferior margin overlapping with dactyli of first two pairs of legs. Last two pairs of legs reduced, similar in size, only last pair subdorsal. Three to five propodal spines opposing dactyli, no spines on outer propodal margin, but two to four small spines on inner margin of dactyli. Abdomen of six free segments. Telson rounded, longer than wide in male, wider than long in female. Uropod plates well developed, visible externally and occluding up to approximately half the sub-terminal abdominal segment from the lateral margins. Abdominal locking mechanism consists of denticulate ridge on coxae of first two legs against lateral margins of telson and last two segments, uropods not used. First male pleopod with a small rounded terminal plate, second pleopod simple, needle-like with an exopod on the basis. Vestigial pleopods present on male segments three-five.

TYPE SPECIES. — *Dromidia kendalli* Alcock & Anderson, 1894, by monotypy.

OTHER SPECIES. — *Sphaerodromia brizops* McLay & Crosnier, 1991, *S. ducoussoi* McLay, 1991, and *S. nux* Alcock, 1899.

DISCUSSION. — The genus *Sphaerodromia* Alcock, 1899, has been reviewed by McLAY (1991). A more detailed definition of the genus is given above. The important characters which make *Sphaerodromia* the most primitive known genus of the Dromiidae, and clearly differentiate it from other genera are as follows : distomedial corner of second antennal segment not produced, exopod extending beyond joint of segments three and four, epipods present on chelipeds and first two pairs of legs, a podobranch present on chelipeds (and sometimes legs), usually a propodal spine at base of dactyli of first two pairs of legs, multiple propodal spines opposing dactyli of last two pairs of legs, inner margins of these dactyli armed with small spines, uropods large, vestigial pleopods on male abdominal segments three-five, first male pleopod has an apical plate, basis of second pleopod has an exopod (see Table 1).

In the other genera these characters show a more advanced state. The distomedial corner of the second antennal segment is produced as a spine, on which the third segment is inserted at an angle, and the exopod attached to the opposite side is shorter. Thus, whereas in *Sphaerodromia*, the second antenna is fairly straight, in other genera it is angled at the junction between second and third segments. An epipod may be present on the cheliped but there are none on any of the other pereiopods. A propodal spine at the base of the dactyli of the first two pairs of legs is only rarely present in these genera. Similarly, spines on the inner margins of the dactyli of the last two pairs of legs, are rare. Uropods, although often visible externally, are smaller and sometimes absent. First two pleopods of males are extremely uniform, lacking an apical plate on the first, and an exopod on the basis of the second. Vestigial male pleopods on third to fifth segments are only found in two other genera (*Eodromia* gen. nov., and *Exodromidia* Stebbing, 1905).

S. lethrinusae Takeda & Kurata, 1976, does not belong in this genus and will be transferred to *Dromidiopsis* Borradaile, 1900 (see below).

Species of *Sphaerodromia* often carry large pieces of sponge for camouflage.

DISTRIBUTION. — The distribution of this genus includes Madagascar, Seychelles, India, Burma, Japan and French Polynesia. *S. nux* Alcock, 1899, has been recorded from Burma, Seychelles and Madagascar but this distribution is extended by a female (CW = 41.7 mm, CL = 36.0 mm, MNHN-B 10523), from Réunion Island, Indian Ocean.

Key to the species of *Sphaerodromia*

(Species studied in this paper are in bold)

1. Orbit divided horizontally into two chambers .... *Sphaerodromia brizops* McLay & Crosnier, 1991
— Orbit not divided horizontally, but with incipient vertical division 2

2. Carapace approximately as wide as long (ratio CW/CL = 1.0 ± 0.05) 3
— Carapace significantly wider than long (ratio CW/CL > 1.05) .... *Sphaerodromia nux* Alcock, 1899

3. Carapace surface smooth, anterolateral margin of carapace entire .... ***Sphaerodromia kendalli*** (Alcock & Anderson, 1894)
— Carapace surface granulated, anterolateral margin of carapace with a deep notch at about the middle .... *Sphaerodromia ducoussoi* McLay, 1991

Sphaerodromia kendalli (Alcock & Anderson, 1894)

Figs 2 a-i, 15 a

Dromidia kendalli Alcock & Anderson, 1894 : 175.
Dromia (Sphaerodromia) kendalli - ALCOCK, 1899 : 16.

Sphaerodromia kendalli - ALCOCK, 1900 : 153; 1901 : 39, pl. 4, figs 18, 18a. — IHLE, 1913 : 92 (list). — BALSS, 1922 : 106. — SAKAI, 1936 : 15; 1976 : 28, text fig. 16.

MATERIAL EXAMINED. — **Philippine Islands.** MUSORSTOM 3 : stn CP 143, 11°29.00'N, 124°11.00'E, 205-214 m, 7.06.1985 : 1 ♀ 40.6 x 39.7 mm (MNHN-B 22543).

South East Molucca Islands. KARUBAR : stn DW 18, 5°18.00'S, 133°01.00'E, 205-212 m, 24.10.1991 : 1 ♂ 20.1 x 20.8mm (MNHN-B 22542).

DESCRIPTION. — Carapace subcircular, approximately as wide as long, globose, smooth except for some scattered granules near the borders, covered with a short thick, erect, yellowish tomentum. Branchial notch evident but grooves faint. Rostrum consists of two prominent lateral teeth separated by a shallow sinus. Anterolateral borders of carapace begin at outer orbital angle, initially shoulder-like then curving more gradually, convex, continuous, with a few small granules before the branchial notch.

Border of lateral rostral tooth extends back as supraorbital margin, slightly notched near middle, to postorbital corner which is not produced. Dorsal surface of orbit ridged, tending to divide the orbit into two sections. No orbital fissure, margin continues on to suborbital lobe which is prominent, rounded, triangular and visible dorsally.

Basal segment of antenna much wider than long, beaked medially, gaping widely, twisted, upper lobe shorter than lower, second segment much longer than wide, convex, a small central distal tubercle, distomedial corner not produced, third segment longer than wide inserted terminally, exopod firmly fixed to second segment, surface convex, tip truncated, blunt, extending as far as joint between third and fourth segments. Ratio of length of antennal flagella to CW = 0.58. Epistome triangular, wider than long, lateral margins notched mid-way, adorned by a row of small granules, surface slightly concave with a pair of central granules.

Subhepatic area swollen with two small granules. Female sternal grooves shallow, scarcely developed, partially concealed by bases of third legs, ending wide apart behind bases of second legs on a common transverse ridge.

Chelipeds well developed, borders of merus granulate, carpus inflated, two strong distal tubercles, covered with many small granules. Similar granules on propodus, fingers elongate, slightly down-curved, not gaping in female. Teeth on fingers tend to be obsolete, especially on dactyl. Chelipeds have a well developed podobranch.

First two pairs of legs slightly shorter than chelipeds, smooth, distal borders of carpi lobed. Dactyli shorter than propodi, not strongly curved, inner borders armed with 6-8 small spines set at an angle to the dactyl. A small spine occurs on the inferior distal border of propodi, overlapping the dactyli for a short distance. First legs have a smaller podobranch than the chelipeds and second legs have a very small podobranch.

Last two pairs of legs reduced, similar in size. Dactyl of third leg short, strongly curved, opposed by four propodal spines with 3-4 smaller spines on the inner margin of the dactyl itself. Fourth leg dactyl reduced and opposed by 6-7 closely-spaced propodal spines and six small spines on inner margin of dactyl as for the third leg.

Abdomen of six free segments, smooth. Telson in female slightly wider than long, longer than wide in male, tip rounded. Uropod plates in female very large, each occupying about one-half of lateral margin. Male uropod plates well developed, visible externally, lying between the bases of first and second walking legs when abdomen is closed but they are not involved in locking the abdomen. The abdominal locking mechanism consists of finely denticulate ridges on the coxae of first and second legs; the coxal ridge of the first leg engages with the margin of the proximal corner of the telson, while the coxal ridge of the second leg engages with the inner face of the joint between the fifth and sixth abdominal segments.

First male pleopod stout, openly grooved to carry needle-like second pair; distal end of endopod bears a blunt lateral knob and a semi-oval, curved medial plate; basis of second pleopod has a long blunt exopod.

DISCUSSION. — The present specimens differ in three minor ways from the description of *S. kendalli* given by McLAY (1991) : distal propodal spines are present on the first two pairs of legs (absent on earlier specimens), spines on of last pair of legs are six-seven opposing the dactyl, none on the outer margin and six spines on the inner margin of the dactyl itself (given earlier as 3 + 0 + 3). The number of propodal spines seems to be variable amongst individuals and this is further complicated by breakage of spines. With this character it seems better not to be too precise about the exact numbers of spines which should be expected. Lastly, the anterolateral margin of the male specimen has up to ten small granules (only five on the left side) which tend to be arranged in groups.

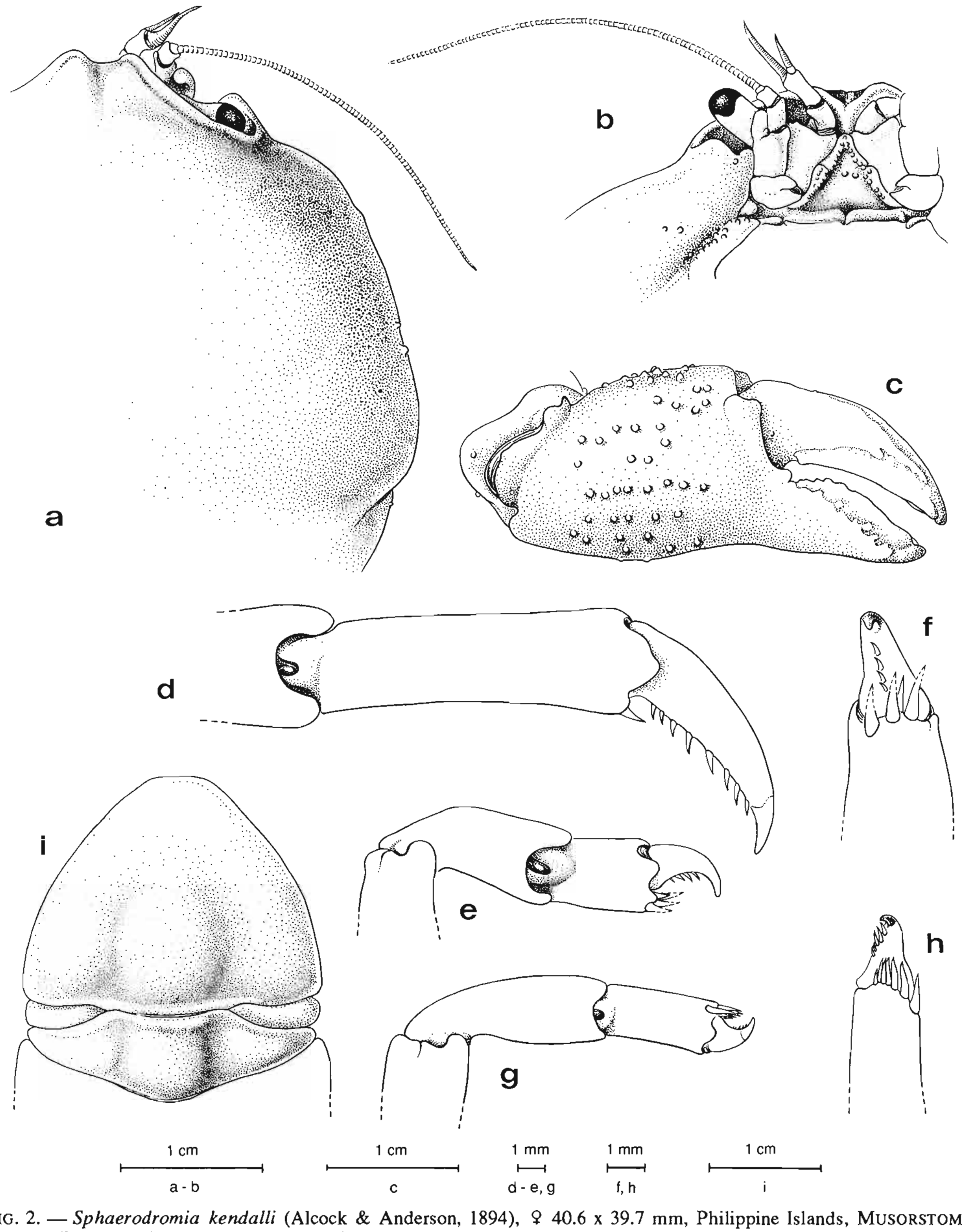


FIG. 2. — *Sphaerodromia kendalli* (Alcock & Anderson, 1894), ♀ 40.6 x 39.7 mm, Philippine Islands, MUSORSTOM 3, stn CP 143, 205-214 m (MNHN-B 22543) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of right third leg; **f**, ventral view propodus and dactyl of right third leg; **g**, posterior view of right fourth leg; **h**, ventral view propodus and dactyl of right fourth leg; **i**, ventral view of telson and terminal segments of female abdomen.

Only three females, including one of the present specimens, of *S. kendalli* have been collected. The male specimen reported here is the first to be collected and so important male characters are now known. In their original description ALCOCK and ANDERSON (1894) stated that the sternal grooves "unite opposite base of chelipeds" but later ALCOCK (1899) stated that they "are very short, ending well behind the level of the genital openings". The female from the Philippines confirms that the latter description is correct. All three of the females collected have been sexually mature and they suggest that this species reaches maturity at a relatively small size. The egg size is evidently at the small end of the range for dromiids.

McLAY (1991) presented a table comparing some of the important characters of the species of *Sphaerodromia*. Since the male of *S. kendalli* was unknown at that time, the information about these characters could not be entered. Now that a male is available, it can be confirmed that this species is in agreement with all of the other three, confirming that all these species form a well-defined, natural group.

SIZE. — The type specimen was a female CW = 19.0, CL = 18.0 mm and BALSS' (1922) specimen from Japan was an ovigerous female CW = 13.5, CL = 12.0 mm with eggs 0.5 mm diameter. Thus the present female is much larger than any of the earlier specimens, and the male is the only known specimen.

DEPTH. — Only three depth records for *S. kendalli* are available : the type specimen (200 m), and the present records, 205-214 m for the female, and 205-212 m for the male, giving a depth range of 200-214 m and suggesting that this species is a deepwater dromiid. Although only a few specimens are known, they come from widely separated localities and the depth range is remarkably narrow.

CAMOUFLAGE. — The kind of camouflage carried by this crab is unknown because none of the specimens have been accompanied by their concealment.

DISTRIBUTION. — Previous records came from the Bay of Bengal and Japan, and so the Indonesian and Philippine specimens provide a link between these two localities, without extending the range.

Genus *EODROMIA* nov.

Carapace sub-globose, longer than wide, front projecting well beyond orbits, rostrum bidentate. Regions of carapace not well defined, surface denticulate and tomentose. Coxae of third maxillipeds closely approximated and separated from tip of sternum by a narrow gap. Female sternal grooves end apart behind the genital openings. Chelipeds longer and stouter than first two pairs of legs, not nodose, fingers not down-curved, epipod present, but without podobranch. Epipods absent from other pereiopods. Dactyli of first two pairs of legs as long as propodi, inner margins armed with small spines, a ventral, distal propodal spine may be present. Last two pairs of legs reduced, similar in size, only the fourth pair are sub-dorsal. Dactyli of both legs opposed by more than one propodal spine, several small spines on the inner margin. Abdomen composed of six free segments and telson. Uropod plates on the female abdomen occluding the penultimate abdominal segment from lateral margin, plates smaller in male. Vestigial pleopods on abdominal segments three to five in the male.

TYPE SPECIES. — *Eodromia denticulata* sp. nov. by monotypy.

ETYMOLOGY. — The generic name is derived from *Dromia* by adding the Greek *eos*, meaning dawn, and was chosen to indicate that this dromiid represents an 'early' stage in the evolution of this group.

DISCUSSION. — *Eodromia* is closely related to *Sphaerodromia* but has some features which must be regarded as more advanced states of these characters (see Table 1).

The similarities of the two genera are as follows : carapace sub-globose, rostrum bidentate, shape of segments of second antenna, epipod present on cheliped, distal propodal spine usually present on first two pairs of legs, six-eight small spines present on inner margins of dactyli of these legs, on last two pairs of legs no spines on the outer propodal margin and several small spines on inner margin of dactyli, segments of abdomen unfused, uropod plates large occluding a substantial portion of the lateral margin, vestigial pleopods on the male abdomen and female sternal grooves ending apart behind genital openings.

Differences between the two genera are : in *Eodromia* the rostrum is more prominent, carapace surface denticulate rather than smooth, no incipient division of the orbit, no epipods on first two pairs of legs, dactyli and propodi the same length rather than propodi being longer. The absence of epipods on the first two pairs of legs

CHARACTER	*Sphaerodromia*	*Eodromia*	*Tunedromia*
Ratio CW/CL	Carapace width equal to or greater than length.	Carapace width less than length.	Carapace width approximately equal to length.
Carapace surface	Smooth.	Denticulate.	Smooth.
Rostrum	Bidentate, teeth blunt.	Bidentate, teeth blunt, forming a thickened eave.	Tridentate, teeth small, subacute.
Anterolateral carapace margin	Without teeth but may be granulate.	Small denticles.	Very small teeth.
Orbit	Orbit horizontally divided or with ridge beneath supra-orbital margin.	Orbit not restricted.	Orbit not restricted.
Antenna	Distomedial corner of second segment not produced. Exopod extends beyond third segment.	Distomedial corner slightly produced. Exopod as long as third segment.	Distomedial corner produced. Exopod as long as third segment.
Sternal grooves	End apart behind second legs.	End apart behind second legs.	End apart between second legs
Epipods/Podobranchs	Epipod on cheliped and first two legs. Podobranch on cheliped and sometimes on legs.	Epipod on cheliped only. No podobranchs on pereiopods.	Epipod on cheliped only. No podobranchs on pereiopods.
First two pairs of legs	Segments not nodose. Distal propodal spine present.	Segments not nodose. Distal propodal spine present.	Segments not nodose. Distal propodal spine absent.
Last two pairs of legs	Multiple propodal spines opposing dactyli. No spines on outer propodal margins. Inner margins of dactyli armed with spines. Last leg shorter than first leg. No spine on outer margin of dactyl of last leg.	Multiple propodal spines opposing dactyli. No spines on outer propodal margins. Inner margins of dactyli armed with spines. Last leg shorter than first leg. No spine on outer margin of dactyl of last leg.	Multiple propodal spines opposing dactyli. Multiple spines on outer propodal margins. Inner margin of third leg dactyl armed with spines. Last leg shorter than first leg. Spine present on outer margin of dactyl of last leg.
Abdominal segments.	No segments fused. Both bases of first two legs used in abdominal locking mechanism.	No segments fused. Both bases of first two legs used in abdominal locking mechanism.	No segments fused. Abdominal locking mechanism unknown.
Uropods	Large, visible externally.	Large, visible externally.	Absent.
Telson	Rounded.	Rounded.	Rounded.
Male pleopods	First pleopod with an apical plate. Basis of second pleopod has an exopod. Vestigial third to fifth pleopods.	Unknown.	Unknown.

TABLE 1. — Comparison of the key characteristics of the genera *Sphaerodromia* Alcock, 1899, *Eodromia* gen. nov., and *Tunedromia* gen. nov.

must be regarded as a more advanced character state. In general, the male pleopods are of little use to the study of dromiid taxonomy, but in *Sphaerodromia* they are different because of the presence of an apical plate on the first and a basal exopod on the second pleopod. Unfortunately the first two pairs of pleopods in the male of *Eodromia denticulata* are not properly developed and so this character cannot be compared.

Besides *Sphaerodromia* and *Eodromia*, vestigial male pleopods are also found in *Exodromidia* Stebbing, 1905.

Eodromia denticulata sp. nov.

Figs 3 a-j, 15 b

MATERIAL EXAMINED. — **New Caledonia - Norfolk Ridge.** SMIB 5 : stn DW 98, 23°01.70'S, 168°16.10'E, 335 m, 14.09.1989 : 1 ♀ (ovig.) 5.7 x 5.8 mm.
Loyalty Islands. MUSORSTOM 6 : stn DW 485, 21°23.48'S, 167°59.53'E, 350 m, 23.02.1989 : 1 ♂ 7.8 x 8.2 mm.

TYPES. — Holotype : ♀ (ovig.), 5.7 x 5.8 mm (MNHN-B 22544) from SMIB 5, stn DW 98. Paratype : ♂, 7.8 x 8.2 mm (MNHN-B 22545) from MUSORSTOM 6 : stn DW 485.

DESCRIPTION. — Carapace slightly longer than wide, evenly convex, frontal and branchial grooves faintly marked, cardiac area weakly defined, surface evenly covered by minute denticles beneath a sparse pile of short stiff setae. Front bidentate, projecting well forward in front of orbits, no median rostral tooth, lateral teeth blunt, continuous with supraorbital margin. Anterolateral margin begins at postorbital corner, margin divergent, armed with 6-7 small blunt denticles before a slight notch mid-way and then followed by a similar number of denticles towards the widest point, two-thirds along carapace length.

Two-thirds of length of supraorbital margin forms a thickened eave and then becomes a denticulated margin flush with the carapace. This margin meets the beginning of the anterolateral and suborbital margins at a triangular intersection at the postorbital corner. Suborbital margin an evenly rounded lobe armed with 6-7 small, blunt denticles. Beside the triangular intersection mentioned above, is a small concavity overhung by the anterolateral margin.

Basal segment of antenna much wider than long, granulated, beaked medially, gaping widely. Second segment much longer than wide, granulated, convex, distomedial corner slightly produced, on which the third segment is inserted at a slight angle. Distal region of second segment, at point of insertion of third segment, swollen and forming a small tubercle. Exopod firmly fixed to second segment, but insertion line still evident. Tip of exopod sloping with a sharp ventral spine, and extending as far as joint between third and fourth segments. Third segment longer than wide, increasing in width distally. Fourth segment longer than wide, ratio of length of antennal flagella to CW = 0.70.

Subhepatic area evenly convex, minutely denticulated. Blunt lobe at corner of buccal frame and a shallow groove extending from beside this lobe, around under anterolateral margin. Female sternal grooves end wide apart, but connected by a ridge, behind the base of the second legs.

Chelipeds well developed, merus trigonal, borders granulated, carpus convex, covered with small sharp granules, propodus inflated, minutely granulated, these tend to be arranged in longitudinal rows. Fingers not especially downcurved, hollowed out internally, teeth poorly developed, similar pattern on each finger : stout proximal tooth (larger on fixed finger), edentate cutting margin, followed by four to five larger teeth. Fingers close along their entire length. Cheliped with a small epipod without podobranch.

First two pairs of legs shorter than chelipeds, smooth, not knobbed although distal margins of carpi slightly lobed. Inferior distal margins of propodi have a short spine which parallels the dactyli for a short distance. Dactyli as long as propodi, inner margins armed with six small spines all of similar size.

Last two pairs of legs reduced, similar in size, last pair sub-dorsal. Dactyl of third leg small, curved, hook-like, opposed by two stout propodal spines with three spines on inner margin of dactyl itself. Dactyl of fourth leg the same as third but opposed by three propodal spines.

Abdomen of six free segments. Male telson as wide as long, tip rounded, surface convex. Uropod plates small but visible externally, occluding only about one tenth of penultimate abdominal segment from lateral margin. Abdominal locking mechanism consists of weak granulated swelling on base of first leg against notch between

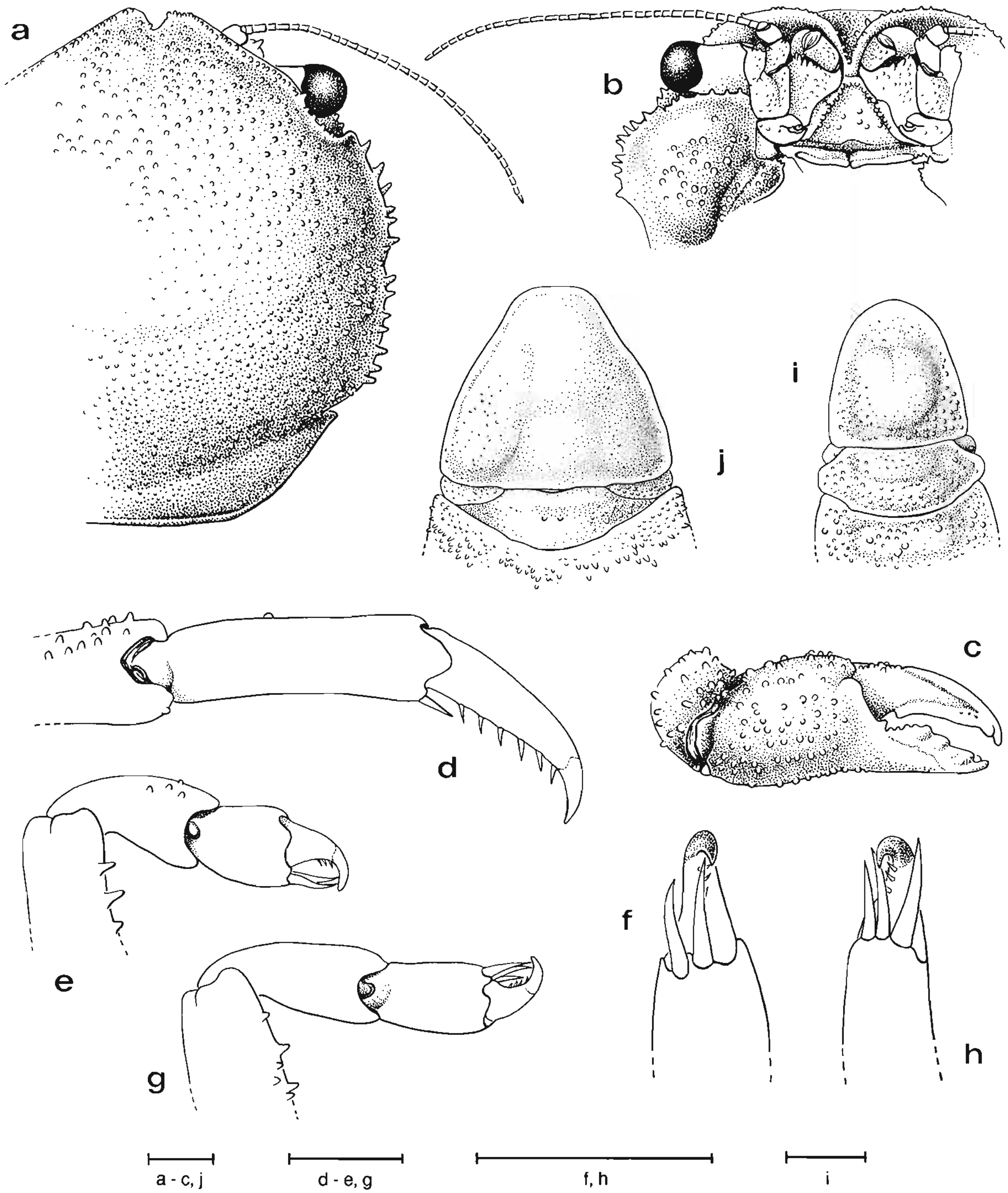


FIG. 3. — *Eodromia denticulata* gen. nov., sp. nov. : **a-i**, ♂ paratype, 7.8 x 8.2 mm, Loyalty Islands, New Caledonia, MUSORSTOM 6, stn DW 485, 350 m (MNHN-B 22545) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of right third leg; **f**, ventral view propodus and dactyl of right third leg; **g**, posterior view of right fourth leg; **h**, ventral view propodus and dactyl of right fourth leg; **i**, ventral view of telson and terminal segments of male abdomen. — **j**, ♀, holotype, 5.7 x 5.8 mm, New Caledonia-Norfolk Ridge, SMIB 5, stn DW 98, 335 m (MNHN-B 22544) : ventral view of telson and terminal segments of female abdomen.

Scale bars represent 1.0 mm.

proximal corner of telson and the uropod plate, which lies behind rather than in front of the swelling, and a better developed serrated ridge on base of second leg against inner surface of fifth abdominal segment. Telson of female also as wide as long, tip tends to be truncated. Uropod plates much larger than in male, entirely occluding the penultimate abdominal segment from the lateral margin.

The male has five pairs of pleopods, the first two pairs larger, but not properly developed, which may indicate that it has been feminized by a parasite, and the last three pairs are vestigial.

ETYMOLOGY.— The specific name of this species is derived from the Latin *denticulus* and refers to the finely denticulated surface of the carapace.

DISCUSSION. — The ovigerous female, CW = 5.7 mm, is mature at a very small size and has some 120 eggs of diameter = 0.4 mm. This egg size is similar to that reported by BALSS (1922) for an ovigerous female, CW = 13.5 mm, of *Sphaerodromia kendalli* which was 0.5 mm. Size at maturity for *Eodromia denticulata* is similar to that seen in some species of *Cryptodromia* (see below). The rudimentary first two pairs of pleopods on the female do not carry eggs.

DEPTH. — The depth range of 335-350 m for *Eodromia denticulata* is similar to many of the records for the *Sphaerodromia* species, suggesting that both these genera are typically found in deep water.

DISTRIBUTION. — Known only from New Caledonia.

Genus *TUNEDROMIA* nov.

Petalomera; - TAKEDA & MIYAKE, 1970 : 203 (in part). — DAI & YANG, 1991 : 25 (in part).

Carapace about as wide as long, surface smooth, tomentose. Rostrum tridentate, median tooth very small, deflexed. Antennal exopod well developed. Female sternal grooves end apart on low tubercles behind bases of the first legs. Anterolateral teeth small. Cheliped with an epipod. Legs not knobbed or ridged. Propodi and dactyli of first two pairs of legs equal in length, inner margins of dactyli armed with five or fewer small spines. Dactyl of third leg opposed by more than one propodal spine, more than one spine on the outer propodal margin and a spine on the inner margin of the dactyl itself. Fourth leg shorter than second leg, dactyl opposed by more than one propodal spine with a similar number of spines on the outer margin and a spine on the outer margin of the dactyl itself. Uropods absent from abdomen and joint between last two segments freely movable. Male characters unknown.

TYPE SPECIES. — *Petalomera yamashitai* Takeda & Miyake, 1970, by monotypy.

ETYMOLOGY. — *Tunedromia* is named to recognize the significant contribution of Tune SAKAI to the study of Pacific and especially Japanese Brachyura.

DISCUSSION. — *Petalomera yamashitai* Takeda & Miyake, 1970, was described from two ovigerous females collected from near Nagasaki on the west coast of Kyushu Island, Japan. Although the depth of the station was not reported, it must have been approximately 100-150 m, judging by the depths given for nearby localities. TAKEDA and MIYAKE (1970) chose to place this new species in the genus *Petalomera* because of an epipod on the cheliped coxa, but they noted that the meri of the cheliped and ambulatory legs were not petaloid. On account of the smooth carapace and two small anterolateral teeth, they likened the new species to *P. lateralis* (Gray, 1831) which they believed was its nearest kin. However, in *P. lateralis* the carapace is wider than long, a subhepatic tooth is prominent, and chelipeds and first two pairs of legs are prominently tuberculated. In addition there are several other features which preclude placement of *P. yamashitai* in this genus : the last two pairs of legs have multiple spines opposing the dactyli and on the outer propodal margins, spines on the inner dactyl margin (third leg) and outer dactyl margin (fourth leg), and the uropod plates on the abdomen are absent. These characters make *P. yamashitai* closer to such genera as *Dromidiopsis* Borradaile, 1903, and *Lauridromia* gen. nov. but none of these genera lack uropod plates and the last two segments of the abdomen are usually fused. A new genus is therefore necessary to accommodate *P. yamashitai* (see Table 1).

TAKEDA (1989) recorded a specimen from Japan which he identified as *Petalomera* sp. and noted that it was most similar to *P. yamashitai*. This mature female is different in having a carapace longer than wide, covered with very short, thick tomentum, and a rostrum apparently composed of only two lobes. This may be an additional species which should be placed in *Tunedromia* but additional information about spines associated with the dactyli of the last two pairs of legs and the nature of the uropods must first be established.

DISTRIBUTION. — Known only from Japanese waters.

Genus *DROMIDIOPSIS* Borradaile, 1900

Dromidiopsis Borradaile, 1900 : 572; 1903a : 298 (in part). — IHLE, 1913 : 25 (in part). — BARNARD, 1950 : 311 (in part).
Dromia - HENDERSON, 1888 : 3.

Carapace as long as wide or longer than wide, surface smooth. Rostrum tridentate, lateral teeth rounded, not prominent. Coxae of third maxillipeds usually separated by a narrow gap and inserted close to the tip of the sternum. Female sternal grooves end on tubercles either apart or together, behind chelipeds. Cheliped with an epipod. Legs not knobbed or ridged. Propodi and dactyli of first two pairs of legs equal in length, inner margins of dactyli armed with five or fewer small spines. Dactyl of third leg opposed by one propodal spine with up to two spines on the outer propodal margin. Fourth leg may be as long as second leg, dactyl opposed by up to two propodal spines, usually one spine on the outer propodal margin and another on the outer margin of the dactyl itself. Uropods usually well developed, visible externally and used in the abdominal locking mechanism by fitting in front of serrated flange on the bases of the first pair of legs. Last two segments of the abdomen maybe fused or freely movable.

TYPE SPECIES. — *Dromia australiensis* Haswell, 1882, by present designation.

OTHER SPECIES. — *Dromidiopsis dubia* Lewinsohn, 1984, *Dromidiopsis edwardsi* Rathbun, 1919, *Dromia globosa* Lamarck, 1818, *Sphaerodromia lethrinusae* Takeda & Kurata, 1976, and *Dromidiopsis tridentata* Borradaile, 1903.

DISCUSSION. — The genus *Dromidiopsis* was erected by BORRADAILE (1900) for three specimens (2 ♂♂, and 1 ♀) from Rotuma and Fiji which he identified as *Dromia australiensis* Haswell, 1882. However a complete definition of the genus did not appear until BORRADAILE (1903a). Subsequently LEWINSOHN (1984) showed that BORRADAILE (1900) was in error and that the specimens which he studied should be *Dromidiopsis tridentata* Borradaile, 1903, although the name *D. tridentatus* was first used by BORRADAILE (1903a), but without a description. Using material from the Laccadive and Maldive Archipelagoes, *D. tridentatus* was first described by BORRADAILE (1903b) who at the same time, identified two varieties of *D. australiensis*, *bidens*, and *unidens*. He mentioned that these two species closely resembled each other, and he used differences in the anterolateral teeth, sternal grooves and presence of a propodal spine on the last pair of legs to separate them. However, the first two characters are variable, and the last character is easily mis-interpreted. Therefore all of these specimens should have been identified as *D. tridentatus* and the recognition of two varieties was not justified. Thus the name of the genus, definition of the genus, and description of the type species all occurred at different times. Consequently, BORRADAILE gave a definition of *Dromidiopsis* which clearly included *D. tridentata* but not necessarily

Dromia australiensis. The chief difference between these two species is that the rostrum in *D. australiensis* is distinctly lobed instead of being rounded. However, this is a minor difference and both species can be accommodated in the same genus.

The definition of *Dromidiopsis* given by BORRADAILE (1903a) is as follows : "Dromiidae with an epipod on the cheliped, the walking legs not knobbed or ridged, the carapace longer than broad, the furrows between the regions almost completely lost, the ridges of the efferent branchial channels well made, the sternal grooves of the female ending together on the cheliped segment or on that of the first walking-leg, the fifth leg about as long as the third and often with a thorn on the outer side of its last joint." However several characters are omitted from the definition of BORRADAILE (1900) : "rostrum triangular, with sides not distinctly lobed; gills phyllobranchiate; uropods present and visible in dorsal view in the angle between the sixth segment and the telson." Furthermore two characters are given differently : "sternal furrows in the female reach the chelipeds, converge, but do not join, and end in a single ill-defined tubercle; fourth and fifth legs (last two walking legs) subchelate." In the case of the sternal grooves, BORRADAILE evidently tried to make the character less specific, but for the last two pairs of legs he in fact focussed on a different aspect of their structure. Having phyllobranchiate gills is not a generic character because all dromiids have phyllobranchiate gills. BARNARD (1950) gave a different definition, selecting some characters from each of BORRADAILE's definitions, but fortunately, it does not greatly conflict with either of the originals.

Clearly it is essential that *Dromidiopsis* should be given an unambiguous definition and any species which do not fall within this definition should be transferred to other genera. The definition of *Dromidiopsis* given above has been slightly modified and amended, after BORRADAILE, so as to accommodate new species which are similar to *D. tridentata*. The major differences are that the last leg need not be as long as the second leg, there may or may not be a spine on the outer propodal margin of the last leg, and the female sternal grooves may end apart or together.

The genera *Dromidiopsis* and *Dromia* include most of the large dromiid crabs found in the Atlantic and Indo-Pacific Oceans. In the past there has been a great deal of confusion about which species should belong to which genus and there have been numerous synonyms. When examining the Dromiidae of Madagascar and the Seychelles, LEWINSOHN (1984) considered *Dromia dehaani*, *D. intermedia*, *Dromidiopsis dormia*, *D. tridentata* and *D. dubia*, and noted some of the specific characters which distinguish them. While clarifying some difficult problems, and introducing some important new characters, he did not apply these to the generic definitions.

The major differences between *Dromia* and *Dromidiopsis*, as defined above, are as follows (see Table 2) : in *Dromidiopsis* the carapace is longer than wide (wider than long in *Dromia*), female sternal grooves usually end together between bases of the chelipeds or first legs (usually end apart behind chelipeds), and a spine is present on the dactyl of the last leg (no spine present). For the species that currently belong in the two genera, these characters, along with the uropods, details of the spines on the last two pairs of legs, ratio of length of dactyli and propodi of first two pairs of legs, abdominal locking mechanism, and fusion of the last two abdominal segments have been used to create several new genera (see below). One consequence of this reorganization is that *Dromidiopsis* species are shown to be typically small crabs (CW < 40 mm) while all the large dromiid crabs are contained in genera such as *Dromia*, *Lauridromia* gen. nov., and *Haledromia* gen. nov.

FOREST (1974) showed that for the Atlantic *Dromia* there was considerable variation in the ratio of CW/CL within species and that a large proportion of this variation was accounted for by crab size; larger crabs had larger ratios of these two measures. However, this is of little consequence since most interest centers on whether the ratio is greater than, approximately equal to, or less than 1.0.

In his analysis of the use of the name *Dromidiopsis tridentata* Borradaile, 1903, LEWINSOHN (1984) showed that many of the supposed records of *D. australiensis* were in fact the former species. He concluded that the only certain records of *D. australiensis* were from Australia. Another Australian species, *D. abrolhensis* Montgomery, 1931, known only from a female from the Abrolhos Islands, Western Australia, is in fact a synonym of *D. australiensis*. Like *D. edwardsi*, *D. australiensis* is a variable species, especially in the nature of the anterolateral teeth. Comparison of the type specimen of *D. abrolhensis*, in the British Museum (registration number, 1931: 7: 24: 10), with specimens of *D. australiensis* shows that it lies within the range of variation of this species. SAKAI (1976) recorded a female of *D. abrolhensis* (locality uncertain, "off Hayama (?)", date unknown), which would imply that the distribution of *D. australiensis* also includes Japan. He verified his identification by comparing his specimen with the type of *D. abrolhensis* but the origin of his specimen needs verification or alternatively confirmation by collection of additional material from Japan.

Dromidiopsis edwardsi is a name given by RATHBUN (1919) to Indo-Pacific specimens called *Dromia caput-mortuum* by H. MILNE EDWARDS (1837). Although most records of *D. edwardsi* are from Australia, others are from the Indian Ocean and Indonesia. There is a need to clarify the validity of the records outside Australia because this species is difficult to separate from *D. tridentata*. Further investigation may show that these two are the same species, with small specimens being identified as *D. tridentata* and large specimens as *D. edwardsi*.

The name *Dromidiopsis globosa* (Lamarck, 1818) is a new combination for the Australian species which has long been known as *Dromidiopsis excavata* (Stimpson, 1858). The original name for this species was *Dromidia excavata* Stimpson, 1858. A specimen in the Muséum national d'Histoire naturelle, Paris (locality unknown, B 22033), consisting of many dried fragments, and labelled *Dromidia globosa* Lam., is clearly the specimen studied by H. MILNE EDWARDS (1837) and later by DE MAN (1888a) who used the name *Dromidia globosa*. The frontal region and one cheliped are intact and when these are compared with three specimens (MNHN-B 22041), one female and two males, of *Dromidiopsis excavata* from Sydney Harbour they can be seen to be identical in every respect. LAMARCK'S description of *Dromia globosa* was exceedingly brief : "D. tomento brevissimo obducta; testa globulosa; marginibus deflexis", but H. MILNE EDWARDS (1837) gave a more detailed description which fits *Dromidiopsis excavata*. Thus there can be little doubt that the name as used by H. MILNE EDWARDS and DE MAN referred to this species. BORRADAILE (1900) identified a small male (5.8 x 5.2 mm) collected by J. STANLEY GARDINER from Rotuma Island as being *Dromidia globosa* but examination of this specimen shows that it is an undescribed species of *Stimdromia* gen. nov. At present, *Dromidiopsis globosa* is known only from Australia.

D. globosa is one of a small number of dromiid crabs which are known to have direct development and brood their young (HALE, 1941). The rich ruby red eggs are reported to be 1.9-2.0 mm diameter and the female examined by HALE, carried about 80 young crabs under its abdomen.

It should be noted that another Australian species, *Dromidiopsis michaelseni* Balss, 1935, is a synonym of *Fultodromia nodipes* (Lamarck, 1818), gen. nov., originally known as *Dromia nodipes*, dealt with later in this paper.

DISTRIBUTION. — The distribution of the species of *Dromidiopsis* includes Madagascar, India, Indonesia, the coast of Australia, New Caledonia and the Pacific as far east as Fiji and as far north as Japan i.e. an Indo-West Pacific genus.

Key to the species of *Dromidiopsis*

(Species studied in this paper are in bold)

1. Carapace approximately as long as wide **3**
— Carapace distinctly longer than wide **2**

2. Anterolateral margin has two blunt teeth, last two abdominal segments not fused, no spine on outer margin of dactyl of fourth leg, large posteriorly directed tooth mid-way along cheliped dactyl .... ***Dromidiopsis dubia*** Lewinsohn, 1984
— Anterolateral margin with one-three teeth, last two segments of the abdomen fused together, spine present on outer margin of dactyl of fourth leg ....
.... *Dromidiopsis australiensis* (Haswell, 1882)

3. Last two segments of abdomen not fused, anterolateral margin with a single tooth, carapace with a dense fringe of setae extending transversely across the front ....
.... *Dromidiopsis globosa* (Lamarck, 1818) nov. comb.
— Last two segments of abdomen fused or partially fused, anterolateral margin with more than one tooth **4**

4. Inner margins of first two pairs of legs armed with four-five spines, two spines on outer propodal margin of third leg, dactyl of fourth leg opposed by two spines **5**

— Inner margins of dactyli of first two pairs of legs armed with two spines, no spines on the outer propodal margin of third leg, dactyl of fourth leg opposed by a single spine .... ***Dromidiopsis lethrinusae*** (Takeda & Kurata, 1976) nov. comb.

5. Last leg comparatively long, almost reaching supraorbital margin when extended forward .... ***Dromidiopsis tridentata*** Borradaile, 1903

— Last leg shorter, not reaching supraorbital margin when extended forward...................... .... *Dromidiopsis edwardsi* Rathbun, 1919

Dromidiopsis dubia Lewinsohn, 1984

Fig. 15 c

? *Dromidiopsis dubia* Lewinsohn, 1984 : 102, fig. 2a-g.

MATERIAL EXAMINED. — **New Caledonia**. LAGON : stn 15, 22°19.70'S, 166°31.50'E, 27 m, 22.05.1984 : 1 ♀ 6.7 x 7.5 mm. — Stn 48, 22°6.60'S, 166°15.20'E, 28 m, 25.05.1984 : 1 ♀ (ovig.) 9.5 x 11.1 mm. — Stn 54, 22°12.90'S, 166°15.40'E, 25 m, 25.05.1984 : 1 ♂ 8.2 x 9.2 mm. — Stn 55, 22°11.40'S, 166°16.60'E, 23 m, 25.05.1984 : 1 ♂ 9.3 x 11.2 mm. — Stn 58, 22°9.40'S, 166°12.90'E, 22 m, 25.05.1984 : 1 ♀ (ovig.) 7.5 x 8.5 mm. — Stn 86, 22°27.00'S, 166°33.70'E, 29 m, 21.08.1984 : 1 ♂ 4.5 x 4.9 mm. — Stn 104, 22°26.00'S, 166°40.40'E, 24 m, 22.08.1984 : 1 ♀ (ovig.) 8.5 x 9.6 mm. — Stn 111, 22°24.30'S, 166°47.70'E, 25 m, 22.08.1984 : 1 ♂ 9.1 x 10.4 mm. — Stn 113, 22°29.90'S, 166°44.00'E, 32 m, 22.08.1984 : 1 ♀ 8.0 x 9.4 mm. — Stn 125, 22°31.20'S, 166°44.00'E, 19 m, 23.08.1984 : 1 ♂ 12.7 x 14.9 mm. — Stn 169, 22°8.00'S, 166°8.40'E, 22 m, 18.09.1984 : 2 ♂♂ 5.2 x 5.9, 9.9 x 11.6 mm; 1 ♀ (ovig.) 8.0 x 9.4 mm. — Stn 215, 21°52.90'S, 165°49.90'E, 14 m, 21.09.1984 : 1 ♀ (ovig.) 10.3 x 12.0 mm. — Stn 303, 22°38.00'S, 166°49.10'E, 30-35 m, 27.11.1984 : 1 ♂ 9.7 x 11.3 mm. — Stn 316, 22°35.30'S, 166°54.00'E, 68 m, 27.11.1984 : 3 ♂♂ 5.7 x 6.3, 7.2 x 8.5, 8.8 x 10.0 mm; 1 ♀ (ovig.) 8.3 x 9.3 mm. — Stn 319, 22°32.20'S, 166°56.70'E, 75 m, 27.11.1984 : 1 ♀ 5.2 x 5.9 mm. — Stn 569, 22°48.80'S, 166°58.90'E, 62 m, 17.07.1985 : 1 ♀ (ovig.) 8.6 x 9.4 mm; 1 ♀ 8.4 x 10.1 mm, carrying a sponge cap. — Stn 570, 22°50.20'S, 167°1.00'E, 52-53 m, 17.07.1985 : 1 ♂ 7.8 x 8.7 mm. — Stn 619, 22°3.2'S, 166°54.2'E, 27-42 m, 6.08.1986 : 1 ♂ 13.2 x 16.2 mm. — Stn 718, 21°25.1'S, 165°56.3'E, 32-34 m, 11.08.1986 : 1 ♀ 8.0 x 9.2 mm.

DESCRIPTION. — Carapace longer than wide, only branchial groove well marked, surface smooth under a dense layer of short, fine setae, some longer setae fringing limbs. Front weakly tridentate, median rostral tooth small, blunt, deflexed scarcely visible dorsally, lateral rostral teeth broadly rounded, eave-like. Anterolateral margin begins at level of suborbital lobe, armed with three evenly spaced teeth, the first largest, blunt and close to orbit, second close by, narrower, and third, smallest and directed almost laterally. Sometimes the third tooth may be very weak or absent. Branchial notch distinct, followed by a small blunt lobe which hardly counts as a posterolateral tooth.

Supraorbital margin interrupted by a small blunt tooth, postorbital corner not produced. A deep fissure separates suborbital border which has a small blunt central tooth.

First segment of antenna much wider than long, beaked medially, slightly gaping, upper lobe of beak downcurved. Second segment much longer than wide, a proximal tubercle on lateral margin, medial margin concave, distomedial corner produced as a blunt spine on which third segment is inserted at an angle. Exopod firmly fixed, tip bilobed, extending as far as joint between third and fourth segments. Epistome triangular, slightly concave, lateral margins adorned with four-five small tubercles and interrupted by a small fissure.

Subhepatic area inflated, a single small inconspicuous tubercle, blunt lobe at corner of buccal frame and between these a shallow groove extending for only a short distance around under the anterolateral margin. Female sternal grooves end apart on small tubercles between bases of first legs.

Chelipeds small, merus trigonal, borders unarmed, carpus outer face slightly sculptured, two distal tubercles, inner margin of superior face with three small tubercles. Propodus smooth, fingers downcurved, hollowed out internally, with a unique arrangement of teeth : distally there are three-four interlocking typical dromiid teeth but proximally there is a large bifid tooth on fixed finger, opposite four small teeth on dactyl which also has a large proximally directed tooth which fits beside the bifid tooth of the fixed finger.

First two pairs of legs shorter than chelipeds, distal margins of carpi and propodi lobed. Dactyli as long as propodi, inner margins armed with three-four small spines increasing in size distally. On posterior face of dactyli there is a pearl-like basal swelling which articulates with the propodus.

Last two pairs of legs reduced, third pair shortest, dactyl opposed by a small propodal spine, none on outer propodal margin. Dactyl of fourth leg also opposed by a single propodal spine but with another spine on outer margin.

Abdomen composed of six free segments. Male telson about as long as wide, tip rounded. Uropod plates large, visible externally. Abdominal locking mechanism consists of uropod plate fitting in front of serrated flange on base of first leg, and lateral margin of penultimate abdominal segment concave, to accommodate the flange. Female telson slightly wider than long, uropod plates well developed.

First male pleopod stout, a semi-rolled setose tube with sharp horny tip, second pleopod simple, needle-like.

DISCUSSION. — LEWINSOHN (1984) based his original description of *Dromidiopsis dubia* on a single male specimen from Madagascar but now that females have been collected, their characteristics can be included. The holotype male had only two blunt anterolateral teeth, second largest, with a suggestion of a third tooth on the right hand side but the present specimens show that the anterolateral teeth are variable in relative size and number both within and between specimens. The peculiar proximal teeth on the fingers of both chelipeds, noted by LEWINSOHN, are confirmed and they are certainly unique amongst dromiids. The teeth are probably used for grasping and possibly severing stems, of perhaps algae, and they may indicate a specialized feeding strategy. In other respects all the specimens agree with the original description. LEWINSOHN was uncertain about where this species should be placed, largely because he did not have a female, but on the basis of some similarities (frontal and general body shape, smooth walking legs) with *Dromidiopsis australiensis* and *D. tridentata*, he chose this genus. The similarities are much greater to *D. tridentata*, and as will be subsequently shown, to *D. lethrinusae*.

SIZE. — Until now the single known specimen of *D. dubia* was a male, CW = 9.0 mm, from Madagascar. The 25 specimens from New Caledonia have a size range for males of CW = 4.5-13.2 mm, for females CW = 5.2-10.3 mm and for ovigerous females CW = 7.5-10.3 mm. The range of clutch sizes for females is 100 eggs (CW = 7.5 mm) to 192 eggs (CW = 10.3 mm) with a mean of 163 eggs (mean egg diameter = 0.7 mm). Females with a smaller carapace width did not have mature sized abdomens and there is no evidence of any overlap in size at maturity with the moult to maturity occurring between CW = 6-7 mm. Compared to *D. lethrinusae* this species has smaller numbers of larger eggs.

DEPTH. — The type specimen was collected from 30 m, which falls within the range, 14-75 m, of the New Caledonian specimens. Thus the depth range of *D. dubia* is extended to shallower and deeper waters.

CAMOUFLAGE. — Only one crab was accompanied by its camouflage cap which was constructed from a piece of sponge.

DISTRIBUTION. — As a result of finding these specimens off New Caledonia, the distribution of *D. dubia* is considerably extended from Madagascar and it is evident that this species is a small, shallow water dromiid.

Dromidiopsis lethrinusae (Takeda & Kurata, 1976) nov. comb.

Fig. 15 e-f

Sphaerodromia lethrinusae Takeda & Kurata, 1976 : 118, text fig. 1a-d.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : J. FOREST and M. DE SAINT. LAURENT coll., Cebu Marine Station, 3-4.04.1976, (det. *Cryptodromia* sp. by R. SERÈNE, 8.06.1976) : 1 ♀ 10.0 x 11.0 mm, carrying a compound ascidian cap.

Chesterfield Islands. CORAIL 2 : stn DW 92, 19°03.00'S, 158°53.93'E, 8 m, 26.08.1988 : 1 ♀ 5.3 x 5.5 mm. — Stn DW 97, 19°06.00'S, 158°38.43'E, 32 m, 27.08.1988 : 1 ♀ 7.8 x 8.1 mm. — Stn CP 127, 19°27.73'S, 158°27.30'E, 45 m, 29.08.1988 : 2 ♀♀ (ovig.) 10.9 x 11.7, 17.2 x 18.1 mm; 2 ♂♂ 9.5 x 9.8, 11.9 x 12.5 mm.

DESCRIPTION. — Carapace strongly convex, as wide as long, semi-circular shape, regions not defined, surface smooth, covered with short, fine, soft hairs except for tips of fingers. Lateral cardiac grooves sometimes evident, three indistinct cardiac tubercles may be present, branchial grooves usually well developed. Frontal region broadly rounded, not projecting, rostral teeth very small, median tooth strongly deflexed and not visible dorsally. Anterolateral margin begins at suborbital level and extends almost straight posteriorly. There is usually one tooth close to corner of orbit, sometimes followed by a smaller tooth, and another tooth may be present equidistant between the first and posterolateral tooth which marks a distinct notch. (The anterolateral teeth in this species are quite variable to the extent of being almost absent in some specimens, and may be different on each side of the carapace, but a common feature is the presence of at least one tooth close to the postorbital corner.) Posterior margin of carapace slightly concave.

Supraorbital margin smoothly curved, postorbital corner also rounded, a small fissure separating the rounded infraorbital margin.

First segment of antenna much wider than long, beaked medially, upper lobe shorter than lower lobe. Second segment much longer than wide, lateral margin convex, distomedial corner produced as an acute spine. Third segment inserted at an angle. Exopod firmly fixed to second segment, tip blunt, slightly concave, barely reaching joint between third and fourth segments. Ratio of length of antennal flagella to CW = 0.54.

Sternal grooves end together on a common raised tubercle between bases of chelipeds.

Chelipeds well developed, fingers pink or red. Merus trigonal, inferior borders finely denticulate. Outer face of carpus convex, with strong dorsal, distal tooth. Outer face of propodus also convex, superior margin may have a few fine denticles. Male fingers gaping basally, armed with seven-eight teeth, proximal three teeth very small, distal four-five teeth large and interlocking. Female fingers close along their entire length. When the outer surface of carpus and, especially, propodus are cleared of setae, an inlaid pattern of pale areas is revealed.

First two pairs of legs slightly shorter than chelipeds, smooth, distal posterior borders of carpi and propodi produced as rounded lobes. Dactyli as long as propodi, inner margins with two spines, distal spine much longer.

Third pair of legs smaller than first two pairs. Dactyl strongly curved, opposed by a single strong propodal spine, no spines on inner margin of dactyl but there are two small spines on the outer propodal margin at the posterior corner (these may not be present in juveniles). Fourth legs very long, slender, flattened, almost reaching supraorbital margin when extended. Curved dactyl opposed by a propodal spine, none on inner margin of dactyl, but there is a strong spine on outer margin and a small spine on outer propodal margin (this may be absent in smaller specimens).

Male telson as long as wide, tip rounded. Uropod plates well developed, visible externally. Fifth and sixth abdominal segments fused, although division still marked by a groove. Abdominal locking mechanism consists of uropods fitting in front of a serrated ridge on base of first leg which engages with the narrowed border of the penultimate abdominal segment. Mature female telson much wider than long, tip bluntly pointed, fifth and sixth abdominal segments also fused.

First male pleopod a simple rolled tube, bluntly tipped but densely setose, second pleopod simple, needle-like, no exopod on basis.

DISCUSSION. — TAKEDA and KURATA (1976) described *Sphaerodromia lethrinusae* on the basis of small male and female specimens recovered from the stomach of a fish (*Lethrinus variegatus* Valenciennes). The female was clearly immature with incompletely developed sternal grooves which ended apart just behind the second pair of legs. This female characteristic lead them to place this species in *Sphaerodromia* despite the absence of vestigial pleopods on the abdomen of their male specimen. The material reported in this paper includes three mature females whose sternal grooves are well developed and end together between the bases of the chelipeds and two males which lack vestigial pleopods. These characters indicate that *S. lethrinusae* should be placed in *Dromidiopsis*. Other characters which confirm this are : fusion of the fifth and sixth abdominal segments (a feature overlooked by TAKEDA and KURATA, 1976), epipod on cheliped, carapace width approximately equal to carapace length, fourth leg well developed and presence of a small spine on the outer margin of the dactyl of the fourth leg.

The smallest female (CW = 5.3 mm) in this collection has sternal grooves similar to those found in the original female from Japan, i.e. the grooves end apart between base of second legs, and the abdomen width is narrow, but the female (CW = 7.8 mm) has sternal grooves ending together on a raised tubercle just behind the chelipeds and has a wider, mature abdomen. The female (CW = 10.9 mm) has similar sternal grooves while the largest female (CW = 17.2 mm) has sternal grooves ending together on a common raised tubercle between the chelipeds. Evidently female *D. lethrinusae* reach sexual maturity around CW = 7-8.0 mm, but the smallest female with eggs was CW = 10.9 mm. This female carried some 300 eggs while the large female had some 1100 eggs, with egg diameter = 0.6 mm. Amongst the species of this genus *D. lethrinusae* is relatively small with a reproductive strategy which combines small egg size with relatively large numbers.

SIZE. — Specimens in the present collection, increase the known maximum CW to 11.9 mm for males and 17.2 mm for females.

CAMOUFLAGE. — One of the present specimens was carrying a piece of compound ascidian camouflage.

DEPTH. — The fish, from which the original specimens were obtained, was caught in shallow water over rocky bottom (TAKEDA & KURATA, 1976). The present specimens all came from depths ranging from 8-45 m, confirming that this is a shallow water species.

DISTRIBUTION. — The distribution of *D. lethrinusae* now includes the Philippine Islands, and New Caledonia as well as Ogasawara Islands, Japan.

Dromidiopsis tridentata Borradaile, 1903

Figs 4 a-j, 16 a-b

Dromidiopsis tridentatus Borradaile, 1903b : 576, pl. 33, fig. 2a. — IHLE, 1913 : 90 (list).
Dromidia australiensis - DE MAN, 1888a : 396, pl. 17, fig. 6. — HENDERSON, 1893 : 406 (not *Dromia australiensis* Haswell, 1882).
Dromidia australiensis var. - DE MAN, 1896 : 372 (not *D. australiensis* Haswell, 1882).
Dromidiopsis australiensis - BORRADAILE, 1900 : 572; 1903b : 576. — IHLE, 1913 : 30 (not *D. australiensis* Haswell, 1882).
Dromidiopsis tridentata - BALSS, 1934 : 502. — GUINOT, 1967 : 239 (list). — LEWINSOHN, 1984 : 97, fig. 1.

MATERIAL EXAMINED. — **New Caledonia.** LAGON : stn DW 436 (d'Entrecasteaux Reefs), 18°6.40'S, 162°50.30'E, 45 m, 25.02.1985 : 1 ♀ (ovig.) 7.0 x 7.3 mm, carrying a sponge cap. — Stn DW 554, 22°50.20'S, 166°53.50'E, 25-29 m, 16.07.1985 : 1 ♂ 12.0 x 12.7 mm; 1 ♀ (ovig.) 12.0 x 12.7 mm, carrying a purple compound ascidian cap. — Stn DW 1157, 19°9.60'S, 163°9.80'E, 48 m, 30.10.1989 : 1 ♀ 6.2 x 6.8 mm.
Chesterfield Islands. CHALCAL 1 : stn DC 34, 19°52.10'S, 158°20.10'E, 37 m, 21.07.1984 : 1 ♂ 7.8 x 8.9 mm, carrying a sponge cap.

DESCRIPTION. — Carapace at least as long as wide, often longer, evenly convex, only the branchial groove evident, surface otherwise smooth under a sparse, short, fine tomentum. Front only weakly tridentate. Median rostral tooth on a lower level, deflexed, just visible in dorsal view. Lateral rostral teeth very short, blunt. Anterolateral margin gradually convex, beginning at level of postorbital corner. Always a small, blunt tooth near postorbital corner, there may be another tooth two-thirds towards the branchial groove, and a third tooth between these, but two teeth seems more common. Branchial notch well marked but not followed by a posterolateral tooth.

Supraorbital margin sinuous, uninterrupted, to postorbital corner which is produced as a rounded lobe. A fissure separates the suborbital lobe which is broad and bluntly produced.

First segment of antenna much wider than long, beaked medially, gaping, upper lobe shorter. Second segment much longer than wide, proximal lateral margin has a small tubercle, otherwise smooth, distomedial corner produced as a short spine on which the third segment is inserted at an angle. No distal central tubercle on second segment. Exopod firmly fixed, curving over eyestalk, tip blunt, sloping, not bilobed, extending as far as joint between third and fourth segments. Ratio of length of antennal flagella to CW = 0.43. Epistome triangular, wider than long, surface concave, a narrow fissure between apex and median rostral tooth.

Subhepatic area smooth, concave. A blunt tooth at the corner of the buccal frame and a distinct groove extending from beside the tooth around under the anterolateral margin towards the branchial groove. Female sternal grooves end together between chelipeds on an elevation which consists of a triangle of three pearl-like knobs.

Chelipeds small, merus trigonal, borders unarmed. Carpus smooth except for two small distal tubercles on superior border and two distal tubercles on outer face. Propodus short, smooth except for two small tubercles on the superior margin. Fingers white, downcurved, hollowed out internally, armed with seven-eight small teeth, gaping basally.

First two pairs of legs shorter than chelipeds, distal margins of carpi and propodi bluntly lobed. Dactyli as long as propodi, inner margins armed with three-four small spines increasing in size distally. A small, proximal, pearl-like tubercle on posterior face of dactyli.

Last two pairs of legs smaller than first two pairs. Third leg shortest, dactyl opposed by one propodal spine with two very small spines on the outer propodal margin. Fourth leg comparatively long and flattened, almost reaching supraorbital margin when extended forward. Dactyl opposed by a single propodal spine, with another spine on the outer propodal margin and a small spine on the outer margin of the dactyl itself.

In both sexes the joint between fifth and sixth abdominal segments is fused and only evident at the margins. Uropod plates well developed and visible externally, in the female occupying about one quarter of lateral margin. Male telson longer than wide, tip bluntly rounded. Proximal margins of sixth abdominal segment narrowed to accommodate serrated ridge on base of first legs and abdominal locking mechanism consists of uropods fitting in front of these ridges. Female telson much wider than long, tip rounded.

First male pleopod a semi-rolled, setose tube with a sharp tip, second pleopod simple, needle-like.

DISCUSSION. — The anterolateral teeth of specimens from New Caledonia are variable in number with a maximum of three teeth, but two are more common and there is always one tooth close to the postorbital corner. BORRADAILE (1903b) suggested the varietal names *bidens* and *unidens* for specimens with different numbers of teeth, but this seems unnecessary. LEWINSOHN (1984) listed the major differences between *Dromidiopsis tridentata* and *Dromidiopsis australiensis* with which it was often confused. In *D. tridentata* the lateral rostral teeth are weaker and merge gradually with the orbital margin (strong and distinct in *D. australiensis*), anterolateral teeth variable in number and unequally spaced (three unequal teeth regularly spaced), epistome wider than long (as wide as long), last leg relatively long, almost reaching orbital margin (only reaching first anterolateral tooth), females reach maturity at CW less than 10 mm (reach maturity at CW greater than 25 mm).

Two females from New Caledonia were carrying eggs : CW = 7.0 mm (with 70 eggs) and CW = 12 mm (with 1000 eggs). In both egg clutches the egg diameter is 0.7 mm. The female with CW = 6.2 mm had an immature sized abdomen. Clearly this species reaches maturity at a relatively small size (CW = 6-7.0 mm) and produces relatively large eggs, a reproductive strategy similar to *D. dubia*.

SIZE. — Some 33 specimens of *D. tridentata* (including the New Caledonian specimens) have been recorded, 1 juvenile, 19 males, and 13 females (including 4 ovigerous females). The maximum size for males is CW = 13 mm and for females CW = 18 mm.

CAMOUFLAGE. — Camouflage carried by this species has been reported by HENDERSON (1893) as sponge, and by BORRADAILE (1900) as an ascidian. I have examined the specimens (MNHN-B 6881, B 6882, B 6887, B 7391) reported by LEWINSOHN (1984) and three carried compound ascidian caps, and one a sponge cap. In the New Caledonian material four specimens were accompanied by caps, three with sponges and one with a compound ascidian. Thus the camouflage used by *D. tridentata* seems to include both of these kinds equally frequently.

DEPTH. — Depth records previously reported for *D. tridentata* range from the intertidal to 62 m, and the present material falls within this range.

DISTRIBUTION. — The distribution of *D. tridentata* extends from India through Indonesia to the Fiji Islands and now includes New Caledonia and Chesterfield islands.

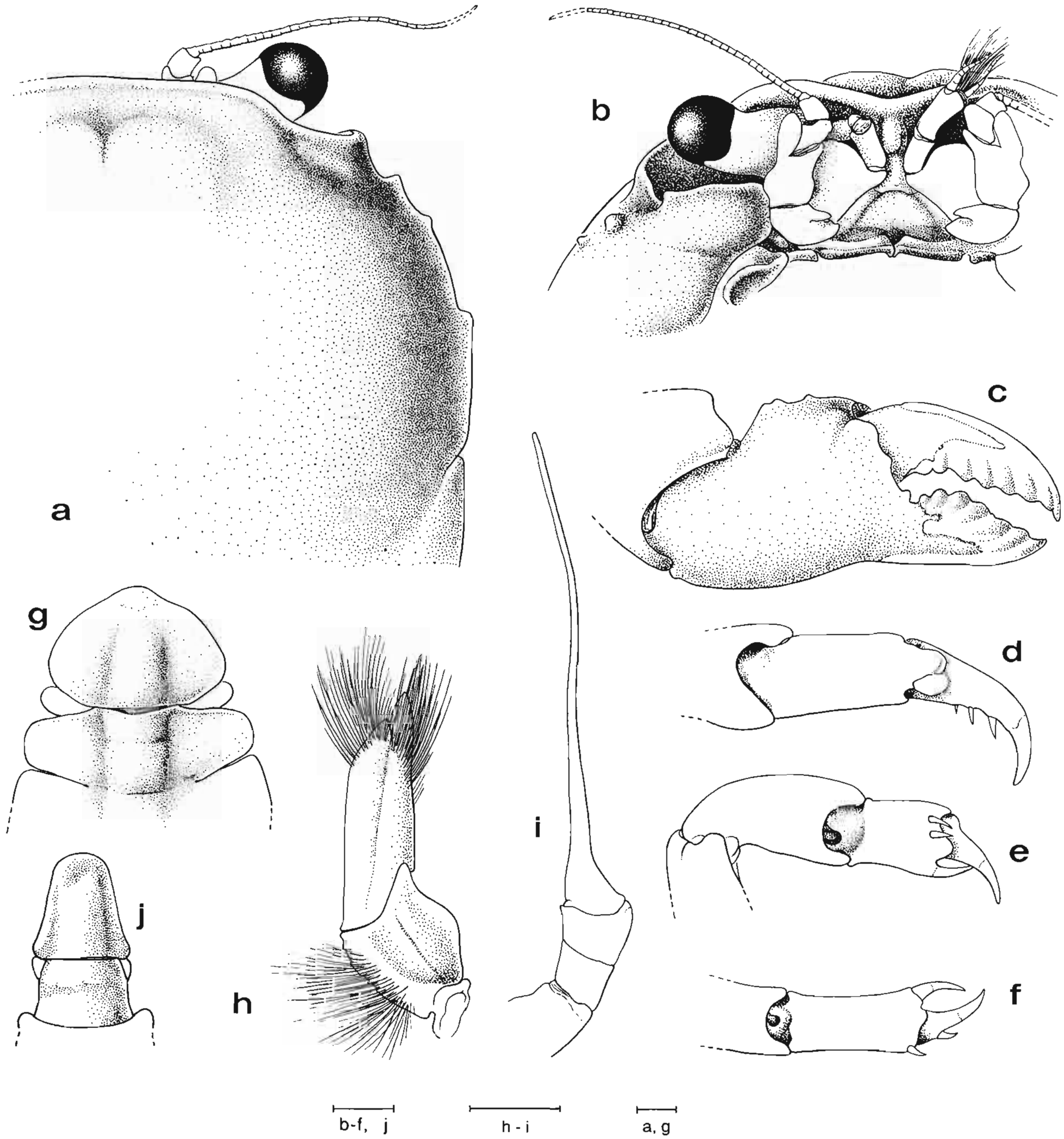


FIG. 4. — *Dromidiopsis tridentata* Borradaile, 1903 : **a-g**, ♀ (ovig.) 12.0 x 12.7 mm, New Caledonia, LAGON, stn 554, 25-29 m (MNHN-B 22549) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of terminal segments of right third leg; **f**, posterior view of terminal segments of right fourth leg; **g**, ventral view of telson and terminal segments of female abdomen. — **h-i**, ♂ 7.8 x 8.9 mm, Chesterfield Islands, CHALCAL 1, stn DC 34, 37 m (MNHN-B 22550) : **h**, first pleopod of male; **i**, second pleopod of male.

Scale bars represent 1.0 mm.

CHARACTER	*Dromidiopsis*	*Lauridromia*	*Dromia*	*Haledromia*
Ratio CW/CL	Carapace width less than or equal to length.	Carapace width greater than or equal to length.	Carapace width greater than length.	Carapace width much greater than length.
Carapace surface	Smooth.	Smooth.	Smooth but may be sculptured.	Smooth.
Rostrum	Tridentate, usually weakly developed, broad.	Tridentate, well developed, subacute.	Tridentate, well developed.	Tridentate, broad, blunt.
Anterolateral margin of carapace	Small teeth.	Large teeth.	Large teeth.	No teeth.
Antenna	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment produced. Exopod as long as third segment.
Sternal grooves	End apart or together on tubercles behind chelipeds.	End apart on prominent tubes behind chelipeds.	End apart or together between or behind chelipeds.	End together between chelipeds.
Epipods/Podobranchs	Epipod on cheliped. No podobranchs on pereiopods.	Epipod on cheliped. No podobranchs on pereiopods.	Epipod on cheliped. No podobranchs on pereiopods.	Epipod on cheliped. No podobranchs on pereiopods.
First two pairs of legs	Segments not nodose. No distal propodal spine.	Segments not nodose. No distal propodal spine.	Segments not nodose. No distal propodal spine.	Segments not nodose. No distal propodal spine.
Last two pairs of legs	Third leg dactyl opposed by one propodal spine, up to two spines on outer propodal margin, no spines on inner or outer margins of dactyl. Fourth leg may be as long as first leg, dactyl opposed by up to two propodal spines, one spine on outer propodal margin, and one spine on outer margin of dactyl.	Third leg dactyl opposed by one propodal spine, up to two spines on outer propodal margin, no spines on inner or outer margins of dactyl. Fourth leg shorter than first leg, dactyl opposed by up to two propodal spines, up to three spines on outer propodal margin, and one spine on outer margin of dactyl.	Third leg dactyl opposed by one propodal spine, no spines on outer propodal margin, spines may be present on inner margin of dactyl. Fourth leg shorter than first leg, dactyl opposed by up to two propodal spines, one spine on outer propodal margin, no spine on outer margin of dactyl.	Third leg dactyl opposed by one propodal spine, no spines on outer propodal margin, or on the dactyl. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, no spines on outer propodal margin, or on the dactyl.
Abdominal fusion	Joint between last two segments may be fused.	Joint between last two segments fused.	No segments fused.	No segments fused.
Uropods	Small, visible externally.	Small, visible externally.	Small, visible externally.	Vestigial, concealed.
Telson	Rounded or subtruncate.	Rounded.	Rounded.	Rounded.
Male pleopods	First sharply tipped. No exopod on second.	First sharply tipped. No exopod on second.	First sharply tipped. No exopod on second.	First sharply tipped. No exopod on second.

TABLE 2. — Comparison of the key characteristics of the genera *Dromidiopsis*, Borradaile, 1900, *Lauridromia* gen. nov., *Dromia* Weber, 1795, and *Haledromia* gen. nov.

Genus *LAURIDROMIA* nov.

Dromia - ALCOCK, 1900 : 136 (in part); 1901 : 43 (in part). — LAURIE, 1906 : 351. — IHLE, 1913 : 21 (in part). — RATHBUN, 1923 : 68. — SAKAI, 1976 : 8. — DAI & YANG, 1991 : 17.
Dromidiopsis Borradaile, 1903a : 298 (in part). — IHLE, 1913 : 25 (in part). — DAI & YANG, 1991 : 17 (in part).

Carapace as wide or slightly wider than long. Coxae of third maxillipeds closely approximated and inserted under tip of sternum. Sternal grooves of mature females end apart on well developed tubes behind base of chelipeds. Cheliped with an epipod, superior margin of carpus and propodus armed with two to four large tubercles. Legs not knobbed or ridged. Propodi and dactyli of first two pairs of legs equal in length, inner margin of dactyli typically armed with seven or more small spines. Dactyl of third leg opposed by a single propodal spine, usually two spines on the outer propodal margin. Fourth leg shorter than second, dactyl usually opposed by two propodal spines with up to three spines on the outer margin and usually a spine on the outer margin of the dactyl itself. Uropods well developed, visible externally, but not used in the locking mechanism. This consists of serrated flange on the bases of first and second legs, sometimes on cheliped base, which fit against lateral margins of abdomen. Joint between the last two abdominal segments wholly or at least partially fused.

TYPE SPECIES. — *Dromia intermedia* Laurie, 1906, by present designation.

OTHER SPECIES. — *Dromia dehaani* Rathbun, 1923; *Dromia indica* Gray, 1831.

ETYMOLOGY. — *Lauridromia* is named after R. Douglas LAURIE, lecturer in Zoology, University of Liverpool, who made a significant contribution to the study of Brachyura from Sri Lanka and the Red Sea.

DISCUSSION. — Although not dealt with in this collection, some comments need to be made about the other two species included in this new genus. *Dromia dehaani* does not belong in the genus *Dromia* because the joint between the last two abdominal segments is partially fused, a character shared by the other species of *Lauridromia* gen. nov., and most species of *Dromidiopsis* Borradaile, 1900. Furthermore, the female sternal grooves of *Dromia dehaani* end on prominent tubes, a unique feature shared by the other species in *Lauridromia* (see Table 2).

Dromia orientalis Miers, 1880, also shares this sternal groove character, and has until now usually been known as *Dromidiopsis cranioides* (De Man, 1888). Comparison of the description of *D. cranioides* by DE MAN (1888b) with MIERS' type specimen (British Museum, 1880 : 6) of *D. orientalis* shows that DE MAN'S name is a synonym. A somewhat inaccurate original description and poor illustrations caused MIERS' species to be overlooked by subsequent authors.

Also in the collection of the British Museum, is a female (CW = 25.9 mm, CL = 26.4 mm) labelled *Dromia indica* which came from GRAY'S dry collection. There are no data accompanying the specimen but it was probably presented by Thomas HARDWICKE and therefore came from India (see WHITE'S, 1847, catalogue). The description of *Dromia indica* Gray, 1831, was based on a specimen, presented by HARDWICKE, of unknown sex, CW = 18 lines (38.1 mm) and CL = 19 lines (40.2 mm) and, as was typical of the time, it is very brief. However three important characters are mentioned : obscure median rostral tooth, five anterolateral teeth and upper edge of carpus (presumably of cheliped) tubercular. Although it is clear that the female specimen in the British Museum cannot be GRAY'S type, because of the size difference, it has the features mentioned in the original description and was presumably identified by GRAY. A comparison of this specimen of *D. indica* with the type of *Dromia orientalis* Miers, 1880, shows that they are the same species. Therefore the name for this species should be *Lauridromia indica* (Gray, 1831). Another name, *D. gibbosa* H. Milne Edwards, 1837, may also be a synonym, but this species was poorly described and there is no type material.

All the species placed in *Lauridromia* are comparatively large crabs with maximum sizes in excess of approximately 40 mm CW. The larvae of one species, *L. dehaani*, is known (TERADA, 1983).

DISTRIBUTION. — The distribution of this genus includes the Indian and Pacific oceans. The recent record of *L. dehaani* from Sala y Gomez (approx. 26° S, 105° E) extends the distribution of this genus across the Pacific (see ZARENKOV, 1990).

Key to the species of *Lauridromia*

(Species studied in this paper are in bold)

1. Carapace approximately as wide as long, posterolateral tooth directed obliquely forward, five to eight small spine on inner margins of dactyli of first two pairs of legs, spines present on outer propodal margins of last two pairs of legs and a spine on outer margin of dactyl of last leg. **2**

— Carapace much wider than long, posterolateral tooth directed laterally, sixteen-twenty tiny spines on inner margins of dactili of first two pairs of legs, spines absent on outer propodal margins of last two pairs of legs on dactyl of last leg .... *Lauridromia dehaani* (Rathbun, 1923) nov. comb.

2. Median rostral tooth small, not visible dorsally, supraorbital tooth strong, subacute, anterolateral carapace margin with three acute, equidistant teeth .... **Lauridromia intermedia** (Laurie, 1906) nov. comb.

— Median rostral tooth smaller than lateral teeth, but visible dorsally, supraorbital tooth weak, blunt, anterolateral carapace margin with five subacute, variable teeth. .... *Lauridromia indica* (Gray, 1831) nov. comb.

Lauridromia intermedia (Laurie, 1906) nov. comb.

Fig. 15 d

Dromia intermedia Laurie, 1906 : 351. — IHLE, 1913 : 23, pl. 1, figs 1-3. — SAKAI, 1936 : 10, pl. 6, fig. 1. — CAMPBELL, 1971 : 29. — SAKAI, 1976 : 8, pl. 1, fig. 3. — LEWINSOHN, 1984 : 92, pl. 1B.

MATERIAL EXAMINED. — **New Caledonia.** "*Vauban*": Canal Woodin, no stn, 40 m, 14.11.1973 : 1 ♀ 35.4 x 37.3 mm, 1 ♂ 57.0 x 52.5 mm. — South Lagoon, no stn, no locality, 130 m, May 1985 : 1 ♀ 31.6 x 32.7 mm, carrying a sponge cap.

"*Vauban*". St. Vincent Bay : 21°58.30'S, 166°01.00'E, 7 m, 6.11.1984 : 1 ♀ (ovig.) 51.5 x 49.0 mm; 1 ♀ 57.2 x 53.3 mm. — No depth, 6.08.1984 : 1 ♂ 37.0 x 35.0 mm. — 22°05.60'S, 166°05.25'E, 16 m, 24.04.1985 : 3 ♂♂ 32.9 x 31.7, 35.3 x 34.0, 39.5 x 36.6 mm; 3 ♀♀ (ovig.) 27.7 x 29.6, 28.0 x 28.9, 28.7 x 27.9 mm; 2 ♀♀ 27.6 x 27.9, 45.0 x 42.8 mm. — 22°04.20'S, 166°05.30'E, 14 m, 30.04.1985 : 1 ♀ (ovig.) 45.2 x 43.0 mm. — 22°05.00'S, 166°05.35'E, 16 m, 20.08.1985 : 4 ♀♀ 30.2 x 29.0, 36.2 x 36.4, 41.4 x 39.9, 44.4 x 44.3 mm. — 21°59.10'S, 166°01.50'E, 17 m, 21.08.1985 : 1 ♀ 34.5 x 34.2 mm. — 21°59.10'S, 166°01.25'E, 18 m, 22.08.1985 : 1 ♂ 16.5 x 17.5 mm. — No depth, 22.04.1986 : 1 ♀ (ovig.) 41.0 x 40.0 mm, carrying a sponge cap. — 12 m, 20.11.1986 : 1 ♀ 30.3 x 29.7 mm. — No depth, 2.12.1986 : 1 ♂ 51.2 x 45.5 mm. — No depth, 23. 04.1986 : 1 ♀ (ovig.) 56.8 x 53.5 mm, carrying a sponge cap.

"*Vauban*". Northern Lagoon : 19°51.10'S, 163°50.20'E, 33-35 m, 14.06.1985 : 1 ♂ 9.2 x 9.7 mm. — 19°36.50'S, 163°39.50'E, 39-41 m, 20.06.1985 : 2 ♂♂ 33.0 x 32.2, 35.2 x 33.3 mm; 2 ♀♀ 25.3 x 25.9, 27.8 x 26.7 mm. — 19°29.30'S, 163°31.50'E, 44-50 m, 22.06.1985 : 1 ♂ 40.3 x 39.4 mm. — 19°32.50'S, 163°35.50'E, 39-41 m, 22.06.1985 : 2 ♂♂ 31.0 x 30.2, 51.2 x 48.7 mm; 3 ♀♀ (ovig.) 29.4 x 29.3, 36.0 x 36.2, 38.3 x 37.9 mm. — 19°46.5'S, 163°47.40'E, 38 m, 23.06.1985 : 1 ♀ 14.7 x 14.2 mm.

Northern Lagoon. SCUBA : 25 m, 3.07.1986, P. LABOUTE coll. : 1 ♂ 17.5 x 18.1 mm, carrying a sponge cap; 2 ♀♀ (ovig.) 42.7 x 42.4, 47.3 x 47.6 mm; 2 ♀♀ 38.0 x 36.7, 42.5 x 41.4 mm.

LAGON : stn 101, 22°31.0'S, 166°35.9'E, 18 m, 21.08.1984 : 2 ♂♂ 30.2 x 29.0, 40.0 x 37.7 mm. — Stn 102, 22°29.4'S, 166°37.2'E, 19 m, 22.08.1984 : 1 ♀ 22.4 x 23.0 mm. — Stn 169, 22°8.0'S, 166°8.4'E, 22 m, 18.09.1984 : 1 ♂ 17.2 x 18.2 mm. — Stn 190, 22°02.1'S, 165°57.3'E, 135-150 m, 19.09.1984 : 1 ♀ 7.0 x 6.7 mm. — Stn 230, 22°37.9'S, 166°41.1'E, 35 m, 22.10.1984 : 1 ♂ 9.3 x 9.2 mm. — Stn 235, 22°30.9'S, 166°52.1'E, 70 m, 23.10.1984 : 1 ♀ 17.0 x 17.4 mm. — Stn 252, 22°20.8'S, 166°23.7'E, 22 m, 7.11.1984 : 1 ♂ 45.2 x 42.3 mm. — Stn 267, 22°21.5'S, 166°14.9'E, 65 m, 8.11.1984 : 1 ♂ 9.0 x 9.5 mm. — Stn 269, 22°18.0'S, 166°18.1'E, 20 m, 8.11.1984 : 1 ♀ (ovig.) 29.7 x 30.0 mm. — Stn 297, 22°38.9'S, 166°45.6'E, 30 m, 26.11.1984 : 1 ♂ 13.4 x 13.5 mm. — Stn 298, 22°37.0'S, 166°47.1'E, 35-37 m, 26.11.1984 : 1 ♀ 41.5 x 41.3 mm. — Stn 312, 22°41.9'S, 166°48.8'E, 26 m, 27.11.1984 : 1 ♀ 6.9 x 7.4 mm. — Stn 337, 22°43.0'S, 166°50.5'E, 33 m, 28.11.1984 : 1 ♂ 26.1 x 25.5 mm. — Stn 558, 22°46.0'S, 166°54.0'E, 43 m, 16.07.1985 : 1 ♂ 17.3 x 16.7 mm. — Stn 564, 22°46.8'S, 166°56.0'E, 32-38 m, 16.07.1985 : 1 ♀ (ovig.) 11.2 x 11.8 mm. — Stn 744, 22°13.6'S, 167°03.2'E, 76-81 m, 13.08.1986 : 1 ♀ 6.9 x 7.3 mm. — Stn 933, 20°44.9'S, 164°14.9'E, 90-100 m, 27.04.1988 : 1 ♀ (ovig.) 12.1 x 12.7 mm. — Stn 1013, 20°7.8'S, 163°55.4'E, 18 m, 3.04.1988 : 1 ♂ 20.0 x 20.2 mm. — Stn 1068, 19°57.3'S, 153°52.8'E, 26 m, 23.10.1989 :

1 ♀ 11.0 x 11.3 mm. — Stn 1116, 19°37.3'S, 163°52.6'E, 38 m, 25.10.1989 : 1 ♂ 29.5 x 30.6 mm; 1 ♀ 12.2 x 13.6 mm.

Bellona Plateau. CORAIL 1 : no stn, no locality, no depth, August 1988 : 1 ♂ 9.0 x 9.8 mm; 4 ♀♀ 17.1 x 18.0, 25.6 x 26.9, 26.7 x 26.5, 34.3 x 33.2 mm.

Chesterfield Islands. CHALCAL 1 : stn CP 1, 20°45.80'S, 161°02.50'E, 70 m, 15.07.1984 : 1 ♀ (ovig.) 15.7 x 16.2 mm. — Stn CP 12, 20°35.30'S, 158°47.40'E, 67 m, 23.07.1984 : 2 ♀♀ 10.0 x 11.1, 12.6 x 13.0 mm, carrying a sponge cap; 1 ♂ 9.1 x 9.3 mm. — Stn CP 15, 21°24.90'S, 159°9.30'E, 60 m, 25.07.1984 : 2 ♂♂ 14.2 x 14.6, 24.0 x 24.7 mm. — Stn CP 16, 21°41.60'S, 159°21.90'E, 53 m, 25.07.1984 : 4 ♀♀ 11.4 x 11.8, 17.7 x 18.6, 32.4 x 32.8, 49.3 x 47.3 mm.

CORAIL 2 : stn CP 23, 20°30.60'S, 161°03.55'E, 88 m, 22.07.1988 : 1 ♂ 12.9 x 13.6 mm. — Stn CP 24, 20°27.35'S, 161°04.70'E, 75 m, 22.07.1988 : 2 ♂♂ 15.2 x 14.4, 48.4 x 44.6 mm; 1 ♀ (ovig.) 49.0 x 47.1 mm. — Stn CP 98, 19°02.83'S, 158°56.20'E, 48-44 m, 26.08.1988 : 1 ♂ 13.5 x 13.3 mm. — Stn DW 122, 19°28.17'S, 158°17.86'E, 32 m, 29.08.1988 : 1 ♂ 10.7 x 11.3 mm; 1 ♀ 6.1 x 6.5 mm.

Philippines. MUSORSTOM 3 : stn CP 117, 12°31.00'N, 120°39.00'E, 92-97 m, 3.06.1985 : 1 ♀ 16.8 x 15.6 mm. — Stn CP 121, 12°08.00'N, 121°18.00'E, 73-84 m, 3.06.1985 : 1 ♂ 35.0 x 36.0 mm.

DESCRIPTION. — Carapace approximately as wide as long, subcircular, convex, rising gradually from the margins, covered by short, coarse tomentum with longer setae on the anterior branchial areas and along carapace margins.

Carapace surface smooth but branchial and cardiac grooves distinct, also frontal groove which extends back from between lateral rostral teeth separating two prominent rounded protuberances. Rostrum tridentate but median tooth very small, strongly deflexed and scarcely visible dorsally. Lateral rostral teeth prominent, acute, separated by a U-shaped sinus. Supraorbital tooth strong, subacute. Anterolateral carapace margin armed with three acute, equidistant teeth, first on the same level as anterior corner of buccal frame. All teeth anterolaterally directed at an angle of approximately 45°. Behind the second and third teeth the carapace margin is laterally inflated and rounded. A prominent, acute, posterolateral tooth which is directed laterally. Posterolateral margins slightly convergent and posterior carapace margin slightly convex.

Orbital margin extends back from lateral rostral tooth as a straight line to a strong, subacute supraorbital tooth which is upturned. Beyond this tooth supraorbital margin is slightly concave to postorbital corner which is slightly produced as a blunt tooth. A narrow fissure separates the suborbital lobe which is produced as a strong, acute tooth visible dorsally.

First segment of antenna wider than long, beaked medially, gaping narrowly, not twisted. Second segment longer than wide, a median distal tubercle present, distomedial corner produced as a short blunt spine on which the third segment is inserted at an angle. Exopod extending as far as joint between third and fourth segments, tip bilobed, inner lobe flattened and curving over base of eyestalk. Ratio of length of antennal flagella to CW = 0.57.

Subhepatic area smooth, convex, marked by a strong groove extending from in front of the first anterolateral tooth, beneath the anterolateral margin and emerging at posterolateral tooth. This groove is interrupted by a dorsoventral groove which ends between the first and second anterolateral teeth. Anterolateral corner of buccal frame has two subacute teeth. Female sternal grooves end well apart, each on a prominent ventrally directed tube, just behind base of cheliped.

Chelipeds fringed with longer setae. This limb is moderately sized in small specimens, but massive in large males, with propodus especially deep. Merus trigonal, borders armed with small tubercles : superior margin has four-five larger tubercles, outer inferior border has seven-eight tubercles and inner inferior border has nine-ten very small tubercles. Inner and outer faces and superior margin near distal end of merus are deeply incised. Outer face of carpus smooth and inflated, distal margin with two very prominent acute tubercles. Upper border of inner carpus face has two unequal, acute distal tubercles, most distal tubercle largest. Distal border of inner face has two small tubercles near lower corner (a large male specimen had four large tubercles). Outer face of propodus smooth and inflated. Upper border armed with two unequal acute tubercles, most distal tubercle largest. A prominent subacute tubercle at base of dactyl. Fingers white or pink, curved, gaping and armed with seven teeth, first three small and last four larger and interlocking.

First two pairs of legs as long as chelipeds. Distal borders of carpi produced. Dactyli about as long as propodi, inner margins of dactyli bear five small spines increasing in size distally. These legs fringed with longer setae.

Last two pairs of legs smaller than first two pairs. Third leg shortest, dactyl opposed by a single propodal spine with two (sometimes three) short propodal spines on the outer margin. Dactyl of fourth leg opposed by two propodal spines with three smaller spines on outer propodal margin and a prominent spine on outer margin of dactyl itself. When extended forward the last leg reaches the second anterolateral tooth.

Male telson longer than wide, posterior margin subacute. Female telson wider than long, posterior margin rounded. A low rounded median ridge along length of abdomen in both sexes. Fifth and sixth abdominal segments fused, the only evidence of a joint is at the margins and on median ridge. Abdominal locking mechanism consists of tuberculate posterior corner of base of cheliped against proximal margin of telson and serrated ridge on base of first leg against proximal margin of penultimate segment. The proximal corner of telson and distal corner of fifth segment are expanded. Uropod plates well developed and visible externally, but lie between bases of first legs and are not used in locking the abdomen.

First male pleopod stout semi-rolled tube, narrowing to a sharp, horny tip which is densely setose. Second pleopod simple, needle-like, tapering to a sharp tip.

DISCUSSION. — *L. intermedia* has always been placed in *Dromia* because the female sternal grooves end apart behind the bases of the chelipeds but there are other characters which must be taken into account. In this species the carapace is approximately as wide as long (in *Dromia* the carapace is distinctly wider than long), it has two spines opposing the dactyl of the third leg (species of *Dromia* have only one), there are three spines on the outer propodal margin of the fourth leg (species of *Dromia* have none or only one spine), and the fifth and sixth abdominal segments are fused (not fused in *Dromia*). These characters clearly distinguish *Lauridromia intermedia* from *Dromia dormia* (Linnaeus, 1763), for example, and suggest that it is more logically placed in a separate genus (see Table 2).

As noted by LEWINSOHN (1984) the sternal grooves of *L. intermedia* differ markedly between immature and mature females. In the smallest ovigerous female, CW = 11.2 mm, the sternal grooves end apart just behind the chelipeds on separate tubercles but in other females of similar size the sternal grooves are only faintly marked and end apart without tubercles behind the bases of the first legs. This is the condition found in smaller immature females and even in females as large as CW = 17-18 mm. Females as large as CW = 34-35 mm have sternal grooves which terminate between the chelipeds but without prominent tubercles. All larger females have fully developed sternal grooves which end apart between the chelipeds on large ventrally directed tubes. All ovigerous females have this condition. The other sexually dimorphic character, abdomen size, shows a similar pattern of change. The process of sexual maturation in female *L. intermedia* evidently occurs over a wide size range from CW = 11-35 mm which is considerable when it is remembered that the maximum size is around CW = 60 mm (see below). This implies that some females do not reproduce until they are more than half the maximum size, whereas other females reproduce when they are less than 20% of the maximum size. Clearly, female maturation is not associated with a particular moult in the life history of this crab. Variation in the development of the female sternal grooves indicates that great care must be taken when using this feature as a taxonomic character and it partially explains why there has been such confusion about identifying and arranging the larger dromiids into well defined genera.

SIZE. — *L. intermedia* is the most abundant (almost 30% of the collection), large dromiid in the material from New Caledonia and the Philippines : the collection (made during the years 1984-88) includes 90 specimens, 35 males (mean CW = 26.2 mm, range 9-51.2 mm), 38 females (mean CW = 35.8 mm, range 6.1-57.2 mm), 17 ovigerous females (mean CW = 34.7 mm, range 11.2-56.8 mm). Overall the mean CW = 31.9 mm (range 6.1-57.2 mm). Previously the maximum recorded male CW = 60.7 mm, female CW = 49.0 mm, and minimum ovigerous female CW = 22.2 mm. Collectively these data show that males and females grow to a similar maximum size and that females reach maturity at a relatively small size. The smallest ovigerous female (CW = 11.2 mm) carried 128 eggs, the largest ovigerous female (CW = 56.8 mm) carried approximately 17,280 eggs, the mean egg number = 7700 and the mean egg diameter = 0.55 mm. In the spectrum ranging from small eggs-large numbers to large eggs-small numbers, *L. intermedia* lies near the former extreme and almost certainly has a planktonic larval stage. Ovigerous females collected in April had newly laid eggs as well as eggs showing some development (but without eyespots) suggesting that the egg-bearing season began earlier, perhaps in March. Females collected in June and July also had newly laid eggs suggesting that the egg-laying season lasts for at least six months, while females collected in November only had eggs showing some development. Overall, ovigerous females were collected from April to November but staging of egg development suggests that the egg-bearing season must extend from at least March until perhaps December or January. It is not clear from this small sample of ovigerous females, whether breeding is seasonal or continuous (it should be noted that the sample spans the years 1984-88). The reproductive strategy of this large dromiid provides an interesting contrast with that of the species of *Dromidiopsis* which are smaller and have smaller numbers of larger eggs (see above).

CAMOUFLAGE. — Previous authors have not indicated the kind of camouflage carried by *L. intermedia*. Only a few of the present specimens were accompanied by a cap and in all cases these were made of pieces of sponge.

DEPTH. — The depth range of this collection of *L. intermedia* was 7-150 m, exceeding the previously recorded range of 15-112 m. The average depth was 38.5 m.

DISTRIBUTION. — The distribution of *L. intermedia* includes Madagascar and the Seychelle Islands (LEWINSOHN, 1984), Sri Lanka (Galle, type locality, LAURIE, 1906), south coast of Timor (IHLE, 1913), various localities off Japan (SAKAI, 1936, 1976), South Queensland (Caloundra, CAMPBELL, 1971) and now New Caledonia and the Philippine Islands. This is a widespread Indo-West Pacific species whose distribution does not apparently include the east coast of Africa, Red Sea or the wider Pacific region. Given the breeding biology outlined above this wide distribution is not unexpected and may well be extended in the future.

Genus ***DROMIA*** Weber, 1795

Dromia Weber, 1795 : 92. — FABRICIUS, 1798 : 359. — DE HAAN, 1833 : 104. — H. MILNE EDWARDS, 1837 : 170 (in part). — STIMPSON, 1858 : 226. — BORRADAILE, 1903a : 298. — STEBBING, 1905 : 61. — IHLE, 1913: 21 (in part).— RATHBUN, 1937 : 30. — BARNARD, 1950 : 309. — FOREST, 1974 : 76. — MANNING & HOLTHUIS, 1981 : 11.
Dromidiopsis - RATHBUN, 1923 : 67. — SAKAI, 1976 : 9 (in part). — DAI & YANG, 1976 : 9 (in part).
Petalomera - SAKAI, 1976 : 20 (in part).
Sternodromia Forest, 1974 : 100.

Carapace wider than long, surface smooth or sculptured. Rostrum tridentate. Antennal exopod well developed. Coxae of third maxillipeds usually closely approximated (but may be separated by a wide gap) and inserted under tip of telson. Female sternal grooves end apart or together between or behind cheliped bases. Cheliped with an epipod. Legs not knobbed or ridged. Length of propodi and dactyli of first two pairs of legs usually equal, inner margins of dactyli armed with 5-7 small spines. Dactyl of third leg opposed by a single propodal spine, no spine on the outer propodal margin, there may be some very small spines on inner dactyl margin. Fourth leg shorter than second leg, dactyl opposed by up to two spines with sometimes another spine on the outer propodal margin. Margin of telson rounded. Uropod plates well developed, visible externally, used in male abdominal locking mechanism by fitting in front of serrated flange on the bases of first legs. Joint between last two abdominal segments freely movable.

TYPE SPECIES. — *Cancer personata* Linnaeus, 1758, by designation of the International Commission of Zoological Nomenclature (1964, opinion 688).

OTHER SPECIES. — *Dromia bollorei* Forest, 1974, *Cancer dormia* Linnaeus, 1763, *Cancer erythropus* George-Edwards, 1771, *Dromia foresti* sp. nov., *D. marmorea* Forest, 1974, *D. monodi* Forest & Guinot, 1966, *D. nodosa* A. Milne Edwards & Bouvier, 1898, *D. spinirostris* Miers, 1881, *Cryptodromia wilsoni* Fulton & Grant, 1902.

DISCUSSION. — Definitions of the genus *Dromia* Weber, 1795, have been given by many authors, but the definition of BORRADAILE (1903a) seems to embody the essential features : "Dromiidae with an epipodite on the cheliped, the walking-legs not knobbed or ridged, the carapace broader than long, the regions well marked or indistinct, the ridges of the efferent branchial channels broken, indistinct, or well made, the sternal grooves of the female ending apart behind the cheliped segment, the fifth leg shorter than the third and with no thorn on the outer side of its last joint". Most of the other definitions include some subset of these characters although STIMPSON (1907) added an important feature : that the abdominal uropod plates are conspicuous. The above definition of *Dromia* summarizes and corrects errors in earlier definitions and adds some important characters which have been overlooked.

Apart from the species dealt with below, some comments need to be made about the inclusion of *Sternodromia spinirostris* (Miers, 1881) in the genus *Dromia*, thereby making *Sternodromia* Forest, 1974, unnecessary. MANNING and HOLTHUIS (1981) have discussed the similarity of *D. monodi* to this species and the difficulty of separating juveniles. While the two species can be clearly separated, their similarities strongly support the contention that both belong to the same genus. I agree with FOREST (1974) that *Sternodromia spinirostris* does not belong in *Dromidiopsis*, where it had been placed by MONOD (1956), but the grounds for erecting a separate genus for it hardly seem necessary. *Sternodromia spinirostris* is characterized by a carapace wider than long, the third and fourth legs have single spines opposing the dactyl, uropods well developed, visible externally, used in the male abdominal locking mechanism by fitting in front of angled, serrated ridges on the bases of the first legs which fit against the narrowed distal borders of the penultimate abdominal segment, the last two segments of the abdomen are freely movable, and the female sternal grooves end together on a tubercle between bases of the first legs. Apart from the sternal grooves, this suite of characters is typical of the species belonging to the genus *Dromia*, and the characters emphasized by FOREST (1974) seem to be more of specific value rather than serving to isolate this species in a separate genus. The only significant change to the generic concept of *Dromia* is to include a species with the female sternal grooves ending together rather than apart. In this respect, *D. spinirostris* is not so very different from *D. bollorei* which has closely approximated sternal grooves. The drastic ontogenetic change in the sternal grooves of *D. spinirostris* has been noted by MANNING and HOLTHUIS (1981) and I agree that such a character by itself should not be used to separate genera.

With the revision of *Dromidiopsis* presented earlier in this paper, and the creation of several new genera, the relationships amongst these large dromiids are considerably clarified (see Table 2) and the characters considered important by FOREST (1974) are placed in their proper perspective. There is no reason for not accepting the hypothesis that all the large Atlantic dromiids with a cheliped epipod belong to a single genus.

As in the genus *Lauridromia* gen. nov., the genus *Dromia* includes some of the larger species of dromiids whose maximum size is usually in excess of 40 mm CW.

The larvae of three species of *Dromia* are known : *D. personata*, *D. erythropus*, *D. wilsoni* (LAUGHLIN *et al*, 1982; RICE *et al*, 1970; TERADA, 1983; WEAR, 1970, 1977).

DISTRIBUTION. — *Dromia* species occur in the Atlantic, Indian and Western Pacific oceans but seven species are restricted to the Atlantic, two species (*D. dormia*, and *D. foresti* sp. nov.) are restricted to the Indo-West Pacific, and only one species (*D. wilsoni*) occurs in all three oceans. It is only in the Atlantic that *Dromia* has undergone a major radiation. I assume that the Atlantic *Dromia* are derived from a common ancestor and share a common ancestor with the Indo-Pacific species. *D. wilsoni*, whose distribution spans all the major oceans, has several primitive characters which may make it closest to the ancestral condition.

Key to the species of *Dromia*

(Species studied in this paper are in bold)

1. Anterolateral margin with four teeth which may be sub-equal **2**
— Anterolateral margin with three teeth, all well developed **5**

2. Four very small anterolateral teeth, no spine on the outer propodal margin of the last leg. .... *Dromia spinirostris* Miers, 1881

— Four anterolateral teeth, all well developed except the third which is smaller and may be very close to the second, spine present on outer propodal margin of last leg 3

3. Third anterolateral tooth smaller, placed midway between second and fourth tooth........... .... *Dromia erythropus* (George Edwards, 1771)

— Third anterolateral tooth very small and close to second tooth 4

4. Median rostral tooth large, extending further forward than lateral teeth, posterolateral tooth strong, tends to be directed anteriorly .... ***Dromia dormia*** (Linnaeus, 1763).

— Median rostral tooth small, deflexed, little visible in dorsal view, posterolateral tooth small, directed laterally .... *Dromia personata* (Linnaeus, 1758)

5. Carapace surface strongly sculptured 6

— Carapace surface not strongly sculptured 7

6. First anterolateral tooth blunt, flattened, second and third teeth sub-acute, dactyl of fourth leg opposed by a single spine with another spine on the outer propodal margin .... *Dromia nodosa* A. Milne Edwards & Bouvier, 1898

— First and third anterolateral teeth slightly larger, an obtuse knob on the posterior margin of the second tooth, dactyl of fourth leg opposed by two spines, no spine on the outer propodal margin .... *Dromia bollorei* Forest, 1974

7. Three acute or sub-acute anterolateral teeth, directed horizontally.............................. 8

— Three blunt, conical anterolateral teeth, last two directed almost vertically..................... ....***Dromia foresti*** sp. nov.

8. Carapace tomentum not areolate, inner margin of third leg dactyl without spines 9

— Carapace densely covered with an areolate tomentum, inner margin of third leg dactyl armed with three small spines .... ***Dromia wilsoni*** (Fulton & Grant, 1902) nov. comb.

9. Carapace much wider than long, dactyl of fourth leg opposed by two spines .... *Dromia marmorea* Forest, 1974.

— Carapace only a little wider than long, dactyl of fourth leg opposed by a single spine .... *Dromia monodi* Forest & Guinot, 1966

Dromia dormia (Linnaeus, 1763)

Fig. 16 c

Cancer lanosus Rumphius, 1705 : 19, pl. 11, fig. 1. — SEBA, 1759 : 42, pl. 18, fig. 1.
Cancer dormia Linnaeus, 1763 : 413; 1769 : 1043. — FABRICIUS, 1775 : 405.
Cancer dromia - FABRICIUS, 1781 : 501; 1787 : 320; 1793 : 451 (erroneous spelling for *dormia*).
Cancer dormitator Herbst, 1790 : 250, pl. 18, fig. 103.
Dromia rumphii Weber, 1795 : 92. — FABRICIUS, 1798 : 359. — LATREILLE, 1803 : 386; 1806 : 27; 1818 : 278, fig. 1. — LAMARCK, 1818 : 264. — HILGENDORF, 1879 : 812 (part, Inhambane : Mozambique). — LENZ, 1901 : 450. — DE MAN, 1902 : 687. — NOBILI, 1906a : 144. — EDMONDSON, 1922 : 33, pl. 1.
Dromia hirsutissima Dana, 1852 : 403 (part).
Dromia dormia - BORRADAILE, 1903 : 298. — MACNAE & KALK, 1958 : 71, 117, 125.
Dromidiopsis dormia - RATHBUN, 1923b : 67. — SAKAI, 1936 : 11, pl. 5, fig. 2. — BUITENDIJK, 1939 : 223. — WARD, 1942 : 70. — TINKER, 1965 : 66. — HOLTHUIS, 1968 : 220. — TAKEDA, 1973 : 79. — ALCALA, 1974 : 174, figs 1a-b. — SAKAI, 1976 : 9, pl. 3. — DAI, YANG, SONG & CHEN, 1981 : 131, figs 1-2, pl. 1 (1). — LEWINSOHN, 1984 : 95, pl. 2. — DAI & YANG, 1991 : 18, figs 4 (2-3), pl. 1 (2),
Not *Dromia rumphii* - H. MILNE EDWARDS, 1837 : 174. — DE HAAN, 1839 : 107. — STIMPSON, 1858 : 240; 1907 : 177, pl. 21, fig. 7. — TARGIONI TOZZETTI, 1877 : 207. — ORTMANN, 1892 : 548. — ALCOCK, 1900 : 137; 1901 : 44, pl. 2, fig. 4. — BORRADAILE, 1903b : 576, pl. 33, fig. 1 [= *Dromidiopsis dehaani* (Rathbun, 1923b)].
Not *Dromia dormia* - RATHBUN, 1902 : 32.— STEBBING, 1905 : 61; 1910 : 342. — IHLE, 1913 : 22. — SHEN, 1931 : 96, figs 3a-b, 4a-b. — BARNARD, 1950 : 310, fig. 58c-e [= *Dromidiopsis dehaani* (Rathbun, 1923b)].
Not *Dromia dornica* - BALSS, 1913 : 109 (erroneous spelling for *dormia*) (= *Dromidia aegibotus* Barnard, 1947).
Not *Dromia dormia* - BARNARD, 1947 : 366 (= *Dromidia aegibotus* Barnard, 1947).

MATERIAL EXAMINED. — **New Caledonia**. Port Bouquet, on SCUBA, 12 m, J.-L. MENOU coll., 8.08.1986 : 1 ♀ 105.8 x 88.0 mm. — Barrier Reef, external slope, on SCUBA, 10-30 m, 27.11.1986 : 1 ♀ (ovig.) 112.2 x 95.6 mm. — Tabu Reef, on SCUBA at night, 8 m, P. LABOUTE coll., 21.09.1987 : 1 ♀ 131.0 x 109.2 mm. — On SCUBA, no locality, no depth, no date : 1 ♀ 172.0 x 136.5 mm.

DESCRIPTION. — Carapace much wider than long, strongly convex, rising steeply behind front and from anterolateral margins, covered by a short velvety tomentum. Cardiac and branchial grooves shallow, as is frontal groove which extends back from median rostral tooth, separating two rounded protuberances. Frontal area narrowed, rostrum tridentate, median tooth large, blunt and extending further forward than lateral teeth, clearly visible dorsally. All three rostral teeth directed horizontally. Anterolateral carapace margin begins beneath suborbital level and bears four unequal teeth. The first tooth is by far the largest, the second much smaller and more acute, the third very small, close to the second, and the fourth intermediate in size between the first and second, narrow and more acute, directed slightly upward. Anterolateral teeth are arranged along an almost straight line connecting the rostrum and posterolateral tooth which is large, broad based, narrowing apically and directed anteriorly. Posterolateral carapace margin convergent and posterior margin almost straight.

Supraorbital margin extends uninterrupted from lateral rostral tooth, concave to postorbital corner where there is a narrow fissure. Suborbital margin has a small rounded lobe which is almost vertical rather than horizontal. Immediately beneath suborbital margin is a large, prominent suborbital tooth which is clearly visible dorsally, and beneath this again is a more acute tooth at corner of buccal frame, also visible dorsally. A deep furrow, beginning beneath suborbital tooth, curves around under anterolateral margin, ending at posterolateral tooth. Sternal grooves in female gradually convergent, ending with divergent tips between bases of chelipeds, separated by a prominent smooth ridge.

First segment of antenna much wider than long, beaked medially, gaping narrowly, not twisted. Second segment has a pitted longitudinal trough, a prominent distal, central tubercle, and a blunt distomedial extension on which the third segment is inserted diagonally. Exopod fixed to second segment, extending to joint between third and fourth segments, tip bilobed to accommodate fourth segment and antennal flagella. Epistome triangular with a smooth convex surface.

Chelipeds massive. Merus trigonal, posterior margin with seven-eight small tubercles, inferior margin with four-five larger tubercles, anterior margin smooth. Outer surface of carpus sculptured, distal margin with two blunt extensions, superior margin with a strong, acute distal tooth. Outer face of propodus inflated, inner superior margin with four tubercles, inner face covered with shaggy tomentum. Fixed finger armed with seven-eight large conical teeth. Dactyl has eight teeth, the first large, blunt, second to fourth much smaller, fifth large and more acute, and the last three much smaller. Fingers downcurved, only last four teeth interlocking.

First two pairs of legs shorter than chelipeds, distal borders of carpi and propodi produced as rounded lobes. Dactyli much shorter than propodi, inner margins armed with four-five strong spines, set at an angle close to the dactyl and increasing in size distally.

Last two pairs of legs reduced, fourth pair slightly shorter and stouter. Dactyl of third leg opposed by a strong propodal spine, no spine on outer propodal margin. Dactyl of fourth leg opposed by two similar spines with another small spine on the outer propodal margin.

Telson about as wide as long, a central longitudinal furrow present distally, central region distally convex which continues along segments of the abdomen. Abdominal locking mechanism in male consists of large serrated boss on bases of first legs against convergent margin of penultimate segment with well developed uropods in front of the bosses. All segments of abdomen freely movable in both sexes.

First male pleopod a semi-rolled tube, bluntly tipped and setose, second male pleopod simple, needle-like, without exopod.

DISCUSSION. — The two oldest names cited in the above synonymy are *Cancer lanosus*, Rumphius, 1705, and *C. dormia* Linnaeus, 1763. However, *C. lanosus* is not recognized by the International Code of Zoological Nomenclature because it is unavailable under Art. 3, and Art. 11a, which give the starting date of zoological nomenclature as 1 January 1758, and indicate that any name published before that date is unavailable. Furthermore, Art. 11c states that an "author must have consistently applied the Principle of Binomial Nomenclature in the work in which the name is published". Although *C. lanosus* is binomial, many other names in RUMPHIUS' work are not. Therefore all of RUMPHIUS' names are unavailable for two reasons. *C. lanosus* Seba, 1759, appeared in vol. 3 of his Locupletissimi but SEBA did not consistently apply the Principle of Binomial Nomenclature and so his names are also unavailable. Thus *C. dormia* Linnaeus, 1763, is the oldest name and that specific name must be used (L. HOLTHUIS, pers. comm.).

There has been a great deal of confusion about the respective identities of *Dromia dormia* (Linnaeus, 1763) and of *Dromidiopsis dehaani* Rathbun, 1923, which both have a convex carapace, wider than long, with well developed tomentum and armed with prominent anterolateral teeth. The first attempt to clarify the situation was by RATHBUN (1923b) who pointed out that, without any consistency, two species had been given the names *D. rumphii* and *D. dormia*. RATHBUN, and later LEWINSOHN (1984) listed the major differences between these two large dromiids. The major differences are as follows : median rostral tooth longer than lateral teeth in *D. dormia* (shorter in *D. dehaani*), no supraorbital tooth or only a slight swelling (small tooth present), four unequal anterolateral teeth, the first much larger (three teeth of about equal size), posterolateral tooth directed obliquely forward (tooth directed more laterally), dactyli of first two pairs of legs distinctly shorter than propodi, upper margin not naked, inner or lower margin armed with four-five small spines increasing in size distally (dactyli approximately as long as propodi, upper margin naked, lower margin armed with about sixteen minute spines of similar size lying almost flat against dactyli), dactyl of last leg opposed by two, unequal propodal spines with another small spine on the outer margin (only a single spine opposing the dactyl and none on the outer margin), female sternal grooves gradually convergent, but diverging slightly near the end, terminating between cheliped bases, separated by a smooth ridge (convergent then parallel for a distance until diverging strongly to end on large conical tubercles just behind bases of chelipeds). One feature of the abdomen which both RATHBUN and LEWINSOHN seem to have overlooked is the fact that in both male and female *D. dehaani* the joint between the fifth and sixth abdominal segments is partially fused (not fused in *D. dormia*). Along with other features, this abdominal fusion serves to place *D. dehaani* in a separate genus, *Lauridromia* gen. nov. Another species which LEWINSOHN (1984) compared closely with *Dromia dormia* was *D. intermedia*, which also belongs in the new genus.

The problem of choosing the genus in which *D. dormia* should be placed has largely resulted from the vague definition of *Dromidiopsis* and misunderstanding about what exactly was meant by "female sternal grooves ending together". In *Dromia dormia* the sternal grooves are convergent and end, not close together on a tubercle, but with divergent tips, separated by a ridge, and its carapace is distinctly wider than long, rather than longer than wide as in *Dromidiopsis*. Thus *D. dormia* belongs in *Dromia* where the sternal grooves are variable in the proximity of their termination (see Table 2).

Although RATHBUN (1923b) attempted to allocate the old records to *Dromia dormia* and *D. dehaani*, LEWINSOHN (1984) questioned many of her decisions, especially those from the western Indian Ocean and, as a result, gave a very reduced synonymy for this species. Using the differences listed above for these two species, I have endeavoured to clarify the situation and have arrived at the synonymy given above for *D. dormia* which is considerably larger than that of LEWINSOHN (1984). However, insufficient information was available to determine the cases of *Dromia rumphii* Brocchi, 1877 : 106, *D. dormia* (err. *dromia*) Balss, 1915 : 13, and *D. dormia* Stephensen 1945 : 61, fig. 3. *Dromia rumphii* Ortmann, 1892 : 548 must be *D. dehaani* because he specifically mentions the fusion of the fifth and sixth abdominal segments. Similarly *D. rumphii* Alcock, 1900, and *D. rumphii* Alcock, 1901, must be *D. dehaani* because of the prominent tubercles on the ends of the female sternal grooves typical of this species. Although this character of the sternal grooves is shared with *Lauridromia intermedia*, the shape of the carapace is consistent with *Dromia dehaani*.

ALCALA (1974) gave a rough estimate of abundance of *Dromia dormia* on coral reefs, Dumaguete City, Philippines as being 4-5 specimens seen per man-hour of observation, noting that it was nocturnal, feeding upon the crown of thorns starfish (*Acanthaster planci*), usually carrying a large sponge and collected by local people for food. DAI and YANG (1991) report that in spite of its large size, this crab is not regarded as edible and is referred to by some chinese fishermen as a "poison crab". Other comments about the supposed toxic qualities of *Dromia dormia* can be found in RUMPHIUS (1705), TINKER (1965), and HOLTHUIS (1968).

Dromia dormia is a very large, widespread, shallow water species. The ovigerous female CW = 112.2 mm, carrying approximately 24,000 eggs, diameter = 0.5 mm, provides the first reproductive information about *D. dormia*. Clearly it has large numbers of small eggs, especially for a dromiid crab, and is similar to *D. dehaani* (see BARNARD, 1950, recorded as *Dromia dormia* , "eggs very small and numerous"). This contrasts with the *Dromidiopsis* species which have small numbers of relatively large eggs (see above).

SIZE. — Maximum recorded sizes are ♂ CW = 200, CL = 160 mm, ♀ CW = 116, CL = 91 mm, and so the ♀ with CW = 172, CL = 136.5 mm, from New Caledonia, is the largest yet recorded.

DEPTH. — Despite numerous locality records of *Dromia dormia*, the only precise depth records are those of SAKAI (1976), 20-50 m, but many specimens have been caught by fishermen and they presumably also came from shallow water. All the present specimens from New Caledonia, were collected by SCUBA divers from depths of 8-30 m.

DISTRIBUTION. — The distribution of *Dromia dormia* includes the east coast of Africa, Madagascar, Seychelles, Mauritius, Red Sea, Amboina, Philippine Islands, China, Japan, Hawaii and now New Caledonia.

Dromia foresti sp. nov.

Figs 5 a-j, 16 d

MATERIAL EXAMINED. — **Bellona Reefs** : MUSORSTOM 5, stn DW 299, 22°47.70'S, 15°23.70'E, 360-390 m, 11.10.1986 : 1 ♂, holotype, 27.3 x 23.0 mm (MNHN-B 22553).

TYPE. — Holotype : ♂ 27.3 x 23.0 mm from MUSORSTOM 5, stn DW 299 (MNHN-B 22553).

DESCRIPTION. — Carapace wider than long, rising steeply at front but only gradually from other margins. Surface almost smooth, covered with very fine, sparse tomentum. A faint frontal groove separates two small protuberances behind rostrum, two small medial pits in cardiac region whose borders are deeply marked by grooves diverging anteriorly, branchial groove only faintly marked. Rostrum bluntly tridentate, median tooth narrower than lateral teeth, almost horizontal, margin rising steeply to blunt lateral teeth which are directed almost vertically. Anterolateral margin begins on level of suborbital margin, widening rapidly at first and then more gradually, bearing three blunt, equally spaced teeth. The first tooth close to orbit and directed almost horizontally, remaining two teeth set in from margin (i.e. sub-marginal) of carapace and directed vertically, posterolateral tooth similar to first anterolateral tooth. Posterolateral carapace margins convergent, posterior margin almost straight.

Prominent supraorbital tooth, similar to and close by lateral rostral tooth, but smaller, postorbital corner not produced. A shallow notch separates the large, blunt suborbital tooth which is visible dorsally. First segment of antenna beak-like medially, gaping narrowly, superior lobe larger than inferior lobe. Second segment elongate (ratio of length to width = 2.1), low rounded distal tubercle medially, distomedial corner produced. Third segment inserted at an angle on the medial extension of second segment. Exopod extending as far as joint between third and fourth segments, apex blunt (not bilobed), ratio of length of antennal flagella to CW = 0.36. Epistome firmly joined to rostrum but leaving distinct groove.

Distinct tooth at corner of buccal frame, subhepatic region inflated, marked by a strong groove which extends sinuously from near basal segment of antenna, beneath anterolateral margin to posterolateral tooth. Female sternal groove characters unknown.

Chelipeds well developed. Merus trigonal in cross-section, borders unornamented, small distal tubercle on superior surface. Carpus inflated, three large tubercles on outer face, one proximal, one inferior and the other distal, also a blunt distal tooth on inner superior margin. Inner face of propodus densely pubescent, outer face smooth, inflated, four small proximal tubercles on superior inner margin. Fingers pink, downcurved, hollowed out internally, both armed with nine-ten teeth. Proximal tooth on each finger largest, blunt, fingers gaping for most of their length and distal teeth do not interlock, tips offset on both chelipeds.

First two pairs of legs shorter than chelipeds, distal borders of meri, carpi and propodi each bearing prominent blunt tubercles. Posterior lower border of second leg merus armed with three small central tubercles. Dactyli as long as propodi, ventral borders of dactyli armed with five-seven small spines increasing in size distally.

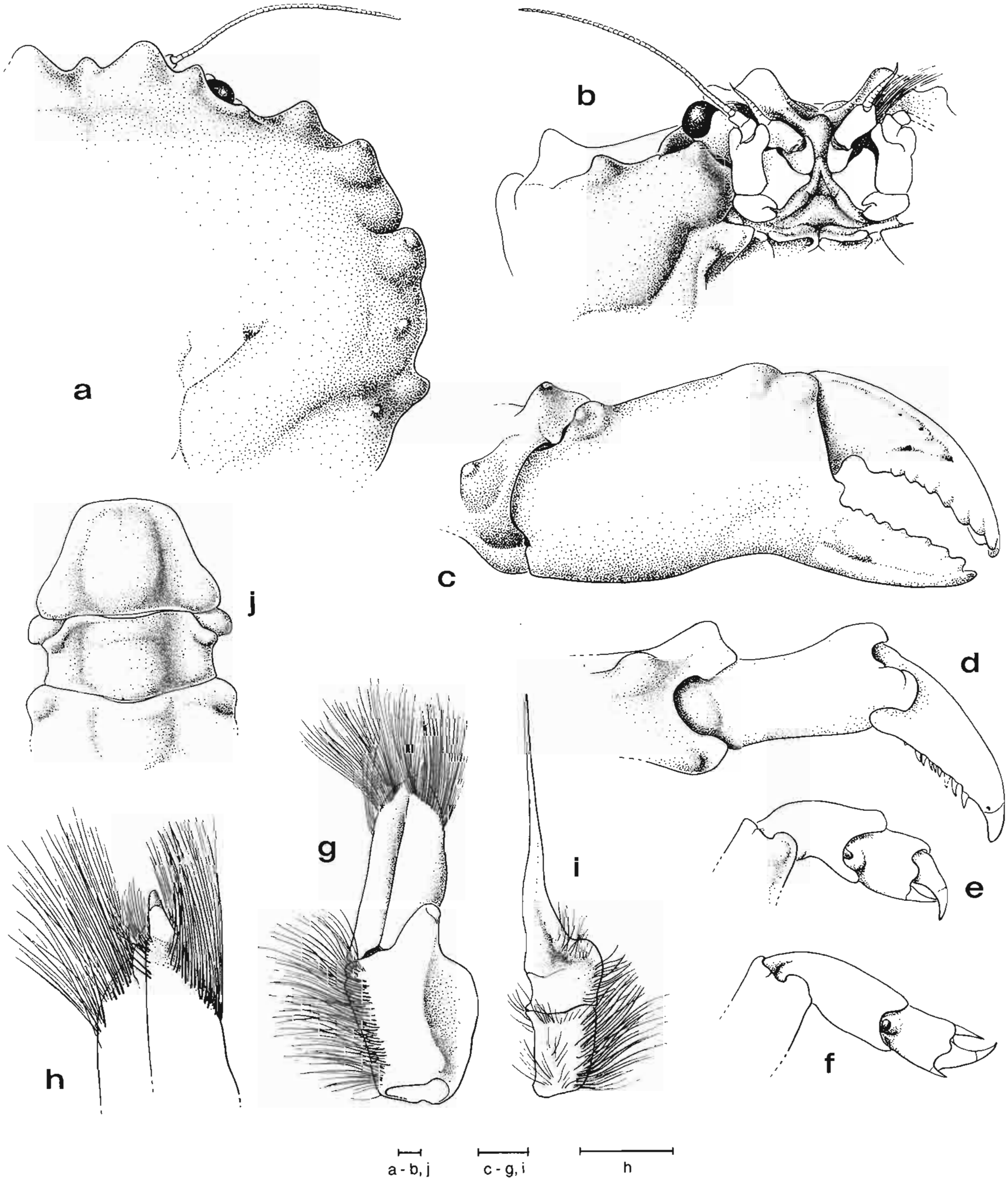


FIG. 5. — *Dromia foresti* sp. nov. : ♂, holotype, 27.3 x 23.0 mm, Chesterfield Islands (Bellona Reefs), MUSORSTOM 5, stn 299, 360-390 m (MNHN-B 22553) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area and anterolateral margin; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of terminal segments of right third leg; **f**, posterior view of terminal segments of right fourth leg; **g**, first male pleopod; **h**, tip of first male pleopod; **i**, second male pleopod; **j**, ventral view of telson and terminal segments of male abdomen.

Scale bars represent 1.0 mm.

Last two pairs of legs much reduced, each of similar size, meri with two tubercles similar to second leg. Carpus of third leg with a single tubercle on distal border. Dactyli of both legs strongly curved and opposed by single propodal spines. Fourth leg has a single spine on outer propodal margin at base of dactyl.

Abdomen of six free segments. Telson much wider than long, terminal margin truncate. A low median ridge along length of abdomen, on segments two-four the ridge is ornamented with a pair of low rounded distal tubercles. Posterolateral corners of segments two-five produced as blunt lobes. Uropod plates well developed, visible externally and used in locking the abdomen, by fitting in front of curved ridge on bases of first legs.

First male pleopod a simple folded tube, produced as a blunt horny tip, densely setose, second pair of pleopods simple, needle-like.

ETYMOLOGY. — This new species of *Dromia* is named after Professor J. FOREST, in recognition of his contribution to the study of the other species in this genus. In particular, his analysis of the Atlantic *Dromia* has provided a model for my revision of the whole family.

DISCUSSION. — *Dromia foresti* is clearly different from the other species in this genus which occur in the waters of New Caledonia, i.e. *D. dormia* and *D. wilsoni*. All three species have a CW/CL ratio of 1.2-1.3 but *D. dormia* has a uniformly short velvety tomentum, no supraorbital tooth, four anterolateral teeth, and a strong, narrowed, anteriorly directed posterolateral tooth. *D. wilsoni* has a longer sculptured (uneven) tomentum, a supraorbital tooth, three anterolateral teeth, and a prominent posterolateral tooth similar to the anterolateral teeth. *D. foresti* has a uniformly short, close tomentum, a supraorbital tooth, three anterolateral teeth, and a small posterolateral tooth similar to the anterolateral teeth. Of these species, *D. dormia* grows much larger than the others.

DEPTH. — The depth at which the type specimen was collected, 360-390 m, is considerably deeper than most Atlantic *Dromia* species (down to about 100 m), but it is not as deep as the maximum for *D. wilsoni* which is 520 m. Thus, in the Pacific, each of the three *Dromia* species has a different maximum depth : *D. dormia* (50 m), *D. foresti* (390 m), and *D. wilsoni* (520 m).

DISTRIBUTION. — *Dromia foresti* is only known from the Bellona Reefs, off New Caledonia.

Dromia wilsoni (Fulton & Grant, 1902)

Fig. 16 e

Cryptodromia wilsoni Fulton & Grant, 1902b : 61, pl. 9.
Cryptodromia lateralis - CHILTON, 1911 : 49. Not *Dromia lateralis* Gray, 1831.
Petalomera wilsoni - RATHBUN, 1923a : 154, pl. 42, fig. 1. — DELL, 1968 : 14, pl. 2. — GRIFFIN, 1972 : 56. — McLAY, 1988 : 68, fig. 10a-f; 1991 : 470, pl. 1B, figs 6a-d, 7a-c, 8a-c (contains a full synonymy).

MATERIAL EXAMINED. — **New Caledonia.** LAGON : stn 754, 21°13.15'S, 165°49.25'E, 36 m, 7.01.1987 : 1 ♂ 14.8 x 12.7 mm.

SMIB 6 : stn DW 120, 18°58.5'S, 163°25.6'E, 310-325 m, 3.03.1990 : 1 ♂ 9.8 x 8.0 mm, (3 cryptoniscus larval stage isopods under the abdomen).

BERYX 4 : stn 2 (trap), 22°47.06'S, 167°18.92'E, 400 m, 22.01.1992 : 1 ♂ 44.0 x 32.3 mm.

Loyalty Islands. MUSORSTOM 6 : stn DW 460, 21°01.72'S, 167°31.45'E, 420 m, 20.02.1989 : 1 ♂ 47.7 x 34.8 mm.

Hunter Island. VOLSMAR : stn CAS 10, 22°23.1'S, 171°41.1'E, 280 m, 1.06.1989 : 1 ♀ 33.3 x 28.5 mm.

Chesterfield Islands. CHALCAL 1 : stn CP 8, 19°43.80'S, 158°35.25'E, 348 m, 19.07.1984 : 1 ♂ 21.5 x 19.6 mm.

MUSORSTOM 5 : stn 255, 25°15.40'S, 159°54.80'E, 280-295 m, 7.10.1986 : 1 ♂ 8.7 x 7.1 mm; 1 ♀ 13.2 x 10.3 mm. — Stn 256, 25°18.00'S, 159°52.70'E, 290-300 m, 7.10.1986 : 2 ♀♀ 5.9 x 5.1, 9.5 x 7.6 mm. — Stn 258, 25°32.80'S, 159°46.10'E, 300 m, 8.10.1986 : 1 ♀ 5.3 x 4.4 mm. — Stn 268, 24°44.70'S, 159°39.20'E, 280 m, 9.10.1986 : carapace only, 33.4 x 23.3 mm.

Philippine Islands. MUSORSTOM 2 : stn CP 4, 14°01.2'N, 120°18.4'E, 190-183 m, 20.11.1980 : 1 ♂ 25.4 x 18.9 mm.

DESCRIPTION. — Carapace distinctly wider than long, moderately convex, surface smooth, gently undulating under a thick cover of soft, long setae which give the surface an areolate appearance. Cardiac and branchial grooves well marked by depressions, a pair of medial cardiac pits and another single one further back. Rostrum tridentate, median tooth small, blunt and on a lower level, projecting as far forwards as lateral teeth which are separated by a U-shaped sinus, from which extends a distinct frontal groove separating two rounded protuberances. Three strong anterolateral teeth extend back from the level of the suborbital tooth : first tooth directed forwards and the last two upwardly directed. Both FULTON and GRANT (1902b) and RATHBUN (1923a), stated that there are four anterolateral teeth, but the first tooth is clearly subhepatic in position and only three teeth are on the anterolateral border. Posterolateral tooth large, also projecting upward. On the ridge behind the branchial groove there is a small tubercle close to the base of the posterolateral tooth. Posterolateral carapace margins convergent and posterior margin concave.

Lateral rostral teeth continuous with supraorbital margin, which has a broad, blunt supraorbital tooth. External orbital corner not produced and with a small fissure separating it from the strong suborbital tooth, which is visible dorsally. In dorsal part of the orbit, beneath supraorbital margin, there is the vestige of a parallel ridge and at the lateral end of the ridge it meets a weak vertical ridge (an extension of the supraorbital tooth), which tends to divide off a corneal region of the orbit.

First segment of antenna much wider than long, medially beaked, gaping, and twisted. Second segment much longer than wide, convex, with flange-like lateral margin, rounded distal tubercle at base of third segment, distomedial corner produced, curved, on which third segment is inserted at an angle. Exopod fused to second segment, produced beyond joint between third and fourth segments, tip bilobed, inner lobe acute and curved over base of eyestalk. Ratio of antennal flagella length to CW = 0.43.

Subhepatic area of carapace convex with a small blunt tubercle beneath the suborbital tooth and another, larger tubercle, lower and between it and the first anterolateral tooth. A well marked groove, beginning below the orbit, curves under the larger subhepatic tubercle and anterolateral margin, terminating near the posterolateral tooth. Female sternal grooves end wide apart on small raised tubercles between bases of first and second legs.

Chelipeds large, especially in male. Merus triangular in section, all three borders have small rounded granules. Carpus has two large distal nodules, inner angle has a sharp tooth. Propodus smooth, upper border in male sparsely covered in rounded nodules, in female these nodules are rudimentary. Inner and outer surfaces of fingers longitudinally grooved and covered with tomentum, distal surface alone is naked and glabrous. Fingers pink, hollowed out internally, armed with seven well developed teeth and gaping when closed, long silky hairs on inner surface of propodus and fingers.

First two pairs of legs shorter than chelipeds, first slightly longer than second. Carpi and propodi have tuberculiform nodules at distal ends of anterior borders. Dactyli approximately as long as propodi, inner margins have five-seven small spines which increase in size distally.

Last two pairs of legs much reduced and of similar size. A single propodal spine opposing the third leg dactyl whose inner margin has three-four tiny spines. Fourth leg dactyl opposed by a propodal spine. No spines on outer propodal margins of either leg.

Abdomen of six free segments. Telson much wider than long, male telson trigonal (ratio = 1.5), female telson subtruncate (ratio = 1.7). Uropod plates well developed and visible externally. Abdominal locking mechanism involves uropods fitting in front of well developed serrated flange on bases of first legs.

Male first pleopod is a partially rolled tube with a densely setose, broadly rounded tip armed with a sharp horny tubercle. Second pleopod simple and needle-like.

DISCUSSION. — A full synonymy of *Dromia wilsoni*, with illustrations, can be found in MCLAY (1991) under the name *Petalomera wilsoni*. In that paper I indicated the need for an extensive revision of the genus *Petalomera* and this is undertaken later in the present contribution. Only citations of *Dromia wilsoni* relevant to the New Caledonian and Philippine regions are included here.

Until now *D. wilsoni* has been placed in the genus *Petalomera*, but it lacks the petaloid cheliped meri and granulate carapace surface of this genus. The carapace shape, and surface, anterolateral teeth, and arrangement of the spines on the last two pairs of legs suggest that it should be placed in the genus *Dromia*. However, the larvae of this species, described by WEAR (1970) and TERADA (1983), are quite different from other known larvae of

Dromia spp. (*D. personata*, and *D. erythropus*) and present something of a problem. While the adult characters suggest that this species should belong in *Dromia*, the larvae are different. Indeed, the larvae of *D. wilsoni* are very different from all other known dromiid larvae. My conclusion is that since the adult characters of other dromiids are well known these should be used to place species in appropriate genera but when the larval characters are equally well known, then the situation could be readdressed.

One feature of the spines associated with the dactyli of the walking legs of *Dromia wilsoni* requires some comment. The dactyl of the third leg is opposed by a single spine with no spines on the outer propodal margin (typical of other *Dromia* species) but there are three small spines on the inner margin of the dactyl. This is a feature not seen on the other species of *Dromia*, but found in species of the primitive genus *Sphaerodromia*. Apart from this feature, which I consider primitive, *Dromia wilsoni* agrees well with the other species in this genus : its carapace is much wider than long, the structure of the antenna is in agreement, there are about five small spines on the inner margins of the dactyli of the first two pairs of legs, uropod plates are well developed and the abdominal locking mechanism involves these plates fitting in front of a serrated flange on the base of the first legs, there is no abdominal fusion, and the female sternal grooves end apart just behind bases of the first legs. FOREST (1974) showed that the sternal grooves in species of *Dromia* were quite variable and in different species could end together or apart between the bases of the chelipeds or first legs. The inclusion of this species brings the number of Atlantic *Dromia* to eight species. By contrast there are only three Pacific species and only *D. wilsoni* occurs in both oceans.

The cryptoniscus larval stages of an isopod found under the abdomen of the small male crab from stn DW 120 are the first record of such a parasite in this species, although McLAY (1991) recorded the cirripede *Poecilasma* sp. from a French Polynesian specimen.

Female *D. wilsoni* reach maturity at a size of CW = 12-14 mm and produce eggs of 0.7-0.8 mm diameter. The largest females, CW = 46 mm, have a clutch size of approximately 3500 eggs (see McLAY, 1991), and larval development involves only two zoeal stages (see HONG & WILLIAMSON, 1986, and TERADA, 1983). A full review of the biology of *Dromia wilsoni* can be found in McLAY (1988).

CAMOUFLAGE. — This species normally carries a sponge or ascidian cap, but larger crabs often do not have a piece of camouflage (see McLAY, 1991).

SIZE. — The largest male (CW = 47.7 mm) and female (CW = 33.3 mm) crabs from the collection do not extend the known size range for this species which is CW = 61.0 mm for males and CW = 49.1 mm for females.

DEPTH. — The specimen from 420 m (stn DW 460) does not exceed the known maximum depth of 520 m.

DISTRIBUTION. — The distribution of *D. wilsoni* includes all three of the world's major oceans and in the vicinity of New Caledonia, includes southern Australia and New Zealand. Its occurrence in the Philippine Islands confirms records from French Polynesia (McLAY, 1991) that *D. wilsoni* is common in tropical as well as temperate waters. In the Pacific, this species occurs on both sides of the equator.

Genus ***HALEDROMIA*** nov.

Dromia Zietz, 1887 : 299.

Carapace much wider than long, surface smooth very convex. Rostrum tridentate. Coxae of third maxillipeds separated by a narrow gap and inserted under tip of telson. Female sternal grooves end together on a large rounded tubercle between chelipeds. Cheliped with an epipod. Legs not knobbed or ridged, propodi and dactyli of first two pairs approximately equal in length. Fourth legs shorter than second. Segments of the last two pairs of legs flattened, dactyli opposed by single propodal spines, no spine on the outer propodal margin. Uropod plates on the abdomen vestigial and concealed. Joint between last two abdominal segments freely movable. Male abdominal locking mechanism involves tooth on bases of first legs against margin of penultimate segment.

TYPE SPECIES. — *Dromia bicavernosa* Zietz, 1887, by monotypy.

ETYMOLOGY. — The generic name *Haledromia* recognizes the substantial contribution of Herbert M. HALE to the study of Australian Brachyura.

DISCUSSION. — *Dromia bicavernosa* Zietz, 1887, from southern Australia is a very distinctive species, having, red, deep reniform cavities on either side of the rostrum, vestigial uropods, and a blunt tooth on the base of the first legs which is used in the abdominal locking mechanism. With this combination of features, this species does not belong in *Dromia* and it is necessary to establish a new genus (see Table 2).

The unusual carapace cavities on either side of the rostrum are not found among the other Dromiidae, but similar deep cavities, associated with the orbits, are found in *Sphaerodromia brizops* McLay & Crosnier, 1991, from the Seychelle Islands. In *Sphaerodromia* this character is regarded as only being important at the species level, and it would not be consistent to treat it as a generic character in *Haledromia*. The most important characters separating *Haledromia* from *Dromia* are the high CW/CL ratio (1.6, much larger than any recorded for species of *Dromia*, see FOREST, 1974), and the uropods : vestigial uropods (well developed and visible externally in *Dromia*).

H. bicavernosa has very large eggs (2.8 mm diam.) and may have direct development.

All the specimens of this large species (CW up to 93 mm) have been collected intertidally or from shallow coastal waters. It may have a similar shallow water distribution to *Dromia dormia*, another large dromiid crab.

DISTRIBUTION. — *Haledromia bicavernosa* nov. comb. is endemic to Australia.

Genus ***HEMISPHAERODROMIA*** Barnard, 1954

Cryptodromia- STEBBING, 1918 : 56.
Hemisphaerodromia Barnard, 1954 : 100. — LEWINSOHN, 1979 : 10; 1984 : 117.
Petalomera - KENSLEY, 1970 : 110.

Carapace wider than long, strongly convex, surface smooth, regions not defined, only branchial groove evident. Frontal region prominent, weakly tridentate, rounded eave-like margins, median tooth small, scarcely visible dorsally. No orbital teeth or fissure. Anterolateral margin evenly convex, bearing indistinct granules. Female sternal grooves end apart on tubercles just behind bases of first legs. Antennal exopod well developed. Coxae of third maxillipeds closely approximated and inserted under tip of sternum. Epipod on cheliped. First three pairs of pereiopods similar in length. Segments of first two pairs of legs lobed. Last two pairs of legs reduced, third pair shortest, fourth pair about three-quarters of carapace length when extended forward. Dactyli of these legs opposed by a propodal spine with another spine on the outer propodal margin. Abdomen of six free segments. Uropods well developed, visible externally, used in abdominal locking mechanism by fitting in front of serrated ridge on base of first leg. Telson wider than long, tip rounded.

TYPE SPECIES. — *Cryptodromia monodus* Stebbing, 1918, by monotypy.

DISCUSSION. — BARNARD (1954) erected this genus for male and female specimens from Madagascar. He noted that these specimens resembled *Sphaerodromia* Alcock, 1899, except that the last pair of legs were less robust, but longer than third pair, and almost as long as second pair, also the female sternal grooves end just behind bases of first legs. But it is only the shape of the carapace which resembles *Sphaerodromia*. Other features make *Hemisphaerodromia* closer to genera such as *Fultodromia* gen. nov. and *Stimdromia* gen. nov. (see Table 3).

Unfortunately, *Hemisphaerodromia abellana* Barnard, 1954, is a synonym for *Cryptodromia monodus* Stebbing, 1918. Indeed, another synonym for this species is *Petalomera laevis* Kensley, 1970. *Cryptodromia monodus* was described using a female from Durban, Natal, but inadequate illustrations and measurements meant that the species remained enigmatic and the name was never used by any other author. I have examined the type specimen in the British Museum (BM 1925: 12: 1: 227) in which the carapace is definitely wider than long, median rostral tooth is not prominent (contrary to STEBBING'S figure, his pl. 8), the cheliped definitely has an epipod, and the uropod plates are well developed (contrary to STEBBING'S figure). More accurate illustrations were provided by BARNARD (1954), KENSLEY (1970, except for his fig. 6h of the male abdomen in which the uropods are omitted) and LEWINSOHN (1979). BARNARD (1954) stated that the carapace of his type and paratype specimens was as wide as long but I have measured these specimens (MNHN-B 7849) and the carapace is definitely wider than long. This correction was confirmed by LEWINSOHN (1979, 1984). None of the previous authors have noted the presence of a small spine, at the base of the dactyl, on the outer propodal margin of the last two pairs of legs. These spines are present on some specimens, but not all, but they are present in both of BARNARD'S specimens. It is possible that these spines are frequently broken off and therefore easily overlooked.

The distinctive features of *Hemisphaerodromia* are the evenly rounded carapace shape, smooth surface and eave-like, uninterrupted frontal margin which is continuous to the suborbital lobe.

H. monodus usually carries camouflage caps made from compound ascidians, and lives in shallow waters, down to approximately 25 m. The largest known specimen is STEBBING'S female type, CW = 20.5 mm. BARNARD (1954) noted that the eggs are comparatively large, 1.3 mm diameter.

DISTRIBUTION. — The only known species occurs in the western Indian Ocean, and Red Sea, including the coast of South Africa.

CHARACTER	*Hemisphaero dromia*	*Fultodromia*	*Paradromia*	*Petalomera*	*Stimdromia*	*Frodromia*
Ratio CW/CL	Carapace width greater than length.	Carapace width less than length.	Carapace width greater than length.	Carapace width equal to or less than length.	Carapace width equal to or greater than length.	Carapace width less than length.
Carapace surface	Smooth.	Sparsely tuberculated.	Sparsely granulate. Regions well defined.	Granulate, may be areolate.	Smooth.	Finely granulate.
Rostrum	Weakly tri-dentate, teeth eave-like.	Tridentate, teeth broad, blunt.	Tridentate, teeth broad, rounded.	Tridentate, teeth eave-like, blunt.	Tridentate, teeth broad, blunt.	Tridentate, teeth small, acute.
Anterolateral margin	Indistinct granules.	Well developed teeth.	Teeth short, broad and blunt.	Teeth small, granulate.	Teeth well developed, blunt.	Numerous small granules.
Antenna	Distomedial corner of second seg-ment produc-ed. Exopod as long as third segment.	Distomedial corner of second seg-ment produc-ed. Exopod as long as third segment.	Distomedial corner of second seg-ment produc-ed. Exopod as long as third segment.	Distomedial corner of second seg-ment produc-ed. Exopod as long as third segment.	Distomedial corner of second seg-ment produc-ed. Exopod as long as third segment.	Distomedial corner of second seg-ment produc-ed. Exopod as long as third segment.
Sternal grooves	End apart behind first legs.	End apart between or behind chelipeds.	End apart between or behind first legs.	End apart between or behind first legs.	End apart between first legs.	End apart behind chelipeds. Blunt coxal tubercle beh-ind genital aperture which opens anteriorly.

Epipods/Podobranchs	Epipod on cheliped. No podobranchs on pereiopods.	Epipod on cheliped. No podobranchs on pereiopods.	Epipod on cheliped. No podobranchs on pereiopods.	Epipod on cheliped. No podobranchs on pereiopods.	Epipod on cheliped. No podobranchs on pereiopods.	Epipod on cheliped. No podobranchs on pereiopods.
First two pairs of legs	Segments distally lobed. No distal propodal spine.	Segments strongly nodular. No distal propodal spine.	Segments granulate, distal margins lobed. No distal propodal spine.	Meri and carpi petaloid (also on chelipeds). Segments may be granulated. No distal propodal spine.	Segments strongly knobbed or ridged (chelipeds similar). No distal propodal spine.	Segments not nodose. No distal propodal spine.
Last two pairs of legs	Third leg dactyl opposed by one propodal spine, and another spine on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, and another spine on outer propodal margin.	Third leg dactyl opposed by up to two propodal spines, and up to three spines on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by up to two propodal spines, and up to three spines on outer propodal margin.	Third leg dactyl opposed by one propodal spine, no spine on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, and one spine on outer propodal margin.	Third leg dactyl opposed by one propodal spine, no spine on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, and one spine on outer propodal margin.	Third leg dactyl opposed by one propodal spine, one spine on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, and one spine on outer propodal margin.	Third leg dactyl opposed by one propodal spine, no spine on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by two propodal spines, no spines on outer propodal margin.
Abdominal segments	No segments fused.	No segments fused.	No segments fused.	No segments fused.	No segments fused. Posterior corners of third to fifth segments bluntly produced.	No segments fused.
Uropods	Small, visible externally in both sexes.	Small, visible externally in both sexes.	Small, visible externally in both sexes.	Small, visible externally in both sexes.	Small, visible externally in both sexes.	Small, visible externally in male, concealed in female.
Telson	Rounded.	Rounded in female, bilobed in male.	Rounded or subtruncate.	Rounded or subtruncate.	Rounded, subtruncate or bilobed.	Rounded.
Male pleopods.	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.

TABLE 3. — Comparison of the key characteristics of the genera *Hemisphaerodromia* Barnard, 1954, *Fultodromia* gen. nov., *Paradromia* Balss, 1921, *Petalomera* Stimpson, 1858, *Stimdromia* gen. nov., *Frodromia* gen. nov.

Genus *FULTODROMIA* nov.

Dromia; - H. MILNE EDWARDS, 1837 : 170 (in part).
Cryptodromia Stimpson, 1858 : 225 (in part); 1907 : 172 (in part). — BAKER, 1907 : 180. — IHLE, 1913 : 32 (in part).
Petalomera - RATHBUN, 1923 : 154 (in part). — HALE, 1927 : 112 (in part).
Dromidiopsis - BALSS, 1935 : 113.

Carapace length greater than width, surface convex, sparsely tuberculate. Lateral rostral teeth prominent, anterolateral teeth well developed, bluntly tipped. Coxae of third maxillipeds closely approximated, but separated from tip of sternum by a deep trough. Female sternal grooves end apart on transverse ridge between or just behind chelipeds. Epipod on the cheliped. First two pairs of legs nodular, margins of dactyli armed with four spines. Last two pairs of legs reduced, third pair usually shortest, dactyli of these two legs opposed by up to two propodal spines with up to three spines on the outer propodal margin. Abdomen of six free segments. Uropod plates well developed, visible externally, used in the abdominal locking mechanism by fitting in front of a small tubercle on bases of first legs. Tip of male telson bilobed.

TYPE SPECIES. — *Dromia nodipes* Guérin-Méneville, 1832, by present designation.

OTHER SPECIES. — *Cryptodromia tumida* var. *spinifera* Montgomery, 1931.

ETYMOLOGY. — The generic name *Fultodromia* is formed by combining *Dromia* with the name of S.W. FULTON, in recognition of his contribution to the study of Australian Brachyura.

DISCUSSION. — LAMARCK (1818) was the first to use the name *Dromia nodipes* but did so without a description and so it was a *nomen nudum*. The first available publication of this name, accompanied by an illustration, is GUÉRIN-MÉNEVILLE (1832, pl. 14, fig. 1) and so he is the author of *Dromia nodipes*. H. MILNE EDWARDS (1837) referred to GUÉRIN's plate and gave the following description of *Dromia nodipes* : "Carapace bombée, et présentant de chaque côté une gouttière oblique, assez profonde entre les régions hépatiques, qui sont très grandes, et les branchiales qui sont très petites; beaucoup de petits tubercules sur la partie antérieure de la carapace. Front très large et divisé en trois dents, dont les deux latérales très larges et très avancées; une dent au-dessus de l'angle orbitaire interne, et une autre très saillante à l'angle orbitaire externe. Bords latéro-antérieurs convexes et armés de quatre dents, dont la première grosse, aplatie, saillante et arrondie; les deux suivantes médiocres, et la dernière rudimentaire. Pattes des trois premières paires hérissées de gros tubercules arrondis". Even though this species was illustrated, including the male pleopods by BROCCHI (1877), it has been ignored. Fortunately the female type specimen of *Dromia nodipes* Guérin-Méneville, 1832 (locality, Cap de Bonne Espérance), is in the collection of the Muséum national d'Histoire naturelle (MNHN-B 15). HENDERSON (1888) mentions (p. 9) examining this specimen. Neither LAMARCK, GUÉRIN-MÉNEVILLE, H. MILNE EDWARDS, nor HENDERSON give a locality for *D. nodipes* and it appears that "Cap de Bonne Espérance" was added at some later date. This term usually refers to the Cape of Good Hope, South Africa, but this cannot be accurate because no specimens even remotely resembling *D. nodipes* have ever been collected from South Africa. If there is any truth at all in the use of "Cap de Bonne Espérance" then it must refer to Port Esperance, Esperance Bay, or Esperance Point all in South Australia. The only other known specimens of *D. nodipes* all come from the south-western coasts of Australia. Thus the exact type locality of this species is unknown but is most likely somewhere in South Australia.

Comparison of the type of *Dromia nodipes* with specimens of *Cryptodromia depressa* Baker, 1907 [not of BROCCHI, 1877, until now known as *Petalomera depressa* (Baker, 1907)] from the Western Australia Museum shows that these are the same species and so BAKER'S name is no longer necessary. Similarly, I have examined the type specimen of *Dromidiopsis michaelseni* Balss, 1935 (Zoologisches Institut and Museum, Hamburg, registration number, K-11578), which was not accurately illustrated. This species is also a synonym of *Petalomera depressa*. Examination of a range of specimens from the Western Australian Museum shows that *P. depressa* is a very variable species, particularly in the size and arrangement of the anterolateral teeth, and the density of tubercles around the frontal region.

Figures of this species were first published by GUÉRIN-MÉNEVILLE (1832) and a photograph by HALE (1927). The inadequate illustrations of BALSS (1935) meant that the name *Dromidiopsis michaelseni* was never subsequently used.

The most distinctive features of *Fultodromia* gen. nov. are the sparse rounded granules on the carapace, which also ornament the bluntly rounded anterolateral teeth, carapace length greater than width, and the presence of multiple propodal spines associated with the dactyli of the last two pairs of legs (see Table 3).

DISTRIBUTION. — Both species in this new genus are known only from Western Australia, and so it is an Australian endemic.

Key to the species of *Fultodromia*

— Carapace ornamented with large tubercles which also adorn the anterolateral teeth, outer propodal margins of last two pairs of legs armed with three spines .... *Fultodromia nodipes* (Guérin-Méneville, 1832) nov. comb.

— Carapace sparsely covered with small tubercles, anterolateral teeth not adorned, outer propodal margins of last two pairs of legs armed with up to two spines .... *Fultodromia spinifera* (Montgomery, 1931) nov. comb.

Genus *PARADROMIA* Balss, 1921

Cryptodromia - HENDERSON, 1888 : 5 (in part). — IHLE, 1913 : 32 (in part). — MONTGOMERY, 1931 : 413.
Paradromia Balss, 1921 : 178; 1922 : 108.
Petalomera - SAKAI, 1936 : 28 (in part); 1976 : 20 (in part). — TAKEDA & MIYAKE, 1970 : 203 (in part). — DAI & YANG, 1991 : 25 (in part).

Carapace width greater than length, subpentagonal in outline, surface convex, granulate, regions well defined. Frontal and branchial grooves especially evident. Rostrum prominent, tridentate, teeth bluntly rounded. Anterolateral teeth short, broad, and blunt. Supraorbital margin scarcely overhanging eye, suborbital margin blunt, visible dorsally. Small tooth above anterolateral margin and close to postorbital corner. Antennal exopod well developed. Coxae of third maxillipeds closely approximated, but separated from tip of sternum by a deep trough. Female sternal grooves end apart on low tubercles between or behind bases of first legs. Cheliped with an epipod. First two pairs of legs lobed, inner margins of dactyli armed with up to six small spines. Last two pairs of legs reduced, third pair shortest. Dactyl of third leg opposed by a propodal spine. Dactyl of fourth leg opposed by a propodal spine and there may be another spine on the outer propodal margin. Abdomen of six free segments. Uropod plates well developed, visible externally. Telson wider than long, tip subtruncate in male, obtusely rounded in female.

TYPE SPECIES. — *Cryptodromia japonica* Henderson, 1888, by present designation.

OTHER SPECIES. — *Petalomera sheni* Dai, Yang, Song & Chen, 1981.

DISCUSSION. — BALSS (1921) erected *Paradromia* and included two species : *Cryptodromia japonica* Henderson, 1888, and *Dromia lateralis* Gray, 1831. Although he did not designate a type species, it is evident that BALSS was trying to accommodate *Cryptodromia japonica* from Japan. The inclusion of *Dromia lateralis* was as a result of BORRADAILE (1903a) pointing out that this species, which had been known as *Cryptodromia lateralis*, had an epipod on the cheliped. In fact BORRADAILE transferred this species to *Petalomera* Stimpson, 1858. Subsequently, only HALE (1925) used the combination *Paradromia lateralis*. However, this species does not belong in *Paradromia* or *Petalomera*, and should be placed in a new genus (see below). Thus, the type species of *Paradromia* must be *Cryptodromia japonica* Henderson, 1888.

BALSS never gave a definition of *Paradromia*, but simply separated the type species from *Cryptodromia* because it had an epipod on the cheliped. Thus, the above generic definition is the first detailed statement of the characteristics of this genus. Synonyms of *Paradromia japonica* include *Cryptodromia stearnsii* Ives, 1891, *C. canaliculata* var. *ophryoessa* Ortmann, 1892, and *C. asiatica* Parisi, 1915.

SHEN (1931) identified some specimens from North China as *Petalomera granulata* Stimpson, 1858, but SAKAI (1965) reassigned them to *Petalomera japonica*. DAI, YANG, SONG, and CHEN (1981) reexamined the material and assigned it to a new species, *Petalomera sheni* Dai, Yang, Song, & Chen, 1981. *P. sheni* closely resembles, but is different from *Paradromia japonica*, and should be included in *Paradromia* Balss, 1921.

Neither *Petalomera japonica* nor *P. sheni* have petaloid meri on the first three pairs of pereiopods and so they cannot belong to *Petalomera*. Also the bluntly rounded features of the carapace in *Paradromia* are distinctive (see Table 3).

HONG and WILLIAMSON (1986) compared the larval stages of *Paradromia japonica* (as *Petalomera japonica*) and *Dromia wilsoni* (as *Petalomera wilsoni*) and concluded that they should be placed in separate genera. My generic revision, based on the adults, confirms this conclusion.

DISTRIBUTION. — *Paradromia* is a West Pacific genus : *P. japonica* has been recorded from China, Japan, Korea, Indonesia, and North West Australia, but *P. sheni* is only known from China. HONG and WILLIAMSON (1986) have described the larval development of *P. japonica* based on material from Korea. The record of *P. japonica* from Funafuti Atoll, Ellice Islands, by WHITELEGGE (1897) is doubtful.

Key to the species of *Paradromia*

— Carapace surface sparsely granular, suborbital tooth compressed and oriented obliquely ... . *Paradromia japonica* (Henderson, 1888)

— Carapace densely granular, suborbital tooth conical .... *Paradromia sheni* (Dai, Yang, Song, & Chen, 1981) nov. comb.

Genus *PETALOMERA* Stimpson, 1858

Petalomera Stimpson, 1858 : 226; 1907 : 179. — ALCOCK, 1900 : 147; 1901 : 55. — BORRADAILE, 1903a : 300 (in part). — IHLE, 1913 : 48. — SAKAI, 1936 : 28 (in part); 1965 : 9; 1976 : 20 (in part). — BARNARD, 1950 : 312. — McLAY, 1991 : 474. — DAI & YANG, 1991 : 25 (in part).
Cryptodromia - ORTMANN, 1894 : 34 (in part). — IHLE, 1913 : 32 (in part).

Carapace width about equal to or less than length, surface slightly convex, granulated and may be areolate. Lateral rostral teeth prominent, anterolateral teeth small. Antennal segments granulated, lateral margin of second segment convex, exopod well developed. Coxae of third maxillipeds closely approximated and separated from tip of sternum by a deep trough. Female sternal grooves end apart between or behind base of first legs. Cheliped with an epipod. Chelipeds and first two pairs of legs with petaloid meri, carpi and propodi may be crested. Legs not knobbed, inner margins of dactyli of first two pairs armed with up to seven small spines. Last two pairs of legs reduced, third pair shortest, dactyli opposed by single propodal spines with sometimes another spine on the outer propodal margin. Abdomen of six free segments. Uropod plates well developed, visible externally, used in abdominal locking mechanism by fitting in front of large tuberculate knob on bases of first legs. Telson wider than long, tip bluntly rounded.

TYPE SPECIES. — *Petalomera granulata* Stimpson, 1858, by original designation and monotypy.

OTHER SPECIES. — *Petalomera pulchra* Miers, 1884.

DISCUSSION. — The original definition of the genus *Petalomera* Stimpson, 1858, was as follows : "Carapax oblongus, convexus, epimeris post suturam membranaceis. Palatum utrinque colliculo instructum. Foeminae sterni sulci — ? Meri pedum sex anticorum laminato-dilatati. Chelipedum digiti apicibus cornei, cochleariformes. Pedes 4 postici iis *Dromiœ* similes". This genus has been expanded from the original form by BORRADAILE (1903a) as follows : "Dromiidae with an epipodite on the chelipeds, the walking legs bearing sharp ridges, the carapace varying in the relation of its length to its breadth, but usually broader than long, the regions clearly or indistinctly marked, the efferent branchial channels well made, the sternal grooves of the female ending apart behind the cheliped segment, the fifth leg shorter than the third, and without a thorn on the outer side of its last joint".

The most distinctive feature of the type species, *P. granulata* Stimpson, 1858, is the petaloid meri on the chelipeds and first two pairs of legs. Indeed, this character is the basis of the name for this genus and it is unfortunate that it was omitted by BORRADAILE (1903a) from his generic definition when it was part of STIMPSON'S definition. The only other species which fits this generic concept is *P. pulchra* Miers, 1884. RATHBUN (1923a) transferred *Cryptodromia lamellata* Ortmann, 1894, to the genus *Petalomera* but it lacks truly petaloid meri and belongs in *Stimdromia* gen. nov.

It is clear that most authors have followed BORRADAILE'S generic definition because most species assigned to *Petalomera* do not fit the original definition of STIMPSON. Both ALCOCK (1900) and BARNARD (1950) included the petaloid meri character in their definition of the genus, but did not allow the absence of such meri to exclude some species. ALCOCK also included a granular carapace as being an essential feature.

It is apparent that the species assigned to *Petalomera* should have petaloid meri, granular carapace, and sternal grooves ending apart behind the chelipeds which bear an epipod (see Table 3). I think that *Petalomera* should be restricted to the original concept and the remaining species assigned to existing or to new genera.

Of the nineteen species (*Petalomera angulata* Sakai, 1936, *P. atypica* Sakai, 1936, *P. atypica reticulata* Sakai, 1974, *Cryptodromia depressa*, Baker, 1907, *Petalomera fukuii*, Sakai, 1936, *P. granulata* Stimpson, 1858, *P. indica*, Alcock, 1901, *Cryptodromia japonica*, Henderson, 1888, *Petalomera kosugei* Takeda & Miyake, 1972, *P. laevis* Kensley, 1970, *Cryptodromia lamellata* Ortmann, 1894, *Dromia lateralis*, Gray, 1831, *Petalomera longipedalis* Dai, Yang, Song, & Chen, 1986, *P. longipes* Ihle, 1913, *P. nodosa* Sakai, 1936, *P. pulchra* Miers, 1884, *P. sheni* Dai, Yang, Song, & Chen, 1981, *Cryptodromia wilsoni* Fulton & Grant, 1902, *Petalomera yamashitai* Takeda & Miyake, 1970) which have been assigned to *Petalomera* the only ones which remain are *P. granulata*, and *P. pulchra*. Even to include these species it has been necessary to modify BORRADAILE'S interpretation of *Petalomera* by noting that there may be a propodal spine on the outer margin of the last legs, and that the meri of the chelipeds and first two pairs of legs are ridged or petaloid. The above definition contains the essential characters of STIMPSON (1858) and has been expanded to encompass important features not originally considered.

DISTRIBUTION. — *P. granulata* occurs off Japan, China, and also the Andamans and Sri Lanka (as *P. indica* Alcock, 1901). *P. pulchra* has been recorded from North Australia and Indonesia. Thus this restricted concept of *Petalomera* shows that the genus is so far known only from the vicinity of India, Indonesia, and includes the Western Pacific from northern Australia to Japan. With the following specimens the distribution now includes New Caledonia.

Key to the species of *Petalomera*

(Species studied in this paper are in bold)

— Carapace surface granulate, two small anterolateral teeth .... ***Petalomera pulchra*** Miers, 1884

— Carapace surface granulate and areolate, three small anterolateral teeth .... *Petalomera granulata* Stimpson, 1858

Petalomera pulchra Miers, 1884

Fig. 17 a-b

Petalomera pulchra Miers, 1884 : 260, pl. 27, fig. A. — IHLE, 1913 : 48.
Petalomera longipes Ihle, 1913 : 49, pl. 2, fig. 12.

MATERIAL EXAMINED. — **New Caledonia.** LAGON : stn 247, 22°24.0'S, 166°50.9'E, 43 m, 24.10.1984 : 1 ♀ 13.9 x 14.1 mm. — Stn 403, 22°34.5'S, 167°17.5'E, 46-44 m, 23.01.1985 : 1 ♀ (ovig.) 19.9 x 20.6 mm. — Stn 465, 18°22.1'S, 163°05.0'E, 45 m, 1.03.1985 : 1 ♂ 7.3 x 7.7 mm. — Stn 522, 19°08.2'S, 163°38.2'E, 42 m, 5.03.1985 : 1 ♂ 10.9 x 11.4 mm. — Stn 539, 19°05.0'S, 163°17.3'E, 240 m, 6.03.1985 : 1 ♀ 5.5 x 6.0 mm. — Stn 626, 21°57.9'S, 166°52.5'E, 47-48 m, 6.08.1986 : 1 ♂ 8.1 x 8.8 mm. — Stn 709, 21°22.2'S, 166°03.5'E, 39-40 m, 10.08.1986 : 1 ♀ 10.3 x 10.6 mm. — Stn 716, 21°22.1'S, 165°58.9'E, 30 m, 11.08.1986 : 1 ♀ 9.4 x 9.7 mm. — Stn 724, 21°19.7'S, 165°57.8'E, 36-38 m, 12.08.1986 : 1 ♀ 9.4 x 9.7 mm. — Stn 1015, 20°10.1'S, 163°51.6'E, 25 m, 3.04.1988 : 1 ♀ (ovig.) 15.4 x 16.0 mm. — Stn 1087, 19°48.3'S, 163°59.5'E, 24 m, 24.10.1989 : 1 ♂ 10.0 x 10.5 mm; 1 ♀ 9.5 x 10.0 mm. — Stn 1168, 19°15.9'S, 163°09.3'E, 50 m, 30.10.1989 : 1 ♂ 5.2 x 5.5 mm.

Chesterfield Islands. CHALCAL 1 : stn DC 10, 20°36.09'S, 161°05.82'E, 87 m, 15.07.1984 : 1 ♀ 8.0 x 8.3 mm. — Stn DC 12, 20°31.33'S, 161°06.51'E, 80 m, 15.07.1984 : 1 ♂ 15.0 x 15.9 mm. — Stn CP 12, 20°35.30'S, 158°47.40'E, 67 m, 23 July, 1984 : 2 ♂♂ 6.2 x 6.7, 20.8 x 22.5 mm; 2 ♀♀ (ovig.) 16.2 x 16.9, 17.3 x 18.0 mm; 1 ♀ 10.2 x 10.5 mm. — Stn DC 43, 20°41.50'S, 158°38.40'E, 78 m, 23.07.1984 : 1 ♀ 16.6 x 17.4 mm. — Stn DC 50, 21°4.40'S, 158°40.70'E, 70 m, 24.08.1984 : 1 ♀ (ovig.) 10.5 x 10.8 mm. — Stn CP 14, 21°13.50'S, 158°50.20'E, 66 m, 24.07.1984 : 1 ♀ 22.5 x 18.1 mm. — Stn DC 53, 21°19.50'S, 158°55.30'E, 60 m, 24.07.1984 : 1 ♂ 13.6 x 14.1 mm; 1 ♀ 16.8 x 17.1 mm, bopyrid (Isopoda) parasite in right gill chamber. — Stn CP 15, 21°24.90'S, 159°9.30'E, 60 m, 25.07.1984 : 1 ♀ (ovig.) 19.0 x 19.4 mm. — Stn CP 16, 21°41.67'S, 159°21.92'E, 53 m, 25.07.1984 : 1 ♂ 15.0 x 16.2 mm. — Stn DC 61, 21°42.40'S, 159°29.00'E, 50 m, 26.07.1984 : 1 ♀ 7.1 x 7.0 mm.

CORAIL 1 : stn unknown : 1 ♂ 18.0 x 19.2 mm.

CORAIL 2 : stn DW 21, 20°36.14'S, 161°01.75'E, 86 m, 22.07.1988 : 1 ♂ 6.2 x 6.0 mm. — Stn CP 27, 20°21.29'S, 160°58.60'E, 75 m, 22.07.1988 : 1 ♀ 8.5 x 9.0 mm, carrying a compound ascidian cap. — Stn DW 34, 19°21.62'S, 158°55.77'E, 47 m, 23.07.1988 : 1 ♂ 6.6 x 7.3 mm. — Stn DW 73, 19°12.11'S, 158°22.57'E, 41 m, 25.08.1988 : 1 ♀ 9.6 x 10.7 mm. — Stn DW 125, 19°28.05'S, 158°24.39'E, 54 m, 29.08.1988 : 1 ♂ 9.8 x 10.0 mm. — Stn DW 140, 19°33.89'S, 158°23.89'E, 57 m, 30.08.1988 : 1 ♀ (ovig.) 6.7 x 7.2 mm. — Stn DW 154, 19°52.04'S, 158°26.50'E, 35 m, 1.09.1988 : 2 ♂♂ 7.3 x 7.2, 11.2 x 10.7 mm; 1 ♀ (ovig.) 10.6 x 11.5 mm. — Landsdowne Bank, stn unknown, depth unknown, August, 1988 : 1 ♀ 11.8 x 11.6 mm.

DESCRIPTION. — Carapace as long or longer than wide, slightly convex, covered with small rounded granules, sparsely pubescent with a few longer setae fringing limbs. Frontal groove well marked, separating a pair of low rounded protuberances behind rostrum. Cervical groove distinct, branchial groove less well marked. Urogastric region well defined, crescent shaped with branchiocardiac groove curving back from this area. Rostrum tridentate, all teeth serrated and horizontally directed, median tooth small and on a lower level, lateral teeth eave-like separated by a U-shaped sinus. Anterolateral margin of carapace begins at level of postorbital corner, two similar granulated teeth separated by cervical groove, no posterolateral tooth although there are several granules along margin behind second anterolateral tooth.

A small supraorbital tooth followed by a distinct notch and a curved, flange-like postorbital tooth. A narrow fissure separates suborbital margin which has a single, central, acute tooth.

First segment of antenna wider than long, oblong, beaked medially, not gaping, upper lobe of beak curved. Second segment much longer than wide, scattered small granules, a central distal tubercle, distomedial corner produced as a curved blunt spine on which third segment is inserted at an angle. Exopod firmly fixed with a central longitudinal furrow, tip reaching as far as joint between third and fourth segments, only slightly bilobed, inner lobe longest and curving over base of eyestalk. Epistome triangular, flat, apex and lateral margins adorned with large granules.

Subhepatic region convex, granulated with a single granulated tubercle which is visible dorsally. A similar granulated tooth at corner of buccal frame and a distinct groove curving around under anterolateral margin towards branchial groove. Female sternal grooves end well apart on tubercles situated just behind base of first legs.

Chelipeds well developed, longer in male. Merus trigonal, inferior borders granulated, superior border petaloid, inner surface nacreous. Carpus convex, minutely granulated, two strong distal tubercles, inner margin of upper border with four-five sharp granules. Propodus outer face lined with one or more longitudinal rows of small granules, inner margin of upper border with four-five sharp granules. Fingers short, downcurved, hollowed out internally, gaping in male, armed with seven-eight teeth, which increase in size distally.

First two pairs of legs shorter than chelipeds. Meri petaloid as for chelipeds, especially merus of first leg. Carpi and propodi tend to be flattened, distal borders bluntly lobed, dactyli as long as propodi, inner margins armed with six-seven short spines all of similar size.

Last two pairs of legs reduced, third pair smallest, both subdorsal. Dactyl of third leg opposed by a single propodal spine. Dactyl of fourth leg also opposed by a single spine with another spine on outer propodal margin at base of dactyl.

Abdomen of six free segments. Telson wider than long, tip truncate in male, bluntly rounded in female. Uropod plates well developed and visible externally. Abdominal segments covered in small rounded granules similar to carapace. Abdominal locking mechanism consists of uropod plates fitting in front of very prominent serrated boss on bases of first legs.

First male pleopod, stout, a semi-rolled setose tube with a sharp horny tip; second pleopod simple, needle-like.

DISCUSSION. — In the *"Siboga"* collection, IHLE (1913) had one ovigerous female which he referred to *P. pulchra* and one smaller male which he named *P. longipes*. Comparison of the type specimen of *Petalomera longipes* Ihle, 1913, from Indonesia, with MIERS' description shows that it is a synonym of *P. pulchra* Miers, 1884, which came from Prince of Wales Channel, Torres Strait, north Australia. The differences between these two species are attributable to sexual dimorphism.

The collection included eight ovigerous females CW = 6.7-19.9 mm whose clutch size ranged from 120-1278 eggs respectively, mean = 526 eggs (diam. = 0.7 mm). Egg-bearing females occurred in January, April, and from July to September, when newly laid eggs were recorded. Although the smallest ovigerous female had a CW = 6.7 mm, other females up to CW = 11.8 mm still had an immature abdomen, with the abdominal locking mechanism still functional. The moult to maturity evidently occurs over a wide size range and some females reach maturity at a very small size (see *Lauridromia intermedia* for comparison)..

A female, CW = 16.8 mm, from station D 53, 60 m depth, contained a bopyrid (Isopoda) parasite in its right gill chamber which was swollen and distorted. An egg-laden female (7.5 mm long) was attached to the gills and attached to her was a small male (2.2 mm long). This is the first record of a bopyrid parasite from a known dromiid host.

SIZE. — Until now only four specimens of *P. pulchra* have been recorded, three females (maximum CW = 18.0 mm, one ovigerous CW = 11.5 mm) and one male (CW = 8.5 mm) and yet this species is the second most abundant dromiid in the New Caledonian fauna. The size range for males CW = 5.2-20.8 mm, and females CW = 5.5-22.5 mm, in the New Caledonian collection, increases the maximum size for both sexes.

DEPTH. — The previously known depth range (7-45 m) of *P. pulchra* is increased to 86 m by the present collection. One sample from stn 539 (LAGON) contained a small female which supposedly came from a depth of 240 m, but the rest came from 25-86 m and it seems likely that this deep record may be an error or contamination from a previous shallow sample.

CAMOUFLAGE. — *P. pulchra* has not been recorded as carrying camouflage material but a female CW = 8.5 mm, from stn CP 27 (CORAIL 2), 75 m depth, carried a small fragment of a compound ascidian which only covered the rear half of its carapace. All the other specimens did not have any covering.

DISTRIBUTION. — The distribution of *P. pulchra* includes Indonesia, Northeast Australia (Prince of Wales Channel), and now New Caledonia.

Genus *STIMDROMIA* nov.

Petalomera - BORRADAILE, 1903a : 300 (in part). — SAKAI, 1936 : 28 (in part); 1965 : 9 (in part); 1976 : 20 (in part). — TAKEDA & MIYAKE, 1972 : 254. — DAI & YANG, 1991 : 25 (in part).
Cryptodromia - IHLE, 1913 : 32 (in part).

Carapace as wide or wider than long, convex, surface smooth or finely granulated. Rostrum tridentate, lateral rostral teeth prominent. Anterolateral teeth well developed, blunt. Antennal exopod well developed. Coxae of third maxillipeds close together or separated by triangular extension from tip of sternum. Female sternal grooves end apart on small tubercles between base of first legs. Cheliped with an epipod. First two pairs of legs strongly knobbed, may be ridged, inner margins of dactyli armed with three-four small spines. Last two pairs of legs reduced, third pair shortest. Dactyli of both legs opposed by a single propodal spine and there may be another spine on the outer propodal margin. Abdomen of six free segments. Uropod plates well developed, visible externally, used in the abdominal locking mechanism by fitting in front of large serrated tubercles on the bases of the first legs. Distolateral corners of third to fifth abdominal segments produced as blunt tubercles. Male telson tends to be truncated or bilobed.

TYPE SPECIES. — *Dromia lateralis* Gray, 1831, by present designation.

OTHER SPECIES. — *Petalomera angulata* Sakai, 1936, *Petalomera kosugei* Takeda & Miyake, 1972, *Cryptodromia lamellata* Ortmann, 1894, *Petalomera longipedalis* Dai, Yang, Song, & Chen, 1986.

ETYMOLOGY. — The generic name *Stimdromia* recognizes the valuable contribution to the study of dromiid crabs made by W. STIMPSON who created most of the early generic names in this family. His name is combined with *Dromia* to create the new genus.

DISCUSSION. — A distinctive feature of the species in this genus is the tubercular or nodular chelipeds and first two pairs of legs. This feature, combined with the nature of the sternal grooves, carapace shape, smooth carapace surface, presence of an epipod on the cheliped, and the absence of petaloid meri on the first three pairs of pereiopods make this genus different from *Petalomera* Stimpson, 1858, *Paradromia* Balss, 1921, *Fultodromia* gen. nov., and *Frodromia* gen. nov. (see Table 3).

Dromia lateralis Gray, 1831, was described, briefly, on the basis of a specimen from Australia. The species *Dromia verrucosipes* White, 1847, from the Philippines, was listed without a description and treated as a synonym of *Cryptodromia lateralis* (Gray, 1831) by HENDERSON (1888). However these species are not the same and *Dromia verrucosipes* is an undescribed species of *Stimdromia.* This undescribed species is not dealt with in this paper and is not included in the key. The only known specimen, purchased from Mr H. CUMING, is held by the British Museum (see WHITE, 1847).

The species until now known as *Petalomera lamellata* (Ortmann, 1894) is also included in *Stimdromia*. It is closely related to *S. lateralis* and GRIFFIN (1972) has listed the major differences between the two species.

One species, *S. lateralis*, from Australia, has direct development (HALE, 1925, MONTGOMERY, 1922).

DISTRIBUTION. — The distribution of the species belonging to *Stimdromia* includes the Andaman Islands, Indonesia, Australia, New Caledonia, Samoa, Philippines, China and Japan, i.e. the Indo-West Pacific area.

Key to the species of *Stimdromia*

(Species studied in this paper are in bold)

1. Carapace approximately as wide as long 2
— Carapace significantly wider than long 3

2. Anterolateral margin armed with four teeth, first and third strongest, distolateral corners of third to fifth abdominal segments produced as distinct lobes ....
.... ***Stimdromia angulata*** (Sakai, 1936) nov. comb.
— Anterolateral margin armed with two similar teeth, distolateral corners of third to fifth abdominal segments angular .. *Stimdromia kosugei* (Takeda & Miyake, 1972) nov. comb.

3. Carapace very convex, anterolateral margin broadly rounded, armed with three small teeth, tending to increase in size from first to last, lateral cardiac groove not deeply marked.............. *Stimdromia longipedalis* (Dai, Yang, Song & Chen, 1986) nov. comb.
— Carapace not strongly convex, anterolateral margin angular, armed with two prominent teeth **4**
4. Sub-hepatic region bearing a strong, blunt tubercle, inner surface of male cheliped propodus entirely covered by dense pubescence, outer surface smooth, ridges of carpi and propodi of first two legs poorly developed .... *Stimdromia lateralis* (Gray, 1831) nov. comb.
— Sub-hepatic region bearing a low, straight ridge, inner surface of male cheliped propodus with dense pubescence distally only, outer surface granular, ridges of carpi and propodi of first two legs well developed, cristate.. .... *Stimdromia lamellata* (Ortmann, 1894) nov. comb.

Stimdromia angulata (Sakai, 1936) nov. comb.

Fig. 16 f

Petalomera angulata Sakai, 1936 : 29, text fig. 7; 1965 : 11, pl. 5, fig. 2; 1976 : 21, pl. 5, fig. 3. — SUZUKI & KURATA, 1967 : 95. — TAKEDA, 1977 : 73.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn CP 134, 12°01.1'N, 121°57.3'E, 92-95 m, 5.06.1985 : 1 ♀ (ovig.) 7.8 x 7.6 mm.

DESCRIPTION. — Carapace slightly wider than long, evenly convex, surface smooth under sparse, short, fine tomentum. Frontal, branchial and cardiac grooves only faintly marked. Rostrum tridentate, teeth prominent, blunt, all of similar size. Median tooth on a lower level, slightly deflexed, lateral teeth directed anterovertically. Anterolateral margin begins at level of postorbital corner. Three equidistant, blunt, teeth, first strongest, second smallest, tip may be slightly bilobed. Small posterolateral tooth behind branchial notch.

Supraorbital margin eave-like, supraorbital tooth well developed, postorbital corner bluntly produced. A shallow fissure separates the suborbital margin which has a strong tooth at its inner corner, visible dorsally.

First segment of antenna much wider than long, beaked medially, gaping, upper lobe shorter. Second segment much longer than wide, a prominent central distal tubercle, distomedial corner bluntly produced, on which the third segment is inserted at an angle. Exopod firmly fixed, extending as far as joint between third and fourth segments, tip bilobed, inner lobe narrower and curving over base of eyestalk. Epistome triangular, slightly concave.

A strong subhepatic tubercle visible dorsally close to and below postorbital corner with another tubercle lower down just above the groove which runs around under anterolateral margin. A small tubercle at corner of buccal frame. Female sternal grooves convergent, but ending apart on small tubercles between bases of first legs.

Chelipeds elongate, lightly built. Merus trigonal, borders unarmed except for a small distal tubercle on superior margin. Carpus and propodus heavily tuberculated. Carpus with four small tubercles on inner margin, another four similar tubercles on outer surface as well as three stronger distal tubercles. Inner face of propodus densely tomentose, superior margin has three small tubercles, three more on upper face and a strong tubercle at base of dactyl and five tubercles scattered over outer face. Fingers gaping basally, slightly downcurved, hollowed out internally, armed with seven small interlocking teeth.

First two pairs of legs slightly shorter than chelipeds, heavily tuberculated. Meri have a strong tubercle midway along posterior inferior margin. Carpi with four strong tubercles along superior margin, distal tubercle strongest, and two tubercles on posterior inferior margin. Propodi with two tubercles on superior margin, distal tubercle strongest, two similar tubercles on posterior margin. Dactyli as long as propodi, strongly curved at tips, inner margin armed with four small spines increasing in size distally. On the posterior face of dactyli there is a pearl-like tubercle which articulates with the penultimate segment.

Last two pairs of legs reduced, non-tuberculate, third pair shortest, fourth pair subdorsal. Dactyli on both legs strongly curved, opposed by a single propodal spine with another smaller spine on outer propodal margin.

Abdomen of six free segments, uropod plates well developed, visible externally. Telson wider than long, tip rounded in female, subtruncate in male. Central ridge of abdominal segments four-six adorned with a pair of distal tubercles (pair on the fourth segment largest), and a broader proximal swelling. Distolateral corners of segments three-five produced as blunt tubercles (only weakly on third segment). In this way segments four and five have a row of four distal tubercles, one at each corner and a pair in the middle. Abdominal locking mechanism consists of uropod plates fitting in front of serrated ridge on bases of first legs.

Details of male pleopods unknown.

DISCUSSION. — SAKAI (1936) described *Petalomera angulata* as having four anterolateral teeth on the carapace, obviously treating the second tooth as representing two teeth. This tooth is smaller, only slightly bilobed at the tip and without proper separation between the lobes extending to the carapace margin. Thus there is only a single tooth involved and the total number of anterolateral teeth is only three. Otherwise the description given above is largely in agreement with that given by SAKAI. With the present specimen a total of twenty three crabs (including nine females) have been reported, but the nature of the female sternal grooves have not been recorded. In the present female, which is ovigerous, the grooves are convergent but ending apart on small tubercles between the first legs.

The eggs carried by the Philippine female, CW = 7.8 mm, are 1.1 mm diameter and there are only twenty four, which means that *Stimdromia angulata* has a reproductive strategy incorporating a small number of relatively large eggs. Nothing has been recorded about the reproductive status of females collected from Japan. An Australian species in this genus, *S. lateralis*, also has large eggs (1.14 mm diameter) and development is direct (MONTGOMERY, 1922; HALE, 1925). The development of *S. angulata* is unknown but may also be direct.

CAMOUFLAGE. — SAKAI (1936) recorded the male holotype as carrying a sponge cap.

SIZE. — The largest crab reported is the holotype male CW = 12.0, CL = 11.5 mm, but the only female size known is the Philippine specimen, CW = 7.8 mm. However, it would appear that *S. angulata* is a small dromiid crab.

DEPTH. — Previous depths are from the low intertidal down to 50 m. Several of the Japanese specimens have been obtained from lobster pots. With the Philippine specimen, the depth range is extended down to 95 m. In shallow water this crab is found in rocky areas and on coral reefs (*Madrepora*) but the habitat of the Philippine specimen is unknown.

DISTRIBUTION. — Until now *Stimdromia angulata* has been known only from Japanese waters. The distribution has now been extended to the Philippines.

Genus ***FRODROMIA*** nov.

Petalomera - SAKAI, 1936 : 28 (in part); 1974 : 87; 1976 : 20 (in part).

Carapace longer than wide, convex, covered with small granules hidden under a short fine tomentum. Lateral borders of carapace sub-parallel, granulated. Rostrum tridentate, teeth acute. Antennal exopod well developed. Coxae of third maxillipeds closely approximated and inserted on tip of sternum. Female sternal grooves end apart on prominent tubercles behind chelipeds. Cheliped with an epipod, granulated. First two pairs of legs without adornment, inner margins of dactyli armed with up to ten small spines. Last two pairs of legs much smaller than first two pairs, dactyli opposed by one or two propodal spines. Abdomen of six free segments. Telson rounded. Uropod plates well developed, visible externally in male (concealed in female), used in the abdominal locking mechanism by fitting in front of serrated flange on the bases of the first legs. Female genital opening located on the anterior border of the coxal segment of the second leg, and directed anteriorly, with a blunt tubercle behind the genital opening

TYPE SPECIES. — *Petalomera atypica* Sakai, 1936, by present designation.

OTHER SPECIES. — *Petalomera reticulata* Sakai, 1974.

ETYMOLOGY. — The generic name *Frodromia* is formed by combining the name of Frodo Baggins, one of the Hobbits of Bag End, a character from J. R. R. TOLKIEN's "Lord of the Rings", and *Dromia.*

DISCUSSION. — As explained earlier, an essential character of *Petalomera* is the presence of petaloid meri on the first three pairs of pereiopods, and therefore *P. atypica* and *P. reticulata* cannot belong to this genus. Distinctive features of this genus are the carapace shape, finely granulated surface, uropods dissimilar in males and females, location of the female genital opening, and presence of an unusual tubercle behind the genital opening (see Table 3).

On the basis of three specimens (two males and one female), from Japan, depth 100-150 m, SAKAI (1974) described a subspecies, *Petalomera atypica reticulata*, which differs from the typical form in having a coarse network of purplish colouration on the carapace and abdomen. However there seem to be some major differences from the typical form : the illustration in SAKAI (1976, pl. 5, fig. 1) has remarkably small eyes, no evidence of teeth or granules on the anterolateral margins, carapace width approximately equal to carapace length (but according to the dimensions given, CW/CL = 0.9). Also the figure supposedly shows a male and yet it seems to have a female abdomen. There are also supposed to be differences in the rostral teeth but these are not confirmed by comparison of the illustrations of the two forms. Thus it is likely that two different species are involved, although several morphological details remain to be established.

DISTRIBUTION. — Previously known only from Japan, but now recorded from New Caledonia.

Key to the species of *Frodromia*

(Species studied in this paper are in bold)

— Carapace longer than wide, anterolateral margin granulated .... ***Frodromia atypica*** (Sakai, 1936) nov. comb.

— Carapace approximately as long as wide, anterolateral margin without teeth or granules .. .. *Frodromia reticulata* (Sakai, 1974) nov. comb.

Frodromia atypica (Sakai, 1936) nov. comb.

Figs 6 a-j, 17 d

Petalomera atypica Sakai, 1936 : 33, pl. 2, fig. 1; 1976 : 23, pl. 5, fig. 2.

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 4 : stn CP 171, 18°57.8'S, 163°14.0'E, 435 m, 17.09.1985 : 1 ♂ 9.5 x 10.6 mm; 1 ♀ 7.3 x 8.5 mm.

Loyalty Islands. MUSORSTOM 6 : stn DW 412, 20°40.00'S, 167°03.75'E, 437 m, 15.02.1989 : 1 ♀ 7.1 x 8.0 mm. — Stn CP 464, 21°02.30'S, 167°31.60'E, 430 m, 21.02.1989 : 1 ♂ 8.2 x 9.7 mm; 2 ♀♀ 7.2 x 8.0, 9.8 x 10.1 mm.

Indonesia (South East Molucca Islands). KARUBAR : stn DW 44, 7°52.00'S, 132°48.00'E, 291-295 m, 29.10.1991 : 1 ♂ 5.0 x 5.7 mm.

DESCRIPTION. — Carapace longer than wide, lateral borders parallel, giving the impression of an oblong shape. Frontal, lateral cardiac and branchial grooves only faintly marked. Carapace surface quite convex and covered in small granules in amongst a short, fine tomentum. Rostrum tridentate, teeth acute, median rostral tooth as long as lateral teeth which are directed anterovertically. Anterolateral margin begins at postorbital corner and extends almost directly backward in a straight line, adorned with about nine small granules, similar to those on carapace surface. A slight interruption in carapace margin for branchial groove followed by posterolateral border which also has about nine small granules.

Supraorbital tooth small, postorbital corner produced as a slight flange ornamented with small granules. Suborbital margin similarly adorned, separated off by a wide fissure, divided into one major acute tooth and one minor tooth at inner corner.

First segment of antenna wider than long, beaked medially, gaping. Second segment much longer than wide, surface convex with a few scattered tubercles, distomedial corner bluntly produced with third segment inserted at an angle. Exopod firmly fixed to second segment, extending as far as joint between third and fourth antennal segments, tip blunt and curved over base of eyestalk. Epistome triangular, not hollowed out, lateral margins lined with small tubercles, apex separated from median rostral tooth by a narrow fissure.

Subhepatic area inflated, covered in scattered small tubercles with a shallow groove extending from corner of buccal frame around under anterolateral margin towards posterolateral region. Sternal grooves end wide apart on small tubercles between bases of second legs. An unusual feature of the female is the orientation of the genital opening which is located on anterior border of coxal segment of second leg and directed anteriorly, and the presence of a prominent, blunt, coxal tubercle directed medially, behind genital opening. It is not obvious what the function of this tubercle might be, and it is not present in any other known dromiid crab. The coxal tubercle, genital opening and end of sternal groove are in close proximity.

Cheliped merus trigonal in section, all borders have small granules. Carpus elongate with scattered tubercles especially near margins, one especially elongate distal tubercle. Propodus with similar tubercles which are larger on upper border. Fingers downcurved, hollowed out internally and armed with eight-nine small teeth.

First two pairs of legs long, but shorter than chelipeds, without adornment. Dactyli curved, as long as propodi, inner margins armed with nine-ten small, similar spines.

Last two pairs of legs much smaller, both subdorsal and similar in size. Dactyl of third leg opposed by a single propodal spine, dactyl of fourth leg opposed by two spines. No spines on the outer propodal margins.

Abdomen of six free segments. Male telson wider than long, margin rounded, uropod plates well developed and visible externally. Abdominal locking mechanism consists of uropod plates fitting in front of small serrated flange on bases of first legs. Female telson much wider than long, margin rounded, uropod plates well developed, but not visible externally.

Male second pleopod simple, needle-like and fits into first pleopod which is a setose, semi-rolled tube with an acute apex.

DISCUSSION. — *Frodromia atypica* with its granulate carapace, which is longer than wide, acute rostral teeth, no anterolateral teeth, non-petaloid meri of first two pairs of legs, simple spine configuration on the last two pairs of legs, and concealed female uropods (but exposed male uropods) does not fit into *Petalomera* Stimpson, 1858, sensu stricto, or either of the other genera, *Fultodromia* gen. nov. and *Stimdromia* gen. nov. Hence a new genus is necessary to accommodate this species (see Table 3).

The only records of *Frodromia atypica* are those given by SAKAI (1936) with the original description and include the holotype male, CW = 6.0, CL = 7.0 mm, and a female of unknown size. SAKAI (1976) stated that the holotype specimen was no longer extant. The description given above largely agrees with that of SAKAI (1936) except that in the present material there are no prominent anterolateral tubercles, instead only several small granules, and the propodi and dactyli of the first two pairs of legs are of similar length, instead of propodi being longer than dactyli.

SIZE. — The New Caledonian and Indonesian collections include four females, maximum size CW = 9.8, CL = 10.1 mm, and three males, maximum size CW = 9.5, CL = 10.6 mm. Most of these specimens are larger than those reported by SAKAI. Although none of the females (CW = 7.1-9.8 mm) were ovigerous, all had a broad abdomen, indicating that they were sexually mature.

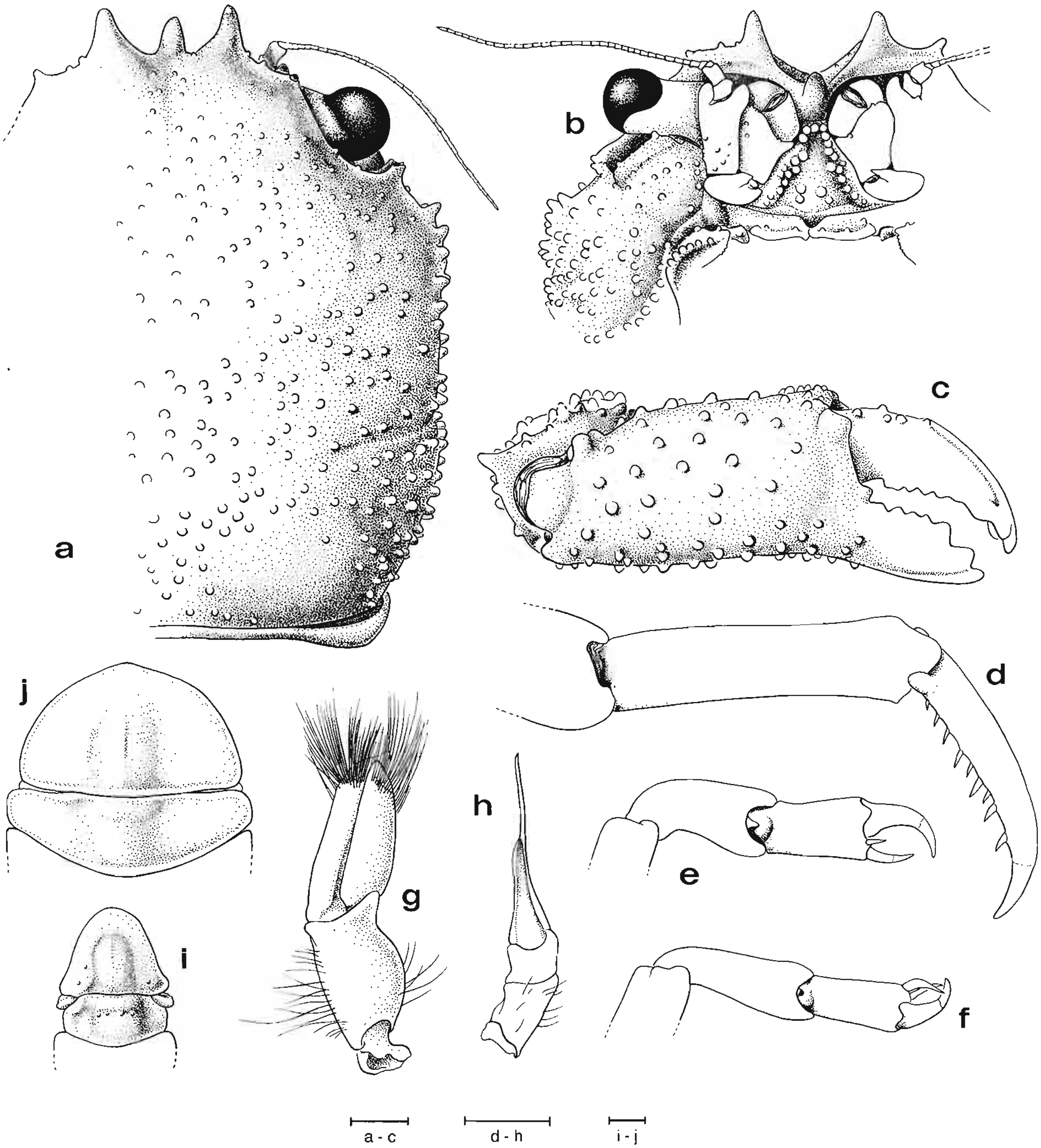


FIG. 6. — *Frodromia atypica* (Sakai, 1936) nov. comb. : **a-j**, ♂ 9.5 x 10.6 mm, New Caledonia, MUSORSTOM 4, stn 171, 435 m (MNHN-B 22559) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of terminal segments of right third leg; **f**, posterior view of terminal segments of right fourth leg; **g**, first male pleopod; **h**, second male pleopod; **i**, ventral view of telson and terminal segments of male abdomen. — **j** : ♀ 9.8 x 10.1 mm, Loyalty Islands, MUSORSTOM 6, stn CP 464, 430 m (MNHN-B 22560), ventral view of telson and terminal segments of female abdomen.

Scale bars represent 1.0 mm.

CAMOUFLAGE. — SAKAI (1936) gave the habitat as being shelly or sandy grounds and his specimens were carrying compound ascidian caps. None of the present specimens were accompanied by camouflage material. SAKAI (1936) described the colour of his specimens as uniformly dark blue, presumably when alive or freshly preserved. The colour of the present preserved material was dark brown.

DEPTH. — The depth range in Japanese waters is 50-100 m, but all the New Caledonian material comes from deep water, 425-437 m and the Indonesian specimen from 291-295 m.

DISTRIBUTION. — The New Caledonian and Indonesian specimens extend the range of *F. atypica* into the southern hemisphere and show that this species is not endemic to Japan.

CHARACTER	*Pseudodromia*	*Ascidiophilus*
Ratio CW/CL	Carapace width much less than length.	Carapace width much less than length.
Carapace surface	Smooth.	Smooth.
Rostrum	Tridentate, teeth well developed.	Unidentate, broad. Branchial groove well marked.
Anterolateral margin	Usually without teeth.	No teeth.
Antenna	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment not produced. This segment narrow, elongate. Exopod absent.
Sternal grooves	End close together between chelipeds or first legs.	End close together between chelipeds or first legs.
Epipods/Podobranchs	No epipods or podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.
First two pairs of legs	Not nodose.	Not nodose.
Last two pairs of legs	Dactyli almost straight, not opposed by propodal spines, and no spines on outer propodal margin. Instead, third leg has one lateral propodal spine, and fourth leg has two lateral propodal spines. Fourth leg equal to or longer than first leg.	Dactyli almost straight, not opposed by propodal spines, and no spines on outer propodal margin. Instead. third leg has three lateral propodal spines, and fourth leg has four lateral propodal spines. Fourth leg equal to or longer than first leg.
Abdominal segments	No segments fused. No abdominal locking mechanism.	No segments fused. No abdominal locking mechanism.
Uropods	Minute, concealed.	Absent.
Telson	Acutely pointed.	Bluntly narrowed.
Male pleopods	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.

TABLE 4. — Comparison of key characteristics of the genera *Pseudodromia* Stimpson, 1858, and *Ascidiophilus* Richters, 1880.

Genus *CONCHOECETES* Stimpson, 1858

Conchoecetes Stimpson, 1858 : 226; 1907 : 180. — ALCOCK, 1900 : 150; 1901 : 40. — BORRADAILE, 1903 : 301. — IHLE, 1913 : 50. — SAKAI, 1936 : 41; 1965 : 11; 1976 : 26. — BARNARD, 1950 : 308. — LEWINSOHN, 1984 : 119. — DAI & YANG, 1991 : 30.

Dromia Fabricius, 1798 : 360 (in part). — HASWELL, 1882b : 139 (in part).

Carapace as wide as long, or slightly wider than long, flattened, subpentagonal, surface granular, with a tomentum of fine setae. Rostrum tridentate, lateral teeth well developed, anterolateral margin may be granular or bear distinct teeth. Coxae of third maxillipeds fit closely together and are inserted at tip of telson. Female sternal grooves end apart between or behind the first pair of walking legs. Epipod present on chelipeds which are well developed, with granular surface. First two pairs of legs shorter, dactyli armed with 20-30 tiny spines. Third leg shorter and stouter than first two pairs, dactyl enlarged, talon-like and opposed by a stout, proximal propodal extension. Fourth leg shortest, segments flattened, dactyl small, no opposing propodal spine. Abdomen of six free segments, uropod plates well developed and visible externally. Abdominal locking mechanism consists of uropod plates fitting in front of serrated flange on bases of first legs. First male pleopod a stout semi-rolled, setose tube; second pleopod needle-like.

TYPE SPECIES. — *Dromia artificiosa* Fabricius, 1798, by monotypy.

OTHER SPECIES. — *Conchoecetes andamanicus* Alcock, 1900, *C. intermedius* Lewinsohn, 1984.

DISCUSSION. — The species of *Conchoecetes* are unusual in that they carry bivalve shells as camouflage, a character which they share with species of *Hypoconcha*, and the characters which make them different derive from this habit : flattened carapace, and large talon-like dactyli on the third walking legs (see Table 5). The structure of the grasping mechanism on the last two pairs of legs is unique amongst the dromiids. Whereas the usual mechanism involves the dactyl being opposed by one or more spines arising from the distal margin of the propodus and forming a sub-chelate arrangement, in *Conchoecetes* these opposing spines are absent. Instead the third leg has a stout, curved dactyl which pinches against a tubercle near the base of the propodus. This means that there is a large gap between the margin of the dactyl and the propodus into which the edge of the camouflaging bivalve shell can fit. This limb resembles some of the limbs found amongst the Homolidae (see GUINOT and RICHER DE FORGES, 1981). The last leg has no sub-chelate mechanism and the dactyl is reduced and curved. The limb is used to support the shell held by the third pair of legs. STIMPSON (1907) claimed that the last two segments of the abdomen are "soldered together" but this is incorrect: all segments of the abdomen are freely moveable.

The larval development of only one species in this genus, *C. artificiosus*, has been provided by SANKOLLI & SHENOY (1968).

The species of *Conchoecetes* are distributed throughout the Indian Ocean from the coast of Africa to the coast of Australia, and in the western Pacific Ocean as far north as Taiwan. Most records are from shallow waters, but the maximum depth is 100 m.

Key to Species of *Conchoecetes*

1. Two teeth on the anterolateral margin .... *C. artificiosus* (Fabricius, 1798)
— No teeth on the anterolateral margin **2**

2. Supraorbital tooth present .... *C. intermedius* Lewinsohn, 1984
— Supraorbital tooth absent .... *C. andamanicus* Alcock, 1900

Genus *PSEUDODROMIA* Stimpson, 1858

Pseudodromia Stimpson, 1858 : 226; 1907 : 177. — HENDERSON, 1888 : 15. — ALCOCK, 1900 : 149 (in part). — STEBBING, 1900 : 23. — BARNARD, 1950 : 315. — GORDON, 1950 : 209 (in part).

Carapace distinctly longer than wide, surface smooth, convex, covered with short setae. Branchial groove deeply marked. Rostrum prominent, divided into three teeth. Epistome triangular, apex very narrow, surface deeply sunken. Anterolateral margin rounded, usually without teeth. Coxae of third maxillipeds closely approximated and separated from tip of sternum by a deep trough. Female sternal grooves end close together on a low tubercle between bases of chelipeds or first legs. Orbital teeth maybe strongly or weakly developed. Cheliped without an epipod. First two pairs of legs about as long as chelipeds, segments not knobbed or ridged, inner margins of dactyli armed with three-four small spines. Third pair of legs smallest, dactyl, long, almost straight, not opposed by a propodal spine : instead, there may be one small, propodal spine laterally. Fourth pair of legs as long or longer than first three pairs of pereiopods, dactyl, long, almost straight, not opposed by a propodal spine : instead, there may be two small propodal spines laterally. Abdomen of six free segments. Uropods minute, concealed. Telson longer than wide, tip acutely pointed in male, blunt in female. No abdominal locking mechanism.

TYPE SPECIES. — *Pseudodromia latens* Stimpson, 1858, by original designation and monotypy.

OTHER SPECIES. — *Dromia rotunda* McLeay, 1838, and *Pseudodromia trepidus* Kensley, 1978.

DISCUSSION. — The above generic definition includes most of the essential features included by STIMPSON (1858) except for the epistome. STIMPSON, and subsequent authors, stated that the epistome is not joined to the rostrum but this feature is not unique to *Pseudodromia*. In all dromiids there is a small fissure separating the apex of the rostrum from the underside of the median rostral tooth but in *Pseudodromia* the fissure is a little wider than usual.

Some species which have been assigned to *Pseudodromia* Stimpson, 1858, must be shifted to other genera because they do not conform to the above definition. *Pseudodromia cacuminis* Kensley, 1980, should be placed in a new monotypic genus because the carapace is wider than long, supraorbital and anterolateral areas bear numerous short spines, last two pairs of legs are reduced, fourth pair only slightly longer than third pair, dactyli of both legs opposed by propodal spines. None of these characteristics are typical of *Pseudodromia*. *P. cacuminis* is known only from South Africa.

Pseudodromia spinosissima Kensley, 1977, is transferred to *Exodromidia* and *Pseudodromia caphyraeformis* (Richters, 1880) is returned to its original genus, *Ascidiophilus* Richters, 1880. ALCOCK (1901) accepted that *Pseudodromia quadricornis* Alcock, 1899, is a synonym of *Homalodromia coppingeri* Miers, 1884. *Pseudodromia inermis* Macpherson, 1988, is a synonym of *Dromidia spongiosa* Stimpson, 1858.

Although STIMPSON (1858) suspected that *Dromia rotunda* McLeay, 1838, should be placed in *Dromidia*, and was followed by many subsequent authors, it was BARNARD (1947) who transferred it to *Pseudodromia*. KENSLEY (1978) described a new species of *Pseudodromia* based on a female specimen collected in 1929 by the Th. Mortensen Java-South Africa Expedition and he was uncertain about the genus in which it should be placed. I have examined the type specimen of *Pseudodromia trepidus* Kensley, 1978, and it is clearly placed in the correct genus. The trepidation which KENSLEY experienced was not necessary. *P. trepidus* has propodal spines on the last two pairs of legs placed laterally rather than opposing the dactyli, the last leg is as long as any of the first three pereiopods, and the abdominal uropods are minute and concealed. Comparison of this species with specimens of *P. latens* and *P. rotunda* shows that it is clearly different.

Pseudodromia is most closely related to the South African genus *Dromidia* Stimpson, 1858, especially in sharing the characters of no epipod on the cheliped, a sharply pointed telson and uropods which may be minute and concealed or absent (see Table 4). But *Pseudodromia* differs in having a carapace longer than wide (wider than long in *Dromidia*), last pair of legs as long or longer than any of first three pairs of pereiopods (last legs reduced) and propodal spines placed laterally at base of dactyli of last two pairs of legs (propodal spines oppose dactyli and may be present on the outer propodal margin). The shape of the carapace and arrangement of propodal spines on the last two pairs of legs, reflect the intimate association of *Pseudodromia* with ascidians. Females carry small numbers of large eggs, 1.8-2.2 mm diameter. The camouflage and reproductive characters of *P. trepidus* are unknown.

DISTRIBUTION. — All species of *Pseudodromia* are confined to South Africa.

Key to the species of *Pseudodromia*

1. Anterolateral carapace margin begins at level of epistome, bearing a blunt tooth, supraorbital and suborbital margins each have a well developed tooth .... *Pseudodromia trepidus* Kensley, 1978

— Anterolateral carapace margin begins at level of postorbital corner, evenly convex without a tooth, supraorbital tooth weakly developed, suborbital tooth absent.............. **2**

2. Lateral rostral teeth, subparallel, close together, concealing much smaller median tooth beneath .... *Pseudodromia latens* Stimpson, 1858

— Lateral rostral teeth separated, slightly divergent, revealing similar sized median tooth .... *Pseudodromia rotunda* (McLeay, 1838)

Genus *ASCIDIOPHILUS* Richters, 1880

Ascidiophilus Richters, 1880 : 158.— LENZ, 1905 : 364.
Pseudodromia Balss, 1922 : 110.

Carapace distinctly longer than wide, surface smooth, convex, covered with short setae. Branchial groove deeply marked. Rostrum prominent, unidentate. Epistome triangular, apex very narrow, surface deeply sunken. Coxae of third maxillipeds separated by a narrow gap and inserted at a lower level, well forward of tip of sternum. Anterolateral margin rounded, without teeth. Female sternal grooves end close together on a low tubercle between bases of chelipeds or first legs. Orbital teeth not developed. Antenna curved around under eyestalk, without an exopod. Cheliped without an epipod. First two pairs of legs about as long as chelipeds, segments not knobbed or ridged, inner margins of dactyli armed with three-four small spines. Third pair of legs smallest, dactyl, long, almost straight, not opposed by a propodal spine : instead, there may be three small, propodal spines arranged laterally. Fourth pair of legs as long or longer than first three pairs of pereiopods, dactyl, long, almost straight, not opposed by a propodal spine : instead, there may be four small propodal spines laterally. Abdomen of six free segments. Telson longer than wide in male, tip narrowed, blunt, telson as long as wide in female, tip rounded. No uropod plates. No abdominal locking mechanism.

TYPE SPECIES. — *Ascidiophilus caphyraeformis* Richters, 1880, by monotypy.

DISCUSSION. — RICHTERS (1880) described *A. caphyraeformis* from Mauritius. BALSS (1922) transferred this species to *Pseudodromia* Stimpson, 1858, and synonymized *P. integrifrons* Henderson, 1888, with it. LEWINSOHN (1977) established that *P. murrayi* Gordon, 1950, is also a synonym of *Ascidiophilus caphyraeformis*.

However, while *A. caphyraeformis* has an overall resemblance to *Pseudodromia* it is more different from the two species in this genus than they are different from each other. *Ascidiophilus caphyraeformis* lacks the sharply pointed telson and has several differences which are related to the organization of the orbital area. In this species the eyes are closer together and directed ventrally, with the base of the antenna forming the suborbital margin, the overhanging frontal margin of the carapace forming the supraorbital margin, and a very narrow epistome separating the two eyes. Associated with the narrow epistome, is a unidentate rostrum. As a result of the placement of the eyes, the structure of the antenna is radically different, being curved instead of straight and also lacking an exopod. GORDON (1950) has also noted the antennal differences of *A. caphyraeformis* as well as differences in the gills. It is clear that *A. caphyraeformis* should be returned to its original genus (see Table 4).

Like the species of *Pseudodromia*, *Ascidiophilus caphyraeformis* has an intimate association with ascidians wherein almost the whole body of the crab is tightly enclosed in a compound ascidian. Females also carry a small number of large eggs, 1.0 mm diameter.

DISTRIBUTION. — Whereas the two species of *Pseudodromia* are confined to South Africa, the distribution of *Ascidiophilus caphyraeformis* includes the Red Sea and western Indian Ocean, but not South Africa (see LEWINSOHN, 1979).

Genus *EXODROMIDIA* Stebbing, 1905

Exodromidia Stebbing, 1905 : 64. — BARNARD, 1950 : 324.

Carapace length (including rostral teeth) may be slightly longer than wide or approximately as long as wide, surface smooth, tuberculated or spinous. Furrows not evident on carapace, surface tomentose. Rostrum tridentate, lateral teeth may be elongate. Anterolateral margin convex, teeth may or may not be present. No fissure at lateral corner of orbit. Antennal segments may be spinous, exopod well developed. Coxae of third maxillipeds separated by a wide gap and separated from tip of sternum by a star-shaped plate on which they articulate. Female sternal grooves end together on a tubercle between or just behind chelipeds. No epipod on the chelipeds which are much larger in males. First two pairs of legs shorter than chelipeds, dactyli long, curved, inner margins armed with up to ten small spines. Last two pairs of legs very reduced, dactyli opposed by single propodal spines. Abdomen of six free segments. Telson terminated by a sharp or knobbed spine. Uropods very small, concealed or absent. Vestigial pleopods on male abdominal segments three to five.

TYPE SPECIES. — *Dromidia spinosa* Studer, 1883, by monotypy.

OTHER SPECIES — *Dromidia bicornis* Studer, 1883. *Pseudodromia spinosissima* Kensley, 1977, should probably be placed in this genus but details of some essential features are unknown.

DISCUSSION. — *Exodromidia* was created by STEBBING (1905) to accommodate *Dromidia spinosa* and later BARNARD (1950) added STUDER'S other species, *D. bicornis*. A character of central interest was the dimorphic chelipeds, much larger in the males. BARNARD (1950) thought that the reasons for erecting *Exodromidia* were not very strong but the major differences between it and *Dromidia* are that rostral teeth are often elongate, no furrows on the carapace, no fissure present at postorbital corner, chelipeds dimorphic, last two pairs of legs very reduced, dactyli opposed by only single propodal spines, and vestigial pleopods present on male segments three to five. These differences justify the existence of a separate genus (see Table 5).

BARNARD (1950) stated that *Exodromidia bicornis* and *E. spinosa* normally lie buried in mud or sand and there have been no reports of camouflage being carried. This is consistent with the very reduced last two pairs of legs, which may be unable to hold camouflage, and the presence of stiff bristles and spines on the carapace which would make it difficult, if not impossible, to have a cap close to the body. These are deep water species which have large eggs, 1.5-2 mm diameter, few in number.

DISTRIBUTION. — The species of *Exodromidia* are confined to South Africa.

Key to the species of *Exodromidia*

1. Carapace slightly wider than long, three well developed anteriorly directed anterolateral teeth, several prominent tubercles on carapace .... *Exodromidia spinosa* (Studer, 1883)
— Carapace longer than wide, anterolateral margins adorned with spines rather than teeth, carapace smooth or spined **2**

2. Rostrum tridentate, lateral teeth much longer than median tooth, carapace surface smooth under a cover of long stiff bristles .... *Exodromidia bicornis* (Studer, 1883)
— Rostrum tridentate, teeth narrow and of similar length, carapace surface covered in short needle-like spines .... *Exodromidia spinosissima* (Kensley, 1977) nov. comb.

Genus *EUDROMIDIA* Barnard, 1947

Eudromia Henderson, 1888 : 13 (name preoccupied).
Eudromidia Barnard, 1947 : 368; 1950 : 314.
Eudromiopsis Balss, 1957 : 1605.
Not *Eudromia* - STEBBING, 1920 : 253.

Carapace convex, ovate, smooth, longer than wide. Only frontal and branchial grooves evident beneath short tomentum. Rostrum composed of prominent lateral teeth, which may be divergent or upturned, rostrum essentially bilobed. No supraorbital tooth. May be an anterolateral tooth, posterolateral tooth small. Antennal exopod well developed. Coxae of third maxillipeds closely approximated and inserted in front of tip of sternum. Female sternal grooves end together on a tubercle just behind chelipeds. No epipod on chelipeds which are narrow. First two pairs of legs smooth, dactyli long, inner margins armed with five or six small spines. Last two pairs of legs very reduced, dactyli opposed by single propodal spines and there may be a spine on the outer propodal margin. Abdomen of six free segments. Telson ends in a sharp point. Uropods very small, concealed. Abdominal locking mechanism consists of small tubercle on bases of first legs against margins of last abdominal segment.

TYPE SPECIES. — *Eudromia frontalis* Henderson, 1888, is the type species, by monotypy, of the genus *Eudromia* Henderson, 1888. As both *Eudromidia* Barnard, 1947, and *Eudromiopsis* Balss, 1957, are replacement names for *Eudromia* Henderson, 1888 (which is a junior homonym of *Eudromia* J. Geoffroy, 1832, for a genus of birds), they also have *Eudromia frontalis* as their type species.

OTHER SPECIES. — *Eudromia hendersoni* Stebbing, 1921.

DISCUSSION. — The main ways in which *Eudromidia* differs from *Dromidia* Stimpson, 1858, are carapace longer than wide, ovate, rostrum bilobed, lateral teeth of rostrum prominent, no spine present on inner distal margin of cheliped carpus, distal margins of carpi and propodi of first two pairs of legs not produced, and last two pairs of legs very small. The shape of the carapace and size of the last two pairs of legs are especially significant (see Table 5).

Besides the above two species, only one other species, *E. bituberculata* Stebbing, 1920, has been assigned to *Eudromia*. STEBBING noted that the ratio of carapace width to length (greater than 1.0), and nodulose, granulate leg segments of this species did not conform to the original definition of *Eudromia*. Because of this, BARNARD (1947) transferred this species to *Cryptodromiopsis* Borradaile, 1903. But additional features such as carapace adorned with prominent tubercles, anterolateral teeth acute, and laterally directed mean that *E. bituberculata* does not belong in either of these genera. *E. bituberculata* is transferred to *Barnardromia* gen. nov. (see below).

DISTRIBUTION. — The species of *Eudromidia* are known only from South Africa.

Key to the species of *Eudromidia*

— Rostrum consists of upturned, eave-like flanges covering the orbits forming a sinuous frontal margin .... *Eudromidia frontalis* (Henderson, 1888)
— Rostrum consists of two blunt, horizontal, projecting lobes separated by a deep V-shaped sinus .... *Eudromidia hendersoni* (Stebbing, 1921)

Genus *BARNARDROMIA* nov.

Eudromia - STEBBING, 1920 : 253 (in part).

Carapace wider than long, surface convex, strongly and densely granular, distinct areolae. Rostrum very prominent, tridentate, lateral teeth broad forming a large part of the supraorbital margin which is lateral rather than frontal. Anterolateral margins subparallel, teeth subequal, acute. Antennal exopod well developed. Female sternal grooves end together just behind bases of chelipeds. No epipod on the cheliped. Chelipeds and legs strongly granular, segments nodular. Inner margins of dactyli of first two pairs of legs armed with small spines, dactyli of last two pairs of legs opposed by single propodal spines. Abdomen of six free segments, uropod plates reduced, concealed. Telson ends in a sharp point.

TYPE SPECIES. — *Cryptodromia hirsutimana* Kensley & Buxton, 1984, by present designation.

OTHER SPECIES. — *Eudromia bituberculata* Stebbing, 1920.

ETYMOLOGY. — *Barnardromia* is formed by combining *Dromia* with the name of K. H. BARNARD, in recognition of the important contribution he made to the study of South African Crustacea.

DISCUSSION. — When STEBBING (1920) described *Eudromia bituberculata* he recognized that it did not conform to the definition of this genus. Subsequently, BARNARD (1947) transferred it to *Cryptodromiopsis* Borradaile, 1903, where it has been until now.

The other species, *Cryptodromia hirsutimana* Kensley & Buxton, 1984, was placed in this genus because it lacked an epipod on the cheliped, but the strongly granular and nodular carapace are sufficient to exclude it from *Cryptodromia*.

CHARACTER	*Conchoecetes*	*Speodromia*	*Exodromidia*	*Eudromidia*	*Dromidia*	*Barnardromia*
Ratio CW/CL	Carapace width about equal to length.	Carapace width much greater than length.	Carapace width much less than length.	Carapace width less than length.	Carapace width greater than or equal to length.	Carapace wider than long.
Carapace surface	Granular.	Granular and areolate.	Smooth, tuberculate, or spinous.	Smooth.	Smooth or gibbous.	Granular, areolate.
Rostrum	Tridentate, teeth well developed.	Tridentate, lateral teeth eave-like.	Tridentate, teeth well developed.	Bidentate, divergent or plate-like teeth.	Tridentate, teeth well developed, acute, blunt or eave-like.	Tridentate, teeth broad, blunt.
Anterolateral margin	Teeth absent or small, granular.	Teeth equal, small, numerous.	Well developed teeth or spines.	Teeth absent or very small.	Teeth absent or well developed, acute.	Teeth sub-equal, acute, well developed.
Antenna	Proximal borders of second segment lobed, distomedial corner produced. Exopod as long as third segment.	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment slightly produced. Exopod as long as third segment.	Distomedial corner of second segment slightly produced. Exopod as long as third segment.	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment produced. Exopod as long as third segment.
Sternal grooves	End apart between or behind first legs.	End together between chelipeds.	End together between or behind chelipeds.	End together just behind chelipeds.	End together between chelipeds.	End together just behind chelipeds.

Epipods/Podobranchs	Epipod on cheliped. No podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.
First two pairs of legs	Granular.	Meri petaloid, segments flattened and produced distally.	Smooth, tuberculate or spinous. Male cheli-peds much larger than in female.	Not nodose.	Not nodose.	Granular, nodular.
Last two pairs of legs	Dactyl of third leg talon-like, opposed by a stout, proximal, propodal extension. Both legs shorter than first two pairs, fourth pair shortest.	Dactyli opposed by single propodal spines. Both legs shorter than first two pairs, third pair shortest.	Dactyl of third leg opposed by one propodal spine, no spine on outer propodal margin. Fourth leg much shorter than first leg, dactyl opposed by one propodal spine, no spine on outer propodal margin.	Dactyl of third leg opposed by one propodal spine, one spine on outer propodal margin. Fourth leg much shorter than first leg, dactyl opposed by one propodal spine, one spine on outer propodal margin.	Dactyl of third leg opposed by one propodal spine, may be one spine on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, may be one spine on outer propodal margin.	Dactyl of third leg opposed by one propodal spine, no spine on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, no spine on outer propodal margin.
Abdominal segments	No segments fused. Abdominal locking mechanism used.	No segments fused. Abdominal locking mechanism used.	No segments fused. Abdominal locking mechanism used.	No segments fused. Abdominal locking mechanism used.	No segments fused. Abdominal locking mechanism used.	No segments fused. Abdominal locking mechanism used.
Uropods	Well developed, visible externally.	Small, concealed.	Absent, or minute, and concealed.	Minute, concealed.	Small, concealed.	Small, concealed.
Telson	Rounded.	Acutely pointed.	Acutely pointed or a knobbed spine.	Acutely pointed.	Acutely pointed.	Acutely pointed.
Male pleopods	First sharply tipped, second without exopod on basis.	Unknown.	First sharply tipped, sec-ond without exopod on basis. Vestigial pleopods on third to fifth segments.	First sharply tipped, second without exopod on basis.	First sharply tipped. second without exopod on basis.	Unknown.

TABLE 5. — Comparison of the key characteristics of the genera *Conchoecetes* Stimpson, 1858, *Speodromia* Barnard, 1947, *Exodromidia* Stebbing, 1905, *Eudromidia* Barnard, 1947, *Dromidia* Stimpson, 1858, *Barnardromia* gen. nov.

The species of *Barnardromia* share the characters which make the endemic South African genera, *Dromidia*, *Eudromidia*, *Exodromidia*, *Pseudodromia*, and *Speodromia* different from other genera. These are lack of an epipod on the cheliped, sharply pointed telson, and vestigial uropods (see Table 5). The size of the uropods in *Barnardromia* gen. nov. are unknown, but are likely to be the same as the other genera.

DISTRIBUTION. — All the known species of *Barnardromia* are restricted to South African waters.

Key to the species of *Barnardromia*

— Two anterolateral teeth, first largest, pair of acute protogastric tubercles behind rostral lobes .... *Barnardromia bituberculata* (Stebbing, 1920) nov. comb.
— Four anterolateral teeth, last largest, pair of rounded protogastric areolae behind rostral lobes .... *Barnardromia hirsutimana* (Kensley & Buxton, 1984) nov. comb.

Genus *SPEODROMIA* Barnard, 1947

Dynomene - STEBBING, 1905 : 58 (in part). Not Latreille, 1825.
Speodromia Barnard, 1947 : 370. — 1950 : 333.

Carapace distinctly wider than long, gastric and branchial regions strongly inflated, especially the latter because of a deep cavity in the subbranchial region, surface vermiculate and studded with minute scale-like setae. Rostrum prominent, triangular and deflexed, lateral rostral teeth united with supraorbital margin to form an eave. Anterolateral margin begins at level of buccal cavity, is broadly rounded and bears numerous small teeth. The deep subbranchial cavity has a membranous inner wall covered with clavate setae. Coxae of third maxillipeds closely approximated and inserted in front of the sternum. Female sternal grooves end close together on a low rounded tubercle between cheliped bases. Cheliped without an epipod, surface vermiculate, meral segment flattened, almost petaloid, bearing clavate and spiniform setae, fingers with well developed teeth. Legs shorter than chelipeds, third legs shortest, meral segments petaloid, other segments flattened and produced distally. Dactyli of first two pairs armed with 3-4 short spines, dactyli of last two pairs opposed by single propodal spines. Only last pair dorsally placed. Abdomen of six free segments, male telson terminated by a sharp spine, female telson rounded, uropod plates in both sexes reduced to small elongate lobes not visible externally. Abdomen held in place by small projecting plate on bases of first and second legs.

TYPE SPECIES. — *Dynomene platyarthrodes* Stebbing, 1905, by monotypy.

DISCUSSION. — STEBBING (1905) placed this species in the Dynomenidae because of the agreement of some features with *Dynomene filholi*. He believed that only the last pair of legs was reduced, uropods were present and there was an epipod on the cheliped. However, BARNARD (1947) showed that the gill formula for this species is 11+3 with no epipod on the cheliped. Also, both of the last two pairs of legs are reduced and while the uropods are present, they are much reduced compared to other dynomenids (see Table 5). These characters, along with reduced gill formula, and the peculiar subbranchial cavities, were the main reason for BARNARD erecting a new genus for *D. platyarthrodes*. Although BARNARD did not explain the etymology of his new generic name, it is no doubt derived by combining the Greek word for cave, '*speos*', with *Dromia*, thereby emphasizing the subbranchial cavities.

Speodromia platyarthrodes is known only from South Africa. STEBBING gave the type locality as off "Cape Point, N.E. by E., 36 miles. Depth, 650-700 fms" but as BARNARD (1947) noted, this was probably the result of mixing of labels as a consequence of bottles having been broken in transit. Thus the type locality is uncertain. All subsequent records have been from shallow water, maximum depth around 50 m.

Maximum size for this species is 40 mm CW and it is not known to carry pieces of camouflage.

Genus *DROMIDIA* Stimpson, 1858

Dromidia Stimpson, 1858 : 225 (in part); 1907 : 170 (in part). — HENDERSON, 1888 : 12 (in part). — BORRADAILE, 1903a : 299. — STEBBING, 1905 : 62 (in part). — BARNARD, 1950 : 319 (in part).
Platydromia Brocchi, 1877 : 54.
Dromidiopsis - BARNARD, 1950 : 311 (in part).
Parasphaerodromia Spiridonov, 1992 : 69.

Carapace approximately as wide or wider than long, surface smooth, gibbous or uneven, short dense tomentum with longer setae on the fringes. Rostrum tridentate, with frontal, branchial and cardiac grooves marked. Frontal groove separates two low rounded protuberances on carapace. Anterolateral margin begins at orbital level, teeth may or may not be present. Supraorbital tooth usually present, postorbital tooth present or else an obtuse lobe, fissure present at postorbital corner, single suborbital tooth and no subhepatic tubercles. Coxae of third maxillipeds separated by a gap and inserted in front of tip of sternum. Female sternal grooves end together on tubercle between chelipeds. No epipod on cheliped, borders of merus not dentate, distal spine usually present on the inner superior margin of carpus, superior margin of propodus smooth. Distal margins of carpi and propodi of first two pairs of legs produced, three-five small spines on inner margins of dactyli. Third leg smaller than fourth, dactyl opposed by one propodal spine and another spine may be present on the outer propodal margin. Fourth leg shorter than second, dactyl opposed by one propodal spine and another spine may be present on the outer propodal margin. Abdomen of six free segments. Telson usually wider than long, terminated by a sharp, stout spine in males, sometimes blunter in females. Uropod plates reduced and concealed. Abdominal locking mechanism involves serrated ridge on bases of first legs (uropods not used). First male pleopod stout, two segmented, sharp tubercle on tip, densely setose. Second pleopod simple, tapering needle or stouter and tapering only at tip.

TYPE SPECIES. — For *Dromidia* Stimpson, 1858, *Dromia hirsutissima* Lamarck, 1818, by original designation (STIMPSON, 1858), for *Platydromia* Brocchi, 1877, *Platydromia depressa* Brocchi, 1877, by monotypy, and for *Parasphaerodromia* Spiridonov, 1992, *Parasphaerodromia subglobosa* Spiridonov, 1992, by monotypy.

OTHER SPECIES. — *Dromidia aegibotus* Barnard, 1947, *Dromidiopsis cornuta* Barnard, 1947, *Dromidia dissothrix* Barnard, 1947, *Cryptodromiopsis lepidota* Barnard, 1947, *Dromidia spongiosa* Stimpson, 1858.

DISCUSSION. — No fewer than eight definitions of the genus *Dromidia* have been published (STIMPSON, 1858, HENDERSON, 1888, BORRADAILE, 1903a, STEBBING, 1905, STIMPSON, 1907, RATHBUN, 1937, BARNARD, 1950, and SAKAI, 1976) and each differs some important ways from the other. STIMPSON (1858) used the following characters : carapace convex, pilose, female sternal grooves end together on a tubercle between the chelipeds, uropod plates minute and concealed, and legs similar to *Dromia* (i.e. not knobbed or ridged). BORRADAILE (1903a) expanded the definition by adding that the carapace is not longer than broad, furrows between regions almost completely lost, fourth leg longer than third (this character is not correct because the type species is an exception), fourth leg as long as or shorter than second and with no spine on the outer side of the last joint (presumably the distal propodal margin, a character which is also not correct because the type species is an exception). BORRADAILE'S most important observation was that the cheliped lacks an epipod.

STIMPSON (1858) placed four quite different species in the new genus and until now only three remain : *D. hirsutissima*, *D. spongiosa* and *D. antillensis*. The other species, *D. excavata*, has been known as *Dromidiopsis excavata* (Stimpson, 1858) because it has an epipod on the cheliped, but it should be known as *Dromidiopsis globosa* (Lamarck, 1818) nov. comb. (see above). As will be shown later *Dromidia antillensis* does not belong in this genus, leaving only *D. hirsutissima* and *D. spongiosa* of the original species.

Dromidia spongiosa has had a somewhat chequered career, having been known under five specific names and placed in no less than six genera. The synonyms for this species include *Platydromia depressa* Brocchi, 1877, *Cryptodromia micronyx* Stebbing, 1920, *Cryptodromiopsis spongiosa* Barnard, 1947, *Pseudodromia inermis* Macpherson, 1988, and *Parasphaerodromia subglobosa* Spiridonov, 1992. *Dromidia spongiosa* was used by HENDERSON (1888), STEBBING (1910), BALSS (1913, 1921a), but more recently this species has been known as

Cryptodromiopsis spongiosa following BARNARD (1947). With the clarification of the generic definitions of *Dromidia* and *Cryptodromiopsis* (see below) it is clear that this species must be returned to its original genus and should be known as *Dromidia spongiosa* Stimpson, 1858.

Since BROCCHI (1877) set up the new monotypic genus, *Platydromia*, to accommodate his new species from St. Paul Island, Indian Ocean, and the name *P. depressa* Brocchi, 1877, is a synonym of *Dromidia spongiosa* Stimpson, 1858, the genus *Platydromia* is a junior synonym of *Dromidia*. Examination of the descriptions and illustrations of *Cryptodromia micronyx* Stebbing, 1920, and *Pseudodromia inermis* Macpherson, 1988, shows that they are synonyms of *Dromidia spongiosa* and were not placed in the correct genus. The history of the study of this species provides a good example of the extent of the confusion reigning amongst carcinologists about the concept of the genus *Dromidia*. Most recently, the same species has been described yet again, this time as *Parasphaerodromia subglobosa* Spiridonov, 1992. Thus *Parasphaerodromia* Spiridonov, 1992, is also a junior synonym of *Dromidia*.

To summarize the important characters for this genus : the carapace must be convex, pilose, regions not strongly marked (i.e. essentially smooth and unornamented), width equal to or greater than length, no epipod on cheliped, legs not knobbed or ridged, telson sharply pointed, uropod plates minute or reduced and concealed, female sternal grooves end together on a tubercle between the chelipeds (see Table 5). The only species which fit these criteria are *Dromidia aegibotus* Barnard, 1947, *D. dissothrix* Barnard, 1947, *Dromia hirsutissima* Lamarck, 1818, and *Dromidia spongiosa* Stimpson, 1858. To these should be added *Cryptodromiopsis lepidota* Barnard, 1947 (including *C. mortenseni* Kensley, 1978, which is probably a synonym) and *Dromidiopsis cornuta* Barnard, 1947, which also has a sharply pointed male telson and probably lacks an epipod on the cheliped.

All other species assigned to *Dromidia* Stimpson, 1858, do not belong in this genus because some have well developed uropod plates and all lack the sharply pointed male telson. These species fall naturally into two groups.

Firstly, a widespread Indo-Pacific-Atlantic group which includes *Dromidia antillensis* Stimpson, 1858, *D. larraburei* Stimpson, 1858, and *Dromia unidentata* Rüppell, 1830 (including *Cryptodromia unilobata* Campbell & Stephenson, 1970, which is a synonym), as well as *Cryptodromia bullifera* Alcock, 1900, and *Dromidiopsis plumosa* Lewinsohn, 1984. These species rightly belong in *Cryptodromiopsis* Borradaile, 1903a.

Secondly, *Dromidia australis* Rathbun, 1923, and *D. insignis* Rathbun, 1923, as well as *Cryptodromia incisa* Henderson, 1888, and *Cryptodromia octodentata* Haswell, 1882, all of which are Australian species. These species are placed in a new genus (see below).

DISTRIBUTION. — The distribution of the species of *Dromidia* is confined to South Africa where a local radiation has produced six species. The record of SPIRIDONOV (1992) (as *Parasphaerodromia subglobosa*) from seamounts to the east of South Africa, extends the range of this genus.

Key to the species of *Dromidia*

1. Carapace significantly wider than long 2
— Carapace approximately as wide as long 4

2. No anterolateral teeth, tomentum short, thick, undulating .... *Dromidia spongiosa* Stimpson, 1858
— Anterolateral teeth present, tomentum short and stiff 3

3. Three well developed anterolateral teeth, no propodal spine on the outer margin of the last two pairs of legs .... *Dromidia aegibotus* Barnard, 1947
— Three anterolateral teeth, second and third may be weakly developed, propodal spine present on outer margin of last two pairs of legs .. *Dromidia hirsutissima* (Lamarck, 1818)

4. No anterolateral teeth 5
— Two acute, evenly spaced, anterolateral teeth .... *Dromidia dissothrix* Barnard, 1947

5. Rostral teeth acute, divergent, median rostral tooth and suborbital tooth visible dorsally ....*Dromidia cornuta* (Barnard, 1947) nov. comb.
— Rostral teeth prominent but bluntly rounded, median tooth scarcely visible dorsally, suborbital tooth weak .... *Dromidia lepidota* (Barnard, 1947) nov. comb.

Genus *AUSTRODROMIDIA* nov.

Dromia - HASWELL, 1882 : 139 (in part).
Cryptodromia - HENDERSON, 1888 : 5 (in part). — IHLE, 1913 : 32 (in part). — HALE, 1927 : 107. — SAKAI, 1976 : 12 (in part).
Dromidia - HASWELL, 1882 : 139 (in part).

Carapace as wide or wider than long, short dense tomentum with longer setae on the fringes, surface smooth, no low rounded protuberances but frontal and branchial grooves distinct. Rostrum tridentate, supraorbital tooth present, postorbital tooth blunt or obtuse. A fissure separates the suborbital margin which has a single tooth. Anterolateral margin begins at orbital level, teeth may or may not be present. Female sternal grooves end together between the first legs. No epipod on the cheliped. Borders of cheliped merus not dentate, no distal spine on inner superior margin of carpus, up to three tubercles on the superior margin of the propodus. Distal margins of carpi and propodi of first two pairs of legs produced, up to four small spines on inner margins of dactyli. Third leg shorter than fourth, dactyl opposed by one or two propodal spines with up to three spines on the outer propodal margin. Fourth leg shorter than second leg, dactyl opposed by a single propodal spine, up to three spines on the outer propodal margin and there may be a spine on the outer margin of the dactyl itself. Abdomen of six free segments. Telson usually wider than long, tip rounded. Uropod plates reduced and concealed or absent.

TYPE SPECIES. — *Dromidia australis* Rathbun, 1923, by present designation.

OTHER SPECIES. — *Cryptodromia incisa* Henderson, 1888, *Dromidia insignis* Rathbun, 1923, *Dromia octodentata* Haswell, 1882.

ETYMOLOGY. — The generic name *Austrodromidia* is formed by combining *Dromidia* with the word "*australis*", meaning southern and referring to the distribution of this group of species.

DISCUSSION. — When discussing the relationships of *Dromidia australis*, RATHBUN (1923a) believed that it was allied to *D. cranioides* De Man, 1888, [i.e. *Lauridromia indica* (Gray, 1831)]. However, despite the similarity of the female sternal grooves, *L. indica* has an epipod on the cheliped, the uropod plates are well developed and visible externally, and the joint between the last two segments of the abdomen is not movable.

When HENDERSON (1888) was describing the "*Challenger*" material he erected *Cryptodromia incisa* but noted that the sternal grooves were closer to the condition in *Dromidia* Stimpson, 1858. Indeed, he could have included the new species amongst the three species of *Dromidia* dealt with in the paper but he misinterpreted the sternal groove character for this genus. As a result, *Cryptodromia incisa* has always been in the wrong genus.

Some of the species which have until now been placed in *Dromidia*, are moved to *Cryptodromiopsis* Borradaile, 1903, and *Austrodromidia* gen. nov. These genera may be characterized as follows : *Dromidia* has reduced and concealed uropod plates, telson ending in a sharp spine, *Austrodromidia* has uropod plates reduced or absent and concealed, tip of abdomen bluntly rounded, and *Cryptodromiopsis* has well developed uropods, visible externally and telson bluntly rounded. In this way, they may be easily distinguished. These differences are associated with different abdominal locking mechanisms (see Tables 5 and 6).

Species in this genus commonly carry camouflage caps made from pieces of sponge or ascidian.

A feature of the species in *Austrodromidia* is that females have large eggs. RATHBUN (1923a) noted that *A. australis* has eggs 2 mm diameter. *A. octodentata* has large (1.9 mm diam.) eggs and broods its young (HALE, 1925). This reproductive strategy is shared with two other Australian dromiids, *Dromidiopsis globosa* (Lamarck, 1818) nov. comb., and *Stimdromia lateralis* (Gray, 1831) gen. nov.

DISTRIBUTION. — The distribution of the species in *Austrodromidia* gen. nov. is confined to Australia except for a single record of *Cryptodromia incisa* by YOKOYA (1933) from Japan. This needs further verification as the specimen is no longer in existence and it is quite possible that it refers to *Cryptodromiopsis unidentata* (Rüppell, 1830) nov. comb. Excluding the Japanese record, the distribution suggests a separate radiation in Australian waters which has produced four species.

CHARACTER	*Austrodromidia*	*Cryptodromiopsis*
Ratio CW/CL	Carapace wider than or equal to length.	Carapace wider than or equal to length.
Carapace surface	Smooth.	Smooth.
Rostrum	Tridentate, teeth well developed, subacute.	Tridentate, teeth well developed, subacute.
Anterolateral margin	Teeth usually well developed, but may be absent.	Teeth usually well developed, but may be absent.
Antenna	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment produced. Exopod as long as third segment.
Sternal grooves	End together between first legs.	End together between chelipeds, or first legs, or second legs.
Epipod/Podobranchs	No epipods or podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.
First two pairs of legs	Smooth.	Smooth.
Last two pairs of legs	Third leg dactyl opposed by up to two propodal spines, up to three spines on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, up to three spines on outer propodal margin, and there may be a spine on outer margin of dactyl.	Third leg dactyl opposed by up to two propodal spines, up to two spines on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by two propodal spines, up to three spines on outer propodal margin, and there may be up to two spines on outer margin of dactyl.
Abdominal segments	No segments fused.	No segments fused.
Uropods	Small, concealed, may be absent.	Small, visible externally.
Telson	Rounded.	Rounded or bluntly tipped.
Male pleopods	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.

TABLE 6. — Comparison of the key characteristics of the genera *Austrodromidia* gen. nov., and *Cryptodromiopsis* Borradaile, 1903.

Key to the species of *Austrodromidia*

1. No anterolateral teeth, carapace approximately as wide as long **2**
— Anterolateral teeth present, carapace wider than long **3**

2. Acute lateral rostral and supraorbital teeth .... *Austrodromidia incisa* (Henderson, 1888) nov. comb.
— Blunt lateral rostral and supraorbital teeth .... *Austrodromidia insignis* (Rathbun, 1923) nov. comb.

3. Three anterolateral teeth, uropod plates reduced concealed under abdomen .... *Austrodromidia australis* (Rathbun, 1923) nov. comb.
— Five anterolateral teeth, uropod plates absent .... *Austrodromidia octodentata* (Haswell, 1882) nov. comb.

Genus *CRYPTODROMIOPSIS* Borradaile, 1903

Cryptodromiopsis Borradaile, 1903a : 299. — BARNARD, 1950 : 329.
Cryptodromia - IHLE, 1913 : 32 (in part). — SAKAI, 1936 : 15 (in part); 1976 : 12 (in part). — DAI, YANG, SONG & CHEN, 1981 : 138 (in part). — DAI & YANG, 1991 : 19 (in part).
Dromia - ALCOCK, 1900 : 136 (in part); 1901 : 43 (in part).
Dromidia - ORTMANN, 1894 : 34. — IHLE, 1913 : 31. — RATHBUN, 1937 : 32. — SAKAI, 1936 : 13; 1976 : 11.

Carapace as wide or wider than long, surface smooth, short dense tomentum with longer setae on the fringes, frontal groove separating two low rounded protuberances, branchial and cardiac grooves marked. Rostrum tridentate, supraorbital tooth usually present, postorbital tooth blunt or obtuse, a fissure may or may not be present separating the suborbital margin on which there are usually two unequal teeth. Anterolateral margin begins at orbital level, teeth may or may not be present. Subhepatic region usually smooth, without teeth. Coxae of third maxillipeds closely approximated (or separated by a narrow gap) and inserted in front of tip of sternum, separated from it by a trough. Female sternal grooves end together between chelipeds, first or second legs, with or without tubercles. No epipod on cheliped, borders of merus may be dentate, no spine on inner superior margin of carpus, up to four tubercles on superior margin of propodus. Distal margins of carpi and propodi of first two pairs of legs lobe-like, two-five spines on inner margins of dactyli. Third leg shorter than fourth, dactyl opposed by one or two propodal spines with one or two spines on the outer propodal margin. Fourth leg shorter than second, dactyl opposed by one or two propodal spines, one-three spines on the outer propodal margin and usually one spine on the outer margin of the dactyl itself. Abdomen of six free segments. Telson rounded or bluntly tipped. Uropod plates well developed. Abdominal locking mechanism involves a serrated ridge or tooth on the bases of first legs and uropod plates may or may not be involved. First male pleopod stout, two segmented, usually tipped by a sharp tubercle, densely setose. Second pleopod simple, needle-like, tapering, or shorter and tapering only at tip.

TYPE SPECIES. — *Cryptodromiopsis tridens* Borradaile, 1903, by monotypy.

OTHER SPECIES. — *Dromidia antillensis* Stimpson, 1858, *Dromia (Cryptodromia) bullifera* Alcock, 1900, *Dromidia larraburei* Rathbun, 1910, *? Dromidiopsis plumosa* Lewinsohn, 1984, *Dromia unidentata* Rüppell, 1830.

Two other poorly known species should probably also be included in this genus : *Cryptodromia dubia* Dai, Yang, Song & Chen, 1981, and *Cryptodromia planaria* Dai, Yang, Song & Chen 1981.

DISCUSSION. — Some differences between the above generic definition and the original definition given by BORRADAILE (1903a) are that the carapace width and length may be equal, and grooves on the carapace may be evident (see Table 6). BORRADAILE erected *Cryptodromiopsis* to separate species of *Cryptodromia* with convergent sternal grooves, but there are other important differences between these genera in the development of spines on the last two pairs of legs. Propodal spines surrounding the dactyli of these legs are few in *Cryptodromia*, but in *Cryptodromiopsis* there are always a greater number. A key difference is the presence of a small spine on the outer margin of the dactyl of the last leg in *Cryptodromiopsis*. BARNARD (1950) questioned the value of this character at the generic level, but I believe that it is important. I have already shown that the presence of such a spine is one character which separates *Dromidiopsis*, and *Lauridromia* from *Dromia* (see Table 2).

McLAY (1991) has briefly discussed the problems with the species which have been placed in *Cryptodromiopsis* and the fact that they do not form a natural group. Besides *C. tridens* (LEWINSOHN, 1984, pointed out that *Dromidia fenestrata* Lewinsohn, 1979, is a synonym for *Cryptodromiopsis tridens*) these species are *C. bituberculata* (Stebbing, 1920) (originally placed in *Eudromia* by STEBBING and later in *Cryptodromiopsis* by BARNARD, 1947), *C. lepidota* Barnard, 1947, and *C. mortenseni* Kensley, 1978. BARNARD also included *Dromidia spongiosa* Stimpson, 1858, but this was not justified. Since McLAY (1991) I have revised my ideas for revision of this group of species. *C. bituberculata* (Stebbing, 1920) has been transferred to *Barnardromia* gen. nov., and *Cryptodromiopsis lepidota* Barnard, 1947, should be placed in *Dromidia* Stimpson, 1858. *Cryptodromiopsis mortenseni* Kensley, 1978, is probably a synonym for *C. lepidota* Barnard, 1947. I had indicated in the earlier paper that *Cryptodromiopsis* was a redundant genus but this was incorrect. Many of the species which do not belong in *Dromidia*, should have been placed in *Cryptodromiopsis* and this is done herein.

Cryptodromia dubia Dai, Yang, Song & Chen, 1981, is only tentatively assigned to this genus. The original description is of such brevity, omitting several important details, that it is difficult to ascertain its status. I assume that it has no epipod on the cheliped (an essential character of *Cryptodromia*), judging from their plate I : 5, the carapace is clearly wider than long (despite the statement to the contrary), the dactyl of the last leg is opposed by two spines with another three or four on the outer propodal margin and the uropod plates are well developed and visible externally. The arrangement of the spines on the last leg excludes it from *Cryptodromia* and makes *Cryptodromiopsis* the most likely genus. A similar argument may be presented for the tentative placement of *Cryptodromia planaria* Dai, Yang, Song & Chen, 1981, in *Cryptodromiopsis*.

The larval development of one species in this genus, *C. antillensis*, is known (RICE & PROVENZANO, 1966).

DISTRIBUTION. — The distribution of this genus includes the entire Indo-Pacific region as well as the Atlantic. The Atlantic species formerly known as *Dromidia antillensis* Stimpson, 1858, as well as the closely related *D. larraburei* Rathbun, 1910, from the Pacific, should now be referred to as *Cryptodromiopsis antillensis* (Stimpson, 1858) and *C. larraburei* (Rathbun, 1910).

Key to the species of *Cryptodromiopsis*

(Species studied in this paper are in bold)

1. Carapace significantly wider than long **2**
— Carapace approximately as wide as long **6**

2. Outer propodal margin of last leg armed with three or more spines **4**
— Outer propodal margin of last leg armed with less than three spines **3**

3. Three unequal, acute anterolateral teeth, pearl-like tubercle beneath suborbital tooth and on merus of third maxilliped ....
.... ***Cryptodromiopsis bullifera*** (Alcock, 1900) nov. comb.
— Two unequal, acute anterolateral teeth, no pearl-like tubercles ....
.... *Cryptodromiopsis tridens* Borradaile, 1903

4. Supraorbital margin notched ....
.... ***Cryptodromiopsis plumosa*** (Lewinsohn, 1984) nov. comb.
— Supraorbital margin may have a small tooth but is not notched **5**

5. Prominent supraorbital tooth ....
.... *Cryptodromiopsis dubia* (Dai, Yang, Song & Chen, 1981) nov. comb.
— Margin from lateral frontal tooth to anterolateral tooth almost straight ....
.... *Cryptodromiopsis planaria* (Dai, Yang, Song & Chen, 1981) nov. comb.

6. Three anterolateral teeth **7**
— No anterolateral teeth ....
.................................***Cryptodromiopsis unidentata*** (Rüppell, 1830) nov. comb.

7. One small spine on the outer margin of dactyl of last leg, no tubercle on inner margin of cheliped carpus, three tubercles on upper margin of cheliped propodus ....
.... *Cryptodromiopsis antillensis* (Stimpson, 1858) nov. comb.
— Two small spines on the outer margin of dactyl of last leg, tubercle present on inner margin of cheliped carpus, four tubercles on upper margin of cheliped propodus ....
.... *Cryptodromiopsis larraburei* (Rathbun, 1910) nov. comb.

Cryptodromiopsis bullifera (Alcock, 1900) nov. comb.

Fig. 17 e

Dromia (Cryptodromia) bullifera Alcock, 1900 : 143.
Cryptodromia bullifera - ALCOCK, 1901 : 51, pl. 2, fig. 9. — BORRADAILE, 1903b : 577. — LAURIE, 1906 : 352. — LENZ, 1910 : 562. — IHLE, 1913 : 40. — SAKAI, 1936 : 23, pl. 7, fig. 3; 1976 : 16, text fig. 8. — WARD, 1941 : 1. — GORDON, 1950 : 206. — GUINOT, 1967 : 240 (list). — KENSLEY, 1970 : 107, figs 4a-c; 1981 : 36 (list). — ZARENKOV, 1971 : 169. — LEWINSOHN, 1977 : 15, fig. 3; 1984 : 111.

MATERIAL EXAMINED. — **Chesterfield Islands**. CHALCAL 1 : stn CP 14, 21°18.50'S, 158°50.90'E, 66 m, 24.07.1984 : 1 ♀ 5.0 x 4.7 mm. — Stn DC 56, 22°24.40'S, 159°08.80'E, 60 m, 25.09.1984 : 1 ♂ 5.5 x 6.3 mm, carrying a compound ascidian cap.

CORAIL 2 : stn DW 63, 19°15.15'S, 158°47.73'E, 71 m, 24.08.1988 : 1 ♂ 6.7 x 6.3 mm. — Stn DW 106, 19°9.00'S, 158°42.62'E, 62 m, 27.08.1988 : 1 ♂ 8.2 x 7.7 mm.

DESCRIPTION. — Carapace slightly wider than long, weakly convex, surface smooth beneath a short fine tomentum with longer spatulate setae interspersed, spatulate setae more evident at carapace margins and especially on legs. Frontal groove, branchial groove and cardiac region weakly marked. Rostrum tridentate, three similar long acute teeth. Median tooth directed horizontally, laterals directed anterovertically.

An acute almost vertically directed supraorbital tooth and similar anteriorly directed postorbital tooth. Although the orbital margin is concave beneath the postorbital tooth, there is no distinct fissure separating the suborbital margin which has a long acute tooth, visible dorsally, at the medial corner.

First segment of antenna reduced, much wider than long, almost crescent-shaped, beaked medially, gaping. Second segment much longer than wide, very convex, a short distal median spine projecting ventrally, distomedial corner produced as a curved spine on which the third segment is inserted at an angle. Exopod firmly fused to second segment, tip bilobed with inner lobe curved over base of eyestalk, extending as far as joint between third and fourth segments. Ratio of length of antennal flagella to CW = 0.75.

Subhepatic area convex, one pearl-like tubercle beneath suborbital tooth, near corner of buccal frame which is marked by a tooth, another similar tubercle ventrolateral to the postorbital tooth and an acute tubercle beneath, the latter two visible dorsally. A small pearl-like tubercle on the merus of the third maxilliped. Female sternal grooves end close together on an elevated platform between bases of chelipeds.

Anterolateral margin begins at the level of the orbit, widening rapidly to a small tooth above the second pearl-like subhepatic tubercle, mentioned earlier, closely followed by a long acute tooth, which curves upward, and then by a smaller anterolaterally directed tooth, giving a total of three anterolateral teeth. In his original description, ALCOCK (1900) treated the small first tooth as belonging to the subhepatic area instead of the anterolateral margin, thus stating that there were only two anterolateral teeth. A small tooth behind the branchial groove, posterolateral margins convergent. A distinct groove extends from between the first pearl-like tubercle and the tooth at the corner of the buccal frame, around under the anterolateral margin, ending at the posterolateral tooth.

Chelipeds well developed, merus trigonal, borders minutely tuberculate. Surface of carpus convex, two strong acute distal tubercles. Propodus smooth, two distal tubercles at base of dactyl. Fingers downcurved, gaping, hollowed out internally, armed with seven-eight teeth of uneven size, proximal tooth on dactyl largest, a hiatus mid-way along fixed finger.

First two pairs of legs smaller than chelipeds, distal borders of carpi and propodi lobe-like. Dactyli as long as propodi, strongly curved at tips, inner margins armed with four-five small spines.

Last two pairs of legs much reduced, third pair shortest, dactyli short, curved and opposed by single propodal spines and another spine on outer propodal margin.

Abdomen of six free segments. Male telson longer than wide, tip rounded. Uropod plates well developed and visible externally. Small pearl-like lateral tubercles on abdominal segments three-six, tubercles poorly developed on female abdominal segments. Abdominal locking mechanism consists of uropod plates fitting in front of serrated flange on bases of first legs.

First male pleopod a stout semi-rolled, setose tube with a strong horny tip, second pleopod simple needle-like.

DISCUSSION. — In his original description ALCOCK (1900) noted the characteristic pearl-like tubercles below the suborbital lobe and on the merus of the third maxilliped but added that another similar tubercle was present on the second segment of the antenna. Such a tubercle is not evident on the present specimens, although the surface is clearly convex, and there is a short distal median spine projecting ventrally which may be what ALCOCK was referring to. ALCOCK (1900, 1901) did not give the sex of the original two specimens and did not comment on the arrangement of the female sternal grooves and LAURIE (1906) also recorded a small female without comment. IHLE (1913) had three females but only commented that in mature females the sternal grooves ended in front of the level of the fourth thoracic sternite, without indicating whether they ended apart or together. LEWINSOHN (1984) had several mature females which showed that the sternal grooves ended close together between the bases of the chelipeds and he noted that this conflicted with the generic diagnosis of *Cryptodromia* given by BORRADAILE (1903a) and that perhaps the species should be removed from *Cryptodromia*. This character alone indicates that this species does not belong in *Cryptodromia* Stimpson, 1858, and together with the absence of an epipod on the cheliped, suggests that it belongs in *Cryptodromiopsis*.

The number and arrangement of spines around the dactyli of the last two pairs of legs, were erroneously described by ALCOCK (1901) as "not cheliform", and subsequent authors have not corrected the situation : in fact the dactyli of both legs are opposed by single propodal spines with another spine on the outer propodal margin. This makes *Cryptodromiopsis bullifera* different because the other species in this genus also have a spine on the outer margin of the dactyl itself. This is regarded as an advanced feature of this species.

Good illustrations of *C. bullifera* are provided by ALCOCK (1901), SAKAI (1936, the same fig. appears in 1976), KENSLEY (1970), and LEWINSOHN (1977). The characteristic pearl-like tubercles on the ventral surface are well shown by ALCOCK (1901, Pl. II, fig. 9a) and KENSLEY (1970, fig. 4b). Originally, ALCOCK (1901) described the anterolateral margin as having two teeth but LEWINSOHN (1977) pointed out that in his specimen from the Red Sea there is another small tooth between the postorbital corner and the first large tooth. The New Caledonian material is also in agreement in having three anterolateral teeth.

CAMOUFLAGE. — None of the previous records of *C. bullifera* have included reference to the type of camouflage carried by these crabs but in the New Caledonian collection one of the small males was carrying a compound ascidian cap.

SIZE. — Including the four reported in this paper, a total of some twenty six specimens have been recorded : of these eleven are males (maximum size CW = 13.0, CL = 12.0 mm), ten are females (maximum size CW = 11.5, CL = 10.0 mm) and five are of unknown sex (including the type specimen). Four ovigerous females have been recorded ranging in size from CW = 5.5, CL = 5.0 mm to the largest female known, but the female recorded from stn CP 14, CW = 5.0, CL = 4.7 mm had plugged sternal grooves, indicating that it had already mated. *C. bullifera* obviously reaches maturity at a small size.

DEPTH. — Most records of *C. bullifera* are from depths between 30-60 m, both New Caledonian specimens are from near 60 m, although LEWINSOHN (1984) reported specimens from the intertidal zone of Madagascar and one specimen of ALCOCK (1900) supposedly came from 880 m but it seems likely that this is an error and that the depth distribution is from 0-60 m (approx.).

DISTRIBUTION. — The geographic distribution of *C. bullifera* ranges from the Red Sea, East Africa, Madagascar, South Nilandu Atoll, Maldive Archipelago, Cinque Is., Andaman Sea (type locality), Philippines, Japan, and now Chesterfield Islands. *C. bullifera* is a small, shallow water, Indo-West Pacific species.

Cryptodromiopsis plumosa (Lewinsohn, 1984) nov. comb.

Fig. 17 f

? *Dromidiopsis plumosa* Lewinsohn, 1984 : 104, fig. 3a-g.
Dromidia plumosa - McLAY, 1991 : 470.

MATERIAL EXAMINED. — **Chesterfield Islands.** CORAIL 2 : stn DW 84, 19°12.00'S, 158°56.80'E, 16-26 m, 25.08.1988 : 1 ♂ 13.3 x 11.7 mm, fragments of sponge attached to last pair of legs.

DESCRIPTION. — Carapace distinctly wider than long, smooth under a dense pile of long plumose setae, rising steeply in front but more gradually convex laterally. Shallow frontal groove separates two low protuberances, lateral borders of cardiac region marked by a paler colour, branchial grooves evident laterally in broad depression. Rostrum tridentate, median rostral tooth acute and slightly deflexed but visible dorsally, lateral rostral teeth slightly longer, also acute. Anterolateral margin of carapace begins at level of suborbital margin, close to postorbital corner, and has two teeth. First tooth blunt with an extended posterior margin, second tooth more acute, both directed anteriorly so that second tooth is almost parallel to the margin. A deep branchial notch, no posterolateral tooth, posterior corners of carapace convex, posterior carapace margin sinuous.

Orbital margin eave-like, no supraorbital tooth, instead a deep notch interrupts the supraorbital margin, postorbital corner produced as a blunt tooth. No fissure separates the suborbital margin which bears one blunt, central tooth, visible dorsally, and another smaller more acute tooth at the medial corner, these two teeth separated by a deep notch.

First segment of antenna wider than long (ratio = 2.0), beak-like medially, gaping and twisted. Second segment much longer than wide (ratio = 3.6), surface convex, a low distal medial tubercle, distomedial corner strongly produced, on which the third antennal segment is inserted. Attachment of exopod marked by a shallow groove, exopod extending slightly beyond joint between third and fourth segments, tip not bilobed but curving over base of eyestalk, ratio of length of antennal flagella to CW = 0.54. Apex of epistome produced as a blunt tooth immediately beneath median rostral tooth, the two separated by a groove.

Subhepatic area slightly concave, near corner of buccal frame is a low tubercle beneath which runs a shallow groove extending under the anterolateral margin and ending at the branchial notch. Nature of female sternal grooves unknown.

Chelipeds well developed, merus trigonal in section, borders smooth. Carpus convex, two large blunt distal tubercles. Propodus smooth with a prominent proximal tooth on the superior border. Fingers white, hollowed out internally, strongly downcurved, gaping, borders armed with seven-eight teeth increasing in size distally.

First two pairs of legs shorter than chelipeds. Distal corners of carpi knob-like. Propodi distinctly longer than dactyli, inferior distal margins have one-two short spines overlapping dactyli. Tip of dactyli strongly curved, inner margins armed with four-five small spines.

Last two pairs of legs reduced. Third pair shortest, dactyl strongly curved, opposed by three propodal spines with one, or two spines on the outer propodal margin. Dactyl of fourth legs opposed by two propodal spines with three spines (two broken off in the present specimen) on the outer propodal margin and an additional spine on the outer margin of the dactyl itself, near the base.

Abdomen of six free segments, low rounded ridge along length. Male telson triangular, tip rounded, about as wide as long. Uropod plates small but visible externally. Abdominal locking mechanism involves a serrated ridge on bases of the first legs against lateral margins of penultimate abdominal segment. Uropods are not used to lock the abdomen. Female characters unknown.

Tip of first male pleopod a setose blunt knob, second pleopod stout, only tapering to a sharp tip near the apex.

DISCUSSION. — *Dromidiopsis plumosa* Lewinsohn, 1984, was assigned, with some uncertainty to this genus by LEWINSOHN because of the absence of any female specimens. However, an examination of the type specimen, (MNHN-B 8572), shows that LEWINSOHN incorrectly stated that there was an epipod on the cheliped and so he should have placed this new species in *Dromidia* (see MCLAY, 1991).

Some comparison should be made between the New Caledonian and type specimens. Both are males but the type is clearly a small immature specimen : on the type the plumose setae are small and sparse (large and dense on the specimen from New Caledonia), ratio of CW/CL = 1.14 (1.36, thus the carapace is relatively much wider), regions of carapace not distinguished (frontal groove well marked and branchial grooves more evident). LEWINSOHN stated that margins of the frontal teeth are finely granular but this is not true (the margins are smooth), a granule on the right supraorbital tooth (not present), notch in supraorbital margin (this unusual feature is also very apparent), and small fissure at postorbital corner separating supraorbital and suborbital margins (not present in the larger New Caledonian specimen). Features of the second antenna and epistome, which were not mentioned by LEWINSOHN, are in agreement. The type has two anterolateral teeth, the first broad and truncated, the second acute and spiniform (disposition of teeth similar except that the first is more acute and the second much closer to the posterior margin of the first and more spiniform than in the type). LEWINSOHN omitted an important feature of the cheliped propodus which is the proximal tooth on the superior margin (present on the New Caledonian specimen). Dactyli of the first two pairs of legs shorter than propodi and armed with four-five small spines (same). LEWINSOHN also missed a key feature of the propodi of the first two pairs of legs which is the presence of a distal propodal spine on the inferior margin, but these are very small and easily overlooked (larger and more apparent in the New Caledonian specimen). Dactyl of third leg opposed by two spines (three spines), and possibly two spines on the outer propodal margin, omitted from his Fig. 3e, (one or two spines). Dactyl of fourth leg opposed by two spines, with three spines on the outer propodal margin and an accessory spine on the dactyl (same). Telson as wide as long and abdominal segments much wider than long (same). LEWINSOHN did not comment on the abdominal locking mechanism but it is identical in both specimens. His comment that the male pleopods of the type are well developed, indicating sexual maturity, needs to be confirmed by other evidence, e.g. relative growth of secondary sexual characters. No female of this species has been collected so the nature of the sternal grooves remains unknown.

Amongst the species placed in *Cryptodromiopsis*, *C. plumosa* must be regarded as having a primitive arrangement of spines on the legs : the most primitive character is the presence of a distal propodal spine overlapping with the base of the dactyl on the first two pairs of legs, a condition found for e.g. in *Sphaerodromia*, but it also has the largest number of propodal spines on the last two pairs of legs, four on the third leg, and six on the fourth leg. This condition is intermediate, because while there is a spine on the outer margin of the dactyl of the last leg, there are no spines on the inner margins of the dactyli of either of the last two legs which are found in *Sphaerodromia*. Compared to *Cryptodromiopsis plumosa*, all the other species in *Cryptodromiopsis* have reduced numbers of spines.

CAMOUFLAGE. — The camouflage carried by *C. plumosa* is made from pieces of sponge.

SIZE. — The present male specimen, CW = 13.3 mm, is the largest known. No female of this species has been collected.

DEPTH. — LEWINSOHN'S small type specimen came from a depth of 55 m while the present larger male specimen came from a depth of 16-25 m.

DISTRIBUTION. — The type specimen came from the Seychelle Islands and the only other known specimen is from the Chesterfield Islands. It may be that this species has a similar geographic distribution to *C. bullifera* .

Cryptodromiopsis unidentata (Rüppell, 1830) nov. comb.

Figs 7 a-k, 18 a

Dromia unidentata Rüppell, 1830 : 16, pl. 4, fig. 2, 2a, pl. 5, fig. 9. — H. MILNE EDWARDS, 1837 : 178. — HELLER, 1861 : 21, 31; 1862 : 243. — A. MILNE EDWARDS, 1868 : 72. — HILGENDORF, 1879 : 813. — MÜLLER, 1887 : 472. — ALCOCK, 1900 : 139; 1901 : 47, pl. 2, fig. 6. — CHILTON, 1911 : 554.
Dromidia unidentata - KOSSMANN, 1880 : 67. — DE MAN, 1888b : 207, pl. 14, figs 4-5. — CANO, 1889 : 255 — HENDERSON, 1893 : 405. — ORTMANN, 1894 : 34. — NOBILI, 1903 : 23; 1905 : 4; 1906a : 145; 1906b : 92. — LAURIE, 1906 : 351; 1915 : 426. — RATHBUN, 1910b : 367. — IHLE, 1913 : 31. — BALSS, 1934 : 502. — SAKAI, 1936 : 13, pl. 6, fig. 2, text fig. 2. — RAMADAN, 1936 : 27. — STEPHENSEN, 1945 : 63. — BARNARD, 1950 : 323, figs 61h-i. — GORDON, 1950 : 206. — GUINOT, 1967 : 240 (list). — SAKAI, 1976 : 11, pl. 2, fig. 2, text figs 2a-b. — LEWINSOHN, 1977 : 9, fig. 1a-e; 1979 : 2; 1984 : 107.
Dromidia unidentata hawaiiensis Edmondson, 1922 : 6, pl II D, fig. 1a-j.
Dromidia unidentata unidentata Garth, 1957 : 316. — RETAMAL, 1981 : 25.
Cryptodromia unilobata Campbell & Stephenson, 1970 : 240, fig. 2A-I.
? *Cryptodromia incisa* Zarenkov, 1971 : 169 (error).

MATERIAL EXAMINED. — **Philippine Islands.** MUSORSTOM 3 : stn CP 142, 11°47.0'N, 123°01.5'E, 26-27 m, 6.06.1985 : 1 ♀ 7.5 x 7.4 mm.

Chesterfield Islands. CORAIL 2 : stn DW 96, 19°6.00'S, 158°41.92'E, 41 m, 27.08.1988 : 1 ♀ (ovig.) 11.9 x 13.0 mm. — Stn DW 109, 19°08.97'S, 158°52.50'E, 47-64 m, 28.08.1988 : 1 ♀ (ovig.) 14.3 x 13.8 mm. — Stn CP 111, 19°18.06'S, 158°48.86'E, 70-65 m, 28.08.1988 : 1 ♀ 7.8 x 7.2 mm.

New Caledonia. LAGON : stn 36, 22°17.2'S, 166°19.9'E, 20 m, 24.05.1985 : 1 ♀ 11.7 x 12.4 mm, carrying a sponge cap. — Stn 123, 22°29.8', 166°39.8'E, 21 m, 23.08.1984 : 1 ♀ (ovig.) 11.5 x 12.8 mm. — Stn 250, 22°18.5'S, 166°25.6'E, 10 m, 7.11.1984 : 1 ♀ (ovig.) 15.8 x 17.5 mm. — Stn 251, 22°19.3'S, 166°25.1'E, 20 m, 7.11.1984 : 1 ♂ 10.8 x 11.4 mm. — Stn 553, 22°51.10'S, 166°55.3'E, 35-40 m, 16.07.1985 : 1 ♂ 13.0 x 13.9 mm. — Stn 693, 21°30.3'S, 166°13.4'E, 35-38 m, 9.08.1986 : 1 ♂ 6.7 x 6.6 mm, carrying solitary ascidian cap.

No stn, trawl, no depth, 2.12.1986 : 1 ♂ (soft) 8.8 x 8.8 mm.

South West Lagoon, SCUBA, under *Sarcophyton*, 25 m, no date, P. LABOUTE coll. : 1 ♀ (ovig.) 18.8 x 19.9 mm.

DESCRIPTION. — Carapace approximately as long or longer than wide, evenly convex, surface smooth beneath a dense mat of fine setae, posterior half of carapace only thinly covered. Shallow frontal groove extends back from between lateral rostral teeth, branchial groove also shallow and cardiac area marked by a pair of shallow pits. Rostrum tridentate, median tooth small, strongly deflexed, not visible dorsally, lateral teeth prominent, sub-acute. Anterolateral margin begins at level of postorbital corner, without teeth and reaching its widest point just before posterolateral tooth which is very small and blunt. Posterolateral margins convergent, posterior carapace margin slightly concave.

Strong supraorbital tooth, margin concave to rounded postorbital corner. A narrow slit separates the suborbital margin which has a very prominent, subacute tooth extending forward almost as much as the lateral rostral tooth, visible dorsally, and a smaller blunt tooth at the inner corner. All these features of the frontal area are concealed by a thick cover of setae.

First segment of antenna much wider than long, beak-like medially, twisted, with upper lobe acute, and overhanging the lower lobe. Second segment narrow (ratio of width/length = 1.75), a small median distal tubercle, distomedial corner only slightly elongated, third segment essentially attached terminally. Exopod firmly fixed, bilobed, ventral lobe tooth-like, ending at the junction of the third and fourth segments, dorsal lobe flattened, extending beyond the junction and curving over base of eyestalk. Ratio of length of antennal flagella/CW = 0.62.

Subhepatic area inflated, smooth, a tooth at the corner of the buccal frame and a deep groove extending from beneath antenna, curving around below orbit and anterolateral margin to emerge at posterolateral tooth. Female sternal grooves end together on a central raised tubercle between bases of first pair of legs.

Cheliped merus trigonal in section, borders unarmed, superior surface has a distinct distal groove close to junction with carpus. Outer face of carpus smooth, inflated, two acute distal tubercles. Surface of propodus also smooth, fingers strongly downcurved, hollowed out internally, borders armed with six small teeth increasing in size distally, gaping in both sexes, interlocking only at tips.

First two pairs of legs almost as long as chelipeds, segments unadorned. Dactyli as long as propodi, inner margin of dactyli armed with eight-ten small spines.

Last two pairs of legs reduced, third pair shortest. Both legs have flattened segments and long, almost straight dactyli opposed by single, stout propodal spines and with two unequal spines on the outer propodal margin. While the third legs are ventrally placed, the fourth pair are subdorsal and extend almost as far forward as the orbits. The limbs are closely folded against the carapace and along with the tomentum this gives the crab the appearance of a hairy ball which fits tightly into the piece of camouflage which it carries.

Abdomen of six free segments. Telson slightly longer than wide in male, wider than long in the female, a pair of small central tubercles. Uropods well developed, visible externally, and these lock the male abdomen in place by fitting in front of elongate flange on bases of the first legs.

First male pleopod a semi-rolled, setose tube with blunt tip, second pleopod simple, needle-like.

DISCUSSION. —The original description of *Dromia unidentata* Rüppell, 1830, included accurate illustrations of a male and a female, including most of the spines around the dactyli of the last two pairs of legs, but somewhat inaccurate illustrations of the abdomen. The figure of the female abdomen shows the pleopods in a diagrammatic fashion and along with the male abdomen, omits the uropod plates at the base of the telson. These inaccuracies and omissions were corrected by LEWINSOHN (1977) who provided the most complete description and accurate figures.

The description provided here adds information about the antenna, the abdominal locking mechanism and the male pleopods.

RÜPPELL (1830) suggested that *Dromia globosa* Lamarck might be a synonym for *Dromia unidentata* but, as discussed above, this is not the case and the species should be known as *Dromidiopsis globosa* (Lamarck, 1818).

The sternal grooves in the mature female *Cryptodromiopsis unidentata* end close together between the bases of the first legs, but in the female, CW = 7.8 mm, from stn CP 111, they end together just behind this level, and in the female, CW = 7.5 mm, from stn CP 142, they end apart between the bases of the second legs. This ontogenetic change in the state of the sternal groove character is typical of dromiid females and has created many past difficulties in identifying sponge crabs. For example, CAMPBELL and STEPHENSON (1970) created a new species, *Cryptodromia unilobata*, on the basis of a single female from Moreton Bay, Queensland. Although having a strong resemblance to *Cryptodromiopsis unidentata*, the specimen had sternal grooves "ending on low, widely separated tubercles between the coxae of the second walking legs, just anterior to the genital openings". Since the *Cryptodromia unilobata* female had CW = 16.5 mm, exceeding the size of the smallest ovigerous female, it might be expected to be mature, and have adult sternal grooves, but this is not necessarily true because sexual maturation can occur over a wide size range.

The sternal groove character also led ZARENKOV (1971) to identify his two specimens as *Cryptodromia incisa* Henderson, 1888, when they probably should have been named *Dromidia unidentata* which was already known from the Red Sea (see LEWINSOHN, 1977).

One sub-species has been described as *Dromidia unidentata hawaiiensis* Edmondson, 1922, from a single, small male specimen collected from Hawaii. The differences noted by EDMONDSON included spots, and some softer, membranous areas on the carapace. These differences are just individual variation and no further specimens have been obtained. Because this name was used for the Hawaiian specimen, GARTH (1957) and RETAMAL (1981) used the name *Dromidia unidentata unidentata* for the typical form which was collected from Easter Is. It seems to me that neither of these sub-specific names are necessary and that the specimens from both of these Pacific islands should be known as *Cryptodromiopsis unidentata*.

SIZE. — The size range of *Cryptodromiopsis unidentata* recorded here is as follows : 4 males, CW = 6.7-13.0 mm, 3 females, CW = 7.5-11.7 mm, 5 females (ovig.), CW = 11.5-18.8 mm. Other records show that the maximum size for males is CW = 34.0 mm (LEWINSOHN, 1984), for females CW = 31.0 mm (SAKAI, 1936) and the minimum size for ovigerous females is CW = 11.0 mm (HENDERSON, 1893). Mean egg size for the ovigerous females = 0.9 mm (range 0.75-1.10 mm), and mean egg numbers = 331 (range 216-440). This combination of egg size and numbers is intermediate between the extremes of small eggs-large numbers, and large eggs-small numbers seen in other dromiid species.

CAMOUFLAGE. — *Cryptodromiopsis unidentata* has been recorded carrying a wide range of camouflage material : sponges (DE MAN, 1888b, HENDERSON, 1893, EDMONDSON, 1922, and GARTH, 1957 who identified the sponge as *Hymeniacidon* sp.), soft coral (ORTMANN, 1894), compound ascidian (CHILTON, 1911), solitary ascidians and sponges (SAKAI, 1936), an actinian, *Palythoa nelliae* (BARNARD, 1950), compound ascidians substantially larger than the crabs (LEWINSOHN, 1977), and a colony of *Xenia* (LEWINSOHN, 1984). In the New Caledonian material one crab was accompanied by a cap made of sponge and another had a solitary ascidian. The most common camouflage material used by *Cryptodromiopsis unidentata* is made of sponges and ascidians.

DEPTH. — The *Cryptodromiopsis unidentata* reported here came from depths of 10-70 m which is within the range of 0-100 m previously reported by LEWINSOHN (1984). Most specimens have been collected from the shallow end of this range, less than 50 m.

DISTRIBUTION. — Geographic distribution includes the Red Sea, east coast of Africa (as far south as Mozambique, see BARNARD, 1950), Persian Gulf, India and Sri Lanka, Andaman Is., Mergui Archipelago, Thailand, Singapore, Indonesia, Japan (approx. 36°N), Moreton Bay, Queensland (as *Cryptodromia unilobata* Campbell & Stephenson, 1970) with the southernmost Pacific record from Meyer Is., 29°15'S, Kermadecs (north of New Zealand). The distribution also extends eastward in the Pacific to Hawaii, north of the equator

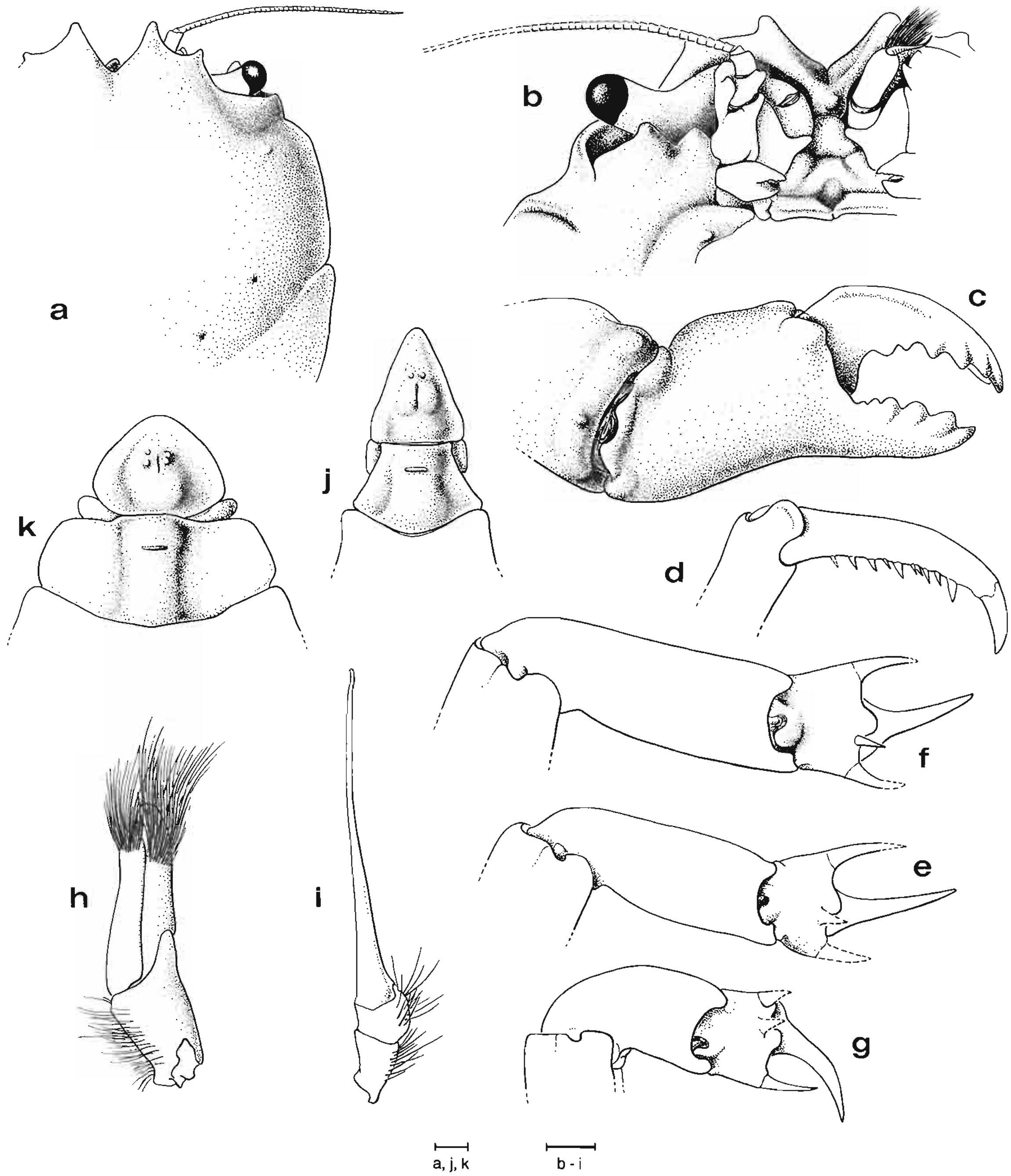


FIG. 7. — *Cryptodromiopsis unidentata* (Rüppell, 1830) nov. comb., ♂ 13.0 x 13.9 mm, New Caledonia, LAGON, stn 553, 35-40 m (MNHN-B 22563); ♀ (ovig.) 14.3 x 13.8 mm, Chesterfield Islands, CORAIL 2, stn DW 109, 47-64 m (MNHN-B 22564) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, ventral view of propodus and dactyl of male right third leg; **f**, ventral view of same leg of female; **g**, posterior view of propodus and dactyl of male right fourth leg; **h**, first pleopod of male; **i**, second pleopod of male; **j**, ventral view of male telson and penultimate abdominal segments; **k**, ventral view of female telson and penultimate abdominal segments. (Fig. 7 a-e, g-j based on male, 7 f, k on female).

Scale bars represent 1.0 mm.

(EDMONDSON, 1922) and to Easter Is. (approx. 27°S, 109°E), south of the equator (GARTH, 1957). Thus it is not surprising to record *Cryptodromiopsis unidentata* from New Caledonia and the Philippine Islands and it confirms that this is a very widespread Indo-Pacific species.

CHARACTER	*Cryptodromia*	*Takedromia*	*Epigodromia*
Ratio CW/CL	Carapace width greater than or equal to length.	Carapace width greater than length.	Carapace may be slightly less than, equal to, or greater than length.
Carapace surface	Smooth.	Granulate, tuberculate or areolate.	Granular, usually areolate.
Rostrum	Tridentate, teeth well developed, blunt, subacute.	Tridentate, teeth subacute or eave-like.	Tridentate, teeth blunt, divergent, may be eave-like.
Anterolateral margin	Teeth always present, blunt, subacute.	Teeth well developed, lacinated or tuberculate. Posterolateral margin also dentate or tuberculate.	Teeth usually broad, granulated lobes, but may be absent.
Antenna	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment produced, prominent median, distal spine. Exopod as long as third segment.	Segments granulate. Distomedial corner of second segment produced. Exopod as long as third segment.
Sternal grooves	End apart between or behind first legs.	End apart between first legs.	End apart between first legs.
Epipods/Podobranchs	Usually no epipod on cheliped, but may be present. No podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.	Usually no epipod on cheliped, but may be present. No podobranchs on pereiopods.
First two pairs of legs	Segments may be lobed, nodular, or tuberculate.	Segments tuberculate, granulate.	Segments tuberculate, granulate.
Last two pairs of legs	Third leg dactyl opposed by one propodal spine, may be another spine on outer propodal margin. Fourth leg shorter than first, dactyl opposed by one propodal spine, up to two spines on outer propodal margin.	Third leg dactyl opposed by one propodal spine, no spine on outer propodal margin. Fourth leg much shorter than than first leg, dactyl opposed by one propodal spine, no spine on outer propodal margin.	Third leg dactyl opposed by one propodal spine, no spine on outer propodal margin. Fourth leg much shorter than first leg, dactyl opposed by one propodal spine, no spine on outer propodal margin.
Abdominal segments	No segments fused, third to sixth segments often have small rounded tubercles arranged in different patterns.	No segments fused, third to sixth segments granulate with a pattern of tubercles superimposed.	No segments fused, third to sixth segments granulate with a pattern of transverse ridges superimposed.
Uropods	Small, visible externally. Abdominal locking mechanism used.	Small, visible externally. Abdominal locking mechanism used.	Small, visible externally. Abdominal locking mechanism used.
Telson	Rounded.	Rounded or subtruncate.	Truncate or bilobed.
Male pleopods	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.

TABLE 7. — Comparison of the key characteristics of the genera *Cryptodromia* Stimpson, 1858, *Takedromia* gen. nov., *Epigodromia* gen. nov.

Genus *CRYPTODROMIA* Stimpson, 1858

Cryptodromia Stimpson, 1858 : 225 (in part); 1907 : 172 (in part). — HASWELL, 1882 : 138. — DE MAN, 1888a : 398 . — ALCOCK, 1900 : 140 (in part); 1901 : 48 (in part). — BORRADAILE, 1903a : 299 (in part). — IHLE, 1913 : 32 (in part). — BALSS, 1922 : 106 (in part). — STEBBING, 1923 : 4. — SAKAI, 1936 : 15 (in part). — BARNARD, 1950 : 327 (in part). — SERENE & LOHAVANIJAYA, 1973 : 13 (in part).
Dromides Borradaile, 1903a : 299.

Carapace as wide or wider than long, surface smooth, convex. Rostrum tridentate. Supraorbital tooth small, blunt, usually a small postorbital tooth, and well developed suborbital tooth. Anterolateral border may bear up to three teeth and subhepatic area may have up to two small tubercles. Antennal exopod well developed. Coxae of third maxillipeds usually separated by a gap and may be inserted directly under tip of sternum or well forward and separated by a deep trough. Female sternal grooves end apart on small tubercles between or behind bases of first legs. Cheliped usually without an epipod but it may be present, carpal and propodal segments usually nodular. Carpi and propodi of first two pairs of legs may be lobed, nodular or tubercular and inner margins of dactyli have up to six small spines. Last two pairs of legs reduced, fourth pair longer, dactyli opposed by a single propodal spine with up to two spines on the outer propodal margin. Abdomen of six free segments. Uropod plates well developed and visible externally, employed in the abdominal locking mechanism by fitting in front of flange on bases of first pair of legs. Telson usually rounded, but may be truncate or even bilobed. Abdominal segments smooth and third to fifth segments may have lateral and/or median tubercles.

TYPE SPECIES. — Of *Cryptodromia* Stimpson, 1858 : *Cryptodromia coronata* Stimpson, 1858, by original designation (STIMPSON, 1858, p. 64). Of *Dromides* Borradaile, 1903a : *Cryptodromia hilgendorfi* De Man, 1888, by monotypy.

OTHER SPECIES. — *Cryptodromia amboinensis* De Man, 1888, *Dromia fallax* Lamarck, 1818, *Petalomera fukuii* Sakai, 1936, *Cryptodromia hilgendorfi* De Man, 1888, *Cryptodromia longipes* sp. nov., *Cryptodromia mariae* Ihle, 1913, *Dromia (Cryptodromia) pentagonalis* Hilgendorf, 1879, *Cryptodromia trituberculata* Buitendijk, 1939, *Cryptodromia tuberculata* Stimpson, 1858, *Cryptodromia tumida* Stimpson, 1858. Probably also includes *Cryptodromia nipponensis* Yokoya, 1933, and *Cryptodromia protubera* Dai, Yang, Song & Chen, 1981.

DISCUSSION. — The genus *Cryptodromia* was created by STIMPSON (1858) for a group of sponge crabs with the following characteristics : small size, carapace convex, covered with a short pubescence, female sternal grooves end apart on tubercles between the first pair of legs, palate armed with a ridge on each side, and legs always more or less nodose. STIMPSON (1907) added the following features : carapace generally broader than long, with a broad front, anterolateral teeth often bifurcated, last pair of pereiopods longer than the penultimate pair, segments of the abdomen freely movable, generally armed with nodiform or spiniform projections, telson usually broader than long, and uropods conspicuous.

The type species for the genus is *Cryptodromia coronata* Stimpson, 1858, and STIMPSON included three other new species : *C. canaliculata*, *C. tuberculata*, and *C. tumida* all from Japan. In addition he suggested that a further four species should be included : *Dromia nodipes* Lamarck, 1818, *D. lateralis* Gray, 1831, *D. fallax* Lamarck, 1818 and *D. caput-mortuum* H. Milne Edwards, 1837.

BORRADAILE (1903a) erected the new genus *Dromides* for *Cryptodromia hilgendorfi* De Man, 1888, a change that was not followed by any other authors, but he did make two significant changes which affected *Cryptodromia*. Firstly, he combined *Epidromia* Kossmann, 1878, with *Cryptodromia* but did not modify the generic definition to include species with a granulate carapace. In this paper I separate these genera again (see below). Secondly, BORRADAILE added a key character, the absence of an epipod on the cheliped, although ALCOCK (1901) had earlier stated that species of *Cryptodromia* may have an epipod, but none of the Indian species which he considered had an epipod. However, this was to allow the inclusion of *Dromia lateralis* Gray, 1831, which BORRADAILE (1903a) placed in *Petalomera* Stimpson, 1858. The generic definition given above contains a major change because it allows the inclusion of species which do have an epipod on the cheliped. This allows the species previously assigned to either *Petalomera* or *Cryptodromia* to be reorganized into natural groups.

SERÈNE and LOHAVANIJAYA (1973) examined the history and current state of *Cryptodromia*, and while they suggested some possible synonyms, they did not propose any rationalization, apart from recognizing that there were two groups of species : those with a granular carapace and those with a smooth carapace. The existence of these groups was, of course, a consequence of the inclusion of *Epidromia*. In his key to the Indian species of *Cryptodromia*, ALCOCK (1900) used this as his first character to subdivide the genus, as did SAKAI (1936) for the Japanese species. In this paper I transfer the small dromiids, with a tuberculate or areolate carapace, which previously belonged to *Cryptodromia*, to two new genera (*Barnardromia* gen. nov., and *Takedromia* gen. nov.), and others are placed in *Epigodromia* gen. nov. (a replacement name for *Epidromia* Kossmann, 1878). The other species, with a smooth carapace, remain in *Cryptodromia* Stimpson, 1858 (see Table 7).

Apart from the species in the New Caledonian collection, some comments need to be made about the other species included in this genus. *Cryptodromia nierstraszi* Ihle, 1913, was described from three small males (CW = 8.5 mm) and a smaller female specimen (CW = 5.1 mm) collected from *Siboga* stn 313 (depth = 36 m) Dangar Besar, Saleh Bay, Indonesia. *C. nierstraszi* is known only from the type locality and has not been reported subsequently. Comparison of the male type (Zoologisch Museum, Amsterdam, De 102.961) with a *Cryptodromia pentagonalis* Hilgendorf, 1879, male (Mombasa, Kenya, MNHN-B 7392), reported by LEWINSOHN (1984), shows that these two species are identical. Similarly, *C. laevis* Ihle, 1913, which was based on an ovigerous female (CW = 13.0 mm) from Pulu Sanguisiapo, Sulu Archipelago, is also a synonym of *C. pentagonalis*. *C. laevis* has not been recorded by any other author and the differences from *C. nierstraszi* , noted by IHLE, are only minor variations in the rostral teeth and subhepatic tubercles which are attributable to size differences. LEWINSOHN (1979, 1984) summarized the records of *C. pentagonalis* which suggest that it only occurs in the Red Sea and Indian Ocean, but these synonymies establish that the distribution also includes Indonesia. Most of the records of *C. pentagonalis* are from the intertidal zone but RATHBUN (1911) recorded material from 70 m so IHLE'S material (from 36 m) is within the depth range for this species.

Cryptodromia nipponensis Yokoya, 1933, and *C. protubera* Dai, Yang, Song & Chen, 1981, are only tentatively included here because they were very poorly described. They are both known only from the type material collected from Japan and China respectively.

Following earlier authors, *Cryptodromia pileifera* Alcock, 1901, is regarded as a synonym of *C. tuberculata* Stimpson, 1858, although TAM, LIM and NG (1986) used the name for specimens which seem to me to be identical to *C. tuberculata*. These authors have provided the only information about larval development in this genus.

DISTRIBUTION. — The distribution of the species of *Cryptodromia* ranges from the Red Sea, through the Indian Ocean, Indonesia, Australia, north to Japan and eastward into the Pacific as far as French Polynesia. All of them are small, shallow water species which carry pieces of sponge or ascidian for camouflage. Prior to this paper, *C. tuberculata* Stimpson, 1858, and *C. tumida* Stimpson, 1858, had been recorded from the Philippine Islands, and *C. fallax* (Lamarck, 1818) had been recorded from New Caledonia as well as the Philippines.

Key to the species of *Cryptodromia*

(Species studied in this paper are in bold)

1. Carapace significantly wider than long **2**
— Carapace approximately as wide as long **9**

2. Single anterolateral tooth **3**
— More than one anterolateral tooth **4**

3. Anterolateral tooth small, almost concealed under margin .... *Cryptodromia pentagonalis* Hilgendorf, 1879
— Anterolateral tooth prominent, laterally directed .... *Cryptodromia protubera* Dai, Yang, Song, & Chen, 1981

4. Two anterolateral teeth, carapace surface canaliculated .... ***Cryptodromia fallax*** (Lamarck, 1818)
— Two or more anterolateral teeth, carapace surface not canaliculated **5**

5. Rostrum bluntly tridentate, small supraorbital tooth **6**
— Rostrum truncate, no supraorbital tooth.......... *Cryptodromia nipponensis* Yokoya, 1933

6. Median rostral tooth more prominent than lateral teeth, three anterolateral teeth, first two strongest, chelipeds strongly tuberculated, propodus with 20-25 tubercles of variable size, margins of carpi and propodi of first two pairs of legs sharply verrucose... *Cryptodromia tuberculata* Stimpson, 1858.
— Lateral rostral teeth more prominent than median tooth, distal margins of carpi and propodi of first two pairs of legs lobed, but not sharply verrucose **7**

7. Carapace minutely granular, frontal teeth sharply projecting, two large anterolateral teeth, posterior margin of each tooth elongated, chelipeds tuberculated but propodus with only a few prominent tubercles, third and fourth abdominal segments armed with four tubercles .... ***Cryptodromia coronata*** Stimpson, 1858
— Carapace smooth, frontal teeth blunt, three anterolateral teeth **8**

8. Lateral cardiac grooves not marked, anterolateral teeth equal, outer face of cheliped propodus marked by some lines of small granules, abdominal segments without distinct tubercles .... *Cryptodromia tumida* Stimpson, 1858
— Lateral cardiac grooves deeply marked, anterolateral teeth unequal (first largest, third smallest), outer face of cheliped propodus minutely denticulated, superior face tends to have ridge-like margins, fourth and fifth abdominal segments have a tubercle near posterior border .... ***Cryptodromia fukuii*** (Sakai, 1936) nov. comb.

9. Single anterolateral tooth .... ***Cryptodromia hilgendorfi*** De Man, 1888
— More than one anterolateral tooth **10**

10. Two anterolateral teeth **11**
— Three anterolateral teeth **12**

11. Last leg long, almost reaching orbit when straightened, a small tubercle close to the postorbital corner, above the level of the anterolateral margin .... ***Cryptodromia amboinensis*** De Man, 1888
— Last leg long, almost reaching orbit when straightened, no tubercle close to postorbital corner .... ***Cryptodromia longipes*** sp. nov.

12. Lateral rostral teeth triangular, anterolateral teeth sharp, not flattened, first two pairs of legs very nodular .... *Cryptodromia mariae* Ihle, 1913
— Lateral rostral teeth truncate, anterolateral teeth blunt, flattened, first two pairs of legs not strongly nodular............................... *Cryptodromia trituberculata* Buitendijk, 1939

Cryptodromia ? coronata Stimpson, 1858

Fig. 18 b

Cryptodromia coronata Stimpson, 1858 : 239; 1907 : 173, pl. 20, fig. 2. — DE MAN, 1888a : 398, pl. 18, fig. 2. — IVES, 1891 : 217 (list). — ORTMANN, 1892 : 543. — NOBILI, 1907 : 378. — IHLE, 1913 : 41 [not specimens from stns 50 and 162, these are *Paradromia japonica* (Henderson, 1888)]. — SAKAI, 1936 : 25; 1976 : 17, text fig. 9. — BUITENDIJK, 1939 : 224; 1950 : 62. — DAI & YANG, 1991 : 22, pl. 2 (1), fig. 5b.

MATERIAL EXAMINED. — **New Caledonia.** LAGON : stn 63, 22°26.0'S, 166°26.3'E, 20 m, 20.08.1984 : 1 ♀ (ovig.) 7.4 x 6.7 mm. — Stn 84, 22°30.0'S, 166°31.2'E, 17 m, 21.08.1984 : 1 ♀ 5.5 x 5.3 mm; 2 ♀♀ (ovig.) 5.2 x 4.8, 6.1 x 5.5 mm. — Stn 100, 22°32.6'S, 166°34.6'E, 15 m, 21.08.1984 : 1 ♀ 6.1 x 6.3 mm, carrying compound ascidian cap; 1 ♀ (ovig.) 6.1 x 6.0 mm, carrying compound ascidian cap. — Stn 112, 22°23.6'S, 166°47.9'E, 42 m, 22.08.1984 : 1 ♀ (ovig.) 5.7 x 5.0 mm. — Stn 126, 22°31.6'S, 166°46.2'E, 19 m, 23.08.1984 : 1 ♀ 4.5 x 4.3 mm. — Stn 127, 22°30.6'S, 166°45.9'E, 55 m, 23.08.1984 : 4 ♀♀ 3.0 x 2.9, 4.6 x 4.2, 5.1 x 4.7, 5.2 x 4.8 mm; 1 ♀ (ovig.) 5.1 x 4.6 mm. — Stn 225, 22°35.9'S, 166°40.0'E, 15 m, 22.10.1984 : 1 ♀ (ovig.) 7.2 x 7.4 mm. — Stn 248, 22°23.8'S, 166°47.0'E, 47 m, 24.10.1984 : 3 ♂♂ 4.9 x 4.6, 5.1 x 4.8, 6.4 x 5.7 mm; 2 ♀♀ 4.5 x 4.1, 4.5 x 4.3 mm, carrying a sponge cap; 2 ♀♀ (ovig.) 5.0 x 4.7, 5.8 x 4.9 mm. — Stn 312, 22°41.9'S, 166°48.8'E, 26 m, 27.11.1984 : 1 ♂ 6.1 x 5.4 mm. — Stn 405, 22°37.5'S, 167°19.5'E, 27 m, 23.01.1985 : 1 ♂ 11.5 x 10.7 mm, carrying a sponge cap; 1 ♀ 4.8 x 4.4 mm, carrying an ascidian cap. — Stn 409, 22°41.5'S, 167°24.2'E, 13-18 m, 24.01.1985 : 1 ♂ 7.4 x 7.8 mm. — Stn 564, 22°46.8'S, 166°56.0'E, 32-38 m, 16.07.1985 : 1 ♂ 5.6 x 5.1 mm, carrying a sponge cap. — Stn 710, 21°24.0'S, 166°2.5'E, 30-31 m, 10.08.1986 : 1 ♂ 5.3 x 5.0 mm.

No locality, probably intertidal, no date (possibly came from M. BALANSA, 1861-73), A. MILNE EDWARDS det., 1903 : 1 ♂ 8.5 x 7.9 mm; 1 ♀ (ovig.) 8.8 x 7.9 mm, carrying sponge caps (MNHN-B 13883).

MISSION SINGER-POLIGNAC. Ile des Pins, no depth, 15.12.1961 : 1 ♀ 5.0 x 4.7 mm.

Indonesia. Ambon (Sieth), intertidal zone, 16.10.91, B. RICHER DE FORGES coll. : 1 ♀ 8.5 x 7.0 mm. — Ambon (Tial), intertidal zone, 16.10.91, B. RICHER DE FORGES coll. : 2 ♀♀ 5.8 x 4.9, 8.7 x 7.2 mm.

DESCRIPTION. — Carapace wider than long, surface smooth, very convex, rising steeply especially at front, covered by short fine tomentum with some longer plumose setae fringing limbs. Frontal, branchial and lateral cardiac grooves well marked. Rostrum tridentate, blunt, teeth horizontally directed, similar in size, median tooth on a lower level. Anterolateral margin convex, begins at level of postorbital tooth, bearing two blunt teeth, first strongest and near orbit, second small, more distant with a slight swelling on intervening margin. Branchial notch well marked with a small posterolateral tooth behind.

Supraorbital tooth smaller than lateral rostral tooth but prominent, postorbital tooth small, more acute. Suborbital margin extends directly without distinct fissure, from beneath postorbital tooth and bears a strong subacute tooth visible dorsally. This tooth is buttressed beneath as far as the groove running from near corner of buccal frame around under anterolateral margin towards branchial notch. On this buttress, just above the groove, is a small rounded swelling, and beneath the groove, at corner of buccal frame, are two small, subacute teeth.

On subhepatic region are two teeth, one larger, more acute, visible dorsally, ventrolateral to postorbital tooth and the other, smaller, just above groove. Epistome triangular, wider than long, surface concave, dorsal apex tooth-like beneath junction with rostrum. Female sternal grooves convergent, ending apart between bases of first legs on prominent tubercles connected by a ridge.

First segment of antenna much wider than long, slightly narrowed laterally, beak-like medially, upper lobe longer than lower. Second segment much longer than wide, surface convex, a small median distal tubercle, distomedial corner produced, curved, on which third segment is inserted at an angle. Exopod firmly fixed to second segment, tip only slightly bilobed, barely extending as far as joint between third and fourth segments. Ratio of length of antennal flagella to CW = 0.46.

Chelipeds well developed. Merus trigonal, borders unarmed. Carpus outer face convex, smooth except for two strong, blunt distal tubercles, some specimens have two-three small central tubercles as well. Propodus upper face with one (sometimes two) proximal tubercles (maybe absent in females), another at base of dactyl and minutely granulated in between. Outer propodus face with a strong proximal tubercle articulating with carpus, lower face minutely granulated. Fingers downcurved, hollowed out internally, spoon-like, four-five tiny granules at base of dactyl, gaping widely, touching only at tips in male, gaping less in female, armed with seven-eight small teeth.

First two pairs of legs smaller than chelipeds, distal borders of carpi and propodi produced as two small lobes, dactyli as long as propodi, strongly curved at tips, inner margins armed with five-six small spines increasing in size distally, a small, pearl-like, proximal, tubercle on posterior face.

Last two pairs of legs reduced, third pair shortest, dactyl strongly curved, normally opposed by one propodal spine (sometimes two spines) with another smaller spine on outer propodal margin. Fourth pair reach approximately as far as second anterolateral tooth when extended forward, flattened, dactyl curved, opposed by a single propodal spine with another small spine on outer propodal margin.

Abdomen of six free segments. Telson much wider than long, tip rounded. Uropod plates well developed, visible externally, locking abdomen in place by fitting in front of small serrated ridge on bases of first legs. Distolateral corners of abdominal segments three-five produced as a blunt lobe, nearby there may be a small tubercle. A pair of tubercles on central abdominal ridge of segments three-six, those on segments four and five largest, in some females only the pair on the fourth segment are prominent.

First male pleopod a setose semi-rolled tube with a sharp horny tip; second pleopod simple, needle-like.

DISCUSSION. — Only five male (maximum CW = 14.2 mm) and four female (maximum CW = 12.0 mm) *C. coronata* have been reported, all in shallow water (0-32 m), from China (Xisha Is.), Japan, Indonesia, Samoa, and Rikitea, Polynesia. Some of these specimens were associated with corals or *Halimede* (Chlorophyta, Codiacenae). The exact identity of this species is somewhat uncertain because there appear to be several small dromiids, including undescribed specimens, which closely resemble one another and are therefore difficult to separate. The citations of SAKAI (1936, 1976) both refer to STIMPSON'S type, so that *C. coronata* has not been recorded from Japan since the original discovery in 1858.

ORTMANN (1892) noted the variability in abdominal tubercles on specimens from Samoa, and BUITENDIJK (1939, 1950) only tentatively assigned her specimens, from Timor and Singapore, to *C. coronata*. In the same manner, the present New Caledonian and Indonesian specimens are for the present, assigned to *C. coronata*. Clarification of this problem awaits the investigation of undescribed material and comparison with the earlier specimens.

SIZE. — The size ranges of *C. coronata* from New Caledonia and Indonesia are CW = 4.9-11.5 mm for males, CW = 3.0-8.7 mm for non-ovigerous females, and CW = 5.0-8.8 mm for ovigerous females. None of these specimens exceed the previously recorded maximum sizes. The smallest female with an abdomen of mature width is CW = 4.5 mm, but all females of equal or greater size than CW = 5.0 mm are mature, indicating that they reach maturity over a very small size range. Ovigerous females carry very small numbers (mean = 8.1) of large (mean diam. = 1.0 mm) eggs which suggests an extreme reproductive strategy. These females were collected during the months of August to October and their eggs were at various stages of development, indicating that the reproductive season extends beyond these months. *C. coronata* may have larval development similar to *C. tuberculata* which has a single, short-lived zoea (reported by TAN, LIM and NG, 1986, as *C. pileifera*).

CAMOUFLAGE. — DE MAN (1888a) recorded a crab carrying a sponge cap and many of the present crabs also carried not only sponge caps but also caps made from compound ascidians.

DEPTH. — The depth range of the New Caledonian and Indonesian specimens is 0-47 m, and so exceeds the previous maximum of 32 m.

DISTRIBUTION. — Previous records are from Japan, Indonesia, Samoa, and Rikitea, Polynesia. Occurrence of *C. coronata* off New Caledonia is new, but it does not extend the distribution beyond the previously known Indonesian-Pacific area (as far east as Polynesia), apart from extending the southern limit. It might not be surprising that *C. coronata* has similar larval development to *C. tuberculata*, because *C. tuberculata* also has an extensive distribution, although it extends westward into the Indian Ocean rather than eastward into the Pacific.

Cryptodromia fukuii (Sakai, 1936) nov. comb.

Fig. 17 c

Petalomera fukuii Sakai, 1936 : 31, pl. 1, fig. 2, text fig. 8a-c; 1965 : 9, pl. 4, fig. 1; 1976 : 21, text fig. 11. — SUZUKI & KURATA, 1967 : 95.

MATERIAL EXAMINED. — **New Caledonia**. No locality, probably intertidal, M. BALANSA coll., 1861-73 : 2 ♂♂ 6.5 x 5.6, 8.3 x 7.4 mm, carrying sponge caps; 4 ♀♀ 5.3 x 4.7, 10.6 x 9.1, 11.2 x 9.7, 14.5 x 12.3 mm, carrying sponge caps; 1 ♀ (ovig.) 10.4 x 8.9 mm, carrying a sponge cap (MNHN-B 22094).

DESCRIPTION. — Carapace distinctly wider than long, surface smooth, convex, sparsely covered with short setae, rising more steeply at front. Regions not defined but branchial and lateral cardiac grooves distinct. Rostrum bluntly tridentate, median tooth deflexed, on a lower level although clearly visible dorsally. Lateral rostral teeth separated by a broad sinus and as long as median tooth. Three anterolateral teeth on an evenly convex margin. First tooth strong, blunt, on same level as suborbital margin, second tooth similar, close by, a rounded eave-like projection separating the third more distinct tooth which is smaller. A small posterolateral tooth follows the branchial groove. Posterolateral carapace margins convergent and posterior margin convex.

Supraorbital margin bearing a blunt tooth, postorbital corner slightly produced as a rounded lobe. Small fissure separating suborbital lobe which has a strong tooth at its inner corner, but this is obscured from above by the supraorbital tooth.

First segment of antenna much wider than long, beaked medially, gaping, not twisted. Second segment much longer than wide, small central distal tubercle, distomedial corner bluntly produced, curved, on which third segment is inserted at an angle. Exopod firmly fixed, tip distinctly bilobed, inner lobe flattened, extended over eyestalk base, tip of exopod extends as far as joint between third and fourth segment. Ratio of length of antennal flagella to CW = 0.37. Epistome triangular, slightly wider than long, concave.

Subhepatic area smooth, flat, a strong tubercle near lateral margin of buccal frame, separated by a distinct groove which runs around under anterolateral margin towards posterolateral tooth. (It is somewhat arbitrary as to whether this tubercle is regarded as being subhepatic or as first anterolateral tooth). A small tubercle close to anterior corner of buccal frame. Female sternal grooves well marked, ending apart on prominent tubercles just behind bases of chelipeds.

Chelipeds small, merus triangular in cross section, borders minutely denticulate. Borders of carpus similar to merus, outer face bears five tubercles, two low, rounded proximal tubercles near lower border and two more acute distal tubercles near joint with propodus and midway between these two pairs, on lower margin of carpus, is a single larger blunt tubercle. Propodus covered with minute denticles and granules, on superior face the margins tend to be ridge-like or a series of small tubercles, a low rounded tubercle at base of dactyl, a large proximal tubercle marking joint with carpus, along lower margin granules tend to be arranged in longitudinal rows. Fingers elongate, straight, gaping basally, cutting edges armed with ten-twelve small interlocking teeth.

First two pairs of legs shorter than chelipeds. Upper distal margins of carpi produced as three rounded lobes. Distal margins of propodi produced as two rounded lobes. Dactyli as long as propodi, inner margins armed with three-five small spines increasing in size distally, a proximal pearl-like tubercle on posterior face articulating with penultimate segment.

Last two pairs of legs reduced, third pair shortest, dactyl long and curved, opposed by a small propodal spine with another small propodal spine on outer margin. When extended forward fourth leg almost reaches last anterolateral tooth, dactyl long and curved, opposed by a single large propodal spine and another spine on outer propodal margin.

Abdomen of six free segments. Male and female telson wider than long, posterior margin rounded, but male telson has three-four spinules. Uropod plates well developed, visible externally and locking abdomen by fitting in front of small serrated ridge on bases of first legs. Median ridge on abdominal segments low and rounded, a prominent tubercle near posterior corner of fourth and fifth segments.

First male pleopod a semi-rolled setose tube with a sharp, horny tip; second pleopod simple, needle-like.

DISCUSSION. — SAKAI (1936) commented on the extreme similarity of *Petalomera fukuii* and *Cryptodromia tumida* Stimpson, 1858, the only substantial difference being the presence of an epipod on the cheliped of *Petalomera fukuii*. Later, SAKAI (1965) noted the similarity to *Cryptodromia tuberculata* Stimpson, 1858. These species, as well as *C. coronata* Stimpson, 1858, are indeed very close. Certainly, *Petalomera fukuii* shows greater affinities with the genus *Cryptodromia* than it does with *Stimdromia* gen. nov., which would be the alternate genus in which to include it. It seems as though it is necessary to assume that the epipod character is capable of reversal. In this case, we must assume that either *Petalomera fukuii* represents the ancestral condition or that the cheliped epipod can be regained after it has been lost.

In his original description of *Petalomera fukuii*, SAKAI (1936) figured lateral tubercles on fourth and fifth abdominal segments of both sexes and these were also present in the New Caledonian specimens. He also noted the differences between male and female telsons : the male telson has four small spinules on the posterior margin, while the female telson is unarmed. I also observed these differences except that there were only two spinules on the male telson.

CAMOUFLAGE. — Many of SAKAI'S specimens of *P. fukuii* were carrying sponge or compound ascidian (e.g. *Botrylloides*) caps. All the New Caledonian specimens carried sponge caps.

SIZE. — The largest *P. fukuii* male found by SAKAI had CW = 15 mm. In the New Caledonian collection males were smaller, but females were as large as CW = 14.5 mm. All the females, except the smallest (CW = 5.3 mm), had mature-sized abdomens and the only ovigerous female (CW = 10.4 mm) was in such poor condition that nothing could be determined about the eggs.

DEPTH. — SAKAI (1936) reported large numbers of *P. fukuii* from shallow waters of Sagami Bay. All the New Caledonian specimens presumably came from shore collecting.

DISTRIBUTION. — Until now *C. fukuii* was only known from Japan but it clearly has a much wider distribution.

Cryptodromia amboinensis De Man, 1888

Fig. 18 c

Cryptodromia amboinensis De Man, 1888a : 406, pl. 18, fig. 4. — IHLE, 1913 : 34 (key), 90 (list).
Dromia (Cryptodromia) de manii Alcock, 1900 : 144.
Cryptodromia demanii - ALCOCK, 1901 : 52. — LAURIE, 1906 : 352. — IHLE, 1913 : 33 (key), 90 (list). — BUITENDIJK, 1939 : 225, pl. 7, fig. 1.

MATERIAL EXAMINED. — **New Caledonia**. LAGON : stn 481, 18°57.4'S, 163°31.5'E, 33 m, 2.03.1985 : 1 ♀ (ovig.) 6.2 x 5.3 mm, carrying a sponge cap.
Philippine Islands. MUSORSTOM 3 : stn CP 142, 11°47.0'N, 123°1.5'E, 26-27 m, 7.06.1985 : 1 ♂ 5.1 x 4.4 mm; 1 ♀ (ovig.) 6.8 x 7.5 mm; 1 ♀ 6.3 x 5.7 mm, carrying a sponge cap.
Persian Gulf. Dredged on rocky bottom, April 1954. No other data : 1 ♀ 7.1 x 6.8 mm, carrying a sponge cap.

DESCRIPTION. — Carapace wider than long, convex, rising more steeply from lateral margins, surface roughened by patches of fine granules under short fine tomentum, a few longer setae and a dense tuft of long setae across front, just behind teeth is characteristic. Frontal, branchial and cardiac grooves only faintly marked. Rostrum tridentate, fringed with tiny granules, teeth blunt, median tooth on a lower level and further forward, slightly deflexed, lateral teeth directed horizontally. Anterolateral margin begins at level of postorbital corner and has two blunt teeth close together, a greater distance to branchial notch which is without a posterolateral tooth.

Small blunt supraorbital tooth, postorbital corner bluntly produced. Shallow fissure separates suborbital margin which has an unusual blunt tooth, not visible dorsally : this tooth is more like a narrow shelf, directed anterolaterally, buttressed by the subhepatic region. On this buttress is a small tubercle followed by a larger subhepatic tubercle at its base, dorsolateral to this tubercle is a second subhepatic tubercle in a straight line towards first anterolateral tooth. Between first anterolateral tooth and postorbital corner is a small tubercle close to orbit. Thus there are six tubercles, plus postorbital corner (most of which are visible dorsally) defining a roughly quadrangular, sunken subhepatic area. This arrangement is a very distinctive character of this species. Female sternal grooves end wide apart on low tubercles just behind bases of first legs.

First segment of antenna much wider than long, lateral margin narrowed, medial margin beaked, gaping. Second segment much longer than wide, small central distal tubercle which has a row of smaller granules running obliquely away from it towards lateral margin, distomedial corner bluntly produced, curved, on which third segment is inserted at an angle. Exopod firmly fixed, extending as far as joint between third and fourth segments where the tip is bilobed, inner lobe curving over base of eyestalk. Epistome triangular, wider than long, concave with a small tubercle on each lateral margin. Blunt tooth at corner of buccal frame.

Chelipeds, stout, well developed. Merus trigonal, borders unarmed. Carpus with three-four small granules along inner margin, a prominent central tubercle and two larger, blunt, distal tubercles. Propodus inner margin with four-five small granules, superior margin with two unequal tubercles at base of dactyl and another small proximal tubercle, outer face finely granulated with a small proximal tubercle near superior distal carpal tubercle. Fingers pearly white, downcurved, hollowed out internally, slightly gaping, armed with five-six small teeth.

First two pairs of legs shorter, fringed with longer setae, distal borders of carpi and propodi bluntly lobed. Dactyli as long as propodi, curved at tips, inner margins armed with four-five small spines increasing in size distally, a small pearl-like proximal tubercle on posterior margin.

Last two pairs of legs reduced, third pair shortest, dactyl strongly curved, opposed by a single propodal spine. Fourth legs long, flattened, almost reaching supraorbital margin if fully extended, dactyl strongly curved, opposed by a single propodal spine.

Abdomen of six free segments. Telson wider than long, tip bluntly rounded. Uropod plates well developed and visible externally. Male abdominal segments four-six have a small lateral tubercle, and a pair of small medial tubercles on fourth segment. These tubercles are only faintly developed in female. Abdominal locking mechanism consists of uropod plates fitting in front of serrated flange on bases of first legs.

First male pleopod is a semi-rolled, setose tube with a sharp horny tip; second pleopods simple, needle-like.

DISCUSSION. — One characteristic feature of *Cryptodromia amboinensis* De Man, 1888, is the arrangement of tubercles on the subhepatic area and near the orbit. This is best seen in DE MAN (1888a, fig. 4a) which shows a small tubercle near the orbit, above the level of the anterolateral margin, an unusual suborbital tooth with a small tubercle on its base, and two subhepatic tubercles in a straight line towards the first anterolateral tooth. Together, these six adornments define a roughly quadrangular area.

Comparison of DE MAN's figure with the description of *Cryptodromia demanii* Alcock, 1900, shows that this species is a synonym of *C. amboinensis*. ALCOCK (1900) stated that "A tooth on the hepatic region, dorsad of the anterolateral border, and just behind the outer orbital angle, is characteristic", and the subsequent illustration of *C. demanii* by BUITENDIJK (1939) confirms this synonymy. It is indeed ironic that a species named in honour of a person, turns out to be a synonym of a species already described by that same person. Until now, the only specimen of *C. amboinensis* known was the ovigerous female type (CW = 4.8 mm). Since ALCOCK described his species, other specimens have been known under this name, overlooking DE MAN'S species.

SIZE. — The size of the type specimen of *C. demanii* was CW = 5.0 mm, but the sex was not given. Including the type of *C. amboinensis*, only females have been recorded with maximum CW = 5.6 mm. The male, CW = 5.1 mm, from Philippines stn CP 142, is the first to be recorded and allows the male characters to be added to the description. All four of the females from New Caledonia and the Philippines and Persian Gulf are larger than any earlier specimens, giving a maximum female CW of 7.1 mm. The two ovigerous females carried 40 and 170 eggs (diam. = 0.7 mm) which is comparable to *C. hilgendorfi* (see McLAY, 1982) but the original type specimen of *C. amboinensis*, CW = 4.8 mm, is smaller than the smallest (CW = 6.0 mm) ovigerous *C. hilgendorfi*. This ovigerous female, less than CW = 5 mm, is one of the smallest mature females known amongst the dromiid crabs.

CAMOUFLAGE. — The type specimen of *C. amboinensis* had a small compound ascidian cap but three of the present specimens have small sponge caps. In this respect, this species uses similar camouflage to *C. hilgendorfi* (see McLAY, 1983).

DEPTH. — The only depth record for *C. amboinensis* of 18 m comes from LAURIE (1906). The New Caledonian and Philippine specimens came from 26-33 m, confirming the previous record, but increasing the known depth range.

DISTRIBUTION. — The distribution of this species includes Sri Lanka, Mergui Archipelago, Amboina and now the Philippine Islands and New Caledonia.

Because the Persian Gulf specimen is the first record outside the West pacific area, it was compared with DE MAN'S type and there was good agreement in all features. Thus the distribution of *C. amboinensis* is now extended into the Indian Ocean.

Cryptodromia hilgendorfi De Man, 1888

Fig. 18 d

Cryptodromia hilgendorfi De Man, 1888a : 404, pl. 18, fig. 3. — NOBILI, 1899 : 249; 1906a : 146; 1907 : 93. — ALCOCK, 1900 : 145; 1901 : 52, pl. 3, fig. 11. — BORRADAILE, 1900 : 571. — LAURIE, 1906 : 352, 426. — IHLE, 1913 : 45. — BALSS, 1938 : 5. — BUITENDIJK, 1939 : 224. — GUINOT, 1967 : 240. — CAMPBELL & STEPHENSON, 1970 : 245, fig. 3. — TAKEDA, 1973 : 78. — LEWINSOHN, 1977 : 13, fig. 2; 1984 : 109. — MCLAY, 1982 : 317. — DAI & YANG, 1991 : 24, pl. 2 (2), fig. 6b.
Dromia (Cryptodromia) hilgendorfi - ALCOCK, 1900 : 145.
Dromides hilgendorfi - BORRADAILE, 1903 : 299; 1906 : 577.

MATERIAL EXAMINED — **New Caledonia.** LAGON : stn 48, 22°16.6'S, 166°15.2'E, 28 m, 25.05.1984 : 1 ♂ 9.2 x 8.9 mm. — Stn 72, 22°18.5'S, 166°35.3'E, 15 m, 20.08.1984 : 1 ♂ 9.4 x 9.1 mm. — Stn 100, 22°32.6'S, 166°34.6'E, 15 m, 21.08.1984 : 1 ♂ 7.7 x 7.5 mm. — Stn 244, 22°25.0'S, 166°59.6'E, 47 m, 23.10.1984 : 1 ♂ 5.4 x 5.2 mm. — Stn 248, 22°23.8'S, 166°47.0'E, 47 m, 24.10.1984 : 1 ♀ (ovig.) 7.2 x 6.5 mm, carrying a sponge cap.

Chesterfield Islands. CHALCAL 1 : stn CP 2, 20°31.50'S, 161°06.45'E, 88 m, 15.07.1984 : 1 ♂ 4.3 x 4.4 mm, carrying a sponge cap. — Stn CP 12, 20°34.30'S, 158°47.40'E, 67 m, 23.07.1984 : 1 ♀ (ovig.) 5.7 x 5.0 mm, carrying a sponge cap.

CORAIL 2 : stn CP 29, 20°31.35'S, 160°52.72'E, 79-84 m, 22.07.1988 : 1 ♀ 4.0 x 3.4 mm, carrying a sponge cap. — Stn DW 34, 19°21.62'S, 158°55.77'E, 47 m, 23.07.1988 : 1 ♂ 5.5 x 5.6 mm.

Philippine Islands. MUSORSTOM 3 : stn DR 117, 12°31.2'N, 120°39.3'E, 92-97 m, 3.06.1985 : juvenile, 2.1 x 2.1 mm.

DESCRIPTION. — Carapace wider than long, subquadrangular, convex, especially laterally, smooth under dense cover of short setae, longer plumose setae near margins. Frontal, branchial and cardiac grooves faintly marked. Rostrum tridentate, teeth similar, subacute, horizontally directed. Anterolateral margin begins at level of suborbital tooth, forming a right angle, adorned by a single blunt tooth, thereafter margin is straight and convergent, interrupted only by branchial groove which is not followed by a recognizable posterolateral tooth.

Supraorbital margin interrupted by a small tooth. Postorbital tooth small, blunt. Narrow fissure separates suborbital margin which has a single acute anterolaterally directed tooth.

First segment of antenna much wider than long, wedge-shaped, almost no lateral margin, medial margin beaked but not gaping, second segment broad basally, tapering, about as wide basally as long, medial margin curved and distally produced as a blunt spine on which third segment is inserted at an angle, a prominent ventrally directed distal tubercle on second segment, exopod firmly fixed, tip bilobed and reaching as far as joint between third and fourth segments. Ratio of length of antennal flagella to CW = 0.63. Epistome slightly concave, smooth.

Subhepatic area flat, shoulder-like with a single small tubercle beneath suborbital tooth. Female sternal grooves end wide apart on small tubercles between base of second legs.

Chelipeds small, merus trigonal, unarmed. Carpus smooth with two strong distal tubercles. Propodus smooth with a strong tubercle at base of dactyl. Fingers elongate, downcurved, hollowed out internally, armed with seven-eight small teeth, gaping basally in male.

First two pairs of legs, fringed with longer plumose setae, about as long as chelipeds. Propodi with strong distal lobe. Dactyli as long as propodi, narrow and talon-like, inner margins armed with four-five small spines, increasing in size distally. Last two pairs of legs reduced, about same length, last pair subdorsal, both have single propodal spines opposing dactyli. The dactyl of the last leg may have another spine on the outer propodal margin.

Abdomen of six free segments. Telson wider than long, tip truncate in male, rounded in female. Uropod plates well developed, visible externally. Abdominal locking mechanism consists of uropod plates fitting in front of a small flange on bases of first legs.

First male pleopod a semi-rolled, setose tube with a sharp horny tip; second pleopod simple, needle-like.

DISCUSSION. — *Cryptodromia hilgendorfi* is a distinctive species having a subquadrangular carapace shape, and a single anterolateral tooth. Indeed, BORRADAILE (1903a) erected a new genus, *Dromides*, for this species because he believed that its legs were not knobbed or ridged, its carapace was longer than wide, grooves between regions absent, and female sternal grooves ending apart between second walking legs. But most of these characters are inaccurate and compared to other species in *Cryptodromia*, the differences do not justify a separate genus.

In the only detailed study of the biology of a dromiid crab, McLAY (1982, 1983) examined the population biology and use of camouflage by *C. hilgendorfi* in an intertidal area of Moreton Bay, Queensland. Briefly, this species is a small, short-lived (maximum, 2-5 yrs), crab which produces planktonic larvae. Occurrence of ovigerous females is limited to summer months (September - February) and compared to other Brachyura of similar size, *C. hilgendorfi* produces smaller (150-600) broods of larger (diam. = 0.73 mm) eggs. Females reach maturity at CW = 5-6 mm and dominate the larger size classes but sex ratio at settling is equal, and growth is indeterminate, with differences in growth format between males and females.

An ovigerous female from New Caledonia stn 248, CW = 7.2 mm, carried 90 eggs (diam. = 0.75 mm), a similar clutch size to females from Moreton Bay. The ovigerous female from stn CP 12 was collected during July, suggesting an extended breeding season in the Chesterfield Islands compared to Moreton Bay. However this difference may be attributable to the fact that the Chesterfield Islands are approximately 7° closer to the equator.

CAMOUFLAGE. — Some crabs from New Caledonia carried sponge caps. In the Moreton Bay study (McLAY, 1983), the crabs used at least twelve different sponges as well as three ascidians for camouflage.

SIZE. — The specimens from New Caledonia and the Philippines do not exceed the maximum size for males (CW = 16.0 mm, NOBILI, 1907) or females (CW = 14.5 mm, LAURIE, 1906).

DEPTH. — The depth range of the New Caledonian and Philippine material, 15-88 m, exceeds the previously recorded maximum of 70 m (LEWINSOHN, 1984).

DISTRIBUTION. — The distribution of *C. hilgendorfi* includes the Indo-West Pacific (Red Sea to Funafuti Atoll, Gilbert and Ellice Islands) and it has been recorded from Xisha Is., China (DAI & YANG, 1991) and Queensland (CAMPBELL & STEPHENSON, 1970). Thus it is not unusual to find that it also occurs off New Caledonia, Chesterfield, and the Philippine Islands.

Cryptodromia fallax (Lamarck, 1818)

Fig. 18 e

Dromia fallax Lamarck, 1818 : 264. — H. MILNE EDWARDS, 1837 : 176. — A. MILNE EDWARDS, 1862 : 10. — RICHTERS, 1880 : 158 (list).

Cryptodromia canaliculata Stimpson, 1858 : 240; 1907 : 176. — DE MAN, 1888a : 402; 1929 : 21. — IVES, 1891 : 218 (list). — ALCOCK, 1900 : 142; 1901 : 50, pl. 2, fig. 8. — DOFLEIN, 1902 : 652. — LENZ, 1905 : 363. — NOBILI, 1906a : 145. — LAURIE, 1906 : 352. — RATHBUN, 1910b : 367; 1911 : 194. — IHLE, 1913 : 41. — BALSS, 1915 : 13; 1934 : 502; 1938 : 5. — BOUVIER, 1915 : 38. — SAKAI, 1936 : 24, pl. 7, fig. 2; 1976 : 16, pl. 4, fig. 1. — BUITENDIJK, 1939 : 224; 1950 : 61. — WARD, 1941 : 1. — STEPHENSEN, 1945 : 62. — HOLTHUIS, 1953 : 3. — GUINOT, 1967 : 240 (list). — KENSLEY, 1970 : 109, figs 5a-c; 1981 : 36 (list). — TAKEDA & NUNOMURA, 1976 : 64. — LEWINSOHN, 1977 : 18, fig. 4; 1979 : 8, fig. 2; 1984 : 108. — DAI, YANG, SONG & CHEN, 1981 : 132, pl. 1 (3), figs 5-6. — DAI & YANG, 1991 : 20, pl. 1 (4), fig. 4 (6).

Dromia tomentosa Heller, 1861 : 21; 1862 : 241.

Cryptodromia tomentosa - PAULSON, 1875 : 83. — KOSSMANN, 1880 : 68. — WARD, 1942 : 70. — BARNARD, 1955 : 37. — GUINOT, 1967 : 240.(list). — KENSLEY, 1981 : 36 (list).

Dromia (Cryptodromia) tomentosa - HILGENDORF, 1879 : 813, pl. 2, figs 3-5.

Cryptodromia fallax - IVES, 1891 : 217 (list). — ALCOCK, 1901 : 77 (list). — LENZ, 1905 : 363. — IHLE, 1913 : 33 (key), 90 (list). — GUINOT, 1967 : 240 (list).

Cryptodromia hirsuta Borradaile, 1903b : 577, pl. 33, fig. 3.

Cryptodromia canaliculata var. sibogae Ihle, 1913 : 42.

Cryptodromia canaliculata var. obtusifrons Ihle, 1913 : 43, pl. 1, fig. 7.

? *Cryptodromia oktahedros* Stebbing, 1923 : 4, pl. 12.

MATERIAL EXAMINED. — **New Caledonia.** No locality, probably intertidal, M. BALANSA coll., 1861-73 : 1 ♀ (ovig.) 8.8 x 8.1 mm, sponge cap (MNHN-B 22094).

Port Brise, intertidal zone, C. VADON coll., 1.10.1978 : 5 ♂♂ 7.5 x 6.6, 7.9 x 7.0, 8.4 x 7.4, 10.0 x 8.8, 10.2 x 9.0 mm, 3 with compound ascidian caps, 2 with sponge caps; 4 ♀♀ 7.5 x 6.5, 7.8 x 7.0, 8.0 x 7.2, 8.9 x 8.0 mm, 3 with compound ascidian caps, 1 with sponge cap; 2 ♀♀ (ovig.) 8.7 x 7.9, 9.6 x 8.6 mm, compound ascidian caps.

DESCRIPTION. — Carapace wider than long, surface smooth, gradually convex under a coarse, dense tomentum consisting of long plumose setae. Frontal, branchial and cardiac grooves well marked. Frontal groove runs back between two low rounded protuberances. Rostrum tridentate, horizontally directed, median tooth on a lower level, strong, projecting further forward, lateral teeth blunter. Anterolateral margin of carapace begins at level of postorbital corner, a single prominent anterolaterally directed tooth which is connected to postorbital corner and to strong subhepatic tooth by slight ridges, thus defining a slightly concave, triangular shoulder. The anterolateral tooth is followed by a broadly rounded, eave-like swelling which is an extension of anterolateral margin but is not tooth-like. Posterolateral tooth prominent, blunt and laterally directed.

Strong supraorbital and postorbital teeth. Margin beneath postorbital tooth strongly concave but not fissured, a strong suborbital tooth, visible dorsally. Two subhepatic teeth, first strongest, visible dorsally, lateral to suborbital tooth, second lower down, just above groove running around under anterolateral margin.

First segment of antenna much wider than long, lateral margin very short, medial margin beaked, gaping, upper lobe longer. Second segment much longer than wide, surface convex, strong central distal tubercle, distomedial corner produced, curved, on which third segment is inserted at an angle. Exopod firmly fixed, extending as far as joint between third and fourth segments, tip bilobed, inner lobe flattened and extending over base of eyestalk.

Blunt tooth at corner of buccal frame, epistome triangular, wider than long, slightly concave, apices produced as small tubercles. Female sternal grooves convergent, but ending apart on low tubercles between bases of first legs.

Chelipeds well developed. Merus trigonal, borders unarmed. Carpus smoothly convex, a central swelling on outer face and two distal tubercles, superior one much stronger. Propodus also smoothly convex, a proximal tubercle articulating with strong carpal tubercle and another tubercle at base of dactyl. Fingers slightly downcurved, hollowed out internally, rather spoon-shaped, especially the dactyl which is narrowed basally. Borders of fingers armed with seven-eight small teeth.

First two pairs of legs shorter than chelipeds. Distal margins of carpi and propodi bluntly lobed. Dactyli as long as propodi, inner margins armed with seven-eight small, blunt spines, the most distal spine largest but the others are all of similar size. Large pearl-like proximal tubercle on posterior face of dactyli articulating with grooved distal margin of propodi.

Last two pairs of legs reduced, of similar size, dactyli strongly curved. Third leg dactyl opposed by a single propodal spine. Fourth leg dactyl also opposed by one propodal spine, and another small spine on outer propodal margin.

Abdomen of six free segments. Telson much wider than long, tip rounded. Uropod plates well developed, visible externally, occupying approximately 20% of lateral margin in female. Surface of abdominal segments smooth with a low broad convex central ridge. Uropod plates lock abdomen by fitting in front of serrated ridge on bases of first pair of legs.

First male pleopod a stout semi-rolled, setose tube with a sharp horny tip; second pleopod simple, needle-like.

DISCUSSION. — *Cryptodromia fallax* (Lamarck, 1818) has had a somewhat chequered career having been initially described by LAMARCK (1818) as *Dromia fallax* from the Ile Bourbon (La Réunion now), Indian Ocean, but never in fact illustrated. H. MILNE EDWARDS (1837) provided a brief description noting the "Carapace médiocrement bombée et bosselée en dessus" and emphasizing a key feature : "Régions ptérygostomiennes hérissées de gros tubercules". By themselves, these features are not diagnostic, but fortunately a specimen (MNHN-B 6, syntype présumé) still exists with which later material can be compared. The only other record of *D. fallax* (as *Cryptodromia fallax*), from Zanzibar, was by LENZ (1905).

Meanwhile, STIMPSON (1858), in erecting his new genus, *Cryptodromia*, described a new species, *C. canaliculata*, from Japan. *C. canaliculata* was first illustrated by ALCOCK (1901), from his collection of Indian material, and most authors have used this text, along with the expanded description by STIMPSON (1907), to identify their specimens. IHLE (1913) recognized two additional varieties, *C. canaliculata* var. *obtusifrons* and *C. canaliculata* var. *sibogae* among the *"Siboga"* material, on the basis of some differences in the rostral and anterolateral teeth and in the subhepatic tubercles.

Next, *Dromia tomentosa* Heller, 1861, was described from the Red Sea and subsequently illustrated by HILGENDORF (1879), as *Dromia (Cryptodromia) tomentosa*, using an example from Mozambique. Comparison of HILGENDORF'S illustration with the presumed syntype of *Dromia fallax* Lamarck, 1818, shows correspondence in almost every detail and there is no doubt that these species are synonyms.

Again, *Cryptodromia hirsuta* Borradaile, 1903b, was described and illustrated using material from the Maldives and comparison of BORRADAILE'S illustration with the presumed syntype of *Dromia fallax* Lamarck, 1818, shows that the two are synonyms.

Finally, *Cryptodromia oktahedros* Stebbing, 1923, was described from Durban, South Africa. STEBBING'S illustrations of this species have been difficult to interpret chiefly because the shape of the carapace was strangely narrowed posteriorly and the anterolateral teeth were crudely drawn. However, the limbs and abdomen closely resemble those of *Dromia fallax*. BARNARD (1950) noted that *Cryptodromia oktahedros* was possibly the same as *Dromia tomentosa* Heller, 1861, and I agree with this hypothesis.

Thus, *Dromia fallax* has been known under five specific and two varietal names. *C. canaliculata* was used for Japanese, Indonesian and Indian specimens, while the other four specific names were used for western Indian Ocean, African, and Red Sea specimens.

I was able to compare the New Caledonian specimens with the presumed syntype of *Dromia fallax* (♂ 13.7 x 12.2 mm) and it is clear that they belong to the same species. Within this material there is variation in the development of the anterolateral teeth so that I believe that the varieties recognized by IHLE (1913) are only the result of individual variation. Comparison of the descriptions and illustrations of all the material described under the other four names, *Dromia tomentosa*, *Cryptodromia canaliculata*, *C. hirsuta*, and *C. oktahedros* suggests that all belong to LAMARCK'S species which should be known as *Cryptodromia fallax* (Lamarck, 1818).

SIZE. — At least 111 specimens (49 ♂♂, 59 ♀♀, 3 of unknown sex) of *Cryptodromia fallax* have been recorded. The maximum sizes known are for females CW = 15.0 mm, and males CW = 13.7 mm, although ALCOCK (1900) measured one of CW = 16.0 mm, but of unknown sex. The smallest ovigerous female was recorded by IHLE (1913), CW = 6.8 mm. The size range of the twelve specimens from New Caledonia, males CW = 7.5-10.2 mm, females CW = 7.5-9.6 mm, and ovigerous females CW = 8.7-9.6 mm, is within the previously known range. The clutch size of the females ranged from 147-196 eggs (average diameter = 0.7 mm).

CAMOUFLAGE. — Most of the crabs from New Caledonia carried a camouflage cap consisting of either a piece of sponge or compound ascidian. Other authors have recorded the utilization of similar material although STIMPSON (1907) recorded a crab carrying a piece of seaweed. BUITENDIJK (1939) found two specimens infected with a sacculinid parasite.

DEPTH. — Almost all records for *C. fallax* are from low intertidal depths or subtidal reefs and rocky areas to about 3 m. RATHBUN (1911) recorded a small male from 55 m but this may be an error.

DISTRIBUTION. — The distribution of *C. fallax* includes the Red Sea, coast of East Africa, Indian Ocean, Indonesia, Philippine Islands, New Caledonia, Gilbert and Ellice Islands, Japan, Marshall Islands, Niue Island, and Raroia Atoll (French Polynesia). This species is one of the few dromiids known from the Philippines and New Caledonia prior to this study (see WARD, 1941, and TAKEDA & NUNOMURA, 1976). A more detailed listing of localities can be found in LEWINSOHN (1977, 1979, 1984), as *C. canaliculata*.

Cryptodromia longipes sp. nov.

Fig. 8 a-g

MATERIAL EXAMINED. — **Chesterfield Islands.** CORAIL 2 : stn DW 8, 20°52.07'S, 161°38.21'E, 63 m, 20.07.1988 : 1 ♂ 3.9 x 3.9 mm. — Stn CP 111, 19°18.06'S, 158°48.86'E, 70-65 m, 28.08.1988 : 1 ♂ 4.4 x 4.6 mm. — Stn DW 159, 19° 46.00'S, 158° 20.00'E, 52 m, 1.08.1988 : 1 ♂ 4.4 x 4.3 mm, with sponge cap.

TYPE — Holotype : 1 ♂, 4.4 x 4.6 mm from CORAIL 2, Stn CP 111 (MNHN-B 22569).

DESCRIPTION. — Carapace longer than wide, lateral sides almost parallel, surface smooth, very convex. Frontal, cardiac and branchial grooves only faintly marked. Rostrum tridentate, all teeth of similar size, blunt, median tooth slightly deflexed, lateral teeth horizontal. Anterolateral margin begins at level of postorbital corner, armed with two small blunt teeth, first slightly larger and close to orbit, second nearby. A greater distance to branchial notch which has a small lobe behind, but this can hardly be called a tooth.

Supraorbital tooth almost as large as lateral rostral tooth, postorbital corner bluntly rounded, not tooth-like. No orbital fissure, strong, blunt suborbital tooth visible dorsally, a small tubercle very close to and just below postorbital corner, subhepatic area flattened to accommodate cheliped when folded away. Female sternal grooves unknown.

First segment of antenna wider than long, beaked medially, gaping, lateral margin shorter than medial margin. Second segment much longer than wide, a small central distal tubercle, distomedial margin produced, curved, on which third segment is inserted at an angle. Exopod firmly fixed to second segment, tip extends as far as joint between third and fourth segments and is bluntly terminated except that inner margin is produced and curves over base of eyestalk. Epistome triangular, wider than long, surface concave, blunt tubercle at corner of buccal frame.

Chelipeds well developed, stout. Merus trigonal in section, borders unarmed. Carpus outer surface convex, slightly uneven, two strong distal tubercles. Propodus with a strong tubercle matching the superior carpal tubercle and another tubercle at base of dactyl. Fingers straight, hollowed out internally, not gaping, armed with seven small teeth.

First two pairs of legs small. Distal borders of carpi and propodi bluntly lobed. Dactyli as long as propodi, strongly curved at tips, inner margins armed with four-five small spines increasing in size distally, a small pearl-like proximal tubercle on posterior margin of dactyli.

Third pair of legs reduced, dactyl strongly curved, opposed by a single propodal spine with another smaller spine on outer propodal margin. Fourth pair of legs flattened, almost as long as first two pairs, when extended forward they reach as far as supraorbital margin. Dactyl opposed by a single propodal spine with two smaller spines on outer propodal margin.

Abdomen of six free segments. Male telson wider than long, a medial elongate shallow pit, margins subparallel, tip deeply concave giving two lateral lobes. Abdominal segments four-six have a small tubercle near distolateral corners. Uropod plates well developed and visible externally. Abdominal locking mechanism consists of uropod plates fitting in front of small serrated flange on bases of first legs. Female characters unknown.

First male pleopod a stout, setose semi-rolled tube with a sharp horny tip; second pleopod simple and needle-like.

ETYMOLOGY. — The specific name, from the latin *longus*, is a reference to the unusually long last pair of legs.

DISCUSSION. — A distinctive feature of *Cryptodromia longipes* sp. nov. is the long last pair of legs, a character shared by *C. amboinensis* De Man, 1888, but *C. longipes* can be distinguished by the prominent supra-orbital tooth (small in *C. amboinensis*), no postorbital tooth (a small tooth), no tubercle near postorbital corner (tubercle present), only one subhepatic tubercle (two tubercles), one propodal spine on outer margin of third leg and two spines on outer margin of fourth leg (no spines on outer margins of either leg), and male telson bilobed (male telson rounded).

C. hilgendorfi De Man, 1888, is also similar to *C. longipes* but differs in having a small supraorbital tooth, no propodal spines on outer margins of last two pairs of legs (as in *C. amboinensis*), a single anterolateral tooth (two in *C. longipes)*, and unornamented abdominal segments (fourth to sixth segments have a small tubercle near distolateral corners in *C. longipes*).

C. mariae Ihle, 1913, like the above species, also has a carapace as wide as long, but has very tuberculate first two pairs of legs, single spines on the outer propodal margins of the last two pairs of legs, and no subhepatic tubercles.

CAMOUFLAGE. — One specimen was accompanied by a sponge cap.

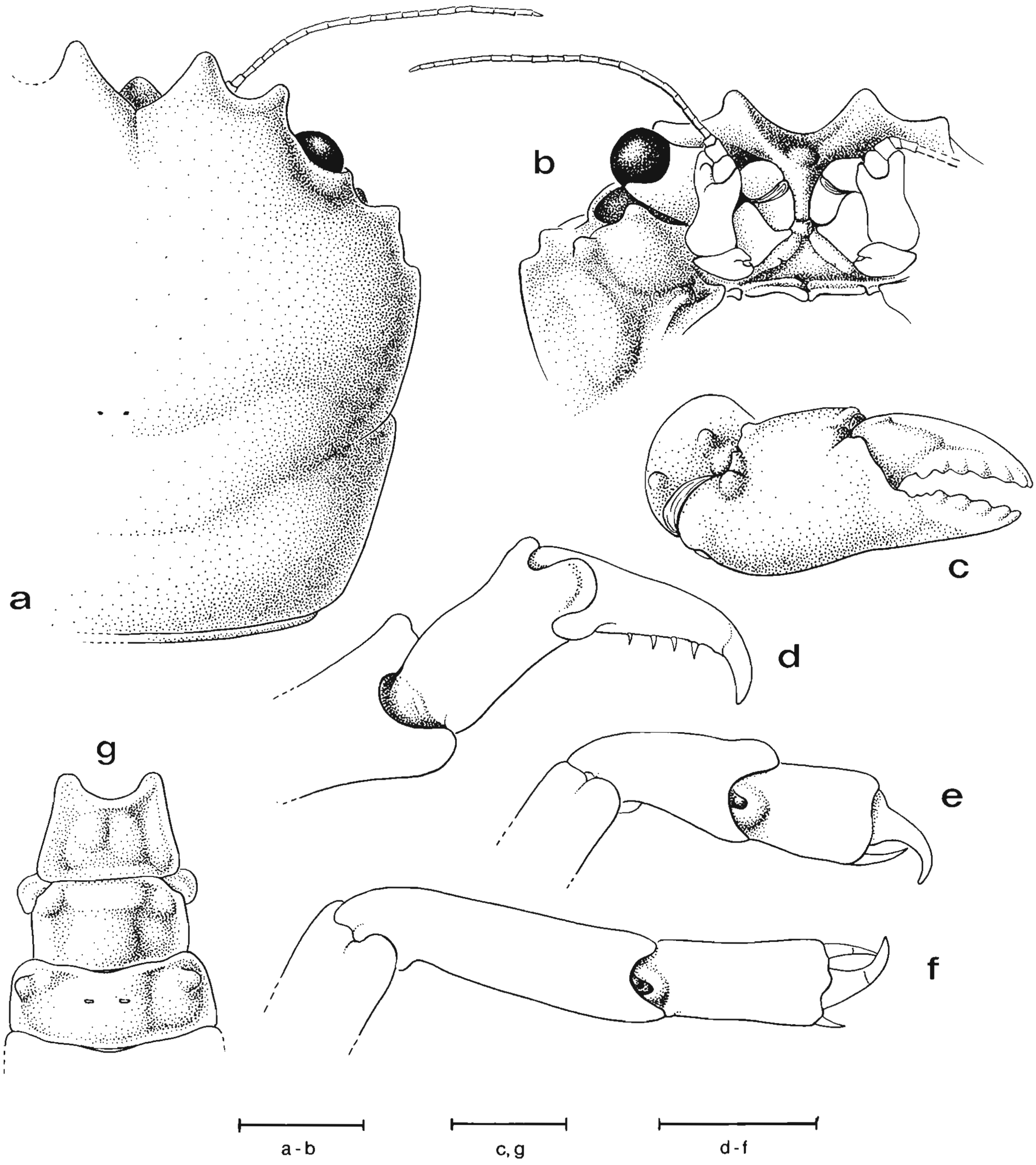


FIG. 8. — *Cryptodromia longipes* sp. nov., ♂, holotype, 4.4 x 4.6 mm, Chesterfield Islands, CORAIL 2, stn CP 111, 70-65 m (MNHN-B 22569) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area and anterolateral margin; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of terminal segments of right third leg; **f**, posterior view of terminal segments of right fourth leg; **g**, ventral view of telson and terminal segments of male abdomen.

Scale bars represent 1.0 mm.

SIZE. — The three small male specimens had CW = 3.9 and 4.4 mm.

DEPTH. — Depth range is from 52-70 m.

DISTRIBUTION. — *C. longipes* sp. nov. is known from only three male specimens collected near the Chesterfield Islands and Bellona Plateau.

Genus *TAKEDROMIA* nov.

Cryptodromia - RATHBUN, 1911 : 194 (in part). — IHLE, 1913 : 32 (in part). — SAKAI, 1976 : 12 (in part).

Carapace distinctly wider than long, surface moderately to strongly convex, granulated or tuberculated, may be areolated. Rostrum tridentate, projecting, may be truncated, lateral teeth usually thin and eave-like. Anterolateral teeth well developed, lacinated or tuberculated, posterolateral borders dentate or tuberculate. Coxae of third maxillipeds separated by a wide gap and inserted well forward of tip of sternum on a triangular plate. Female sternal grooves end apart between bases of first legs. Antennal exopod well developed, prominent median distal spine on second segment, all antennal segments minutely denticulated. Cheliped without an epipod, male chelipeds much larger than those of female. First two pairs of legs tuberculated and granulated, inner margins of dactyli armed with up to five small spines. Last two pairs of legs very small, third pair shortest, dactyli of both pairs opposed by single propodal spines, none on outer propodal margin. Abdomen of six free segments. Uropod plates well developed, visible externally, used in abdominal locking mechanism by fitting in front of serrated flange on bases of first legs. Male telson rounded or subtruncate. Abdominal segments adorned with granules and or tubercules.

TYPE SPECIES. — *Cryptodromia cristatipes* Sakai, 1969, by present designation.

OTHER SPECIES. — *Takedromia longispina* sp. nov., *Cryptodromia ornata* Rathbun, 1911, *Cryptodromia yoshidai* Takeda & Kurata, 1976.

ETYMOLOGY. — This generic name *Takedromia* is formed by combining the name of Masatsune TAKEDA, Department of Zoology, National Science Museum, Tokyo, with *Dromia*. M. TAKEDA has made a very important contribution to the study of Pacific Brachyura in general, and Dromiidae in particular.

DISCUSSION. — Apart from the new species, all species in this new genus were previously in *Cryptodromia*. They do share the characters of no epipod on the cheliped, and the same abdominal locking mechanism, but they differ in having a very ornate carapace, always much wider than long, anterolateral teeth acute and lacinated, very small last two pairs of legs, with reduced number of propodal spines, and strong sexual dimorphism in the chelipeds (see Table 7).

DISTRIBUTION. — The above species have been recorded from the Seychelle Islands, Japan and New Caledonia, so that *Takedromia* is an Indo-West Pacific genus.

Key to the species of *Takedromia*

(Species studied in this paper are in bold)

1. Rostrum scarcely tridentate, rostral teeth blunt .... ***Takedromia cristatipes*** (Sakai, 1969) nov. comb.
— Rostrum distinctly tridentate, projecting, rostral teeth triangular or acute **2**

2. Lateral rostral teeth acute, carapace sparsely granular .... ***Takedromia longispina*** sp.nov.
— Lateral rostral teeth triangular, carapace granulate and areolate **3**

3. Anterolateral teeth lacinated ... *Takedromia yoshidai* (Takeda & Kurata, 1976) nov. comb.
— Anterolateral teeth flange-like .... *Takedromia ornata* (Rathbun, 1911) nov. comb.

Takedromia cristatipes (Sakai, 1969) nov. comb.

Figs 9 a-b, 19 a-b

Cryptodromia cristatipes Sakai, 1969 : 245, pl. 1, fig. 1; 1976 : 18, text fig. 10.

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 4 : stn DW 181 (d'Entrecasteaux Reefs), 18°57.20'S, 163°22.40'E, 355 m, 18.09.1985 : 1 ♂ 14.0 x 12.8 mm; 1 ♀ 9.9 x 9.7 mm, parasitized by sacculinid barnacle, externa evident under abdomen. — Stn CP 193, 18°56.30'S, 163°23.20'E, 430 m, 19.09.1985 : 1 ♀ 13.0 x 11.9 mm.

LAGON : stn DW 1158, 19°10.0'S, 163°6.5'E, 48 m, 30.10.1989 : 1 ♀ (ovig.) 15.5 x 13.8 mm.

SMIB 6 : stn DW 126, 18°59.1'S, 163°22.7'E, 320-330 m, 3.03.1990 : 1 ♂ 6.5 x 6.5 mm.

Loyalty Islands. MUSORSTOM 6 : stn DW 459, 21°01.39'S, 167°31.47'E, 425 m, 20.02.1989 : 1 ♂ 10.8 x 9.9 mm.

Chesterfield Islands. MUSORSTOM 5 : stn DW 337, 19°53.80'S, 158°38.00'E, 412-430 m, 15.10.1986 : 1 ♀ 8.2 x 7.4 mm. — Stn DC 372, 19°52.96'S, 158°38.63'E, 400 m, 20.10.1986 : 1 ♂ 14.4 x 13.3 mm.

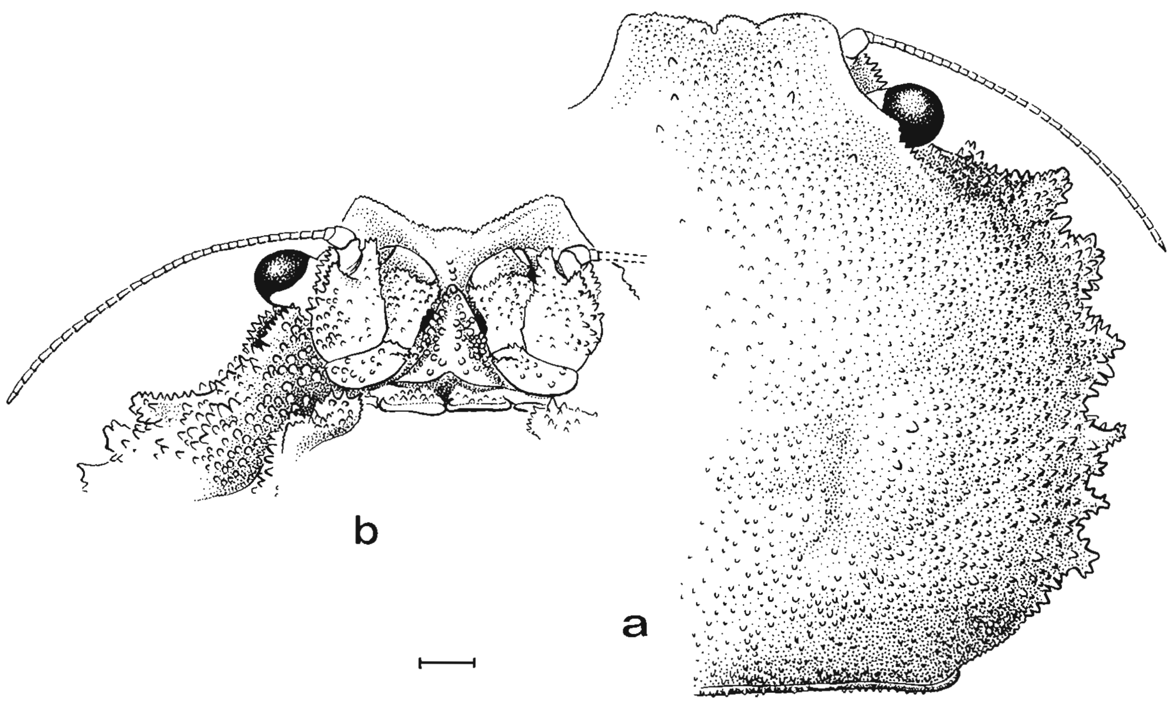


FIG. 9. — *Takedromia cristatipes* (Sakai, 1936), nov. comb., ♂ 14.0 x 12.8 mm, New Caledonia (d'Entrecasteaux Reefs), MUSORSTOM 4, stn 181, 355 m (MNHN-B 22571) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area.
Scale bar represents 1.0 mm.

DESCRIPTION. — Carapace subquadrangular, wider than long, surface moderately convex, regions ill-defined, covered with fine granules and sparse tufts of long plumose setae. Median frontal groove, branchial and lateral cardiac grooves faint. Rostrum truncate, well forward of rest of carapace, forming an almost continuous, upturned margin not clearly divided into teeth. Anterolateral margins of carapace subparallel, beginning at level of suborbital tooth, three-four lacinated teeth in front of branchial groove, behind which is a strong posterolateral tooth followed by two lacinated teeth.

Supraorbital eave continuous with rostral margin, bearing a small blunt tooth, postorbital margin smooth, not produced. Small fissure separates suborbital margin which has a blunt tooth at medial corner.

All segments of antenna finely granulated. First segment much wider than long, beaked medially but not gaping. Second segment much longer than wide, stout distal median spine, distomedial corner produced as a spine on which third segment is inserted on an angle. Exopod firmly fixed, tip slightly bilobed, extending as far as joint between third and fourth segments. Ratio of length of antennal flagella to CW = 0.53. Epistome triangular, wider than long, and granulated.

Subhepatic region convex, finely granulated, with two small tubercles, one beneath suborbital tooth and the other lower down. An acute tooth at anterior corner of buccal frame, above which begins a shallow groove passing under anterolateral margin to beginning of branchial groove. Female sternal grooves end wide apart on small raised tubercles between bases of first legs.

Male chelipeds robust, length more than 1.5 x CL. Merus triangular in section, all borders have small granules, distal superior border has three broad tubercles. Carpus granulate, upper distal border armed with two large, sharp tubercles. Upper and outer faces of propodus granulate, two small tubercles at base of dactyl, which is granular. Fingers strongly downcurved, armed with seven-eight teeth, only the five most distal teeth interlocking.

First two pairs of legs much shorter than chelipeds. Upper surface of carpus sulcate, margins granulated, carpi and propodi have large distal tubercles. Dactyli as long as propodi, curved, with five small equal spines on inner margin.

Last two pairs of legs very reduced, third pair shortest, fourth more slender, both have single propodal spines opposing dactyli.

Abdomen of six free segments. Telson in both sexes much wider than long, posterior margin rounded. Uropod plates large, visible externally. Abdominal locking mechanism in male consists of uropods fitting in front of serrated flange on bases of first legs. Abdominal segments finely granulated, a pair of small median granules near posterior margins of third and fourth segments.

First male pleopod a stout, semi-rolled setose, tube with a sharp horny tip; second pleopod simple, needle-like.

DISCUSSION. — Although SAKAI (1969) had female specimens he did not describe the sternal grooves : they end apart on small raised tubercles between the bases of the first pair of legs. The smallest female in the present collection, CW = 8.2 mm, is immature with a small abdomen and the abdominal locking mechanism still functional, while the female with CW = 13.0 mm, has a mature-sized abdomen, non-functional abdominal locking mechanism, and the sternal grooves plugged, indicating that it had already mated. Thus the size at maturity for females is somewhere within this size range.

In addition, the nature of the male pleopods can be included : they are typical of most dromiid crabs. Sexual dimorphism of the chelipeds is particularly apparent in this species with males having very robust limbs, much larger than those of females.

A female specimen from stn DW 181 is parasitized by a sacculinid barnacle with an externa evident under the abdomen.

CAMOUFLAGE. — *T. cristatipes* is not known to carry any camouflage, indeed the last two pairs of legs may be too small to be functional.

SIZE. — The size range of male New Caledonian specimens does not exceed the largest (CW = 22.0 mm) of the Japanese specimens reported by SAKAI (1969, 1976). The size of females ranged from CW = 8.2-15.5 mm. The largest female, from stn DW 1158, is ovigerous, carrying 140 eggs (diam. = 0.8 mm), a comparatively small clutch size considering the size of the crab.

DEPTH. — The Japanese records range from 50-150 m depth, while those from New Caledonia range from 48-430 m, considerably extending the maximum known depth.

DISTRIBUTION. — SAKAI (1969) described this species from Tosa Bay, Japan, and besides several other records from Japan it has not been reported elsewhere. The New Caledonian material is therefore of special interest.

Takedromia longispina sp. nov.

Figs 10 a-j, 19 c-d

MATERIAL EXAMINED. — **New Caledonia.** MUSORSTOM 4 : stn DW 183, 19°01.80'S, 163°25.80'E, 280 m, 18.09.1985 : 1 ♂ 13.2 x 11.2 mm. — Stn DW 184, 19°04.00'S, 163°27.50'E, 260 m, 18.09.1985 : 1 ♀ 4.6 x 4.7 m. — Stn DW 234, 22°15.50'S, 167°08.30'E, 350-365 m, 2.10.1985 : 1 ♂ 11.0 x 10.7 mm.

LAGON : stn DW 1151, 19°01.2'S, 163°27.3'E, 280 m, 28.10.1989 : 1 ♂ 8.4 x 7.5 mm.

Chesterfield Islands. CHALCAL 1 : stn DC 31, 19°33.30'S, 158°30.30'E, 230 m, 19.07.1984 : 2 ♀♀ (ovig.) 9.9 x 9.7, 10.0 x 11.0 mm.

MUSORSTOM 5 : stn DW 348, 19°36.00'S, 158°31.70'E, 260 m, 17.10.1986 : 1 ♀ 11.9 x 11.1 mm.

TYPES . — Holotype : 1 ♂ 13.2 x 11.2 mm from MUSORSTOM 4, stn DW 183 (MNHN-B 22572). Paratype : 1 ♀ (ovig.) 10.0 x 11.0 mm, from CHALCAL 1, stn DC 31 (MNHN-B 22573).

DESCRIPTION. — Carapace generally wider than long, convex, rising steeply from orbital and anterolateral margins. Surface smooth under short, sparse setae except for small patches of low rounded tubercles behind rostral and orbital margins, above anterolateral and posterolateral margins and a crescentic line in inner branchial area. Frontal and branchial grooves well marked, lateral cardiac grooves faint. Rostrum tridentate, teeth prominent, narrow, acute, median tooth projecting horizontally, lateral teeth directed anterovertically. Anterolateral margin begins close to the subhepatic tooth, below level of suborbital tooth and has three long, acute teeth. First two teeth more widely separated, there may be small tubercles between them. Second tooth has two small tubercles near its base and third tooth has two-three small tubercles on posterior margin. Posterolateral tooth similar to third tooth except that tip may be bifid. Remaining carapace margin has two-three small tubercles. Anterolateral teeth are much more strongly developed in male.

Supraorbital margin adorned with small tubercles, supraorbital tooth prominent, no postorbital tooth. Narrow fissure separates suborbital margin which is also tuberculate with prominent tooth at inner corner which is visible dorsally.

First segment of antenna much wider than long, wedge-shaped, beaked medially. Second segment much longer than wide, surface sparsely granulated, convex, distomedial corner produced as an acute spine on which third segment is inserted at an angle. A well developed, acute spine, directed anterolaterally, just beneath point of insertion of third segment. Exopod extending as far as joint between third and fourth segments, tip slightly bilobed, inner lobe curving over base of eyestalk. Epistome triangular with scattered small tubercles, especially near apex.

Distinct tooth at corner of buccal frame, and well marked groove extending around under anterolateral margin towards posterolateral tooth. Subhepatic area small, inflated, bearing one prominent acute tooth, visible dorsally. Subhepatic tooth much more strongly developed in male. Female sternal grooves end wide apart on low tubercles between bases of first legs.

Chelipeds especially long in male. Merus trigonal with tuberculate margins. Carpus with scattered small tubercles and two especially prominent and acute distal tubercles. Propodus very elongate, with scattered small tubercles. Fingers long, downcurved, hollowed out internally, gaping, armed with seven-eight small teeth, upper margin of dactyl also tuberculate. Female chelipeds similar, but much shorter.

First two pairs of legs shorter than chelipeds. Distal borders of carpi and propodi produced as spines. Dactyli as long as propodi, inner margins armed with four-five small spines.

Last two pairs of legs very reduced, both subdorsal. Fourth pair longer than third, dactyli opposed by single propodal spines.

Abdomen of six free segments. Telson wider than long, tip rounded, four small central tubercles and another tubercle in each proximal corner. Uropod plates well developed and visible externally, fitting in front of serrated plate on bases of first walking legs to create the abdominal locking mechanism. Sixth segment of abdomen with a single small tubercle beside base of each uropod, and second to fifth segments each have a row of four distal tubercles evenly spaced across the breadth.

First male pleopod a semi-rolled, setose tube with a sharp tip; second pleopod simple needle-like.

ETYMOLOGY. — The specific name is a combination of the latin *longus* and *spina* and refers to the long, acute anterolateral teeth.

DISCUSSION. — *T. longispina* shares with *T. cristatipes*, and the other two species in this genus, the characters of having large male chelipeds and the last two pairs of legs very reduced. However, *T. longispina* differs in having only a sparsely tuberculate carapace.

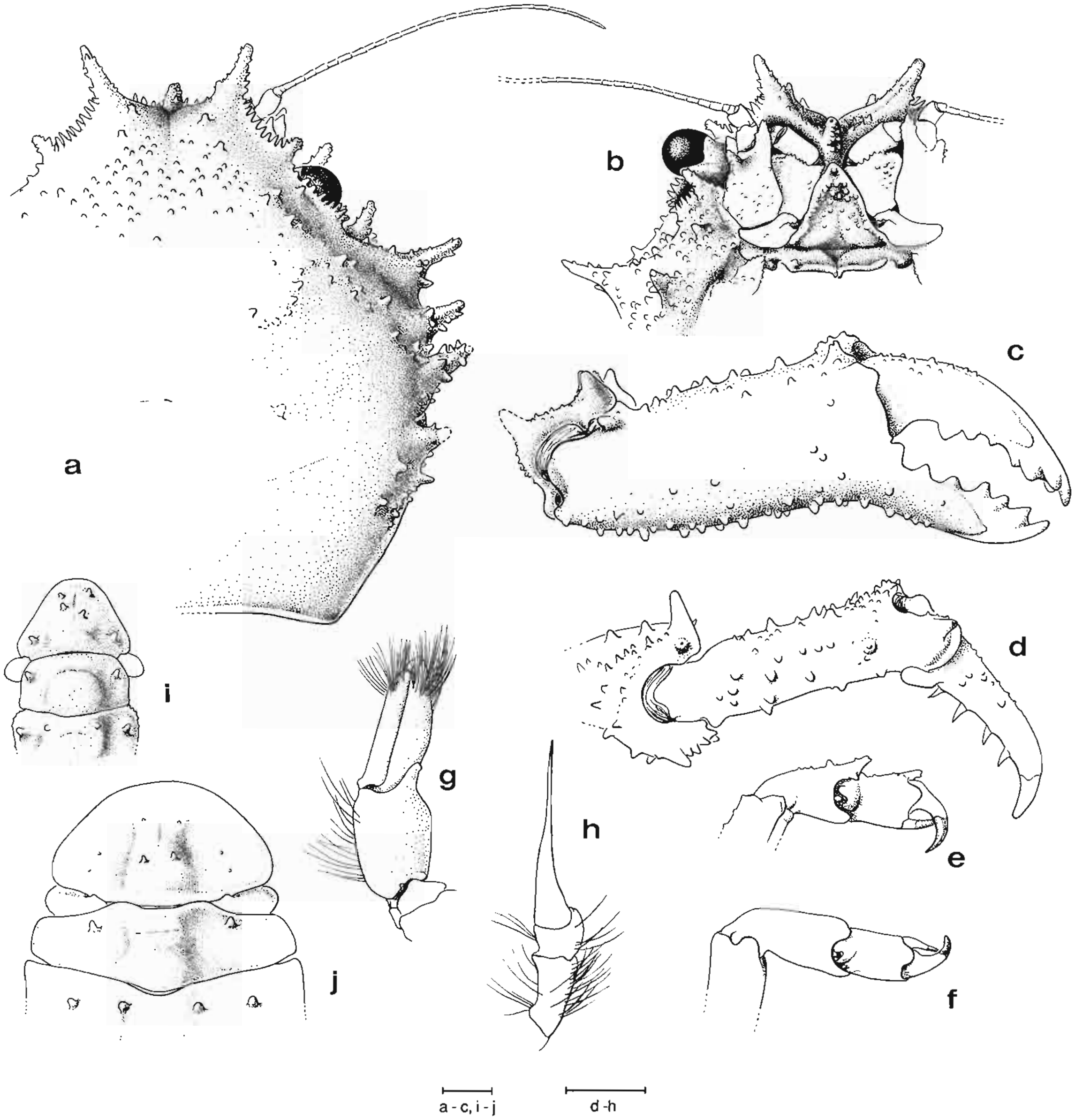


FIG. 10. — *Takedromia longispina* gen. nov., sp. nov. : **a-i**, ♂, holotype, 13.2 x 11.2 mm, New Caledonia, MUSORSTOM 4, stn DW 183, 280 m (MNHN-B 22572) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area and anterolateral margin; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of terminal segments of right third leg; **f**, posterior view of terminal segments of right fourth leg; **g**, first pleopod of male; **h**, second pleopod of male; **i**, ventral view of telson and terminal segments of male abdomen. — **j**, ♀, paratype, 10.0 x 11.0 mm, Chesterfield Islands, CHALCAL 1, stn DC 31, 230 m (MNHN-B 22573) : ventral view of telson and terminal segments of female abdomen.

Scale bars represent 1.0 mm.

CAMOUFLAGE. — None of the specimens were carrying pieces of camouflage. It may be that the last two pairs of legs are too small to be functional. An ornate carapace and use of camouflage seem to be mutually exclusive among dromiid crabs.

SIZE. — The maximum sizes recorded for this new species are males CW = 15.7 mm and females CW = 11.9 mm. The New Caledonian collection included two ovigerous females both around CW = 10.0 mm. Unfortunately, their condition precluded an accurate estimate of egg size and numbers.

DEPTH. — The depth range is 230-365 m, which is within the range of 48-430 m recorded for the other species of *Takedromia*.

DISTRIBUTION. — *Takedromia longispina* sp. nov. is only known from New Caledonia and Chesterfield Islands.

Genus *EPIGODROMIA* nov.

Epidromia Kossmann, 1878 : 256; 1880 : 69 (name preoccupied).
Cryptodromia - BORRADAILE, 1903a : 299 (in part). — IHLE, 1913 : 32 (in part). — BALSS, 1922 : 106 (in part). — SAKAI, 1936 : 15 (in part); 1976 : 12 (in part). — SERÈNE & LOHAVANIJAYA, 1973 : 13 (in part).
Petalomera - SAKAI, 1936 : 28 (in part); 1965 : 9 (in part); 1976 : 20 (in part).

Carapace may be wider than long or longer than wide, surface convex, granular and usually areolate. Rostrum tridentate, projecting, no postorbital tooth. Anterolateral teeth usually broad granulated lobes, but may be absent. Coxae of third maxillipeds separated by a gap and inserted on a triangular shaped plate well forward of tip of sternum. Sternal grooves end apart on small tubercles between bases of first legs. Cheliped usually without an epipod, but it may be present. First two pairs of legs tuberculate and granular, inner margins of dactyli armed with up to seven small spines. Last two pairs of legs very reduced, fourth pair sometimes slightly longer, dactyli of both legs opposed by single propodal spines. Abdomen of six free segments, whose surface is usually sculptured and granulate. Uropod plates well developed, used in abdominal locking mechanism by fitting in front of serrated flange on bases of first legs. Tip of male telson truncate or produced as two small lobes, female telson rounded.

TYPE SPECIES. — *Epidromia granulata* Kossmann, 1878, by present designation.

OTHER SPECIES. — *Cryptodromia areolata* Ihle, 1913, *Dromia (Cryptodromia) ebalioides* Alcock, 1899, *Dromia (Cryptodromia) gilesii* Alcock, 1899, *Cryptodromia globosa* Lewinsohn, 1977, *Petalomera nodosa* Sakai, 1936, *Epigodromia rotunda* sp. nov., *Epigodromia rugosa* sp. nov., *Dromia sculpta* Haswell, 1882.

ETYMOLOGY. — Since the name *Epidromia* Kossmann, 1878, is preoccupied by *Epidromia* Guenee, 1852, used for a genus of Lepidoptera, I propose the replacement name *Epigodromia*. This name is formed by combining the noun "epigone" meaning 'one of a later generation' (from the Greek *epigonoi* - those born afterwards) with *Dromia*. The name indicates the advanced nature of some characters of the species included in this genus.

DISCUSSION. — The genus *Epidromia* (= *Epigodromia*) was erected by KOSSMANN for a new species, *E. granulata*, from the Red Sea, but beginning with BORRADAILE (1903a) subsequent authors included it in *Cryptodromia* Stimpson, 1858. This may have been appropriate at the time but we now know that there are many more species, resembling *Epidromia granulata*, which form a natural group. They are small dromiids usually without an epipod on the cheliped, with a projecting rostrum and a granulate and areolate carapace. I propose that this generic name should be resurrected for this group of *Cryptodromia* species. SERÈNE and LOHAVANIJAYA (1973) noted the existence of this group of species but did not choose to place them in a separate genus.

KOSSMANN'S original definition of the genus was exceedingly brief : "Cephalothorax, praesertim dimidio anteriore valde convexus. Margo anterolateralis usque ad angulum labialem productus est. Palatum colliculo instructum. Feminae sulci sternales ? Pedes Cryptodromiae similes". Therefore the more detailed definition given above is necessary (see Table 7).

The major innovation with this genus is to include a species which does have an epipod on the cheliped. *Petalomera nodosa* shows greatest affinity with *Epigodromia areolata* (Ihle, 1913), *E. gilesii* (Alcock, 1899), and *E. granulata* (Kossmann, 1878). SAKAI (1936, 1976) commented on the similarity of this species to *Cryptodromia areolata* and *C. gilesii*. However, *P. nodosa* has an epipod on the cheliped (see LEWINSOHN, 1984) while this is absent in all other species of *Epigodromia*. A similar problem can be found with *Cryptodromia*. Amongst the larger dromiid crabs, for e.g. *Dromia* and *Dromidia*, use of the cheliped epipod as a fundamental character to separate genera causes no problems but in these genera of smaller crabs it seems that the epipod may be lost in some species. The extreme similarity of *Petalomera nodosa* to the other species of *Epigodromia* makes unlikely the assumption that the distinctive areolate carapace evolved independently in two different groups.

The species of *Epigodromia* may be distinguished from those of *Takedromia* because the carapace is usually areolate, anterolateral teeth not well developed, or lacinated, and male telson is truncate or bilobed. In addition, strongly dimorphic chelipeds are not found in *Epigodromia*.

DISTRIBUTION. — Apart from the new species dealt with below, which are from New Caledonia, the other seven species are all small dromiids known from the Red Sea, Indian Ocean, Indonesia, Australia and Japan.

Key to the species of *Epigodromia*

(Species studied in this paper are in bold)

1. Carapace significantly wider than long **2**
— Carapace as wide as long or longer than wide **7**

2. Anterolateral carapace margins granular, but without distinct teeth .... *Epigodromia ebalioides* (Alcock, 1899) nov. comb.
— Anterolateral carapace margins with distinct teeth **3**

3. Two granulated anterolateral teeth **4**
— Three granulated anterolateral teeth **5**

4. Suborbital tooth prominent, visible dorsally .... *Epigodromia granulata* (Kossmann, 1878) nov. comb.
— Suborbital tooth not visible dorsally ..... *Epigodromia gilesii* (Alcock, 1899) nov. comb.

5. Carapace distinctly areolate .... *Epigodromia nodosa* (Sakai, 1936) nov. comb.
— Carapace not areolate **6**

6. Carapace covered with large granulated tubercles .... *Epigodromia sculpta* (Haswell, 1882) nov. comb.
— Carapace with a few small, scattered granules .... ***Epigodromia rugosa*** sp. nov.

7. Rostrum tridentate, lateral teeth bluntly rounded .... *Epigodromia globosa* (Lewinsohn, 1977) nov. comb.
— Rostrum tridentate, lateral teeth broadly triangular **8**

8. Inner margins of dactyli of first two pairs of legs armed with 7-8 small spines .... ***Epigodromia areolata*** (Ihle, 1913) nov. comb.
— Inner margins of dactyli of first two pairs of legs armed with four small spines .... ***Epigodromia rotunda*** sp. nov.

Epigodromia areolata (Ihle, 1913) nov. comb.

Fig. 19 e-f

Cryptodromia areolata Ihle, 1913 : 47, pl. 2, figs 10-11. — SAKAI, 1936 : 26, pl. 1, fig. 1; 1965 : 8, pl. 3, fig. 4; 1976 : 17, pl. 4, fig. 2. — MIYAKE, 1961 : 13. — TAKEDA & MIYAKE, 1970 : 202; 1972 : 66. — CAMPBELL, 1971 : 29. —

SERÈNE & LOHAVANIJAYA, 1973 : 18, pl . 2A, figs 5-7. — TAKEDA, 1982 : 18 (list). — DAI & YANG, 1991 : 25, pl. 1 (8).
Cryptodromia ihlei Balss, 1921 : 177; 1922 : 107, text fig. 2. — YOKOYA, 1933 : 98.

MATERIAL EXAMINED. — **New Caledonia.** LAGON : stn 387, 22°39.1'S, 167°07.3'E, 225 m, 22.01.1985 : 1 ♀ 7.2 x 7.1 mm.
MUSORSTOM 4 : stn CC 173, 19°02.50'S, 163°18.80'E, 250-290 m, 17.09.1985 : 1 ♂ 8.4 x 7.7 mm. — Stn 204, 22°37.00'S, 167°05.70'E, 120 m, 27.09.1985 : 1 ♀ (ovig.) 7.9 x 7.6 mm.
"*Kandjar*": no stn, dredged between 22°40'-22°50'S, 167°10'-167°30'E, 200-350 m, 7-10.10.1986 : 1 ♂ 8.8 x 7.8 mm.
SMIB 6 : stn DW 108, 19°06.9'S, 163°30.1'E, 210-220 m, 2.03.1990 : 1 ♂ 12.3 x 11.4 mm. — Stn DW 112, 19°05.6'S, 163°30.2'E, 220-225 m, 2.03.1990 : 1 ♂ 12.1 x 10.3 mm. — Stn DW 127, 19°6.8'S, 163°22.6'E, 190-205 m, 4.03.1990 : 1 ♂ 7.8 x 7.5 mm.
"Alis" : stn 1147, 19°07.50'S, 163°330.40'E, 205-210 m, 28.10.1989 : 1 ♀ (ovig.) 9.0 x 8.8 mm.
Loyalty Islands. MUSORSTOM 6: stn DW 443, 20°53.27'S, 167°17.46'E, 250 m, 19.02.1989 : 1 ♀ (ovig.) 7.2 x 7.0 mm. — Stn DW 451, 20°59.00'S, 167°24.50'E, 330 m, 20.02.1989 : 1 ♂ 7.8 x 7.4 mm. — Stn 462, 21°05.10'S, 167°26.85'E, 200 m, 21.02.1989 : 1 ♀ 4.0 x 4.3 mm.
Chesterfield Islands. CHALCAL 1 : stn DC 31, 19°33.30'S, 158°30.30'E, 230 m, 19.07.1984 : 1 ♀ (ovig.) 10.0 x 9.9 mm.
MUSORSTOM 5 : stn DW 290, 23°6.20'S, 159°26.30'E, 300 m, 11.10.1986 : 1 ♂ 14.4 x 12.3 mm. — Stn DW 334, 20°06.27'S, 158°47.62'E, 315-320 m, 15.10.1986 : 1 ♂ 11.1 x 10.3 mm. — Stn 347, 19°38.61'S, 158°28.03'E, 260 m, 17.10.1986 : 1 ♀ 7.1 x 7.0 mm. — Stn DW 349, 19°34.45'S, 158°34.48'E, 275 m, 17.10.1986 : 1 ♀ 6.6 x 6.4 mm. — Stn DW 353, 19°26.50'S, 158°40.40'E, 290 m, 18.10.1986 : 1 ♂ 8.0 x 8.0 mm.

DESCRIPTION. — Carapace slightly wider than long, convex, areolate, covered with sharp granules which are small in frontal region and also along posterior area of carapace, elsewhere comparatively large and dense. A few short setae, especially in grooves between areolae. Regions of carapace well defined. Short frontal groove extending back between lateral rostral teeth. Branchial and cervical grooves distinct. Mesogastric region convex with three poorly defined protuberances, anterior one smallest, followed by two larger protuberances, behind these are a pair of small protuberances arranged side by side in urogastric region. Cardiac area broadly convex, granulated, well defined by grooves. Branchial areas have five protuberances, two anterior, large, most lateral one being just behind postorbital corner, and three protuberances further back, which decrease in size laterally. Posterior branchial areas convex, evenly covered with large granules. Rostrum tridentate, teeth separated by a broad U-shaped sinus. Borders of rostral teeth granulated, median tooth deflexed but visible dorsally, lateral teeth prominent, slightly curved out at tips, slightly longer than median tooth. Anterolateral margin evenly convex, bearing two granulated lobes, first on same level as anterior corner of buccal frame. Each anterolateral lobe ornamented with five-six sharp granules. A distinct branchial notch, posterolateral margins convergent, covered in sharp granules. Posterior carapace margin distinctly concave.

Supraorbital border strongly concave, granulated. A small supraorbital tooth followed by postorbital corner which is flush with carapace surface. No orbital fissure, suborbital margin very eroded, although there is a small tooth at inner corner, visible dorsally.

First segment of antenna much wider than long, tuberculate, medially beaked, superior lobe longest. Second segment longer than wide, convex, tuberculate, distomedial corner produced as a blunt curved lobe on which third segment is inserted at an angle. Exopod firmly fixed to second segment, tuberculate, tip not bilobed, reaching joint between third and fourth segments, inner border curved over base of eyestalk. Ratio of length of antennal flagella/CW = 0.50.

Subhepatic area convex with two small granulated tubercles. Most dorsal tubercle visible dorsally, lower tubercle on same level as anterior corner of buccal frame where there is an elongate, obliquely oriented lobe. Above this begins a shallow groove extending around under anterolateral margin to branchial groove. Female sternal grooves end close together, but apart on a raised, curved, transverse ridge between bases of first legs.

Chelipeds well developed, much larger in male (length about twice CL), covered in sharp granules. Merus especially long in male. Carpus has two obtuse, distal tubercles. Propodus especially long in male, outer face granulated as are bases of fingers. Fingers strongly downcurved, cutting edges armed with five-six teeth, meeting at tips.

First two pairs of legs smaller than chelipeds, sharply granulated except anterior faces which are smooth. Distal corners of meri and propodi have large, rounded nodules. Dactyli as long as propodi, inner margins have seven-eight very small spines, all of similar size.

Last two pairs of legs very reduced, both subdorsal, of similar length although third pair are thicker. Dactyli of both legs very reduced and opposed by single minute propodal spines.

Abdomen of six free segments. Telson much wider than long, posterior margin rounded. Uropod plates very large, visible externally. Abdominal locking mechanism consists of uropods fitting in front of serrated flanges on bases of first legs. Median ridge of abdomen strongly developed, covered in small granules. On second-sixth segments, granules tend to be arranged into two transverse rows : posterior row continuous while anterior row is divided into two lobes.

First male pleopod a semi-rolled, setose tube with sharp tip; second pleopod simple, needle-like.

DISCUSSION. — *Cryptodromia ihlei* Balss, 1921, was synonymized with *C. areolata* Ihle, 1913, by SAKAI (1936). He obtained several specimens from the type locality of *C. ihlei* and identified them as *C. areolata*. Dr BALSS was able to confirm that these two species are in fact the same. Excellent figures of this species have been provided by IHLE (1913) and SAKAI (1976), and the male pleopods have been figured by SERÈNE and LOHVANIJAYA (1973). *Epigodromia areolata* males have much larger chelipeds than similar sized females, a feature also seen amongst the species of *Takedromia* gen. nov. which must be regarded as being closely related.

CAMOUFLAGE. — None of the *Epigodromia areolata* specimens was accompanied by a piece of camouflage and it may well be that the very small last two pairs of legs are not able to hold a camouflage cap.

SIZE. — The largest specimen known until now was the male type, CL = 10 mm, and the largest female is CL = 9.5 mm (TAKEDA & MIYAKE, 1972a). The New Caledonian collection included a male CL = 12.3 mm and an ovigerous female CL = 9.9 mm. The size range of ovigerous females is CL = 7.0-9.9 mm, but TAKEDA and MIYAKE (1970) recorded an ovigerous female of CL = 6.3 mm. In the New Caledonian material a female, CW = 7.1 mm, is immature while one of CW = 7.2 mm is mature. Thus maturation occurs over the approximate range CW = 6-7.5 mm. Until now no other information about the reproduction of *E. areolata* has been reported. Mean egg diameter for the three females was 0.7 mm and clutch size ranged from 40-108 eggs, a small number for a dromiid crab of this size.

DEPTH. — Previous specimens have come from depths of 30-150 m while those from New Caledonia were found from 120-350 m, greatly extending the depth range.

DISTRIBUTION. — *Epigodromia areolata* (Ihle, 1913) was first described from Timor Island, and has proved to be abundant in collections from Japan and the south China Sea. CAMPBELL (1971) recorded it from south Queensland and so it is not surprising to find it amongst the fauna of New Caledonia.

Epigodromia rotunda sp. nov.

Figs 11 a-h, 18 f.

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 4 : stn DW 207, 22°39.00'S, 167°07.40'E, 220-235 m, 28.09.1985 : 1 ♀ 4.2 x 4.8 mm.

TYPE. — Holotype : 1 ♀, 4.2 x 4.8 mm from MUSORSTOM 4, stn DW 207 (MNHN-B 22576).

DESCRIPTION. — Carapace longer than wide, very convex, almost semi-circular in lateral cross-section. Regions well defined, covered in many small rounded granules and a few tubercles. A shallow frontal groove extends back towards a well-defined urogastric area which has a single median tubercle, followed by a well-defined mesogastric area and cardiac area which is surrounded (except anteriorly) by an agranulate surface. On each side of medial area is a prominent tubercle, opposite the urogastric tubercle, making a line of three together. Branchial region has three separate granulated humps, first behind postorbital corner, the others increasing in size as they curve around posteriorly. Front tridentate, median tooth small, deflexed, lateral teeth prominent, bluntly rounded, granulated. It is difficult to recognize a distinct anterolateral margin, but extending from near the smaller subhepatic tubercle are two larger tubercles which might be counted as teeth. These are followed by a gap marking branchial groove, behind which is a larger, granulate posterolateral tooth. Posterolateral margins granulated, convergent.

Eave-like supraorbital margin which is unevenly granulate so that a distinct supraorbital tooth is not evident (left and right margins of the only known specimen are different). Postorbital corner granulate although flush with carapace surface. No fissure separates suborbital margin which has a strong blunt tooth, not visible dorsally.

First segment of antenna much wider than long, wedge-shaped, lateral margin narrow, medial margin wider, beaked, not gaping, upper lobe serrated and overhanging lower lobe. Second segment slightly longer than wide, granulate, a row of larger granules along centre, distomedial corner produced as a blunt spine on which third segment is inserted at an angle. Exopod firmly fixed to second segment, granulate, broad in side view, tip not bilobed but sloping and reaching as far as joint between third and fourth segments. Epistome triangular, flat, adorned by eight-nine small granules.

Subhepatic region inflated, granulate, two, unequal, granulated tubercles low down near corner of buccal frame which is marked by a prominent blunt tooth beside a distinct groove. Female sternal grooves end apart between bases of second legs, but the present specimen is immature.

Chelipeds small, merus trigonal, borders granulated, two prominent distal tubercles. Carpus with granules which tend to be arranged in four longitudinal rows and two large distal tubercles. Propodus decorated with similar rows of granules. Fingers downcurved, hollowed out internally, armed with five-six small teeth which close along entire length.

First two pairs of legs similar in size to chelipeds. Meri, carpi, and propodi have several large distal tubercles. Dactyli longer than propodi, inner margins armed with four small spines, increasing in size distally.

Last two pairs of legs not especially tuberculated, reduced. Third pair shortest, dactyl opposed by a single propodal spine. Fourth pair subdorsal, extending across posterolateral corner of carapace, dactyl also opposed by a single propodal spine.

Abdomen of six free granulated segments. Female telson wider than long, tip rounded. Uropod plates large and visible externally. Abdominal locking mechanism consists of uropod plate fitting in front of serrated flange on bases of first legs. A prominent feature of abdomen is presence of a pair of large submedial, pearl-like, tubercles on fourth abdominal segment.

Male characters unknown.

ETYMOLOGY. — The specific name of this species refers to the rotund shape of the carapace.

DISCUSSION. — *Epigodromia rotunda* sp. nov. can be distinguished from *E. areolata* by the almost straight supraorbital margin without a supraorbital tooth, an indistinct anterolateral margin without distinct teeth and the presence of a granular posterolateral tooth. Similarly, it may be distinguished from *E. rugosa* sp. nov. by the inflated, more heavily granular carapace which is longer than wide, the absence of distinct anterolateral teeth, and absence of a supraorbital tooth. Only a single immature female specimen is available and thus the male characters are unknown.

CAMOUFLAGE. — The only known specimen was not accompanied by a camouflage cap but it seems likely that *E. rotunda* may, like the other species in this genus, not usually carry concealment.

DEPTH. — The type specimen came from a depth of 235 m which is considerably deeper than most of the material of the other species in this genus : *E. granulata* seems to only occur in shallow water (0-? 3 m), *E. rugosa* sp. nov. (38-45 m), *E. globosa* (50 m), *E. gilesii* (30-80 m), *E. nodosa* (65-100 m), *E. areolata* (30-350 m), while the depth of *E. ebalioides* is unknown. Only *E. areolata* is found as deep as *E. rotunda*.

DISTRIBUTION. — *Epigodromia rotunda* sp. nov. is only known from New Caledonia.

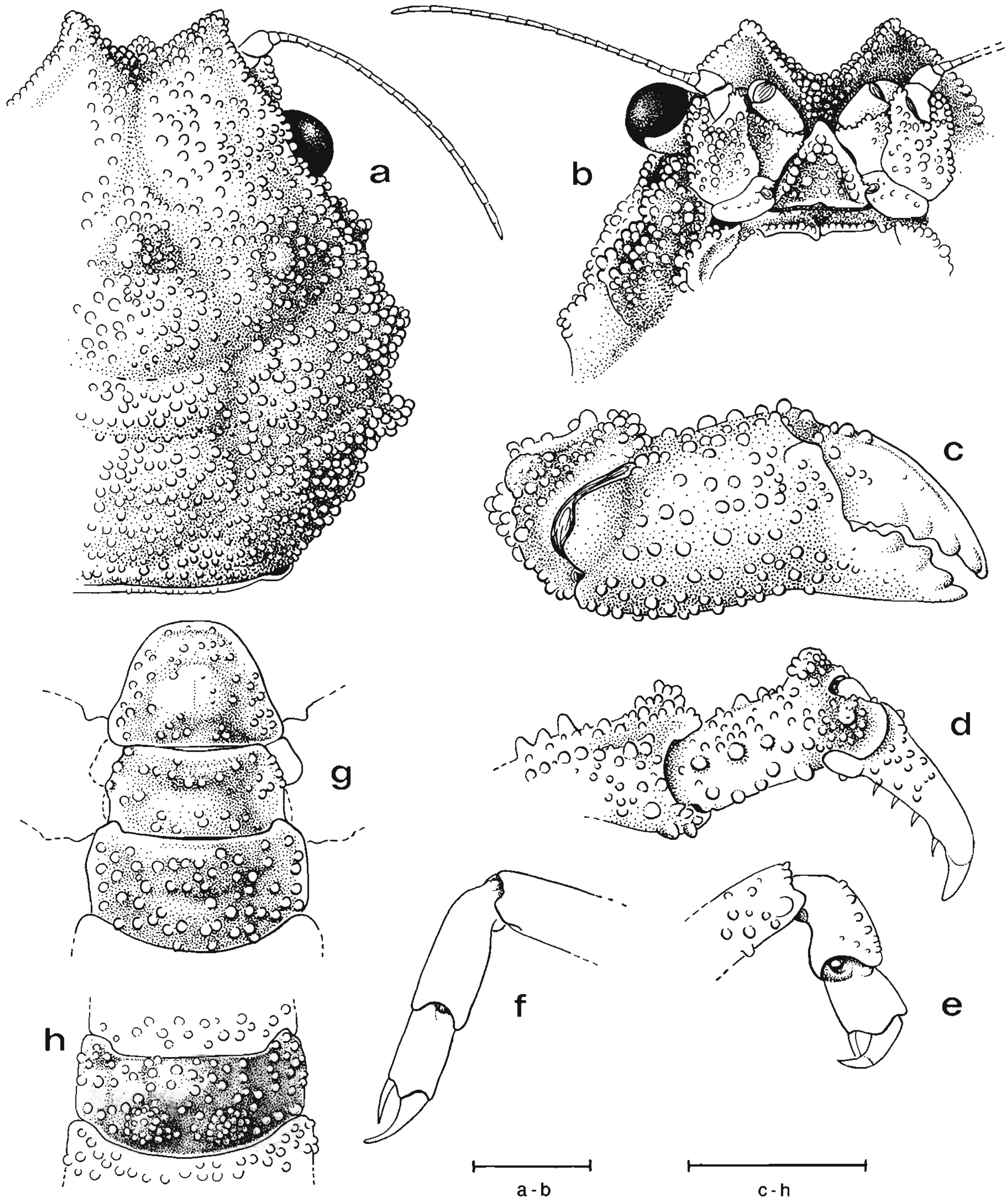


FIG. 11. — *Epigodromia rotunda* sp. nov., ♀, holotype, 4.2 x 4.8 mm, New Caledonia, MUSORSTOM 4, stn 207, 220-235 m (MNHN-B 22576) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area and anterolateral margin; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of terminal segments of right third leg; **f**, posterior view of terminal segments of left fourth leg; **g**, ventral view of telson and terminal segments of female abdomen; **h**, ventral view of detail of fourth segment of female abdomen.
Scale bars represent 1.0 mm.

Epigodromia rugosa sp. nov.

Fig. 12 a-h

MATERIAL EXAMINED. — **New Caledonia.** LAGON : stn 723, 21°21.6'S, 165°56.7'E, 45 m, 12.08.1986 : 1 ♂ 9.7 x 8.5 mm. — Stn 736, 22°06.7'S, 166°58.4'E, 44-45 m, 12.08.1986 : 1 ♀ 7.4 x 6.5 mm. — Stn 850, 20°42.1'S, 165°09.5'E, 38 m, 11.01.1987 : 1 ♀ 11.2 x 9.8 mm.

TYPE.— Holotype : 1 ♀, 11.2 x 9.8 mm from LAGON, stn 850 (MNHN-B 22578). Paratype : 1 ♂ , 9.7 x 8.5 mm from LAGON, stn 723 (MNHN-B 22577).

DESCRIPTION. — Carapace wider than long, convex, surface sculptured with some raised granulated areas, intervening areas smooth. Sculpturing somewhat concealed by a thin covering of short, fine setae. Regions well marked, frontal groove evident, as are cervical and branchial grooves. Cervical groove separates a pair of prominent tubercles on either side. Urogastric region well marked, containing a pair of protuberances. Cardiac region also well marked. A line of small granules runs along behind branchial groove on to posterolateral tooth. Rostrum tridentate, teeth short, blunt. Median tooth on a lower level, horizontally directed. Lateral teeth verticolaterally directed. Anterolateral margin begins at a level just below suborbital tooth, with three teeth. First anterolateral tooth, granulated, lateral to orbit, separated by a larger distance from two other similar teeth. Posterolateral tooth, behind branchial notch, is largest and directed laterally, as is third anterolateral tooth.

A distinct blunt supraorbital tooth. Small orbital fissure separates suborbital margin which has a single blunt tooth near medial corner. Close by this tooth is a similar subhepatic tubercle, lateral and slightly below, with another subhepatic tubercle even lower. All three, i.e. suborbital, and two subhepatic tubercles, are all visible dorsally.

First segment of antenna wider than long, beaked medially, upper lobe of beak downcurved and overhanging lower lobe. Second segment much longer than wide, sparsely granulated, in central distal region is a cluster of three granules forming a raised area, distomedial corner produced as curved acute spine on which third segment is inserted at an angle. Exopod firmly fixed, union marked by a distinct groove, tip shelf-like with inner margin produced and curving over base of eyestalk, extending as far as joint between third and fourth antennal segments. Ratio of length of antennal flagella to CW = 0.46.

A blunt lobe at corner of buccal frame and a distinct groove running from beside this lobe around under anterolateral margin towards posterolateral tooth. The female specimens are immature, but faint sternal grooves end apart between bases of second legs.

Chelipeds well developed. Merus trigonal, borders armed with small granules. Carpus with small granules which tend to be arranged in longitudinal rows, one prominent proximolateral tubercle, two similar distal tubercles and a pair of small granules at superior, inner distal corner. Upper face of propodus granulated, outer face largely smooth. Fingers downcurved, hollowed out internally, fixed finger armed with seven blunt teeth, dactyl with a large proximal tooth followed by a gap and then five teeth increasing in size distally.

First two pairs of legs smaller than chelipeds. Carpi with three longitudinal rows of granules on superior face and distal margin bluntly lobed. Propodi with scattered granules, distal margin lobed. Dactyli as long as propodi, strongly curved at tip, inner margins with four-five small spines increasing in size distally and a distinctive proximal pearl-like knob on posterior face, articulating with penultimate segment.

Last two pairs of legs very reduced, third pair smallest, fourth pair subdorsal. Dactyli on both legs opposed by single propodal spines.

Abdomen of six free segments. Male telson distinctly wider than long, tip rounded with lateral corners bluntly produced. Female telson also wider than long, but tip broadly rounded. Uropod plates well developed, visible externally. Abdominal segments with a broad rounded median ridge. Abdominal locking mechanism consists of concave margins of penultimate abdominal segment against serrated flange on bases of first legs and uropod plate locking in front of flanges.

First male pleopod a semi-rolled, setose tube with sharp, horny tip; second pleopod simple, needle-like.

ETYMOLOGY. — The specific name of this species is derived from the Latin *rugosus* and refers to the sculptured surface of the carapace.

DISCUSSION. — Compared to the other species of *Epigodromia*, *E. rugosa* has a CW/CL ratio which is larger, the carapace surface is only sparsely granular, the anterolateral margin has three distinct teeth, and segments of the abdomen are without granules.

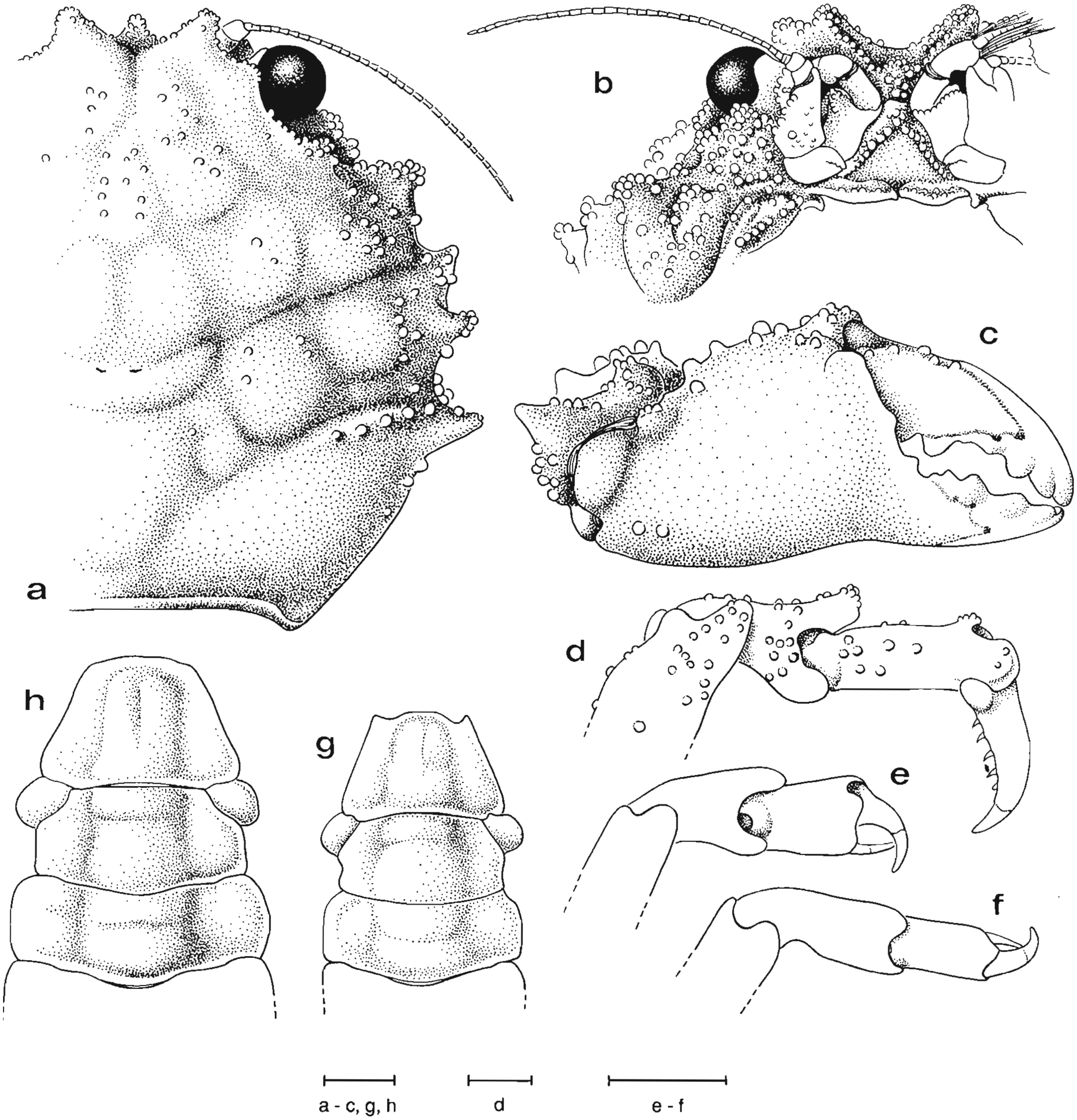


FIG. 12. — *Epigodromia rugosa* sp. nov. : **a-g**, ♂, paratype, 9.7 x 8.5 mm, New Caledonia, LAGON, stn 723, 45 m (MNHN-B 22577) : **a**, dorsal view of right half of carapace; **b**, ventral view of right orbital area and anterolateral margin; **c**, outer face of right cheliped; **d**, posterior view of terminal segments of right second leg; **e**, posterior view of terminal segments of right third leg; **f**, posterior view of terminal segments of right fourth leg; **g**, ventral view of telson and terminal segments of male abdomen. — **h**, ♀, holotype, 11.2 x 9.8 mm, New Caledonia, LAGON, stn 850, 38 m (MNHN-B 22578) : ventral view of telson and terminal segments of female abdomen.

Scale bars represent 1.0 mm.

CAMOUFLAGE. — None of New Caledonian specimens were accompanied by pieces of camouflage.

SIZE. — The size of *E. rugosa* is within the range (maximum CW = 19 mm) of the other species in this genus. Both female specimens, CW = 7.4-11.2 mm, are immature perhaps indicating that females do not mature until they are larger, but some may still mature within this size range. If this is true, *E. rugosa* may have a larger maximum body size than the other species.

DEPTH. — The depth range, 38-45 m, of *E. rugosa* is similar to other *Epigodromia* species.

DISTRIBUTION. — *Epigodromia rugosa* sp. nov. is only known from New Caledonia.

CHARACTER	*Epipedodromia*	*Homalodromia*
Ratio CW/CL	Carapace as wide as long.	Carapace width less than length.
Carapace surface	Minutely granulate.	Smooth.
Rostrum	Bidentate, eave-like.	Bidentate, teeth subacute, on broad, prominent eaves.
Anterolateral margin	Teeth absent.	Teeth very small, not visible dorsally.
Antenna	Distomedial corner of second segment produced. Exopod as long as third segment.	Distomedial corner of second segment strongly produced. Exopod as long as third segment.
Sternal grooves	End apart between chelipeds on a sinuous raised ridge.	End apart on tube-like structures behind chelipeds.
Epipod/Podobranchs	No epipods or podobranchs on pereiopods.	No epipods or podobranchs on pereiopods.
First two pairs of legs	Longer than chelipeds, segments smooth.	Longer than chelipeds, segments smooth.
Last two pairs of legs	Third leg shortest, dactyl opposed by one propodal spine, no spine on outer propodal margin. Fourth leg shorter than first leg, dactyl opposed by one propodal spine, no spine on outer propodal margin.	Third leg dactyl opposed by one propodal spine, no spine on outer propodal margin. Fourth leg about as long as first leg, dactyl opposed by one propodal spine, no spine on outer propodal margin.
Abdominal segments	No segments fused, surface smooth.	No segments fused, surface smooth.
Uropods	Absent.	Small, visible externally. Abdominal locking mechanism used.
Telson	Rounded.	Rounded.
Male pleopods	First sharply tipped, second without exopod on basis.	First sharply tipped, second without exopod on basis.

TABLE 8 — Comparison of the key characteristics of the genera *Epipedodromia* André, 1932, and *Homalodromia* Miers, 1884.

Genus *EPIPEDODROMIA* André, 1932

Platydromia Fulton & Grant, 1902a : 57.
Epipedodromia André, 1932 : 180.

Carapace as wide as long, flattened, subpentagonal in outline, margins with short stiff setae, surface minutely granulate. Rostrum bidentate, frontal margin strongly deflexed, above and behind the front is a prominent arcuate ridge divided into four equal parts by deep grooves. No anterolateral teeth. Epistome almost entirely fused to rostrum. Female sternal grooves end apart behind chelipeds. Chelipeds without an epipod, smaller than first two pairs of legs which are fringed with short setae. Last two pairs of legs reduced, third pair shortest, merus of fourth leg almost as long as lateral margin of carapace. Dactyli of both legs opposed by single propodal spines. Abdomen of six free segments, telson rounded, uropod plates absent. Abdominal locking mechanism involves raised knob on bases of first legs.

TYPE SPECIES.— *Platydromia thomsoni* Fulton & Grant, 1902, by monotypy. *Epipedodromia* being a replacement name for *Platydromia* Fulton & Grant, 1902, has the same type species.

DISCUSSION. — The replacement generic name of *Epipedodromia* was necessary because *Platydromia* was preoccupied by *Platydromia depressa*, Brocchi, 1877. *Epipedodromia thomsoni* is most closely related to *Homalodromia* (see Table 8).

Epipedodromia thomsoni is known only from southern Australia and is a small, maximum CW = 11.5 mm, shallow water species with a maximum depth of 60 m. The camouflage material used by this species is unknown.

Genus *HOMALODROMIA* Miers, 1884

Homalodromia Miers, 1884 : 553.
Lasiodromia Alcock, 1901 : 56. — IHLE, 1913 : 51. — SAKAI, 1976 : 27.
Pseudodromia Alcock, 1900 : 149 (in part).

Carapace longer than wide, flattened, but rising steeply at front, little convex behind, smooth but remarkably tomentose. Rostrum bidentate, two prominent lobes, each of which is broadly bifid. Epistome triangular united with front. Coxae of third maxillipeds separated by a narrow gap and inserted under tip of sternum. Female sternal grooves end apart on tubular prominences, nearly in contact at their bases, just behind chelipeds. Cheliped without an epipod, little more massive than first two pairs of legs. None of these limbs verrucose or dilated. Inner margins of dactyli of first two pairs of legs armed with several small spines. Last two pairs of legs very unequal. Third pair of legs shortest, dactyl opposed by a single propodal spine. Fourth pair almost as long as either of first two pairs, dactyl opposed by a single propodal spine. Abdomen of six free segments. Uropod plates well developed, visible externally, used in male abdominal locking mechanism by locking in front of serrated ridge on bases of first legs.

TYPE SPECIES. — *Homalodromia coppingeri* Miers, 1884, by monotypy. *Lasiodromia* Alcock, 1901, being a replacement name for *Homalodromia* Miers, 1884, has the same type species.

DISCUSSION. — This generic definition is based on MIERS (1884) and ALCOCK (1901) with the addition of details about the uropods and abdominal locking mechanism (see Table 8).

Most authors have used the generic name *Lasiodromia* Alcock, 1901. This name was created because ALCOCK believed that *Homalodromia* was too similar to *Homolodromia* A. Milne Edwards, 1880, and would therefore be confusing. Although *Lasiodromia* was a very apt name, alluding to the long, shaggy fringe across the anterior border of the carapace, *Homalodromia* has priority. *Homalodromia* Miers, 1884, is not a junior homonym of *Homolodromia* A. Milne Edwards, 1880, because of Art. 56c of the Code (the one-letter difference clause).

Epipedodromia André, 1932, is a monotypic genus whose only species, *E. thomsoni* (Fulton & Grant, 1902), is most closely related to *Homalodromia*. In addition, there is undescribed material from Australia which includes additional species, belonging to new, related genera. All of these species come from shallow coastal waters.

Epipedodromia thomsoni may be distinguished from *Homalodromia coppingeri* because the lateral rostral teeth form a continuous eave over the eyes, behind which the carapace rises to a prominent, arcuate, ridge divided into four lobes. Furthermore, uropod plates are absent from the abdomen and the female sternal grooves end apart on a sinuous raised ridge behind the chelipeds.

DISTRIBUTION. — *H. coppingeri* was originally described using an adult female from Providence Reef, Seychelles, collected by H.M.S. "*Alert*". Subsequent records are from the Indo-West Pacific.

Homalodromia coppingeri Miers, 1884

Fig. 13

Homalodromia coppingeri Miers, 1884 : 554, pl. 50, fig. 8. — RATHBUN, 1911 : 195.
Lasiodromia coppingeri - ALCOCK, 1901 : 57, pl. 3, figs 15, 15a.
Lasiodromia coppingeri var. *unidentata* Ihle, 1913 : 51. — ODAWARA, 1963 : 18, text fig. 1. — SUZUKI & KURATA, 1967 : 89, 95, pl. 8, fig. 1. — SAKAI, 1976 : 27, text fig. 15.
Lasiodromia unidentata - TAKEDA, 1977 : 73.
Pseudodromia quadricornis Alcock, 1900 : 149.

MATERIAL EXAMINED. — **New Caledonia.** LAGON : stn 65, 22°29.2'S, 166°26.3'E, 24 m, 20.08.1984 : 1 ♀ 5.0 x 6.1 mm. — Stn 556, 22°48.0'S, 166°51.9'E, 24-31 m, 16.07.1985 : 1 ♀ 7.8 x 9.0 mm.

Chesterfield Islands. CHALCAL 1 : stn DC 37, 19°54.00'S, 158°46.30'E, 50 m, 22.07.1984 : 1 ♀ (ovig.) 6.1 x 7.5 mm, carrying a sponge cap.

Hawaiian Islands. "*Albatross*" : stn 3847, South Coast of Molokai Island, 42 m, 8.04.1902 : 1 ♂ 4.5 x 5.8 mm, carrying a sponge cap (USNM 55983).

DESCRIPTION. — Carapace longer than wide, rising steeply at front, convex laterally, smooth when denuded of long, coarse setae. A dense fringe of long setae atop the swollen anterior half of the carapace is characteristic. Frontal groove separates two low gibbosities, branchial groove distinct. Rostrum bidentate, no median rostral tooth. Lateral teeth very prominent, acute and fused with acute supraorbital tooth to form a broad eave over bases of antennae and antennules, and base of eyes. This arrangement makes the front appear as though it consists of four similar teeth. Lateral rostral teeth directed anteriorly but supraorbital teeth curved upward. Anterolateral margins subparallel, beginning at level just above orbit, bearing a single small tooth which is directed anterolaterally but downward and therefore not visible dorsally. Posterolateral tooth small, blunt. Posterolateral carapace margins converging. Posterior carapace margin straight.

Entire orbit not overhung by eave, postorbital corner produced as an acute laterally directed tooth. Narrow fissure separates suborbital lobe which is armed with an acute deflexed tooth.

First segment of antenna wider than long, beaked medially, gaping, upper lobe shortest. Second segment much longer than wide, distomedial corner produced as a blunt spine on which third segment is inserted at an angle. Exopod firmly fixed, tip bilobed, reaching joint of third and fourth segments, inner lobe curving over base of eyestalk. Epistome triangular, smooth.

Subhepatic area inflated and smooth except for a small tubercle medial to the anterolateral tooth. In an immature female specimen the sternal grooves are faint and end apart between bases of second legs, but in mature females the sternal grooves converge and run parallel between bases of first legs, diverging a little, and ending on the underside of prominent tubular structures just behind chelipeds.

Chelipeds small, borders of merus minutely granulated. Carpus with one small central, blunt tubercle and two large acute tubercles. Propodus with a few minute granules on superior border. Propodus curves upwards from its joint with carpus and fingers are curved downward, giving a peculiar angular appearance to the limb. Fingers have four-five obsolete teeth which all interlock.

First two pairs of legs covered with long coarse setae, limbs as long as chelipeds, smooth. Dactyli shorter than propodi, slightly curved, inner margin armed with three small spines, increasing in size distally.

Last two pairs of legs, covered with long coarse setae, limbs very unequal. Third pair shortest, dactyl long, curved, opposed by a single propodal spine. Fourth pair dorsally placed, when extended forward they reach orbit, dactyl long, curved, opposed by single propodal spine.

Abdomen of six free segments. Male abdomen with a weak medial ridge, telson as wide as long, tapered, posterior margin rounded. Uropod plates well developed, attached to anterior border of telson, elongate, with truncate margins and directed anteriorly. Uropod plates lock male abdomen by fitting in front of serrated ridge on bases of first legs. Female telson wider than long, narrowing near tip, strong median ridge along length of abdomen.

First male pleopod a semi-rolled tube with sharp, horny tip; second pleopod simple, needle-like.

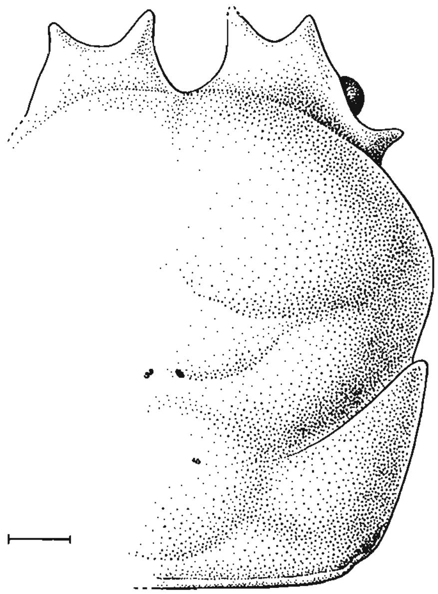


FIG 13. — *Homalodromia coppingeri* Miers, 1884, ♀ 7.8 x 9.0 mm , New Caledonia, LAGON, stn 556, 24-31 m (MNHN-B 22528) : dorsal view of frontal region and right half of carapace.
Scale bar represents 1.0 mm.

DISCUSSION. — ALCOCK (1900) described *Pseudodromia quadricornis* Alcock, 1900, on the basis of five specimens from the coast of Ceylon (Sri Lanka) but added the caveat that perhaps it was the same as *Homalodromia coppingeri* Miers, 1884. At the same time he synonymized *Homalodromia* Miers, 1884, with *Pseudodromia* Stimpson, 1858. However, ALCOCK (1901) later synonymized his species with *Homalodromia coppingeri* Miers, 1884, but erected the new genus *Lasiodromia* Alcock, 1901, for this species. MIERS (1884) described *Homalodromia coppingeri* from the Seychelle Islands, the type specimen being a small (6.7 x 7.3 mm), damaged female. Later IHLE (1913) described a separate variety, *H. coppingeri unidentata*, because of the presence of a small tooth on the anterolateral margin and a posterolateral tooth. I have compared the New Caledonian specimens with MIERS' type specimen (British Museum) and established that they are almost identical. In fact, MIERS overlooked the presence of the small anterolateral tooth and a nearby small sub-hepatic tubercle. Because they were omitted from his description, IHLE (1913) erected a new variety for the *"Siboga"* material. TAKEDA (1977) clearly recognized the presence of a small anterolateral tooth on his specimens from southwest Japan, and believed that IHLE's varietal name should be elevated to a full species and known as *Lasiodromia unidentata*. It is now clear that in fact only one species is involved and no separate variety is necessary. The only difference between the New Caledonian specimens and the type is the presence of a small posterolateral tooth. This structure only seems to be present in larger specimens.

SIZE. — A total of eighteen specimens (six males, seven females and five of unknown sex) have been reported. Maximum size for males is CW = 11.5 mm and for females CW = 11.6 mm but none of the New Caledonian specimens are larger. There have been no records of size at sexual maturity : the two largest females, CW = 6.1 and 7.8 mm, were mature but the smallest female (CW = 5.0 mm) did not have a mature sized abdomen, suggesting that size at maturation is around CW = 5-6.0 mm.

CAMOUFLAGE. — There have been no records of the type of camouflage material used by *H. coppingeri* but one specimen from New Caledonia and the Hawaiian specimen carried a piece of sponge.

DEPTH. — Previous records indicate a depth range of 35-50 m. The depth range for the New Caledonian material, 24-50 m, does not extend the maximum depth.

DISTRIBUTION. — Previous records of *H. coppingeri* are from the Seychelles, Sri Lanka, Laccadives, Indonesia, and Japan. TITGEN (1987) reported *Lasiodromia* sp. from Hawaii and, given the *Albatross* specimen reported here, his specimen may well belong to the present species. The New Caledonian specimens and the one from Hawaii, considerably extend the range of *H. coppingeri* southward and eastward, indicating that it is probably a widespread Indo-Pacific species.

DISCUSSION

Evolution of the Dromiidae

Some explanation should be given here of the ideas about evolutionary radiation within the family Dromiidae and the relationships between the genera. In his review of the dromiid genera, using a limited range of characters, BORRADAILE (1903a) suggested that *Hypoconcha*, *Conchoecetes*, and *Sphaerodromia* were the most primitive genera, with all the other genera being derived from them. He arranged these into three groups consisting of firstly, *Dromidiopsis*, *Dromides*, *Eudromia*, and *Dromidia*, secondly, *Lasiodromia*, and *Cryptodromiopsis*, and thirdly, *Dromia*, *Petalomera*, and *Cryptodromia*. However he added the caveat that this was a good example of a "kaleidoscopic shuffling of characters" and that it did not resolve the genera into unified groups. It is difficult to ascertain the basis of this arrangement but it seems to be aimed at separating genera with broad well-regioned bodies, and legs which are knobbed and ridged, from those with simple legs, and narrow bodies without trace of regions. BORRADAILE'S arrangement of genera does not seem to reflect any particular hypothesis about dromiid evolution but more an arrangement of convenience.

In my revision of the dromiid genera, I have had in mind a particular hypothesis about their evolution and this is reflected in the generic rearrangements made here. Elsewhere (McLAY, 1991), I have argued that *Sphaerodromia* is the most primitive genus not only because of the presence of podobranchs on the limbs and vestigial pleopods on the male abdomen but also because of the structure of spines around and on the dactyli of the legs. A key feature of dromiid crabs is the presence of spines opposed to the dactyli which can be used to form a sub-chelate mechanism on the last two pairs of legs for grasping pieces of camouflage. In *Sphaerodromia*, distal propodal spines and spines along the inner margins of the dactyli can be found on all four legs. My hypothesis is that this set of characters represents the ancestral condition from which the combinations of characters found in all other genera can be derived. In any one species of *Sphaerodromia*, we can see the gradual reduction in spines on the inner margin of the dactyl from the first to the last leg. This is accompanied by shortening of the propodus, curving of the dactyl, and increase in the number of spines opposing the dactyl. The first two pairs of legs are used for walking while the last two pairs are reduced, placed sub-dorsally and used for carrying pieces of camouflage. I suggest that the ancestral dromiid had four legs, used for walking, each similar to the first or second walking legs of *Sphaerodromia* with strong dactyli carrying numerous spines on the inner margin and with one or more distal propodal spines overlapping the base of the dactyl. From this one can derive any of the spine arrangements found in other dromiids, whether they are used for grasping sponges, ascidians or shells.

The primitive arrangement of propodal spines on the pereiopods can also be found in the Homolodromiidae Alcock, 1899 (see BAEZ & MARTIN, 1989). In these crabs the spines are much more numerous, and this along with other features (e.g. carapace shape, antennal structure, and pereiopodal podobranchs) perhaps indicates that they are a more primitive group than the Dromiidae. Radically different structures are found on the last pair of legs of the Homolidae De Haan, 1839, where the more proximal region of the propodal segment has been greatly elaborated to form an amazing variety of sub-chelate mechanisms (GUINOT & RICHER DE FORGES, 1981). Much greater use could be made of the structure of the last two pairs of legs of the primitive Brachyura to separate these families.

The direction of evolution in the Dromiidae has been towards loss of the habit of carrying camouflage, involving reduction of propodal and dactyl spines on all legs, further reduction in the size of the last two pairs of legs to the point where they are almost vestigial, and the development of a strongly ornamented carapace. In the two latter respects, they resemble the dynomenids except that both of the hind limbs are reduced instead of only the last limb. The relationships amongst the genera are complex, involving specialization, but they fall into two groups : a) species usually with and b) species usually without an epipod on the cheliped. In the first group the most primitive genera are *Sphaerodromia*, and *Eodromia*, with the more advanced genera *Tunedromia*, *Lauridromia*, and *Dromidiopsis*, forming a cluster of larger crabs. Near to these is *Dromia*, and a group of smaller crabs including *Fultodromia*, and *Stimdromia*, with *Petalomera*, *Paradromia* and *Frodromia* being the most advanced in this group. Also there are two specialized genera, *Hypoconcha* and *Conchoecetes*, which are shell-carrying dromiids, whose relationships with the others is difficult to establish. While *Conchoecetes* probably belongs in the Dromiidae, the placement of *Hypoconcha* is doubtful (see below). Of the dromiids in the second group the most primitive genera are *Cryptodromiopsis*, *Dromidia*, *Exodromidia*, and *Austrodromidia*. The two genera, *Cryptodromia* and *Lasiodromia*, include small crabs which are more advanced, and a cluster including *Epigodromia*, *Barnardromia*, *Speodromia*, and *Takedromia* represent the most advanced genera in this group. *Pseudodromia* also lacks an epipod but is a group of species specialized for an intimate association with ascidians.

This briefly outlines my ideas on relationships amongst the dromiid genera but the hypothesis is based on morphology of the adults. Larval studies have provided information about development of the larvae or juveniles of ten genera : *Dromia* (LAUGHLIN, RODRIGUEZ & MARVAL, 1982, RICE, INGLE & ALLEN, 1970, WEAR, 1970, 1977, TERADA, 1983), *Lauridromia* (TERADA, 1983), *Dromidiopsis* (HALE, 1941), *Stimdromia* (MONTGOMERY, 1922, HALE, 1925), *Paradromia* (HONG & WILLIAMSON, 1986, TERADA, 1983), *Cryptodromiopsis* (RICE & PROVENZANO, 1966), *Austrodromidia* (HALE, 1925), *Cryptodromia* (TAN, LIM & NG, 1986), *Conchoecetes* (SANKOLLI & SHENOY, 1968), and *Hypoconcha* (KIRCHER, 1970, LANG & YOUNG, 1980). This information should be included in a more detailed future analysis of this family, but at the moment it is not particularly useful for determining the grouping of species into genera. Intensive studies of adult morphology have provided a sound basis for generic restructuring, but for the larval information to be used for this purpose, requires that this be equally well known. It is no use giving special emphasis to what appear to be unusual larval features unless the extent of variation of these features is known for other dromiid larvae.

Evolutionary relationships are also evident in the geographic distribution of the dromiids. It is clear that there have been four "theatres" of evolution in the radiation of dromiid crabs : these are a) the Atlantic, b) South Africa, c) southern Australia, and finally d) the remainder of the whole Indo-Pacific region. In the Indo-Pacific we find the greatest diversity including the most primitive genus, *Sphaerodromia*, along with *Dromidiopsis*, *Lauridromia*, *Dromia*, *Stimdromia*, *Cryptodromiopsis*, *Cryptodromia*, *Petalomera*, *Takedromia*, *Epigodromia* and *Conchoecetes*. All of these genera are very widespread, having some species which occur in the other regions. This region contains not only the most primitive genera, but also the more advanced genera such as *Stimdromia*, *Cryptodromia*, *Takedromia* and *Epigodromia*. These genera represent a relatively recent tropical radiation. The other three regions are characterized by some unique groups of genera. Besides several undescribed genera, Australia has *Haledromia*, *Fultodromia*, *Epipedodromia*, and *Austrodromidia* which is probably derived from *Cryptodromiopsis*. Several Australian species have direct development and many have very large eggs. South Africa has six endemic genera including *Pseudodromia*, *Exodromidia*, *Eudromidia*, *Dromidia*, *Barnardromia*, and *Speodromia* whose occurrence supports the hypothesis by KENSLEY (1981) of a "cool water stenothermic radiation" in this area. Like Australia, the South African fauna includes many species with very large eggs although none are known to have direct development. Both the South African and Australian unique genera seem to be of more ancient origin. In the Atlantic we find the major radiation of *Dromia* most of whose species are endemic to this sea. This radiation probably dates from the origin of the Atlantic ocean. Two other genera, not closely related to *Dromia*, are present in this area. *Cryptodromiopsis antillensis* undoubtedly shared a common ancestor with *C. larraburei* which originated from the Indo-Pacific. The other genus, *Hypoconcha*, is restricted to the east and west coasts of North and South America.

In order to examine the question of the unity of the Brachyura, SPEARS *et al.* (1992) carried out a phylogenetic study based on 18s rRNA and rDNA sequences found in, among others, *Hypoconcha arcuata* and *Cryptodromiopsis antillensis* (reported as *Dromidia antillensis*). The most important result, which is relevant to the question of inclusion or exclusion of the genus *Hypoconcha* from the Dromiidae, is that *H. arcuata* and *Cryptodromiopsis antillensis* are not closely related. This led SPEARS *et al.* to question whether the Dromiidae is a monophyletic group. There certainly are significant morphological differences between the adults of *Hypoconcha* and other dromiid genera particularly in the structure of the last two pairs of legs and the sternum. It may be justifiable to place this genus in a separate sub-family or family. The level could be influenced by whether or not the genus *Conchoecetes* is included along with *Hypoconcha*. The main features of the shape of the carapace of *Conchoecetes*

Conchoecetes are more like those found in other dromiids than is the case with *Hypoconcha*. It seems to me that this problem can only be solved by comparing all these crabs on a common basis of molecular data.

Relative Abundance and Depth Distribution

Almost two-thirds of the New Caledonian and Philippine specimens belong to five species : by far the most common species is *Lauridromia intermedia* (Laurie, 1906), followed by *Petalomera pulchra* Miers, 1884, *Cryptodromia* ? *coronata* Stimpson, 1858, *Dromidiopsis dubia* Lewinsohn, 1984, and *Epigodromia areolata* (Ihle, 1913). *L. intermedia* occurs from 7-150 m, *P. pulchra* 25-86 m (with one specimen from 240 m), *C. coronata* 15-47 m, *D. dubia* 14-75 m, and *E. areolata* 120-350 m. Thus most of the dromiids come from water shallower than 100 m (see Fig. 14). The maximum number of species occurs in the depth interval 20-60 m where up to 14 species are found, and in shallower or deeper water, the number of species declines. Six species are found in the interval 0-10 m, and one species, *Frodromia atypica*, was found at the maximum depth of 437 m. A similar pattern is found with the depth distribution of genera. The largest dromiid crab in this fauna, *Dromia dormia*, is a shallow water species.

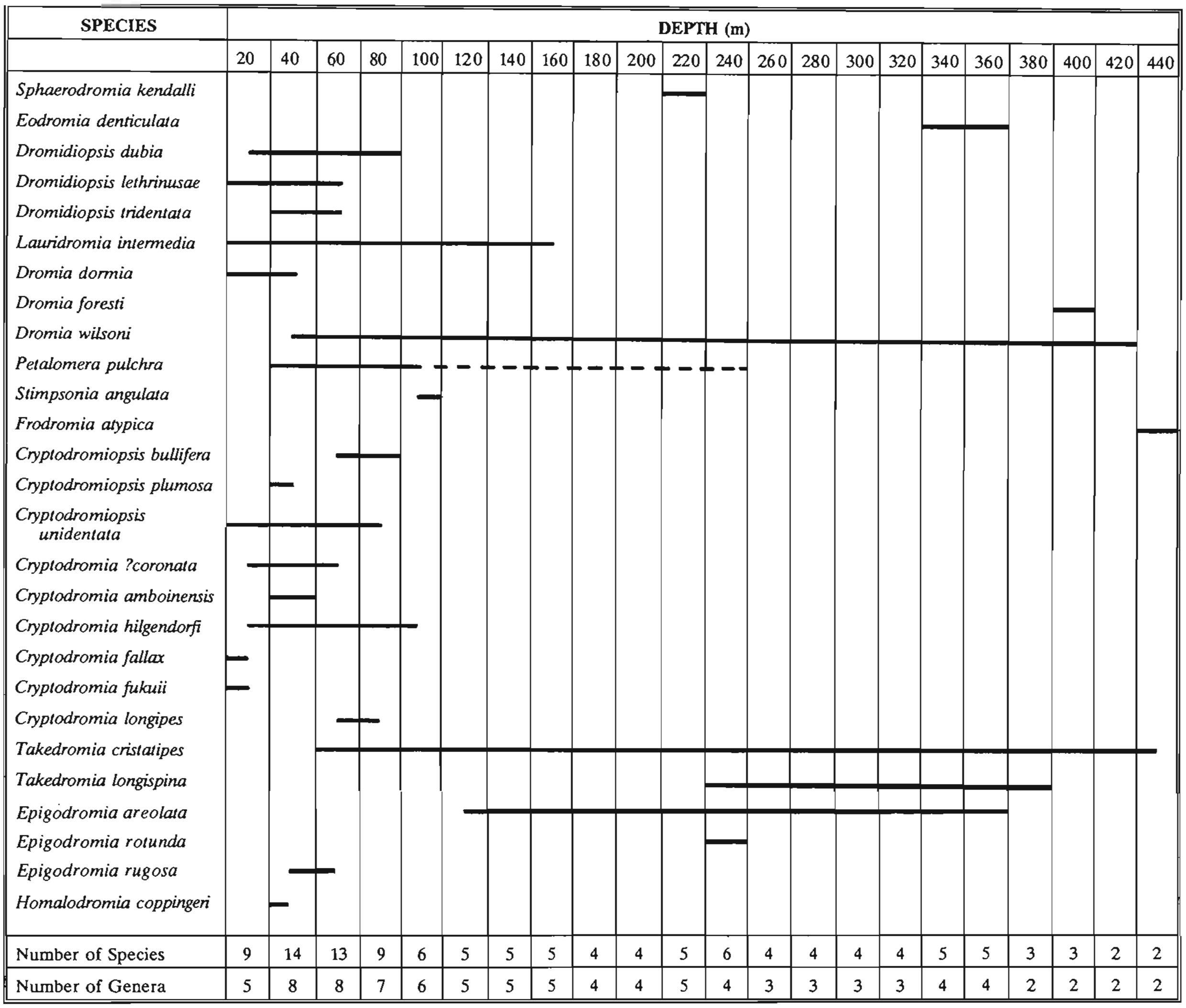


FIG. 14. — Depth distribution of the dromiids from New Caledonia and the Philippine Islands.

Reproductive Biology

Almost all the dromiid species recorded here reach sexual maturity at CW less than 8.0. mm. The smallest mature females, CW = 4.5 mm, were found in *Cryptodromia amboinensis* and *C. ? coronata* both of which probably do not grow to a very large size, perhaps only CW = 15.0 mm. Egg size ranged from 0.4 mm, (*Eodromia denticulata*) to 1.1 mm diameter (*Stimdromia angulata*) with the modal size class being 0.7-0.8 mm. While some species may have abbreviated development, there is no evidence of direct development amongst the dromiids from this region, unlike Australia where several dromiids without larval stages are known. The dromiids of New Caledonia and the Philippines are widely distributed species typical of an island, rather than continental, fauna. Egg number is largely explained by body size and ranged from only eight per clutch for *C. ? coronata* to approximately 24,000 for *Dromia dormia* which is by far the largest (CW = 200 mm) dromiid found in this region. There tends to be an inverse correlation between egg size and egg numbers but there is no clear relationship between egg size or egg number and depth. The data on reproductive biology will be analyzed in more detail in a subsequent publication.

Biogeography of New Caledonian and Philippine Dromiidae

Prior to the present study the only dromiid known from New Caledonia was *Cryptodromia fallax* (as *C. canaliculata*) recorded by TAKEDA and NUNOMURA (1976). This species is included in the present collection, along with the following species : *Eodromia denticulata, Dromidiopsis dubia, D. lethrinusae, D. tridentata, Lauridromia intermedia, Dromia dormia, D. foresti, D. wilsoni, Petalomera pulchra, Frodromia atypica, Cryptodromiopsis bullifera, C. plumosa, C. unidentata, Cryptodromia ? coronata, C. amboinensis, C. fukuii, C. hilgendorfi, C. longipes, Takedromia cristatipes, T. longispina, Epigodromia areolata, E. rotunda, E. rugosa,* and *Homalodromia coppingeri.* The New Caledonian dromiid fauna includes 25 species.

Excluding the six new species, known only from New Caledonia, the fauna has its greatest affinity with Japan (68% species in common), the Indian Ocean region (63%), Indonesia (58%), the Philippine Islands (47%), Australia (32%) and the Pacific eastward of New Caledonia (32%). Only two species, *Cryptodromiopsis unidentata* and *Dromia wilsoni* occur south of New Caledonia.

The only species previously known from the Philippine Islands were *Cryptodromia tuberculata, C. tumida, C. fallax* (as *C. canaliculata*), *Cryptodromiopsis bullifera, Dromia dormia* and *Stimdromia* sp. (see ALCALA, 1974, ESTAMPADOR, 1937, and WARD, 1941). To these can now be added *Sphaerodromia kendalli, Dromidiopsis lethrinusae, Lauridromia intermedia, Dromia wilsoni, Stimdromia angulata, Cryptodromiopsis unidentata, Cryptodromia amboinensis,* and *C. hilgendorfi* to make a total of 14 species.

The affinities of the Philippine dromiid fauna are with Japan (83% species in common), the Indian Ocean region (83%), Indonesia (58%) and Australia (42%). These are essentially the same relationships as for New Caledonia. There are only three species, *Dromia dormia, D. wilsoni,* and *Cryptodromiopsis unidentata,* shared eastward with the Pacific.

It must be pointed out that the apparent strong affinities of both the New Caledonian and Philippine dromiid faunas with Japan, and not with closer areas, must be tempered with the fact that the Japanese fauna is much better known than any other areas. Much remains to be discovered about the distribution of dromiids.

The most wide ranging of the New Caledonian and Philippine dromiids are *Lauridromia intermedia, Dromia dormia, D. wilsoni, Cryptodromiopsis unidentata, Cryptodromia hilgendorfi, C. fallax* and *C. tuberculata.* Of these all except *C. tuberculata* are shared. The only endemic dromiid species are the six new species described herein from New Caledonia.

At the generic level a similar picture of affinities emerges for both New Caledonia and the Philippines, with the most widely distributed genera being *Dromidiopsis, Lauridromia, Dromia, Stimdromia, Cryptodromiopsis,* and *Cryptodromia.*

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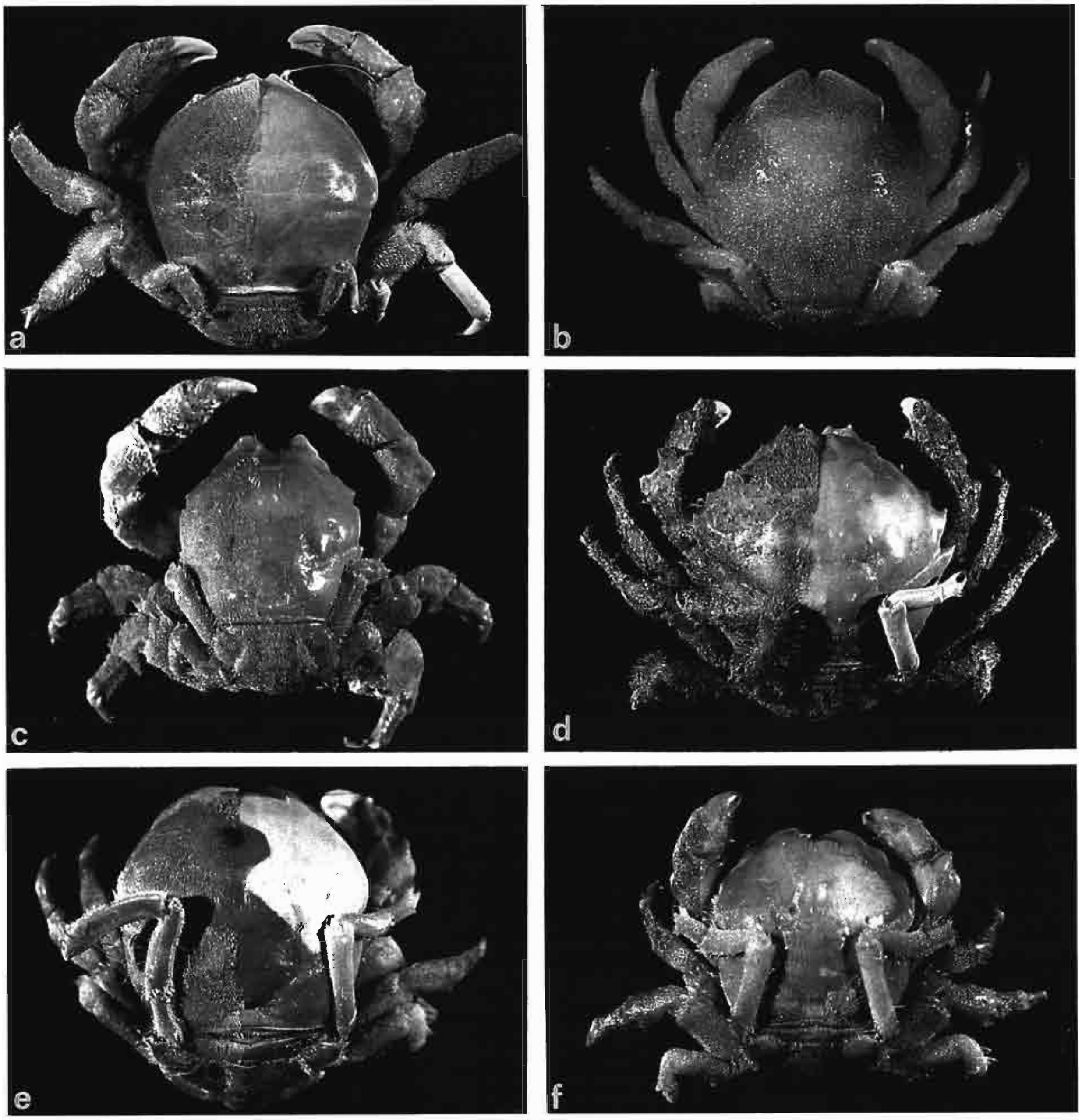

FIG. 15 a. — *Sphaerodromia kendalli* (Alcock & Anderson, 1894), ♀ 40.6 x 39.7 mm, Philippine Islands, MUSORSTOM 3, stn CP 143, 205-214 m (MNHN-B 22543) : dorsal view of the whole crab, setae removed from the right half of the carapace and terminal segments of the right cheliped and last three legs.

FIG. 15 b. — *Eodromia denticulata* gen. nov., sp. nov., ♀, holotype, 5.7 x 5.8 mm, New Caledonia - Norfolk Ridge, SMIB 5, stn DW 98, 335 m (MNHN-B 22544) : dorsal view of the whole crab.

FIG. 15 c. — *Dromidiopsis dubia* Lewinsohn, 1984, ♂ 13.2 x 16.2 mm, New Caledonia, LAGON, stn 619, 27-42 m (MNHN-B 22546) : dorsal view of the whole crab, setae removed from right half of carapace.

FIG. 15 d. — *Lauridromia intermedia* (Laurie, 1906), nov. comb., ♀ 44.4 x 44.3 mm, New Caledonia, "*Vauban*", St. Vincent Bay, 16 m (MNHN-B 22551) : dorsal view of whole crab, setae removed from right half of carapace and last leg.

FIG. 15 e-f. — *Dromidiopsis lethrinusae* (Takeda & Kurata, 1976), nov. comb., Chesterfield Islands, CORAIL 2, stn CP 127, 45 m, dorsal view of whole crab, setae removed from right half of carapace : **e**, ♀ 17.2 x 18.1 mm (MNHN-B 22547); **f**, ♂ 11.9 x 12.5 mm (MNHN-B 22548).

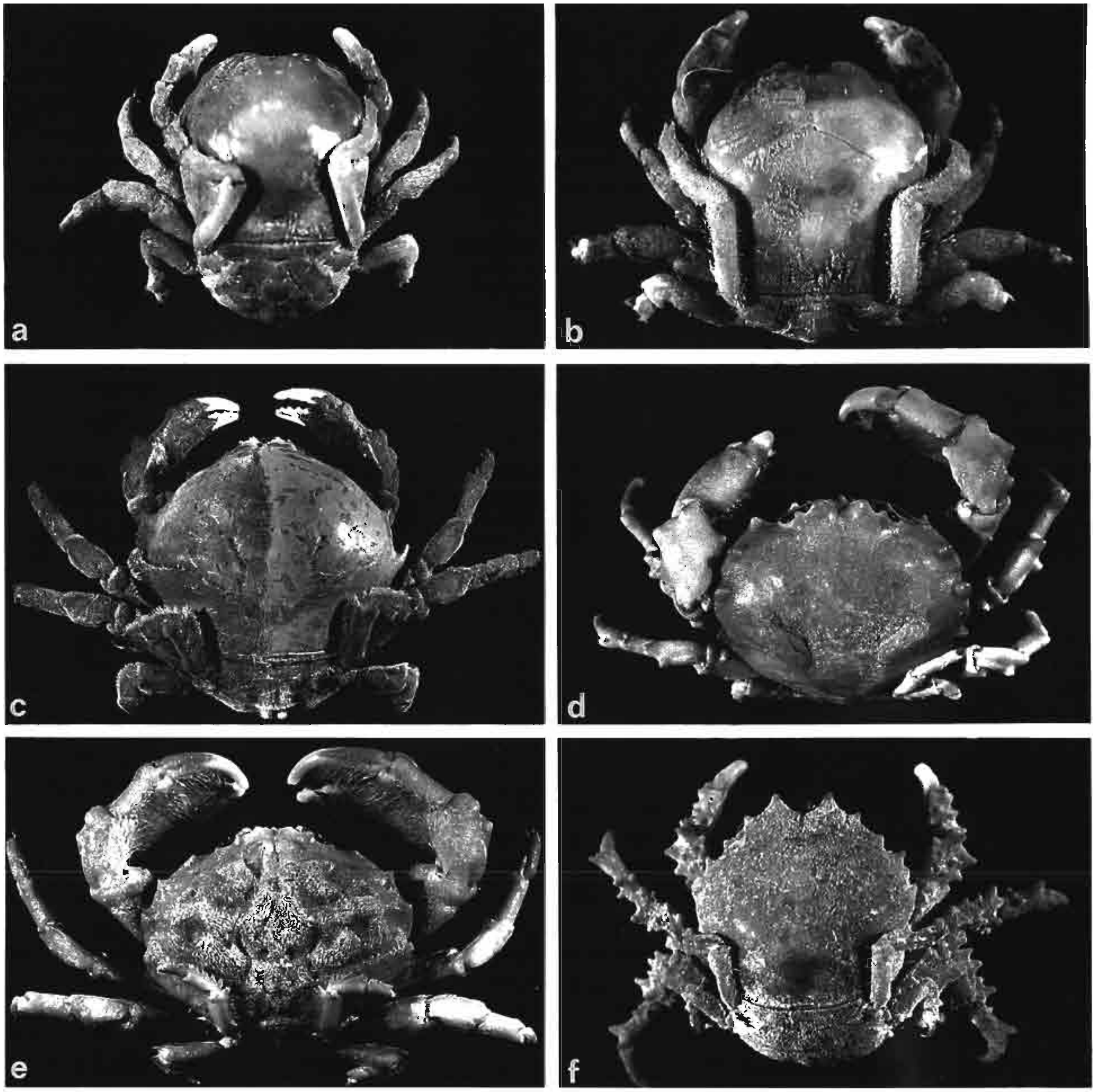

FIG. 16 a-b. — *Dromidiopsis tridentata* Borradaile, 1903, New Caledonia, LAGON, stn 554, dorsal view of whole crab, setae removed from the right half of the carapace which is cracked in the male : **a**, ♀ (ovig.) 12.0 x 12.7 mm (MNHN-B 22549); **b**, ♂ 12.0 x 12.7 mm (MNHN-B 22550).

FIG. 16 c. — *Dromia dormia* (Linnaeus, 1763), ♀ (ovig.) 112.2 x 95.6 mm, New Caledonia, Barrier Reef, 27.11.1986, 10-30 m (MNHN-B 22552) : dorsal view of whole crab, setae removed from right half of carapace.

FIG. 16 d. — *Dromia foresti* sp. nov., ♂, holotype, 27.3 x 23.0 mm, Chesterfield Islands (Bellona Reefs), MUSORSTOM 5, stn 299, 360-390 m (MNHN-B 22553) : dorsal view of whole crab.

FIG. 16 e. — *Dromia wilsoni* (Fulton & Grant, 1902), nov. comb., ♂ 47.7 x 34.8 mm, Loyalty Islands, MUSORSTOM 6, stn DW 460, 420 m (MNHN-B 22554) : dorsal view of the whole crab.

FIG 16 f. — *Stimdromia angulata* (Sakai, 1936) nov. comb., ♀ (ovig.) 7.8 x 7.6 mm, Philippine Islands, MUSORSTOM 3, stn CP 134, 92-95 m (MNHN-B 22557) : dorsal view of whole crab.

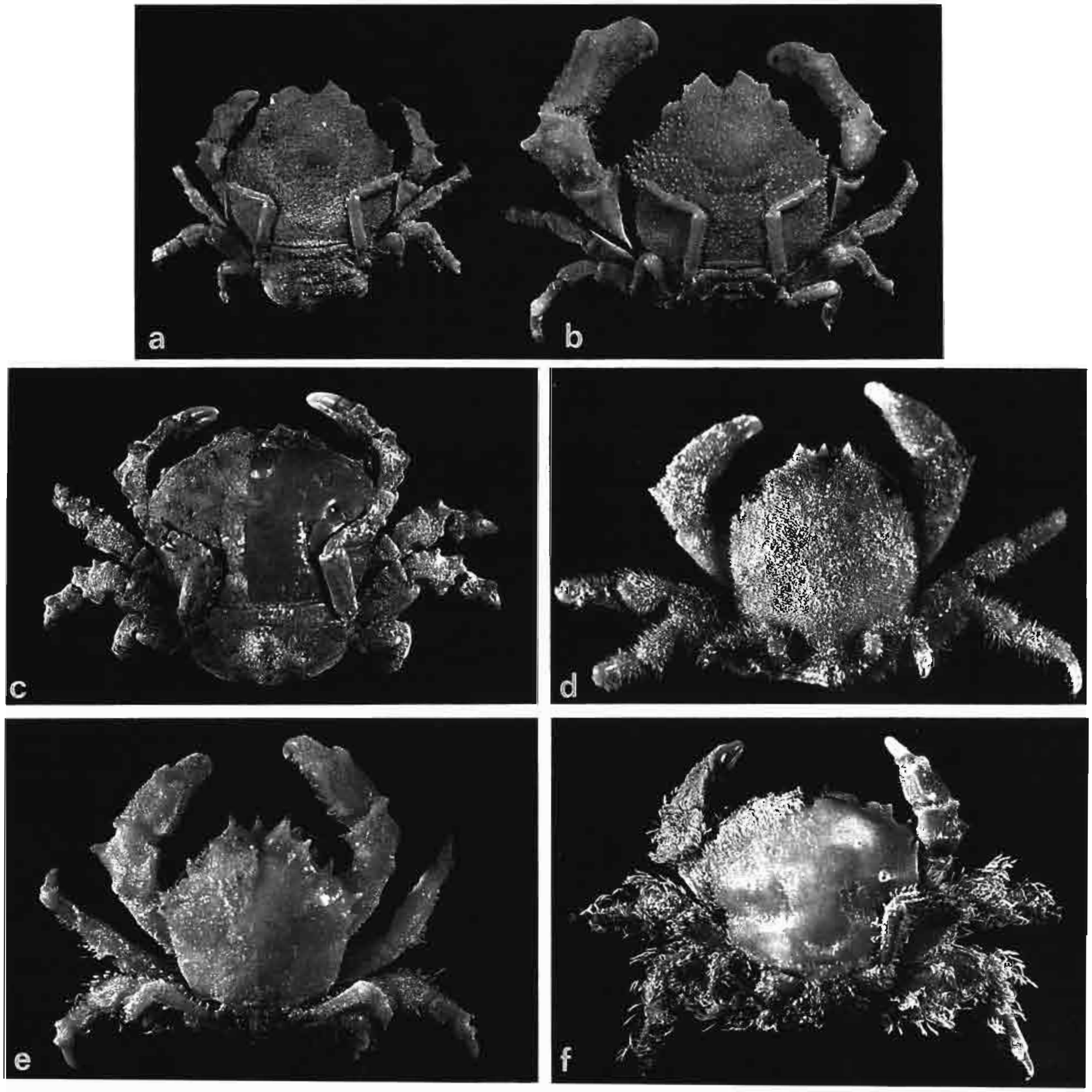

FIG. 17 a-b. — *Petalomera pulchra* Miers, 1884, Chesterfield Islands, CHALCAL 1, stn CP 12, 67 m, dorsal view of whole crab : **a**, ♀ 17.3 x 18.0 mm (MNHN-B 22555); **b**, ♂ 20.8 x 22.5 mm (MNHN-B 22556).

FIG. 17 c. — *Cryptodromia fukuii* (Sakai, 1936), nov. comb., ♀ 14.5 x 12.3 mm, New Caledonia (MNHN B-22094) : dorsal view of whole crab, setae removed from right half of carapace.

FIG. 17 d. — *Frodromia atypica* (Sakai, 1936) nov. comb., ♂ 8.2 x 9.7 mm, Loyalty Islands, MUSORSTOM 6, stn CP 464, 430 m (MNHN-B 22558) : dorsal view of whole crab.

FIG. 17 e. — *Cryptodromiopsis bullifera* (Alcock, 1900), nov. comb., ♂ 8.2 x 7.7 mm, Chesterfield Islands, CORAIL 2, stn DW 106, 62 m (MNHN-B 22561) : dorsal view of whole crab, setae removed from right half of carapace.

FIG. 17 f. — *Cryptodromiopsis plumosa* (Lewinsohn, 1984) nov. comb., ♂ 13.3 x 11.7 mm, Chesterfield Islands, CORAIL 2, stn DW 84, 16-26 m (MNHN-B 22562) : dorsal view of whole crab, setae removed from right half of carapace.

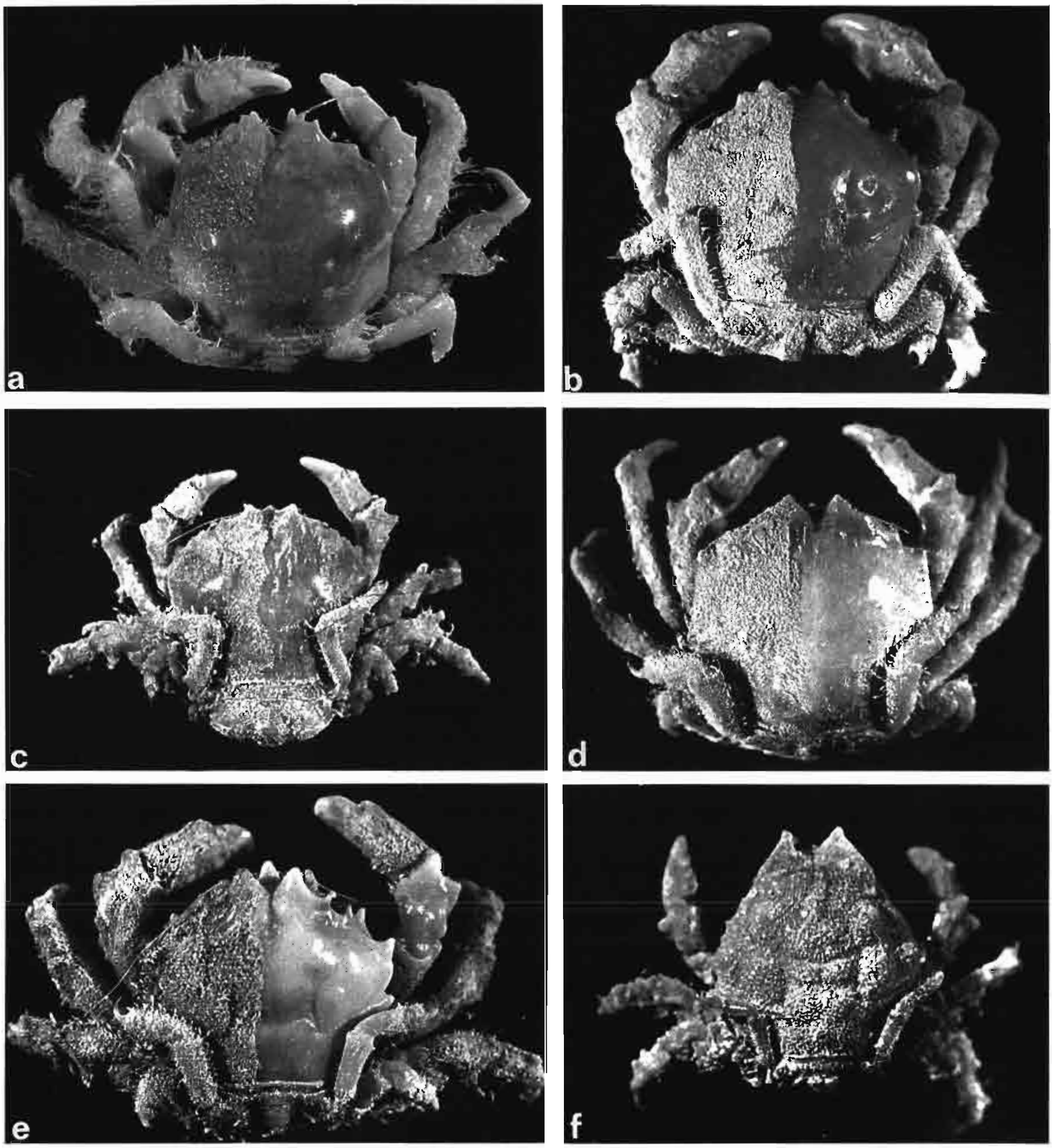

FIG. 18 a. — *Cryptodromiopsis unidentata* (Rüppell, 1830) nov. comb., 13.0 x 13.9 mm, New Caledonia, LAGON, stn 553, 35-40 m (MNHN-B 22563) : dorsal view of whole crab, setae removed from right half of carapace and limbs.

FIG. 18 b. — *Cryptodromia ? coronata* Stimpson, 1858, ♂ 11.5 x 10.7 mm, New Caledonia, LAGON, stn 405, 27 m (MNHN-B 22565) : dorsal view of whole crab, setae removed from right half of carapace.

FIG. 18 c. — *Cryptodromia amboinensis* De Man, 1888, ♀ (ovig.) 6.2 x 5.3 mm, New Caledonia, LAGON, stn 481, 33 m (MNHN-B 22566) : dorsal view of whole crab, setae removed from right half of carapace.

FIG. 18 d. — *Cryptodromia hilgendorfi* De Man, 1888, ♂ 9.2 x 8.9 mm, New Caledonia, LAGON, stn 48, 28 m (MNHN-B 22567) : dorsal view of whole crab, setae removed from right half of carapace.

FIG. 18 e. — *Cryptodromia fallax* (Lamarck, 1818), ♂ 10.2 x 9.0 mm, New Caledonia, Port Brise, intertidal (MNHN-B 22568) : dorsal view of whole crab, setae removed from right half of carapace, carpus of right cheliped, and last two pairs of legs.

FIG. 18 f. — *Epigodromia rotunda* sp. nov., ♀, holotype, 4.2 x 4.8 mm, New Caledonia, MUSORSTOM 4, stn 207, 220-235 m (MNHN-B 22576) : dorsal view of whole crab.

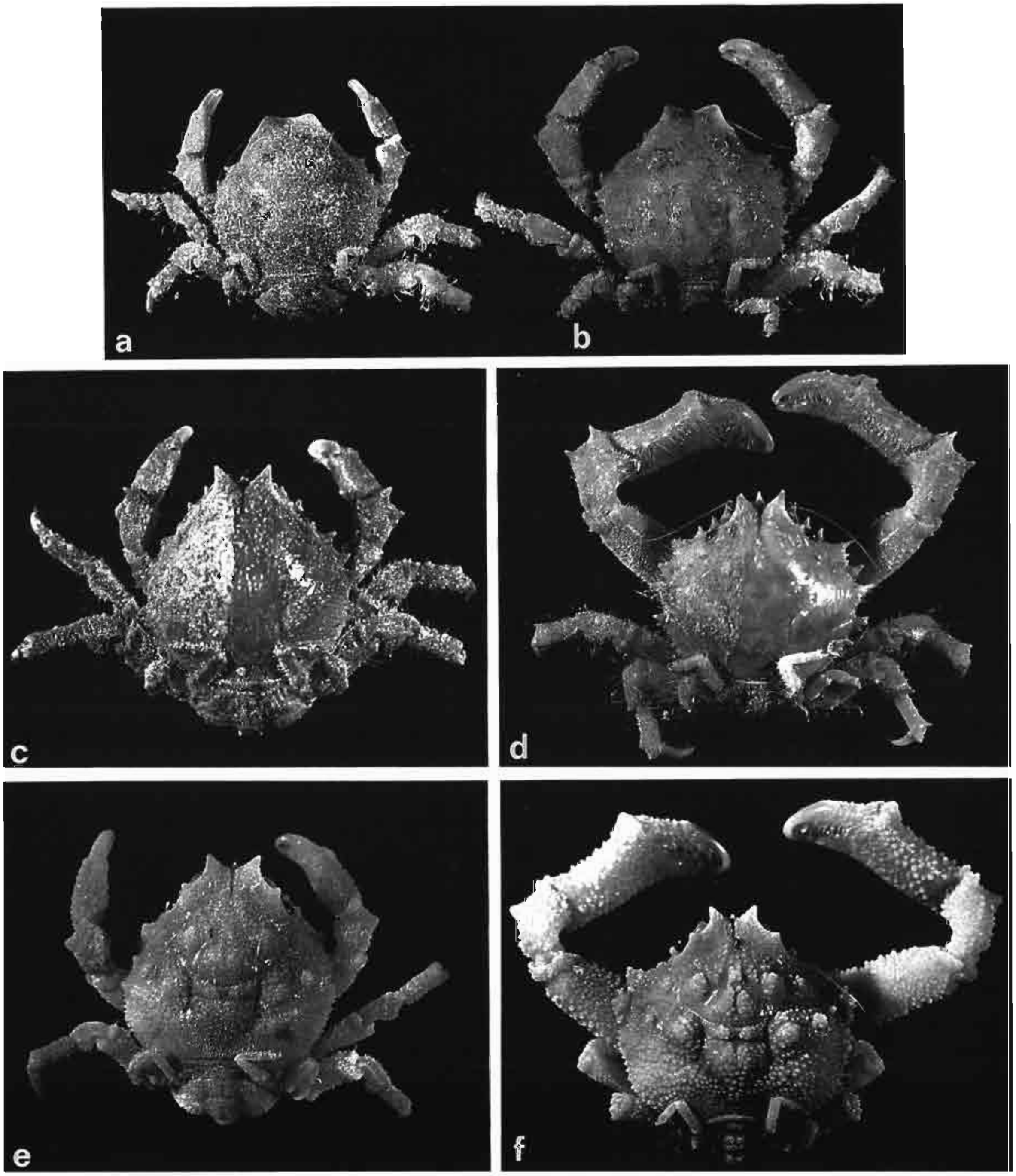

FIG. 19 a-b. — *Takedromia cristatipes* (Sakai, 1969) nov. comb., dorsal view of whole crab : **a**, ♀ 13.0 x 11.9 mm, New Caledonia, MUSORSTOM 4, stn CP 193, 430 m (MNHN-B 22570); **b**, ♂ 14.0 x 12.8 mm, d'Entrecasteaux Reefs, MUSORSTOM 4, stn 181, 355 m (MNHN-B 22571).

FIG. 19 c-d. — *Takedromia longispina* gen. nov., sp. nov., dorsal view of whole crab, setae removed from right half of carapace : **c**, ♀, paratype, 10.0 x 11.0 mm, Chesterfield Islands, CHALCAL 1, stn DC 31, 230 m (MNHN-B 22573); **d**, ♂, holotype, 13.2 x 11.2 mm, New Caledonia, MUSORSTOM 4, stn DW 183, 280 m. (MNHN-B 22572)

FIG. 19 e-f. — *Epigodromia areolata* (Ihle, 1913) nov. comb., dorsal view of whole crab : **e**, ♀ 7.2 x 7.1 mm, New Caledonia, LAGON, stn 387, 225 m (MNHN-B 22574); **f**, ♂ 14.4 x 12.3 mm, Chesterfield, MUSORSTOM 5, stn 290, 300 m (MNHN-B 22575).

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Family and genus names are given in capital letters, species names in italics. Bold species names indicate that the species are treated in detail.

Bold numbers indicate the pages where the subject is treated in detail.

6

Crustacea Decapoda : Les Cyclodorippidae et Cymonomidae de l'Indo-Ouest-Pacifique à l'exclusion du genre *Cymonomus*

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RÉSUMÉ

Cette étude fait partie d'une série (TAVARES, 1991a, 1991b, 1992a, 1992b, 1992c) consacrée à la révision mondiale des Cyclodorippidae Ortmann, 1892, et des Cymonomidae Bouvier, 1897. Le présent article est consacré à l'étude systématique des Cyclodorippidae indo-ouest-pacifiques, à laquelle nous avons ajouté la diagnose d'un nouveau Cymonomidae, *Elassopodus stellatus* gen. nov., sp. nov. Il s'agit d'une approche systématique préliminaire à une recherche plus complète sur la morphologie des Cyclodorippoidea et à des considérations sur les affinités phylogénétiques entre les genres de la superfamille.

La révision présentée ici a bénéficié d'une très belle collection provenant de l'Indo-Ouest-Pacifique (Madagascar, Japon, Viêtnam, Philippines, Indonésie, Australie, îles Chesterfield, Nouvelle-Calédonie, îles Loyauté, îles Wallis et Futuna). La plupart des échantillons examinés ont été récoltés lors d'expéditions françaises récentes (MUSORSTOM 1-7, BIOCAL, CHALCAL 2, CORAIL 2, LAGON, SMIB 6) ainsi que lors d'une expédition franco-indonésienne, KARUBAR. Le matériel rapporté a mis en évidence l'existence d'une faune cyclodorippoïdienne assez riche. Nous y avons ajouté quelques récoltes faites par les expéditions de la "*Siboga*", en 1899, auparavant étudiée par IHLE (1916a), et de l' "*Albatross*", en 1908, du matériel rassemblé par les navires russes "*Orlik*", en 1960, au Viêtnam, et "*Vytiatz*" sur la côte ouest d'Australie, deux récoltes faites par Raoul SERÈNE en Indonésie, au cours des expéditions RUMPHIUS I, en 1973, et RUMPHIUS IV, en 1975, ainsi que des récoltes faites par le navire australien "*Soela*", en 1984, sur la côte nord d'Australie, et d'autres faites lors de la campagne CIDARIS I organisée par la James Cook University, en 1986, au large de la Grande Barrière de Corail.

TAVARES, M., 1993. — Crustacea Decapoda : Les Cyclodorippidae et Cymonomidae de l'Indo-Ouest-Pacifique à l'exclusion du genre *Cymonomus*. *In* : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, Volume 10. *Mém. Mus. natn. Hist. nat.*, **156** : 253-313. Paris ISBN 2-85653-206-3.

Pour compléter nos observations, nous avons également obtenu en prêt du matériel déposé dans diverses institutions : The Natural History Museum (British Museum), Londres ; Museum of Comparative Zoology, Massachusetts ; Musée Zoologique de l'Université de Moscou ; National Science Museum, Tokyo ; Northern Territory Museum of Arts and Science, Darwin ; Queensland Museum, Brisbane ; South African Museum, Cape Town ; National Museum of Natural History, Smithsonian Institution, Washington ; Zoölogisch Museum, Amsterdam.

Préalablement à l'étude systématique des taxons nouveaux, nous avons recherché les types de toutes les espèces décrites auparavant, afin de pouvoir établir une correspondance exacte entre ces derniers et les noms mentionnés dans la littérature. C'est ainsi que nous avons précisé les diagnoses de toutes les espèces. D'autre part, nous nous sommes efforcé de réexaminer les spécimens pour lesquels une description a été publiée.

A l'exception de *Tymolus truncatus* (Ihle, 1916), dont le matériel-type est, semble-t-il, égaré, et du type de *Genkaia gordonae* Miyake & Takeda, 1970, les types de toutes les espèces décrites à ce jour ont été examinés et de nombreux spécimens mentionnés dans la littérature ont été revus.

Jusqu'à présent, les Cyclodorippidae et les Cymonomidae étaient représentés, dans l'Indo-Ouest-Pacifique, par sept genres (*Tymolus*, *Corycodus*, *Xeinostoma*, *Genkaia*, *Krangalangia*, *Ketamia*, et *Cymonomus*) et 23 espèces.

Douze de ces espèces appartiennent aux Cyclodorippidae : *Tymolus japonicus* Stimpson, 1858, *T. uncifer* (Ortmann, 1892), *T. dromioides* (Ortmann, 1892), *T. similis* (Grant, 1905), *T. truncatus* (Ihle, 1916), *T. brucei* Tavares, 1991, *Corycodus disjunctipes* (Stebbing, 1910), *Xeinostoma eucheir* Stebbing, 1920, *Krangalangia rostrata* (Ihle, 1916), *K. spinosa* (Zarenkov, 1970), *Ketamia depressa* (Ihle, 1916), *Genkaia gordonae* Miyake & Takeda, 1970.

Onze de ces espèces appartiennent aux Cymonomidae : *Cymonomus valdiviae* Lankaster, 1903, *C. andamanicus* Alcock, 1905, *C. indicus* Ihle, 1916, *C. trifurcus* Stebbing, 1920, *C. japonicus* Balss, 1922, *C. curvirostris* Sakai, 1965, *C. aequilonius* Dell, 1971, *C. bathamae* Dell, 1971, *C. delli* Griffin & Brown, 1976, *C. umitake* Takeda, 1981, *C. hakuhoae* Takeda & Moosa, 1990.

Notre étude nous a amené à :

— décrire comme nouveaux, parmi les Cyclodorippidae, un genre (*Phyllotymolinum*) et 11 espèces (*Corycodus merweae*, *C. decorus*, *Xeinostoma richeri*, *X. sakaii*, *Krangalangia orstom*, *Ketamia handokoi*, *K. limatula*, *K. proxima*, *Genkaia keijii*, *Phyllotymolinum crosnieri*) et, parmi les Cymonomidae, un genre (*Elassopodus*) et une espèce (*Elassopodus stellatus*).

— rétablir deux espèces : *Corycodus bouvieri* Ihle, 1916, retirée de la synonymie de *C. disjunctipes* (Stebbing, 1910) et *Krangalangia spinosa* (Zarenkov, 1970), retiré de la synonymie de *K. rostrata* (Ihle, 1916).

— désigner des lectotypes pour quatre espèces : *Corycodus disjunctipes*, *Xeinostoma eucheir*, *Krangalangia rostrata* et *Ketamia depressa*.

Ainsi, l'ensemble des Cyclodorippoidea de l'Indo-Ouest-Pacifique se trouve maintenant représenté par 9 genres (7 Cyclodorippidae et 2 Cymonomidae) et par 34 espèces (22 de Cyclodorippidae et 12 de Cymonomidae), tous étudiés ici, sauf le genre *Cymonomus* dont la révision en cours sera publiée ultérieurement.

Des clefs pour distinguer les familles, les genres et les espèces sont proposées et des illustrations sont fournies pour chaque espèce.

ABSTRACT

This is part of a series of papers (TAVARES, 1991a, 1991b, 1992a, 1992b, 1992c) reviewing the Cyclodorippidae Ortmann, 1892, and Cymonomidae Bouvier, 1897, of the world. It contains a review of all the Cyclodorippidae from the Indo-West Pacific as well as one genus of Cymonomidae. This is a systematic approach preceding a more detailed study of the Cyclodorippoidea morphology and of the phylogenetic relationships within the superfamily.

The present work was based upon large collections from the Indo-West Pacific (Madagascar, Japan, Vietnam, Philippines, Indonesia, Australia, Chesterfield Islands, New Caledonia, Loyalty Islands, and Wallis and Futuna Islands) carried out by the following French expeditions : MUSORSTOM 1-7, BIOCAL, CHALCAL 2, CORAIL 2, KARUBAR, LAGON, and SMIB 6. Also included is the material collected by the "*Siboga*" Expedition, 1899,

"*Albatross*", 1908, the material collected by the Russian oceanographic ships "*Orlik*" in 1960 on the coast of Vietnam and "*Vytiatz*" on the west coast of Australia, two samples made by Raoul SERÈNE in Indonesia in during the RUMPHIUS I expedition in 1973 and RUMPHIUS IV in 1975, as well as collections made by the Australian ship "*Soela*" in 1984 on the north coast of Australia, and others made during the expedition CIDARIS I under the auspices of the James Cook University on the Great Barrier Reef.

Additional material from the collections of The Natural History Museum (British Museum), London ; Museum of Comparative Zoology, Massachusetts ; Zoological Museum of Moscow University ; National Science Museum, Tokyo ; Northern Territory Museum of Arts and Science, Darwin ; Queensland Museum, Brisbane ; South African Museum, Cape Town ; National Museum of Natural History, Smithsonian Institution, Washington and Zoölogisch Museum, Amsterdam was also examined.

Because of insufficient original descriptions, the re-examination of all type specimens [except for *Tymolus truncatus* (Ihle, 1916) which is apparently lost and *Genkaia gordonae* Miyake and Takeda, 1970] and most of the specimens cited in the literature, was required to properly establish the correspondence between species and the names introduced in the literature.

Until now, seven genera (*Tymolus*, *Corycodus*, *Xeinostoma*, *Genkaia*, *Krangalangia*, *Ketamia*, and *Cymonomus*) and 23 species of Cyclodorippidae and Cymonomidae were known from the Indo-west Pacific. They are as follows : Cyclodorippidae : *Tymolus japonicus* Stimpson, 1858, *T. uncifer* (Ortmann, 1892), *T. dromioides* (Ortmann, 1892), *T. similis* (Grant, 1905), *T. truncatus* (Ihle, 1916), *T. brucei* Tavares, 1991, *Corycodus disjunctipes* (Stebbing, 1910), *Xeinostoma eucheir* Stebbing, 1920, *Krangalangia rostrata* (Ihle, 1916), *K. spinosa* (Zarenkov, 1970), *Ketamia depressa* (Ihle, 1916), *Genkaia gordonae* Miyake and Takeda, 1970. Cymonomidae : *Cymonomus valdiviae* Lankaster, 1903, *C. andamanicus* Alcock, 1905, *C. indicus* Ihle, 1916, *C. trifurcus* Stebbing, 1920, *C. japonicus* Balss, 1922, *C. curvirostris* Sakai, 1965, *C. aequilonius* Dell, 1971, *C. bathamae* Dell, 1971, *C. delli* Griffin and Brown, 1976, *C. umitake* Takeda, 1981, *C. hakuhoae* Takeda and Moosa, 1990.

From this study :

— Two new genera (*Phyllotymolinum* and *Elassopodus*) and 11 new species of Cyclodorippoidea are herein described : Cyclodorippidae : *Corycodus merweae*, *C. decorus*, *Xeinostoma richeri*, *X. sakaii*, *Krangalangia orstom*, *Ketamia handokoi*, *K. limatula*, *K. proxima*, *Genkaia keijii*, *Phyllotymolinum crosnieri*. Cymonomidae : *Elassopodus stellatus*.

— Two species are resurrected : *Corycodus bouvieri* Ihle, 1916, from the synonymy of *C. disjunctipes* (Stebbing, 1910) and *Krangalangia spinosa* (Zarenkov, 1970) from the synonymy of *K. rostrata* (Ihle, 1916).

— Four lectotypes are designated here for the following species : *Corycodus disjunctipes*, *Xeinostoma eucheir*, *Krangalangia rostrata*, and *Ketamia depressa*.

Presently, a total of 9 genera (7 Cyclodorippidae and 2 Cymonomidae) and 34 species (22 Cyclodorippidae and 12 Cymonomidae) are known from the Indo-West Pacific. All these species are studied here except those belonging to the genus *Cymonomus* which will be treated in a future publication. Keys for families, genera and species are provided as well as illustrations for all species.

SOMMAIRE

INTRODUCTION

L'ensemble des formes actuelles de Cyclodorippidae et de Cymonomidae est connu à ce jour par 13 genres et 63 espèces, distribués dans les principaux bassins océaniques mondiaux, à une profondeur moyenne de 700 m.

Dans l'océan Indo-Ouest-Pacifique, les Cyclodorippidae se trouvent représentés par 7 genres et 22 espèces. Les Cymonomidae, moins nombreux, comptent à l'heure actuelle 2 genres et 12 espèces. Le présent travail fait partie d'une série (TAVARES, 1991a, 1991b, 1992a, 1992b, 1992c) consacrée à la révision mondiale des Cyclodorippidae et des Cymonomidae. Il concerne les Cyclodorippidae indo-ouest-pacifiques dans leur totalité ainsi qu'un genre de Cymonomidae, et représente une approche systématique préliminaire à une étude plus complète sur la morphologie des Cyclodorippoidea et des considérations sur les affinités phylogénétiques entre les genres actuels de la superfamille.

RÉSUMÉ DES CONNAISSANCES ANTÉRIEURES DANS L'INDO-OUEST PACIFIQUE

Nous rappelons ici, brièvement, l'historique de la nomenclature des Cyclodorippidae et des Cymonomidae. Pour plus de détails, voir TAVARES (1991a). Lorsque STIMPSON (1858 : 61) découvre le premier *Tymolus* et en fait la description, il l'inclut dans la famille des Dorippidae. Par la suite, un petit nombre de genres, très proches les uns des autres, ont été décrits dans les Dorippidae et, par conséquent, dans la section des Oxystomata, groupement qui, alors, recevait les Dorippidae, les Calappidae et les Leucosiidae. ORTMANN (1892 : 552) fait un premier pas vers une classification plus naturelle du groupe : considérant que la section Oxystomata renferme trois subdivisions : Calappinea, Leucosiinea et Dorippinea, il départage cette dernière en deux familles : Dorippidae McLeay, 1838, et Cyclodorippidae, créée par lui dans le même travail pour y accueillir le genre *Cyclodorippe*. Néanmoins, pour ALCOCK (1896 : 274), le genre *Cyclodorippe* "may belong to STIMPSON'S genus *Tymolus*" : c'est pourquoi ALCOCK propose l'appellation de Tymolinae (= Cyclodorippidae Ortmann), dénomination qui sera utilisée par la plupart des auteurs. BOUVIER (1897) fut le premier à s'apercevoir de l'existence, parmi les Dorippidae, de formes péditrèmes et sternitrèmes. Cette distinction allait s'avérer importante car elle apportait des justifications à la classification proposée par ORTMANN. BOUVIER (1897 : 4) place les sternitrèmes dans la sous-famille des Dorippinae, tandis qu'il range les formes péditrèmes parmi les Cyclodorippinae (= Tymolinae Alcock). BOUVIER reprend donc le nom créé par ORTMANN en ne lui donnant, cependant, qu'un statut de sous-famille. Dans le même ouvrage, BOUVIER divise les Cyclodorippinae en deux tribus : Cymonomae et Cyclodorippae. Malgré toutes ces réformes, *Tymolus* et les genres affines restaient dans la section des Oxystomata. GORDON (1963 : 57) a montré que les Tymolidés avaient leur "place in the classification with or near Dromiacea" et qu'ils pouvaient être considérés au rang de famille, soit Tymolidae. Ainsi GORDON ressuscite les Tymolinae d'ALCOCK. Plusieurs auteurs ont suivi GORDON en utilisant le nom de Tymolidae et en incluant ceux-ci parmi les Dromiacea. GUINOT (1977) démembre les Oxystomata et abandonne cette appellation. Elle en sépare les formes péditrèmes comme constituants de sa section des Podotremata. En outre, pour GUINOT (1978 : 232), les "tymolidés ainsi que tous les Podotremata actuels autres que les Dromiacea, doivent être placés dans la sous-section nouvelle des Archaeobrachyura Guinot, 1977". GUINOT (1978 : 214) a élévé les Tymolidés au rang de superfamille. Plus récemment, TAVARES (1991a) a relevé les caractères distinctifs entre les genres *Tymolus* et *Cyclodorippe* et montré que l'appellation Cyclodorippidae doit être préférée à celle de Tymolidae.

Les Cyclodorippidae actuels sont réprésentés par 34 espèces, distribuées dans neuf genres (*Tymolus* Stimpson, 1858 ; *Corycodus* A. Milne Edwards, 1880 ; *Cyclodorippe* A. Milne Edwards, 1880 ; *Clythrocerus* A. Milne Edwards & Bouvier, 1899 ; *Xeinostoma* Stebbing, 1920 ; *Simodorippe* Chace, 1940 ; *Genkaia* Miyake & Takeda, 1970 ; *Krangalangia* Tavares, 1992 ; *Ketamia* Tavares, 1992). Les Cymonomidae, un peu moins nombreux, renferment 22 espèces, incluses dans les seuls genres *Cymonomus* A. Milne Edwards, 1880, et *Cymopolus* A. Milne Edwards, 1880.

Huit genres de Cyclodorippidae et un genre de Cymonomidae avaient été recensés dans l'océan Indo-Ouest-Pacifique, à savoir :

1) *Tymolus*, récemment révisé par TAVARES (1991b; 1992c). Ce genre compte actuellement six espèces dans l'Indo-Ouest-Pacifique (côte est de l'Afrique, Japon, mer de Chine méridionale, Indonésie et Australie) : *T. japonicus* Stimpson, 1858 ; *T. uncifer* (Ortmann, 1892) ; *T. dromioides* (Ortmann, 1892) ; *T. truncatus* (Ihle, 1916) ; *T. similis* (Grant, 1905) ; *T. brucei* Tavares (1991).

2) *Corycodus*, connu dans l'océan Indien par une seule espèce, *C. disjunctipes* (Stebbing, 1910). *Corycodus bouvieri*, décrit par IHLE (1916a) d'après une femelle récoltée par la "*Siboga*" dans la mer de Sulu ("*Siboga*", st. 95, 5°43,5'N - 119°40'E), fut peu après considéré par IHLE lui-même (1916b) comme synonyme de *C. disjunctipes* (Stebbing).

3) *Xeinostoma* Stebbing, 1920, monospécifique, avec *X. eucheir* Stebbing, 1920, signalée dans l'océan Indien (BARNARD, 1950 ; KENSLEY, 1981b) et au Japon (SAKAI, 1976).

4) *Cyclodorippe*, créé par A. MILNE EDWARDS (1880) pour deux espèces américaines, a été ensuite divisé par IHLE (1916b) en deux sous-genres : *Cyclodorippe* (*Cyclodorippe*) A. Milne Edwards, 1880, et *Cyclodorippe* (*Cyclortmannia*) Ihle, 1916. IHLE (1916) n'ayant pas désigné d'espèce-type pour le sous-genre *Cyclortmannia*, TAVARES (1991) a sélectionné *Cyclodorippe uncifera* Ortmann, 1892, comme l'espèce-type de ce sous-genre.

Pour IHLE (1916b), le genre *Cyclodorippe* comprenait huit espèces, deux d'origine américaine : *C.* (*Cyclodorippe*) *antennaria* A. Milne Edwards, 1880, et *C.* (*Cyclodorippe*) *agassizi* A. Milne Edwards, 1880, et six espèces indo-ouest-pacifiques : *C.* (*Cyclortmannia*) *uncifera* Ortmann, 1892 ; *C.* (*Cyclortmannia*) *similis* (Grant, 1905) ; *C.* (*Cyclodorippe*) *rostrata* Ihle, 1916 ; *C.* (*Cyclodorippe*) *depressa* Ihle, 1916 ; *C.* (*Cyclortmannia*) *truncata* Ihle, 1916.

Par la suite, ZARENKOV (1970) a décrit *Cyclodorippe spinosa*, regardé comme un synonyme de *Cyclodorippe rostrata* Ihle, 1916, par TAKEDA et MOOSA (1990).

5) *Cymonomus*, jusqu'à présent représenté dans la région par 11 espèces.

6) *Genkaia*, monotypique, avec *Genkaia gordonae* Miyake & Takeda, 1970, connue seulement du Japon (MIYAKE & TAKEDA, 1970 ; TAKEDA, 1973a ; SAKAI, 1976 ; TAKEDA, 1985), jusqu'à présent placé dans la famille des Dromiidae.

7) Dans un travail tout récent, TAVARES (1992a) a établi les genres : *Krangalagia* pour *Cyclodorippe (Cyclodorippe) rostrata* Ihle, 1916, et *Cyclodorippe spinosa* Zarenkov, 1970, et *Ketamia* pour *Cyclodorippe (Cyclodorippe) depressa* Ihle, 1916.

Il a également créé deux sous-familles à l'intérieur des Cyclodorippidae : 1) Cyclodorippinae Ortmann, 1892 : pour *Tymolus* Stimpson, 1858 ; *Cyclodorippe* A. Milne Edwards, 1880 ; *Corycodus* A. Milne Edwards, 1880 ; *Clythrocerus* A. Milne Edwards & Bouvier, 1899 ; *Simodorippe* Chace, 1940 ; 2) Xeinostominae Tavares, 1992 : pour *Xeinostoma* Stebbing, 1920 ; *Krangalangia* Tavares, 1992 ; *Ketamia* Tavares, 1992.

Au total, les Cyclodorippoidea n'étaient connus dans l'océan Indo-Ouest-Pacifique que par 23 espèces actuelles, distribuées dans les sept genres suivants : *Tymolus*, *Corycodus*, *Xeinostoma*, *Genkaia*, *Krangalangia*, *Ketamia* et *Cymonomus*.

Compte tenu des remaniements taxonomiques récents introduits par TAVARES, la liste des espèces connues avant le présent travail est la suivante :

CYCLODORIPPIDAE

Tymolus japonicus Stimpson, 1858
Tymolus uncifer (Ortmann, 1892)
Tymolus dromioides (Ortmann, 1892)
Tymolus similis (Grant, 1905)
Tymolus truncatus (Ihle, 1916)
Tymolus brucei Tavares, 1991
Corycodus disjunctipes (Stebbing, 1910)
Xeinostoma eucheir Stebbing, 1920
Krangalangia rostrata (Ihle, 1916)
Krangalangia spinosa (Zarenkov, 1970)
Ketamia depressa (Ihle, 1916)
Genkaia gordonae Miyake & Takeda, 1970

CYMONOMIDAE

Cymonomus valdiviae Lankaster, 1903
Cymonomus andamanicus Alcock, 1905
Cymonomus indicus Ihle, 1916
Cymonomus trifurcus Stebbing, 1920
Cymonomus japonicus Balss, 1922
Cymonomus curvirostris Sakai, 1965
Cymonomus aequilonius Dell, 1971
Cymonomus bathamae Dell, 1971
Cymonomus delli Griffin & Brown, 1976
Cymonomus umitake Takeda, 1981
Cymonomus hakuhoae Takeda & Moosa, 1990

DONNÉES NOUVELLES

Grâce à la richesse du matériel étudié ici, nous avons pu réviser toutes les espèces indo-ouest-pacifiques connues de Cyclodorippidae et de Cymonomidae (sauf celles du genre *Cymonomus*, qui feront l'objet d'une étude particulière, et quatre espèces de *Tymolus* qui ont fait l'objet d'une publication précédente, TAVARES, 1991b), et établir plusieurs taxons nouveaux. Ce travail nous a donné la possibilité de préciser les caractères qui séparent ces deux familles, de proposer des clefs d'identification des familles, des genres et des espèces, de donner des diagnoses et des illustrations pour tous les genres et toutes les espèces et, enfin, de préciser l'aire de distribution géographique de plusieurs espèces.

Les principales contributions que nous apportons à la connaissance des Cyclodorippoidea dans l'Indo-Ouest-Pacifique sont résumées ci-après :

1) Le genre *Tymolus* ayant été revu par TAVARES (1991b ; 1992c), seules deux espèces sont reprises ici : *T. truncatus* (Ihle, 1916), dont le matériel-type est, semble-t-il, égaré, et *T. brucei* Tavares, 1991, qui connu uniquement de sa localité-type, sur la côte ouest d'Australie, est ici recensé pour la première fois au Viêtnam, aux Philippines et en Indonésie.

2) Le genre *Corycodus* est entièrement revu. *Corycodus disjunctipes* (Stebbing) est restreint à l'est de l'Afrique. *C. bouvieri* Ihle, 1916, des îles Sulu (5°43,5'N - 119°40'E), habituellement considéré comme synonyme de *C. disjunctipes*, est rétabli. *Corycodus merweae* sp. nov. et *Corycodus decorus* sp. nov., tous deux d'Afrique du Sud sont décrits et leur différences morphologiques par rapport aux trois autres espèces du genre (les deux mentionnées ci-dessus, plus *C. bullatus* A. Milne Edwards, 1880, des Caraïbes) sont relevées ; un lectotype est désigné pour *C. disjunctipes*.

3) Nous adjoignons deux espèces nouvelles au genre *Xeinostoma* : l'une provenant des Philippines, *X. sakaii*, et l'autre de Nouvelle-Calédonie, *X. richeri*. *Xeinostoma eucheir*, pour laquelle un lectotype a été choisi, connu uniquement d'Afrique du Sud, voit sa distribution étendue à Madagascar.

4) *C.* (*Cyclodorippe*) *rostrata* Ihle, 1916, et *C. spinosa* Zarenkov, 1970, appartiennent au genre *Krangalangia* Tavares, 1992. L'examen des syntypes nous a montré que ces deux espèces sont bien distinctes et ne peuvent être mises en synonymie comme l'ont proposé TAKEDA et MOOSA (1990). Une nouvelle espèce, *K. orstom*, décrite ici, constitue un troisième réprésentant pour le genre *Krangalangia*. Un lectotype est choisi pour *C.* (*Cyclodorippe*) *rostrata*.

5) Pour *Cyclodorippe* (*Cyclodorippe*) *depressa* Ihle, 1916, nous avons précédemment créé le genre *Ketamia* (TAVARES, 1992a) : un lectotype est désigné ici pour *K. depressa* (Ihle). Le genre *Ketamia* reçoit en outre trois espèces nouvelles : *K. handokoi*, *K. proxima*, *K. limatula*.

6) Le genre *Genkaia* Miyake & Takeda, 1970, est transféré ici dans la famille des Cyclodorippidae. *Genkaia*, auparavant monotypique, est enrichi d'une nouvelle espèce, *G. keijii*, en provenance de Nouvelle-Calédonie.

7) Un genre nouveau de Cyclodorippidae, *Phyllotymolinum*, est établi pour une espèce nouvelle de Nouvelle-Calédonie, *P. crosnieri*.

8) Un genre nouveau de Cymonomidae, *Elassopodus*, voisin de *Cymopolus* A. Milne Edwards, 1880 (genre américain), est établi pour une espèce nouvelle de Nouvelle-Calédonie, *E. stellatus*.

Les collections MUSORSTOM 2 et 5, BIOCAL, CORAIL 2, et KARUBAR incluent quelques échantillons appartenant au genre *Cymonomus*, dont l'étude en cours sera publiée ultérieurement.

En résumé, deux genres nouveaux et onze espèces nouvelles de Cyclodorippoidea s'ajoutent aux sept genres et 23 espèces connus auparavant dans l'Indo-Ouest-Pacifique. Quatre lectotypes ont été désignés pour les espèces suivantes : *Corycodus disjunctipes*, *Xeinostoma eucheir*, *Krangalangia rostrata* et *Ketamia depressa*.

Liste des espèces de CYCLODORIPPIDAE et CYMONOMIDAE indo-ouest-pacifiques

(les espèces étudiées dans le présent travail sont en caractères gras)

CYCLODORIPPIDAE

Tymolus japonicus Stimpson, 1858
Tymolus uncifer (Ortmann, 1892)
Tymolus dromioides (Ortmann, 1892)
Tymolus similis (Grant, 1905)
Tymolus truncatus (Ihle, 1916)
Tymolus brucei Tavares, 1991
Corycodus disjunctipes (Stebbing, 1910)
Corycodus bouvieri Ihle, 1916
Corycodus merweae sp. nov.
Corycodus decorus sp. nov.
Genkaia gordonae Miyake et Takeda, 1970
Genkaia keijii *sp. nov.*
Phyllotymolinum crosnieri sp. nov.
Xeinostoma eucheir Stebbing, 1920
Xeinostoma richeri sp. nov.
Xeinostoma sakaii sp. nov.
Krangalangia rostrata (Ihle, 1916)

Krangalangia orstom sp. nov.
Ketamia depressa (Ihle, 1916)
Ketamia handokoi sp. nov.
Ketamia limatula sp. nov.
Ketamia proxima *sp. nov.*
Krangalangia spinosa (Zarenkov, 1970)

CYMONOMIDAE
Cymonomus valdiviae Lankaster, 1903
Cymonomus andamanicus Alcock, 1905
Cymonomus indicus Ihle, 1916
Cymonomus trifurcus Stebbing, 1920
Cymonomus japonicus Balss, 1922
Cymonomus curvirostris Sakai, 1965
Cymonomus aequilonius Dell, 1971
Cymonomus bathamae Dell, 1971
Cymonomus delli Griffin et Brown, 1976
Cymonomus umitake Takeda, 1981
Cymonomus hakuhoae Takeda et Moosa, 1990
Elassopodus stellatus sp. nov.

ORIGINE DES COLLECTIONS ET MÉTHODES DE TRAVAIL

Les collections étudiées ici proviennent de :
— *Madagascar* : récoltes par A. CROSNIER en 1973 (CROSNIER & JOUANNIC, 1973) ;
— *Philippines* : MUSORSTOM 1, en 1976, MUSORSTOM 2, en 1980, et MUSORSTOM 3, en 1985 (FOREST, 1981, 1986, 1989) ;
— *Indonésie* : KARUBAR, en 1991 ;
— *îles Chesterfield* : MUSORSTOM 5, en 1986 (RICHER DE FORGES, LABOUTE & MENOU, 1986) ; CORAIL 2, en 1988 ((RICHER de FORGES *et al.*, 1988) ;
— *Nouvelle-Calédonie* : LAGON, de 1984 à 1989 ((RICHER DE FORGES, 1991) ; BIOCAL, en 1985 (LEVI, 1985) ; MUSORSTOM 4, en 1985 (RICHER DE FORGES, 1986) ; CHALCAL 2, en 1986 (RICHER DE FORGES, GRANDPERRIN & LABOUTE, 1987) ; SMIB 6, en 1990 ;
— *îles Loyauté* : MUSORSTOM 6, en 1989 (RICHER DE FORGES & LABOUTE, 1989).

Nous y avons ajouté quelques récoltes faites par les expéditions de la "*Siboga*", en 1899, auparavant étudiées par IHLE (1916a), et de l'"*Albatross*", en 1908, du matériel rassemblé par les navires russes "*Orlik*", en 1960, au Viêtnam, et "*Vytiatz*" sur la côte ouest d'Australie, deux récoltes faites par Raoul SERÈNE en Indonésie, au cours des expéditions RUMPHIUS I, en 1973 (SERÈNE, ROMIMOHTARTO & MOOSA, 1974), et RUMPHIUS IV, en 1975, ainsi que des récoltes faites par le navire australien "*Soela*", en 1984, sur la côte nord d'Australie, et d'autres faites lors de la campagne CIDARIS I organisée par la James Cook University, en 1986, au large de la Grande Barrière de Corail.

Au cours de notre étude, nous avons, par ailleurs, fait appel aux collections de divers musées, dont les abréviations, utilisées dans les listes de matériel examiné, sont :

BM = The Natural History Museum (British Museum), London.
MCZ = Museum of Comparative Zoology, Massachusetts.
MNHN = Muséum national d'Histoire naturelle, Paris.
MZUM = Musée zoologique de l'Université de Moscou.
NSMT = National Science Museum, Tokyo.
NTM = Northern Territory Museum of Arts and Science, Darwin.
QM = Queensland Museum, Brisbane.
SAM = South African Museum, Cape Town.
USNM = National Museum of Natural History, Smithsonian Institution, Washington.
ZMA = Zoölogisch Museum, Amsterdam.

Les abréviations employées dans les listes de stations et de matériel examiné sont : St. = station, CC et CH = chalut à crevettes à panneaux, CP = chalut à perche, DC = drague Charcot, DE = drague épibenthique, DR = drague à roche, DW = drague Waren.

A l'exception de doubles déposés au National Museum of Natural History à Washington et de spécimens, récoltés en Indonésie, envoyés au Pusat Penelitian dan Pengembangam Oseanologi, Jakarta, notre matériel est déposé au Muséum national d'Histoire naturelle, à Paris.

La terminologie utilisée pour désigner les différentes structures de la carapace est indiquée sur la représentation schématique (d'après TAVARES, 1991b) d'un cyclodorippidé (fig. 1). Sauf indication contraire, les mesures données pour les spécimens correspondent respectivement à la longueur (rostre inclus) et à la largeur maximales de la carapace, exprimées en millimètres (mm).

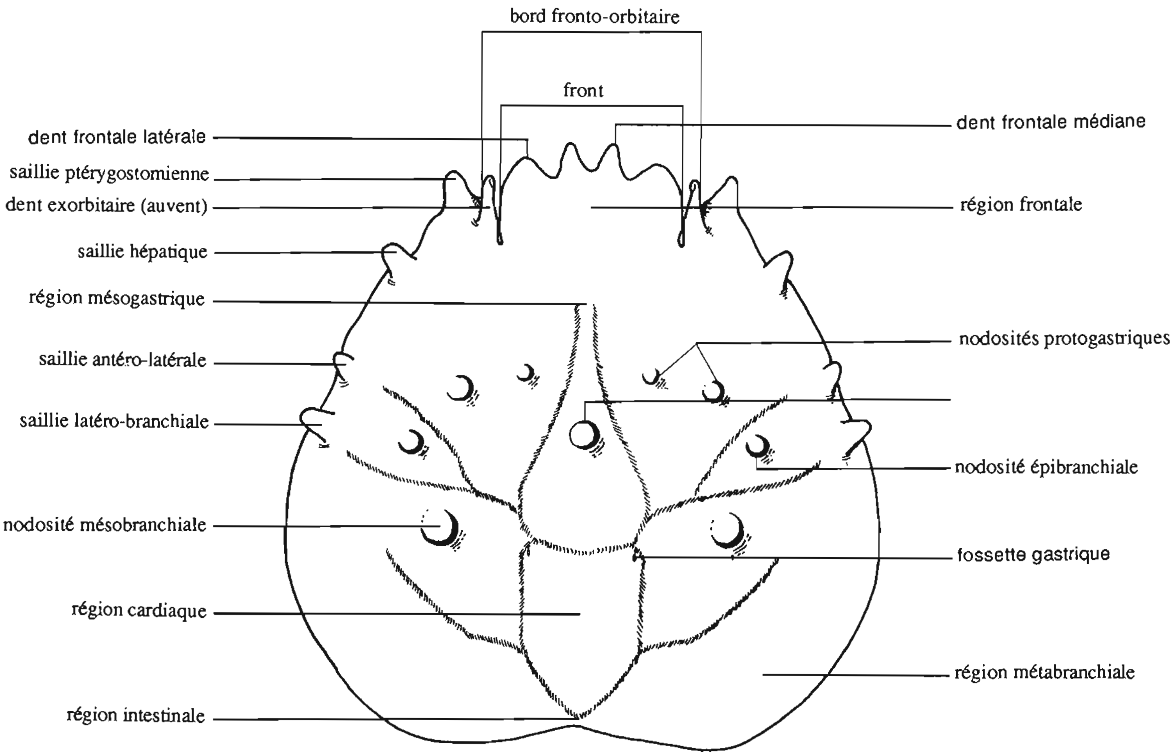

FIG. 1. — Carapace, vue dorsale schématique : terminologie utilisée pour les différentes structures de la carapace.

LISTE DES STATIONS

Madagascar. — N.O. "*Vauban*"
Chalutage, 8.11.1972, 15°21'E - 46°12,5'E, 150 m : *X. eucheir*.
Dragage, 24.2.1973, côte ouest, vers 18°50'S, 90-140 m : *K. proxima*.
Station CH 84, 1.8.1973, 12°40,2S - 48°18'E, 190-185 m : *X. eucheir*.
Dragage, 1.8.1973, 12°40',S - 48°18'E, 205-185 m : *X. eucheir*.
Dragage 2, 11.10.1975, 12°38,5'S - 48°16,5'E, 240 m : *X. eucheir*.

Japon. — N.O. "*Genkaia*"
Station 415, 32°48,8'N - 128°48,65'E, 68 m : *G. gordonae*.

Viêtnam. — N.O. "*Orlik*"
Station 2 (31), 1960, 14°47,5'N - 109°42'E, 305 m : *T. brucei*.
Station 4 (33), 1960, 15°07'N - 109°42,4'E, 300 m : *T. brucei*.
Station 5 (34), 1960, 15°17,5'N - 109°42,4'E, 350 m : *T. brucei*.

Philippines. — MUSORSTOM 1
Station 51, 25.3.1976, 13°49,4'N - 120°04,2'E, 200-170 m : *X. sakaii.*

MUSORSTOM 2
Station DR 33, 24.11.1980, 13°32,3'N - 121°07,5'E, 137-130 m : *K. depressa.*

MUSORSTOM 3
Station CP 106, 2.6.1985, 13°47'N - 120°30,3'E, 668-640 m : *K. rostrata.*

Indonésie. — EXPEDITION RUMPHIUS
Station V-1, 10.1.1973, 03°16,30'S - 129°08,05'E : *X. sakaii.*
Dragage, 1975, Iles Moluques (Amboine), 15-20 m : *K. limatula.*

KARUBAR
Station DW 13, 24.10.1991, 05°26'27"S - 132°37'48"E, 393-417 m : *K. rostrata.*
Station CP 15, 24.10.1991, 05°17'38"S - 132°41'07"E, 214-221 m : *K. handokoi.*
Station CP 20, 25.10.1991, 05°16'30"S - 132°58'36"E, 768-810 m : *T. brucei.*
Station CC 21, 25.10.1991, 05°16'25"S - 133°00'20"E, 688-694 m : *K. rostrata, T. brucei.*
Station CP 35, 27.10.1991, 06°07'22"S - 132°44'43"E, 390-502 m : *T. brucei.*
Station CP 38, 28.10.1991, 07°38'41"S - 132°27'29"E, 666-620 m : *K. rostrata.*
Station CC 57, 31.10.1991, 08°15'48"S - 131°53'43"E, 603-622 m : *T. brucei.*
Station CP 59, 31.10.1991, 08°20'01"S - 132°11'07"E, 405-399 m : *T. brucei.*
Station CP 62, 01.11.1991, 09°02'10"S - 132°42'23"E, 245-251 m : *T. brucei.*
Station CP 71, 02.11.1991, 08°39'39"S - 131°44'12"E, 477-480 m : *T. brucei.*
Station CP 73, 02.11.1991, 08°29'46"S - 131°33'25"E, 854-840 m : *T. brucei.*
Station CP 91, 05.11.1991, 08°44'54"S - 131°05'22"E, 884-890 m : *T. brucei.*

Australie. — N.O. "*Soela*". Cruise 0184
Station NWS-38, 30.1.1984, 18°52,2'S - 116°11,1'E, T/12, 458 - 456 m : *T. brucei.*
Station NWS-57, 3.2.1984, 17°30,1'S - 118°28,9'E, T/33, 504-506 m : *T. brucei.*
Station NWS-60, 1984, 19°25,2'S - 119°11,8'E, 352-360 m : *T. brucei.*

CIDARIS I
Station 5-3, 7.5.1986, 18°08,34'S - 147°58,60'E, 1107-1091 m : *K. spinosa.*
Station 9-3, 7.5.1986, 18°10,56'S - 148°21,61'E, 1109-1110 m : *K. spinosa.*
Station 11-3, 8.5.1986, 18°09,12'S - 148°31,24'E, 1103-1115 m : *K. spinosa.*
Station 15-3, 9.5.1986, 17°45,49'S - 148°37,52'E, 945 m : *K. spinosa.*
Station 16-3, 10.5.1986, 17°47,01'S - 148°13,44'E, 1141-1102 m : *K. spinosa.*
Station 20-3, 10.5.1986, 17°46,53'S - 147°48,82'E, 1224-1223 m : *K. spinosa.*
Station 24-3, 11.5.1986, 17°22,99'S - 147°48,29'E, 1187-1200 m : *K. spinosa.*
Station 47-2, 16.5.1986, 17°51,76'S - 147°07,95'E, 503-479 m : *K. spinosa.*

Iles Chesterfield. — MUSORSTOM 5
Station CP 268, 9.10.1986, 6h37, 24°44,70'S - 159°39,20'E, 280 m : *X. richeri.*
Station DW 274, 9.10.1986, 15h31, 24°44,83'S - 159°41'E, 285 m : *K. depressa, X. richeri.*
Station CP 275, 9.10.1986, 16h33, 24°46,60'S - 159°40,30'E, 285 m : *X. richeri.*
Station DW 277, 10.10.1986, 6h27, 24°10,60'S - 159°34,90'E, 270 m : *X. richeri.*
Station DW 281, 10.10.1986, 11h02, 24°10,54'S - 59°34,32'E, 272 m : *X. richeri.*
Station DW 288, 10.10.1986, 17h21, 24°04,80'S - 159°36,80'E, 270 m : *X. richeri.*
Station CP 289, 10.10.1986, 18h58, 24°01,50'S - 159°38,40'E, 273 m : *X. richeri.*
Station DW 302, 12.10.1986, 7h45, 22°10'S - 159°23,30'E, 345-360 m : *K. depressa.*
Station DW 304, 12.10.1986, 10h04, 22°10,34'S - 159°25,51'E, 385-420 m : *K. depressa.*
Station DW 313, 13.10.1986, 8h28, 22°24,31'S - 159°32,53'E, 780-930 m : *K. spinosa.*
Station CP 323, 14.10.1986, 9h35, 21°18,52'S - 157°57,62'E, 970 m : *K. spinosa.*
Station CP 324, 14.10.1986, 12h20, 21°15,01'S - 157°51,33'E, 970 m : *K. spinosa.*
Station DW 335, 15.10.1986, 14h54, 20°03,24'S - 158°45,35'E, 315 m : *P. crosnieri.*

Station DW 336, 15.10.1986, 16h26, 19°55,80'S - 158°38,90'E, 350 m : *P. crosnieri*.
Station DW 350, 17.10.1986, 16h45, 19°34'S - 158°35,30'E, 280 m : *P. crosnieri*.
Station DW 353, 18.10.1986, 6h39, 19°26,50'S - 158°40,40'E, 290 m : *P. crosnieri*.
Station DC 376, 20.10.1986, 16h12, 19°51,10'S - 158°29,80'E, 280 m : *P. crosnieri*.
Station CC 390, 22.10.1986, 18h45, 21°00,90'S - 160°50,30'E, 745-825 m : *K. spinosa*.

CORAIL 2
Station DE 13, 21.7.1988, 21°02,77'S - 160°05'E, 700 m : *K. spinosa*.
Station DE 14, 21.7.1988, 21°00,69'S - 160°57,18'E, 660 m : *K. spinosa*.
Station DE 15, 21.7.1988, 20°50,72'S - 160°55,76'E, 590 m : *K. spinosa*.

Nouvelle-Calédonie. — LAGON
Station 190, 14.9.1984, 22°02,1'S - 165°57,3'E, 135-150 m : *G. keijii*.
Station 500, 4.3.1985, 19°04,3'S - 163°30,5'E, 225 m : *P. crosnieri*.

BIOCAL
Station CP 30, 29.8.1985, 8h20, 23°08,44'S - 166°40,83'E, 1140 m : *K. spinosa*.
Station DW 33, 29.8.1985, 19h18, 23°09,71'S - 167°10,27'E, 675 m : *K. spinosa*.
Station DW 36, 29.8.1985, 23h26, 23°08,64'S - 167°10,99'E, 650 m : *K. spinosa*.
Station DW 44, 30.8.1985, 15h33, 22°47,30'S - 167°14,30'E, 440 m : *K. depressa*.
Station DW 46, 30.8.1985, 19h52, 22°53,05'S - 167°17,08'E, 570 m : *K. spinosa*.
Station DW 51, 31.8.1985, 21h50, 23°05,27'S - 167°44,95'E, 700 m : *E. stellatus*, *K. spinosa*.

MUSORSTOM 4
Station DW 163, 16.9.1985, 7h47, 18°33,80'S - 163°11,50'E, 350 m : *P. crosnieri*.
Station CP 169, 17.9.1985, 6h55, 18°54,03'S - 163°11,20'E, 600 m : *K. spinosa*.
Station CP 170, 17.9.1985, 8h23, 18°57,00'S - 163°12,60'E, 485 m : *K spinosa*.
Station CC 175, 17.9.1985, 15h47, 18°59,30'S - 163°17,50'E, 370 m : *P. crosnieri*.
Station DW 186, 19.9.1985, 6h15, 19°07,20'S - 163°29,70'E, 205 m : *P. crosnieri*.

CHALCAL 2
Station DW 72, 28.10.1986, 7h34, 24°54,50'S - 168°22,30'E, 527 m : *E. stellatus*.

SMIB 6
Station DW 117, 2.3.1990, 18°59,40'S - 163°25,40'E, 290 m : *P. crosnieri*.

Iles Loyauté. — MUSORSTOM 6
Station DW 391, 13.2.1989, 6h13, 20°47,35'S - 167°05,70'E, 390 m : *X. richeri*.
Station DW 397, 13.2.1989, 17h05, 20°47,35'S - 167°05,17'E, 380 m : *X. richeri*.
Station DW 399, 14.02.1989, 7h32, 20°41,80'S - 167°00,20'E, 282 m : *X. richeri*.
Station DW 406, 15.02.1989, 6h26, 20°40,65'S - 167°06,80'E, 373 m : *X. richeri*.
Station CP 419, 16.2.1989, 10h17, 20°41,65'S - 167°03,70'E, 283 m : *X. richeri*.
Station CP 438, 18.2.1989, 17h55, 20°23'S - 166°20,10'E, 780 m : *K. orstom*.
Station DW 451, 20.2.1989, 8h27, 20°59'S - 167°24,50'E, 330 m : *X. richeri*.
Station DW 453, 20.2.1986, 9h33, 21°00,50'S - 167°26,90'E, 250 m : *X. richeri*.
Station DW 479, 22.2.1989, 15h23, 21°09,13'S - 167°54,95'E, 310 m : *X. richeri*.
Station DW 480, 22.2.1989, 15h49, 21°08,50'S - 167°55,98'E, 380 m : *K. depressa*.
Station DW 485, 23.02.1989, 12h14, 21°23,48'S - 167°59,33'E, 350 m : *X. richeri*.

Wallis et Futuna. — MUSORSTOM 7
Station DW 527, 14.5.1992, 13°24,01'S - 176°14,06'W, 540-560 m : *K. orstom*.
Station DW 540, 17.5.1992, 12°26,07'S - 177°28,04'W, 700 m : *K. orstom*.
Station CP 552, 18.5.1992, 12°15,07'S - 177°27,08'W, 786-800 m : *K. orstom*.
Station DW 560, 19.5.1992, 11°47,00'S - 178°20,00'W, 697-702 m : *K. orstom*.
Station CP 564, 20.5.1992, 11°46,01'S - 178°27,04'W, 1015-1020 m : *K. spinosa*.
Station CP 565, 20.5.1992, 11°47,04'S - 178°25,03'W, 900 m : *K. spinosa*.

Station CP 567, 20.5.1992, 11°47,00'S - 178°27,03'W, 1010-1020 m : *K. spinosa.*
Station DW 586, 22.5.1992, 13°10,07'S - 176°13,01'W, 510-600 m : *K. orstom.*
Station DW 626, 29.5.1992, 11°53,06'S - 179°32,00'W, 597-600 m : *K. orstom.*
Station CP 627, 14.5.1992, 11°54,02'S - 179°31,04'W, 597-600 m : *K. orstom.*
Station DW 631, 14.5.1992, 11°54,00'S - 179°31,06'W, 600 m : *K. orstom.*

ÉTUDE SYSTÉMATIQUE

Clef de détermination des familles de Cyclodorippoidea

— Carapace à contour subcirculaire ou subpentagonale. Orbites toujours présentes. Yeux orientés (sauf chez *Tymolus*) dans un sens perpendiculaire par rapport à l'axe de la carapace. Exopodite des Mxp3 portant rarement un flagelle. Généralement, endostome allongé en gouttière rétrécie vers l'avant, atteignant le bord frontal de la carapace (type oxystome). Pleurites thoraciques au niveau de P2 et P3 toujours recouverts par la carapace. Spermathèque se traduisant extérieurement par un simple ouverture à l'extrémité du sillon sternal 7/8 .... **Cyclodorippidae**

— Carapace à contour subquadratique. Orbites absentes. Yeux toujours orientés dans un sens longitudinal par rapport à l'axe de la carapace. Exopodite de Mxp3 portant toujours un flagelle. Endostome assez court. Pleurites thoraciques au niveau de P2 et P3 apparaissant toujours à découvert. Sternite 8 chevauchant partiellement le sternite 7 au niveau de la spermathèque, en ménageant une sorte de poche située à l'extrémité du sillon sternal 7/8 ... . **Cymonomidae**

Famille CYCLODORIPPIDAE Ortmann, 1892

Cyclodorippidae Ortmann, 1892 : 552.

Tymolinae Alcock, 1896 : 274 (*pro parte*).

Cyclodorippae - BOUVIER, 1897 : 7. — A. MILNE EDWARDS & BOUVIER, 1899 : 16, 17 ; 1902 : 84.

Cyclodorippidae - STEBBING, 1920 : 242. — MANNING & HOLTHUIS, 1981 : 28. — ABELE & KIM, 1986 : 39. — SOTO, 1986 : 15. — TAKEDA & MOOSA, 1990 : 55. — TAVARES, 1991a : 626 ; 1991b : 440 ; 1992a : 509 ; 1992b : 75 ; 1992c : 201.

Dorippidae - SCHMITT, 1921 : 185 (*pro parte*). — RATHBUN, 1937 : 75 (*pro parte*). — CHACE, 1940 : 10 (*pro parte*). — BARNARD, 1950 : 387 (*pro parte*). — SHIKAMA, 1964 : 164. — WILLIAMS, MCCLOSKEY & GRAY, 1968 : 42 (*pro parte*). — ZARENKOV, 1970 : 460. — LEMAITRE, 1984 : 428 (*pro parte*). — GARTH, 1991 : 125 (*pro parte*).

Tymolinae - BALSS, 1922 : 116 ; 1957 : 1609 (*pro parte*). — SAKAI, 1965 : 18. — GLAESSNER, 1969 : 492 (*pro parte*). — GORDON, 1963 : 57. — STEVCIC, 1971a : 82. — GUINOT, 1978 : 243 ; 1979 : 129 (*pro parte*).

Tymolidae - GORDON, 1963 : 57 (*pro parte*). — STEVCIC, 1971a : 82 (*pro parte*) ; 1971b : 336 ; 1971c : 190. — TAKEDA, 1970 : 195, 206 ; 1973a : 24 ; 1973b : 75 ; 1981 : 36 (*pro parte*). — MIYAKE & TAKEDA , 1970 : 26. — WRIGHT & COLLINS, 1972 : 33. — SERÈNE, ROMIMOHTARTO & MOOSA, 1974 : 18. — COLLINS & MORRIS, 1976 : 109. — SAKAI, 1976 : 32 (*pro parte*) ; 1985 : 334. — GUINOT, 1978 : 243 (*pro parte*); 1979 : 129 (*pro parte*). — SERÈNE &VADON, 1981 : 121. — KENSLEY, 1981a : 37 (*pro parte*). — ABELE & FELGENHAUER, 1982 : 316. — TAKEDA & TOMIDA, 1984 : 43. — WILLIAMS, 1984 : 259. — TOMIDA, 1985 : 56. — DAI & YANG, 1986 : 30. — SCHRAM, 1986 : 308. — WICKSTEN, 1986 : 364. — BRIGGS, FORTEY & CLARKSON, 1988 : 199, 200. — HENDRICKX, 1990 : 42. — JAMIESON & TUDGE, 1990 : 348.

Tymoloidea - GUINOT, 1978 : 241-243. — RICE, 1981 : 1009. — GLAESSNER, 1980 : 171. — HENDRICKX, 1990 : 42. — JAMIESON & TUDGE, 1990 : 348.

Cymonomidae - KENSLEY, 1981b : 60 (*pro parte*).

Tymolide - GLAESSNER & SECRETAN, 1987 : 11.

Clef de détermination des sous-familles et des genres de CYCLODORIPPIDAE

(les genres présents dans l'Indo-Ouest-Pacifique sont en caractères gras)

1. Abdomen femelle de six ou sept segments très élargis par rapport à la largeur de la carapace, bombés et avec les bords incurvés vers le bas. Pl 1 présents ou absents ; Pl 2-5 s'articulant sur la face ventrale des segments abdominaux (fig. 5e-f). Abdomen mâle de 5 ou 7 segments. Largeur du bord fronto-orbitaire supérieure ou inférieure (chez *Tymolus* et *Corycodus*) à la moitié de la largeur maximale de la carapace. Propode et dactyle des péréiopodes 2 et 3 sans rangées de soies ventrales et dorso-externes.............................. .... subfam. **Cyclodorippinae** (**2**)
— Abdomen femelle de six ou sept segments très courts et étroits par rapport à la largeur de la carapace. Pl 1 toujours présents, uniramés et vestigiaux, articulés ventralement. Pl 2-5 s'articulant sur les extrémités latérales des segments abdominaux (fig. 5a-d). Abdomen mâle de 5 ou 6 segments. Largeur du bord fronto-orbitaire toujours supérieure à la moitié de la largeur maximale de la carapace. Propode et dactyle des péréiopodes 2 et 3 ornés chacun de deux rangées de soies assez longues, l'une située sur leur face ventrale, l'autre sur la face dorso-externe .... subfam. **Xeinostominae** (**8**)

2. Exopodite des Mxp3 pourvu d'un flagelle... **3**
— Exopodite des Mxp3 dénué de flagelle... **4**

3. Pl 1 absents chez la femelle. Exopodite des Pl 2-5 foliacé. Sternites thoraciques 6-7 contigus .... ***Phyllotymolinum*** (p. 285)
— Pl 1 présents, uniramés et vestigiaux. Exopodite des Pl 2-5 comme d'ordinaire. Sternite thoracique 7 chevauchent une partie du sternite 6 .... ***Genkaia*** (p. 280)

4. Antennes plus courtes que la moitié de la longueur maximale de la carapace. Article 2+3 des antennes valviforme **5**
— Antennes plus longues que la moitié de la longueur maximale de la carapace. Article 2+3 des antennes cylindrique **6**

5. Carapace subpentagonale, extrêmement renflée et épaisse. Abdomen femelle de 7 segments. Doigt mobile des chélipèdes assez grêle, armé sur la face interne d'une série d'épines longues et aiguës .... ***Corycodus*** (p. 272)
— Carapace subcirculaire, peu renflée. Abdomen mâle de 5 segments, abdomen femelle de 6 segments. Doigt mobile des chélipèdes légèrement aplati, orné sur la face interne de soies courtes et denses .... *Clythrocerus*

6. Ornementation de la face dorsale de la carapace plutôt faible, constituée par des saillies (latérales, hépatiques et ptérygostomiennes) et des nodosités protogastriques peu marquées **7**
— Ornementation de la face dorsale de la carapace très accentuée : surface régulièrement recouverte de gros granules et d'épines à sommet tronqué .... *Simodorippe*

7. Largeur fronto-orbitaire nettement inférieure à la moitié de la largeur maximale de la carapace. Yeux rétractiles, alignés dans un sens longitudinal par rapport à la longueur de la carapace .... ***Tymolus*** (p. 267)
— Largeur fronto-orbitaire supérieure à la moitié de la largeur maximale de la carapace. Yeux orientés dans un sens perpendiculaire à l'axe longitudinal de la carapace .... *Cyclodorippe*

8. Front très court avec une encoche médiane, ne dépassant pas le niveau des dents exorbitaires. Abdomen femelle de 7 segments .... ***Ketamia*** (p. 300)
— Front proéminent, triangulaire ou semi-circulaire, sans encoche médiane. Abdomen femelle de 6 segments **9**

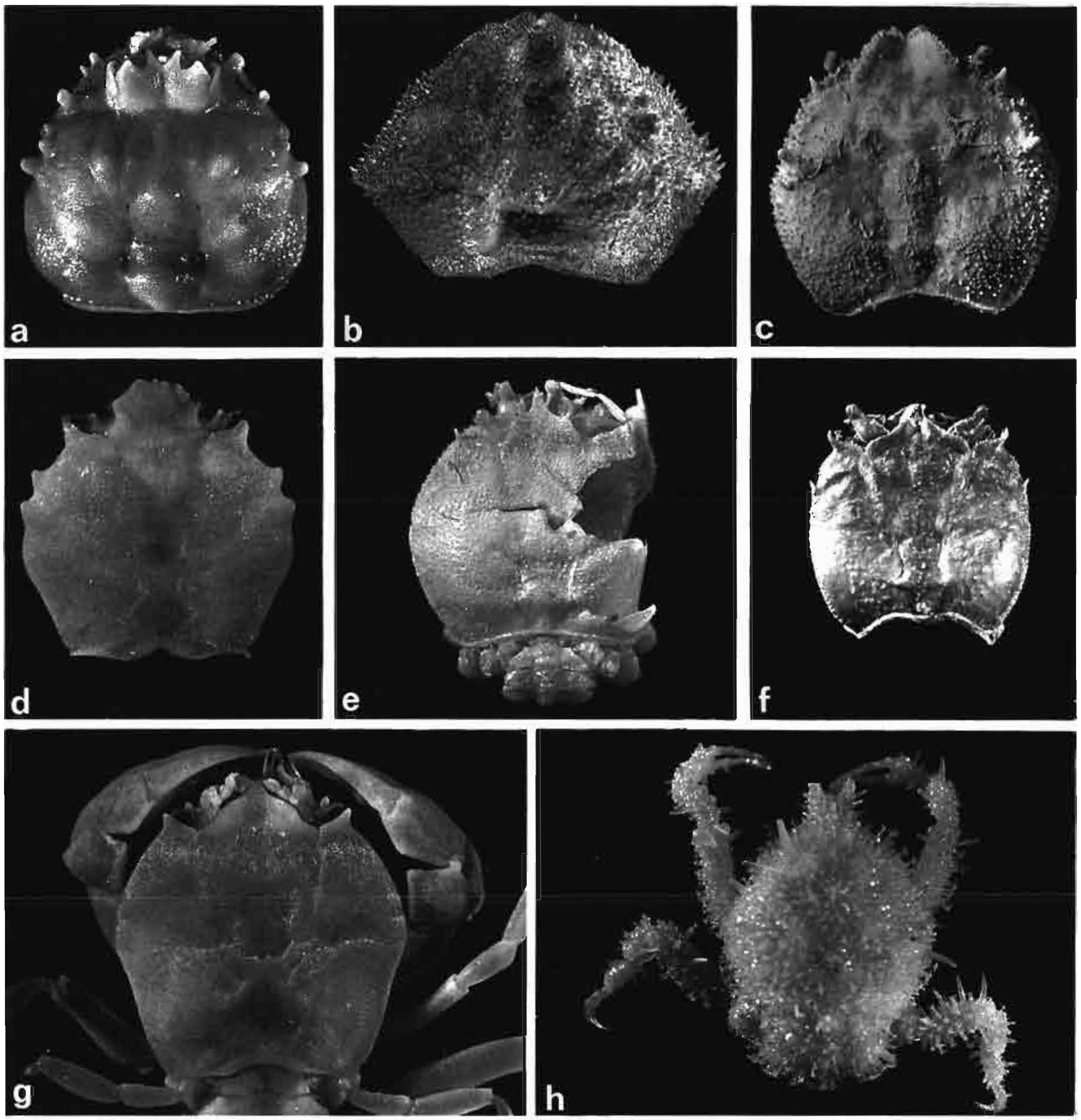

FIG. 2. — Les genres indo-ouest-pacifiques de la famille des Cyclodorippidae et des Cymonomidae (genre *Cymonomus* exclu).

a-f : Vue dorsale de la carapace. **a**, *Tymolus japonicus* Stimpson, 1858, ♂ 10,4 x 10,3 mm, Hakodate, Japon (USNM 45844) ; **b**, *Corycodus disjunctipes* (Stebbing, 1910), localité imprécise (étiquettes mélangées, Cape Natal, Cape Vidal, et Umhloti River) : ♀ conservée à l'état sec (SAM) ; **c**, *Xeinostoma eucheir* Stebbing, 1920, Afrique du Sud, Cape Vidal, 144 m : ♂ lectotype (abdomen et pattes détachés) 6,6 x 7,7 mm (BM 1928.12.1.195-196) ; **d**, *Genkaia keijii* sp. nov., Nouvelle-Calédonie, LAGON, st. 190, 22°02,1'S - 165°57,3'E, 135-150 m : ♀ holotype 3,9 x 4 mm (MNHN-B 24619) ; **e**, *Krangalangia rostrata* (Ihle, 1916), "*Siboga*", st. 267, 5°54'S - 152°56,7'E : ♀ paralectotype 5 mm de long (avec le bord latéral de la carapace endommagé) (ZMA-De 100793) ; **f**, *Ketamia depressa* (Ihle, 1916), "*Siboga*", st. 260, 5°36,5'S - 132°55,2'E,: ♀ paralectotype 3 x 3,5 mm (ZMA-De 102973).

g-h : Vue d'ensemble. **g**, *Phyllotymolinum crosnieri* gen. nov., sp. nov., Nouvelle-Calédonie, MUSORSTOM 5, st. DW 350, 19°34,00'S - 158°35,30'E, 280 m : ♀ paratype 5 x 6,2 mm (MNHN-B 24684); **h**, *Elassopodus stellatus* gen. nov., sp. nov., Nouvelle-Calédonie, BIOCAL, st. DW 51, 23°05,27'S - 167°44,95'E, 700 m : ♀ holotype 6,5 x 5,5 mm (MNHN-B 24620).

9. Front trilobé se terminant par une avancée rostrale triangulaire très proéminente. Orbites peu profondes, leurs bords supérieur et inférieur mal délimités. Dactyle des P2 et P3 comprimé dorso-ventralement. Dernier segment abdominal foliacé................................ .... ***Krangalangia*** (p. 294)

— Front semi-circulaire, bordé par une rangée de petites dents. Orbites profondément creusées, leurs bords supérieur et inférieur bien délimités. Dactyle des P2 et P3 comprimé latéralement. Dernier segment abdominal très étroit environ 3 fois plus long que large...... .... ***Xeinostoma*** (p. 288)

Sous-famille CYCLODORIPPINAE Ortmann, 1892

Fig. 2-5

Cyclodorippidae Ortmann, 1892 : 552.
Cyclodorippinae - TAVARES, 1992a : 514.

DESCRIPTION. — Largeur du bord fronto-orbitaire supérieure ou inférieure (chez *Tymolus* et *Corycodus*) à la moitié de la largeur maximale de la carapace. Propode et dactyle des péréiopodes 2 et 3 ornés de soies ordinaires. Abdomen femelle formé de six ou de sept segments, tous élargis par rapport à la carapace; dernier segment en forme de calotte semi-circulaire. Chez la femelle, pléopodes 1 généralement absents ; pléopodes 2-5 articulés ventralement et pourvus de longues soies. Abdomen mâle formé de cinq ou de sept segments.

GENRE-TYPE. — *Cyclodorippe* A. Milne Edwards, 1880.

GENRES INCLUS. — *Tymolus* Stimpson, 1858, *Cyclodorippe* A. Milne Edwards, 1880, *Corycodus* A. Milne Edwards, 1880, *Clythrocerus* A. Milne Edwards & Bouvier, 1899, et *Simodorippe* Chace, 1940.

DISTRIBUTION. — Les Cyclodorippinae englobent cinq genres, dont trois sont exclusivement américains (*Cyclodorippe*, *Clythrocerus* et *Simodorippe*). *Corycodus* est representé à la fois dans l'Indo-Ouest-Pacifique (quatre espèces) et dans l'océan Atlantique (une espèce). Seul le genre *Tymolus* est entièrement indo-ouest-pacifique (fig. 3). Distribution bathymétrique : 50-890 m.

REMARQUES. — TAVARES (1992a) reconnaît chez les Cyclodorippidae, deux lignées évolutives distinctes, qui s'expriment principalement par le type de protection de la ponte, et les distingue comme deux sous-familles : les Cyclodorippinae Ortmann, 1892, et les Xeinostominae Tavares, 1992.

Chez les Cyclodorippinae, les segments abdominaux, assez calcifiés, sont toujours très bombés, avec les bords incurvés vers le bas, et le dernier segment (6+7) est en forme de calotte semi-circulaire. Cette sorte de chambre incubatrice semble compenser l'absence de la vraie cavité sterno-abdominale qui existe chez les Crabes vrais Heterotremata Guinot, 1977, et Thoracotremata Guinot, 1977. Chez la femelle, on observe aussi une tendance vers la réduction du nombre de pléopodes (le premier pléopode est toujours absent ; le pléopode du somite 5 peut manquer), de leur taille et de leur calcification.

Pour les caractéristiques de la deuxième voie évolutive chez les Cyclodorippidae, voir ci-après le chapitre consacré à la sous-famille des Xeinostominae.

Genre *TYMOLUS* Stimpson, 1858

Tymolus Stimpson, 1858 : 163.
Tymolus - ORTMANN, 1892 : 559. — ALCOCK, 1896 : 274. — SHIKAMA, 1954 : 71. — BALSS, 1957 : 1609. — GORDON, 1963: 53. — GLAESSNER, 1969 : R492. — STEVCIC, 1971a : 75. — TAKEDA , 1973b : 82. — SAKAI, 1976 : 32. — GUINOT, 1978 : 243 ; 1979 : 129. — ABELE & FELGENHAUER 1982 : 316. — TAKEDA & TOMIDA, 1984 : 43. — TOMIDA, 1985 : 56. — TAVARES, 1990 : 627 ; 1991b : 442 ; 1992a : 509 ; 1992c : 201.

Cyclodorippe (pro parte) - ORTMANN, 1892 : 559. — ALCOCK, 1896 : 274. — IHLE, 1916 : 128. — SAKAI, 1976 : 32. — ABELE & FELGENHAUER, 1982 : 316. — ABELE & KIM, 1986 : 39 (non *Cyclodorippe* A. Milne Edwards, 1880).
Cymonomops Alcock, 1894 : 406 [espèce-type par monotypie : *Cymonomops glaucomma* Alcock, 1894].
Cymonomops - ALCOCK, 1896 : 274, 286 ; 1905 : 572. — GRANT, 1905 : 315.
Cyclodorippe (*Cyclortmannia*) Ihle, 1916 : 128 [espèce-type : *Cyclodorippe uncifera* Ortmann, 1892, par sélection par TAVARES, 1991b : 442].

DESCRIPTION. — Carapace à contour subcirculaire. Face dorsale de la carapace séparée des flancs par des limites indistinctes. Front découpé en quatre dents ou tronqué. Largeur fronto-orbitaire inférieure à la moitié de celle, maximale, de la carapace. Pédoncules oculaires rétractiles, courts, orientés longitudinalement par rapport à l'axe de la carapace. Avancée de l'endostome en forme de gouttière, plus étroite vers l'avant, atteignant le bord frontal de la carapace. Exopodite des premiers et deuxièmes maxillipèdes avec un flagelle réduit, celui des troisièmes maxillipèdes dénué de flagelle. Dactyle des P2 et P3 comprimé dorsoventralement. Abdomen femelle formé de six segments. Pléopodes articulés sur la face ventrale des segments 2-5. Abdomen mâle formé de cinq segments.

ESPÈCE-TYPE. — *Tymolus japonicus* Stimpson, 1858, par monotypie. Genre masculin.

ESPÈCES INCLUSES. — *Tymolus* renferme six espèces actuelles : *T. japonicus* Stimpson, 1858 ; *T. uncifer* (Ortmann, 1892) ; *T. dromioides* (Ortmann, 1892) ; *T. truncatus* (Ihle, 1916) ; *T. similis* (Grant, 1905) ; *T. brucei* Tavares, 1991, et trois espèces fossiles, toutes du Miocène du Japon (TAVARES, 1992b) : *Tymolus kamadai* † Imaizumi, 1952 ; *Tymolus ingens* † Takeda & Tomida, 1984 ; et *Tymolus itoigawai* † Takeda & Tomida, 1984.

DISTRIBUTION. — Genre entièrement indo-ouest-pacifique, entre 50-890 m.

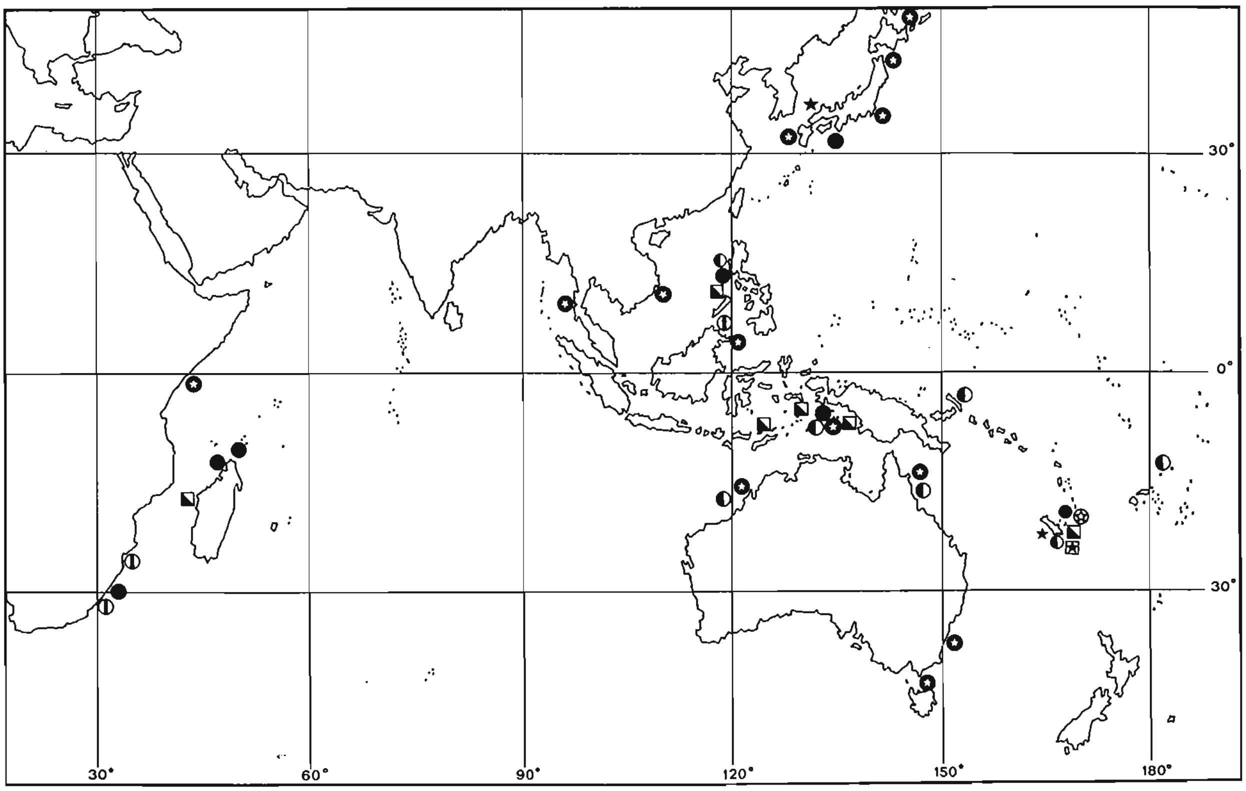

FIG. 3. — Distribution géographique des genres de Cyclodorippidae et de Cymonomidae dans l'océan indo-ouest-pacifique (à l'exclusion du genre *Cymonomus*) : *Corycodus*, *Elassopodus* gen. nov., *Genkaia*, *Ketamia*, *Krangalangia*, *Phyllotymolinum* gen. nov., *Tymolus*, *Xeinostoma*.

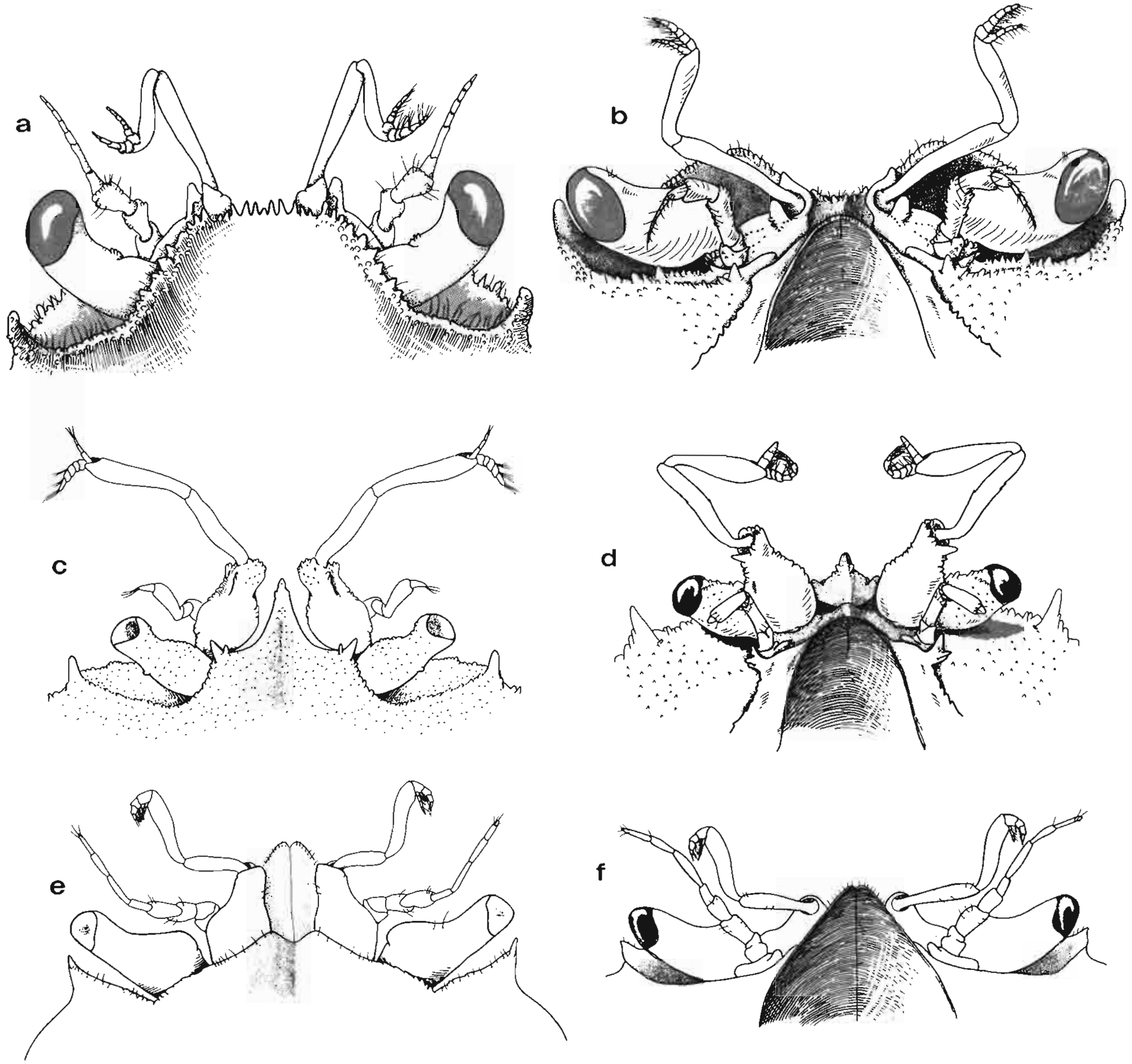

FIG. 4 a, c, e . — Bord frontal de la carapace : **a,** *Xeinostoma eucheir* Stebbing, 1920, 12°40'S - 48°18'E, ♀ 5 x 5,5 mm (MNHN-B 24596) ; **c,** *Krangalangia rostrata* (Ihle, 1916), Nouvelle-Guinée, "*Siboga*", st. 267, 5°54'S - 152°56,7'E, 984 m, ♀ paralectotype 5 mm de long (ZMA-De 100793) ; **e,** *Ketamia depressa* (Ihle, 1916), Nouvelle-Guinée, "*Siboga*", st. 260, 5°36,5'S - 132°55,2'E, 90 m, ♀ paralectotype (ZMA-De 102973).

FIG. 4 b, d, f. — Vue ventrale de la région antérieure et cadre buccal : **b,** *X. eucheir* (MNHN-B 24596) ; **d,** *K. rostrata* (ZMA-De 100793) ; **f,** *K. depressa* (ZMA-De 102973).

REMARQUES. — Une clef de détermination pour toutes les espèces actuelles de *Tymolus* est donnée ci-dessous, mais seulement deux espèces sont étudiées ici : *T. truncatus* (Ihle, 1916), dont le matériel-type est égaré, et *T. brucei* Tavares, 1991, connu jusqu'ici seulement de la côte ouest d'Australie et recensé pour la première fois au Viêtnam, aux Philippines et en Indonésie. Les quatre autres espèces du genre ont été revues récemment par TAVARES (1991b ; 1992c).

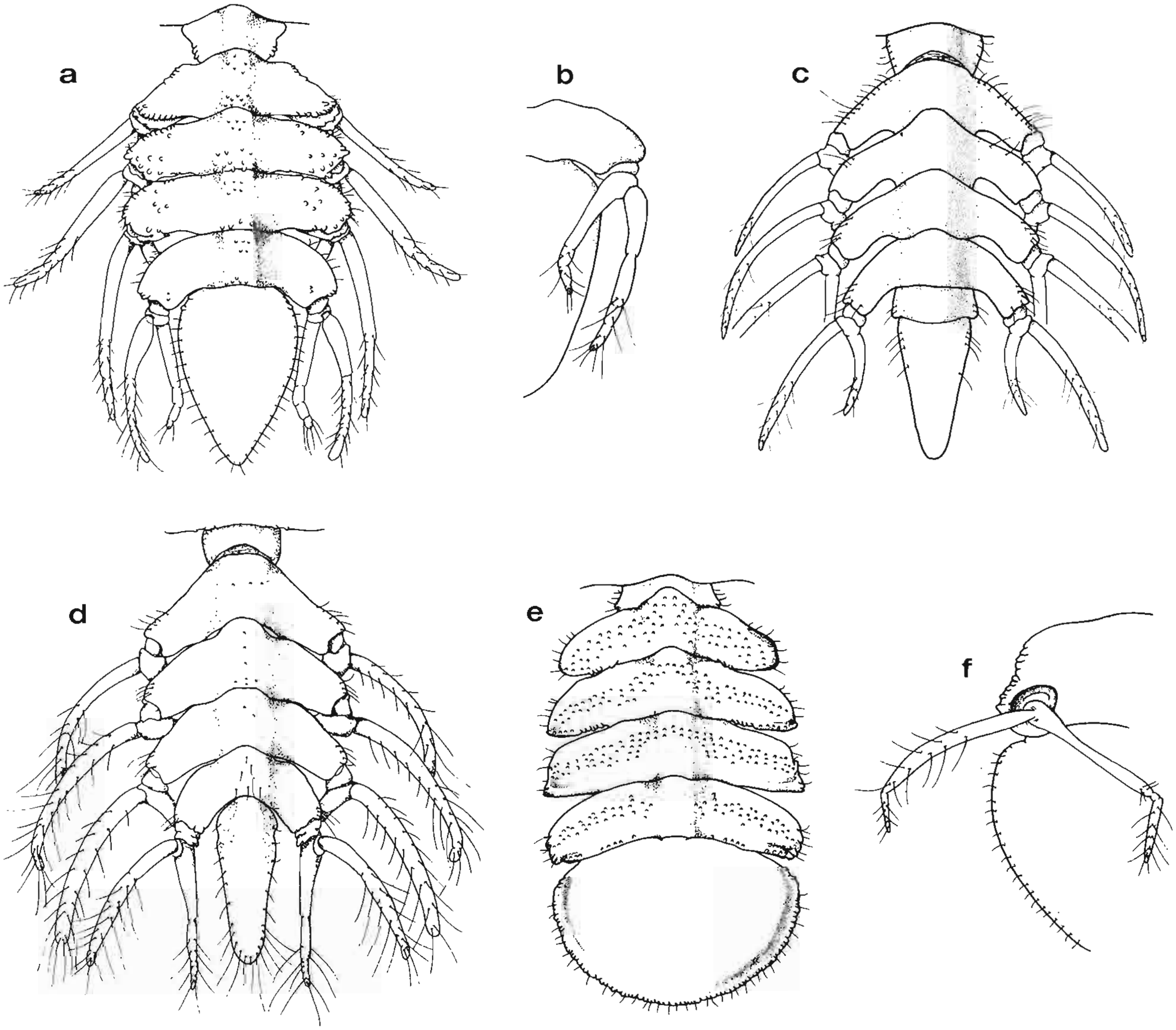

FIG. 5 a, c-e. — Face externe de l'abdomen femelle : **a**, *Krangalangia rostrata* (Ihle, 1916), Nouvelle-Guinée, "*Siboga*", st. 267, 5°54'S - 152°56,7'E, 984 m, ♀ paralectotype 5 mm de long (ZMA-De 100793) ; **c**, *Ketamia depressa* (Ihle, 1916), Nouvelle-Guinée, "*Siboga*", st. 260, 5°36,5'S - 132°55,2'E, 90 m, ♀ paralectotype (ZMA-De 102.973) ; **d**, *Xeinostoma eucheir* Stebbing, 1920, 12°40'S - 48°18'E, ♀ 5 x 5,5 mm (MNHN-B 24596) ; **e**, *Cyclodorippe antennaria* A. Milne Edwards, 1880, 23°02,5'S - 83°00'W, ♀ 6 x 6 mm (MNHN-B 13483).

FIG. 5 b, f. — Vue ventrale du dernier et de l'avant-dernier segment abdominal femelle : **b**, *K. rostrata* (ZMA-De 100793). A noter le pléopode articulé sur l'extrémité latérale du segment abdominal ; **f**, *C. antennaria* (MNHN-B 13483). On notera le pléopode articulé sur la face ventrale du segment abdominal.

Clef de détermination des espèces actuelles du genre *Tymolus*

(les espèces traitées dans ce travail sont en caractères gras)

1. Front découpé en quatre dents **2**
— Front tronqué .... ***T. truncatus***

2. Saillies ptérygostomiennes, hépatiques, antéro-latérales et latéro-branchiales présentes ; dents exorbitaires contiguës avec les dents frontales externes **3**

— Pas de saillies ptérygostomiennes ; saillies hépatiques, antéro-latérales et latéro-branchiales (si présentes) en général faiblement marquées ; dents exorbitaires non contiguës avec les dents frontales externes 4

3. Grand *Tymolus*. Saillies ptérygostomiennes, hépatiques, antéro-latérales et latéro-branchiales plutôt spatulées ; région fronto-orbitaire moyennement avancée ; distance entre la base de la saillie hépatique et la base de la dent exorbitaire (du même côté de la carapace) supérieure à la longueur de la dent exorbitaire .... *T. japonicus*

— Saillies ptérygostomiennes, hépatiques, antéro-latérales et latéro-branchiales assez accusées ; région fronto-orbitaire très avancée ; distance entre la base de la saillie hépatique et la base de la dent exorbitaire (du même côté de la carapace) plus petite que la longueur de la dent exorbitaire .... *T. dromioides*

4. Mérus des P2 beaucoup plus long que l'ensemble carpe + propode + dactyle .... ***T. brucei***

— Mérus des P2 aussi long que l'ensemble carpe + propode + dactyle 5

5. Saillies latéro-branchiales plus petites que les saillies antéro-latérales ; saillies hépatiques à peine visibles ; carapace très finement granuleuse et peu sétifère ; granulation de la face externe des Mxp3 faible .... *T. uncifer*

— Pas de saillies latéro-branchiales ; saillies antéro-latérales dirigées vers l'avant, pointues ; carapace granuleuse et sétifère ; des granules spiniformes sur la face externe des Mxp3 ....*T. similis*

Tymolus truncatus (Ihle, 1916)

Cyclodorippe (Cyclortmannia) truncata Ihle, 1916 : 135, fig. 72-73.
Tymolus truncatus - TAVARES, 1991b : 446.

DISTRIBUTION. — Cette espèce est connue seulement de sa localité-type, côte ouest de Bornéo (1°17,5'N - 118°53'E), où elle a été récoltée à 281 m de profondeur.

REMARQUES. — *Tymolus truncatus* (Ihle, 1916) a été originalement décrit dans le genre *Cyclodorippe* A. Milne Edwards, 1880, puis placé par TAVARES (1991b) dans le genre *Tymolus*. Le genre *Cyclodorippe* a été très longtemps confondu avec *Tymolus*, jusqu'à ce que TAVARES (1991a) souligne les différences qui séparent ces deux genres. Comme nous l'avons déjà mentionné, *Cyclodorippe* a été redéfini comme un genre strictement américain, tandis que toutes les espèces de *Tymolus* appartiennent à la faune indo-ouest-pacifique.

Tymolus truncatus n'est connu, encore actuellement, que par ses syntypes : deux mâles et trois femelles, qui devraient se trouver dans la collection du Zoölogisch Museum à Amsterdam. Il n'a toutefois pas été possible de les y retrouver.

Tymolus brucei Tavares, 1991

Tymolus brucei Tavares, 1991 : 451.

MATÉRIEL EXAMINÉ. — **Viêtnam**. "*Orlik*" : st. 2 (31), 305 m : 5 ♂, 4 ♀, 4 ♀ ovigères (MNHN-B 24622). — St. 4 (33), 300 m : 2 ♂ et 3 ♀ (MZUM). — St. 5 (34), 350 m : 1 ♂ (MZUM).

Philippines. "*Albatross*" : 12°25'35"N - 121°42'15"E, 305 m : 1 ♀ ovigère (USNM).

Indonésie. KARUBAR : st. CP 20, 768-810 m : 1 ♂ (MNHN-B 24626). — St. CC 21, 688-694 m : 1 ♀ (MNHN-B 24627). — St. CP 35, 390-502 m : 1 ♂, 6 ♀, 1 ♀ ovigère. — St. CC 57, 603-622 m : 3 ♀ (MNHN-B 24628). — St. CP 59, 405-399 m : 2 ♀ (MNHN-B 24629). — St. CP 62, 245-251 m : 4 ♂, 4 ♀ (MNHN-B 24630). — St. CP 71, 477-480 m : 1 ♂, 1 ♀ (MNHN-B 24631). — St. CP 73, 854-840 m : 1 ♀ (MNHN-B 24632). — St. CP 91, 884-890 m : 1 ♂, 2 ♀ (MNHN-B 24633).

Australie : "*Soela*", Cruise 0184 : st. NWS-38, 458-456 m : 1 ♂ 4 x 5 mm, holotype (NTM-Cr. 001179). — St. NWS-57, 504-506 m : 1 ♀ 5,5 x 6 mm, paratype (MNHN-B 24460). — St. NWS-60, 352-360 m : 1 ♂ (NTM-Cr 000949).

DISTRIBUTION. — Viêtnam (14° à 15°N - 109°42'E), Philippines (12°25'35"N-121°42'15"E), Indonésie (05° à 09°S - 131° à 133°E) et Australie (18°52,2'S - 116°11,1'E), entre 245 et 890 m de profondeur.

VARIATIONS. — Le matériel rassemblé par les navires "*Albatross*", "*Siboga*", "*Orlik*" et par l'expédition KARUBAR, nous a permis d'étudier certains aspects des variations morphologiques chez cette espèce. Nous avons constaté des variations bien nettes en ce qui concerne l'écartement des dents rostrales (plus ou moins dirigées vers l'extérieur), le nombre et le développement des épines qui ornent la région ptérygostomienne et la marge interne du carpe de P1. Il n'est pas possible, pour l'instant, d'établir si les variations observées ont un rapport avec l'âge des spécimens. Selon toute vraisemblance, il n'existe pas de dimorphisme sexuel chez *T. brucei*. Comme nous l'avons indiqué (TAVARES, 1991b), *T. brucei* se distingue des autres espèces du genre surtout par le mérus des P2 beaucoup plus long que l'ensemble carpe + propode + dactyle. Ce caractère ne manifeste aucune variation dans l'ensemble du matériel examiné.

Genre *CORYCODUS* A. Milne Edwards, 1880

Corycodus A. Milne Edwards, 1880 : 23.
Corycodus - ALCOCK, 1896 : 274. — A. MILNE EDWARDS & BOUVIER, 1902 : 86. — IHLE, 1916a : 361 ; 1916b : 124. — STEBBING, 1920 : 242. — RATHBUN, 1937 : 101. — BARNARD, 1950 : 393. — BALSS, 1957 : 1609. — POWERS, 1977 : 26. — GUINOT, 1979 : 129. — KENSLEY, 1981a : 37. — ABELE & FELGENHAUER, 1982 : 316. — TAVARES, 1991b : 626.
Nasinatalis Stebbing, 1910 : 340 [espèce-type : *Nasinatalis disjunctipes* Stebbing, 1910, par monotypie].

DESCRIPTION. — Carapace à contour subpentagonal, très renflée, surtout au niveau des régions gastrique et branchiales. Céphalothorax très épais. Région cardiaque très basse. Saillies antéro-latérales de la carapace toujours présentes. Limites entre la face dorsale et les flancs de la carapace assez nettes. Front semi-circulaire, à bord denticulé. Largeur fronto-orbitaire bien inférieure à la moitié de celle, maximale, de la carapace. Orbites profondément creusées, à bords supérieur et inférieur bien délimités. Pédoncules oculaires mobiles, courts, orientés transversalement par rapport à l'axe de la carapace. Antennes beaucoup plus courtes que la moitié de la longueur maximale de la carapace ; segment 2+3 valviforme. Avancée de l'endostome en forme de gouttière, plus étroite vers l'avant, atteignant le bord frontal de la carapace. Exopodite des premiers et deuxièmes maxillipèdes normalement flagellés, celui des troisièmes maxillipèdes sans flagelle. Troisièmes maxillipèdes avec l'ischion et le mérus bien plus longs que larges ; palpe inséré sur la face interne du mérus. Chélipèdes de longueur égale ; doigts assez grêles, armés d'épines longues et aiguës. Péréiopodes 2 et 3 avec le propode et le dactyle ornés de soies courtes et peu denses ; dactyle légèrement comprimé latéralement. Abdomen femelle formé de sept segments, tous assez élargis, sauf le dernier qui est triangulaire. Pléopodes articulés sur la face ventrale des segments abdominaux 2 à 5, normalement biramés, pourvus de longues soies. Abdomen mâle formé de cinq segments. Sutures abdominales 5-6 et 6-7 parfois reconnaissables.

ESPÈCE-TYPE. — *Corycodus bullatus* A. Milne Edwards, 1880, par monotypie. Genre masculin.

ESPÈCES INCLUSES. — *Corycodus bullatus* A. Milne Edwards, 1880 ; *C. disjunctipes* (Stebbing, 1910) ; *C. bouvieri* Ihle, 1916 ; *C. merweae* sp. nov. et *C. decorus* sp. nov., décrites ci-après.

DISTRIBUTION. — Le genre *Corycodus* est représenté à la fois dans l'Indo-Ouest-Pacifique, par quatre espèces (*C. disjunctipes*, *C. bouvieri*, *C. merweae* et *C. decorus*), et dans l'océan Atlantique, par une espèce (*C. bullatus*), entre 113-620 m de profondeur.

REMARQUES. — Suite à la présente révision, le genre *Corycodus* renferme cinq espèces. Auparavant, *Corycodus* en comprenait seulement deux : *C. bullatus* A. Milne Edwards, 1880, qui est l'espèce-type, et *C. disjunctipes*. Une troisième, *C. bouvieri*, a été décrite des Philippines (îles Sulu, "*Siboga*", st. 95, 5°43,5'N - 119°40'E) par IHLE (1916a), puis considérée par IHLE lui-même (1916b), comme synonyme de *C. disjunctipes*. Après l'examen du matériel-type des trois espèces décrites auparavant dans le genre *Corycodus*, nous proposons la revalidation de *C. bouvieri*.

Deux autres espèces de *Corycodus* sont reconnues dans cette révision : *Corycodus merweae* sp. nov., établi pour un mâle et une femelle en provenance de l'Afrique du Sud (32°14,9'S - 29°10,4'E), récoltés entre 620-560 m de profondeur, et *Corycodus decorus* sp. nov., créé pour deux femelles originaires des côtes du Natal, Afrique du Sud.

Toutes les espèces du genre *Corycodus* sont étudiées ci-dessous, y compris la seule espèce américaine, *C. bullatus*.

Clef de détermination des espèces du genre *Corycodus*

1. Carapace ornée d'épines très fines et peu serrées. Distance entre la saillie antéro-latérale de la carapace et la dent exorbitaire correspondante, supérieure à la largeur du bord fronto-orbitaire. Saillies ptérygostomiennes représentées chacune par une dent très forte et aiguë. Longueur de l'exopodite des Mxp 3 dépassant de beaucoup le niveau de l'articulation ischio-mérale. Propode des chélipèdes armé d'épines très développées et aiguës .... ***C. merweae***

— Carapace à relief mouvementé, ornée de tubercules forts et aigus, de granules peu serrés, fins et arrondis, ou de tubercules à sommet aplati. Distance entre la saillie antéro-latérale de la carapace et la dent exorbitaire correspondante, nettement inférieure à la largeur du bord fronto-orbitaire. Saillies ptérygostomiennes absentes. Exopodite des Mxp 3 dépassant à peine le niveau de l'articulation entre l'ischion et le mérus. Propode des chélipèdes orné de tubercules arrondis **2**

2. Carapace couverte de tubercules forts et aigus, plus développés sur les régions frontale, hépatiques et épibranchiales. Entre ces tubercules, des petits granules très fins. Régions gastrique, cardiaque et intestinale généralement très ornées. Front semi-circulaire, bordé de fortes dents .... ***C. disjunctipes***

— Carapace couverte de tubercules en forme de vésicule, de tubercules fins et arrondis, ou de tubercules au sommet aplati. Régions gastrique, cardiaque et intestinale peu ou pas ornées. Front semi-circulaire à ornementation plutôt discrète **3**

3. Front légèrement dirigé vers le bas, bordé de tubercules vésiculaires. Dent exorbitaire peu écartée de la dent frontale latérale correspondante. Régions ptérygostomiennes recouvertes par des tubercules contigus, en forme de vésicule. Un creux, de dimension semblable à celle de l'orbite, au-dessous de celle-ci, orné à l'intérieur de grains minuscules .... ***C. decorus***

— Front semi-circulaire, fortement incliné vers le bas, bordé de tubercules discrets. Dent exorbitaire très écartée de la dent frontale latérale correspondante. Régions ptérygostomiennes ornées de tubercules espacés. Aucun creux au-dessous de l'orbite **4**

4. Carapace couverte de granules épars, fins et arrondis, se développant sur les régions frontale, hépatiques et épibranchiales en petits tubercules, parfois aigus .... ***C. bouvieri***

— Carapace couverte d'excroissances en forme de bâtonnets, dont la plupart se terminent par une étoile à nombre de pointes variable [six en général] .... ***C. bullatus***

Corycodus bullatus A. Milne Edwards, 1880

Fig. 6 a-c

Corycodus bullatus A. Milne Edwards, 1880 : 23.
Corycodus bullatus - A. MILNE EDWARDS & BOUVIER, 1902 : 86. — IHLE, 1916a : 361 ; 1916b : 124. — RATHBUN, 1937 : 103. — POWERS, 1977 : 26.

MATÉRIEL EXAMINÉ. — **Caraïbes.** "*Blake*" : st. 101, 315-457 m : 1 ♀ 4,5 x 8,5 mm, holotype (MCZ 6670). **Cuba** : "*Albatross*", st. 2342, 23°10'39"N - 82°20'21"W, 361 m : ♀ 7 x 15 mm (USNM 18061).

TYPES. — Holotype : femelle 4,5 x 8,5 mm, carapace et pattes détachées.

LOCALITÉ-TYPE. — Phare de Morro, ("*Blake*", st. 101), 315-457 m.

DESCRIPTION. — Carapace couverte d'excroissances à extrémité aplatie dont quelques-unes se développent de manière à ressembler à de petits bâtonnets. Ces excroissances tendent à disparaître dans les parties médiane et postérieure de la carapace ; elles sont très grandes le long des bords antérieurs. Régions de la carapace à peine marquées, à l'exception de la région cardiaque, petite et limitée par des sillons profonds, très rapprochés en avant et très divergents en arrière. Bords antéro-latéraux de la carapace un peu plus longs que les postéro-latéraux. Région frontale fortement déprimée en son milieu. Nodosités protogastriques bien marquées. Saillies ptérygostomiennes absentes. Saillies antéro-latérales de la carapace proéminentes, ornées de petits bâtonnets. Distance entre celles-ci et la dent exorbitaire (auvent) correspondante nettement inférieure à la largeur du bord fronto-orbitaire de la carapace. Front semi-circulaire, bordé de fortes épines. Dent exorbitaire assez écartée de la dent frontale latérale correspondante. Pédoncules oculaires courts, à face dorsale garnie de petites épines. Cornée bien pigmentée. Mérus et exopodite des troisièmes maxillipèdes munis d'épines émoussées sur leur face externe ; exopodite dépassant à peine le niveau de l'articulation ischio-mérale.

DISTRIBUTION. — Mer des Caraïbes (au large de la côte nord de Cuba), à 315-457 m de profondeur.

REMARQUES. — La femelle holotype a été conservée à sec jusqu'en 1970, date à laquelle elle a été mise en alcool. Subsistent au Museum of Comparative Zoology, le céphalothorax, deux pattes détachées du corps, et le troisième maxillipède droit.

Corycodus disjunctipes (Stebbing, 1910)

Fig. 2 b, 6 d-f

Nasinatalis disjunctipes Stebbing, 1910 : 340.
Corycodus disjunctipes - STEBBING, 1920 : 242. — BARNARD, 1950 : 393. — KENSLEY, 1978 : 250 ; 1981a : 37
Non *Corycodus disjunctipes* - IHLE, 1916b : 124 = *C bouvieri* Ihle, 1916.

MATÉRIEL EXAMINÉ. — **Afrique du Sud**. Cape Natal, 113 m : 1 ♀ 6 x 10 mm, lectotype à l'état sec (SAM) ; 1 ♀ 5 x 8 mm, paralectotype à l'état sec (SAM) ; 1 ♀ paralectotype abimée (BM 1928.12.1:220). — Localités imprécises (étiquettes mélangées : Cape Natal, Cape Vidal, et Umhloti River) : 5 ♂ et 11 ♀ conservés à l'état sec (SAM).

TYPES. — Lectotype : femelle à l'état sec conservée au South African Museum. Paralectotypes : une femelle à l'état sec conservée au South African Museum et une femelle avec la carapace abîmée conservée au The Natural History Museum, à Londres (BM 1928.12.1:220).

LOCALITÉ-TYPE. — Afrique du Sud, Cape Natal, 113 m.

DESCRIPTION. — Carapace couverte de tubercules serrés, forts et aigus, plus développés sur les régions frontale, hépatiques, et épibranchiales ; entre ceux-ci, des petits granules très fins. Région frontale fortement déprimée en son milieu. Bord latéral de la carapace bordé de dents fortes, plus développées au niveau de la région mésobranchiale. Flancs munis de tubercules pointus, plus développés sur la région ptérygostomienne.

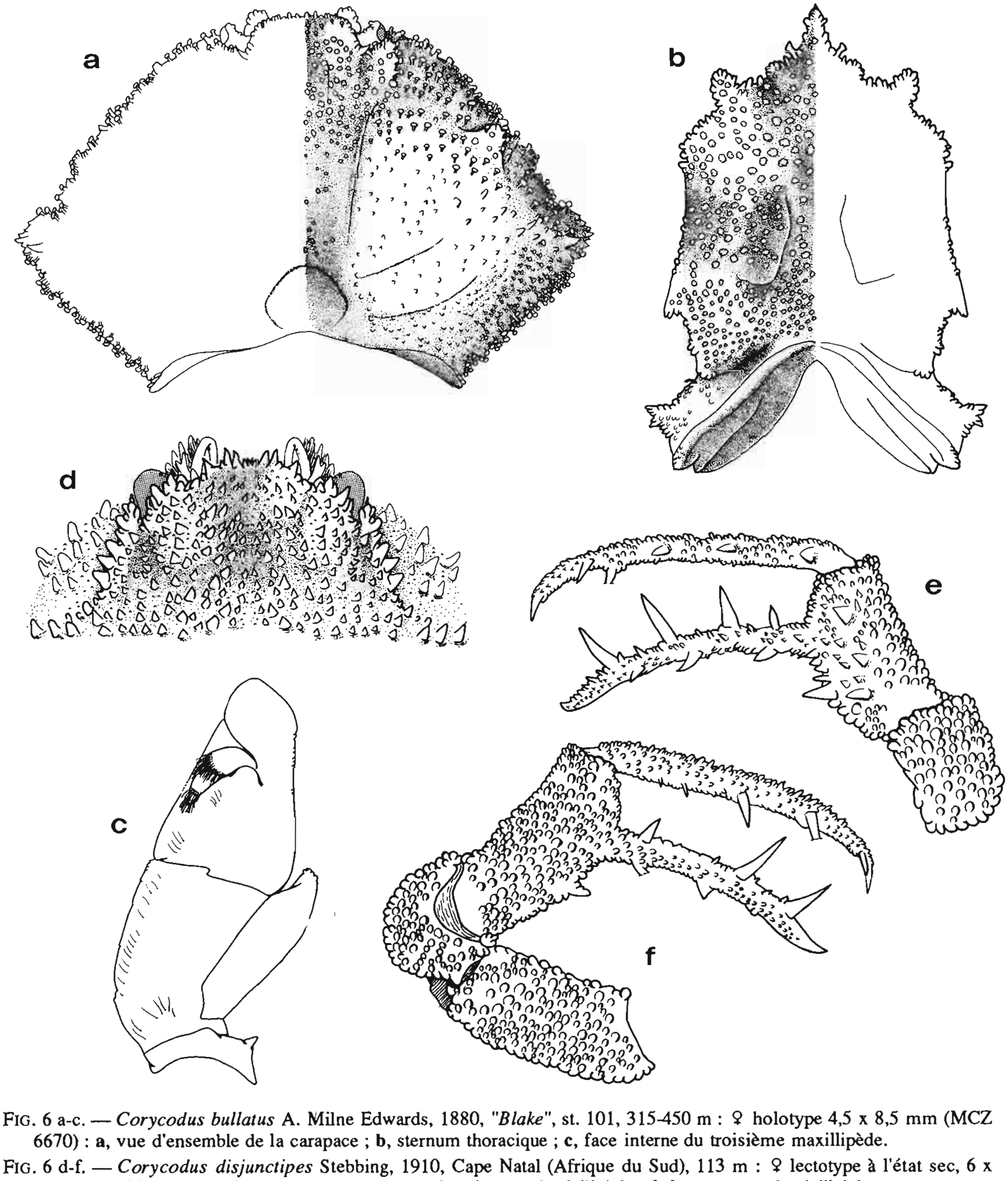

FIG. 6 a-c. — *Corycodus bullatus* A. Milne Edwards, 1880, "*Blake*", st. 101, 315-450 m : ♀ holotype 4,5 x 8,5 mm (MCZ 6670) : **a**, vue d'ensemble de la carapace ; **b**, sternum thoracique ; **c**, face interne du troisième maxillipède.

FIG. 6 d-f. — *Corycodus disjunctipes* Stebbing, 1910, Cape Natal (Afrique du Sud), 113 m : ♀ lectotype à l'état sec, 6 x 10 mm (SAM) : **d**, bord frontal de la carapace ; **e**, face interne du chélipède ; **f**, face externe du chélipède.

Fossettes gastriques très marquées. Nodosités protogastriques assez faibles. Région cardiaque délimitée latéralement par un sillon peu profond. Saillie ptérygostomienne absente. Saillie antéro-latérale de la carapace bien développée, ornée de tubercules arrondis. Distance entre celle-ci et la dent exorbitaire (auvent) nettement inférieure à la largeur du bord fronto-orbitaire de la carapace. Front semi-circulaire, bordé de fortes dents. Dent exorbitaire peu divergente de la dent frontale latérale. Face dorsale du pédoncule oculaire garnie de petites épines ; cornée faiblement pigmentée. Chélipèdes égaux ; face externe du mérus, du carpe et du propode, ainsi que la face interne du mérus et du carpe, ornées de gros granules arrondis ; sur la face interne du propode, quelques dents aiguës et très développées ; doigts assez grêles et allongés, armés d'épines très fortes et aiguës ; entre celles-ci, de petites épines et des tubercules spinuleux. Abdomen femelle assez gros par rapport à la carapace ; tergites abdominaux ornés d'amas de granules arrondis ; septième segment remarquablement petit par rapport aux segments précédents. Abdomen mâle de cinq segments, sutures abdominales 5-6 et 6-7 parfois reconnaissables.

DISTRIBUTION. — Afrique du Sud : Cape Natal, peut-être également Cape Vidal, et Umhloti River, 113 m.

VARIATIONS. — Le matériel étudié comprend 19 spécimens (5 mâles et 14 femelles, y compris les types), dont les dimensions de la carapace s'échelonnent de 4 x 5 à 5 x 7 mm chez les mâles, et de 5 x 7 à 6 x 10 mm chez les femelles.

Les variations individuelles sont pricipalement liées à la taille des individus. Chez les femelles les plus petites, les tubercules qui ornent la carapace sont moins développés et peu denses. Il en est de même chez les petits mâles.

REMARQUES. — STEBBING (1910), a fondé sa description de *C. disjunctipes* sur trois femelles que nous avons pu examiner. Comme nous l'avons déjà mentionné, deux sont conservées au South African Museum et une au The Natural History Museum, à Londres. STEBBING n'ayant pas désigné d'holotype pour *C. disjunctipes*, nous avons sélectionné comme lectotype, en vertu de son état de conservation beaucoup plus satisfaisant, l'un des deux spécimens deposés à Cape Town. Les deux autres femelles de *Corycodus disjunctipes* sont donc les paralectotypes.

Corycodus bouvieri Ihle, 1916

Fig. 7 a-d

Corycodus bouvieri Ihle, 1916a : 362.
Corycodus disjunctipes - IHLE, 1916b : 124.

MATÉRIEL EXAMINÉ. — **Philippines.** "*Siboga*" : st. 95, 5°43,5'N - 119°40'E, 522 m : 1 ♀ holotype (ZMA).

TYPES. — Holotype : femelle avec la carapace abîmée (ZMA).

LOCALITÉ-TYPE. — Proximité des îles Sulu ("*Siboga*", st. 95, 5°43,5'N - 119°40'E).

DESCRIPTION. — Carapace couverte de granules peu serrés, fins et arrondis, se développant en petits tubercules, parfois aigus, sur les régions frontale, hépatiques et épibranchiales. Régions gastrique, cardiaque et intestinale pratiquement sans ornementation ; région frontale fortement déprimée en son milieu. Flancs parcourus horizontalement par une série de dents qui commencent au niveau de la région mésobranchiale. Des tubercules arrondis assez denses sur les régions ptérygostomiennes. Nodosités protogastriques assez faibles. Saillies ptérygostomiennes absentes ; saillies antéro-latérales de la carapace bien nettes, ornées de petits granules. Distance entre celles-ci et la dent exorbitaire (auvent) correspondante nettement inférieure à la largeur du bord fronto-orbitaire de la carapace. Front semi-circulaire, fortement incliné vers le bas, bordé de petites dents. Dent exorbitaire très écartée de la dent frontale latérale correspondante. Face dorsale des pédoncules oculaires garnie de petites épines ; cornée faiblement pigmentée, semblant dégénérée. Troisièmes maxillipèdes avec le mérus et l'ischion ornés d'épines et de tubercules moyennement forts sur leur face externe ; exopodite dépassant un peu la suture entre ces deux articles. Chélipèdes de longueur égale ; face externe du mérus, du carpe et du propode, ainsi que la face interne du mérus et du carpe, ornées de granules arrondis ; sur la face interne du propode quelques dents aiguës ; doigts assez grêles et allongés, armés d'épines moyennement fortes et aiguës ; entre celles-ci, de petites épines et des tubercules spinuleux. Péréiopodes 2 et 3 similaires ; mérus, carpe, propode et dactyle ornés de tubercules fins.

DISTRIBUTION. — Espèce connue seulement de la localité-type (5°43,5'N - 119°40'E), à 522 m de profondeur.

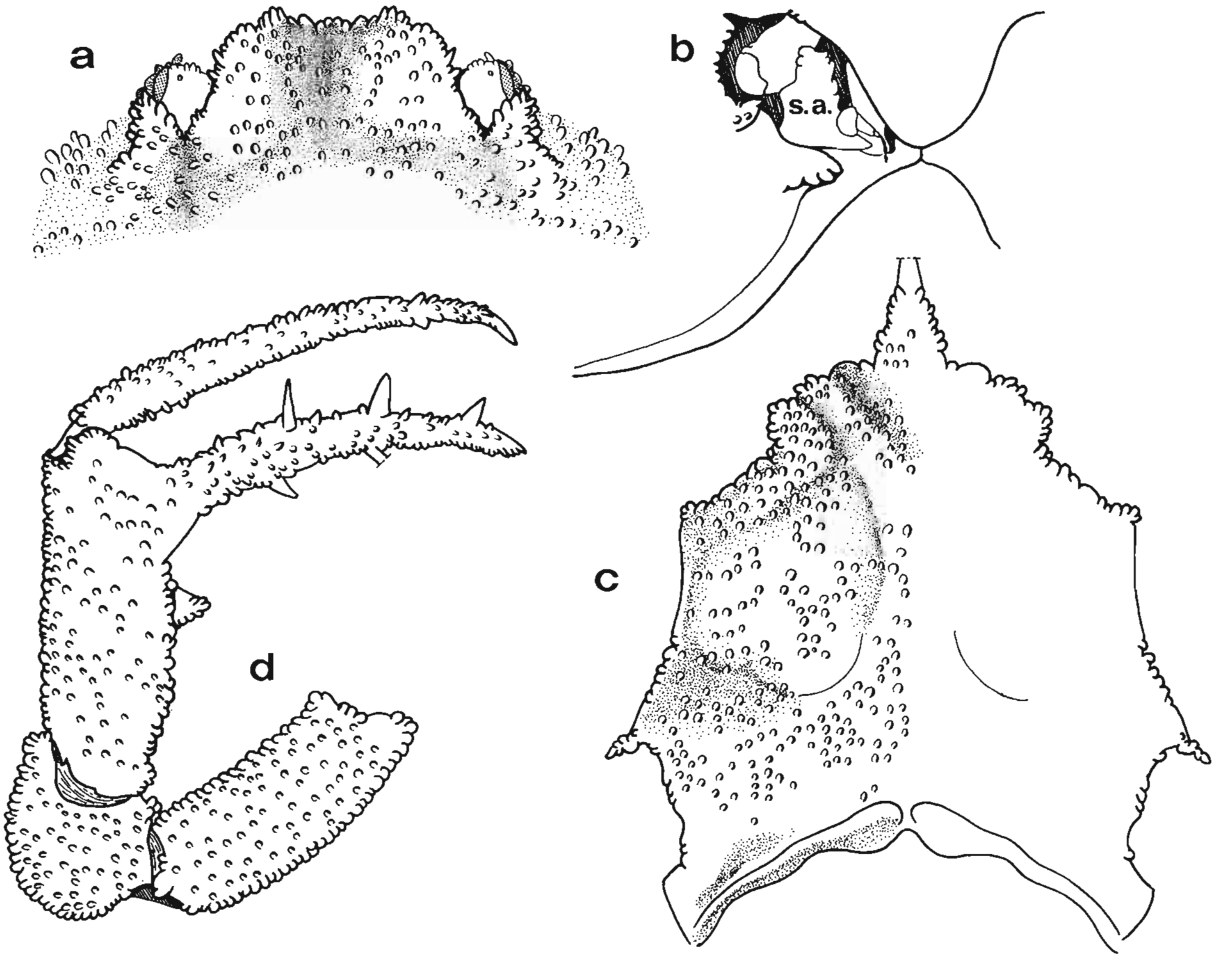

FIG. 7. — *Corycodus bouvieri* Ihle, 1916, Philippines, "*Siboga*", st. 95, 5°43,5'N - 119°40'E, 522 m : ♀ holotype avec la carapace abîmée (ZMA) : **a**, bord frontal de la carapace ; **b**, vue détaillée de la cavité orbitaire montrant le segment antennaire 2+3 valviforme (s.a.) ; **c**, sternum thoracique ; **d**, face externe du chélipède.

REMARQUES. — IHLE (1916a), a décrit *Corycodus bouvieri* d'après une femelle récoltée par la "*Siboga*" (st. 95, 5°43,5'N - 119°40'E), puis, la même année (IHLE, 1916b), en se basant uniquement sur la description de *C. disjunctipes* (Stebbing, 1910), a mis en synonymie sa nouvelle espèce et celle de STEBBING. La démarche de IHLE n'ayant jamais été remise en question par les auteurs ultérieurs, *C. bouvieri* est demeuré dans la synonymie de *C. disjunctipes*. En fait, ces deux espèces sont assez faciles à distinguer par l'ornementation de la carapace, beaucoup moins développée chez *C. bouvieri*, par les régions gastrique, cardiaque et intestinale pratiquement lisses, et par les dents exorbitaires divergeant fortement de la dent frontale latérale correspondante. Par certains points, l'ornementation de la carapace de *C. bouvieri* rappelle d'assez près celle de *C. bullatus*.

Corycodus merweae sp. nov.

Fig. 8 a-c

Corycodus disjunctipes - KENSLEY, 1981b : 60. Non *Corycodus disjunctipes* (Stebbing, 1910).

MATÉRIEL EXAMINÉ. — **Afrique du Sud** : R.V. "*Meiring Naude*" : st. SM 232, 32°14,9'S - 29°10,4'E, 620-560 m : 1 ♀ 6 x 9 mm, holotype (SAM A17679), 1 ♂ 5 x 7,5 mm, paratype (SAM A17679).

TYPES. — Holotype : femelle 6 x 9 mm (SAM A17679, R.V. "*Meiring Naude*", st. SM 232, 25.6.1979). L'autre spécimen de la liste ci-dessus est le paratype.

LOCALITÉ-TYPE. — Afrique du Sud, 32°14,9'S - 29°10,4'E, 620-560 m.

ÉTYMOLOGIE. — Cette espèce est dédiée à Michelle VAN DER MERWE, conservateur au South African Museum, toujours prête à apporter son aide lorsque des prêts de matériel lui sont demandés.

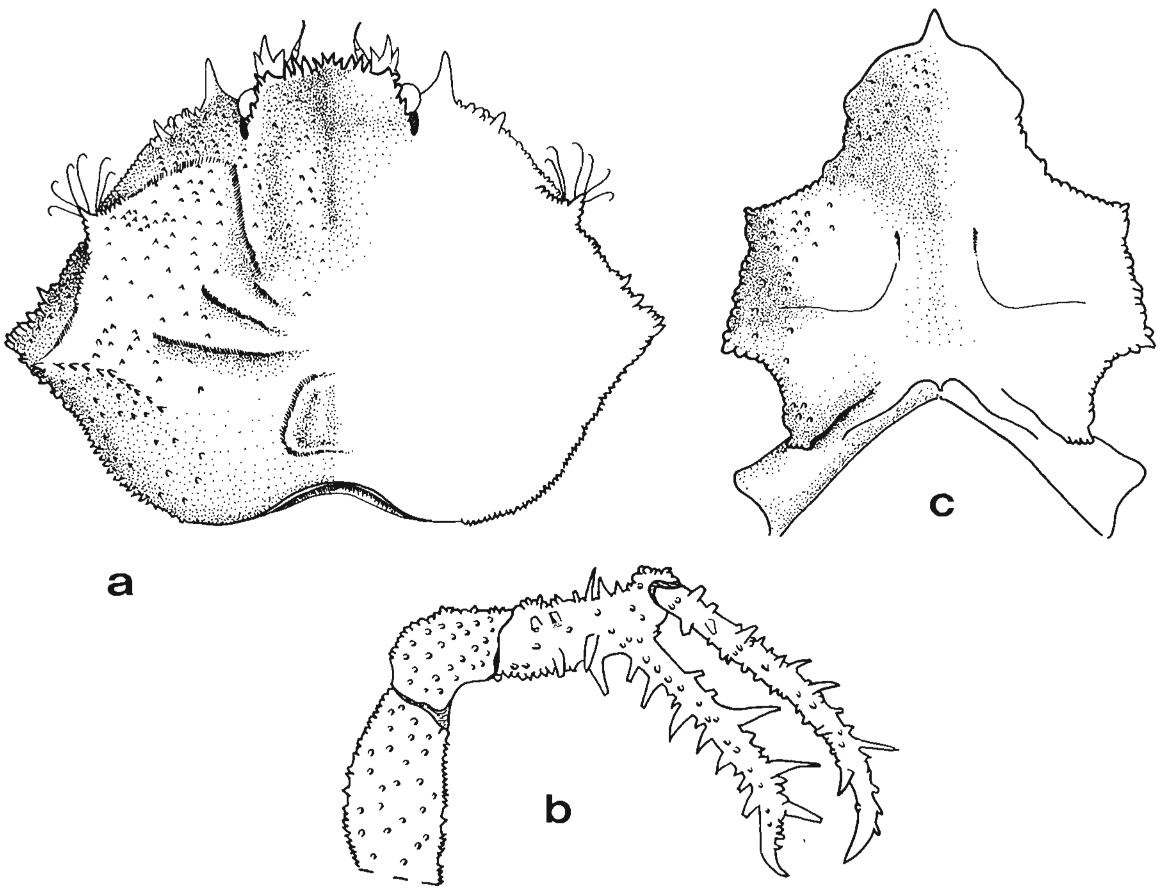

FIG. 8. — *Corycodus merweae* sp. nov., Afrique du Sud, R.♀. "*Meiring Naude*" st. SM 232, 32°14,9' S-29°10,4' E, 620-560 m : ♀ holotype 6 x 9 mm (SAM A17679) : **a**, vue d'ensemble de la carapace ; **b**, face externe du chélipède ; **c**, sternum thoracique.

DESCRIPTION. — Carapace ornée de granules émoussés assez clairsemés, un peu plus évidents sur les régions frontale, hépatiques et épibranchiales. Ornementation des régions gastrique, cardiaque et intestinale beaucoup moins dévéloppée. Région frontale fortement déprimée en son milieu. Flancs parcourus horizontalement par une série de dents développées qui commencent au niveau de la région mésobranchiale pour se réduire brusquement au niveau de la région ptérygostomienne. En plus de cette série de dents, régions ptérygostomiennes ornées de tubercules aigus. Nodosités protogastriques assez faibles. Saillies ptérygostomiennes représentées par une dent très forte et aiguë. Saillies antéro-latérales de la carapace très pointues, ornées de petits granules. Distance entre celles-ci et la dent exorbitaire (auvent) correspondante, supérieure à la largeur du bord fronto-orbitaire de la carapace. Front semi-circulaire, bordé de fortes épines. Dents exorbitaires peu écartées de la dent frontale latérale correspondante. Face dorsale des pédoncules oculaires garnie de petites épines ; cornée complètement dégénérée, ne présentant aucune trace de pigmentation. Mérus et ischion des troisièmes maxillipèdes munis d'épines très fortes sur leur face externe ; longueur de l'exopodite dépassant de beaucoup le niveau de la suture entre le mérus et l'ischion. Chélipèdes égaux ; face externe du mérus et du carpe ornée de granules arrondis ; propode (sur les faces externe et supérieure) et dactyle (surtout la face interne) armés d'épines très fortes et aiguës. Péréiopodes 2 et 3 similaires ; mérus et carpe ornés de tubercules fins, ceux-ci presque absents sur le propode ; dactyle lisse, muni de soies courtes. Péréiopodes 4 et 5 subdorsaux, similaires, courts ; mérus, carpe et propode assez peu ornementés, munis de très petits granules ; dactyle incurvé, muni de quelques granules spinuleux sur la face préhensile. Tergites 2-7 de l'abdomen femelle ornés de tubercules aigus ; premier tergite abdominal inerme ; septième segment petit par rapport aux précédents. Abdomen mâle de cinq segments, ornés de granules émoussés, moins visibles sur le segment cinq.

DISTRIBUTION. — Afrique du Sud (32°14,9'S - 29°10,4'E), à 620-560 m de profondeur.

VARIATIONS. — Il existe vraisemblablement un dimorphisme sexuel chez *C. merweae*, en ce qui concerne le renflement de la région cardiaque et l'ornementation de la carapace. Chez les deux sexes, les régions frontale, hépatique et épibranchiales sont très renflées, tandis que la région cardiaque l'est peu chez la femelle et nettement plus chez le mâle. Ainsi, chez la femelle, la région cardiaque paraît beaucoup plus déprimée que chez le mâle par rapport au reste de la carapace. Quant à l'ornementation de la carapace, elle est, chez la femelle, moins développée sur la face dorsale et les régions sous-hépatiques et ptérygostomiennes que chez le mâle. Il nous paraît peu probable que ces variations soient en rapport avec la taille des spécimens, car les différences de proportion entre la femelle holotype (6 x 9 mm) et le mâle paratype (5 x 7,5 mm) sont assez faibles.

REMARQUES. — Le matériel décrit ci-dessus comme *C. merweae* avait été identifié par KENSLEY (1981 : 60) à *C. disjunctipes* (Stebbing, 1910).

C. merweae se sépare assez facilement des deux autres espèces indo-ouest-pacifiques du genre, *C. disjunctipes* (Stebbing, 1910) et *C. bouvieri* Ihle, 1916, par l'ornementation assez discrète de la carapace (plus marquée chez les deux autres espèces), par la distance entre la saillie antéro-latérale et la dent exorbitaire (auvent) supérieure à la largeur du bord fronto-orbitaire de la carapace (au lieu d'être nettement inférieure), par le propode des chélipèdes armé d'épines fortes et aiguës (une telle ornementation n'existe pas chez les deux autres espèces), par les saillies ptérygostomiennes représentées par une forte épine très aiguë (absente chez les deux autres espèces), par la longueur de l'exopodite des troisièmes maxillipèdes qui dépasse de beaucoup la suture entre l'ischion et le mérus (au lieu de la dépasser à peine).

Corycodus decorus sp. nov.

Fig. 9 a-b

MATÉRIEL EXAMINÉ. — **Afrique du Sud.** Côtes du Natal : 1 ♀ 6 x 9 mm, holotype (SAM) ; 1 ♀ 5 x 8 mm, paratype (SAM).

TYPES. — Holotype : femelle 6 x 9 mm (SAM). L'autre spécimen mentionné ci-dessus est le paratype. Jusqu'à présent, les deux femelles types avaient été conservées à l'état sec ; après les avoir régénérées, nous les avons remises dans l'alcool.

LOCALITÉ-TYPE. — Côtes du Natal (Afrique du Sud) avec certitude, mais on ne peut préciser s'il s'agit de Cape Natal, de Cape Vidal ou de Umhloti River.

Les collections du South African Museum contiennent un échantillon identifié à *Corycodus disjunctipes*, comportant trois étiquettes (Cape Natal SAM-A 1456, Cape Vidal SAM-A 1609, et Umhloti River SAM-A 517) sans indication du nom du déterminateur et qui n'a pas donné lieu à une publication. Il est manifeste que trois lots ont été mélangés. Cet échantillon comprend 20 spécimens, dont 5 mâles et 13 femelles sont identifiables à *C. disjunctipes*, et deux femelles à l'espèce nouvelle, baptisée ici *Corycodus decorus*. Il est impossible de déceler l'appartenance géographique exacte des divers spécimens.

ÉTYMOLOGIE. — Du Latin *decoratus*, ornementé, par allusion au type particulier d'ornementation de la carapace.

DESCRIPTION. — Carapace couverte de tubercules serrés, en forme de vésicule, sur les régions frontale, hépatiques, mésogastrique et branchiales ; régions gastrique, cardiaque, et intestinale à peine ornées de quelques granules arrondis épars ; régions ptérygostomiennes recouvertes de tubercules vésiculaires serrés qui deviennent moins marqués et espacés vers l'arrière des flancs de la carapace. Fossettes gastriques bien marquées. Nodosités protogastriques à peine perceptibles. Saillies ptérygostomiennes absentes. Saillies antéro-latérales de la carapace distinctes, complètement recouvertes de petits tubercules vésiculaires. Distance entre la saillie antéro-latérale et la dent exorbitaire (auvent) correspondante nettement inférieure à la largeur du bord fronto-orbitaire de la carapace. Front dirigé vers le bas, bordé de tubercules vésiculaires ; dents exorbitaires peu écartées de la dent frontale latérale correspondante. Au-dessous de chaque orbite et de dimensions semblables à celle-ci, s'observe un creux orné à l'intérieur de grains minuscules. Cornée moyennement pigmentée. Chélipèdes, péréiopodes et abdomen manquant.

DISTRIBUTION. — Afrique du Sud, côtes du Natal. Distribution bathymétrique inconnue.

REMARQUES. — *Corycodus disjunctipes* (Stebbing, 1910) et *C. decorus* cohabitent en Afrique du Sud, sur la côte du Natal. *C. decorus* se distingue aisément grâce aux nombreux tubercules en forme de vésicule qui couvrent la majeure partie de la face dorsale de la carapace (régions frontale, hépatiques, mésogastrique, et branchiales) et les régions ptérygostomiennes, et aux creux situés au-dessous des orbites.

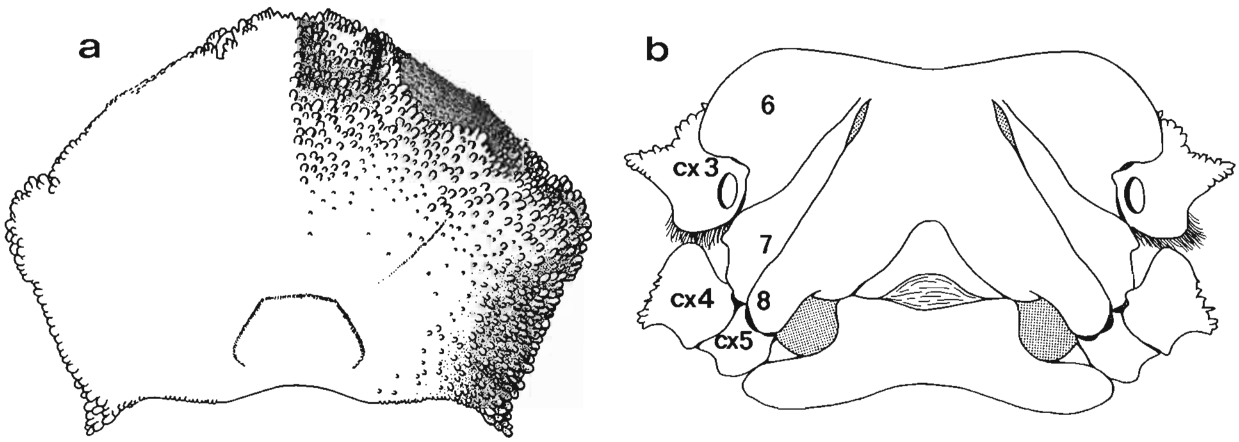

FIG. 9. — *Corycodus decorus* sp. nov., Afrique du Sud, côtes du Natal : 1 ♀ holotype 6 x 9 mm (SAM) : **a**, vue d'ensemble de la carapace ; **b**, sternum thoracique incliné pour montrer les derniers sternites. 6-8, sternites thoraciques ; cx3-cx5, coxa des péréiopodes 3 à 5.

Genre *GENKAIA* Miyake & Takeda, 1970

Genkaia Miyake & Takeda, 1970 : 20.
Genkaia - TAKEDA, 1973a : 22 ; 1973b : 77 ; 1985 : 97. — SAKAI, 1976 : 7.

DESCRIPTION. — Carapace à face dorsale assez plane, à contour subcirculaire, plus large en arrière des saillies latéro-branchiales. Saillies antéro-latérales et latéro-branchiales (les seules sur la carapace) bien reconnaissables. Limites entre la face dorsale de la carapace et les flancs assez nettes. Région frontale peu déprimée en son milieu. Front hexagonal, proéminent, se prolongeant par une avancée rostrale très courte. Largeur fronto-orbitaire supérieure à la moitié de la largeur maximale de la carapace. Orbites assez profondes, avec les bords supérieur et inférieur bien délimités. Pédoncules oculaires mobiles, courts, orientés transversalement par rapport à l'axe de la carapace. Antennes robustes ; article 2+3 se prolongeant en une avancée externe très allongée, dépassant de beaucoup la longueur des articles suivants. Avancée de l'endostome très courte ; bords latéraux du cadre buccal allongés et concaves, se prolongeant jusqu'au segment 2+3 de l'antenne. Troisièmes maxillipèdes se coaptant parfaitement avec le bord latéral du cadre buccal. Exopodites des trois paires de maxillipèdes pourvus d'un flagelle bien développé. Exopodite de Mxp3 avec l'extrémité effilée ; palpe articulé à l'angle antéro-externe du mérus, ses articles 2 et 3 comprimés dorso-ventralement. Abdomen femelle formé de sept segments, tous assez élargis. Pléopodes 1 de la femelle vestigiaux, uniramés, insérés sur la face ventrale du premier segment abdominal. Septième sternite thoracique femelle chevauchant une partie du sternite précédent. Sternites thoraciques contigus chez le mâle. Abdomen mâle formé de sept segments.

ESPÈCE-TYPE. — *Genkaia gordonae* Miyake & Takeda, 1970, par désignation originale.

ESPÈCES INCLUSES. — *Genkaia gordonae* Miyake & Takeda, 1970, et *Genkaia keijii* sp. nov., décrite ci-après.

DISTRIBUTION. — Genre indo-ouest-pacifique, entre 43 et 150 m de profondeur.

REMARQUES. — MIYAKE et TAKEDA (1970) ont rattaché le genre *Genkaia* à la famille des Dromiidae. Selon ces deux auteurs (1970 : 19), *Genkaia* "is referable to the section Dromiacea on account of having first pleopods in the female", et plus loin (1970 : 26) "the present new genus [*Genkaia*] is tentatively referred to the family Dromiidae to which it seems to be more related rather than to the family Homolodromiidae in the general formation of the carapace". Peu après, TAKEDA (1973b : 77) laisse apparaître ses incertitudes quant à la position systématique du genre *Genkaia* : "Although the genera may represent a family distinct from the Dromiidae, they remain in the original family [Dromiidae] due to that imperfect knowledege of the branchial formulae".

A notre avis, *Genkaia* appartient à la lignée cyclodoripoïdienne. Il en présente le sternum thoracique élargi chez les femelles (un peu moins élargi chez les mâles), donc incomplètement recouvert par l'abdomen ; les sternites 7-8 perpendiculaires par rapport aux sternites 4-6 ; les sillons sternaux du mâle et de la femelle assez nets ; les sternites 7-8 participant seuls à la formation de la cavité sterno-abdominale ; une structure du pléopode mâle ne différant pas de celle des autres genres de la famille (Pl 1 et Pl 2 presque de la même épaisseur ; Pl 2 styliforme chez les Dromiidae). Évoqué par MIYAKE et TAKEDA (1970) puis par TAKEDA (1985), l'argument selon lequel le pléopode du premier segment abdominal serait absent chez les femelles des Cyclodorippidae, est inexact. Ce pléopode existe, sous forme certes vestigiale mais toutefois très distincte, chez les femelles des genres *Xeinostoma*, *Krangalangia*, et *Ketamia*.

Chez les Dromiidae, le sternum thoracique est étroit et l'abdomen replié le recouvre entièrement ; les sternites 4-6 participent à la formation de la cavité sterno-abdominale ; la forme du plastron est assez particulière (sillons sternaux 4 à 8, surtout le 7-8, fortement rejetés vers l'avant) et les sillons sternaux chez les mâles sont à peine reconnaissables ; les pléopodes mâles, assez uniformes, se distinguent bien de ceux des Cyclodorippidae (Pl 1 beaucoup plus épais que Pl 2, ce dernier particulièrement effilé).

Les Cyclodorippidés des genres *Genkaia* et *Phyllotymolinum* gen. nov. offrent un appareil respiratoire de type oxystome, mais les modifications subies par les appendices buccaux ne sont pas exactement les mêmes que celles présentées par les autres genres de la famille. Une disposition oxystome n'est présente chez aucun des genres de Dromiidae.

Clef de détermination des espèces du genre *Genkaia*

— Distance entre la saillie latéro-branchiale de la carapace et la dent exorbitaire correspondante aussi grande que la moitié de la largeur du bord fronto-orbitaire de la carapace. Régions métabranchiales presque lisses. Doigts des chélipèdes allongés (doigt fixe orné de deux carènes longitudinales assez nettes sur chacune des faces interne et externe ; doigt mobile avec une seule carène). Bord préhensile du doigt fixe armé de dents menues. Face ventrale du propode du chélipède avec une avancée bien développée et en forme d'aile ; face ventrale du mérus muni d'une bosse assez grosse .... ***G. keijii***

— Distance entre la saillie latéro-branchiale de la carapace et la dent exorbitaire correspondante nettement moins grande que la moitié de la largeur du bord fronto-orbitaire. Régions métabranchiales abondamment garnies de granules aplaties. Doigts des chélipèdes plutôt courts (la paire de carènes sur le doigt fixe et la carène impaire du doigt mobile très peu nettes). Bord préhensile du doigt fixe armé de dents triangulaires fortes et assez développées. L'avancée aliforme de la face ventrale du propode des chélipèdes moyennement développée ; pas de bosse (ni d'autre protubérance accentuée, seulement des granules) sur la face ventrale du mérus .... ***G. gordonae***

Genkaia gordonae Miyake & Takeda, 1970

Fig. 10 a-d

Genkaia gordonae Miyake & Takeda, 1970 : 20.
Genkaia gordonae - TAKEDA, 1973a : 23 ; 1985 : 97. — SAKAI, 1976 : 7.

MATÉRIEL EXAMINÉ. — **Japon**. *"Genkai"* : st. 415, North of Fukue, Goto Is., 32°48,8'N - 128°48,65'E, 68 m : 1 ♂ 3,7 x 3,8 mm (MSMT-Cr. 6531).

Okinawa : 26°30'N - 127°50'E, 61 m : 1 ♂ (USNM). — 26°30'N - 127°50,9'E, 45-49 m : 1 ♂ (USNM). — 26°30'N - 127°50,9'E, 61 m : 1 ♀ (USNM). — 26°30,9'N - 127°50,9'E, 55 m : 1 ♂, 1 ♀ (USNM). — 26°30,9'N - 127°50,9'E, 58 m : 1 ♀ (USNM). — 26°30,9'N - 127°50,9'E, 64 m : 1 ♂ (USNM). — 26°30'N - 127°50,9'E, 52-58 m : 1 ♀ (USNM). — 26°30'N - 127°50,9'E, 58 m : 1 ♀ (USNM). — 26°30'N - 127°50,9'E, 67 m : 1 ♂ (USNM). — 26°30,4'N - 127°52,6'E, 43 m : 1 ♀ (USNM). — 26°30'N - 127°50,9'E, 64 m : 1 ♀ ovigère (USNM). — 26°30,9'N - 127°50,9'E, 55 m : 1 ♀ (USNM). — 26°30,9'N - 127°50,9'E, 67 m : 1 ♂ juvenile (USNM). — 26°30,4'N - 127°52,6'E, 52 m : 1 ♂, 1 ♀ (USNM). — 26°30'N - 127°50,9'E, 61 m : 1 ♂ (USNM). — 26°30'N - 127°50,9'E, 52 m : 1 ♀ ovigère (USNM).

DISTRIBUTION. — Japon (Tsushima, nord-est de Kyushu ; Goto, nord de Fukue), entre 68 et 100 m de profondeur.

REMARQUES. — MIYAKE et TAKEDA (1970) ont établi *G. gordonae* d'après une femelle ovigère, récoltée au Japon sur un fond de sable et de coquilles, et en ont fait une description détaillée. En 1985, TAKEDA a décrit le mâle et figuré la carapace, le troisième maxillipède, le chélipède, les péréiopodes et l'abdomen. TAKEDA n'ayant pas illustré le pléopode mâle, ni précisé certains détails du chélipède et de la troisième patte thoracique, nous donnons ici une figure des ces appendices.

Les caractères qui séparent *Genkaia gordonae* de *G. keijii* sp. nov. sont mentionnés ci-après.

Genkaia keijii sp. nov.

Fig. 2d, 11 a-e, 13 d

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie**. LAGON : st. 190, 135-150 m : 1 ♀ 3,9 x 4 mm, holotype, partiellement mutilée. Les P4 et P5 ainsi que les segments abdominaux 2-7 manquent (MNHN-B 24619).

TYPES. — Le seul spécimen connu, la femelle mentionnée ci-dessus, est l'holotype.

LOCALITÉ-TYPE. — Nouvelle-Calédonie, baie de St. Vincent, 22°02,1'S - 165°57,3'E, 135 à 150 m.

ÉTYMOLOGIE. — Espèce dédiée à Keiji BABA, professeur à l'Université de Kumamoto, toujours prêt a apporter son aide lorsque des recherches de matériel japonais lui sont demandées.

DESCRIPTION. — Carapace couverte de granules aplatis, plus serrés sur la région frontale, très espacés sur l'aire centrale, et presque absents sur les régions métabranchiales. Fossettes gastriques très peu marquées. Nodosités protogastriques à peine reconnaissables. Régions cardiaque et gastrique délimitées par un sillon profond. Saillies

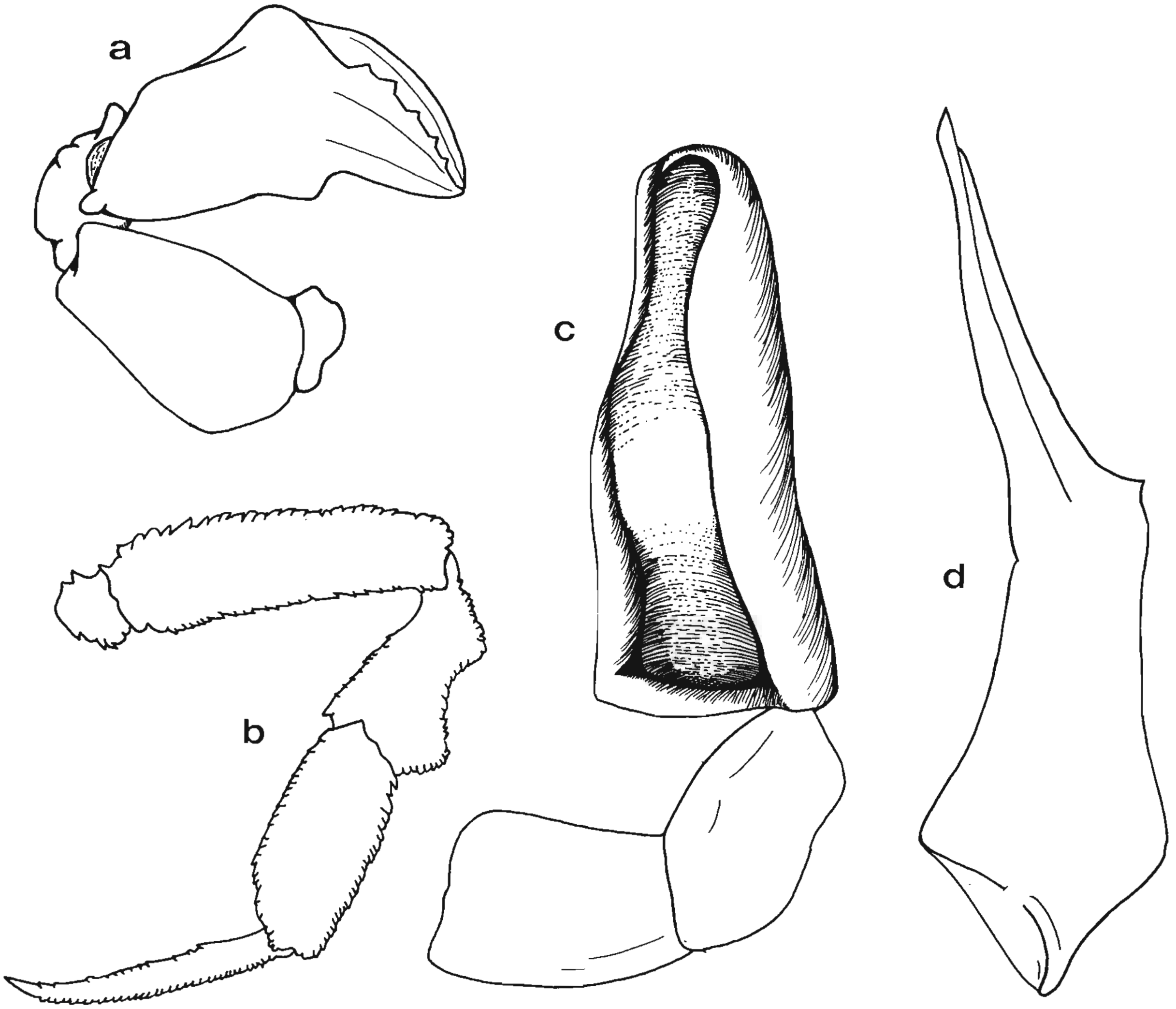

FIG. 10. — *Genkaia gordonae* Miyake & Takeda, 1970, Japon, North of Fukue, Goto Is., "*Genkai Maru*", st. 415, 32°48,8'N - 128°48,65'E, 68 m : ♂ 3,7 x 3,8 mm (MSMT-Cr. 6531) : **a**, face externe du chélipède ; **b**, face externe du troisième péréiopode ; **c**, premier pléopode sexuel ♂ ; **d**, deuxième pléopode sexuel ♂.

hépatiques et antéro-latérales (les seules sur la carapace) plutôt spatulées, dirigées vers l'avant, ornées de granules aplatis. Face dorsale des pédoncules oculaires garnie de granules saillants et armée d'un tubercule proéminent lui-même granuleux et incurvé vers la cornée. Cornée bien pigmentée. Antennes avec l'avancée de l'article 2+3 munie d'épines aiguës. Troisièmes maxillipèdes très peu sétifères, avec toute leur face externe munie de granules pointus assez peu espacés. Chélipèdes avec une ornementation constituée par des bosses et des proéminences en forme d'aile revêtues, les unes et les autres, de granules contigus et arrondis. On observe une bosse très saillante sur la face ventrale du mérus, tandis que le propode présente, ventralement, une avancée très prononcée, en forme d'aile et, sur sa face externe, deux bosses élevées. Doigt fixe avec deux carènes assez étendues le long de la face interne et de la face externe. Doigt mobile étroit par rapport au doigt fixe, avec une carène assez étendue le long de ses faces interne et externe. P2 et P3 similaires, ornés de granules aplatis. Sternum thoracique et tergites abdominaux garnis de granules arrondis.

DISTRIBUTION. — Nouvelle-Calédonie, à 135-150 m de profondeur.

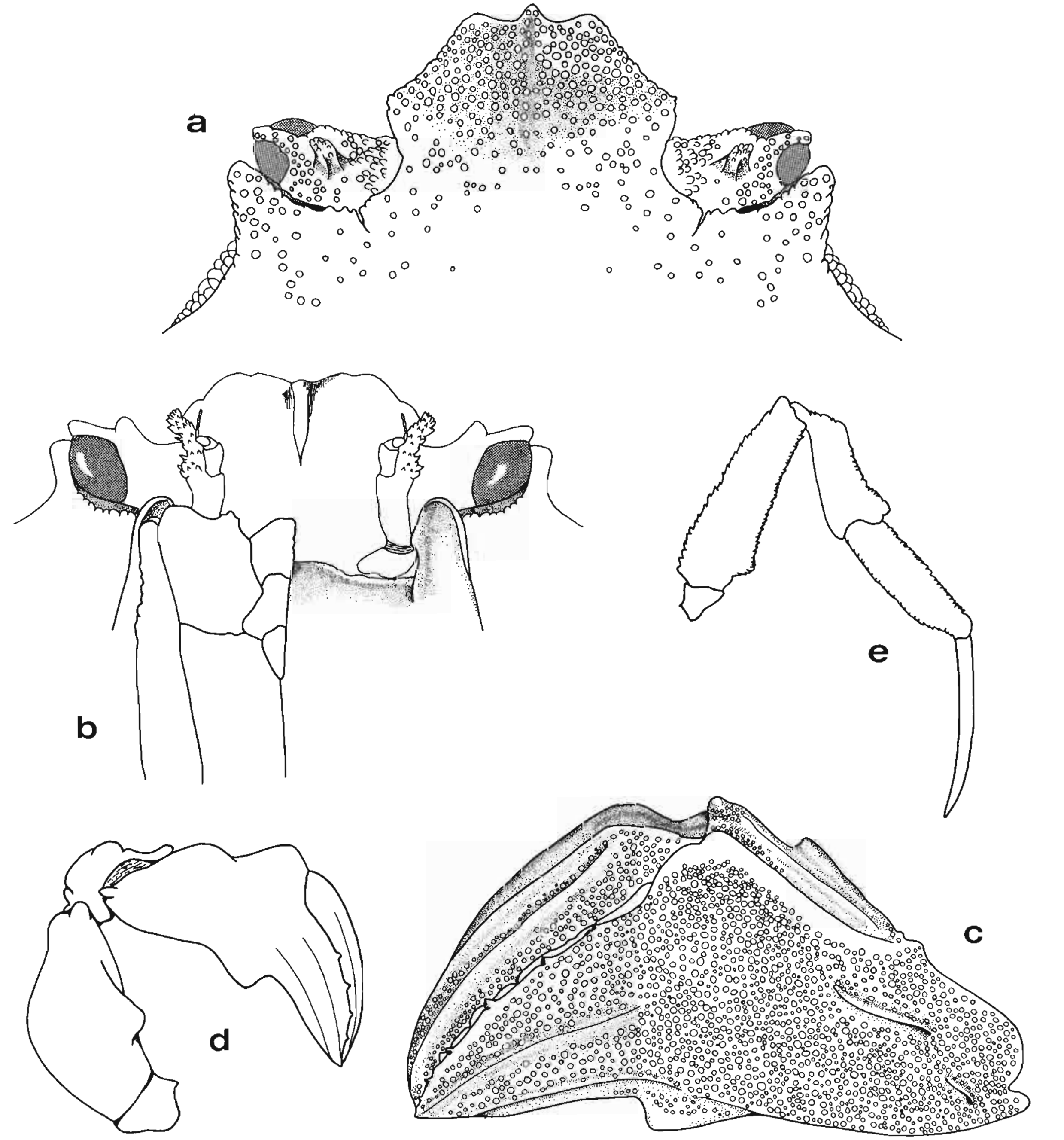

FIG. 11. — *Genkaia keijii* sp. nov., Nouvelle-Calédonie, LAGON 3, st. 190, 22°02,1'S - 165°57,3'E, 135-150 m : ♀ holotype 3,9 x 4 mm (MNHN-B 24619) : **a**, bord frontal de la carapace ; **b**, vue ventrale de la région antérieure et cadre buccal ; **c**, face externe de la pince du chélipède ; **d**, face externe de l'ensemble du chélipède ; **e**, face externe du troisième péréiopode.

REMARQUES. — Les caractères par lesquels s'opposent *Genkaia keijii* et *G. gordonae* sont les suivants : chez la nouvelle espèce, l'extrémité du rostre est faiblement dirigée vers le bas, tandis que chez *G. gordonae* la pointe du rostre est fortement inclinée. Par ailleurs, chez *G. keijii*, la distance entre la saillie latéro-branchiale de la carapace et la dent exorbitaire correspondante est aussi grande que la moitié de la largeur du bord fronto-orbitaire et les régions métabranchiales de la carapace sont presque lisses. Contrairement à l'espèce de la Nouvelle-Calédonie, chez celle du Japon la distance entre la saillie latéro-branchiale de la carapace et la dent exorbitaire correspondante est nettement inférieure à la moitié de la largeur du bord fronto-orbitaire et les régions métabranchiales sont abondamment garnies de granules aplatis.

Genkaia keijii et *G. gordonae* se différencient aussi par la forme et par l'ornementation des chélipèdes et des troisièmes péréiopodes. La nouvelle espèce se caractérise par des chélipèdes à doigts allongés (doigt fixe orné de deux carènes longitudinales assez nettes, sur chacune des faces interne et externe ; doigt mobile avec une seule carène) ; le bord préhensile du doigt fixe est armé de dents menues ; sur la face ventrale du propode il y a une avancée bien développée et en forme d'aile. Le mérus est muni d'une bosse assez grosse sur sa face ventrale.

Chez *G. gordonae*, les doigts fixe et mobile des chélipèdes sont plus courts ; les carènes qui les ornent sont orientées de la même façon que celles de *G. keijii*, mais très peu nettes. Le bord préhensile du doigt fixe est armé de dents triangulaires, fortes et assez développées. Contrairement à ce qu'on trouve chez *G. keijii*, chez *G. gordonae* l'avancée aliforme de la face ventrale du propode des chélipèdes est moyennement développée et il n'y a pas de bosse (ni d'autre protubérance accentuée, seulement des granules) sur la face ventrale du mérus.

En ce qui concerne les troisièmes péréiopodes, *G. keijii* possède un propode presque 3,5 fois plus long que haut, avec le bord supérieur légèrement concave. Par contre, chez *G. gordonae*, le propode est moins de 2,5 fois plus long que haut, avec le bord supérieur découpé en deux structures aliformes : l'une proximale et l'autre distale. Chez l'espèce de la Nouvelle-Calédonie, le dactyle est faiblement ornementé, tandis que chez l'espèce japonaise celui-ci est abondamment garni de petites spinules.

Genre *PHYLLOTYMOLINUM* nov.

DESCRIPTION. — Carapace à face dorsale assez plane et à contour subcirculaire, sa plus grande largeur au niveau des saillies antéro-latérales. Saillies hépatiques et antéro-latérales (les seules sur la carapace) bien reconnaissables. Limites entre la face dorsale de la carapace et les flancs assez nettes. Front subtriangulaire terminé par une avancée rostrale plus aiguë. Région frontale déprimée en son milieu. Largeur fronto-orbitaire supérieure à la moitié de la largeur maximale de la carapace. Orbites assez profondes, avec les bords supérieur et inférieur bien délimités. Pédoncules oculaires mobiles, courts, orientés transversalement par rapport à l'axe de la carapace. Antennes remarquablement robustes, surtout l'article 2+3, qui est en forme d'auvent. Avancée de l'endostome très courte. Bords latéraux du cadre buccal assez allongés, atteignant le segment 2+3 de l'antenne. Exopodites des trois paires de maxillipèdes pourvus d'un flagelle normal. Exopodite de Mxp3 avec l'extrémité distale assez étroite ; palpe articulé à l'angle antéro-externe du mérus, ses articles 2 et 3 comprimés dorso-ventralement. Sternites thoraciques 6-7 contigus aussi bien chez les mâles que chez les femelles. Abdomen femelle formé de sept segments très élargis ; pléopodes sur les segments abdominaux 2 à 5 ; exopodite de Pl 2-Pl 5 assez élargi, foliacé, articulé sur la face ventrale des segment abdominaux. Abdomen mâle formé de sept segments.

ÉTYMOLOGIE. — Nom générique formé par la combinaison des mots grecs, *phyllon*, feuille, et du nom neutre *tymolinum*, par allusion aux pléopodes foliacés de la femelle. Genre neutre.

ESPÈCE-TYPE. — *Phyllotymolinum crosnieri* sp. nov.

ESPÈCES INCLUSES. — *Phyllotymolinum crosnieri* sp. nov., décrite ci-après.

DISTRIBUTION. — Genre indo-ouest-pacifique, trouvé entre 205 et 370 m de profondeur.

REMARQUES. — *Phyllotymolinum* gen. nov. est créé ici pour une seule espèce, *Phyllotymolinum crosnieri* sp. nov., provenant des eaux profondes néo-calédoniennes.

Le nouveau genre montre certaines affinités avec le genre *Genkaia*, surtout en ce qui concerne l'aspect général de la carapace, de la région buccale et de l'abdomen. Néanmoins, l'absence de pléopodes sur le premier segment abdominal (premier pléopode présent chez *Genkaia*), l'exopodite des pléopodes 2-5 élargis, foliacé (exopodite des pléopodes normaux chez *Genkaia*) et les sternites thoracique 6-7 contigus chez les mâles comme chez les femelles (septième sternite thoracique femelle surmontant une partie du sternite précédent chez *Genkaia*), sont autant de traits qui distinguent les genres *Phyllotymolinum* et *Genkaia*.

Phyllotymolinum crosnieri sp. nov.

Fig. 2 g, 12 a-e

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie**. LAGON : st. 500, 225 m : 1 ♂ (MNHN-B 24609).

MUSORSTOM 4 : st. DW 163, 350 m : 1 ♂ (MNHN-B 24610). — St. CC 175, 370 m : 1 ♂ (MNHN-B 24611). — St. DW 186, 205 m : 1 ♂ (MNHN-B 24612).

MUSORSTOM 5 : st. DW 335, 315 m : 1 ♂ (MNHN-B 24613). — St. DW 336, 350 m : 1 ♀ (MNHN-B 24614). — St. DW 353, 290 m : 1 ♂ (MNHN-B 24615) ; 1 ♀ (MNHN-B 24616). — St. DC 376, 280 m : 1 ♂, 1 ♀ (USNM).

SMIB 6 : st. DW 117, 280 m : 1 ♂ 5,7 x 6,9 mm, holotype (MNHN-B 24617) ; 1 ♂, 1 ♀ (MNHN-B 24618).

TYPES. — Holotype : mâle 5,7 x 6,9 mm (MNHN-B 24617, SMIB 6, station DW 117). Les autres spécimens mentionnés ci-dessus sont les paratypes.

LOCALITÉ-TYPE. — Nouvelle-Calédonie, 18°59,4'S - 163°25,4'E, 280 m.

ÉTYMOLOGIE. — Espèce dédiée à Alain CROSNIER, l'un des principaux animateurs des campagnes MUSORSTOM.

DESCRIPTION. — Carapace régulièrement couverte de granules arrondis et peu espacés. Fossettes gastriques peu marquées. Nodosités protogastriques à peine reconnaissables. Régions cardiaque et gastrique délimitées par un sillon assez peu profond. Saillies hépatiques et antéro-latérales (les seules sur la carapace) très peu prononcées et ornées de granules fins. Face dorsale des pédoncules oculaires garnie de granules arrondis et armée d'un tubercule proéminent, incurvé vers la cornée et orné de granules. Cornée bien pigmentée. Segments antennaires (à l'exception du flagelle) et article basal de l'antennule munis de granules arrondis et peu espacés. Troisièmes maxillipèdes très peu sétifères, avec toute leur face externe tapissée de granules arrondis. Chélipèdes peu sétifères, couverts de granules arrondis et contigus. P2 et P3 similaires, peu sétifères, faiblemment ornés. P4 et P5 également similaires et avec la même ornementation que les précédents. Sternum thoracique et segments abdominaux mâles et femelles garnis de granules arrondis.

DISTRIBUTION. — Nouvelle-Calédonie, de 205 à 370 m de profondeur.

Sous-Famille XEINOSTOMINAE Tavares, 1992

Xeinostominae Tavares, 1992a : 514.

DESCRIPTION. — Largeur fronto-orbitaire toujours supérieure à la moitié de la largeur maximale de la carapace. Propode et dactyle des péréiopodes 2 et 3 ornés chacun de deux rangées de soies assez longues : l'une située sur la face ventrale, et l'autre sur la face dorso-externe. Abdomen femelle formé de six ou de sept segments, tous extrêmement étroits (segments 6 et 7 distincts ou bien soudés) formant une languette allongée. Chez la femelle, pléopodes 1 vestigiaux, uniramés, insérés sur la face ventrale du premier segment abdominal. Pléopodes 2-5 biramés, articulés sur l'extrémité latérale des segment abdominaux 2 à 5 et pourvus de longues soies. Présence d'une chambre incubatrice en forme de corbeille (voir les remarques ci-dessous). Abdomen mâle formé de cinq segments.

GENRE-TYPE. — *Xeinostoma* Stebbing, 1920.

GENRES INCLUS. — *Xeinostoma* Stebbing, 1920, *Krangalangia* Tavares, 1992, et *Ketamia* Tavares, 1992.

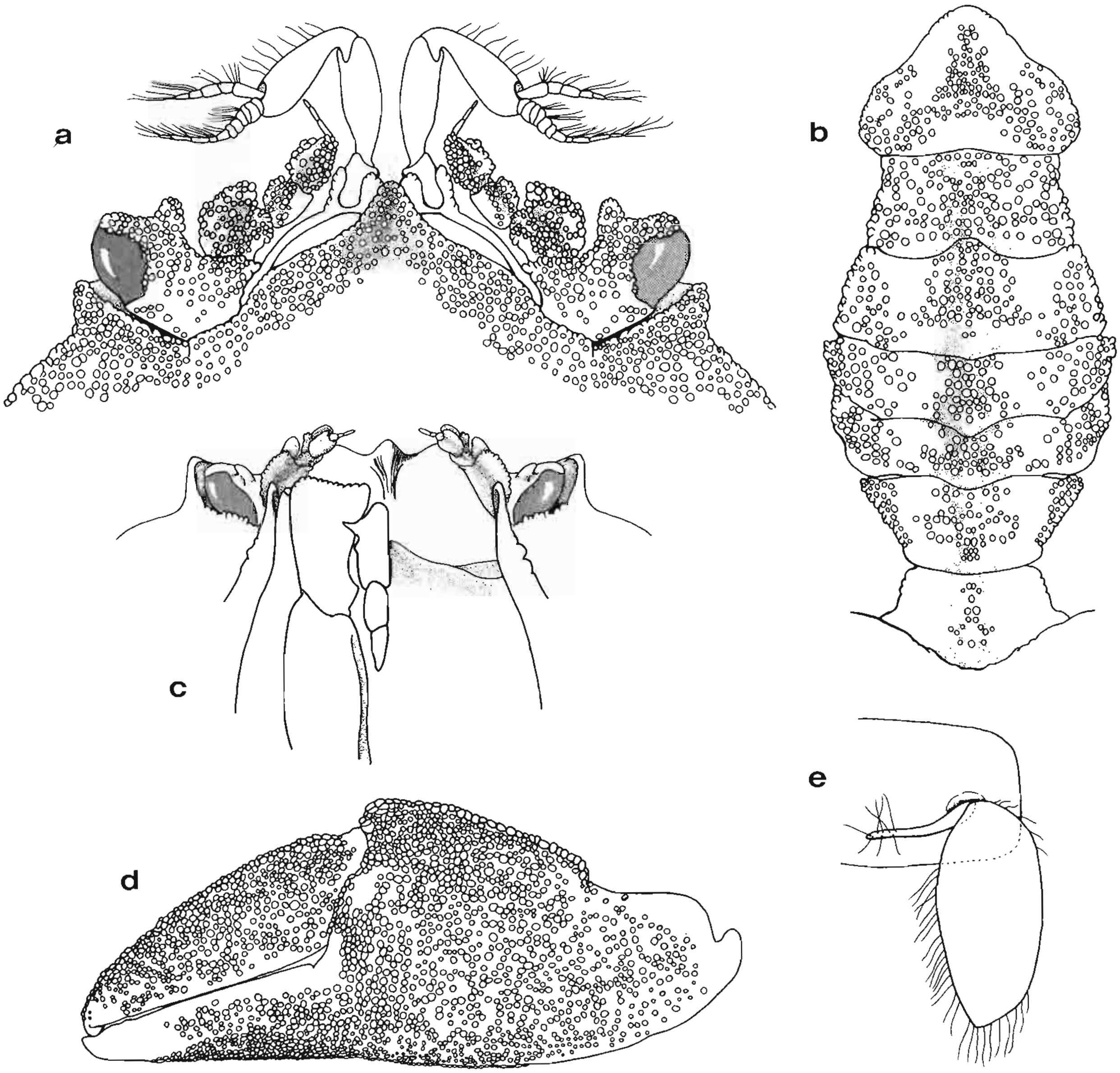

FIG. 12. — *Phyllotymolinum crosnieri* sp. nov., Nouvelle-Calédonie, SMIB 6, st. DW 117, 18°59,40'S - 163°25,40'E, 280 m : ♂ holotype 5,7 x 6,9 mm (MNHN-B 24617) : **a**, bord frontal de la carapace ; **b**, face externe des segments abdominaux 1 à 7 ; **c**, vue ventrale de la région antérieure et cadre buccal ; **d**, face externe de la pince du chélipède. — ♀ paratype (MNHN-B 24618) : **e**, pléopode du cinquième segment abdominal. A noter l'exopodite du pléopode foliacé.

DISTRIBUTION. — Les Xeinostominae sont tous indo-ouest-pacifiques. Ils ont été récoltés entre 15 et 1223 m de profondeur (fig. 2).

REMARQUES. — Contrairement aux Cyclodorippinae, les Xeinostominae montrent des modifications uniques par rapport à ce que l'on connaît chez les Crustacés Décapodes Brachyoures. Chez la femelle, l'abdomen, qui compte six ou sept segments très courts et étroits, ne forme qu'un ensemble réduit et peu calcifié. La première paire de pléopodes, uniramés et vestigiaux, s'articule normalement sur la face ventrale du premier segment abdominal ; en revanche, les pléopodes 2-5, longs, cylindriques et bien calcifiés, s'articulent non pas à la face ventrale des segments abdominaux comme chez tous les Brachyoures, mais à l'extrémité latéro-externe. Les pléopodes 2-5 portent des soies très longues et plumeuses ; celles-ci, en se rejoignant plus ou moins complètement, forment une sorte de corbeille : c'est à celle-ci qu'incombe la protection des oeufs. Chez *Xeinostoma*, ce mécanisme de protection de la ponte atteint un degré d'évolution encore plus perfectionné : les segments abdominaux relativement plats, décrivent, dans un plan horizontal, un large arc de cercle, avec les pléopodes insérés dans leur prolongement. Chez la femelle ovigère, l'abdomen rabat ses segments distaux vers le thorax, la corbeille est fermée par des longues soies insérées sur le bord postérieur du sternite 6 et de la coxa de P3.

Genre *XEINOSTOMA* Stebbing, 1920

Xeinostoma Stebbing, 1920 : 243.
Xeinostoma - BARNARD, 1950 : 395. — BALSS, 1957 : 1609. — SAKAI, 1976 : 34. — KENSLEY, 1981a : 37. — ABELE & FELGENHAUER, 1982 : 316. — TAVARES, 1991a : 626 ; 1992a : 513.

DESCRIPTION. — Carapace à face dorsale plane et à contour subcirculaire. Saillies antéro-latérales présentes, bien reconnaissables. Limites entre la face dorsale de la carapace et les flancs très peu nettes. Front semi-circulaire, à contour denticulé. Largeur fronto-orbitaire supérieure à la moitié de la largeur maximale de la carapace. Orbites profondément creusées, à bords supérieur et inférieur bien délimités. Pédoncules oculaires mobiles, courts, orientés transversalement par rapport à l'axe de la carapace. Avancée de l'endostome en forme de gouttière, plus étroite vers l'avant, n'atteignant pas le bord frontal de la carapace. Exopodite des premiers et deuxièmes maxillipèdes normalement flagellé, celui des troisièmes maxillipèdes sans flagelle. Mxp3 avec l'ischion et le mérus notablement plus longs que larges ; palpe inséré sur la face interne du mérus. Propode et dactyle des P2 et P3 ornés, chacun, de deux rangées de soies assez longues et très serrées, l'une située sur la face ventrale, l'autre sur la face dorso-externe. Dactyle des P2 et P3 comprimé latéralement. Abdomen femelle formé de six segments, tous assez étroits, surtout le dernier qui est, en plus, très allongé. Pléopodes 1 vestigiaux, uniramés, insérés sur la face ventrale du premier segment abdominal. Pléopodes 2-5 normalement biramés, articulés sur les extrémités latéro-externes des segments abdominaux 2 à 5 (et non sur leur face ventrale) et pourvus de très longues soies. Abdomen mâle comptant cinq segments.

ESPÈCE-TYPE. — *Xeinostoma eucheir* Stebbing, 1920, par monotypie. Genre neutre.

ESPÈCES INCLUSES. — *Xeinostoma eucheir* Stebbing, 1920 ; *X. sakaii* sp. nov. et *X. richeri* sp. nov.

DISTRIBUTION. — Genre indo-ouest-pacifique, entre 144 et 390 m de profondeur.

REMARQUES. — La diagnose du genre *Xeinostoma* par STEBBING en 1920, était en grande partie fondée sur les caractères des appendices buccaux. La découverte des deux nouveaux genres apparentés à *Xeinostoma*, *Krangalangia* et *Ketamia*, décrits ci-après, montre que la définition générique exige un amendement et le recours à d'autres caractères morphologiques que ceux mentionnés précédemment.

Xeinostoma n'était jusqu'à présent connu que par son espèce-type, *X. eucheir* Stebbing, 1920. Deux nouvelles espèces, *X. sakaii*, du Japon et des Philippines, et *X. richeri*, de Nouvelle-Calédonie, sont décrites ci-dessous.

Clef de détermination des espèces du genre *Xeinostoma*

1. Régions frontale (sauf sur les bords) et mésogastrique ainsi que l'aire autour de la région métagastrique de la carapace inermes ; les autres régions ainsi que le sternum thoracique ornés de granules forts et émoussés. Largeur maximale de la carapace nettement en arrière des saillies antéro-latérales. Bord supérieur des orbites légèrement oblique .... ***Xeinostoma eucheir***

— Régions frontale et mésogastrique ainsi que l'aire autour de la région métagastrique de la carapace couvertes de granules. Largeur maximale de la carapace au niveau des saillies antéro-latérales. Bord supérieur des orbites plutôt horizontal 2

2. Carapace entièrement couverte de granules fins, plus forts sur les régions frontale, mésogastrique ainsi qu'autour de la région métagastrique. Sternum thoracique faiblement orné de granules fins .... ***Xeinostoma sakaii***

— Carapace entièrement couverte par des granules forts, émoussés et serrés. Sternum thoracique orné par de gros granules clairsemés, surtout au niveau des P3 .... ***Xeinostoma richeri***

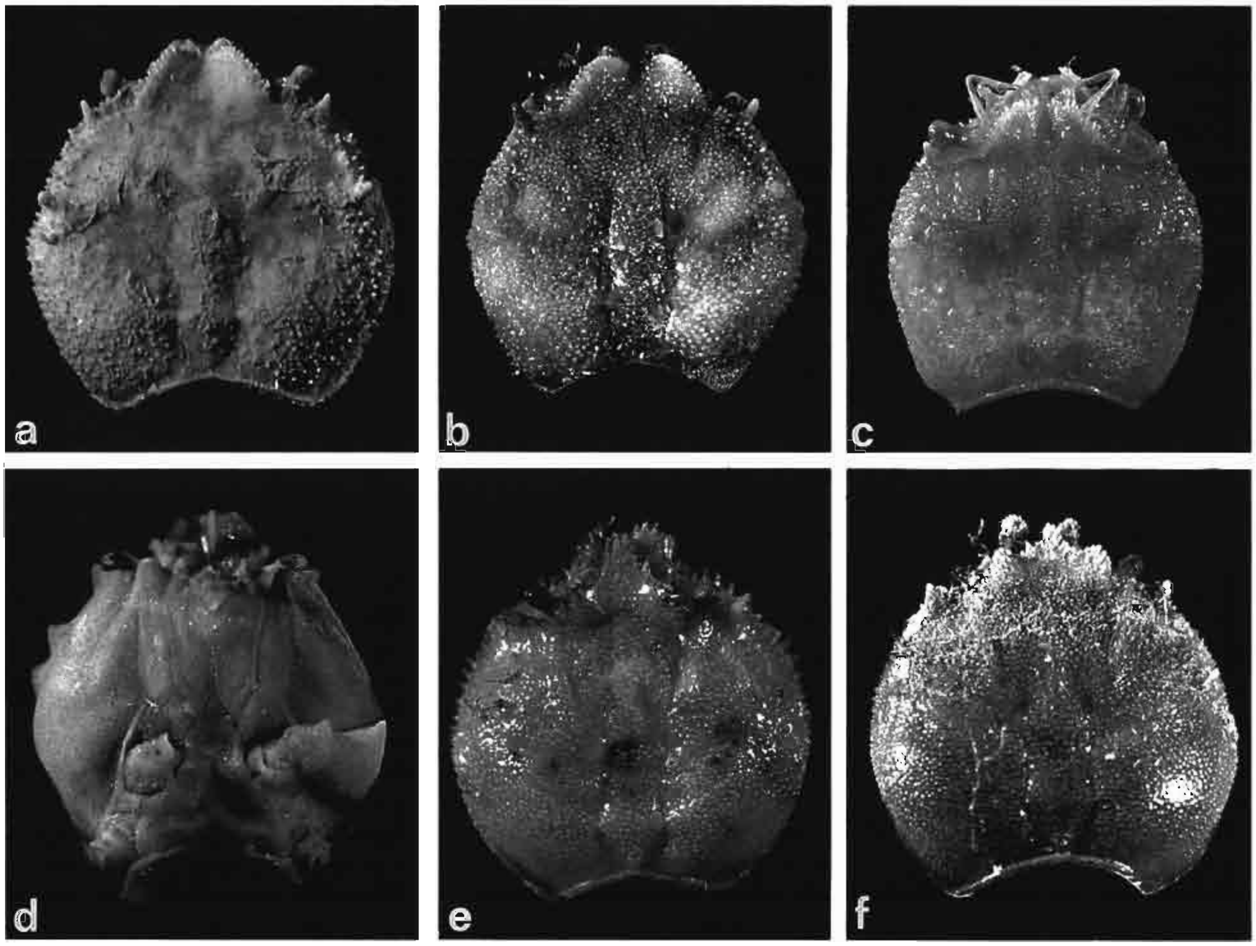

FIG. 13 a-c, e-f. — Vue dorsale de la carapace : **a**, *Xeinostoma eucheir* Stebbing, 1920, Afrique du Sud, Cape Vidal, 144 m, ♂ lectotype, abdomen et pattes détachés, 6,6 x 7,7 mm (BM 1928.12.1.195-196) ; **b**, *Xeinostoma richeri* sp. nov., Nouvelle-Calédonie, MUSORSTOM 5, st. DW 274, 24°44,83'S - 159°41'E, 285 m, ♂ paratype 8 x 7,5 mm (MNHN-B 24683) ; **c**, *Xeinostoma sakaii* sp. nov., Philippines, MUSORSTOM 1, st. 51, 13°49,4'N - 120°04,2'E, 200-170 m, ♀ paratype 5 x 5,5 mm (MNHN-B 24593) ; **e**, *Krangalangia spinosa* (Zarenkov, 1970), Australie occidentale, "*Vytiatz*", st. 4564, 820 m, ♂ paratype 5 x 5,2 mm (MNHN-B24571) ; **f**, *Krangalangia orstom* sp nov., Nouvelle-Calédonie, MUSORSTOM 6, st. CP 438, 20°23'S - 166°20,10'E, 780 m, ♂ paratype 6 x 6,5 mm (MNHN-B 24576).

FIG. 13 d. — Vue ventrale : *Genkaia keijii* sp. nov., Nouvelle-Calédonie, LAGON, st. 190, 22°02,1'S - 165°57,3'E, 135-150 m, ♀ holotype 3,9 x 4 mm (MNHN-B 24619). On notera le septième sternite thoracique chevauchant une partie du sternite précédent.

Xeinostoma eucheir Stebbing, 1920

Fig. 2 c, 4 a-b, 5 d, 13 a, 14 a

Xeinostoma eucheir Stebbing, 1920 : 243.
Xeinostoma eucheir - BARNARD, 1950 : 395. — GORDON, 1963 : 51. — KENSLEY, 1981a : 37.
Non *Xeinostoma eucheir* - SAKAI, 1976 : 34 = *X. sakaii* sp. nov.

MATÉRIEL EXAMINÉ. — **Afrique du Sud.** Cape Vidal, 144 m : 1 ♂, abdomen et pattes détachés, 6,6 x 7,7 mm, lectotype ; 1 ♀ 5,2 x 6,1 mm, carapace très abimée, abdomen et pattes détachés, paralectotype (BM 1928.12.1.195-196).

Madagascar. — "*Vauban*" : chalutage, 150 m : 1 ♂ (MNHN-B 24594). — St. CH 84, 190-185 m : 1 ♀ (MNHN-B 24595). — Drague, 205-185 m : 1 ♂, 3 ♀ (MNHN-B 24596). — Dragage 2, 240 m : 2 ♂ 5 x 5,5 mm (MNHN-B 24597).

TYPES. — Lectotype : mâle 6,6 x 7,7 mm, abdomen et pattes détachés (BM 1928.12.1.195-196). Paralectotypes : femelle 5,2 x 6,1 mm, carapace endommagée, pattes et abdomen détachés (BM 1928.12.1.195-196), deux mâles à l'état sec et abimés, conservés au SAM (A1608).

LOCALITÉ-TYPE. — Afrique du Sud, Cape Vidal, 144 m.

DESCRIPTION. — Carapace présentant son maximum de largeur en arrière des saillies antéro-latérales. Région frontale granuleuse au voisigage des bords. Granulation envahissant les régions protogastrique, cardiaque, intestinale, et métabranchiales; absente sur l'aire médiane de la région frontale, ainsi que sur les régions mésogastrique, et mésobranchiales. Région frontale assez déprimée en son milieu. Fossettes gastriques bien marquées. Régions cardiaque et gastrique délimitées par un sillon peu marqué, qui se prolonge en une dépression assez nette vers les saillies antéro-latérales. Flancs recouverts de granules forts et espacés. Saillies antéro-latérales (les seules sur la carapace) développées, et ornées de granules. Dents exorbitaires proéminentes, ornées de granules arrondis. Face dorsale des pédoncules oculaires munie de quelques granules fins ; cornée pigmentée. Antennules environ deux fois plus courtes que la carapace. Premier segment antennaire mobile ; flagelle remarquablement long. Chélipèdes robustes ; leur ornementation constituée par des granules grossiers, parfois pointus ; pilosité plus développée à l'extrémité et à la face interne des doigts ; carpe armé, sur la face interne, d'une très forte dent triangulaire, elle-même garnie de granules spinuleux ; sur la face externe du propode, une bande transversale inerme ; tiers proximal du doigt mobile faiblement granuleux. P2 similaires à P3, mais à dactyle plus fort. P4 et P5 subdorsaux, similaires, courts, avec le dactyle incurvé.

DISTRIBUTION. — *X. eucheir* n'était connu jusqu'ici que de sa localité-type (Afrique du Sud, Cape Vidal) et du Japon (au large de la baie de Mikawa et du canal de Kii). En fait, la présence de *X. eucheir* au Japon (SAKAI, 1976) doit être regardée avec beaucoup de prudence : nous n'avons pas réussi à retrouver les deux spécimens de *Xeinostoma* mentionnés par cet auteur mais, grâce à l'amabilité du conservateur du National Science Museum, à Tokyo, nous avons pu étudier un mâle et une femelle en provenance de Minabe, Kii Peninsula, Honshu, qui s'avèrent appartenir à une autre espèce, *Xeinostoma sakaii* sp. nov., décrite ci-dessous. On peut noter par ailleurs que, sur les 107 espèces de décapodes benthiques sud-africains récensées à des profondeurs supérieures à 200 m par KENSLEY (1981a), seulement quatre sont communes avec le Japon (Galatheidae exclus). Il est donc à peu près certain que les spécimens de *Xeinostoma* mentionnés par SAKAI, sous le nom d'*eucheir*, étaient des *X. sakaii*.

Dans la présente révision, nous limitons les informations relatives à la distribution de *X. eucheir* aux seules données obtenues à partir des collections étudiées. L'examen des récoltes faites à Madagascar par A. CROSNIER, nous permet d'étendre la distribution de *X. eucheir* vers l'est. La distribution de *X. eucheir* est donc restreinte à l'océan Indien occidental : Afrique du Sud (Cape Vidal), Madagascar, entre 144 et 240 m de profondeur.

VARIATIONS. — L'examen du mâle et de la femelle types ainsi que celui des quatre mâles et des quatre femelles en provenance de Madagascar, nous a permis de faire quelques remarques sur la variation morphologique chez cette espèce. Ces variations concernent l'ornementation de la carapace et vraisemblablement n'ont pas de lien avec le sexe. Jusqu'ici le genre *Xeinostoma* n'était connu que par son espèce-type, *X. eucheir* Stebbing, 1920. STEBBING (1920) a fondé sa description sur plusieurs spécimens sans en préciser le nombre exact. Un mâle (abdomen et

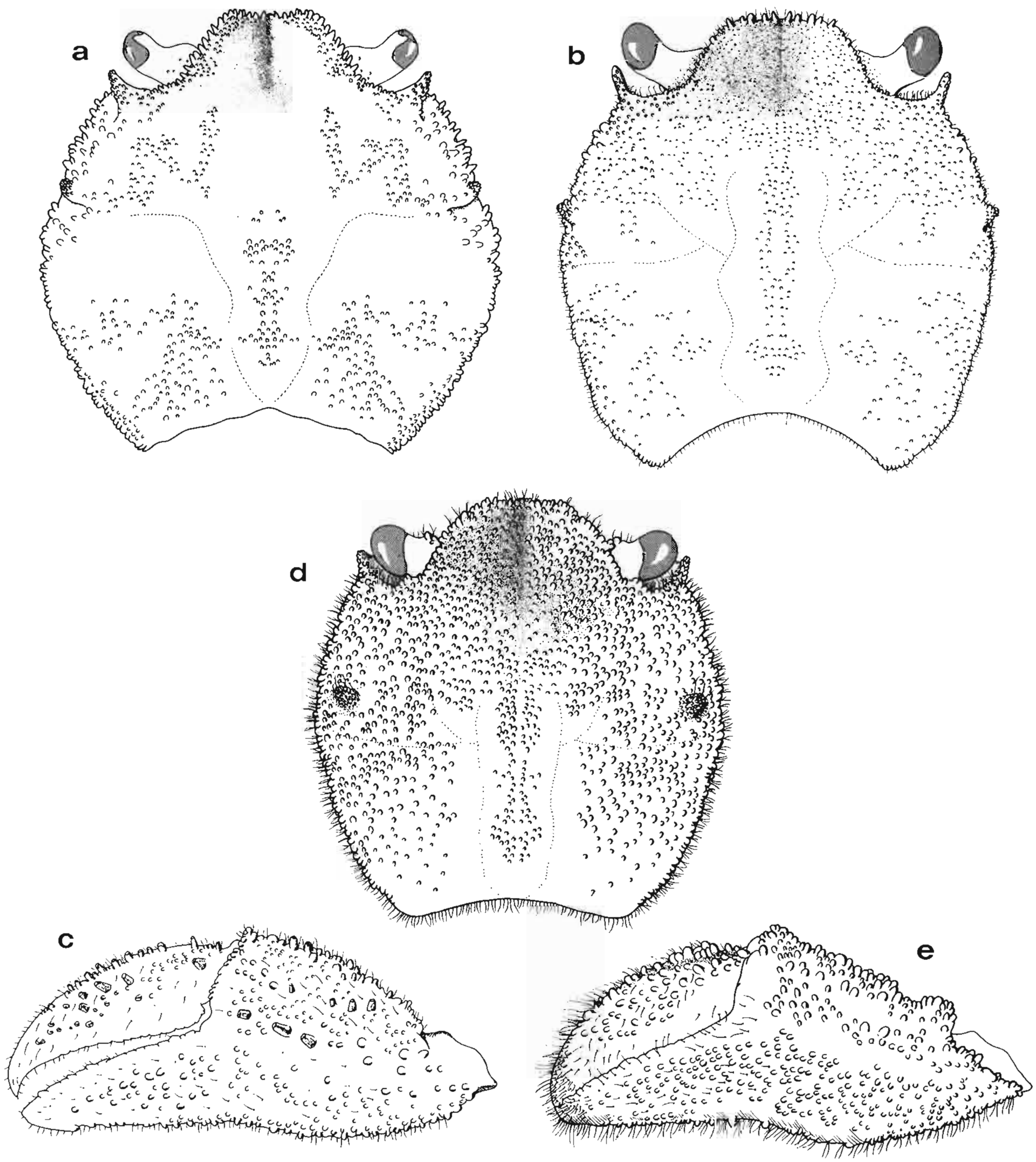

FIG. 14. a, b, d. — Vue d'ensemble de la carapace : **a**, *Xeinostoma eucheir* Stebbing, 1920, Afrique du Sud, Cape Vidal, 144 m, ♂ lectotype, abdomen et pattes détachés, 6,6 x 7,7 mm (BM 1928.12.1.195-196) ; **b**, *Xeinostoma sakaii* sp. nov., Japon, Minabe, Kii Peninsula, Honshu, ♂ holotype 10 x 11 mm (NSMT-Cr 9805) ; **d**, *Xeinostoma richeri* sp. nov., Nouvelle-Calédonie, MUSORSTOM 4, st. DW 274, 24°44,83'S - 159°41'E, 285 m, ♂ holotype 4,9 x 5,1 mm (MNHN-B 24593).

FIG. 14 c-e. — Face externe du chélipède : **c**, *Xeinostoma sakaii* sp. nov. (NSMT-Cr 9805) ; **e**, *Xeinostoma richeri* sp. nov. (MNHN-B 24593).

pattes détachés) et une femelle (carapace très abîmée, abdomen et pattes détachées) subsistent dans les collections du Natural History Museum, à Londres. Deux syntypes mâles à l'état sec et abîmés, sont déposés dans les collections du South African Museum (A1608), à Cape Town.

Grâce à l'amabilité des conservateurs de ces deux institutions, nous avons pu obtenir, pour étude, le mâle et la femelle syntypes conservés à Londres, et examiner une photographie, assez nette, des syntypes mâles du South African Museum. STEBBING n'ayant pas désigné d'holotype de *X. eucheir*, nous avons sélectionné comme lectotype, en vertu de son état de conservation beaucoup plus satisfaisant, le spécimen mâle de la collection du Natural History Museum. La femelle fragmentée conservée au Natural History Museum et les deux mâles à l'état sec du South African Museum sont donc les paralectotypes.

STEBBING (1920) a mentionné et donné une illustration d'un abdomen mâle de six segments chez *X. eucheir*. Grâce à l'examen du matériel-type, nous pouvons corriger l'observation de STEBBING : chez le lectotype mâle, ainsi que chez les mâles en provenance de Madagascar, l'abdomen est constitué par cinq segments seulement et il en est de même pour les mâles des deux autres espèces du genre.

Xeinostoma sakaii sp. nov.

Fig. 13c, 14 b-c

Xeinostoma eucheir - SAKAI, 1976 : 34. — SERÈNE & VADON, 1981 : 119, 121. Non *Xeinostoma eucheir* Stebbing, 1920.
Tymolus rostratus - SERÈNE, ROMIMOHTARTO & MOOSA, 1974 : 18. Non *Cyclodorippe* (*Cyclodorippe*) *rostrata* Ihle, 1916.

MATÉRIEL EXAMINÉ. — **Japon**. Minabe, Kii Peninsula, Honshu : 1 ♂ 10 x 11 mm, holotype (NSMT-Cr 9805) ; 1 ♀ 8 x 9 mm, paratype (NSMT-Cr 9805).
Osi Saki : "*Albatross*" : st. 4893, 190 m : 1 ♂ (USNM).
Philippines. — MUSORSTOM 1 : st. 51, 200-170 m : 1 ♀ 5 x 5,5 mm, paratype (MNHN-B 13484).

TYPES. — Holotype : mâle 10 x 11 mm (NSMT-Cr 9805, Minabe, Kii Peninsula, Honshu). Les femelles de la liste ci-dessus sont les paratypes.

LOCALITÉ-TYPE. — Minabe, Kii Peninsula, Honshu, Japon.

ÉTYMOLOGIE. — Cette espèce est dédiée au regretté Tune SAKAI qui a entièrement renouvelé nos connaissances sur la faune carcinologique du Japon.

DESCRIPTION. — Carapace présentant son maximum de largeur au niveau des saillies antéro-latérales. Face dorsale de la carapace couverte de granules fins, plus forts sur les régions hépatiques et métabranchiale. Région frontale assez déprimée en son milieu. Fossettes gastriques peu marquées. Nodosités protogastriques peu saillantes. Régions cardiaque et gastrique délimitées latéralement par un sillon profond. Saillies antéro-latérales (les seules sur la carapace) ornées de granules. Dents exorbitaires proéminentes, ornées de quelques granules. Face dorsale des pédoncules oculaires munie de petites épines. Cornée pigmentée. Antennules environ deux fois plus courtes que la longueur de la carapace. Premier article antennaire mobile ; flagelle remarquablement long. Chélipèdes robustes, sétifères ; leur ornementation constituée par des épines tronquées, surtout sur la face externe du propode et du doigt mobile ; carpe garni, sur le côté interne, d'une très forte dent triangulaire, elle-même ornée, sur le dessus, de granules spinuleux. P2 similaires à P3, mais à dactyle plus fort. P4 et P5 subdorsaux, similaires, courts, ornés de quelques granules très fins et de soies courtes, à dactyle incurvé.

DISTRIBUTION. — Japon (Minabe, Kii Peninsula, Honshu ; Osi Saki) et Philippines (13°49,4'N - 120°04,2' E), entre 170 et 200 m de profondeur.

VARIATIONS. — *Xeinostoma sakaii* présente dans l'ornementation de la carapace quelques variations en liaison, à notre avis, avec l'âge. Chez les spécimens japonais (mâle 10 x 11 mm et femelle 8 x 9 mm), les granules qui ornent la carapace sont plus développés, surtout sur les régions frontale et protogastrique. La femelle des

Philippines (5 x 5,5 mm) possède des granules nettement plus fins sur ces mêmes régions, mais distribués de la même façon que chez les spécimens japonais.

REMARQUES. — *Xeinostoma sakaii* se distingue essentiellement de *X. eucheir* Stebbing par sa carapace moins large, à bords plus régulièrement convexes en arrière des saillies antéro-latérales ; par ailleurs, l'ornementation de la carapace est moins accusée; toutefois les régions frontale et mésogastrique portent des granules fins, alors que sur ces régions ils sont absents chez *X. eucheir*.

Xeinostoma richeri sp. nov.

Fig. 13 b, 14 d-e

MATÉRIEL EXAMINÉ. — **Iles Chesterfield.** MUSORSTOM 5 : st. DW 274, 285 m : 1 ♂ 4,9 x 5,1 mm holotype (MNHN-B 24593). — St. CP 275, 285 m : 1 ♀ (MNHN-B 24594). — St. DW 277, 270 m : 1 ♂ (MNHN-B 24595). — St. CP 288, 270 m : 1 ♂ (MNHN-B 24596). — St. CP 289, 273 m : 2 ♀ ovigères (MNHN-B24597).
Iles Loyauté. MUSORSTOM 6 : st. DW 391, 390 m : 4 ♂ (MNHN-B 24598). — St. DW 397, 380 m : 1 ♀ (MNHN-B 24599). — St. DW 399, 282 m : 1 ♂ (MNHN-B 24600). — St. DW 406, 373 m : 1 ♂, 1 ♀ (USNM). — St. CP 419, 283 m : 2 ♂, 2 ♀, 1 ♀ ovigère (MNHN-B 24601). — St. DW 451, 330 m : 1 ♀ (MNHN-B 24602). — St. DW 453, 250 m : 1 ♂ (MNHN-B 24603). — St. DW 479, 310 m : 1 ♀ (MNHN-B 24604). — St. DW 485, 350 m : 1 ♂ (MNHN-B 24605).

TYPES. — Holotype : mâle 4,9 x 5,1 mm (MNHN-B 24593, MUSORSTOM 5, st. DW 274). Les autres spécimens de la liste ci-dessus sont les paratypes.

LOCALITÉ-TYPE. — Iles Chesterfield, 24°44,83'S - 159°41'E, 285 m.

ÉTYMOLOGIE. — Cette espèce est dédiée à Bertrand RICHER DE FORGES, océanographe biologiste de l'ORSTOM, auquel nous devons une grande partie des récoltes faites en Nouvelle-Calédonie depuis une décennie.

DESCRIPTION. — Carapace présentant le maximum de largeur au niveau des saillies antéro-latérales, celles-ci sont situées dorsalement, à une petite distance du bord. Face dorsale de la carapace entièrement couverte de granules assez forts. Région frontale assez déprimée en son milieu. Fossettes gastriques à peine visibles. Nodosités protogastriques faibles. Régions cardiaque et gastrique délimitées latéralement par un sillon profond. Saillies antéro-latérales (les seules sur la carapace) ornées de granules forts. Dents exorbitaires proéminentes, ornées de nombreux granules arrondis. Face dorsale des pédoncules oculaires munie de petits granules spinuleux et de quelques soies ; cornée pigmentée. Antennules environ deux fois plus courtes que la carapace. Premier article antennaire mobile ; articles 4 et 5 avec quelques granules pointus ; flagelle remarquablement long. Chélipèdes robustes ; leur ornementation constituée par de forts granules ; pilosité notablement développée à l'extrémité et à la surface interne des doigts ; carpe armé, sur le côté interne, d'une très forte dent triangulaire, elle-même ornée sur le dessus de granules spinuleux. P2 et P3 similaires. P2 légèrement plus courts ; mérus faiblement sétifère ; carpe, propode et dactyle garnis, sur toute leur surface, de soies assez courtes. Dactyle des P2 plus robuste que celui des P3. P4 et P5 subdorsaux, similaires, courts, munis de soies très courtes, à dactyle incurvé. P5 seulement un peu plus longs, à propode plus grêle.

DISTRIBUTION. — Iles Chesterfield et Loyauté, de 250 à 390 m de profondeur.

VARIATIONS. — Chez *X. richeri*, le développement et le nombre de granules sur la carapace présentent de légères variations. Chez certains individus (5 x 5 mm, ou moins), la granulation de la carapace, surtout au niveau de la région frontale, peut être un peu plus développée.

REMARQUES. — Même si chez certains petits spécimens de *X. richeri*, la granulation sur l'ensemble de la carapace est un peu moins accusée, dans l'ensemble, l'ornementation de la carapace est, de loin, beaucoup plus importante chez cette espèce que chez *X. eucheir* et *X. sakaii*.

Genre *KRANGALANGIA* Tavares, 1992

Cyclodorippe (Cyclodorippe) Ihle, 1916 : 128 (*pro parte*).
Cyclodorippe - ZARENKOV, 1970 : 460. — TAKEDA & MOOSA 1990 : 55 (*pro parte*).
Krangalangia Tavares, 1992a : 514.

DESCRIPTION. — Carapace à face dorsale plane et à contour subcirculaire. Limites entre la face dorsale et les flancs très peu nettes. Front large, muni de fortes dents à l'angle supéro-externe et se terminant par une avancée rostrale très proéminente, triangulaire, garnie d'épines sur les côtés. Largeur fronto-orbitaire supérieure à la moitié de la largeur maximale de la carapace. Orbites peu profondes, à bords supérieur et inférieur mal délimités, surtout ventralement. Pédoncules oculaires mobiles, courts, orientés transversalement par rapport à l'axe de la carapace. Avancée de l'endostome en forme de gouttière, plus étroite vers l'avant, n'atteignant pas tout à fait le bord frontal de la carapace. Exopodite des premiers et deuxièmes maxillipèdes avec un flagelle réduit ; celui des troisièmes maxillipèdes dénué de flagelle. Propode et dactyle des P2 et P3 ornés, chacun, de deux rangées de soies peu denses mais assez longues : l'une située sur la face ventrale, l'autre sur la face dorso-externe. Dactyle des P2 et P3 comprimé dorsoventralement. Abdomen femelle formé de six segments assez étroits par rapport à la largeur de la carapace. Dernier segment abdominal foliacé. Pléopodes 1 vestigiaux, uniramés, insérés sur la face ventrale du premier segment abdominal. Pléopodes 2-5 normalement biramés, pourvus de très longues soies, articulés à l'extrémité latéro-externe des segments abdominaux 2 à 5 et non sur leur face ventrale. Abdomen mâle formé de cinq segments.

ÉTYMOLOGIE. — Nom générique d'après *Krangalang*, nom aborigène australien, qui signifie crabe. Genre : féminin.

ESPÈCE-TYPE. — *Cyclodorippe* (*Cyclodorippe*) *rostrata* Ihle, 1916

ESPÈCES INCLUSES. — *Krangalangia rostrata* (Ihle, 1916) ; *K. spinosa* (Zarenkov, 1970) ; *K. orstom* sp. nov.

DISTRIBUTION. — Genre entièrement indo-ouest-pacifique, récolté entre 411 et 1223 m de profondeur.

REMARQUES. — *Krangalangia* a été établi pour recevoir deux espèces décrites originalement dans le genre *Cyclodorippe* A. Milne Edwards, 1880 : *Cyclodorippe* (*Cyclodorippe*) *rostrata* Ihle, 1916, et *Cyclodorippe spinosa* Zarenkov, 1970. Les ressemblances entre les genres *Krangalangia* et *Cyclodorippe* sont en fait superficielles. *Cyclodorippe* appartient aux Cyclodorippinae et *Krangalangia* comme *Xeinostoma*, aux Xeinostominae, voir TAVARES (1991a, 1992a).

Les principaux caractères qui différencient les genres *Krangalangia, Cyclodorippe* et *Xeinostoma* sont les suivants :

1) chez *Krangalangia*, le front est élargi, orné à l'angle supérieur de dents pointues et se termine par une avancée rostrale très proéminente, triangulaire, armée de dents sur son tiers distal, de chaque côté (chez *Cyclodorippe*, ainsi que chez *Xeinostoma*, le front est semi-circulaire, bordé par une rangée de petites dents) ;

2) chez *Krangalangia*, les orbites sont peu creusées, avec les bords inférieur et supérieur, surtout ce dernier, assez mal délimités (chez *Cyclodorippe* et chez *Xeinostoma*, les orbites sont assez profondes avec des bords supérieur et inférieur bien formés) ;

3) chez *Krangalangia*, le propode et le dactyle des péréiopodes 2 et 3 portent deux rangées de soies peu nombreuses et très longues : l'une située sur la face ventrale et l'autre sur la face dorso-externe (cette rangée de soies est très fournie chez *Xeinostoma*, absente chez *Cyclodorippe*) ;

4) chez *Krangalangia*, l'avancée de l'endostome est beaucoup plus proche du bord frontal de la carapace que chez les deux autres genres mentionnés ci-dessus ;

5) chez *Krangalangia*, ainsi que chez *Cyclodorippe*, le dactyle des P2 et P3 est comprimé dorso-ventralement (tandis que, chez les espèces de *Xeinostoma*, le dactyle des P2 et P3 est comprimé latéralement) ;

6) les femelles appartenant aux genres *Krangalangia* et *Xeinostoma* ont l'abdomen constitué par six segments assez étroits par rapport à la largeur de la carapace. Le dernier segment abdominal est foliacé chez *Krangalangia* et très allongé chez *Xeinostoma* (fig. 5 a et d). Chez *Cyclodorippe*, dont l'abdomen est également divisé en six segments, ceux-ci sont beaucoup plus larges comparés à la largeur de la carapace; par ailleurs, le dernier de ces segments est en forme de calotte semi-circulaire (fig. 5 e).

Mentionnons enfin que *Krangalangia* et *Xeinostoma* se rapprochent par le nombre et le type d'insertion des pléopodes présents sur les segments abdominaux 1-5 : pléopodes 1 vestigiaux, uniramés, insérés sur la face ventrale du premier segment abdominal, pléopodes 2 à 5 normaux, articulés sur les extrémités latérales des segments abdominaux 2 à 5. En revanche, chez *Cyclodorippe*, les six segments abdominaux sont comme d'ordinaire : le premier segment est dépourvu de pléopodes et il n'y a donc que quatre paires de pléopodes, tous insérés sur la face ventrale des segments 2 à 5.

Clef de détermination des espèces du genre *Krangalangia*

1. Avancée rostrale très courte et triangulaire, ornée dorsalement de granules gros et trapus .. .. ***K. orstom***

— Avancée rostrale assez longue, ornée dorsalement de petites épines **2**

2. Carapace couverte d'épines serrées, assez petites et aiguës. Saillies antéro-latérales très faibles ou absentes. Rostre long et étroit. Front jamais régulièrement frangé par une série de longues soies serrées. Pas d'épine proéminente sur l'axe des troisième et quatrième segments abdominaux mâles .... ***K. rostrata***

— Carapace recouverte d'épines espacées, qui tendent à s'émousser sur la région postérieure. Rostre long et moyennement étroit. Front parfois régulièrement frangé par une série de longues soies serrées. Saillies antéro-latérales toujours distinctes, quelquefois assez développées. Une épine assez proéminente, ou bien deux épines plus petites, sur l'axe des troisième et quatrième segments abdominaux mâles .... ***K. spinosa***

Krangalangia rostrata (Ihle, 1916)

Fig. 2 e, 4 c-d, 5 a-b , 15 a-b

Cyclodorippe (*Cyclodorippe*) *rostrata* Ihle, 1916 : 129.
Cyclodorippe rostrata - Takeda & Tomida, 1984 : 46.
Krangalangia rostrata - Tavares, 1992a : 514.

Matériel examiné. — **Philippines**. Musorstom 3 : st. CP 106, 668-640 m : 1 ♀ 4,6 x 5,2 (MNHN-B 24592).
Indonésie. "*Siboga*" : st. 267, 5°54'S - 132°56,7'E, 984 m : 1 ♀ 5 mm de long (ZMA-De 100793). — St. 159, 0°59,1'S - 129°48,8'E, 411 m : 1 ♂ (ZMA-De 102971) ; 1 ♀ 5 mm de long, lectotype (ZMA-De 102971).
Karubar : st. DW 13, 393-417 m : 1 ♀ (MNHN-B 24634). — St. CC 21, 688-694 m : 1 ♂, 1 ♀ ovigère (MNHN-B 24635). — St. CP 38, 666-620 m : 1 ♀ ovigère (MNHN-B 24636).

Types. — Lectotype : femelle 5 mm de long (ZAM-De 102971). Le mâle (ZMA-De 102971) et la femelle (ZMA-De 100793), mentionnés ci-dessus, sont les paralectotypes.

Localité-type. — Mer d'Halmahera (0°59,1'S - 129°48,8'E), 411 m.

Description. — Carapace couverte d'épines serrées, assez petites et aiguës. Région frontale modérément déprimée en son milieu. Flancs garnis d'épines pointues, plus développées sur les régions ptérygostomiennes. Fossettes gastriques marquées. Nodosités protogastriques très faibles. Régions cardiaque et gastrique délimitées latéralement par un sillon assez peu profond ; entre elles, un sillon à peine marqué. Saillies antéro-latérales (les seules sur la carapace) très faibles ou absentes. Front long et étroit, muni à l'angle supéro-externe de deux, parfois trois ou quatre dents fortes et aiguës (dent médiane toujours plus forte et longue); front se prolongeant en son milieu par une avancée rostrale très pointue, triangulaire, légèrement incurvée vers le haut, et armée sur chaque côté de sa partie terminale de deux épines assez fortes et dirigées vers l'avant. Dents exorbitaires très proéminentes, dépourvues d'ornements. Face dorsale des pédoncules oculaires garnie de petites épines ; cornée faiblement pigmentée, semblant dégénérée. Antennules environ deux fois plus courtes que la carapace. Premier article antennaire mobile. Mérus des troisièmes maxillipèdes fortement orné d'épines sur sa face externe. Chélipèdes égaux ; carpe, propode et dactyle ornés de petits granules spinuleux sur leur face externe ; sur le côté interne du carpe, une dent courte, triangulaire, elle-même munie de petites épines ; bord supérieur du propode armé d'une rangée d'épines fortes et aiguës, en nombre variable, incurvées vers l'extrémité du chélipède ; doigts assez allongés. Péréiopodes 2 et 3 similaires ; mérus, carpe et propode ornés de petites épines. Péréiopodes 4 et 5 subdorsaux, similaires, courts ; mérus, carpe et propode à peu près de la même longueur, munis de petites épines ; dactyle incurvé, un peu moins de deux fois plus court que le propode.

DISTRIBUTION. — Espèce connue des Philippines et d'Indonésie, entre 411 et 984 m de profondeur.

Jusqu'à récemment, *K. rostrata* n'était connue que par son matériel-type. Cette espèce a été retrouvée lors des récoltes effectuées dans la mer de Flores par le bateau japonais "*Hakuhô Maru*" en 1985 (TAKEDA & MOOSA, 1990), ainsi que dans la mer d'Arafura lors de l'expédition KARUBAR (1991). *Krangalangia rostrata* pouvait sembler alors confinée à l'Indonésie. Cependant, l'étude des collections faites lors de la campagne MUSORSTOM 3 nous a montré, depuis, que la distribution de *K. rostrata* s'étend jusqu'aux Philippines.

VARIATIONS. — Les saillies antéro-latérales de la carapace sont absentes chez la femelle lectotype et le mâle paralectotype ; chez la femelle paralectotype, elles sont à peine perceptibles. Chez tous les autres spécimens examinés, ces saillies sont assez faibles. L'arrangement des épines qui couvrent le dessus de la carapace est très homogène dans l'ensemble du matériel examiné, toutefois ces épines sont légèrement plus développées chez la femelle en provenance des Philippines ; par ailleurs, le nombre et la taille des épines qui ornent l'angle supéro-externe du front et son avancée rostrale sont assez variables.

REMARQUES. — *Krangalangia rostrata* (Ihle, 1916) a été décrite originalement dans le genre *Cyclodorippe* A. Milne Edwards, 1880, et ensuite transférée par TAVARES (1992a) dans le genre *Krangalangia* Tavares, 1992. IHLE (1916b) n'ayant pas désigné d'holotype pour *Cyclodorippe rostrata*, nous avons sélectionné comme lectotype la femelle (ZAM-De 102971).

Krangalangia spinosa (Zarenkov, 1970)

Fig. 13 e, 15 c-d

Cyclodorippe spinosa Zarenkov, 1970 : 460.
Cyclodorippe spinosa - TAKEDA & TOMIDA 1984 : 46.
Cyclodorippe rostrata - TAKEDA & MOOSA, 1990 : 55 (*pro parte*). Non *Cyclodorippe rostrata* Ihle, 1916.
Krangalangia spinosa - TAVARES, 1992a : 514.

MATÉRIEL EXAMINÉ. — **Australie**. *Côte occidentale*. "*Vytiatz*" : st. 4564, position inconnue, 820 m : 1 ♂ 5 x 5,2 mm, 1 ♀ ovigère 5,2 x 5,9 mm, 1 ♀ 5,9 x 6,5 mm, paratypes (MNHN-B 24571).

Côte orientale. CIDARIS I : st. 5-3, 1107-1091 m : 1 ♂, 1 ♀ (QM-W15412). — St. 9-3, 1109-1110 m : 1 ♂ (QM-W15410). — St. 11-3, 1103-1115 m : 3 ♀ (QM-W15414) ; 2 ♀ (MNHN-B 24637). — St. 15-3, 945 m : 1 ♀ (QM-W15411). — St. 16-3, 1141-1102 m : 1 ♀ (QM-W15408). — St. 20-3, 1224-1223 m : 1 ♂ (MNHN-B 24638). — St. 24-3, 1187-1200 m : 5 ♀ (QM-W15413). — St. 47-2, 503-479 m : 1 ♂, 4 ♀ (QM-15407).

Nouvelle-Calédonie. BIOCAL : st. CP 30, 1140 m : 1 ♂ 6 x 6,5 mm (MNHN-B 24588) ; 1 ♂ (MNHN-B 24589). — St. DW 33, 675 m : 2 ♀ ovigères, 2 ♀ (MNHN-B 24577). — St. DW 36, 650 m : 1 ♀ (MNHN-B 24578). — St. DW 46, 570 m : 2 ♂, 1 ♀ (USNM). — St. DW 51, 700 m : 2 ♂, 2 ♀ (MNHN-B 24579).

MUSORSTOM 4 : st. CP 169, 600 m : 7 ♂, 6 ♀ ovigères, 6 ♀ (MNHN-B 24580). — St. CP 170, 485 m : 1 ♂ (MNHN-B 24581).

Iles Chesterfield. CORAIL 2 : st. DE 13, 700 m : 1 ♂ (MNHN-B 24584) ; 2 ♂, 1 ♀ (MNHN-B 24585). — St. DE 14, 660 m : 6 ♂, 1 ♀ (MNHN-B 24586). — St. DE 15, 590 m : 2 ♂, 2 ♀ ovigères, 3 ♀ (MNHN-B 24587).

MUSORSTOM 5 : st. CP 323, 970 m : 1 ♂, 1 ♀ ovigère, 5 ♀ (MNHN-B 24590). — St. CP 324, 970 m : 3 ♂, 3 ♀ ovigères, 5 ♀ (MNHN-B 24591). — St. CP 324, 970 m : 1 ♂, 1 ♀ ovigère, 1 ♀ (USNM). — St. DW 313, 780-930 m : 1 ♂ (MNHN-B 24582). — St. CC 390, 745-825 m : 1 ♀ (MNHN-B 24583).

Iles Wallis et Futuna. MUSORSTOM 7 : st. CP 564, 1015-1020 m : 5 ♂, 7 ♀ ovigères, 4 ♀ (MNHN-B 24684). — St. CP 565, 900 m : 3 ♂, 2 ♀ ovigères, 1 ♀ (MNHN-B 24687). — St. CP 567, 1010-1020 m : 3 ♂, 7 ♀ ovigères, 2 ♀ (MNHN-B 24686).

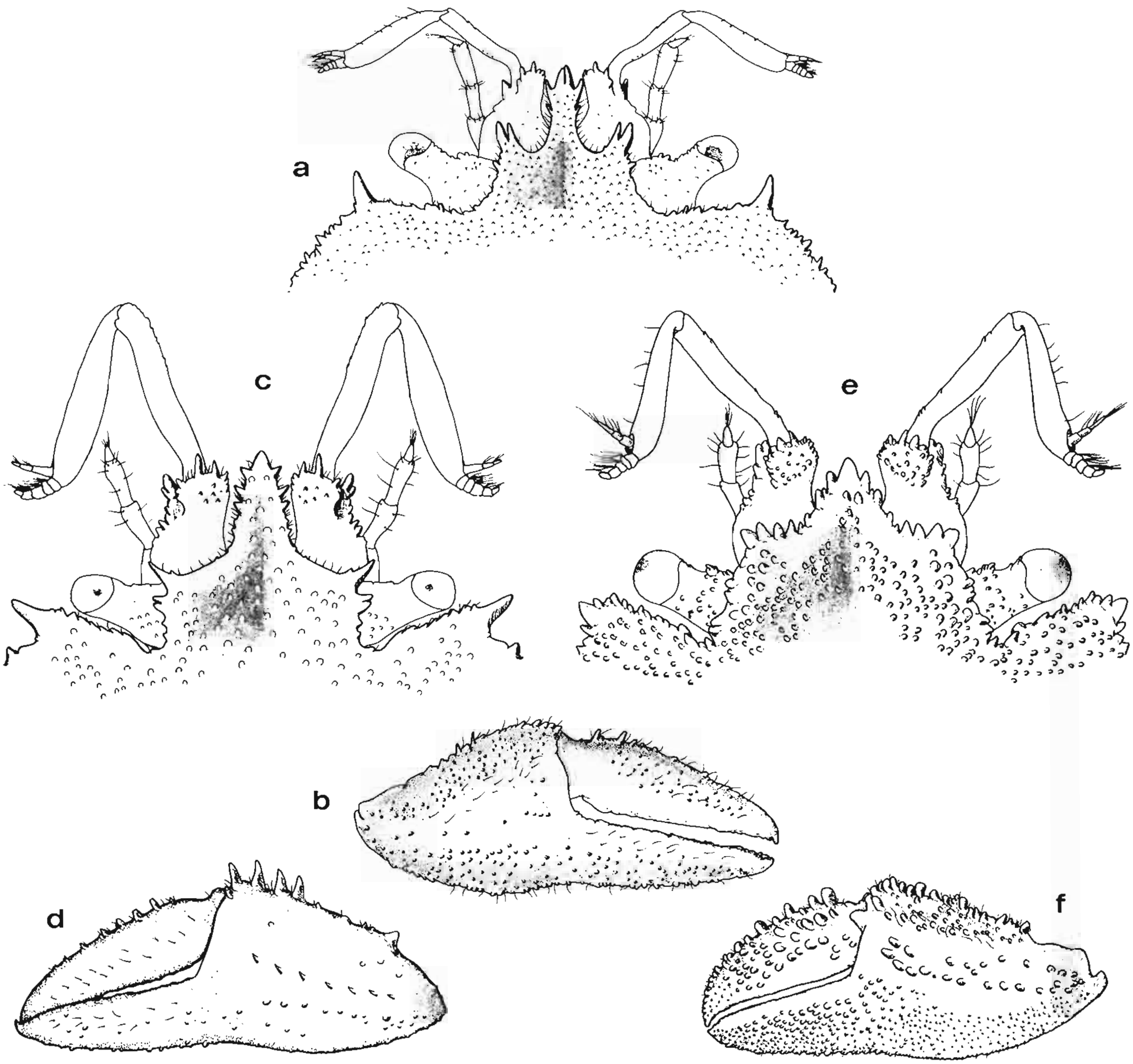

FIG. 15 a-b. — *Krangalangia rostrata* (Ihle, 1916), Nouvelle-Guinée, "*Siboga*", st. 159, 0°59,1'S - 129°48,8'E, 411 m, ♀ lectotype 5 mm de long (ZMA-De 102971) : **a**, bord frontal de la carapace ; **b**, face externe de la pince du chélipède.

FIG. 15 c-d. — *Krangalangia spinosa* (Zarenkov, 1970), Australie occidentale, "*Vytiatz*", st. 4564, 820 m, ♂ paratype 5 x 5,2 mm (MNHN-B 24571) : **c**, bord frontal de la carapace ; **d**, face externe de la pince du chélipède.

FIG. 15 e-f. — *Krangalangia orstom* sp. nov., Nouvelle-Calédonie, MUSORSTOM 6, st. CP 438, 20°23'S-166°20,10'E, 780 m, ♂ holotype 6,2 x 6,5 mm (MNHN-B 24575) : **e**, bord frontal de la carapace ; **f**, face externe de la pince du chélipède.

TYPES. — La série-type de *K. spinosa* est composée par trois mâles et cinq femelles, récoltés sur la côte ouest-australienne ("*Vytiatz*", st. 4564). L'holotype mâle, un mâle et trois femelles paratypes, sont conservés dans la collection du Musée de Zoologie de l'Université de Moscou. Les autres paratypes, un mâle et deux femelles, sont conservés à Paris.

LOCALITÉ-TYPE. — Côte ouest d'Australie, 820 m. Aucune autre indication n'a été fournie par ZARENKOV (1970) à l'occasion de la description originale de cette espèce, ou sur l'étiquette des paratypes que nous avons examinés.

DESCRIPTION. — Carapace couverte, sur le dessus, d'épines espacées et émoussées. Région frontale déprimée en son milieu. Flancs et régions ptérygostomiennes très spinuleux. Fossettes gastriques bien marquées. Nodosité protogastrique médiane obsolète, les autres très faibles. Régions cardiaque et intestinale non séparées par un sillon et délimitées latéralement par un sillon profond. Saillies antéro-latérales (les seules sur la carapace) toujours distinctes ; derrière elles, une épine plus petite. Front large, armé sur l'angle supéro-externe de trois, parfois quatre, épines développées (épine médiane au moins deux fois plus longue que les épines latérales) ; front se prolongeant par une avancée rostrale triangulaire, très pointue, incurvée vers le haut, bordé d'épines de taille variable (plus développées à l'extrémité). Dents exorbitaires très proéminentes, droites, cylindriques, dirigées vers le haut. Face dorsale des pédoncules oculaires garnie de granules et de petites épines ; cornée faiblement pigmentée, semblant dégénérée. Antennules environ deux fois plus courtes que la carapace. Premier article antennaire mobile. Mérus des troisièmes maxillipèdes fortement orné d'épines sur sa face externe. Chélipèdes égaux, couverts de granules peu accusés ; carpe avec une dent triangulaire, très aiguë et armée d'épines pointues ; bord supérieur du propode et du dactyle garni par une série d'épines proéminentes, incurvées vers l'extrémité du chélipède ; doigts courts. Péréiopodes 2 et 3 similaires : mérus, carpe et propode munis de nombreux granules spinuleux. Péréiopodes 4 et 5 subdorsaux, similaires, courts, garnis de soies et de quelques granules spinuleux, à dactyle incurvé.

DISTRIBUTION. — Côtes occidentale et orientale (de 17°22'S à 18°10'S) d'Australie, îles Chesterfield, Nouvelle-Calédonie et îles Wallis et Futuna, entre 479 et 1223 m de profondeur.

VARIATIONS. — Chez *K. spinosa*, l'ornementation de la carapace et des appendices varie considérablement. Ces variations sont relevées ci-dessous, selon l'origine des échantillons :

Australie occidentale : trois paratypes ont été examinés (un mâle et deux femelles). La carapace et les appendices ont un aspect spinuleux ; les épines qui ornent le front sont toujours bien développées, mais leur nombre est variable. Le front se prolonge par une avancée rostrale triangulaire, fortement incurvée vers le haut, bordée par des épines de taille variable. Le front est frangé par une série de soies éparses.

Australie orientale : 26 spécimens ont été examinés (5 mâles et 21 femelles, dont quelques-unes ovigères). Dans le matériel de cette région, dominent les individus à carapace et appendices dotés d'une ornementation moins accusée. Les épines qui ornent le front sont moyennement développées ; l'avancée rostrale est à peine incurvée vers le haut et elle munie d'épines à peine perceptibles. Le front est frangé par une série de soies peu denses.

Iles Chesterfield, Nouvelle-Calédonie et îles Wallis et Futuna : 81 spécimens ont été examinés (38 mâles et 43 femelles, dont quelques-unes ovigères), parmi lesquels dominent les individus à carapace et appendices d'aspect spinuleux. Les épines qui ornent le front sont toujours bien développées, mais leur nombre est variable. L'avancée rostrale fortement incurvée vers le haut, est armée d'épines aiguës. Le front est frangé par une série de soies peu serrées. Chez la plupart des mâles, il y a une épine assez proéminente, ou bien deux épines plus petites, sur l'axe des troisième et quatrième segments abdominaux.

Une partie des spécimens en provenance de Nouvelle-Calédonie (4 mâles et 19 femelles, dont quelques-unes ovigères) présentent un front régulièrement frangé par une série dense de longues soies.

REMARQUES. — *K. spinosa*, a été originalement décrite dans le genre *Cyclodorippe* A. Milne Edwards, 1880, et a ensuite été transférée par TAVARES (1992a) dans le genre *Krangalangia* Tavares, 1992.

Au cours d'une étude des crabes récoltés dans la mer de Flores, TAKEDA et MOOSA (1990) ont rattaché trois mâles et trois femelles ovigères de *K. rostrata* (Ihle, 1916) au genre *Cyclodorippe*. Se basant seulement sur les descriptions de *K. rostrata* et de *K. spinosa*, ces deux auteurs ont proposé la mise en synonymie de ces deux espèces : "Considering such a variability of the armature, it may have been inevitable that the epibranchial spine [saillie antéro-latérale de la carapace] was not mentioned in the original description of *C. rostrata*, which was based on one male and two females. Only a difference between these two species is the presence or absence of the epibranchial spine, and it is very difficult to find other distinguishing characters."

Nous avons eu entre les mains le matériel-type de ces deux espèces, ainsi que d'autres échantillons, assez riches, provenant de localités diverses. L'examen de l'ensemble de ce matériel, nous a permis d'étudier les variations morphologiques chez *K. rostrata* et *K. spinosa* et de préciser les caractères qui les distinguent.

Chez *K. spinosa*, l'ornementation de la carapace est variable (voir ci-dessus), mais bien différente de celle de *K. rostrata* ; les flancs de la carapace, surtout sur la région ptérygostomienne et les appendices ont un aspect plus spinuleux. Par contre, les épines qui recouvrent le dessus de la carapace sont espacées et émoussées (elles sont serrées, assez petites et aiguës, chez *K. rostrata*) ; les saillies antéro-latérales sont toujours distinctes ; elles sont précédées d'une épine plus petite (inexistante chez *K. rostrata*) ; l'avancée rostrale est plus large à la base ; le nombre d'épines qui ornent le rostre est variable, mais celles-ci sont souvent plus développées que chez *K. rostrata*. Chez *K. spinosa*, le front est, en général, régulièrement frangé par une série de longues soies serrées et l'axe des troisième et quatrième segments abdominaux mâles est armé d'une épine assez proéminente, ou bien de deux épines plus petites (inexistantes chez *K. rostrata*).

Krangalangia orstom sp nov.

Fig. 13 f, 15 e-f

MATÉRIEL EXAMINÉ. — **Iles Loyauté**. MUSORSTOM 6 : st. CP 438, 780 m : 1 ♂ 6,2 x 6,5 mm, holotype (MNHN-B 24575) ; 2 ♂ et 1 ♀ ovigère 5,2 x 5,8 mm (MNHN-B 24576).

Iles Wallis et Futuna. MUSORSTOM 7 : st. DW 527, 540-560 m : 3 ♂ (MNHN-B 24694). — St. DW 540, 700 m : 1 ♂, 2 ♀ (MNHN-B 24691). — St. CP 552, 786-800 m : 3 ♀ ovigères (MNHN-B 24689). — St. DW 560, 697-702 m : 1 ♂, 1 ♀, 1 ♀ ovigère (MNHN-B 24688). — St. DW 586, 510-600 m : 1 ♂ (MNHN-B 24693). — St. DW 626, 597-600 m : 1 ♂ (MNHN-B 24685). — St. CP 627, 597-600 m : 2 ♂, 1 ♀ (MNHN-B 24690). — St. DW 631, 600 m : 2 ♂ (MNHN-B 24692).

TYPES. — Holotype : mâle 6,2 x 6,5 mm (MNHN-B 24575, MUSORSTOM 6, st. CP 438). Les autres spécimens de la liste ci-dessus sont les paratypes.

LOCALITÉ-TYPE. — Iles Loyauté, 20°23'S - 166°20,10'E, 780 m.

ÉTYMOLOGIE. — Espèce dédiée à l'ORSTOM (Institut Français de Recherche Scientifique pour le Développement en Coopération) qui réalise le programme d'étude de la faune lagonaire (LAGON) et bathyale de Nouvelle-Calédonie (MUSORSTOM) en coopération avec le Muséum national d'Histoire naturelle.

DESCRIPTION. — Carapace couverte de forts granules surtout dans la région antérieure. Flancs garnis d'épines incurvées (régions ptérygostomiennes) et de granules fins (parties antérieures). Fossettes gastriques peu visibles. Nodosités protogastriques très faibles. Régions cardiaque et gastrique délimitées latéralement par un sillon assez faible ; entre ces deux régions un sillon un peu plus marqué. Aucune saillie sur la carapace, à l'exception des saillies antéro-latérales. Front large, avec l'angle supérieur muni de granules très forts ; front se prolongeant en son milieu par une avancée rostrale triangulaire, courte, elle-même ornée de granules forts. Dents exorbitaires bien développées, couvertes de granules. Face dorsale des pédoncules oculaires possédant quelques granules aigus ; cornée bien nette, peu pigmentée. Antennules environ deux fois plus courtes que la carapace. Premier article antennaire mobile. Mérus des troisièmes maxillipèdes orné de granules aigus sur sa face externe. Chélipèdes égaux ; carpe, propode et dactyle munis de gros granules sur leur face externe, surtout sur celle du propode et du doigt mobile ; sur la face interne du carpe, une dent aiguë, courte et triangulaire. Péréiopodes 2 et 3 similaires ; mérus, carpe et propode, surtout ces deux derniers, munis de granules pointus. Péréiopodes 4 et 5 subdorsaux, similaires, courts, à dactyle incurvé. P5 un peu plus longs que les P4, tous munis de soies courtes.

DISTRIBUTION. — Iles Loyauté, Wallis et Futuna, entre 510 et 800 m de profondeur.

REMARQUES. — *Krangalangia orstom* se distingue assez facilement des deux autres espèces du genre par les granules gros et trapus qui ornent régulièrement le bord fronto-orbitaire de la carapace, ainsi que par l'avancée rostrale nettement plus courte que chez les autres espèces.

Les femelles ovigères portent 32 œufs en moyenne, de 0,6 mm de diamètre chacun.

Genre *KETAMIA* Tavares, 1992

Cyclodorippe (Cyclodorippe) Ihle, 1916 : 128 (*pro parte*).
Ketamia Tavares, 1992a : 514.

DESCRIPTION. — Carapace à contour subrectangulaire ou subcirculaire, à peine plus large que longue. Limites entre la face dorsale de la carapace et les flancs assez nettes. Front très court, triangulaire, présentant une encoche médiane à sommet déprimé. Largeur fronto-orbitaire supérieure à la moitié de la largeur maximale de la carapace. Orbites assez profondes, avec les bords supérieur et inférieur bien délimités. Pédoncules oculaires mobiles, orientés transversalement par rapport à l'axe de la carapace. Avancée de l'endostome en forme de gouttière, plus étroite vers l'avant, très allongée, généralement dépassant de beaucoup le bord frontal de la carapace et visible en vue dorsale. Exopodite des premiers et deuxièmes maxillipèdes pourvu d'un flagelle normal ; celui des troisièmes maxillipèdes dénué de flagelle. Propode et dactyle des P2 et P3 ornés, chacun, de deux rangées de nombreuses soies très longues : l'une située sur la face ventrale, l'autre sur la face dorso-externe ; dactyle comprimé latéralement. Abdomen femelle formé de sept segments, tous assez étroits, notamment le dernier qui est en plus très allongé. Pléopodes articulés sur les segments abdominaux 1 à 5. Pléopode 1 vestigial, uniramé, inséré sur la face ventrale du premier segment abdominal ; pléopodes 2-5 normaux, pourvus de très longues soies, articulés aux extrémités latéro-externes des segment abdominaux 2 à 5 et non sur leur face ventrale. Abdomen mâle formé de cinq segments.

ÉTYMOLOGIE. — D'après *Ketam*, nom indonésien pour crabe. Genre : féminin.

ESPÈCE-TYPE. — *Cyclodorippe* (*Cyclodorippe*) *depressa* Ihle, 1916.

ESPÈCES INCLUSES. — *Ketamia depressa* (Ihle, 1916) ; *K. handokoi* sp. nov. ; *K. limatula* sp. nov. ; *K. proxima* sp. nov.

DISTRIBUTION. — Genre entièrement indo-ouest-pacifique, trouvé entre 15 et 440 m de profondeur.

REMARQUES. — *Ketamia* Tavares a été établi pour abriter une espèce décrite à l'origine dans le genre *Cyclodorippe* A. Milne Edwards, 1880 : *Cyclodorippe* (*Cyclodorippe*) *depressa* Ihle, 1916. Les ressemblances entre les genres *Ketamia* et *Cyclodorippe* ne sont que superficielles. Par la morphologie de l'abdomen femelle, le nouveau genre se place au voisinage des genre *Xeinostoma* Stebbing et *Krangalangia* Tavares.

Les principales différences entre ces trois genres sont les suivantes :

1) chez *Ketamia*, le front est très court, triangulaire et présente une encoche médiane (chez *Krangalangia*, le front se termine par une avancée rostrale très proéminente, triangulaire ; chez *Xeinostoma*, le front à contour semi-circulaire, dépasse de beaucoup le niveau des dents exorbitaires) ;

2) chez *Ketamia*, l'avancée de l'endostome est très allongée et, généralement, dépasse de beaucoup le bord frontal de la carapace, si bien que, dans certains cas, elle est visible en vue dorsale (chez *Krangalangia* comme chez *Xeinostoma*, l'avancée de l'endostome ne dépasse jamais le bord frontal de la carapace et elle n'est donc pas visible dorsalement).

Ketamia, *Xeinostoma* et *Krangalangia* se rapprochent par la présence d'un abdomen constitué de segments assez étroits ainsi que par le nombre et le type d'insertion des pléopodes femelles, présents sur les segments abdominaux de 1 à 5 : Pl 1 vestigiaux, uniramés, insérés sur la face ventrale du premier segment abdominal ; Pl 2-5 normaux, articulés aux extrémités latéro-externes des segments abdominaux 2 à 5. Quant au nombre de segments abdominaux de la femelle, il est de 7 chez *Ketamia* et de 6 chez *Xeinostoma* et *Krangalangia*. Le dernier segment abdominal est semblable chez les femelles de *Ketamia* et de *Xeinostoma*.

Clef de détermination des espèces du genre *Ketamia*

1. Carapace subrectangulaire. Endostome s'allongeant jusqu'à dépasser nettement le bord frontal de la carapace. Abdomen mâle formé de 5 segments **2**

— Carapace subcirculaire. Endostome ne dépassant pas le bord frontal de la carapace. Abdomen mâle formé de 6 segments .... ***Ketamia handokoi***

2. Carapace et sternum thoracique ornés de granules ou d'épines **3**

— Carapace et sternum thoracique inermes .... ***Ketamia limatula***

3. Ornementation de la carapace et de ses appendices moyennement développée, surtout sur les régions ptérygostomiennes. Saillies antéro-latérales de la carapace obsolètes. Face externe du propode des chélipèdes sans rangée longitudinale de gros tubercules .... ***Ketamia proxima***

— Ornementation de la carapace et de ses appendices peu développée, surtout sur les régions ptérygostomiennes. Saillies antéro-latérales de la carapace plutôt proéminentes. Face externe du propode des chélipèdes avec une rangée longitudinale de 10 gros tubercules .... ***Ketamia depressa***

Ketamia depressa (Ihle, 1916)

Fig. 2 f, 4 e-f, 5 c, 16 a-c

Cyclodorippe (Cyclodorippe) depressa Ihle, 1916 : 131.
Cyclodorippe depressa - TAKEDA & TOMIDA 1984 : 46.
Ketamia depressa - TAVARES, 1992a : 514.

MATÉRIEL EXAMINÉ. — **Philippines**. "*Siboga*" : st. 105, île Sulu, 6°8'N - 121°19'E, 275 m : 1 ♂ 4 x 4,3 mm, lectotype (ZMA-De 102972) ; 2 ♂, paralectotypes (ZMA-De 102972).
MUSORSTOM 2 : st. DR 33, 137-130 m : 1 ♂, 1 ♀ (MNHN-B 24682).
Indonésie. "*Siboga*" : st. 260, îles Kei, 5°36,5'S - 132°55,2'E, 90 m : 1 ♀, paralectotype (ZMA-De 102973). — St. 289, Timor, 9°00,3'S - 126°24,5'E, 112 m : 1 ♂, paralectotype (ZMA-De 102974). — St. 305, île Flores, 113 m : 1 ♂, paralectotype (ZMA-De 102975).
Iles Chesterfield. MUSORSTOM 5 : st. DW 274, 285 m : 1 ♂ (MNHN-B 24601). — St. DW 302, 345-360 m : 1 ♀ (MNHN-B 24602). — St. DW 304, 385-420 m : 1 ♂ (MNHN-B 24603).
Nouvelle-Calédonie. BIOCAL : st. DW 44, 440 m : 1 ♂ 4,4 x 4,6 mm (MNHN-B 24599) ; 3 ♂ (MNHN-B 24600) ; 2 ♂ (USNM).
Iles Loyauté. MUSORSTOM 6 : st. DW 480, 380 m : 1 ♂ (MNHN-B 24604).

TYPES. — Lectotype : mâle 4 x 4,3 mm (ZMA-De 100972). Paralectotypes : 2 mâles (ZMA-De 102972), 1 femelle (ZAM-De 102973), 1 mâle (ZMA-De 102974), 1 mâle (ZMA-De 102975).

LOCALITÉ-TYPE. — Philippines, île Sulu ("*Siboga*" : st. 105, 6°8'N - 121°19'E), 275 m.

DESCRIPTION. — Carapace ornée de granules, plus importants sur les régions hépatique, protogastrique, épibranchiales et métabranchiales. Région frontale peu déprimée en son milieu. Flancs légèrement sétifères, garnis de quelques granules. Fossettes gastriques à peine visibles. Nodosités protogastriques bien nettes. Régions cardiaque et gastrique délimitées par un sillon peu profond. Saillies antéro-latérales (les seules sur la carapace) moyennement développées. Dents fronto-orbitaires proéminentes. Face dorsale des pédoncules oculaires ornée de petits granules. Cornée pigmentée. Antennules environ deux fois plus courtes que la carapace ; flagelle remarquablement long. Premier article antennaire mobile. Ischion et mérus des troisièmes maxillipèdes peu sétifères ; mérus faiblement orné sur sa face externe. Chélipèdes égaux, robustes, ornés de forts granules, avec une pilosité plus développée à l'extrémité des doigts ; face externe du propode avec une rangée longitudinale de 10 gros tubercules, doigts effilés. Péréiopodes 2 et 3 similaires ; mérus, carpe et propode ornés de quelques granules très petits sur leur face dorsale. Péréiopodes 4 et 5 subdorsaux, similaires, courts ; mérus, carpe et propode munis de granules très fins ; dactyle arqué.

DISTRIBUTION. — Philippines et Indonésie (Timor, île de Flores, îles Kei), entre 90 et 275 m de profondeur.

VARIATIONS. — Les spécimens néo-calédoniens se distinguent de ceux de Philippines et d'Indonésie par les saillies antéro-latérales de la carapace très peu développées (moyennement développées chez les spécimens des Philippines et d'Indonésie) ; par le mérus de Mxp3 orné de granules spinuleux sur la face externe (faiblement orné chez les autres) ; et par l'ornementation des mérus, carpe et propode de P2 à P5 légèrement plus marquée chez le matériel néo-calédonien.

REMARQUES. — IHLE (1916b) n'ayant pas désigné d'holotype pour *Cyclodorippe depressa*, nous avons sélectionné comme lectotype l'un des trois mâles syntypes (ZMA-De 102972).

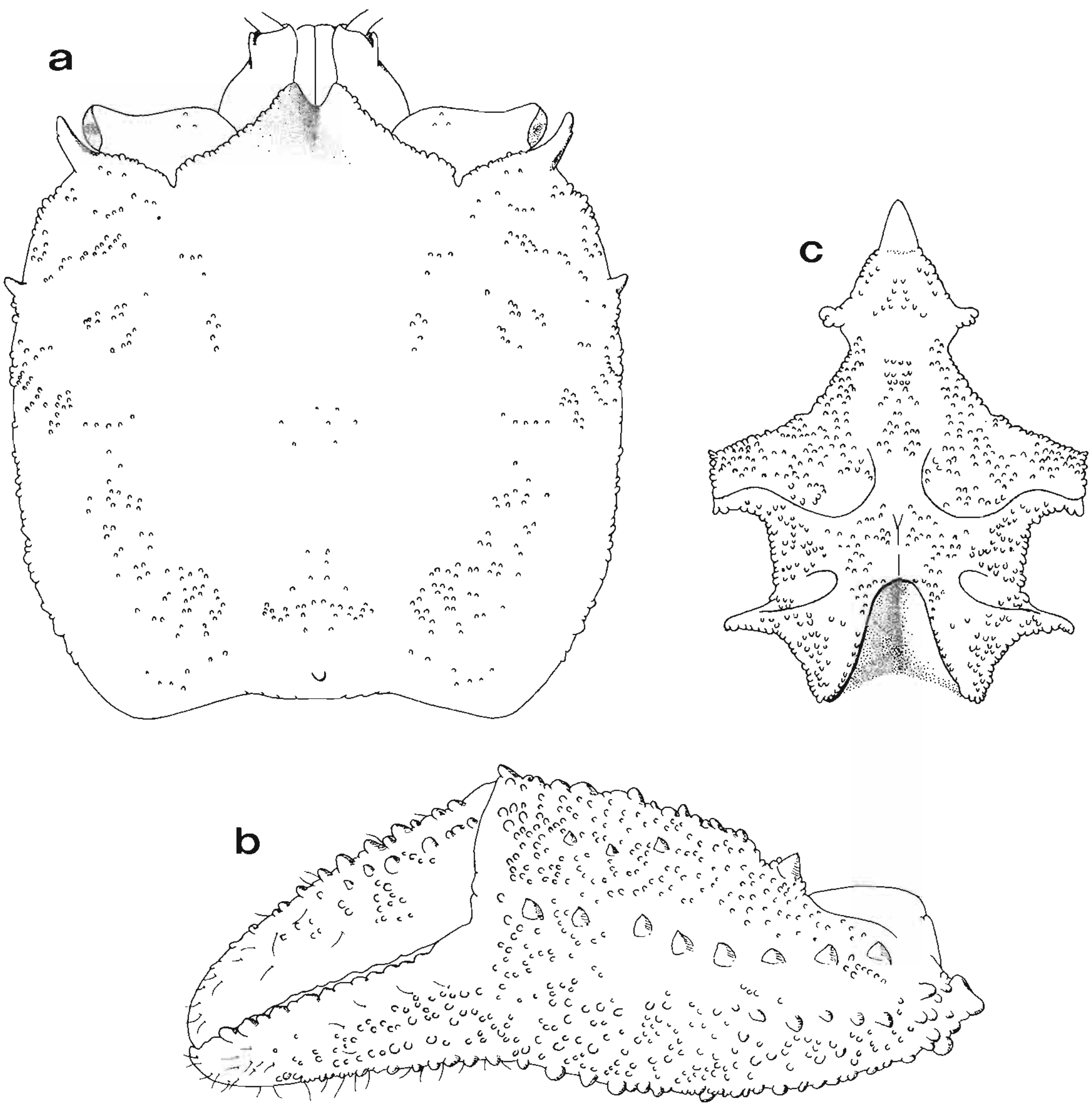

FIG. 16. — *Ketamia depressa* (Ihle, 1916), Philippines, "*Siboga*", st. 105, 6°08'N - 121°19'E, 275 m, ♂ lectotype 4 x 4,3 mm (ZMA-De 102.972) : **a**, vue d'ensemble de la carapace ; **b**, face externe de la pince du chélipède ; **c**, sternum thoracique.

Ketamia handokoi sp. nov.

Fig. 17 a-c

MATÉRIEL EXAMINÉ. — **Indonésie**. KARUBAR : st. CP 15, îles Kei, 214-221 m : 1 ♂ 10 x 11 mm, holotype (MNHN-B 24681).

TYPES. — Holotype : mâle 10 x 11 mm (MNHN-B 24681).

LOCALITÉ-TYPE. — Indonésie : îles Kei (05°17,38'S - 132°41,07'E).

ÉTYMOLOGIE. — Espèce dédiée au Lieutenant-Colonel HANDOKO, commandant du navire "*Baruna Jaya I*" lors de la mission franco-indonésienne KARUBAR (1991)

DESCRIPTION. — Carapace ornée d'épines courtes, plus développées sur les régions ptérygostomiennes et sur les flancs de la carapace. Région frontale assez déprimée en son milieu. Flancs très sétifères. Fossettes gastriques bien marquées. Nodosités protogastriques peu accusées. Régions cardiaque et gastrique délimitées par un sillon assez profond. Saillies antéro-latérales (les seules sur la carapace) saillantes, armées de petites épines. Dents fronto-orbitaires proéminentes. Face dorsale des pédoncules oculaires complètement lisse ; cornée bien pigmentée, facettes normales. Face externe des Mxp3 recouverte d'épines courtes et pointues, surtout sur le mérus. Ornementation des chélipèdes constituée par des tubercules aigus ; pilosité assez développée, surtout sur les doigts. Péréiopodes 2 et 3 similaires, sétifères ; mérus, carpe et propode munis sur leur face inférieure de quelques granules très fins ; dactyle complètement lisse. Péréiopodes 4 et 5 similaires, sétifères, ornés de granules très fins. Abdomen du mâle formé de 6 segments ; une suture assez faible entre les segments 5 et 6.

DISTRIBUTION. — Cette espèce n'est connue actuellement que de sa localité-type : Indonésie, îles Kei, à 214-221 m de profondeur.

Ketamia limatula sp. nov.

Fig. 18 a-c

MATÉRIEL EXAMINÉ. — **Indonésie**. Îles Moluques (Amboine), SERÈNE coll., dragage, 15-20 m : 1 ♂ 5,2 x 5 mm, holotype (MNHN-B 24607) ; 1 ♂ (MNHN-B 24608) ; 1 ♀ ovigère (MNHN-B 24608).

TYPES. — Holotype : mâle 5,2 x 5 mm (MNHN-B 24607, îles Moluques, Amboine). Les autres spécimens mentionnés ci-dessus sont les paratypes.

LOCALITÉ-TYPE. — Indonésie, îles Moluques (Amboine), 15-20 m.

ÉTYMOLOGIE. — Nom spécifique tiré du latin *limatulus*, poli, passé à la lime, par allusion à la surface de la carapace et du sternum thoracique dénué de granules ou d'épines.

DESCRIPTION. — Carapace complètement dénuée de granules ou d'épines, régulièrement recouverte de soies assez courtes et avec des bords latéraux ornés de quelques soies très longues. Région frontale déprimée en son milieu. Flancs lisses, peu sétifères. Fossettes gastriques bien marquées. Nodosités protogastriques à peine visibles. Saillies antéro-latérales (les seules sur la carapace) très peu prononcées. Régions cardiaque et gastrique délimitées par un sillon assez peu profond. Dents fronto-orbitaires proéminentes. Face dorsale des pédoncules oculaires lisse ; cornée pigmentée. Antennules environ deux fois plus courtes que la carapace ; flagelle remarquablement long. Premier article antennaire mobile. Ischion et mérus des troisièmes maxillipèdes sétifères ; aucune autre ornementation à leur surface. Chélipèdes sétifères, leur ornementation constituée par des granules fins ; pilosité plus développée à l'extrémité des doigts qui sont effilés. Péréiopodes 2 et 3 similaires, sétifères ; aucun granule ni épine à leur surface. Péréiopodes 4 et 5 similaires, courts, à dactyle incurvé.

DISTRIBUTION. — Cette espèce n'est connue actuellement que de sa localité-type : Indonésie, îles Moluques (Amboine), à 15-20 m de profondeur.

REMARQUES. — *Ketamia limatula* est la seule espèce de la famille des Cyclodorippidae connue des eaux littorales (15 à 20 m), la grande majorité ayant été recensée à des profondeurs supérieures à 135 m.

K. limatula se distingue très facilement des autes espèces du genre par sa carapace et son sternum thoracique complètement lisses, couverts seulement de soies.

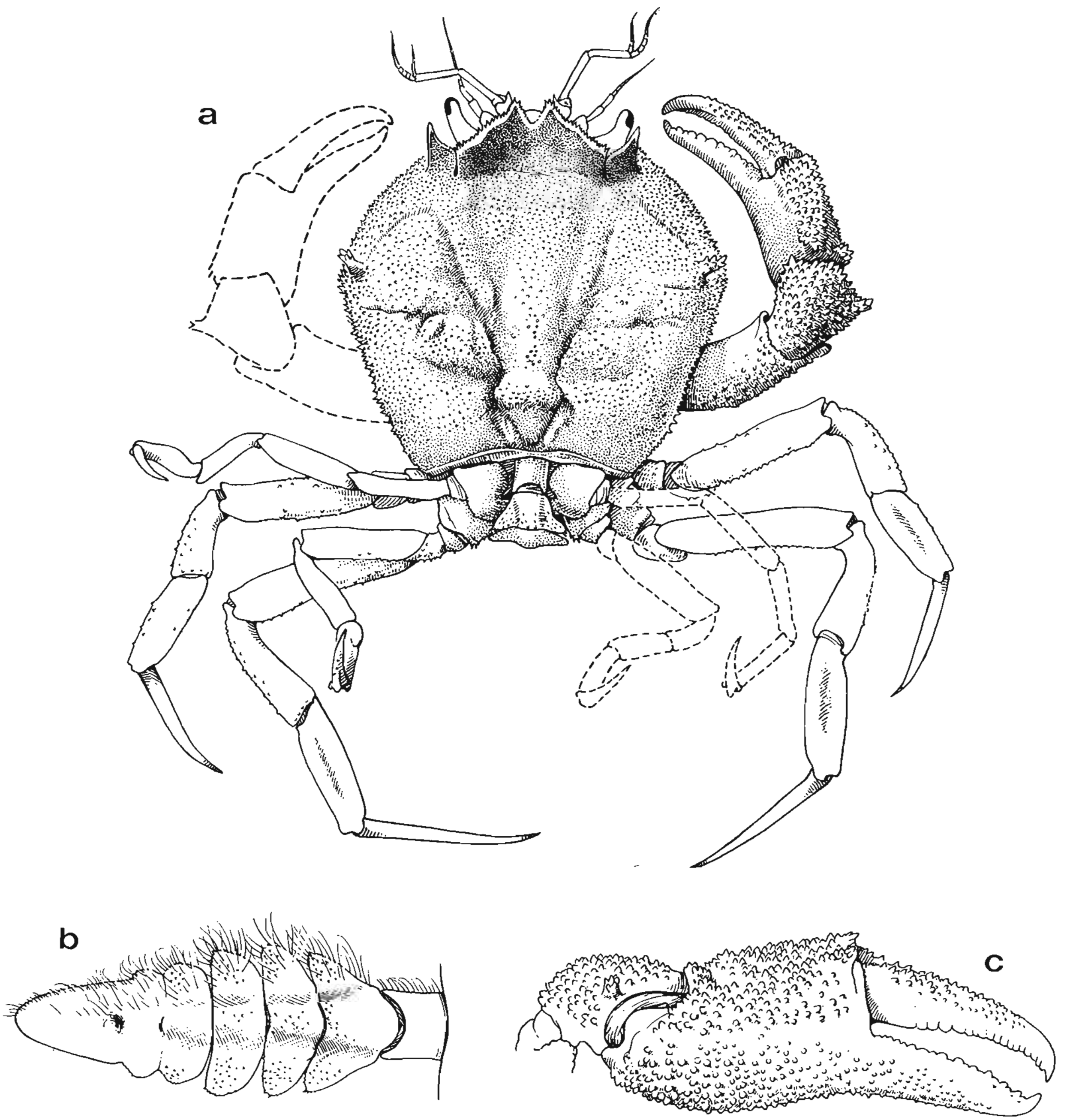

FIG. 17. — *Ketamia handokoi* sp. nov., Indonésie, KARUBAR st. CP 15, 05°17'38"S- 132°41'07" E, 214-221 m, ♂ holotype 10 x 11 mm (MNHN-B 24681) : **a**, vue d'ensemble. La pilosité n'est pas représentée ; **b**, face externe des segments abdominaux. La pilosité n'est pas représentée du coté droit. On notera une suture assez faible entre les segments 5 et 6 ; **c**, face externe de la pince du chélipède.

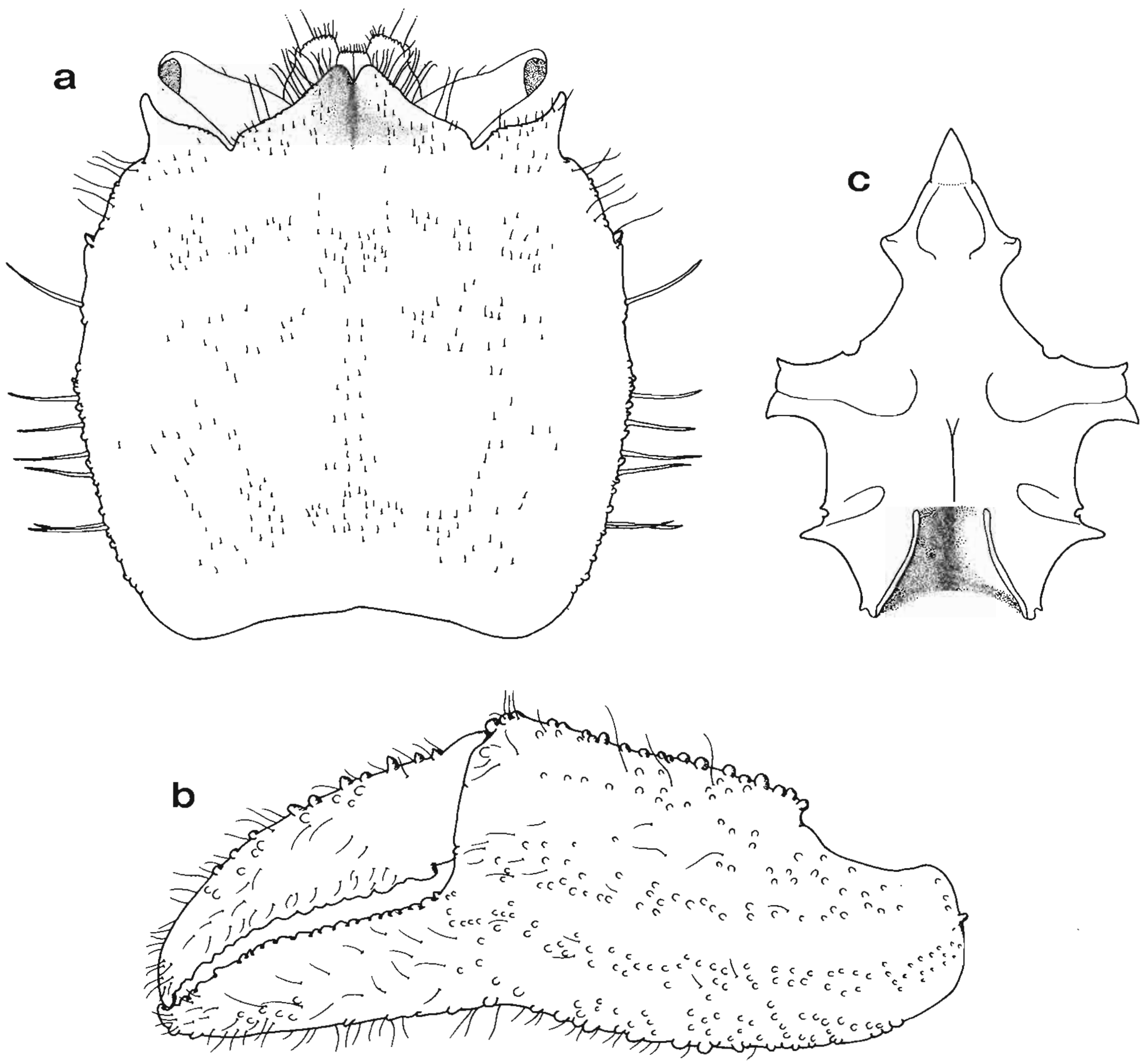

FIG. 18. — *Ketamia limatula* sp. nov., Indonésie, Iles Moluques, Amboine, dragage 15-20 m, ♂ holotype 5,2 x 5 mm (MNHN-B 24607) : **a**, vue d'ensemble de la carapace ; **b**, face externe de la pince du chélipède ; **c**, sternum thoracique. A noter le bord antérieur de la cavité sterno-abdominale tronqué.

Ketamia proxima sp. nov.

Fig. 19 a-b

MATÉRIEL EXAMINÉ. — **Madagascar**. "*Vauban*" : côte ouest, vers 18°50'S, dragage, 90-140 m : 1 ♀ 4,6 x 4,9 mm, holotype (MNHN-B 24605) ; 1 ♀ (MNHN-B 24606).

TYPES. — Holotype :·femelle 4,6 x 4,9 mm (MNHN-B 24605). L'autre femelle mentionnée ci-dessus est le paratype.

LOCALITÉ-TYPE. — Madagascar, côte ouest, vers 18°50'S, 90-140 m.

ÉTYMOLOGIE. — Nom spécifique tiré du latin *proximus*, le plus près, par allusion à l'aspect de cette espèce qui est proche de celui de *K. depressa*.

DESCRIPTION. — Carapace ornée d'épines aiguës sur les régions hépatiques et de granules sur les régions branchiales. Granulation beaucoup moins importante sur la partie centrale de la carapace. Région frontale déprimée en son milieu. Flancs et régions ptérygostomiennes faiblement sétifères, recouverts de fins granules ; régions sous-hépatiques garnies de quelques petites épines. Fossettes gastriques bien marquées. Nodosités protogastriques nettes. Régions cardiaque et gastrique délimitées par un sillon profond. Saillies antéro-latérales (les seules sur la carapace) assez faibles. Dents fronto-orbitaires proéminentes. Face dorsale des pédoncules oculaires garnie de petits granules. Cornée pigmentée. Ischion et mérus des troisièmes maxillipèdes ornés de granules spinuleux. Chélipèdes sétifères, ornés de nombreuses épines émoussées ; pilosité plus développée à l'extrémité des doigts qui sont effilés. Péréiopodes 2 et 3 similaires ; mérus, carpe et propode sétifères, munis de petites épines ; dactyle lisse, sétifère. Péréiopodes 4 et 5 similaires, courts ; mérus, carpe et propode très peu ornementés ; dactyle incurvé.

DISTRIBUTION. — Madagascar, à 90-140 m de profondeur.

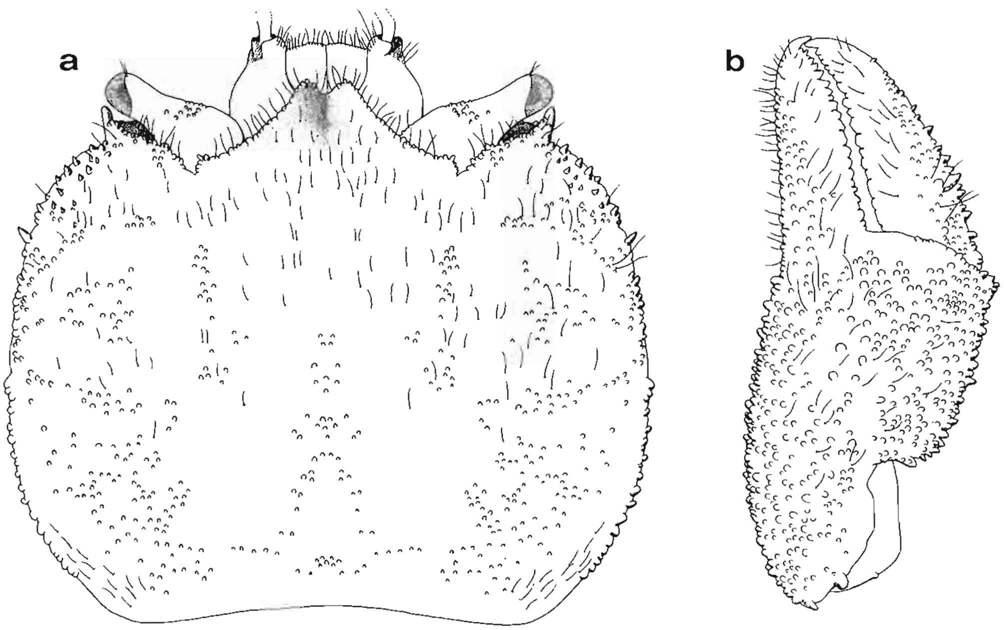

FIG. 19. — *Ketamia proxima* sp. nov., Madagascar, "*Vauban*", vers 18°50'S, 90-140 m, ♀ holotype 4,6 x 4,9 mm (MNHN-B 24605) : **a**, vue d'ensemble de la carapace ; **b**, face externe de la pince du chélipède.

Famille des CYMONOMIDAE Bouvier, 1897

Cymonomae Bouvier, 1897 : 7.

Cymonomae - A. MILNE EDWARDS & BOUVIER, 1899 : 16, 17 ; 1902 : 74. — IHLE, 1916 b : 116, 118. — BOUVIER, 1940 : 195, 196. — BARNARD, 1950 : 38. — GORDON, 1963 : 57.

Cymonomidae - GLAESSNER, 1969 : 627. — GARTH & HAIG, 1970 : 6, 7. — DEL SOLAR, 1972 : 16. — WRIGHT & COLLIN, 1972 : 33. — GRIFFIN & BROWN, 1976 : 251. — MANNING & HOLTHUIS, 1981 : 28. — ABELE & FELGENHAUER, 1982 : 316. — INGLE, 1980 : 82. — KENSLEY, 1981b : 60. — ABELE & KIM 1986 : 39. — SCHRAM, 1986 : 307. — SOTO, 1986 : 16. — TAVARES, 1991a : 635.

Dorippidae - RATHBUN, 1937 : 75 (*pro parte*). — CHACE, 1940 : 10 (*pro parte*). — BARNARD, 1950 : 387 (*pro parte*). — MONOD, 1956 : 84 (*pro parte*). — ZARIQUIEY ALVAREZ, 1968 : 309 (*pro parte*).

Dorippinae - SAKAI, 1965 : 18.

Tymolidae - GUINOT, 1979 : 174. — KENSLEY, 1981a : 37 (*pro parte*). — VAN DOVER, 1982 : 211 (*pro parte*). — VAN DOVER, FACTOR & GORE, 1982 : 50 (*pro parte*). — WEAR & FIELDER, 1985 : 24.

Tymolinae - BALSS, 1922 : 116 (*pro parte*) ; 1957 : 1609 (*pro parte*).

Clef de détermination des genres de CYMONOMIDAE

(les genres présents dans l'Indo-Ouest-Pacifique sont en caractères gras)

1. Pédoncules oculaires et antennules non cachés sous le rostre. Mérus des Mxp3 très saillant en avant ; palpe articulé sur sa face interne. P2 et P3 grêles et assez allongés par rapport à la carapace .... ***Cymonomus***

— Pédoncules oculaires et antennules recouverts par le rostre. Mérus des Mxp3 normal ; palpe articulé à son extrémité. P2 et P3 plutôt courts et robustes **2**

2. Pédoncules oculaires mobiles. P4 et P5 courts, mais constitués par les six articles habituels (coxa, ischion, mérus, carpe, propode, dactyle) .... *Cymopolus*

— Pédoncules oculaires soudés au rostre. P4 et P5 vestigiaux, ne comptant qu'un seul article .... ***Elassopodus***

Genre *ELASSOPODUS* nov.

DESCRIPTION. — Carapace épaisse, à peine plus longue que large. Rostre assez large, se prolongeant par deux fortes épines. Bord fronto-orbitaire beaucoup plus court que la moitié de la largeur maximale de la carapace. Pédoncules oculaires soudés à la carapace, recouverts par celle-ci. Antennules totalement repliées sous le front. Mérus des troisièmes maxillipèdes comme d'ordinaire ; palpe articulé sur son extrémité. Exopodite des maxillipèdes 1-3 possédant un flagelle normalement développé. Chélipèdes égaux, un peu plus robustes que les P2, garnis d'épines de toutes tailles ; doigts extrêmement grêles. P2 et P3 plutôt courts et robustes, très ornementés ; dactyle assez arqué, un peu plus long que l'article précédent. P4 et P5 vestigiaux, ne comptant qu'un seul article, qui est assez peu mobile. Abdomen femelle formé de sept segments, muni de quatre paires de pléopodes (sur les segments 2, 3, 4, et 5). Abdomen mâle formé de six segments.

ÉTYMOLOGIE. — Nom générique formé par la combinaison des mots grecs, *elasson*, moindre, *podion*, pied. Genre masculin.

ESPÈCE-TYPE. — *Elassopodus stellatus* sp. nov.

ESPÈCES INCLUSES. — *Elassopodus stellatus* sp. nov.

DISTRIBUTION. — Genre indo-ouest-pacifique, trouvé à 700 m de profondeur.

REMARQUES. — *Elassopodus* gen. nov. est remarquable par ses P4 et P5 vestigiaux. Chez les Brachyoures, P4 et P5 peuvent être réduits à des degrés divers ou même absents (cas des P5 chez les Hexapodidae) (cf. GUINOT, 1990 : 589), mais aucun cas de réduction extrême à savoir la présence d'un seul et unique article comme celui constaté chez le genre *Elassopodus* n'a jamais été signalé. Comme nous l'avons déjà mentioné, la présente révision n'est qu'une étude préliminaire de la morphologie des Cyclodorippoidea. Les traits de la morphologie très particulière du genre *Elassopodus* seront étudiés avec plus de détails dans un travail sur la morphologie et les affinités des Cyclodorippoidea.

Elassopodus stellatus sp. nov.

Fig. 2 h, 20 a-b

MATÉRIEL EXAMINÉ. — **Nouvelle-Calédonie.** BIOCAL : st. DW 51, 700 m : 1 ♀ 6,5 x 5,5 mm, holotype (MNHN-B 24620).
CHALCAL 2 : st. DW 72, 527 m : 1 ♂, 2 ♀ (MNHN-B 24621).

TYPES. — Holotype : femelle 6,5 x 5,5 mm (MNHN-B 24620). Les trois autres spécimens de la liste ci-dessus sont les paratypes.

LOCALITÉ-TYPE. — Nouvelle-Calédonie, BIOCAL, st. 51, 23°05,27'S - 167°44,95'E, 700 m.

ÉTYMOLOGIE. — Nom de l'espèce tiré du latin *stellatus*, étoilé, par allusion aux épines du corps, dont le sommet est en forme d'étoile.

DESCRIPTION. — Carapace garnie d'épines de toutes tailles, dont certaines se terminent par une sorte d'étoile, à pointes en nombre variable. Il en est de même pour l'ornementation des péréiopodes et de l'abdomen. Pédoncules oculaires garnis d'épines émoussées. Cornée complètement dégénérée, sans facettes et sans trace de pigment. Antennes plus courtes de moitié que les antennules. Antennules assez courtes, avec l'article basal muni de tubercules tronqués. Mxp3 armés d'épines et de tubercules sur leur face externe ; mérus découpé irrégulièrement. Chélipèdes garnis d'épines de toute taille ; carpe avec deux épines remarquablement longues sur la face dorsale ; doigts cylindriques. P2 et P3 ornés d'épines et de tubercules ; dactyle arqué, avec quelques soies et de petites épines sur la face ventrale.

DISTRIBUTION. — Nouvelle-Calédonie, à 700 m de profondeur.

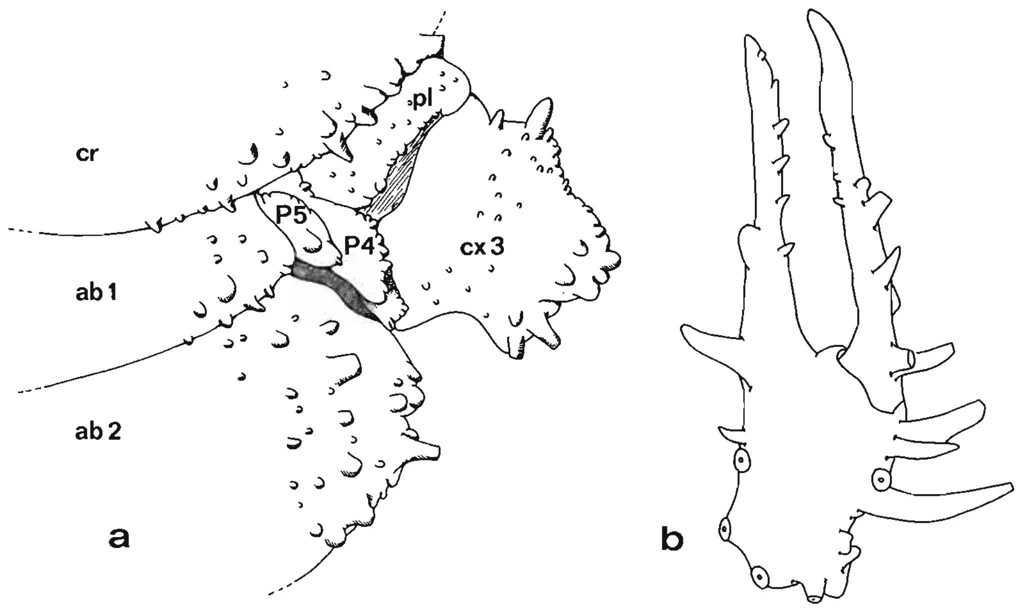

FIG. 20. — *Elassopodus stellatus* sp. nov., Nouvelle-Calédonie, BIOCAL, st. DW 51, 23°05,27'S - 167°44',95'E, 700 m, ♀ holotype 6,5 x 5,5 mm (MNHN-B 24620) : **a**, vue dorsale de la région postérieure du corps : cr, carapace ; ab1-ab2 segments abdominaux 1 et 2 ; pl, région exposée du pleurite 6 ; cx3, coxa du troisième péréiopode ; p4, p5, péréiopodes 4 et 5 ; **b**, face externe de la pince du chélipède.

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7

Crustacea Decapoda : Dorippidae of New Caledonia, Indonesia and the Philippines

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ABSTRACT

Dorippidae material collected by several French expeditions (MUSORSTOM 3-6, CHALCAL 1, BIOCAL, BIOGEOCAL) from 1980 to 1989, a French Indonesian cruise (CORINDON 2) in 1980 and the MARIEL KING MEMORIAL EXPEDITION in 1970 off the Philippines, Indonesia, Chesterfield Islands and New Caledonia yielded a total of 24 species (including 2 uncertain species) belonging to 2 subfamilies and 3 genera. Twelve species are new and 10 species are first records from New Caledonia.

RÉSUMÉ

Crustacea Decapoda : Dorripidae de Nouvelle-Calédonie, d'Indonésie et des Philippines.

Les Dorippidae récoltés par diverses expéditions françaises (MUSORSTOM 3-6, CHALCAL 1, BIOCAL et BIOGEOCAL) de 1980 à 1989, une expédition franco-indonésienne (CORINDON 2) en 1980 et la MARIEL KING MEMORIAL EXPEDITION en 1970 dans les eaux des Philippines, de l'Indonésie, des îles Chesterfield et de la Nouvelle-Calédonie, comprennent 24 espèces appartenant à 3 genres. Douze espèces sont nouvelles pour la Science et 10 n'avaient jamais été signalées en Nouvelle-Calédonie.

INTRODUCTION

This report is based on the collections obtained during various expeditions made by French research vessels to the Philippines (MUSORSTOM 3, 1980), Indonesia (CORINDON 2, 1986), Chesterfield Islands (CHALCAL 1, 1984; MUSORSTOM 5, 1986) and New Caledonia (LAGON, 1984-1989; BIOCAL, 1985; MUSORSTOM 4, 1985; BIOGEOCAL, 1987; MUSORSTOM 6, 1989).

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Also included are collections made in Indonesia by the MARIEL KING MEMORIAL EXPEDITION in 1970.

Cruise details and station data, with the exception of that of the MARIEL KING MEMORIAL EXPEDITION for which, to our knowledge, no report has been published, may be found in : FOREST (1989) - MUSORSTOM 3; MOOSA (1985) - CORINDON 2; RICHER DE FORGES (1991) - LAGON; RICHER DE FORGES (1990) remaining expeditions.

Twenty-four species (including 2 uncertain species) belonging to 2 subfamilies and 3 genera have been identified, of which 12 new species are described, and 10 species (marked with an asterisk in the accompanying list) are reported for the first time from New Caledonia.

Twenty-three species belonging to 2 genera of Ethusinae (*Ethusina* and *Ethusa*) were from shallow and deep waters. The species of *Ethusina* were taken from the deep sea at depths between 970 and 2950 m and the species of *Ethusa* from the shallow waters of the continental shelf and slope from 21 to 790 m. One species, *Dorippoides facchino*, of the subfamily Dorippinae, was obtained at a depth of 25 m.

LIST OF SPECIES

(New species are in bold)

Subfamily DORIPPINAE MacLeay, 1838

Dorippoides facchino (Herbst, 1785)

Subfamily ETHUSINAE Guinot, 1977

Ethusa crosnieri **sp. nov.**
Ethusa curvipes **sp. nov.**
Ethusa furca **sp. nov.**
**Ethusa granulosa* Ihle, 1916
**Ethusa indica* Alcock, 1894
**Ethusa izuensis* Sakai, 1937
**Ethusa latidactylus* (Parisi, 1914)
Ethusa magnipalmata **sp. nov.**
Ethusa major **sp. nov.**
Ethusa makasarica **sp. nov.**
**Ethusa minuta* Sakai, 1937
Ethusa obliquidens **sp. nov.**
Ethusa parapygmaea **sp. nov.**
**Ethusa pygmaea* Alcock, 1894
**Ethusa sexdentata* (Stimpson, 1858)
Ethusa sp.
Ethusina brevidentata **sp. nov.**
**Ethusina desciscens* Alcock, 1896
Ethusina dilobotus **sp. nov.**
Ethusina paralongipes **sp. nov.**
Ethusina pubescens **sp. nov.**
**Ethusina robusta* Miers, 1886
Ethusina sp.

SYSTEMATIC ACCOUNT

Subfamily DORIPPINAE MacLeay, 1838

Genus *DORIPPOIDES* Serène & Romimohtarto, 1969

Dorippoides facchino (Herbst, 1785)

Fig. 1

Cancer facchino Herbst, 1785 : 190, pl. II, fig. 68.
Dorripe facchino - BOSC, 1802 : 208 (not seen).
Dorripe (Dorippoides) facchino - SERÈNE & ROMIMOHTARTO, 1969 : 4, 8, figs 2, 6, 11, 16A-D, pls 1C, 3D. — DAI & YANG, 1991 : 51-52, fig. 22, pl. 5(3).
Dorippoides facchino - HOLTHUIS & MANNING, 1985 : 304; 1990 : 49-66, figs 19-25. — CHEN, 1986b : 121, 139, fig. 3 (14-16); 1987 : 679.

MATERIAL EXAMINED. — **Indonesia**. CORINDON 2 : st. CH 203, 01°09'S, 117°08'E, 25 m, 30.10.1980 : 2 juv. 11.0 x 14.0 mm, 7.0 x 8.0 mm (MNHN-B 19072).

REMARKS. — Only two juvenile females were collected. The posterior borders of the meri, carpi and propodi of the second and third pereiopods (P2 and P3) are bare and hairless. The carapace of adults is usually more than 12 mm and bears dense setae on full grown specimens.

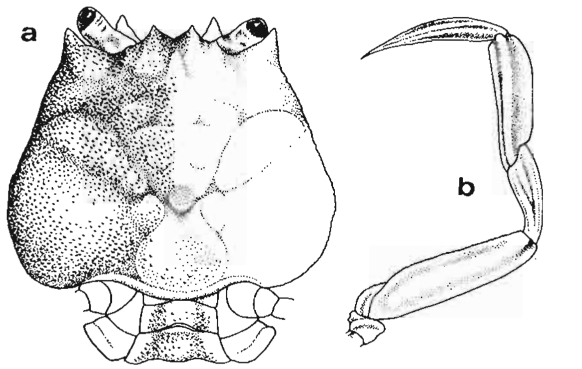

FIG. 1. — *Dorippoides facchino* (Herbst, 1785), juv. ♀ 7.0 x 8.0 mm (MNHN-B 19072) : **a**, carapace; **b**, third pereiopod.

DISTRIBUTION. — India, Sri Lanka, Burma, Thailand, Malaysia, Singapore, Indonesia, the Philippines, Vietnam and China (the northernmost to Ningbo, 29°53'N, 121°33'E, Zhejiang Province), at depths of 6-69 m.

Subfamily ETHUSINAE Guinot, 1977

Genus *ETHUSA* Roux, 1830

Key to Indo-West Pacific species of the genus *Ethusa*

(Species studied in this paper are in bold)

1. Carapace as long as broad or broader than long, notches of front shallow and rounded...... .... ***E. latidactylus*** (Parisi, 1914)
— Carapace longer than broad 2

2. Outer borders of exorbital teeth converging inwards....... 3
— Outer borders of exorbital teeth straight or swollen 4

3. Carapace with indistinct fine granules and hairs, fingers of female chelipeds without teeth .... ***E. obliquidens*** sp. nov.
— Carapace with distinct granules, no hair, fingers of female chelipeds with teeth....... .... *E. foresti* Chen, 1985

4. Front divided into 2 teeth and 2 lobes 5
— Front divided into 4 teeth 6

5. Lateral borders of carapace almost straight .... ***E. furca*** sp. nov.
— Lateral borders of carapace moderately swollen .... ***E.*** sp.

6. Exorbital teeth of male adult reaching beyond frontal teeth....... 7
— Exorbital teeth of male adult only reaching to bases or tips of frontal teeth....... 9

7. Second and third pereiopods very long....... *E. somalica* Doflein, 1904
— Second and third pereiopods moderately long....... 8

8. Fingers of chelipeds with teeth....... ***E. indica*** Alcock, 1894
— Fingers of chelipeds without tooth....... ***E. crosnieri*** sp. nov.

9. Large species (length of carapace of adults more than 15 mm) **10**
— Small species (length of carapace of adults less than 15 mm) **12**

10. Lateral borders of carapace straight, carapace granulated .... *E. orientalis* Miers, 1886
— Lateral borders of carapace slightly swollen.. **11**

11. Carapace smooth .... ***E. sexdentata*** (Stimpson, 1858)
— Carapace with short hairs and fine granules .... ***E. major*** sp. nov.

12. Exorbital teeth thin and sharp.. **13**
— Exorbital teeth relatively thick **14**

13. Cardiac region of carapace with 2 lobes, exorbital and frontal teeth small......................
.... *E. haiwaiiensis* Rathbun, 1906
— Cardiac region of carapace without lobe, exorbital and frontal teeth large ....
.... *E. quadrata* Sakai, 1937

14. Male adult cheliped unequal **15**
— Male adult cheliped equal.. **20**

15. Tips of exorbital teeth directed forwards.. **16**
— Tips of exorbital teeth directed outwards.. **17**

16. Carapace with pubescence and fine granules, frontal and exorbital teeth long ....
.... ***E. makasarica*** sp. nov.
— Carapace without hairs and with fine granules, frontal and exorbital teeth short.............
.... ***E. granulosa*** Ihle, 1916

17. Carapace with short hairs .... *E. hirsuta* McArdle, 1900
— Carapace with fine granules **18**

18. Notches of median and lateral frontal teeth relatively shallow, frontal teeth very small ....
.... ***E. magnipalmata*** sp. nov.
— Notches of median and lateral frontal teeth relatively deep...................................... **19**

19. First segment of male abdomen as long as second............. ***E. pygmaea*** Alcock, 1894
— First segment of male abdomen longer than second .... ***E. parapygmaea*** sp. nov.

20. Palm of adult cheliped moderatey swollen.. **21**
— Palm of adult chelipeds very swollen... **22**

21. Fingers of male chelipeds with small teeth, palm with granules... ***E. curvipes*** sp. nov.
— Fingers of male chelipeds without tooth, palm smooth..... *E. zurstrasseni* Doflein, 1904

22. Second and third pereiopods naked....................................... ***E. minuta*** Sakai, 1937
— Second and third pereiopods with hairs.. **23**

23. Palm of male chelipeds smooth............................... *E. madagascariensis* Chen, 1987
— Palm of male chelipeds with granules.. **24**

24. Movable finger with one large tooth or several obtuse teeth, cutting edges of fingers not gaping when closed .... ***E. izuensis*** Sakai, 1937
— Movable finger with 2 small teeth, cutting edges of fingers gaping when closed ....
.... *E. sinespina* Kensley, 1969

REMARKS. — Hereafter some informations are given on the distribution of the species cited in the key and not studied in this paper :

Ethusa foresti Chen, 1985, is known only from the Philippines (14°00.9'N, 14°01.9'E) between 185-205 m (CHEN, 1985a).

Ethusa hawaiiensis Rathbun, 1906, is known only from Hawaiian Islands between 97-386 m (RATHBUN, 1906).

Ethusa hirsuta McArdle, 1900, has been found from Sri Lanka and Indonesia between 112-216 m (MACGILCHRIST, 1905; IHLE, 1916).

Ethusa madagascariensis Chen, 1987, has been found only from the N. W. Coast of Madagascar at 150 m (CHEN, 1987).

Ethusa orientalis Miers, 1886, has been found only from Fiji Islands (19°09.32'S, 179°41.55'E) at 567 m (MIERS, 1886).

Ethusa quadrata Sakai, 1937, has been found from Japan, the Philippines, South China Sea and East China Sea between 35-209 m (SAKAI, 1937, 1965, 1976; CHEN, 1986a, 1986b).

Ethusa sinespina Kensley, 1969, is known from Natal (South Africa) and the N. W. Coast of Madagascar between 138-370 m (KENSLEY, 1969; CHEN, 1987).

Ethusa somalica Doflein, 1904, has been found only from Somaliland (2°58.5'N, 46°50.8'E) at 132 m (DOFLEIN, 1904).

Ethusa zurstrasseni Doflein, 1904, has been found only from Somaliland (0°29.3'S, 42°47.6'E) at 977 m (DOFLEIN, 1904).

Ethusa crosnieri sp. nov.

Fig. 2

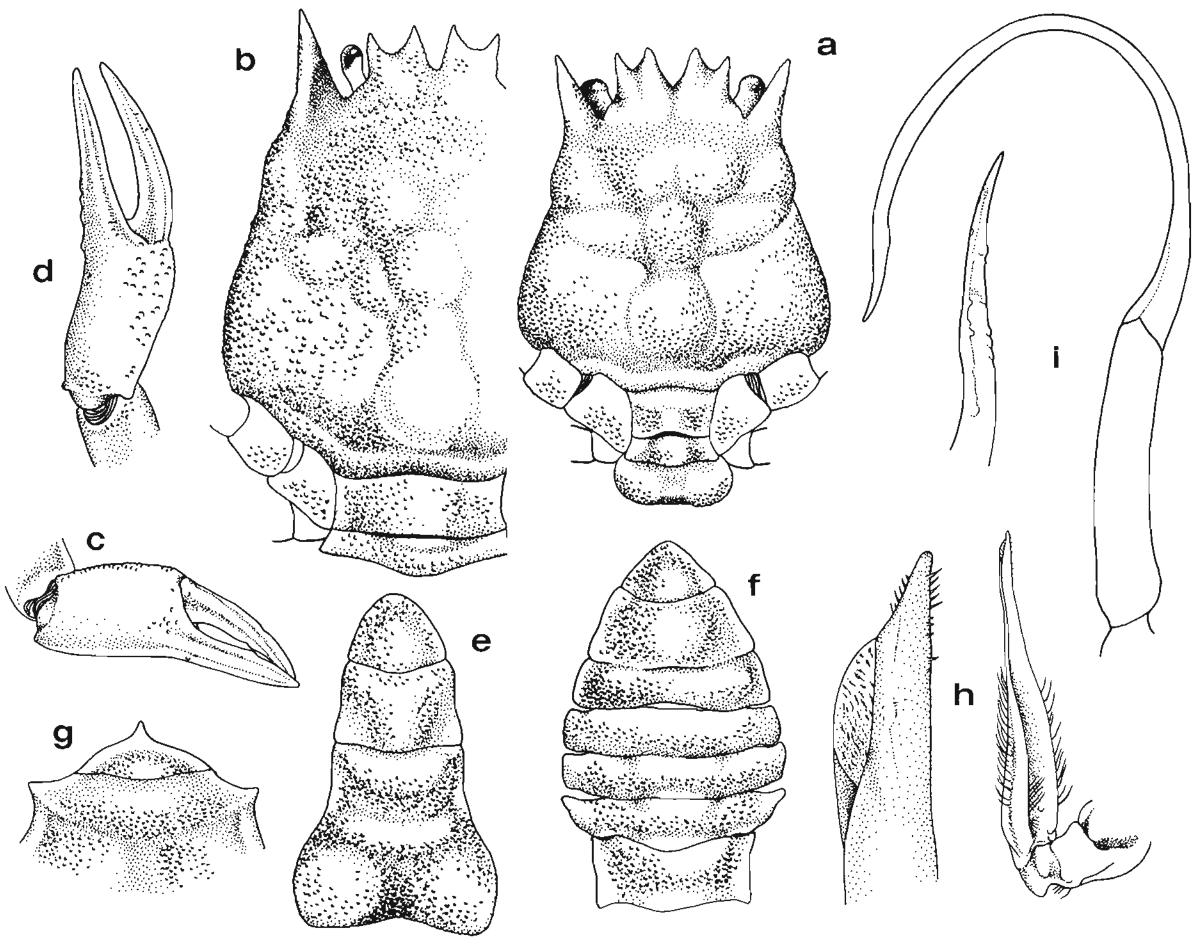

FIG. 2. — *Ethusa crosnieri* sp. nov., ♂ holotype 6.9 x 6.8 mm (MNHN-B 19063); ♀ allotype 8.9 x 10.0 mm (MPHN-B 19068) : **a**, male carapace; **b**, female carapace; **c**, male cheliped; **d**, female cheliped; **e**, male abdomen; **f**, female abdomen; **g**, male anterior sternal shield; **h**, male first pleopod; **i**, male second pleopod.

MATERIAL EXAMINED AND TYPES. — **Chesterfield Islands**. MUSORSTOM 5 : st. DW 256, 25°18.0'S, 159°52'E, 290-300 m, 07.10.1986 : 1 ♀, allotype, broken, 8.9 x 10.0 mm (MNHN-B 19068); 1 ♂, paratype, 6.4 x 6.2 mm (kept at IOAS). — St. DW 296, 23°12.61'S, 25°36.27'E, 178 m, 11.10.1986 : 1 ♂, holotype, 6.9 x 6.8 mm (MNHN-B 19063). — St. DW 298, 22°00'S, 159°22.00'E, 320 m, 11.10.1986 : 1 ♂, paratype, 7.3 x 7.0 mm (MNHN-B 19065).

DESCRIPTION. — Carapace longer than broad, covered with dense fine granules and short pubescence. Regions and grooves well marked : protogastric, mesogastric, cardiac and epibranchial regions convex. Frontal border divided into 4 teeth by a V-shaped and two broad U-shaped notches. Exorbital teeth very long and directed outward, the tip distinctly reaching beyond the frontal teeth.

Chelipeds equal in both sexes, covered with fine granules except on fingers. Palm slender, about 1.5 times as long as high. Movable finger slightly shorter than immovable finger; cutting edges of both sexes without teeth but in female the gap larger than that of male when closed.

Third pereiopods the longest. Second pereiopods relatively shorter. Merus of P3 about 6 times as long as high, propodus of P3 being 5 times. Last two legs short, meri cylindrical. Merus of P4 slightly higher than that of P5. Distal part of propodi with some setae.

Male abdomen of 5 segments (3rd-5th fused). First segment large, less than twice as long as second; third segment more convex on both sides. Sixth segment broader than long. Telson triangular.

Basal three fifths of male first pleopods stout, distal two fifths very slender, having a protuberance near the tip, its surface with spines. Second pleopods shorter than first, distal part relatively long and thin.

ETYMOLOGY. — This species is named in honor of Alain CROSNIER who provided the material for this study and who has kindly helped me in many ways.

REMARKS. — This new species resembles *Ethusa minuta* Sakai, 1937, of Japan. It can be distinguished by its exorbital teeth distinctly reaching beyond the frontal teeth, lateral frontal notches shallow, larger palm not swollen, cutting edges of fingers without teeth and distal two-fifths of first pleopod very slender.

DISTRIBUTION. — Chesterfield Islands, in depths between 290 and 320 m.

Ethusa curvipes sp. nov.

Fig. 3

MATERIAL EXAMINED AND TYPES. — **New Caledonia**. MUSORSTOM 4 : st. CP 169, 18°54.03'S, 163°11.20'E, 600 m, 17.09.1985 : 1 ♂, holotype, 5.7 x 5.4 mm (MNHN-B 22253).
SMIB 6 : st. DW 126, 18°59.1'S, 163°32.7'E, 320-330 m, 3.03.1990 : 1 ♂, paratype, 5.0 x 4.8 mm (MNHN-B 22427).

DESCRIPTION. — Carapace longer than broad, surface covered with closely set fine granules and pubescence. Regions and grooves being very distinct : protogastric, mesogastric, cardiac, meso- and metabranchial regions more convex than other regions. Metagastric region depressed, urogastric region flat. Frontal border divided into 4 teeth by a V-shaped and two broad U-shaped notches. Exorbital teeth long and acute, falling short of frontal teeth. Eyestalks slender and movable. Anterolateral borders convex outward near distal end of branchial groove.

Chelipeds of male of equal size, about 1.5 times as long as carapace. Merus with rather long hairs at borders, basal half broad and distal half gradually narrower, but surface smooth and glossy. Carpus convex, inner surface smooth and outer surface with fine granules. Palm 1.5 times as long as high, inner surface smooth, upper part of outer surface with acute granules. Fingers as long as palm; cutting edges with 3-5 teeth.

Merus of second and third legs about 5.5 times as long as high. Propodus of P3 slightly more than 4 times longer than high, that of P2, 3.5 times longer than high. Borders of ischium, meri and carpi of P2 and P3 bearing acute granules.

Male abdomen consisting of 5 segments (3rd-5th fused). First segment twice as long as second. Third convex on both sides. Sixth segment 1.6 times as broad as long. Telson bluntly triangular.

Male first pleopods stout, gradually narrower from base to 3/4, distal 1/4 slender and bent outwardly.

ETYMOLOGY. — The name is formed by a combination of the Latin *curvatus*, bent, and *pes*, foot, in reference to the shape of the first pleopods

REMARKS. — This new species closely resembles *Ethusa sinespina* Kensley, 1969, but the shape of fingers and palm in the male chelipeds and also the male pleopods differ completely.

DISTRIBUTION. — New Caledonia, in depths between 320 and 600 m.

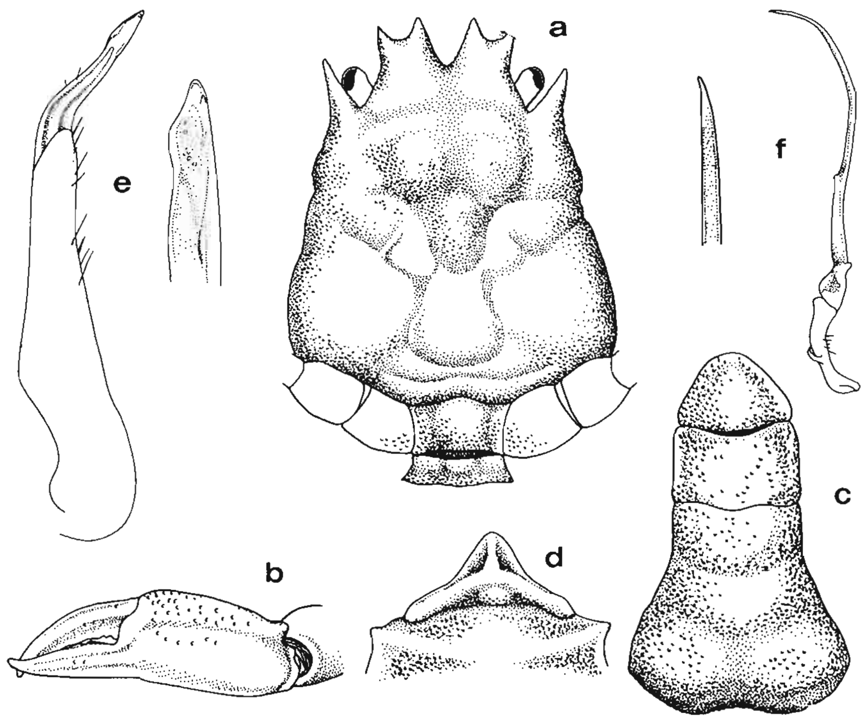

FIG. 3. — *Ethusa curvipes* sp. nov., ♂ holotype 5.7 x 5.4 mm (MNHN-B 22253) : **a**, carapace; **b**, cheliped; **c**, abdomen; **d**, anterior sternal shield; **e**, first pleopod; **f**, second pleopod.

Ethusa furca sp. nov.

Fig. 4

MATERIAL EXAMINED AND TYPES. — **New Caledonia**. MUSORSTOM 4 : st. DW 162, 18°35.0'S, 163°10.3'E, 525 m, 16.09.1985 : 1 ♂, paratype, broken (MNHN-B 18403).

MUSORSTOM 5 : st. CP 324, 21°15.01'S, 157°51.33'E, 970 m, 14.10.1986 : 1 ♂, paratype, 4.7 x 4.0 mm (kept at IOAS).

MUSORSTOM 6 : st. DW 485, 21°23.48'S, 167°59.33'E, 350 m, 23.02.1989 : 1 ♂, holotype, 6.0 x 5.1 mm (MNHN-B 21521).

DESCRIPTION. — Carapace slightly longer than broad, dorsal surface smooth. Cervical, branchial grooves and regions poorly marked : protogastric, mesogastric and branchial regions slightly raised but cardiac region lower than branchial one. Frontal region swollen, its anterior border divided into 4 teeth : the median ones broad and large, lateral teeth slender and small. Exorbital teeth short and acute, borders thin, and the tip slightly projecting upwards and sidewards.

Chelipeds symmetrical or if asymmetrical, the right one larger than left, surface smooth. Larger palm 1.6 times as long as high, cutting edges of fingers without teeth. Smaller palm slender, cutting edges of fingers of the smaller cheliped also without teeth.

Third pereiopods the longest, meri 5.5 times as long as high and propodi 4 times longer than high. Meri of P4 shorter than that of P5.

Male abdomen with 5 segments (3rd-5th somites fused). First segment transversely rectangular, second segment slightly broader and shorter than the first. Third with broad groove in the middle of base and both sides slightly raised. Sixth segment 1.6 times as broad as long, with converging lateral sides. Telson roundly triangular.

Male first pleopods stout, distal part gradually narrowed, with some hairs; tip forked. Second pleopods slender; tip forked.

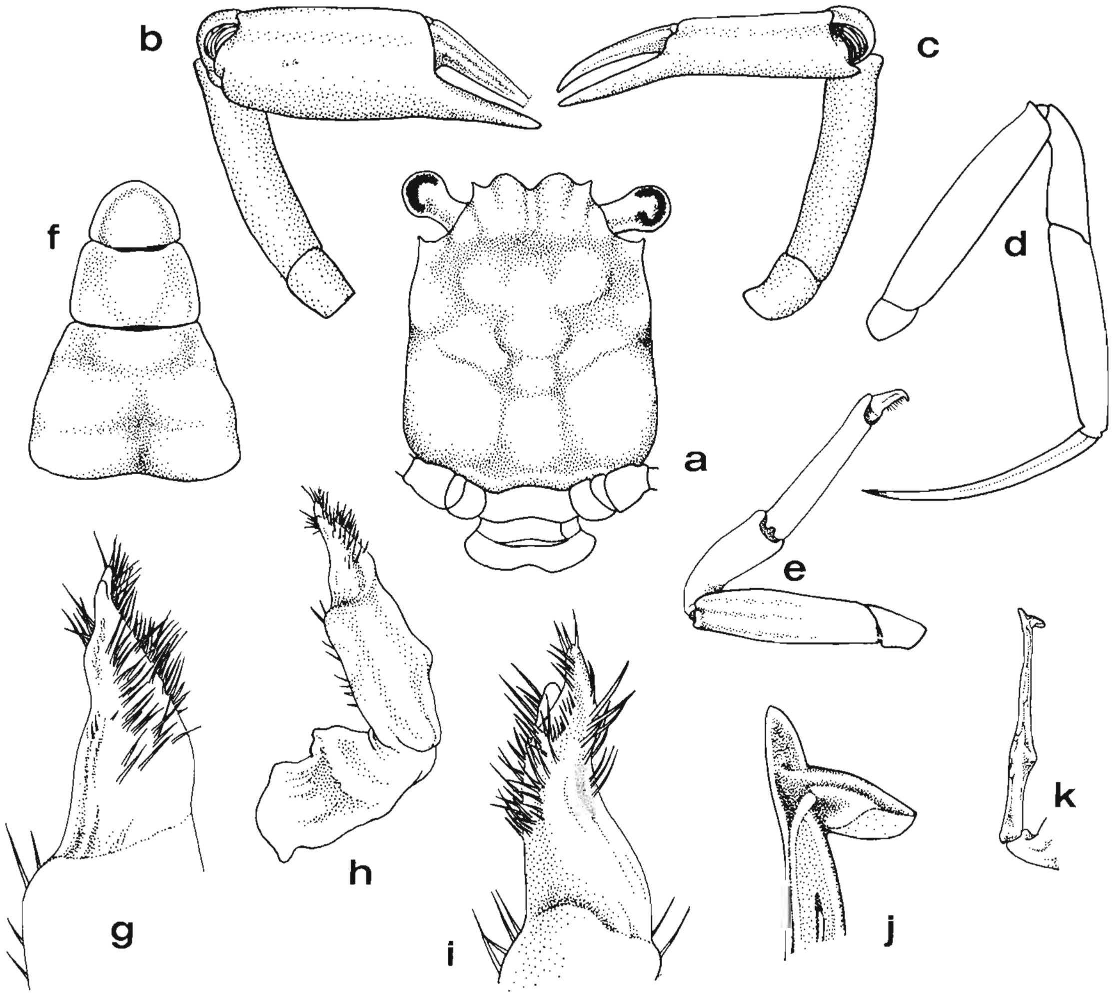

FIG. 4 — *Ethusa furca* sp. nov., ♂ holotype 6.0 x 5.1 mm (MNHN-B 21521) : **a**, carapace; **b-c**, chelipeds; **d**, third pereiopod; **e**, last pereiopod (another specimen); **f**, abdomen; **g-i**, first pleopod; **j-k**, second pleopod.

ETYMOLOGY. — The name is from the Latin *furca*, fork, in reference to the tip of the first and second pleopods.

REMARKS. — This new species is closely allied to *Ethusa quadrata* Sakai, 1937, but it may be distinguished from the latter species by having small and short exorbital teeth, frontal borders cut into 2 teeth and 2 lobes, larger palm cheliped not so swollen and rather long, the tips of second pleopods with 2 lobes and the telson of male abdomen roundly triangular.

DISTRIBUTION. — New Caledonia, in depths between 350 and 970 m.

Ethusa granulosa Ihle, 1916

Fig. 5

Ethusa granulosa Ihle, 1916 : 143-145, text-fig. 76. — SERÈNE, 1968 : 40.

MATERIAL EXAMINED. — **New Caledonia.** MUSORSTOM 4 : st. CP 157, 18°52.5'S, 163°16.9'E, 575 m, 15.09. 1985 : 1 ♂ 9.0 x 8.4 mm (MNHN-B 18419). — St. CC 175, 18°59.3'S, 163°17.5'E, 370 m, 17.09.1985 : 1 ♂ 9.4 x 8.8 mm (MNHN-B 19082). — St. DW 197, 18°51.3'S, 163°21.0'E, 560 m, 20.09.1985 : 3 ♂ 6.4 x 6.0 mm, 7.2 x 6.8 mm, 8.3 x 7.9 mm (MNHN-B 22252; 1 ♂ kept at IOAS).

SUPPLEMENTARY DESCRIPTION. — Male chelipeds symmetrical or asymmetrical (right larger than left), surface with fine granules. Larger cheliped with palm 1.25 times as long as high; fingers shorter than palm; cutting edges without teeth. Smaller cheliped slender, palm 1.4 times as long as high; cutting edges of fingers also without teeth.

Male abdomen consisting of 5 segments (3rd-5th fused). First segment much longer, second linear, third convex on both sides, the middle depressed. Sixth segment more or less rectangular, 1.8 times as broad as long. Telson bluntly triangular.

DISTRIBUTION. — Indonesia and New Caledonia, in depths between 370 and 575 m.

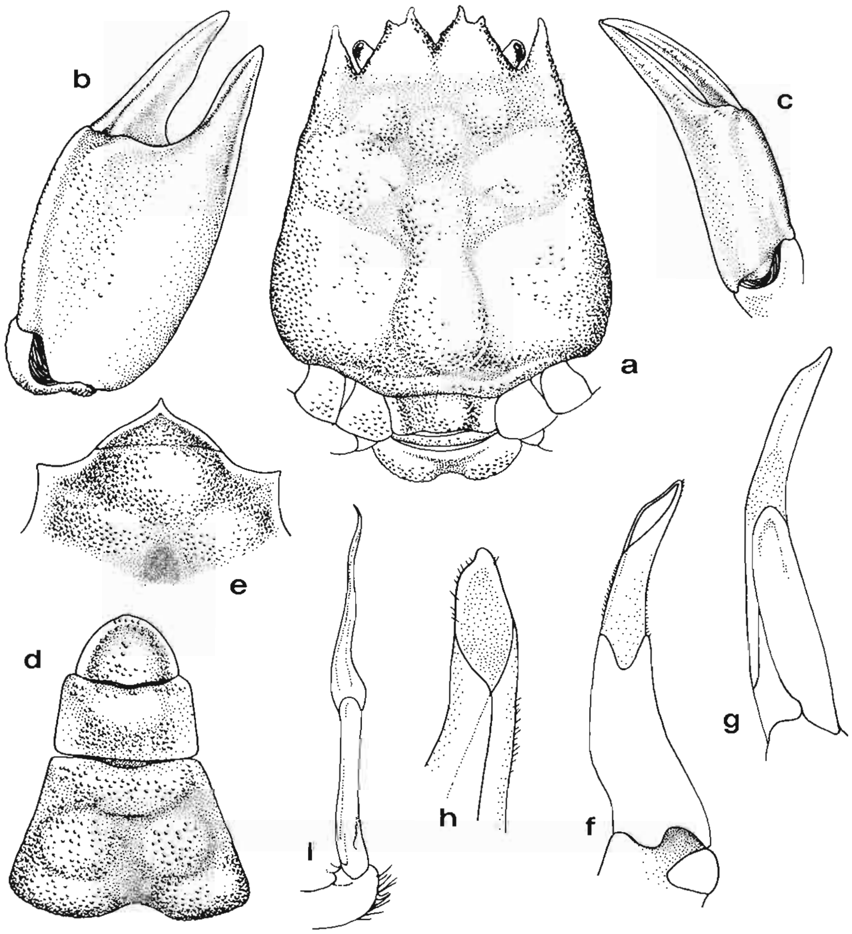

FIG. 5. — *Ethusa granulosa* Ihle, 1916, ♂ 9.4 x 8.8 mm (MNHN-B 19082) : **a**, carapace; **b-c**, chelipeds; **d**, abdomen; **e**, anterior sternal shield; **f-h**, first pleopod; **i**, second pleopod.

Ethusa indica Alcock, 1894

Ethusa indica Alcock, 1894 : 405; 1896 : 283. — ALCOCK & ANDERSON, 1895 : pl. 14, fig. 2. — IHLE, 1916 : 136. — SAKAI, 1965 : 24, pl. 11, fig. 4; 1976 : 64-65, text-fig. 27. — SERÈNE, 1968 : 40. — CHEN, 1986a : 189, figs 8-9, pl. I, fig. 1, pl. II, fig. 5; 1986b : 128, fig. 10 (45-49). — DAI & YANG, 1991 : 59-60, fig. 27 (3-4), pl. 6 (4).
Ethusa gracilipes - SERÈNE & LOHAVANIJAYA, 1973 : 35-36, figs 56-59, pl. 14, fig. c-d [Not *Ethusa (Ethusina) gracilipes* Miers, 1886].
Ethusa serenei Sakai, 1983 : 4-5.
Ethusina gracilipes - SERÈNE & VADON, 1981 : 119, 121 [Not *Ethusa (Ethusina) gracilipes* Miers, 1886].

MATERIAL EXAMINED. — **Indonesia**. CORINDON 2 : st. CH 201, 01°11'S, 111°06'E, 21 m, 30.10.1980 : 1 ♀ 6.9 x 7.0 mm (MNHN-B 19074). — St. CH 217, 00°38'S, 117°59'E, 470 m, 1.11.1980 : 1 ovig. ♀ 8.9 x 9.0 mm (MNHN-B 19076). — St. CH 240, 00°37'S, 119°33'E, 675 m, 5.11.1980 : 1 ♀ 9.0 x 9.4 mm (MNHN-B 19075). — St. CH 280, 01°59'S, 119°10'E, 715-800 m, 8.11.1980 : 6 ♂ 6.8 x 6.5 - 9.5 x 10.0 mm; 7 ♀ 7.0 x 7.7 - 9.5 x 10.0 mm (MNHN-B 19069).
New Caledonia. BIOGEOCAL : st. CP 232, 21°33.81'S, 166°27.07'E, 760-790 m, 12.04.1987 : 2 ♂ 10.0 x 10.1 mm, 12.0 x 13.0 mm; 1 ovig. ♀ 13.8 x 14.9 mm (MNHN-B 19098).
MUSORSTOM 6 : st. CP 438, 20°23'S, 166°20.10'E, 780 m, 18.02.1989 : 1 ♀ 9.1 x 9.5 mm (MNHN-B 21522).

REMARKS. — Of 8 male specimens examined, there were 6 males with unequal chelipeds, the right chelipeds being much larger than the left ones.

In the present material this species was found in depths between 470 and 790 m, except one female which was collected at 21 m from Makasar, Indonesia. Previous reports in the literature give a range of 30-1315 m.

DISTRIBUTION. — Maldive Islands, Andaman Sea, Laccadive Sea, Sri Lanka, Indonesia, the Philippines, Japan, East China Sea and South China Sea, in depths between 21 and 1315 m.

Ethusa izuensis Sakai, 1937

Ethusa izuensis Sakai, 1937 : 80, text-fig. 4; 1965 : 23, pl. 12, figs 1-2. — SERÈNE, 1968 : 40. — TAKEDA & MIYAKE, 1972a : 67. — SAKAI, 1976 : 66, text-figs 26d, 29. — SERÈNE & VADON, 1981 : 119-121. — CHEN, 1986a : 193-194, figs 11-12, pl. 1, fig. 2; 1986b : 131, fig. 12 (59-61). — DAI & YANG, 1991 : 58, 60, fig. 27 (5-6), pl. 6 (5).

MATERIAL EXAMINED. — **Philipines**. MUSORSTOM 3 : st. CP 97, 14°00'N, 120°18'E, 189-194 m, 31.05.1985 : 1 ♂ 6.6 x 6.3 mm (MNHN-B 18278).
New Caledonia. Dredge, 22°40.5'S, 167°10.3'E, 200-350 m, 10.10.1986 : 2 ♀ 7.0 x 6.9 mm, 8.3 x 8.1 mm (MNHN-B 19095).

DISTINCTIVE FEATURES. — Carapace covered with granules and pubescence. Each region slightly convex. Front divided into 4 teeth by a deep V-shaped and two shallow, short U-shaped notches. Base of exorbital teeth broad, not needle-like. Legs covered with soft hairs.

DISTRIBUTION. — Japan, the Philippines, New Caledonia, South China Sea and East China Sea, in depths between 30 and 350 m.

Ethusa latidactylus (Parisi, 1914)

Fig. 6

Ethusina latidactylus Parisi, 1914 : 28, pl. 13, fig. 1.
Ethusa latidactyla - IHLE, 1916 : 139, text-figs 74-75. — SAKAI, 1937 : 78, text-fig. 1b; 1965 : 23, pl. 11, fig. 3. — SERÈNE, 1968 : 40. — SAKAI, 1976 : 64, pl. 23, fig. 2, text-fig. 26b. — CHEN, 1986a : 186-189, fig. 7; 1986b : 127-128, fig. 9 (41-44).

MATERIAL EXAMINED. — **Indonesia**. CORINDON 2 : st. CH 273, 01°56'S, 119°16'E, 220-180 m, 7.11.1980 : 1 ♀ 13.0 x 14.6 mm (MNHN-B 19073).

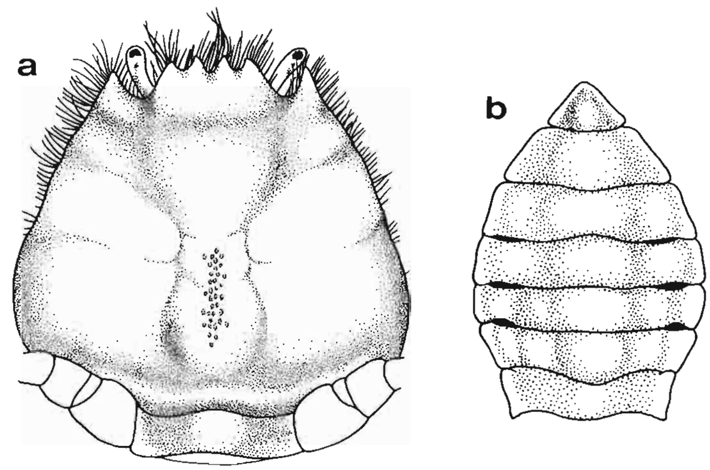

FIG. 6. — *Ethusa latidactylus* (Parisi, 1914), ♀ 13.0 x 14.0 mm (MNHN-B 19073) : **a**, carapace ; **b**, abdomen.

REMARKS. — This species differs from its congeners by its carapace being distinctly broader than long, the floors of frontal notches and orbits being round, the middle of the cardiac region having some longitudinally arranged granules and the body being almost entirely covered with short pubescence.

DISTRIBUTION. — South China Sea, Indonesia, Japan and the Philippines, in depths between 50 and 209 m.

Ethusa magnipalmata sp. nov.

Fig. 7

MATERIAL EXAMINED AND TYPES. — **New Caledonia.** BIOGEOCAL : st. DW 289, 20°36.35'S, 167°00.31'E, 830-840 m, 27.04.1987 : 1 ♂, holotype, 12.4 x 12.1 mm (MNHN-B 21524).

DESCRIPTION. — Carapace slightly longer than broad, dorsal surface finely granular. Granules of frontal borders and metabranchial region laterally more numerous and larger than others. Regions distinct : protogastric and mesogastric regions slightly convex, cardiac, and metabranchial regions more convex. Four frontal teeth short, lateral notch of front, broad and oblique. Exorbital teeth broader at base, the tip produced into a spine. Exorbital teeth reaching to the base of frontal teeth.

Male chelipeds very unequal, right cheliped much larger than left. Larger palm 1.34 times as long as high; fingers shorter than palm; cutting edges of fingers without teeth and almost without gap when closed. Smaller palm slender, slightly longer than fingers, about twice as long as high; cutting edges of fingers also without teeth but with small gap when closed.

Third pereiopods the longest, merus of P3 5.5 times longer than high, that of P2, 4.73 times. Propodus of P3 about 4 times as long as high, that of P2, 3.5 times. Last two legs (except dactyli) bearing fine granules. Distal half of propodus bearing a tuft of setae and dactyli with some hairs at borders.

Male abdomen consisting of 5 segments (3rd-5th fused). First segment about 1.3 times as long as second. Third convex on both sides, the middle depressed. Sixth segment 1.5 times as broad as long. Telson bluntly triangular.

Male first pleopods stout. Distal 1/5 knife-shaped, with some spines. Second pleopods slender, basal half slightly inflated, distal half laminated; tip curved.

ETYMOLOGY. — The name is formed by a combination of the Latin *magnus*, large, and *palma*, palm, in reference to the larger palm of the cheliped.

REMARKS. — This new species is closely related to *Ethusa sexdentata* Stimpson, 1858, but the latter has a larger body, a slightly smoother carapace surface and a more convex anterior sternal shield.

DISTRIBUTION. — New Caledonia, in depths between 830 and 840 m.

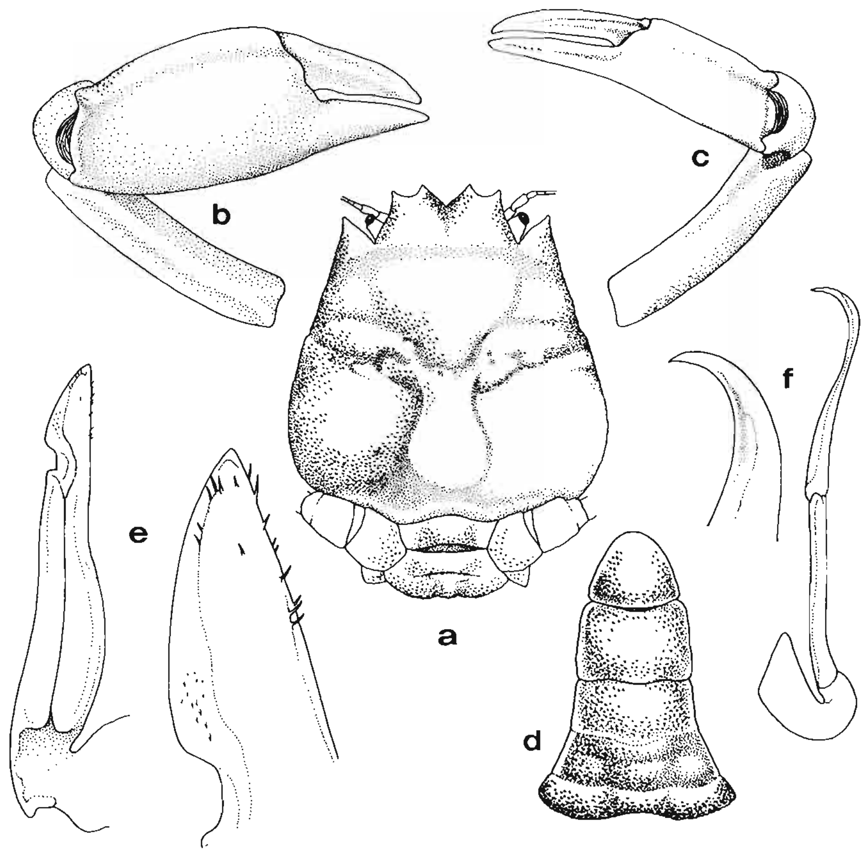

FIG. 7. — *Ethusa magnipalmata* sp. nov., ♂ holotype 12.4 x 12.1 mm (MNHN-B 21524) : **a**, carapace; **b-c**, chelipeds; **d**, abdomen; **e**, first pleopod; **f**, second pleopod.

Ethusa major sp. nov.

Fig. 8

MATERIAL EXAMINED AND TYPES. — **New Caledonia.** MUSORSTOM 6 : st. DW 413, 20°40.10'S, 167°03.50'E, 463 m, 15.02.1989 : 1 ♀, holotype, 17.9 x 17.5 mm (MNHN-B 21520); 1 ♀, paratype, 16.5 x 16.1 mm (MNHN-B 22257).

DESCRIPTION. — Carapace rough with very indistinct fine granules, pubescence and sparse short hairs. Regions slightly convex, grooves very distinct : branchiogastric and branchiocardiac grooves deep and narrow, but cervical and branchial grooves broad and shallow. Front with 4 small teeth, separated by a V-shaped and 2 obliquely U-shaped notches : the tip of median frontal teeth directed outward, that of lateral frontal teeth directed forward. Exorbital teeth stout, base much broader, with acute tip. Orbit large, eyestalks slender, movable, cornea small; exorbital and frontal borders with dense hairs.

Female chelipeds symmetrical. Merus slightly curved, 2.9 times as long as high, raised ridge with pubescence and short hairs on dorsal border, inner face laterally depressed, outer face convex. Carpus small and smooth. Palm slightly swollen, 1.3 times longer than high, movable finger longer than palm. Cutting edges without teeth.

Dactyli, propodi, carpi and distal half of meri of P2 and P3 bearing pubescence, the rest smooth, bare. Third legs longest; meri 5.5 times as long as high; propodi 4 times longer than high, and P2 rather short. Last two legs fringed with pubescence and short setae, their meri about 3.5 times longer than high; propodi slightly longer than carpi; dactyli claw-shaped.

Female abdomen consisting of 7 segments. The first longer than the second, the second to fifth with a transverse ridge. Anterior sternal shield slightly convex and densely granular.

ETYMOLOGY. — The name is from the Latin *major*, in reference to the large body size.

REMARKS. — This new species is very similar to *Ethusa orientalis* Miers, 1886, in the shape of the carapace, but may be easily distinguished from it by the carapace being entirely covered with pubescence, sparse short setae, and indistinct fine granules.

DISTRIBUTION. — New Caledonia, at a depth of 463 m.

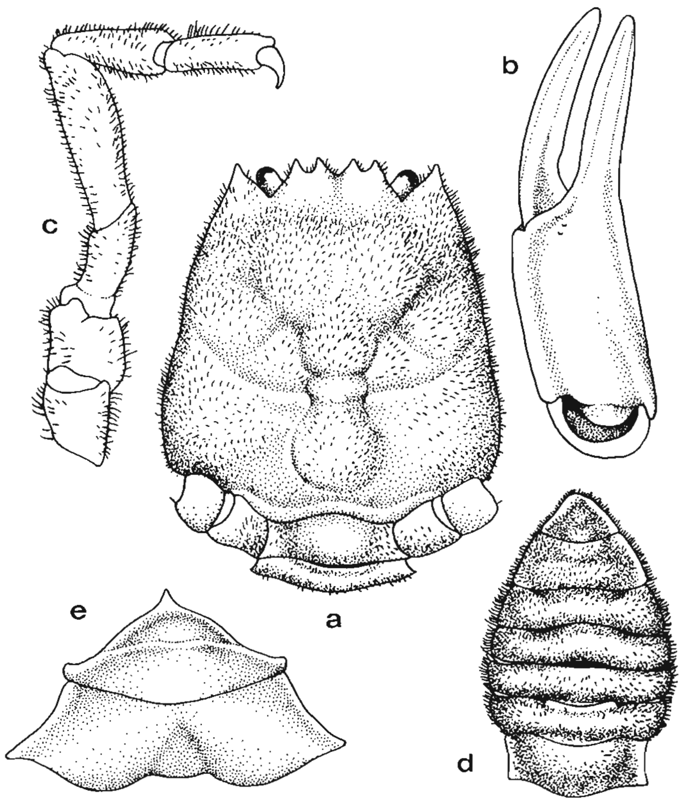

FIG. 8. — *Ethusa major* sp. nov., ♀ holotype 17.9 x 17.5 mm (MNHN-B 21520) : **a**. carapace; **b**, cheliped; **c**, last pereiopod; **d**, abdomen; **e**, anterior sternal shield.

Ethusa makasarica sp. nov.

Fig. 9

Ethusa hirsuta - CHEN, 1987 : 685-686, pl. 1F (Not McArdle, 1900).

MATERIAL EXAMINED AND TYPES. — **Indonesia.** CORINDON 2 : st. CH 276, 01°55'S, 119°13.8'E, 395-456 m, 8.11. 1980 : 1 ♂, holotype, 7.9 x 7.6 mm (MNHN-B 19071); 1 ♀, allotype, 8.0 x 7.7 mm (MNHN-B 22251).

DESCRIPTION. — Carapace covered with pubescence, surface rough, with some fine granules especially on gastric and cardiac regions. Regions poorly marked but branchial regions swollen. Branchial groove more distinct than cervical groove. Anterolateral borders behind exorbital teeth depressed. Frontal and orbital borders bearing rather long and soft hairs. Four subequal teeth : median teeth broader than lateral teeth. Exorbital teeth long and acute, needle-like, almost reaching to the tips of frontal teeth.

Male chelipeds very unequal (right much larger than left). Meri stout and pubescent, its dorsal border with sharp edge. Larger palm swollen, 1.1 times as long as high and 1.3 times as long as fingers. Fingers short; cutting edges without teeth.

Third pereiopods the longest. Meri of P2 and P3 being 3.5-4.0 times as long as high, propodi of P2 and P3, 2.27-2.26 times as long as high and carpi as long as propodi. Dactyli very long, as long as combined length of carpi and propodi. Last two legs short, with dense pubescence, meri about 3.2 times as long as broad.

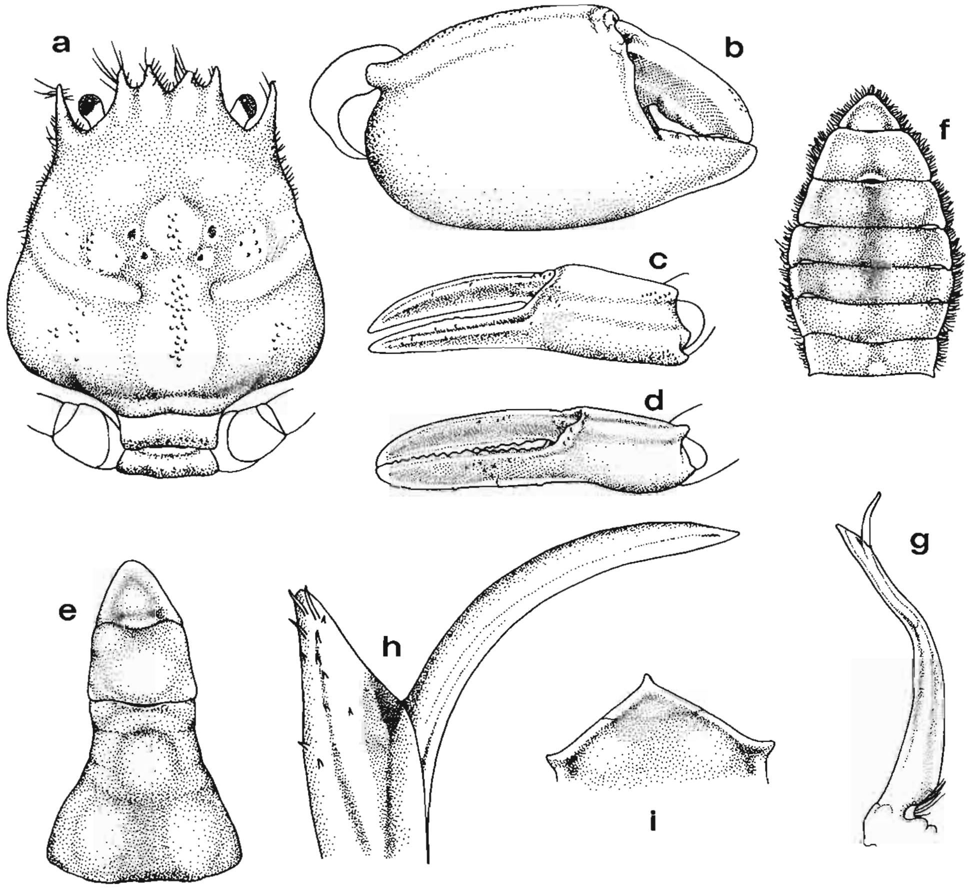

FIG. 9. — *Ethusa makasarica* sp. nov., ♂ holotype 7.9 x 7.6 mm (MNHN-B 19071); ♀ allotype 8.0 x 7.7 mm (MNHN-B 22251) : **a**, male carapace; **b-c**, male chelipeds; **d**, female cheliped; **e**, male abdomen; **f**, female abdomen; **g-h**, male first and second pleopods; **i**, male anterior sternal shield.

Male abdomen consisting of 5 segments (3rd-5th fused) : the first segment much larger than second, both sides of third segment very much raised. Sixth segment broader than long, telson triangular, slightly broader than long. Female abdomen with 7 segments : first to fourth segments subequal in length, fifth as long as sixth. Telson broader than long.

Male first pleopods moderately stout, gradually narrower from base to tip, curved in middle; tip blunt with some spines. Second pleopods slender and curved, slightly longer than the first.

ETYMOLOGY. — The species is named after the place where it has been collected, Makasar Strait.

REMARKS. — This new species is similar to *Ethusa hirsuta* McArdle, 1900, but they can be distinguished easily as shown in Table 1.

	E. hirsuta	*E. makasarica*
1. - Carapace	hirsute and not granular	pubescent and granular
2. - Exorbital teeth	short, falling short of front and directed outwards	long, almost reaching to front and directed forwards
3. - Larger palm	1.57 times longer than finger and 1.2 times as long as high	1.3 times longer than finger and 1.1 times as long as high
4. - Smaller finger	as long as palm	longer than palm
5. - Meri of P2 and P3	relatively longer, 4.5-5 times as long as high	relatively shorter, 3.5-4 times as long as high
6. - Meri of P4 and P5	4.0-4.4 times as long as high	about 3.2 times as long as high

TABLE 1. — Main differences between *Ethusa hirsuta* and *E. makasarica*.

DISTRIBUTION. — Indonesia, in depths between 395 and 456 m.

Ethusa minuta Sakai, 1937

Fig. 10

Ethusa minuta Sakai, 1937 : 81, pl. 11, fig. 2; 1965 : 23, pl. 11, fig. 4. — TAKEDA & MIYAKE, 1972 : 68. — CHEN, 1986a : 193-194, figs 11-12, pl. 1, fig. 2; 1986b : 131-133, figs 12 (55-58). — DAI & YANG, 1991 : 58, fig. 27 (1-2), pl. 6 (3).

MATERIAL EXAMINED. — **Indonesia Moluccas**. MARIEL KING MEMORIAL EXPEDITION, 1970 : St. AHI/H4, 3°36'S, 128°24'E, 110-115 m, 31.05.1970 : 1 juv. ♀ 4.1 x 3.9 mm (MNHN-B 19083). — St. CPI/H4, 3°15'S, 128°8'E, 42-49 m, 1.06.1970 : 1 juv. ♀ 3.9 x 3.7 mm (MNHN-B 19086). — St. CPII/H8-9, approx. 1 mile S of Tg Tutuhuhur, Piru Bay, 27-64 m, 2.06.1970 : 1 juv. ♀ 4.1 x 3.9 mm (MNHN-B 19087). — St. KRVII/H3, 5°32'S, 132°46'E, 32-37 m, 11.06.1970 : 1 ♂ 4.2 x 4.0 mm (MNHN-B 19085). — St. AWI/H 11-12, 5°30'S, 134°12'E, 73-91 m, 15.06.1970 : 1 juv. ♀ 5.0 x 5.0 mm (MNHN-B 19084).

Chesterfield Islands. CHALCAL 1 : st. D 10, 20°36.09'S, 161°05.82'E, 87 m, 15.07.1984 : 2 ♂ 4.8 x 4.5 mm, 4.5 x 4.3 mm (MNHN-B 19066). — St. D 23, 19°12.9'S, 158°36'E, 63 m, 17.07.1984 : 1 juv. ♀ 4.5 x 4.0 mm (MNHN-19064).

New Caledonia. LAGON : st. 244, 22°25'S, 167°00'E, 47 m, 23.10.1984 : 1 ♀ 6.4 x 6.3 mm (MNHN-B 21350). — St. 324, 22°24'S, 167°03'E, 39 m, 28.11.1984 : 1 ♀ 6.9 x 6.9 mm (MNHN-B 21353). — St. 350, 22°38'S, 166°57'E, 67 m, 29.11.1984 : 1 ♀ 6.1 x 6.0 mm (MNHN-B 21351). — St. 384, 22°34'S, 167°11'E, 70 m, 22.01.1985 : 4 ♂ 4.2 x 4.1 mm, 4.6 x 4.3 mm, 4.7 x 4.5 mm, 5.2 x 4.9 mm; 3 ♀ 4.8 x 4.6 mm, 6.0 x 6.0 mm, 6.5 x 6.2 mm (MNHN-B 19094) . — St. 403, 22°35'S, 167°18'E, 45 m, 23.01.1985 : 2 ♀ 6.3 x 6.2 mm, 6.7 x 6.4 mm (MNHN-B 19088). — St. 413, 22°39'S, 167°17'E, 40-60 m, 24.01.1985 : 1 ♂ 4.1 x 3.8 mm (MNHN-B 19093). — St. 580, 22°44'S, 167°19'E, 95-100 m, 17.07.1985 : 2 ♂ 4.3 x 4.0 mm ; 4.5 x 4.1 mm (MNHN-B 21352). — St. 598, 22°19.1'S, 167°06.2'E, 73-75 m, 5.08.1986 : 1 ♀ 5.0 x 4.8 mm (MNHN-B 21532). — St. 603, 22°15.8'S, 167°04.8'E, 78-80 m, 5.08.1986 : 2 ♂ 4.0 x 3.9 mm, 4.1 x 3.9 mm; 1 ovig. ♀ 5.2 x 5.1 mm; 1 juv. ♀ 3.8 x 3.5 mm (MNHN-B 21529); 1 ♀ 5.3 x 5.0 mm (MNHN-B 21527). — St. 626, 21°57.9'S, 166°52.5'E, 47-48 m, 6.08.1986 : 1 ♂ 4.7 x 4.6 mm; 1 ♀ 4.9 x 4.8 mm (MNHN-B 21530). — St. 644, 21°52.1'S, 166°41.2'E, 45-48 m, 7.08.1986 : 1 ♂ 5.1 x 4.8 mm (MNHN-B 21526). — St. 650, 21°49.3'S, 166°37.7'E, 50 m, 7.08.1986 : 1 ♂ 4.8 x 4.3 mm (MNHN-B 21531). — St. 682, 21°33.7'S, 166°18.6'E, 36-37 m, 9.08.1986 : 1 juv. ♀ 4.0 x 3.8 mm (MNHN-B 21525). — St. 702, 21°26.7'S, 166°08.2'E, 37 m, 10.08.1986 : 1 ♂ 4.5 x 4.0 mm; 1 ♀ 4.9 x 4.8 mm (MNHN-B 21528).

MUSORSTOM 4 : st. DW 149, 19°07.6'S, 163°22.7'E, 165 m, 14.09.1985 : 1 spec. (broken), 5.3 x 5.0 mm (MNHN-B 19080). — St. DW 151, 19°07'S, 163°22'E, 200 m, 14.09.1985 : 1 juv. ♂ 4.2 x 4.0 mm (MNHN-B 19081). — St. DW 231, 22°33.7'S, 167°10.5'E, 75 m, 1.10.1985 : 2 ♂ 3.9 x 3.5 mm, 4.2 x 4.0 mm; 1 ovig. ♀ 5.4 x 5.3 mm; 1 ♀ 5.5 x 5.3 mm; 1 juv. ♂ 3.8 x 3.3 mm (MNHN-B 19079).

DISTINCTIVE FEATURES. — Carapace covered with granules. Regions and grooves distinctly defined : protogastric region more convex than metagastric region. Front divided into 4 acute teeth. Exorbital teeth long and acute, needle-like. Meri of chelipeds fringed with some long hairs, the other segments as well as P2 and P3 being smooth and naked.

REMARKS. — Forty-one specimens were collected.

DISTRIBUTION. — East China Sea, Coral Sea, New Caledonia, Indonesia and Japan, in depths between 30 and 200 m.

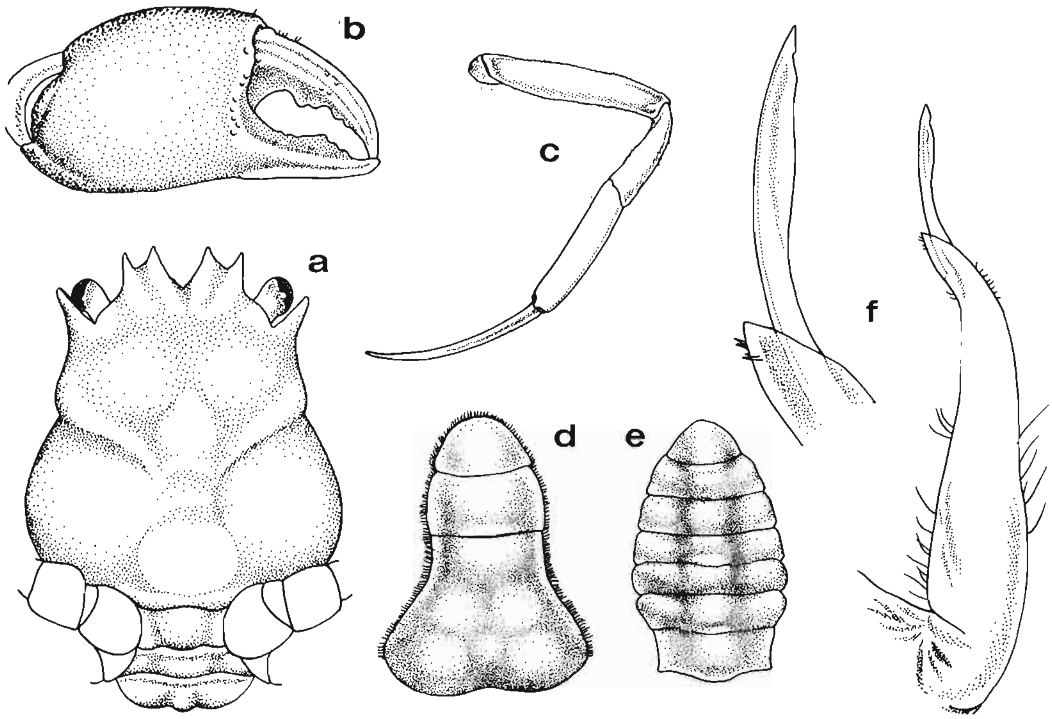

FIG. 10. — *Ethusa minuta* Sakai, 1937, ♂ 4.7 x 4.6 mm; ♀ 4.9 x 4.8 mm (MNHN-B 21530) : **a**, male carapace; **b**, male cheliped; **c**, male third pereiopod; **d**, male abdomen; **e**, female abdomen; **f**, male first and second pleopods.

Ethusa obliquidens sp. nov.

Fig. 11

MATERIAL EXAMINED AND TYPES. — **New Caledonia.** MUSORSTOM 4 : st. 197, 18°51.3'E, 163°21.9'E, 550 m, 20.09.1985 : 1 ♂, holotype, 8.9 x 8.6 mm (MNHN-B 22429); 1 ♀, allotype, 10.1 x 9.8 mm (kept at IOAS). — St. 198, 18°49.4'S, 163°18.8'E, 585 m, 20.09.1985 : 1 ♀, paratype, 9.5 x 9.0 mm (MNHN-B 18421). — St. 169, 18°54.3'S, 163°11.2'E, 590 m, 17.09.1985 : 2 ♀, paratypes, 11.3 x 11.0 mm, 11.5 x 11.1 mm (MNHN-B 18418).

DESCRIPTION. — Carapace longer than broad, covered with fine granules and sparse hairs anteriorly. Regions and grooves distinctly defined. Front consisting of 4 teeth : each tooth small, the tip produced into a spine (that of male slightly blunt). Exorbital teeth stout, broad at base, border inwardly oblique, forming the distal 1/4 of lateral borders of carapace convergent inwardly, narrower than basal 3/4 of lateral borders.

Middle of ischium of third maxillipeds with deep longitudinal groove.

Chelipeds symmetrical in both sexes. Surface with fine granules (except fingers) but hairless. Male palm 1.6

times as long as high. Fingers broken in male; cutting edges of fingers in female without teeth.

Second and third pereiopods bearing fine granules, hairless. Third pereiopods the longest; meri 4.7 times as long as high and propodi 3 times longer than high. Last two legs short, meri cylindrical, 3-3.5 times longer than high. Dactyli short and clawed.

Male abdomen consisting of 5 segments (3rd-5th fused) : the first segment long, 3 times as long as second, the middle portion of third segment depressed, the lateral portion raised. Sixth segment 1.8 times as broad as long. Telson broadly triangular, broader than long.

Male first pleopods stout, basal half stouter than distal one, gradually narrowed, tip bluntly rounded, with some spines and hairs. Second pleopods slender, distal end curved.

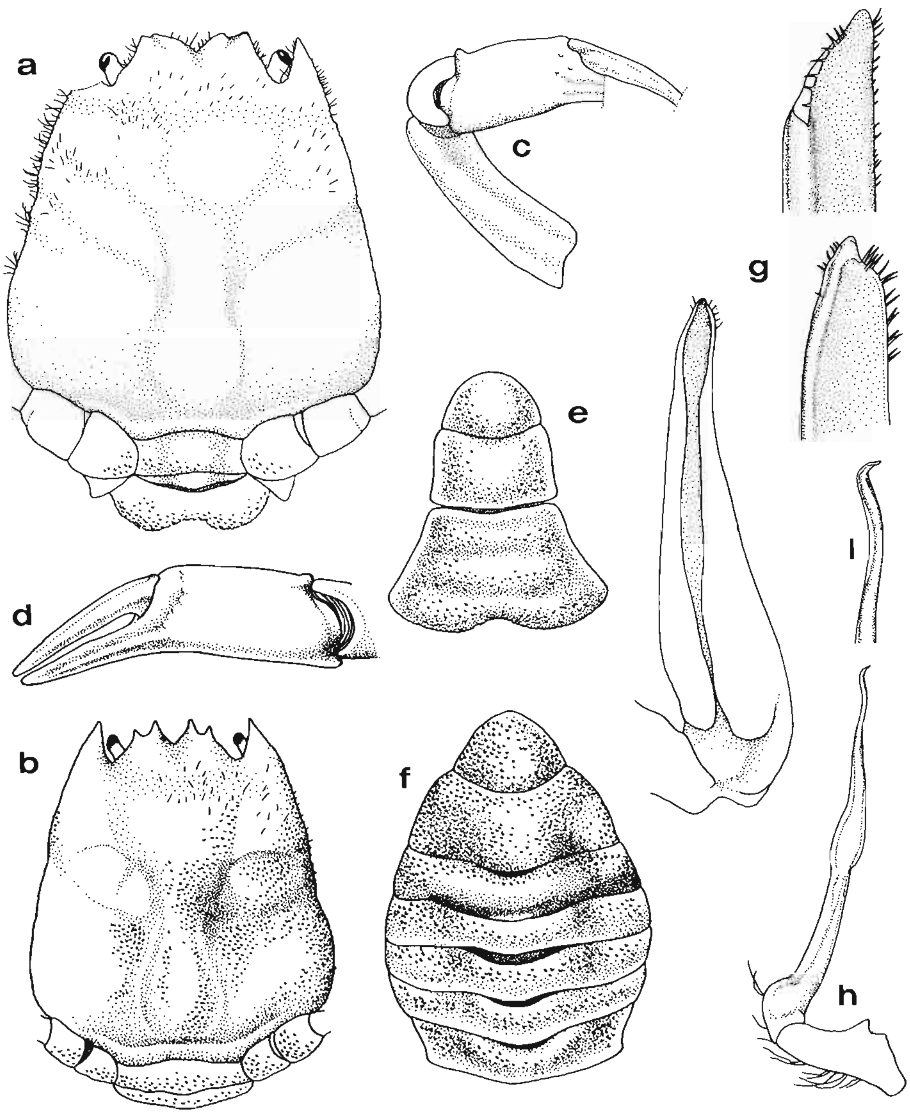

FIG. 11. — *Ethusa obliquidens* sp. nov., ♂ holotype 8.9 x 8.6 mm (MNHN-B 18420); ♀ allotype 11.3 x 11.0 mm (MNHN-B 18418) : **a**, male carapace; **b**, female carapace; **c**, male cheliped ; **d**, female cheliped; **e**, male abdomen; **f**, female abdomen; **g**, male first pleopod; **h-i**, male second pleopod.

ETYMOLOGY. — The name is formed by a combination of the Latin *obliquus*, oblique, and *dens*, tooth, in reference to the shape of the exorbital teeth.

REMARKS. — This new species may easily be distinguished from *Ethusa granulosa* Ihle, 1916, in that the carapace is covered with much finer granules and sparse short hairs, the exorbital teeth are oblique, not straight, forming the distal 1/4 of lateral border of the carapace which is convergent inwardly (more distinctly in female than in male), and in the meri of the fourth legs being relatively short.

DISTRIBUTION. — New Caledonia, in depths between 550 and 590 m.

Ethusa parapygmaea sp. nov.

Fig. 12

MATERIAL EXAMINED AND TYPE. — **New Caledonia.** CHALCAL 2 : st. DW 73, 24°39.9'S, 168°38.1'E, 573 m, 29.10.1986 : 1 ♂, holotype, 6.1 x 5.5 mm (MNHN-B 19092).

DESCRIPTION. — Carapace covered with closely fine granules. Regions and grooves distinct : protogastric, mesogastric and metabranchial regions more convex than others. Front strongly convex and thick, frontal-orbital region depressed. Frontal border divided into 4 teeth by three broad V-shaped notches. Exorbital teeth thin and short, with tip directed upward. Eyestalks median in size and movable.

Male chelipeds very unequal : larger cheliped 1.6 times as long as carapace. Palm thick, 1.5 times longer than high. Fingers short, cutting edges without teeth.

Second and third pereiopods 2.7 times as long as carapace. Merus of P3 about 4 times as long as high. Dactylus longer than propodus. Last two legs short and small; meri cylindrical, about 4-4.5 times as long as high. Propodi with short hairs. Dactyli short and clawed.

Male abdomen with 5 segments (3rd-5th fused). First two segments of subequal length, third slightly convex on both sides. Telson bluntly triangular. Abdomen and thoracic sternites with granules.

Male first pleopods stout, with a foot-shaped tip and some spines. Second pleopods slender, longer than first.

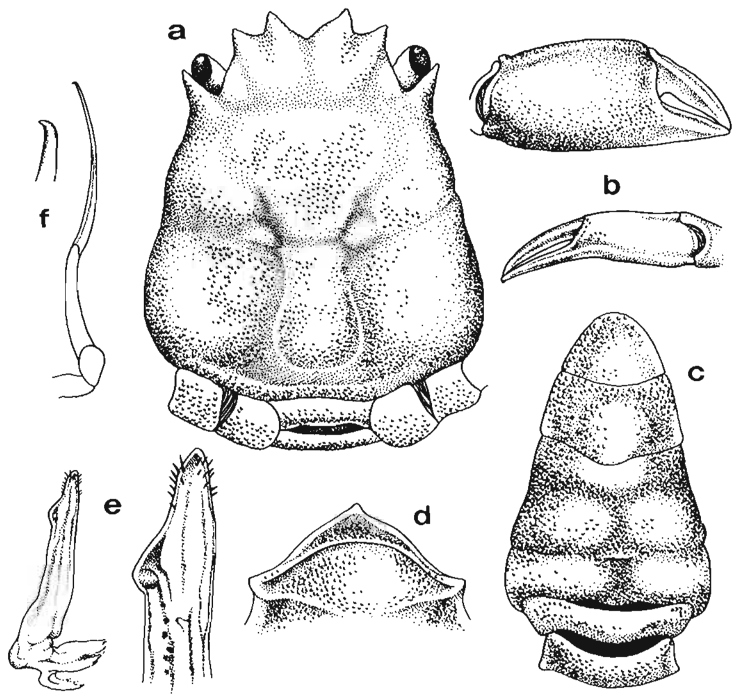

FIG. 12. — *Ethusa parapygmaea* sp. nov., ♂ holotype 6.1 x 5.5 mm (MNHN-B 19092) : **a**, carapace; **b**, chelipeds; **c**, abdomen; **d**, male anterior sternal shield; **e**, first pleopod; **f**, second pleopod.

ETYMOLOGY. — From the Greek, *para*, meaning near, to denote the resemblance of this species to *E. pygmaea* Alcock, 1894.

REMARKS. — This new species is very similar to *Ethusa pygmaea* Alcock, 1894, but the latter species has U-shaped notches between the median frontal teeth as well as the lateral teeth, a larger palm which is slightly longer and more swollen, and a tubercle at the distal 1/4 of the first pleopods.

DISTRIBUTION. — New Caledonia, at a depth of 573 m.

Ethusa pygmaea Alcock, 1894

Fig. 13

Ethusa pygmaea Alcock, 1894 : 405; 1896 : 284. — ALCOCK & ANDERSON, 1895 : pl. 14, fig.5. — IHLE, 1916 : 141-142. — SERÈNE, 1968 : 40.

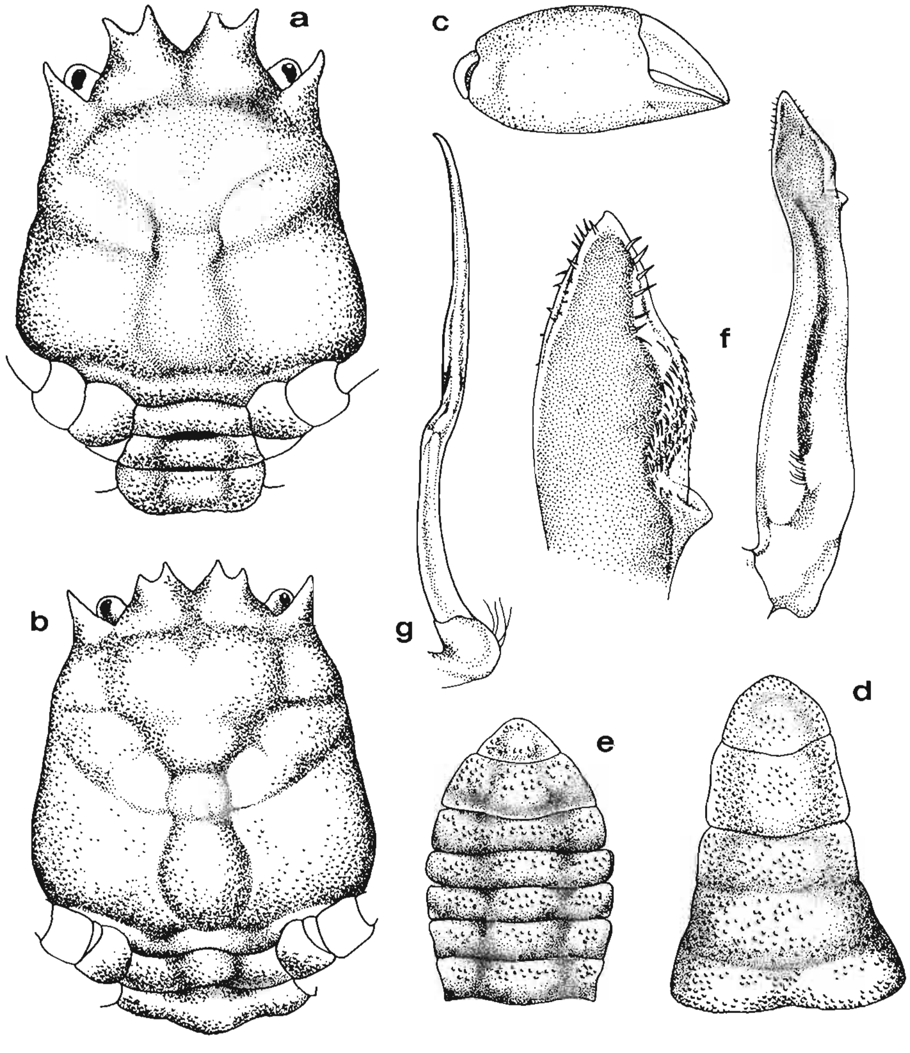

FIG. 13. — *Ethusa pygmaea* Alcock, 1894, ♂ 6.0 x 5.6 mm (MNHN-B 19089); ♀ 7.0 x 6.8 mm (IOAS) : **a**. male carapace; **b**, female carapace; **c**, male larger cheliped; **d**, male abdomen; **e**, female abdomen; **f**, male first pleopod; **g**, male second pleopod.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL : st. DW 33, 23°10'S, 167°10'E, 675 m, 29.08.1985 : 1 juv. ♀ 5.3 x 5.0 mm (MNHN-B 18402).

MUSORSTOM 4 : st. DW 197, 18°51.3'S, 163°21.0'E, 560 m, 20.09.1985 : 1 ♀ 9.0 x 8.6 mm (MNHN-B 18420).

CHALCAL 2 : st. DW 73, 24°39.9'S, 166°38.1'E, 573 m, 29.10.1986 : 1 ♀ 7.0 x 6.8 mm (kept at IOAS). — St. DW 74, 24°40.36'S, 168°38.38'E, 650 m, 29.10.1986 : 2 ♂ 5.8 x 5.3 mm, 6.5 x 6.0 mm; 1 ovig. ♀ 7.8 x 7.5 mm (MNHN-B 19091, 1 ♂ kept at IOAS); 1 ♂ 5.3 x 5.0 mm (MNHN-B 19090). — St. DW 75, 24°39.31'S, 168°39.67'E, 600 m, 29.10.1986 : 1 ♂ 6.0 x 5.6 mm; 2 ovig. ♀ 7.5 x 7.0 mm, 8.7 x 8.2 mm (MNHN-B 19089).

SUPPLEMENTARY DESCRIPTION. — Carapace longer than broad, surface with closely set fine granules. Regions and grooves indistinct. Protogastric, cardiac and metabranchial regions slightly convex. Fron' strongly convex, divided into 4 teeth by a V- and two U-shaped notches. Exorbital teeth of male only reaching to base of frontal teeth and that of female almost reaching to tip of frontal teeth. Eyestalks relatively stout, cornea rather large.

Male chelipeds symmetrical or asymmetrical. Larger palm rather swollen, 1.3 times as long as high, fingers shorter than palm; cutting edges without teeth and with very small gap when closed. Smaller palm slender, 1.6 times as long as high and as long as finger; cutting edges of fingers also without teeth and with very small gap when closed.

Second and third pereiopods slender, P3 the longest. Merus of P3 more than 5 times as long as high; propodus 5 times as long as high, dactyli slightly longer than propodi. Except dactyli, surface with fine granules, those at the edge being more distinct than those on the surface.

Last two legs, except dactyli, with fine granules, posterior part of propodi with short hairs. Ischium of P5 longer than that of P4.

Male abdomen consisting of 5 segments (3rd-5th fused). First segment as long as second. Telson bluntly triangular.

Male first pleopods stout, slightly curved near middle, distal 1/4 with a tubercle, its inner surface with some oblique rows of spines, tip bluntly rounded with some spines. Second pleopods slender and thin.

DISTRIBUTION. — Andaman Sea, Indonesia and New Caledonia, in depths between 69 and 675 m.

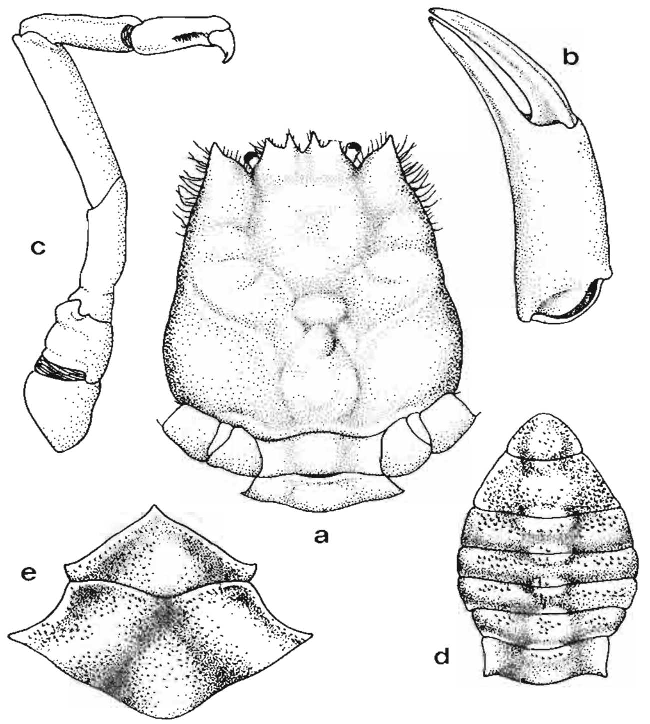

FIG. 14. — *Ethusa sexdentata* (Stimpson, 1858), ♀ 17.0 x 16.8 mm (MNHN-B 18929) : **a**, carapace; **b**, cheliped; **c**, last pereiopod; **d**, abdomen; **e**, anterior sternal shield.

Ethusa sexdentata (Stimpson, 1858)

Fig. 14

Dorippe sexdentata Stimpson, 1858 : 163.

Ethusa sexdentata - STIMPSON, 1907 : 168, pl. 19, fig. 4. — BALSS, 1922 : 120. — YOKOYA, 1933 : 109. — SAKAI, 1937 : 77, pl. 11, fig. 1, text-figs la, 2; 1965 : 22, pl. 11, fig. 2; 1976 : 63-64, pl. 23, fig. 1, text-figs 26a. — CHEN, 1986a : 185-186, figs 5-6; 1986b : 126-127, fig. 8 (36-40).

Ethusa andamanica Alcock, 1894 : 405; 1896 : 254. — ALCOCK & ANDERSON, 1895, pl. 14, fig. 8. — DOFLEIN, 1904 : 27, pl. 13, figs 7-8. — BOUVIER, 1906 : 482. — PARISI, 1914 : 302, text-figs 3-4.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : st. CP 143, 11°29'N, 124°11'E, 205-214 m, 07.06. 1985 : 2 ♀ 12.6 x 12.4 mm, 17.0 x 16.8 mm (MNHN-B 18929).

DISTRIBUTION. — South China Sea and East China Sea, Japan, Indonesia, the Philippines, Andaman Sea and Nicobar Islands, in depths between 30 and 550 m.

Ethusa sp.

Fig. 15

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL : st. CP 75, 22°19'S, 167°23'E, 825-860 m : 1 juv. V 6.0 x 5.8 mm (MNHN-B 18405).

DESCRIPTION. — Carapace slightly longer than broad, surface smooth and flat, with regions poorly marked, and branchial groove distinct. Frontal border cut into 2 lobes and 2 sharp teeth. Exorbital teeth short and sharp.

Eyestalks short and movable.

Chelipeds almost twice as long as carapace. Merus curved, 5.7 times as long as high. Palm slightly swollen and smooth, almost as long as high. Fingers longer than palm; cutting edges without teeth. Meri of P2 and P5 about 7-8 times as long as high.

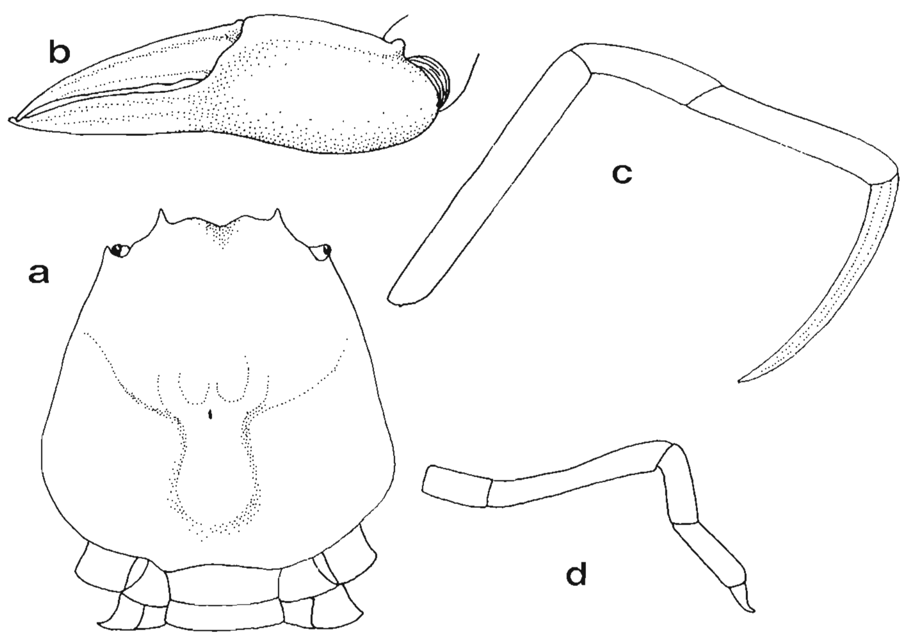

FIG. 15. — *Ethusa* sp., juv. ♀ 6.0 x 5.8 mm (MNHN-B 18405) : **a**, carapace; **b**, cheliped; **c**, third pereiopod; **d**, last pereiopod.

REMARKS. — Only one juvenile incomplete female was obtained. The features of the carapace and all legs are very similar to *Ethusina challengeri* (Miers, 1886), but by other characters, it belongs to the genus *Ethusa*.

DISTRIBUTION. — New Caledonia, at a depth between 825 and 860 m.

Genus *ETHUSINA* Smith, 1884

Key to the Indo-West Pacific species of the genus *Ethusina*

(Species studied in this paper are in bold)

1. Exorbital teeth very short **2**
— Exorbital teeth long **5**
2. Carapace about as broad as long, cervical and cardio-branchial grooves very indistinctly defined, lateral borders nearly straight .... *E. challengeri* Miers, 1886
— Carapace longer than broad **3**
3. Lateral borders of carapace very swollen, surface with sharp granules .... ***E. brevidentata*** sp. nov.
— Lateral borders of carapace slightly swollen **4**
4. Exorbital teeth directed outwards .... *E. dofleini* Ihle, 1916
— Exorbital teeth directed forwards .... ***E.*** sp.
5. Exorbital teeth nearly reaching to tips of frontal teeth **6**
— Exorbital teeth only reaching to base of frontal teeth **10**
6. Branchial grooves distinct **7**
— Branchial groove indistinct **8**
7. Merus of third pereiopods more than 10 times as long as high .... ***E. longipes*** Chen, 1987
— Merus of third pereiopods less than 10 times as long as high .... *E. investigator* Alcock, 1896
8. Telson of male abdomen semi-rounded .... *E. gracilipes* Miers, 1886
— Telson of male abdomen bluntly triangular .... ***E. paralongipes*** sp. nov.
9. Cervical and branchial grooves distinct, 4 frontal teeth equal .. ***E. robusta*** Miers, 1886
— Cervical and branchial grooves indistinct, 4 frontal teeth unequal **10**
10. Carapace with hairs and fine granules .... ***E. pubescens*** sp. nov.
— Carapace only with fine granules **11**
11. Notches of median and lateral frontal teeth narrow .... ***E. desciscens*** Alcock, 1896
— Notches of median and lateral frontal teeth broad .... ***E. dilobotus*** sp. nov.

REMARKS. — Hereafter some informations are given on the distribution of the species cited in the key and not studied in this paper:

Ethusina challengeri Miers, 1886, is known only from off Japan (34°37'N, 140°32'E) at 3419 m (MIERS, 1886).

Ethusina dofleini Ihle, 1916, is known only from Indonesia (5°26'S, 121°18'E) at 1944 m (IHLE, 1916).

Ethusina gracilipes has been found near the Philippines (12°21'N, 122°15'E) and in the Arafura Sea (5°41'S, 134°04.30'E) between 1280-1463 m (MIERS, 1886).

Ethusina investigator Alcock, 1896, is known from India (Bay of Bengal), Laccadive Sea, Indonesia and East China Sea between 1115-2394 m (ALCOCK, 1896; CHEN, 1986b).

Ethusina brevidentata sp. nov.

Fig. 16

MATERIAL EXAMINED AND TYPES. — **New Caledonia.** BIOCAL : st. CP 72, 22°10'S, 167°33'E, 2100 m, 04.09. 1985 : 1 ♀, allotype, 10.2 x 10.1 mm (MNHN-B 18401); 1 ♂, paratype, 9.1 x 9.0 mm (kept at IOAS).

BIOGEOCAL : st. CP 272, 21°00.04'S, 166°56.94'E, 1615-1710 m, 20.04.1987 : 1 immature ♂, paratype, 5.6 x 5.3 mm (MNHN-B 19096). — St. CP 283, 21°22.25'S, 166°31.07'E, 2370-2375 m, 26.04.1987 : 1 ♂, holotype, 8.8 x 8.3 mm (MNHN-B 19099).

DESCRIPTION. — Carapace longer than broad, dorsal surface with sharp granule. Urogastric, cardiac and branchial regions more distinct than others. Branchial groove more distinct than cervical one. Front convex and separated into 4 teeth : median teeth broad and triangular, lateral teeth narrow and small, their borders with sharp granules. Exorbital teeth short and small, the tip directed forward and outward. Eyestalks immobile, eyes visible in dorsal view.

Chelipeds symmetrical in both sexes, length about 1.6 times as long as carapace. Merus about 3 times as long as high. Surface of merus and carpus with fine granules. Palm smooth, shorter than fingers. Cutting edge of fingers with small teeth.

Second and third pereiopods very long and slender, the latter longer than the former, merus of P3 about 6.7-7 times as long as high, with fine granules. Carpus and propodus long with indistinct granules. Propodus of P3 about 5.3 times longer than high. Dactylus longer than propodus, naked. Each somite of last two legs (exept dactyli) with fine granules.

Male abdomen consisting of 5 segments (3rd-5th fused). First about as long as second, third convex on both sides. Sixth segment twice as broad as long, the middle of its distal part concave, lateral part angularly convex. Telson bluntly triangular, broader than long.

Male first pleopods short, stout and curved, the tip not narrow. Second pleopods longer than first and distal half lamelliform.

ETYMOLOGY. — The name is formed by a combination of the Latin *brevis*, short, and *dens*, tooth, in reference to the length of the exorbital teeth.

REMARKS. — This new species differs from *Ethusina dofleini* Ihle, 1916, by its carapace having sharp granules; its lateral borders being arched; exorbital teeth being directed forward and outward; telson being broader than long; and meri of P2 and P3 being about 7 times as long as high.

DISTRIBUTION. — New Caledonia in depths between 1615 and 2375 m.

Ethusina desciscens Alcock, 1896

Ethusina desciscens Alcock, 1896 : 286. — ALCOCK & MCARDLE, 1903, pl. 62, figs 2, 2a. — CHEN, 1986a : 197, figs 15-16, pl. I, figs 4-5; 1986b : 136, figs 71-73; 1987 : 689-690, fig. 7, pl. II F.
Ethusina gracilipes - IHLE, 1916 : 147, fig. 77 (Not Miers, 1886).

MATERIAL EXAMINED. — **Indonesia.** CORINDON 2 : st. CH 220, 0°13.6'S, 118°12.3'E, 2350 m, 2.11.1980 : 1 ♀ 10.0 x 10.0 mm (MNHN-B 19077). — St. CH 231, 0°04.9'N, 119°47.8'E, 1080-980 m, 4.11.1980 : 2 ♀ 8.0 x 8.0 mm, 8.5 x 8.5 mm (MNHN-B 19070).

REMARKS. — Three female specimens were collected from depths of 980-2950 m. Lateral teeth of front longer than median teeth, with tip directed outward. Second to fifth legs relatively longer and slender. Merus of P3 about 7.6 times longer than broad, of P5 about 6 times.

DISTRIBUTION. — Madagascar, Laccadive Sea, Andaman Sea, the Philippines, Indonesia, South China Sea and East China Sea, in depths between 485 and 2350 m.

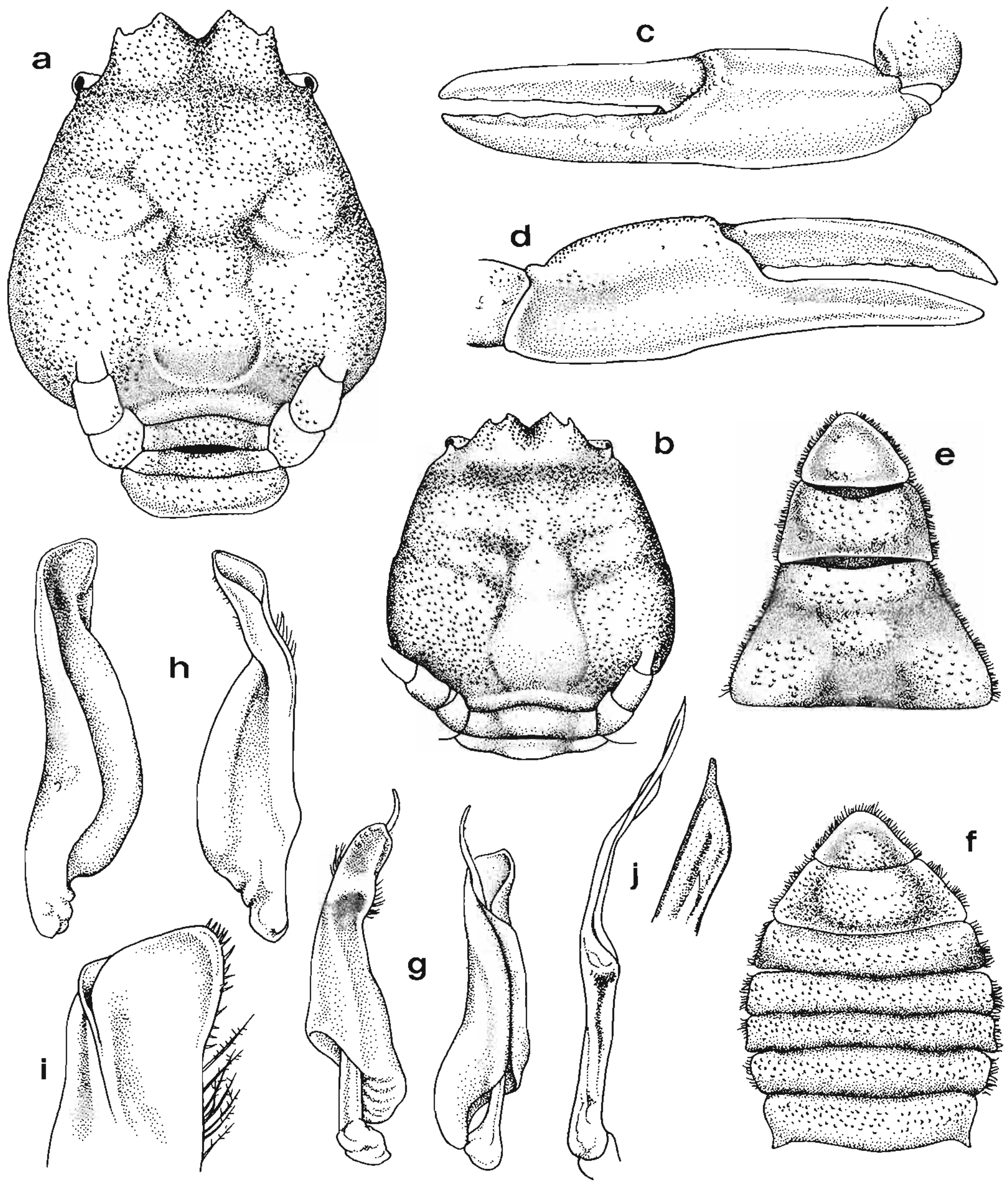

FIG. 16. — *Ethusina brevidentata* sp. nov., ♂ holotype 8.8 x 8.3 mm (MNHN-B 19099); ♀ allotype 10.2 x 10.1 mm (MNHN-B 18401) : **a**, male carapace; **b**, female carapace; **c**, male cheliped; **d**, female cheliped; **e**, male abdomen; **f**, female abdomen; **g**, male first and second pleopods; **h-i**, male first pleopod; **j**, male second pleopod.

Ethusina dilobotus sp. nov.

Fig. 17

MATERIAL EXAMINED AND TYPE. — **New Caledonia.** BIOCAL : st. CP 62, 24°19'S, 167°49'E, 1395-1410 m, 02.09.1985 : 1 ♂, holotype, 9.2 x 9.0 mm (MNHN-B 22428).

DESCRIPTION. — Carapace of male slightly longer than broad, as long as broad in female, dorsal surface with fine granules. Cervical and branchial grooves obscure. Posterior part of gastric region, cardiac and branchial regions slightly convex with distinct grooves. Median frontal teeth sharp and long, about twice as long as lateral frontal teeth, its tip directed obliquely outward.

Only left cheliped still existing, surface smooth. Palm longer than high but shorter than fingers. Cutting edges of fingers with indistinct teeth.

Second and third pereiopods long, smooth and naked. Third pereiopods the longest. Meri of P2 and P3 about 7-7.3 times as long as high. Propodus of P3 about 5.8 times as long as high. Last two pereiopods short; meri about 6 times longer than high, carpi and propodi covered with dense, short hairs.

Male abdomen consisting of 5 segments (3rd-5th fused). First longer than second. Sixth segment rectangular, about times as broad as long. Telson bluntly triangular.

Male first pleopods stout, slightly shorter than second; tip with two lobes.

ETYMOLOGY. — The name is from a combination of the Greek *di*, two, and *lobotes*, lobate, in reference to the two lobes at the tip of the male first pleopods.

DISTRIBUTION. — New Caledonia, at a depth between 1395 and 1410 m.

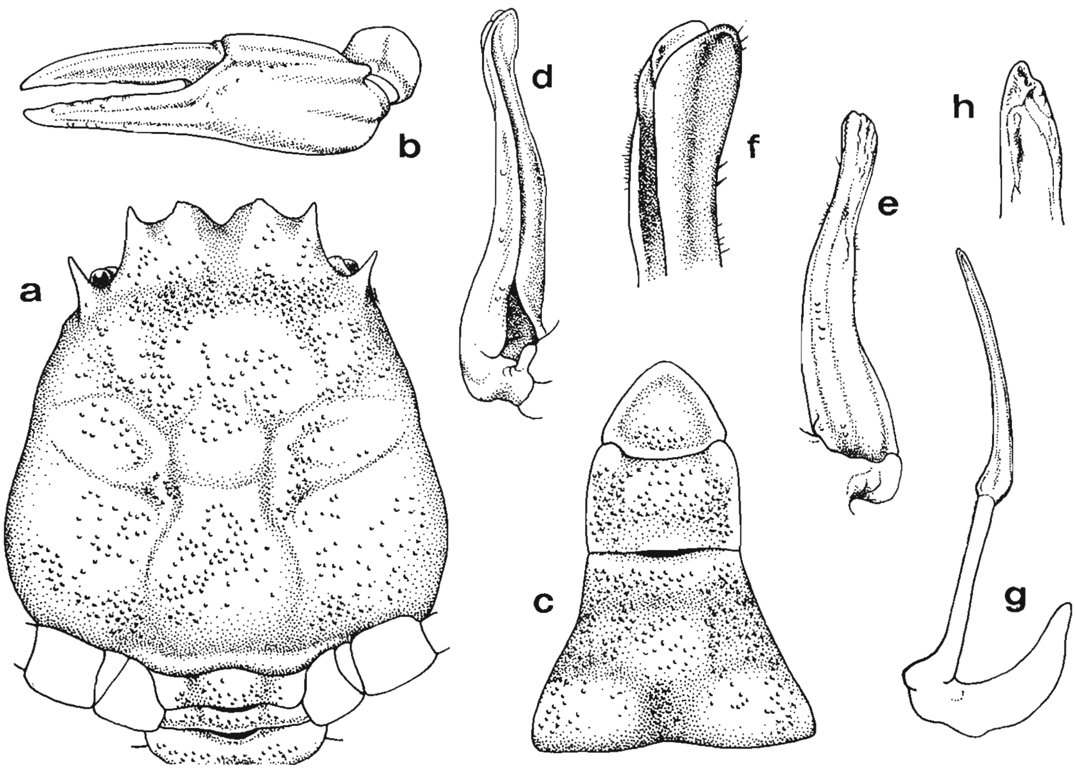

FIG. 17. — *Ethusina dilobotus* sp. nov., ♂ holotype 9.2 x 9.0 mm (MNHN-B 22428) : **a**, carapace; **b**, cheliped; **c**, abdomen; **d-f**, first pleopod; **g-h**, second pleopod.

Ethusina paralongipes sp. nov.

Fig. 18

MATERIAL EXAMINED AND TYPES. — **New Caledonia.** MUSORSTOM 5 : st. CP 324, 21°15.01'S, 157°51.33'E, 970 m, 14.10.1986 : 1 ♂, holotype, 6.2 x 6.0 mm (MNHN-B 22254); 1 ♀, allotype, 8.1 x 8.0 mm (MNHN-B 22255).

DESCRIPTION. — Carapace slightly longer than broad, dorsal surface covered with short pubescence. Region indistinct : protogastric and branchial regions slightly convex. Frontal border divided into 4 subequal and straight teeth by 3 notches. Exorbital teeth long and slender, the tip reaching to middle of lateral frontal teeth and directed obliquely outward. Eyestalks immobile, cornea extended out to the exorbital teeth and visible in dorsal view.

Chelipeds equal in both sexes. Surface smooth, slightly longer than carapace. Palm 1.5 times as long as high but shorter than fingers. Cutting edges of fingers with indistinct teeth.

Second and third pereiopods very slender and long. Third pereiopods the longest. Merus of P3 8 times as long as high and propodus 5 times longer than high. Last two pereiopods short and slender, with short pubescence.

Male abdomen with 5 segments (3rd-5th fused). First segment long, about 2.3 times as long as broad. Sixth segment broader than long. Telson triangular, longer than broad.

Male first pleopods stout, slightly curved, with a produced tip. Second pleopods longer than first, with a tip produced into a spine.

ETYMOLOGY. — From the Greek, *para*, meaning near, to denote the resemblance of this species to *E. longipes* Chen, 1987.

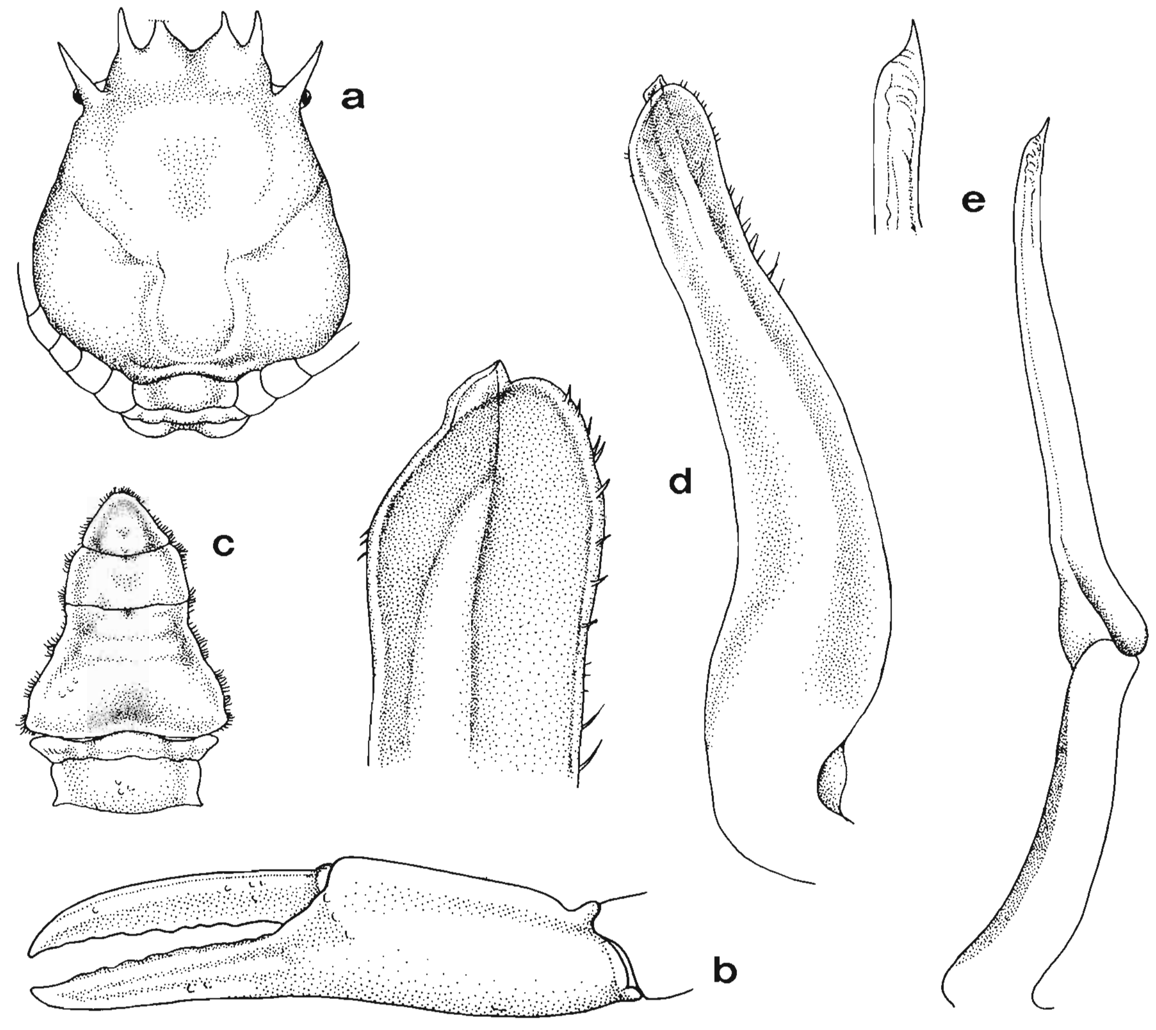

FIG. 18. — *Ethusina paralongipes* sp. nov., ♂ holotype 6.2 x 6.0 mm (MNHN-B 22254) : **a**, carapace; **b**, cheliped; **c**, abdomen; **d**, first pleopod; **e**, second pleopod.

REMARKS. — This new species is very similar to *Ethusina longipes* Chen, 1987, in the size and shape of the carapace, but may be easily distinguished from it by the 4 subequal frontal teeth and slightly longer exorbital teeth, merus of P3 about 8 times as long as high and male pleopods relatively longer and differently shaped as figured.

DISTRIBUTION. — New Caledonia, at a depth of 970 m.

Ethusina pubescens sp. nov.

Fig. 19

MATERIAL EXAMINED AND TYPES. — **New Caledonia**. MUSORSTOM 5 : st. CP 323, 21°18.52'S, 157°57.62'E, 970 m, 14.10.1986 : 1 ♂, holotype, 10.1 x 10.0 mm (MNHN-B 19060); 1 ♂, paratype, 10.0 x 10.0 mm (MNHN-B 22256). — St. CP 324, 21°15.01'S, 157°51.33'E, 970 m, 14.10.1986 : 2 ♂, paratypes, 10.0 x 10.0 mm, 10.1 x 10.0 mm (MNHN-B 19061, 1 ♂ kept at IOAS).

DESCRIPTION. — Carapace as long as broad, dorsal surface covered with very fine granules and sparsely covered with short pubescence. Grooves and regions distinct. Middle of lateral borders of carapace depressed. Frontal border divided into 4 equal teeth. Exorbital teeth sharp and rather large, its tip reaching to the middle of lateral frontal teeth. Eyestalks immobile, cornea small, concealed under the exorbital teeth.

Chelipeds symmetrical or almost symmetrical. Meri and carpi armed with very fine granules. Palm and fingers smooth. Middle part of palm swollen, 1.3 times as long as high. Cutting edges of fingers without teeth or with indistinct teeth.

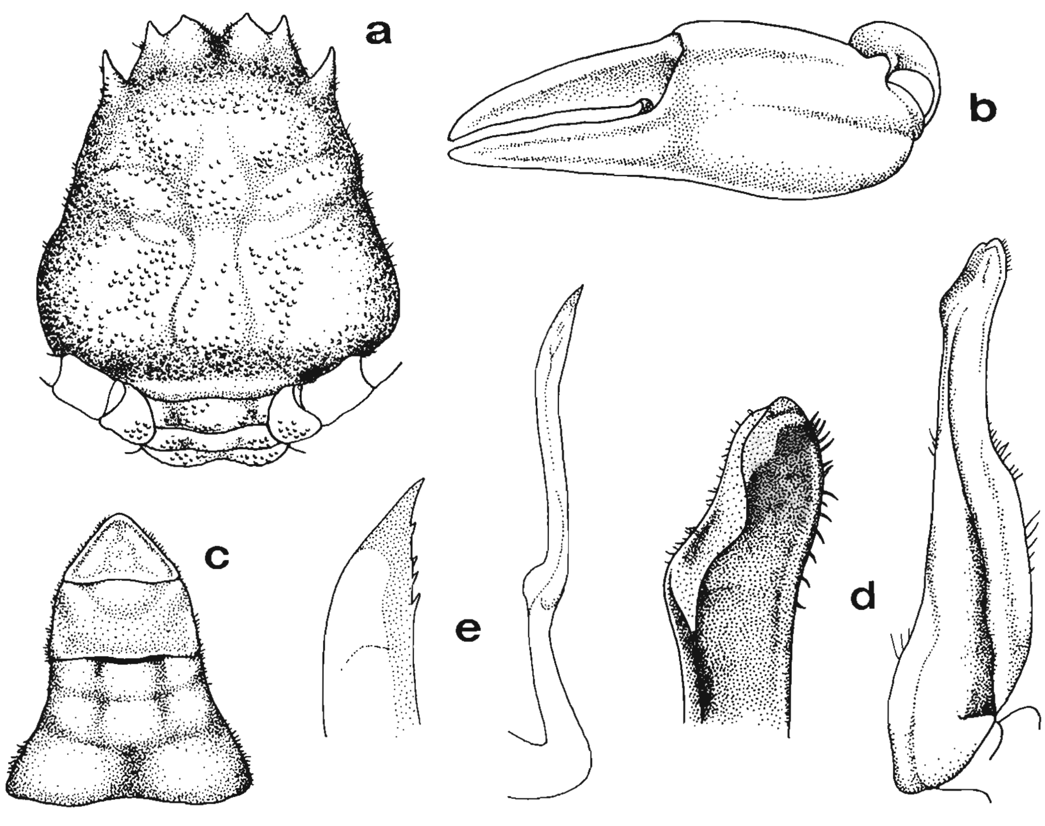

FIG. 19. — *Ethusina pubescens* sp. nov., ♂ holotype 10.1 x 10.0 mm (MNHN-B 19060) : **a**, carapace; **b**, cheliped; **c**, abdomen; **d**, first pleopod; **e**, second pleopod.

Second and third pereiopods long and slender. Merus of P2 about 7 times as long as high, that of P3, 7.4 times. Palm of P3 more than 5 times as long as high. Last two legs short, except dactyli, each somite bearing very fine granules and sparse short pubescence, claw-shaped dactyli short.

Male abdomen 3rd to 5th segments fused. First segment longer than broad. Middle of third segment slightly convex. Sixth segment almost twice as broad as long. Telson broadly triangular.

Male first pleopods stout and large, distal 2/5 narrower than basal 3/5, with a foot-shaped tip.

ETYMOLOGY. — The name is from the Latin *pubescens*, pubescent, in reference to the ornamentation of the carapace.

REMARKS. — This new species resembles *Ethusina dilobotus* sp. nov. but it can be distinguished from the latter by the carapace bearing sparse short pubescence, merus and carpus of cheliped covered with fine granules, each segment of P2 and P3 with indistinct fine granules except dactylus, telson in male abdomen broadly triangular. In the latter species, the carapace is hairless, P2 and P3 very smooth, telson in male abdomen bluntly triangular and male first pleopods have two lobes at tip.

DISTRIBUTION. — New Caledonia at a depth of 970 m.

Ethusina robusta Miers, 1886

Ethusa (Ethusina) var. *robusta* Miers, 1886 : 333, pl. 29, fig. 2a-b.
Ethusina gracilipes robusta - SERÈNE, 1968 : 40.
Ethusina robusta - CHEN, 1986b : 133, fig. 13 (62-66).

MATERIAL EXAMINED. — **Philippines.** ESTASE 2 : st. CP 02, 14°05.28'N, 120°02.17'E, 1960-1980 m, 14.11. 1984 : 1 ♀ 12.0 x 12.0 mm (MNHN-B 19078).

New Caledonia. MUSORSTOM 5 : st. CP 323, 21°18.52'S, 157°57.62'E, 970 m, 14.10.1986 : 2 ♀ 12.8 x 13.0 mm, 13.6 x 14.0 mm (MNHN-B 19062).

BIOGEOCAL : st. CP 317, 20°48.12'S, 166°53.16'E, 1620-1630 m : 1 ♀ 10.1 x 10.2 mm (MNHN-B 19097).

REMARKS. — This species is very similar to *Ethusina desciscens* Alcock, 1986, in the shape of the carapace and legs, but may be distinguished by the following characters : the front divided into 4 teeth by a V-shaped and 2 U-shaped notches : the tips of median teeth directed forward, not laterally; second to fifth legs rather broad, merus of P3 about 4.4 times as long as high, and that of P5 about 6.3 times as long as high.

DISTRIBUTION. — Indonesia, the Philippines, New Caledonia and East China Sea, in depths between 1350 and 2606 m.

Ethusina sp.

Fig. 20

MATERIAL EXAMINED. — **New Caledonia.** BIOCAL : st. CP 57, 23°44'S, 166°58'E, 1490-1620 m : 1 ♂ immature, 5.8 x 5.2 mm (MNHN-B 18404).

DESCRIPTION. — Carapace longer than broad, surface with pubescence but without granules. Regions and grooves distinct. Frontal border divided into 4 teeth by one broad and two small V-shaped notches : median teeth low and triangular, lateral ones small and slender. Exorbital teeth slightly larger than frontal teeth. Eyestalks stout, immobile, cornea large and visible in dorsal view.

Only right cheliped still existing. Merus 3 times as long as high. Palm not swollen. Fingers longer than palm; cutting edges with indistinct teeth.

Second and third pereiopods very long, smooth and naked. Merus of P3 about 9 times as long as high, propodus 7.5 times as long as high. Last two pereiopods short, longer than cheliped, with sparse hairs on both borders.

Male abdomen of 5 segments (3rd-5th fused) : anterior two subequal. Telson bluntly triangular.

Male pleopods 1 and 2 as figured.

REMARKS. — Although this immature specimen is not yet identified it has some definite characters which differ from those of its congeners. In my opinion, it may be new.

DISTRIBUTION. — New Caledonia, at a depth between 1490 and 1620 m.

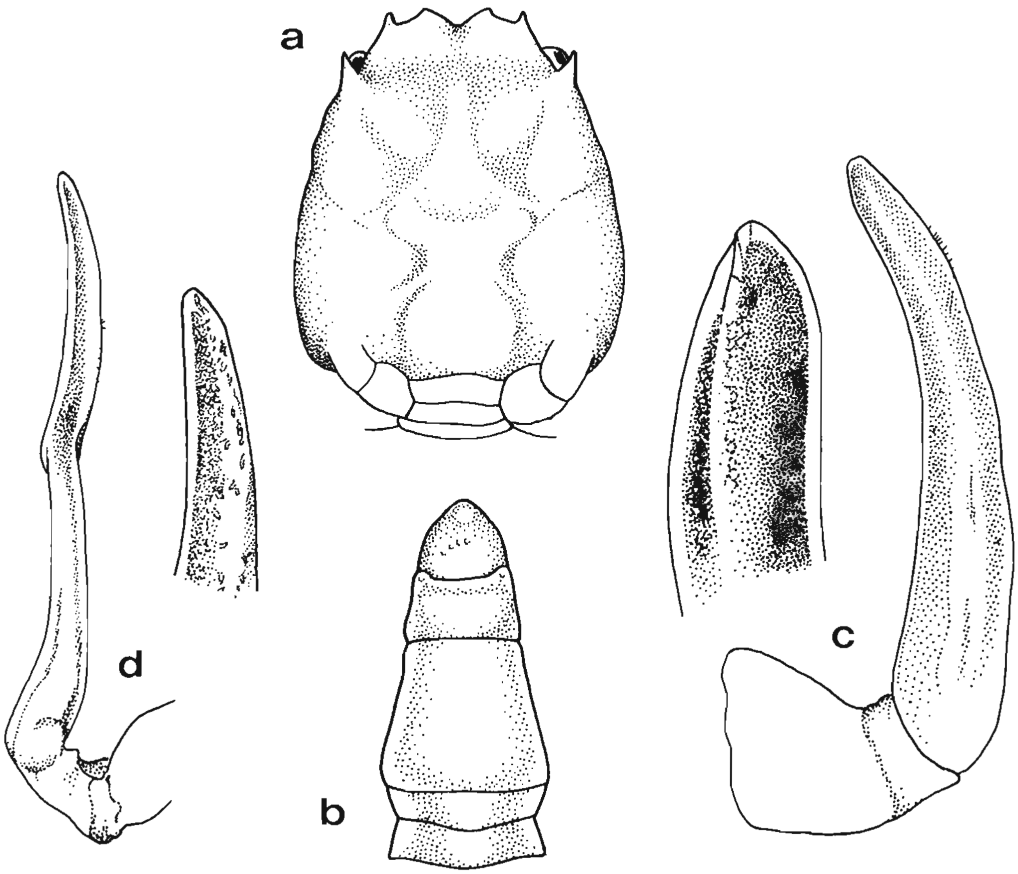

FIG. 20. — *Ethusina* sp., immature ♂ 5.8 x 5.2 mm (MNHN-B 18404) : **a**, carapace; **b**, abdomen; **c**, first pleopod; **d**, second pleopod.

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8

Crustacea Decapoda : A revision of the genus *Mursia* Desmarest, 1823 (Calappidae)

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ABSTRACT

The collections of the deep water calappid crab genus *Mursia* at the Muséum national d'Histoire naturelle, assembled between 1971 and 1991 off Madagascar, the Philippines and New Caledonia, have been studied, in addition to material sought from other collections. Fifteen species have been identified, of which four are new : *M. africana, M. danigoi, M. flamma* and *M. musorstomia*. The allied genus *Platymera*, formerly submerged within *Mursia*, is reinstated as a distinct genus. All taxa are described, photographed and illustrated, and a key to their identification is provided.

RÉSUMÉ

Crustacea Decapoda : Révision du genre *Mursia* Desmarest, 1823 (Calappidae).

Les collections de Calappidae du genre *Mursia* se trouvant au Muséum national d'Histoire naturelle, récoltées entre 1971 et 1991 au large de Madagascar, des Philippines et de la Nouvelle-Calédonie, ont été étudiées ainsi que diverses autres. Quinze espèces ont été identifiées dont quatre sont nouvelles : *M. africana, M. danigoi, M. flamma* et *M. musorstomia*. Le genre proche *Platymera*, autrefois mis en synonymie avec *Mursia*, est rétabli. Toutes les espèces sont décrites et figurées et une clé pour leur identification est proposée.

INTRODUCTION

The Institut Français de Recherche Scientifique pour le Développement en Coopération (ORSTOM) and the Muséum national d'Histoire naturelle, Paris, have carried out a series of cruises in the Indo-West Pacific Ocean. These resulted in extensive collections of specimens belonging to the deep water calappid crab genus *Mursia* Desmarest, 1823.

A study of the material at the Muséum national d'Histoire naturelle, and collections made available by The Natural History Museum, London (BM), Nationaal Natuurhistorisch Museum, Leiden (NNM), South

GALIL, B. S., 1993. — Crustacea Decapoda : A revision of the genus *Mursia* Desmarest, 1823 (Calappidae). *In* : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, Volume 10. *Mém. Mus. natn Hist. nat.*, **156** : 347-379. Paris ISBN 2-85653-206-3.

African Museum, Capetown (SAM), and the National Museum of Natural History, Washington (USNM) have allowed re-examination of most type specimens and much of the published material.

Although *Mursia* has been known since 1823, the relative rarity and superficial resemblances of its species have caused taxonomic confusion. *Mursia cristiata* H. Milne Edwards, 1837, whose illustration was first published by DESMAREST (1825) as 'Mursie mains-en-crête', was also described as *Cryptosoma orientis* (Adams & White, 1848). Similarly, *Mursia armata* de Haan, 1837, was redescribed as *Thealia acanthophora* Lucas, 1839. On the other hand, ALCOCK (1899a) suggested that the closely allied genus *Platymera* H. Milne Edwards, 1837, is synonymous with *Mursia*. DOFLEIN (1904 : 37) elevated to specific rank five of the six "formen" of *M. armata*, explaining : "ihre Verschiedenheiten sind aber so gering, das sie nicht zur Aufstellung von oesonderen Arten genbigen." This course was upheld by IHLE (1918) : "Mit Recht hat DOFLEIN *M. armata, curtispina, aspera, bicristimana* and *hawaiiensis* als eine Art zusammengefasst, welche er dann in mehrere Unterarten zer legt. Als Unterarten von *M. armata* durfen win auch *M. spinimanus* Rathbun, welche sich *M. armata bicristimana* anschliesst, und *M. armata trispinosa* Parisi betrachten." The superficial resemblance and seeming intergradation of the species has also engendered equivocating statements. GRINDLEY (1961 : 133) stated : "This form [*M. armata curtispina*] is strikingly distinct from the typical form of *M. armata*, but is now regarded as a subspecies. *M. aspera* is relegated to the synonymy, despite its characteristic appearance." Thus SAKAI (1965) wrote disconcertingly : "With regard to the Indo-Pacific species, some confusion may be taken into consideration, as far as synonymy and validity are concerned."

The present study includes descriptions of four new species : *M. africana, M. danigoi, M. flamma* and *M. musorstomia*. Descriptive and distributional information is given here as well as detailed references to literature. Some material, notably that of SAKAI, was unavailable for examination, so that unequivocal identifications were sometimes impossible. All the taxa have been illustrated and photographed, and a key is proposed for their identification.

Measurements given refer to the carapace length (cl), carapace width excluding lateral spines (cw) and carapace width including lateral spines (mcw).

SYSTEMATIC ACCOUNT

Genus *MURSIA* Desmarest, 1823

Mursia Desmarest, 1823 : 231. — DESMAREST, 1825 : 108. — LATREILLE, 1829 : 39. — H. MILNE EDWARDS, 1837a : 54; 1837b : 109. — DE HAAN, 1837 : 68. — LUCAS, 1840 : 108. — DANA, 1852 : 391. — MIERS, 1886 : 290. — ORTMANN, 1892 : 564. — ALCOCK, 1896 : 146. — DOFLEIN, 1904 : 36. — STEBBING, 1910 : 334. — IHLE, 1918 : 179, 300, 307. — RATHBUN, 1937 : 215. — SAKAI, 1937 : 85; 1965 : 51; 1976 : 134. — BARNARD, 1950 : 353. — GUINOT-DUMORTIER & DUMORTIER, 1960 : 139.
Thealia Lucas, 1839 : 577.

TYPE SPECIES. — *Mursia cristiata*, H. Milne Edwards, 1837.

DIAGNOSIS. — Carapace subcircular to transversely ovate, convex, granulate, regions undefined, ridges tuberculate. Front wider than orbit, trilobate, median lobe projecting. Anterolateral margin arcuate, tuberculate. Posterolateral margin sharply convergent, carinate. Lateral spine well developed. Eyes filling orbit, eyestalk short, granulate, setose, cornea large. Orbital margins with long plumose setae. Supraorbital margin with one or two fissures. Inner orbital tooth separated from outer orbital margin by wide hiatus opening into oblique subhepatic canal. Subhepatic region minutely granulate. Third maxilliped not covering anterior part of buccal cavity, ischium of endopod with granulate row distally forming stridulating organ when rasped against milled ridge on dactylus of chela. Chelipeds massive, subequal. Merus distally spinose. External surface of chela swollen, granulose, upper margin crested, dentate; internal surface setose near lower margin; lower margin serrate. Larger dactylus with molariform tooth proximally fitting into cup-like depression. Pereiopods large, laterally compressed, dactyli long, styliform. Male abdomen five-segmented, tapering, prominent trilobate carina on second segment. First male pleopod stout, tapering, distally spinulose. Second male pleopod long, slender, distally cornute.

REMARKS. — DESMAREST (1823 : 231) described *Mursia* in a footnote in the 'Dictionnaire des Sciences naturelles' as "se rapproche beaucoup des hépates par la forme générale du corps et par la compression des mains, mais qui en diffère en ce que ses pieds-mâchoires extérieurs ont, comme ceux des crabes, leur troisième article court, presque carré et échancré intérieurement". That same note appeared two years later (DESMAREST, 1825) accompanied by a figure (pl. 9 fig. 3) of 'Mursie Mains-en-Crête', clearly identifiable as *Mursia cristiata* H. Milne Edwards, 1837. *Thealia*, erected by LUCAS (1839 : 579) has, in his own words "beaucoup d'analogie avec les *Mursia*" - so much so that MIERS (1886) and subsequent authors considered it a junior synonym of *Mursia*.

We recognize as valid the following species : *M. africana* sp. nov.; *M. armata* de Haan, 1837; *M. aspera* Alcock, 1899; *M. australiensis* Campbell, 1971; *M. bicristimana* Alcock & Anderson, 1894; *M. cristiata* H. Milne Edwards, 1837; *M. curtispina* Miers, 1886; *M. danigoi* sp. nov.; *M. flamma* sp. nov.; *M. hawaiiensis* Rathbun, 1893; *M. mcdowelli* Manning & Chace, 1990; *M. microspina* Davie & Short, 1989; *M. musorstomia* sp. nov.; *M. spinimanus* Rathbun, 1906; *M. trispinosa* Parisi, 1914.

Key to *Mursia* species

1. Internal surface of cheliped dactylus irregularly granulate; carina on second abdominal segment entire .... ***Platymera gaudichaudii***
— Internal surface of cheliped dactylus with a milled ridge; carina on second abdominal segment trilobate .... ***Mursia*** **2**

2. Posterior margin of carapace arcuate, entire; suborbital tooth subquadrate; front pointed .... ***M. cristiata***
— Posterior margin bi- or trilobate; suborbital tooth triangular; front trilobate **3**

3. Lateral spine of carapace less than 0.07 carapace width **4**
— Lateral spine of carapace more than 0.07 carapace width **7**

4. Conical tubercles on external surface of cheliped and carpus of fourth pereiopod .... ***M. aspera***
— No conical tubercles on external surface of cheliped and carpus of fourth pereiopod **5**

5. Posterior margin distinctly trilobed .... ***M. flamma*** sp. nov.
— Median lobe on posterior margin indistinct or missing **6**

6. Carapace coarsely granulose, lateral spine upcurved, inferior proximal tubercle on external surface of chela conical, second male pleopod crook-shaped distally (fig. 6h) .... ***M. microspina***
— Carapace finely granulose, lateral spine straight, inferior proximal tubercle on external surface of chela keel-like, second male pleopod beta-shaped distally (fig. 6d) .... ***M. hawaiiensis***

7. Lateral spine massive, over one third carapace width, posterior margin bearing two cylindrical lobes, second male pleopod distally looped (fig. 3c) .... ***M. armata***
— Lateral spine slender, less than one third carapace width, lobes on posterior margin not cylindrical, second male pleopod different **8**

8. Posterior margin bilobed **9**
— Posterior margin trilobed **10**

9. Supraorbital margin bifissured, distalmost spine on merus of cheliped longer than lateral spine, external surface of fourth ambulatory merus granulose, second male pleopod distally curved (fig. 10a) .... ***M. musorstomia*** sp. nov.

— Supraorbital margin unifissured, distalmost spine on merus of cheliped shorter than lateral spine, external surface of fourth ambulatory merus smooth, second male pleopod distally hook-like, tip upcurved (fig. 10h) .... ***M. trispinosa***

10\. Supraorbital margin bifissured .... ***M. mcdowelli***

— Supraorbital margin unifissured **11**

11\. Lower margin of chela minutely serrate **12**

— Lower margin of chela prominently serrate **13**

12\. Cheliped merus trispinose, distalmost spine longer than lateral spine, second male pleopod sinuous (fig. 3e) .... ***M. australiensis***

— Cheliped merus quadrispinose, distalmost spine shorter than lateral spine, second male pleopod distally coiled (fig. 3j) .... ***M. bicristimana***

13\. Lobes on posterior margin indistinct, nearly effaced, second male pleopod crook-shaped (fig.3a) .... ***M. africana*** sp. nov.

— Lobes on posterior margin distinct, triangular, second male pleopod different **14**

14\. Carapace minutely granulate .... ***M. spinimanus***

— Carapace prominently granulate **15**

15\. Anterolateral margins indistinctly denticulate, three tubercles in inferior row externally on chela .... ***M. curtispina***

— Anterolateral margins distinctly dentate, more than three tubercles in inferior row externally on chela .... ***M. danigoi*** sp. nov.

Mursia africana sp. nov.

Fig. 1 a, 2 a-b, 3 a-b

Mursia armata - BARNARD, 1950 : 356, fig. 67g. Non de Haan, 1837.

MATERIAL EXAMINED. — **Kenya**, 3°08'S, 40°20.5'E, 250-255 m, 5 September 1974, coll. A. J . BRUCE : 1 ♂, holotype, cl 30.8, cw 38.8, mcw 56.7 (NNM).

Portuguese East Africa, 26°03'S, 33°04'E, 290 m, 1924, coll. GILCHRIST, id. BARNARD : 1 ♂ juv., paratype, cl 20.1, cw 24.5, mcw 34.8; 1 ♀ juv., paratype, cl 17.8, cw 20.9, mcw 27.5 (SAM A6794).

TYPE LOCALITY. — Kenya, 3°08'S, 40°20.5'E.

DESCRIPTION. — Carapace 1.25 wide as long, surface coarsely granulate. Radial tubercles granulate. Front with rounded median lobe projecting beyond lateral lobes. Supraorbital margin unifissured. Anterolateral margin with nine small triangular teeth. Lateral spine 0.2 carapace width, granular. Posterolateral margin beaded, sinuous. Posterior margin minutely beaded, with flattened, nearly effaced lobes. Merus of cheliped bispinose, distal spine twice as long as proximal spine. External surface of palm with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest. Proximal tubercle in lowest row acuminate, keel-like, median and distal tubercles smaller, triangulate. Lower margin strongly serrate, teeth smaller proximally. Dactylus basally granulose on exterior surface. Upper margin of pereiopodal meri minutely granulose, as well as external surface of fourth ambulatory merus. Upper margin of propodi unicristate. Lobes of abdominal crest coequal. Second male pleopod distally crook-shaped, tip slightly outcurved.

Color. - "As preserved, pinkish, a bright red spot on inner surface of hand of both chelipeds at insertion of finger" (BARNARD, 1950).

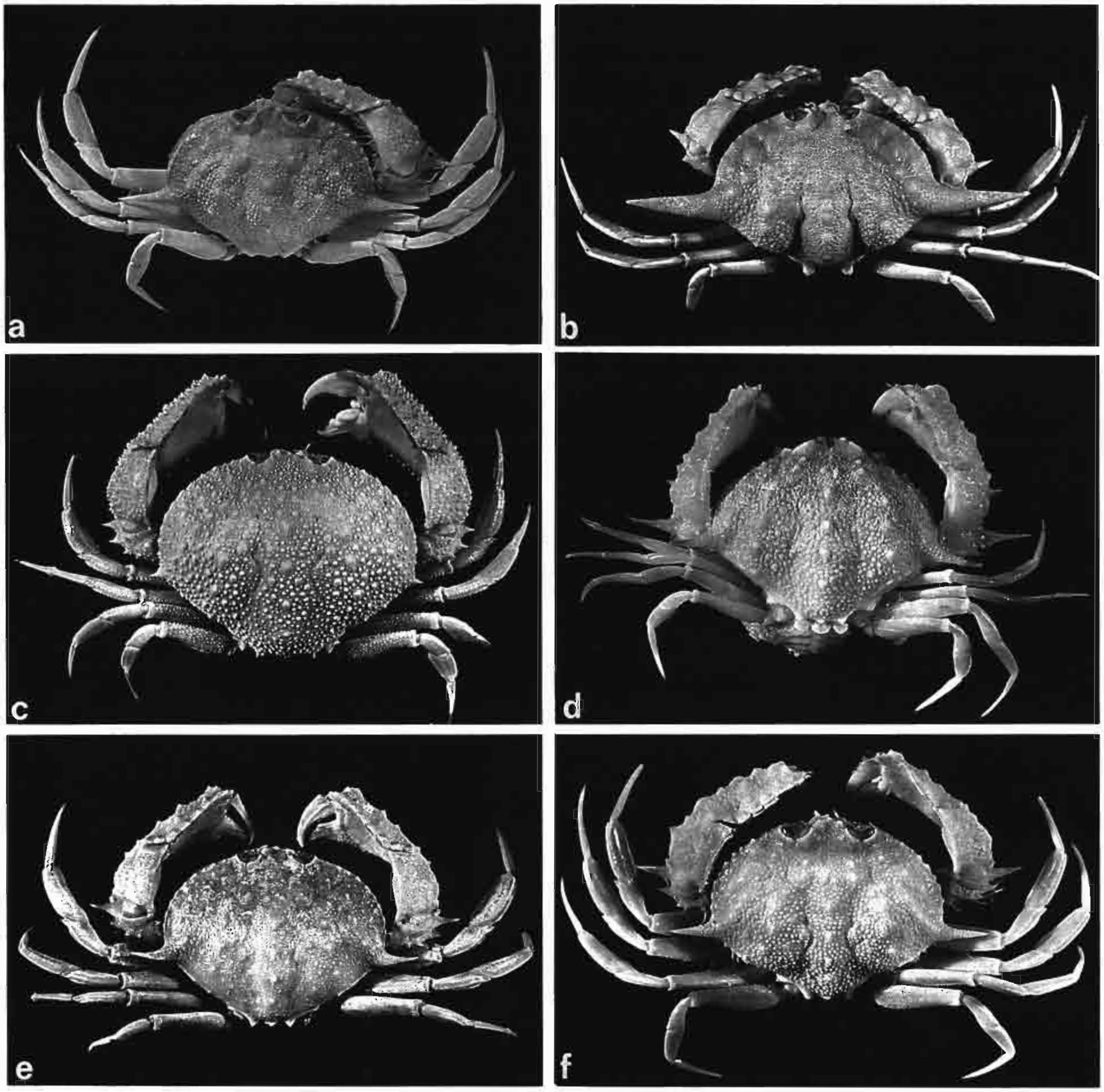


FIG. 1. — Dorsal view : **a**, *Mursia africana* sp. nov., ♂, holotype, cl 30.8 mm, Kenya, 250 m (NNM). — **b**, *Mursia armata* de Haan, 1837, ♂ cl 30.1 mm, Viet Nam, 145 m (MNHN-B 16325). — **c**, *Mursia aspera* Alcock, 1899, ♀ cl 54.6 mm, Madagascar (MNHN-B 24352). — **d**, *Mursia australiensis* Campbell, 1971, ♀ ovigerous cl 14.6 mm, New Caledonia, 315-320 m (MNHN-B 24369). — **e**, *Mursia danigoi* sp. nov., ♂, holotype, cl 45 mm, Philippines, 143-178 m (MNHN-B 22369). — **f**, *Mursia bicristimana* Alcock & Anderson, 1894, ♂, syntype, cl 19.1 mm, Nicobar Ids, 124-271 m (BM 1898.8.26.3).

ETYMOLOGY. — The specific name refers to the occurence of the species off the African coast.

REMARKS. — *M. africana* resembles both *M. mcdowelli* and *M. bicristimana* in carapace shape and granulosity. *M. mcdowelli* differs from *M. africana* in its shorter lateral spine, bifissured supraorbital margin and beta-shaped second male pleopod. *M. bicristimana* differs from *M. africana* in its quadrispinose cheliped merus and distally curled second male pleopod. *M. africana* and *M. microspina* both possess a crook-shaped second male pleopod. However, the latter is easily distinguished from *M. africana* by its minute lateral spine.

DISTRIBUTION. — Kenya, Mozambique; 250-290 m.

Mursia armata de Haan, 1837

Fig. 1 b, 2 c-d, 3 c-d

Mursia armata de Haan, 1837 : 70 (list), pl. 19 fig. 2; 1839 : 73. — ORTMANN, 1892 : 564 (part). — DOFLEIN, 1902 : 653; 1904 : 36. — PARISI, 1914 : 290. — IHLE, 1918 : 179. — GORDON, 1931 : 527 (list). — ANDRÉ, 1931 : 641. — YOKOYA, 1933 : 114. — SAKAI, 1937 : 85, pl. 11 fig. 3; 1965 : 51, pl. 20 fig. 4; 1976 : 135, pl. 43 fig. 2. — SHEN, 1940 : 214. — UCHIDA, 1949 : 723, fig. 2091. — GUINOT-DUMORTIER & DUMORTIER, 1960 : 139, fig. 19a-b . — SERÈNE, 1968 : 41 (list). — KIM, 1970 : 11, pl. 2 fig. 1. — TAKEDA, 1978 : 34; 1979 : 153 (list). — MIYAKE, 1983 : 23, 199, pl. 8 fig. 3. — DAI & YANG, 1991 : 107, text-fig. 53, pl. 12 fig. 2.
Thealia acanthophora Lucas, 1839 : 579, pl. 21 figs 1-3.
Mursia armata tipica Doflein, 1904 : 40, pl. 17 fig. 1, pl. 18 fig. 2. — BALSS, 1922 : 124. — SAKAI, 1934 : 284; 1936 : 47, pl. 7 fig. 1.
Not *Mursia armata* - BARNARD, 1950 : 356, fig. 67g. — KENSLEY, 1981a : 38 (list); 1981b : 60 (list) (= *M. africana* sp. nov.).

MATERIAL EXAMINED. — **Japan**. 1825-1834, coll. H. BURGER : 1 ♀ cl 27.4, lectotype (NNM 38154); 2 ♂, 4 ♀, paralectotypes (NNM 38155). — Near Tokyo, 1906, coll. J. HARMAND : 1 juv. (MNHN-B 24350). — Amakusa, off Tomioka, 60-70 m, August 1983, coll. K. HARADA : 2 ♂ cl 22.1, 22.6, cw 27.5, 28.0, mcw 50.0 (NNM 38192). — Misaki, 1930, id. M. J. RATHBUN : 1 ♂ cl 30.1, cw 36.9 (USNM 63691).
Hong Kong. Coll. BARNES: 2 ♂, cl 25.0, 28.3, cw 30.3, 35.9, mcw 53.8, 61.2; 1 ♀ cl 25.0, cw 30.7, mcw 52.6 (BM 1930.12.2.34-36). — vic. Hong Kong, 21°53'N, 115°51'E, 113 m, 4 November 1908 : 1 ♀ cl 26, cw 31.4, mcw 54.7 (USNM).
Viet Nam. Coll. A. KREMPF : 1 ♀ cl 33.2, cw 41.7, mcw 74.3 (MNHN-B 16324). — " *De Lanessan*", 145 m, 30 September 1925, coll. A. KREMPF : 1 ♂ cl 30.1, cw 38.6, mcw 69.5 (MNHN-B 16325).
New Caledonia. Off Thio, trap, 260 m, 21. June 1986 : 1 juv. cl 19.5, cw 24,0 (MNHN-B 24351).

TYPE LOCALITY. — Japan (DE HAAN, 1837).

DESCRIPTION. — Carapace about 1.2 wide as long, surface covered with close spaced flattened granules anteriorly, well-spaced, rounded granules posteriorly. Radial tubercles prominent, median row laterally bordered by deep grooves. Front with slightly rounded lateral lobes and triangular rostrum. Supraorbital margin unifissured. Suborbital sinus v-shaped, suborbital tooth triangular. Anterolateral margins with seven rounded, nearly effaced teeth. Lateral spine massive, over one third carapace width, minutely granulate. Posterolateral margin oblique, beaded, angled medially. Posterior margin beaded, lateral processes stout, cylindrical. Merus of cheliped bispinose, distal spine much longer than proximal. Carpus with nearly effaced granules. Upper margin of palm set with eight teeth. External surface of palm with large, rounded tubercles in three diagonal rows and three more at base of palmar crest, lowest row with median tubercle largest. Lower margin of palm serrate, teeth diminishing in size proximally. Dactylus basally granulate on anterior margin. Upper margins of pereiopodal meri granulose, meri, propodi nearly smooth; fourth pereiopodal meri distinctly granulose on external surface. Abdominal crest with finely granulate margin, rounded lateral lobes widely separated from trapezoid median lobe. Second male pleopod distally looped, its tip incurved.

Color. - Carapace tubercles orange-red; internal palmar surface near dactylar base with deep-orange patch (SAKAI, 1936, pl. 7 fig. 11).

REMARKS. — *M. armata* alone among its congeners possesses long, stout, straight lateral spines, two cylindrical protuberances on posterior margin and distally looped second male pleopod.

M. armata was listed and drawn by DE HAAN (1837), and later described by him (1839), unbeknown to LUCAS (1839), who described it, that same year, as *Thealia acanthophora*. Though clearly distinct, *M. armata* was merged with other species (ORTMANN, 1892; IHLE, 1918), so that some authors found it necessary to reestablish it as *M. armata typica* (DOFLEIN, 1904; BALSS, 1922; SAKAI, 1934, 1935).

DISTRIBUTION. — Hong Kong, Indochina, Korea, Japan, New Caledonia; 60-260 m.

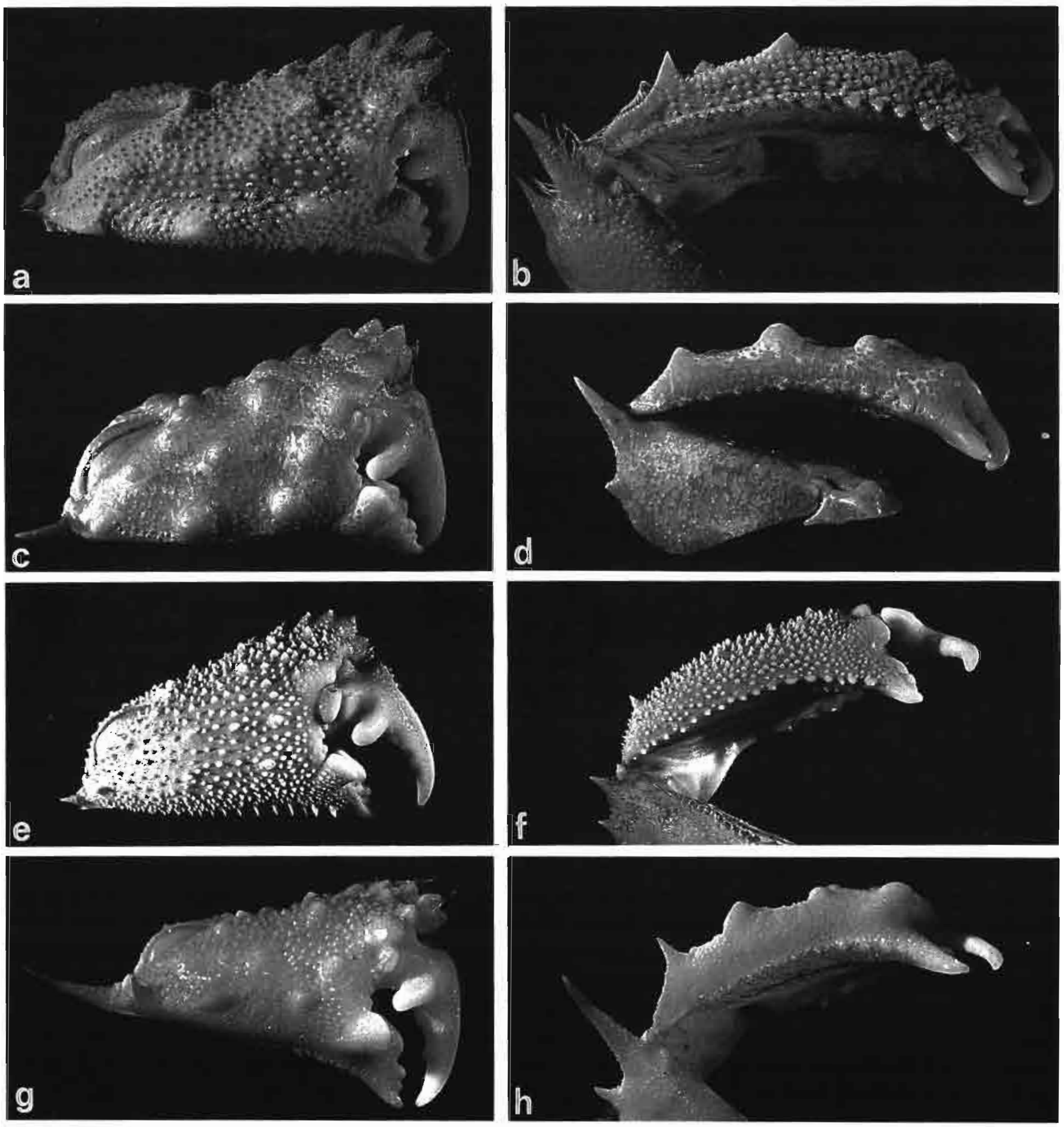


FIG. 2. — Cheliped, external and ventral views : **a-b**, *Mursia africana* sp. nov., ♂, holotype, cl 30.8 mm, Kenya, 250 m (NNM). — **c-d**, *Mursia armata* de Haan, 1837, ♂ cl 30.1 mm, Viet Nam, 145 m (MNHN-B 16325). — **e-f**, *Mursia aspera* Alcock, 1899, ♀ cl 54.6 mm, Madagascar (MNHN-B 24352). — **g-h**, *Mursia australiensis* Campbell, 1971, ♀ ovigerous cl 14.6 mm, New Caledonia, 315-320 m (MNHN-B 24369)

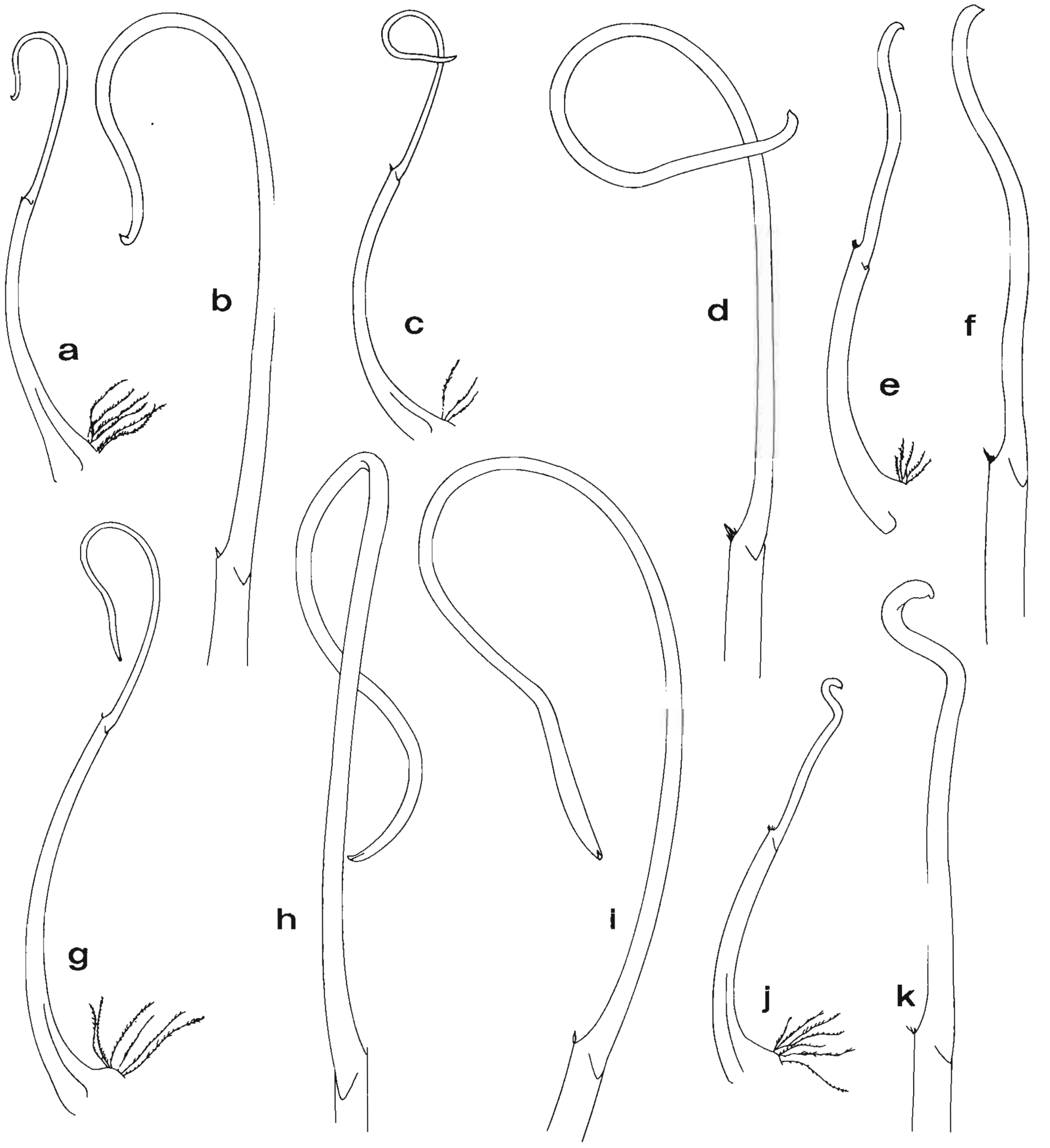


FIG. 3. — Second pleopod male with enlargement of distal part : **a-b**, *Mursia africana* sp. nov., ♂, holotype, cl 30.8 mm, Kenya, 250 m (NNM). — **c-d**, *Mursia armata* de Haan, 1837, ♂ cl 30.1 mm, Viet Nam, 145 m (MNHN-B 16325). — **e-f**, *Mursia australiensis* Campbell, 1971, ♂ cl 11.9 mm, New Caledonia, 300 m (MNHN-B 24355). — **g-i**, *Mursia danigoi* sp. nov., ♂, holotype, cl 45 mm, Philippines, 143-178 m (MNHN-B 22369). — **j-k**, *Mursia bicristimana* Alcock & Anderson, 1894, ♂, syntype, cl 19.1 mm, Nicobar Islands, 124-271 m (BM 1898.8.26.3).

Mursia aspera Alcock, 1899

Fig. 1 c, 2 e-f

Mursia aspera Alcock, 1899a : 24; 1899b, pl. 40 fig. 2. — SERÈNE, 1968 : 41 (list).
Not *Mursia aspera* - MIYAKE, 1983 : 24, 199, pl. 8 fig. 5 (= *M. australiensis* Campbell, 1971 ?).
Not *Mursia aspera* - BABA, 1986 : 221, pl. 165 (= *M. microspina* Davie & Short, 1989).
Not *Mursia aspera* - SAKAI, 1965 : 54, textfig 8c-c'; 1976 : 138, textfig. 74c-c', pl. 42 fig. 2. — ZARENKOV, 1990 : 220, fig. 2.

MATERIAL EXAMINED. — **Madagascar.** "*Vauban*": West coast, coll. A. CROSNIER : 1 ♀ cl 54.6, cw 68.2, mcw 73.3 (MNHN-B 24352).
Seychelles. CEPROS : stn 15, 04°09.3'S, 56°11'E, 150-210 m, 20 October 1987 : 2 ♀ cl 50.4, 53.4, cw 63.0, 66.2, mcw 67.9, 71.3 (MNHN-B 19113).

TYPE LOCALITY. — Maldives (ALCOCK, 1899a).

DESCRIPTION. — Carapace strongly convex, about 1.2 wide as long, surface closely covered with conical tubercles, smaller anteriorly. Radial tubercles only slightly enlarged. Front with lateral teeth more prominent than median. Supraorbital margin unifissured. Anterolateral margins setose, with eleven small granular tubercules. Lateral spine minute, less than 0.04 carapace width, granulate. Posterolateral margin oblique, beaded, medially angled. Posterior margin with three acuminate denticles of nearly equal size. Outer surface of chelipeds covered with acuminate granules and tubercles. Merus of cheliped with four spines increasing in size distally. Palm crested with nine granulate lobes. Lower margin prominently spinose. Posterior surface of fourth pereiopodal merus covered with conical tubercles, as well as upper and lower margins of pereiopodal meri. Upper margin of first and second pereiopodal carpi with three rows of conical tubercles, third with two rows, fourth with single row. Abdominal crest with granulate lateral lobes widely separated from irregularly tuberculate median lobe.

Color. - Carapace bone colored with coral-pink patches on hepatic, mesogastric and branchial regions. Inner palmar face with large, coral-colored patch, at base of dactylus. Ambulatory legs pale coral.

REMARKS. — The rarity of *M. aspera* was probably the reason that, despite ALCOCK's clear description (1899a) and illustration (1899b), it has been submerged as a junior synonym of *M. armata curtispina* by DOFLEIN (1904) and IHLE (1918). The specimens described and depicted by SAKAI (1965, 1976) differ from *M. aspera* in having more prominent medial tubercles on the external surface of the chela and a longer lateral spine. MIYAKE (1983) described a specimen with an even longer lateral spine and a thin, elongate spine distally on the merus of the cheliped, quite similar to *M. australiensis* Campbell, 1971. The specimen depicted by BABA (1986) is *M. microspina* Davie & Short, 1989, which indeed closely resembles *M. aspera* in having a short lateral spine. However, *M. aspera* differs from *M. microspina* in having evenly sized frontal denticles, acuminate tubercles externally on cheliped, four spines distally on cheliped merus, lower margin of palm prominently spinose as well as granulate ambulatory legs. ZARENKOV's (1990) specimens differ from *M. aspera* in lacking prominent conii on carapace, external surface of chela and on upper margins of pereiopodal meri.

DISTRIBUTION. — Madagascar, Seychelles, Maldives; 150-384 m.

Mursia australiensis Campbell, 1971

Fig. 1 d, 2 g-h, 3 e-f, 11

Mursia armata - WHITELEGGE, 1900 : 160. Non de Haan, 1837.
Mursia australiensis Campbell, 1971 : 31, pl. 2a-b, fig. 1.
? *Mursia aspera* - MIYAKE, 1983 : 24, 199, pl. 8 fig. 5.

MATERIAL EXAMINED. — **Australia.** Off New South Wales coast, August 1929, coll. and id. M. WARD : 2 ♂, cl 23.6, 24.4, cw 27.5, 27.6, mcw 39.5, 40.9 (USNM 63715).

New Caledonia. MUSORSTOM 5 : stn 252, 25°08.53'S, 159°55.11'E, 300-310 m, 7 October 1986 : 1 ♀ ovigerous, cl 13.7, cw 15.4, mcw 20.9 (MNHN-B 24353). — Stn 255, 25°15.40'S, 159°54.80'E, 280-295 m, 7 October 1986 : 1 ♂, cl 15.7, cw 18.1, mcw 27.7 (MNHN-B 24354). — Stn 261, 25°26.58'S, 159°45.88'E, 300 m, 8 October 1986 : 1 ♂, cl 11.9, cw 19.5, mcw 30.3 (tip broken); 1 ♀, cl 14.3, cw 16.4, mcw 24.9 (MNHN-B 24355).- — Stn 263, 25°21.30'S, 159°46.44'E, 255-150 m, 8 October 1986 : 1 ♀, cl 14.3, cw 16.2, mcw 22.8 (MNHN-B 24356). — Stn 265, 25°21.10'S, 159°45.20'E, 190-260 m, 8 October 1986 : 3 juv. (MNHN-B 24357). — Stn 266, 25°20.20'S, 159°45.70'E, 240 m, 8 October 1986 : 1 ♂, cl 12.8, cw 15.3, mcw 21.3; 1 ♀, cl 14.8, cw 16.1, mcw 23.8; 2 juv. (MNHN-B 24358). — Stn 267, 25°23.60'S, 159°47.20'E, 285 m, 8 October 1986 : 1 ♀, cl 13.5, cw 15.4, mcw 24.3 (MNHN-B 24359). — Stn 269, 24°47.0'S, 159°37.30'E, 270-250 m, 9 October 1986 : 1 juv., cl 6.6 (MNHN-B 24360). — Stn 274, 24°44.83'S, 159°41.00'E, 285 m, 9 October 1986 : 1 ♂, cl 13.8, cw 15.5 (MNHN-B 24361). — Stn 275, 24°46.60'S, 159°40.30'E, 285 m, 9 October 1986 : 1 ♀, cl 14.4, cw 16.3, mcw 22.8; 5 juv. (MNHN-B 24363). — Stn 276, 24°48.90'S, 159°40.90'E, 269-258 m, 9 October 1986 : 3 ♂, cl 12.9-14.5; 2 ♀, cl 13.5, 13.7 (MNHN-B 24362). — Stn 281, 24°10.54'S, 159°34.32'E, 272 m, 10 October 1986 : 1 ♀, cl 11.8, cw 13.2, mcw 17.4 (MNHN-B 24364). — Stn 282, 24°11.55'S, 159°32.22'E, 226-230 m, 10 October 1986 : 3 juv., cl 6.3-10 (MNHN-B 24365). — Stn 284, 24°09.96'S, 159°33.49'E, 225-230 m, 10 October 1986 : 1 ♂, cl 10.6, cw 11.9, mcw 16.4 (MNHN-B 24366). — Stn 285, 24°09.35'S, 159°34.04'E, 245-255 m, 10 October 1986 : 1 ♂, cl 12.8, cw 14.9, mcw 22.1 (MNHN-B 24367). — Stn 289, 24°01.50'S, 159°38.40'E, 273 m, 10 October 1986 : 1 ♂, cl 14.6, cw 16.3, mcw 25.4; 1 ♀, cl 13.3, cw 15.0, mcw 20.7 (MNHN-B 24368). — Stn 312, 22°17.20'S, 159°24.80'E, 315-320 m, 12 October 1986 : 1 ♀ ovigerous, cl 14.6, cw 16.6, mcw 22.6 (MNHN-B 24369).

TYPE LOCALITY. — Cape Moreton, Queensland, Australia (CAMPBELL, 1971).

DESCRIPTION. — Carapace 1.1 wide as long, surface closely covered with granules. Radial tubercules prominent. Median frontal lobe triangular, projecting beyond rounded lateral lobes. Supraorbital margin unifissured. Suborbital sinus v-shaped suborbital tooth triangular pointing distad. Anterolateral margins indistinctly cristate, with ten minute teeth diminishing in size posteriorly. Lateral spine one quarter carapace width, minutely granulate, curved upwards. Posterolateral margins beaded, angled medially. Posterior margin with lateral teeth projecting further than median lobe. Chelipeds externally granulate. Merus of cheliped trispinose, distal spine largest, nearly as long as lateral spine. Outer surface of chela with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest, lowest row with proximal tubercle acuminate, prominent, median and distal tubercles smaller, rounded. Lower margin minutely serrate, teeth smaller proximally. Dactylus minutely granulate proximally on anterior margin. Upper margin of pereiopods nearly rounded, minutely granulate. Abdominal crest with flattened, subequal, rounded lobes. Cornute distal portion of second male pleopod sinuous, tip outcurved.

Color (in alcohol). - Carapace buff with irregular pink spots. Meral and anterolateral spines red distally. Inner palmar face with small, red patch at base of dactylus. Four red dots on distal margin of buccal cavity.

REMARKS. — *M. australiensis* differs from its congeners in having the distal portion of the second male pleopod sinuous with tip curved distad.

DISTRIBUTION. — Australia, New Caledonia, ? Japan; 40-320 m.

Mursia bicristimana Alcock & Anderson, 1894

Fig. 1 f, 3 j-k, 5 c-d

Mursia bicristimana Alcock & Anderson, 1894 : 179. — ALCOCK, 1896 : 150; 1899a : 23; 1899b, pl. 3 fig. 3. — ALCOCK & ANDERSON, 1896, pl. 24 fig. 5. — ANDERSON, 1897 : 103. — LAURIE, 1906 : 355. — LLOYD, 1907 : 6. — BARNARD, 1926 : 120. — SERÈNE, 1968 : 41 (list).
Mursia armata bicristimana - DOFLEIN, 1904 : 41, pl. 17 fig. 3, pl. 18 fig. 4.

MATERIAL EXAMINED. — **Indian Ocean.** 11°14.30'N, 74°57.15'E, 124-271 m, pres. Indian Museum : 1 ♂, cl 19.1, cw 24.1, mcw 32.4. Syntype. (BM 1898.8.26.3). — Stn AB-22B, 31 July 1963, coll. "*Anton Brunn*" : 2 ♂, cl 18.9, 44.3, cw 23.8, 58.8, mcw 30.9, 74.7; 1 ♀, cl 27.2, cw 34.9, mcw 46.1 (USNM). — Ceylon. coll. HERDMAN : 1 ♂ cl 11.9, cw 21.1, mcw 28.0 (BM 1907.5.22). — Gulf of Manaar, coll. HERDMAN : 1 ♀ ovigerous, cl 11.8, cw 20.5, mcw 25.4 (BM 1934.1.16.23).

TYPE LOCALITY. — Gulf of Manaar (ALCOCK & ANDERSON, 1894).

DESCRIPTION. — Carapace about 1.2 long as wide, coarsely granulate, granules smaller anteriorly. Radial tubercules minutely granulate, prominent. Lateral frontal lobes rounded, effaced, median lobe triangular, projecting. Supraorbital margin unifissured, suborbital sinus v-shaped. Suborbital tooth triangular, pointing distad. Anterolateral margin with nine tuberculate teeth, largest medially. Lateral spine less than one fifth carapace width, granulate. Posterolateral margin beaded, sinuous. Posterior margin with laminar lobes, lateral lobes projecting beyond median. External surface of chelipeds granulose. Merus quadrispinose, distal spine largest. External surface of palm with two longitudinal rows of three granulate tubercles and with granular ridge, unevenly trilobate, with proximal lobe most prominent, triangulate distad, median lobe broadly rounded, distal lobe smallest, obtuse. Lower margin minutely serrate. Dactylus granulose on external surface. Margins of pereiopodal carpi minutely granulate as well as external surface of last pair. Upper margin of meri with three granulate costae, but for last which is bicristate. Abdominal crest with rounded, subequal lobes. Second male pleopod distally coiled.

Color. - "Salmon-pink" (ALCOCK & ANDERSON, 1894 : 179); "upper surface of leg and carapace pale bluish-white studded with orange red granules, lower surface white; fingers of chelipeds white, inner surface of merus of chelipeds deep orange" (ANDERSON, 1897 : 103).

REMARKS. — *M. bicristimana* was well described and illustrated by ALCOCK and ANDERSON (1894), ALCOCK (1899) and DOFLEIN (1904).

M. bicristimana alone among its congeners possesses a corkscrew-shaped second male pleopod.

DISTRIBUTION. — Sri Lanka, Nicobar Islands; 260-732 m.

Mursia cristiata H. Milne Edwards, 1837

Fig. 4 a, 5 e-f, 6 a-c

Mursia Desmarest, 1823 : 231; 1825 : 108.
Mursie Mains-en-crête - Desmarest, 1825, pl. 9 fig. 3.
Mursie en crête - LATREILLE, 1831 : 352.
Mursia cristiata H. Milne Edwards, 1837b : 109.
Mursia cristimanus de Haan, 1837 : 70. — STEBBING, 1900 : 22; 1910 : 334. — DOFLEIN, 1901 : 136. — BARNARD, 1950 : 354, fig. 67a-f. — MACPHERSON, 1983 : 18, figs 8, 9a-f. — MANNING & CHACE, 1990 : 46, 76, 77.
Mursia cristimana - DE HAAN, 1837 : pl. E; 1839 : 73. — KRAUSS, 1843 : 52. — MIERS, 1886 : 291. — DOFLEIN, 1904 : 38, pl. 16, figs 5-12, pl. 18 fig. 1. — STEBBING, 1914 : 272, 307. — ODHNER, 1923 : 26. — GUINOT-DUMORTIER & DUMORTIER, 1960 : 139. — SERÈNE, 1968 : 41 (list). — KENSLEY, 1981a : 38 (list).
Mursia cristata - H. MILNE EDWARDS, 1840 : 17 (explication des planches); 1843, pl. 13 fig. 1-1a. — LUCAS, 1840 : 108, pl. 8 fig. 1. — STUDER, 1883 : 15. — ORTMANN, 1894 : 35.
Mursie custata - H. MILNE EDWARDS, 1840 : 627 (index).
Mursica cristata - H. MILNE EDWARDS, 1843 : pl. 13 fig. 1-1a.
Cryptosoma orientis Adams & White, 1848 : 62, pl. 13 fig. 4.

MATERIAL EXAMINED. — **South Africa**. Cape Province, coll. H. B. VAN HORSTOCK : 1 ♂, cl 27.5, cw 30.0, mcw 34.8. Holotype. det. DE HAAN (NNM 38213). — Coll. STEBBING : 1 ♂, cl 22.3, cw 23.8 (BM 1928.12.1.197). — Simon's Bay, 9-33 m, coll. HMS *"Challenger"* : 1 ♂, cl 27.4, cw 30.4, mcw 36.2 (BM 1884.31). — Sea Point, nr Capetown, coll. HMS *"Challenger"* : 1 ♀, cl 20.1, cw 21.8, mcw 25.3 (BM 1884.31). — Agulhas Bank, stn 142, 35°0'S, 18°37'E, 274 m, coll. HMS *"Challenger"* : 1 ♂, cl 21.3, cw 22.4, mcw 26.5; 2 ♀, cl 15.3, 19.0, cw 15.3, 19.3, mcw 20.3, 23.1 (BM 1884.31). — False Bay, coll. STEBBING : 1 ♂, cl 29.1, cw 31.8 (BM 1928.12.1.198). — Jeffrey's Bay, 28 April 1961, coll. GRAS : 1 ♂, cl 29.7, cw 32.4, mcw 37.2 (NNM 16821). — Durban, coll. STEBBING : 1 ♂, cl 27.6, cw 30.0, mcw 35.2 (BM 1928.12.1.206). — 29°07.24'S, 15°26.06'E, 183 m, 31 July 1986 : 4 ♂, cl 25.6-30.5, cw 27.9-33.2, mcw 31.6-39.3; 1 ♀, cl 26.0, cw 28.2, mcw 32.8 (USNM 237561).

TYPE LOCALITY. — South Africa, Cape Province (DE HAAN, 1837).

DESCRIPTION. — Carapace nearly as long as wide, granulate, ridges coarsely tuberculate, mesogastric tubercles largest, most prominent. Front ogival. Inner and outer orbital angles prominent. Supraorbital margin bifissured.

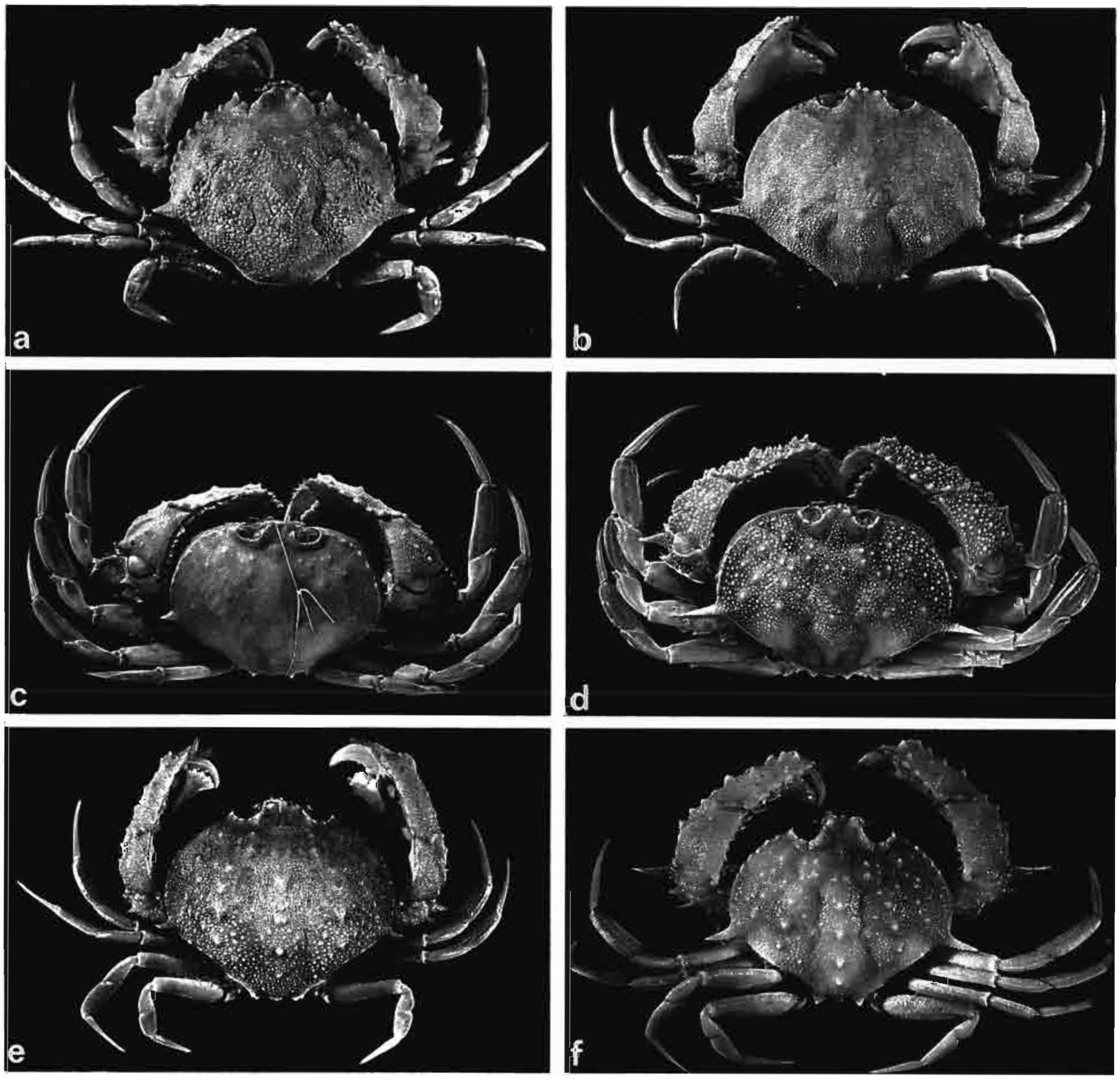


FIG. 4. — Dorsal view : **a**, *Mursia cristiata* H. Milne Edwards, 1837, ♂ cl 27.4 mm, South Africa, Simon's Bay, 9-33 m (BM 1884.31). — **b**, *Mursia curtispina* Miers, 1886, ♀, holotype, cl 29.5 mm, Fiji Ids, 576 m (BM 1884.31). — **c**, *Mursia hawaiiensis* Rathbun, 1893, ♂ cl 22.9 mm, Hawaiian Ids, 386-463 m (USNM 29903). — **d**, *Mursia mcdowelli* Manning & Chace, 1990, ♂, holotype, cl 37.5 mm, Ascension Id., 120-150 m (USNM 221893). — **e**, *Mursia microspina* Davie & Short, 1989, ♂ cl 24.5 mm, New Caledonia, 385-420 m (MNHN-B 24392). — **f**, *Mursia musorstomia* sp. nov., ♂, holotype, cl 19.7 mm, New Caledonia, 475 m (MNHN-B 24396).

Suborbital sinus v-shaped, suborbital tooth quadrate, pointing distad. Anterolateral margins cristate, prominently tuberculate, tubercles diminishing in size posteriorly. Lateral spine less than 0.1 carapace width, minutely granulate, curving upwards. Posterolateral margins beaded, nearly straight. Posterior margin arcuate, evenly beaded. Chelipeds externally granulate. Merus of cheliped trispinose, distal spine largest, longer than lateral spine. Outer surface of chela with nine conical tubercles in three oblique rows and three tubercles near base of serrate upper crest, lower row with proximal tubercle acuminate, somewhat curved, median and distal tubercles smaller, rounded. Lower margin distinctly serrate, teeth smaller proximally. Dactylus minutely granulate proximally on anterior margin. Upper margin of pereiopods slightly beaded, granulate. Abdominal crest with flattened, subequal, rounded lobes. Cornute distal portion of second male pleopod resembling the Greek letter beta.

Color. - Carapace buff with dark red spots on radial tubercles, cheliped carpus and palmar crest.

REMARKS. — *M. cristiata* differs from its congeners in having an ogival front, evenly beaded posterior margin and a subquadrate suborbital tooth.

It was the first species of the genus to be figured (DESMAREST, 1823) and described (H. MILNE EDWARDS, 1837). However, its name fell prey to repeated misspellings and typographical errors, beginning with H. MILNE EDWARDS who provided four different spellings. The specific name itself, *M. cristiata* (H. Milne Edwards, 1837), is evidently a misspelling as in subsequent publications H. MILNE EDWARDS named it *cristata* (1840; 1843), but also *Mursie custata* (1840, index) and *Mursica cristata* (1843, pl. 13). In addition, DE HAAN supplied us with two versions : *M. cristimanus* (1837 : 70) and *M. cristimana* (1837, pl. E; 1839 : 73).

DISTRIBUTION. — Southern Africa, from Natal to Namibia; ? St. Helena Id. (DOFLEIN, 1900); 9-304 m

Mursia curtispina Miers, 1886

Fig. 4 b, 5 g-h

Mursia curtispina Miers, 1886 : 291, pl. 29 fig. 2.
Mursia armata curtispina - DOFLEIN, 1904 : 40, pl. 17 fig. 2, pl. 18 fig. 3.
Not *Mursia armata curtispina* - YOKOYA, 1933 : 115. — SAKAI, 1936 : 48, pl. 7 fig. 3; 1937 : 87, pl. 11 fig. 4 (= *M. trispinosa* Parisi, 1914).
Not *Mursia curtispina* - SAKAI, 1965 : 52, textfig. 8a-a', pl. 21 fig. 2; 1976: 136, textfig. 74a-a', pl. 43 fig. 1. — TAKEDA & KOYAMA, 1974 : 105.

MATERIAL EXAMINED. — **Fiji Ids.** "*Challenger*": stn 173, 19°09.35'S, 179°41.50'E, 576 m : 1 ♀, cl 29.5, cw 34.0. Holotype (BM 1884.31).

TYPE LOCALITY. — Fiji (MIERS, 1886).

DESCRIPTION. — Carapace 1.15 wide as long, surface closely granulate. Radial tubercles minutely granulate. Front with rounded median lobe projecting beyond lateral lobes. Supraorbital margin unifissured. Anterolateral margin with nine, nearly effaced, granulate teeth. Lateral spine about 0.2 carapace width, granular. Posterolateral margin beaded, sinuous. Posterior margin minutely beaded, with sharply triangular lateral teeth and a small median tooth. Merus of cheliped trispinose, distalmost spine as long as lateral spine. External surface of palm with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest. Lowest row with proximal tubercle acuminate, triangular, median and distal tubercles smaller, rounded. Lower margin strongly serrate, teeth smaller proximally. Dactylus basally granulose on exterior surface. Upper margin of pereiopodal meri minutely granulose, as well as external surface of fourth pereiopodal merus. Upper margin of propodi unicristate. Median lobe of abdominal crest wider than lateral lobes, slightly emarginate.

Color. - "(in spirit) yellowish-brown, inclining to pink on chelipedes; the apices of the dactyli of the ambulatory legs are brown-pink, and a patch of the same colour ornaments the inner surface of the palms of the chelipedes." (MIERS, 1886).

REMARKS. — MIERS (1886) described and depicted *M. curtispina* quite clearly but later authors sought to synonymize *M. curtispina* with *M. armata* (ORTMANN, 1892), later making it a subspecies of *M. armata* (DOFLEIN, 1904; IHLE, 1918; BALSS, 1922). The species described and depicted by SAKAI (1965, 1976) differs from *M. curtispina* in having longer spines laterally on carapace and distally on cheliped merus, in the form of inferior tubercles externally on palm and in the shape of the color patch on inner palmar face.

DISTRIBUTION. — Fiji, Indonesia; 470-576 m.

Mursia danigoi sp. nov.

Fig. 1 e, 3 g-i, 5 a-b

MATERIAL EXAMINED AND TYPES. — **Philippines.** MUSORSTOM 1 : stn 58, 13°58.0'N, 120°13.7'E, 143-178 m, 26 March 1976 : 1 ♂, cl 45, cw 55, mcw 71 (MNHN-B 22369). Holotype. — Stn 58, 13°58.0'N, 120°13.7'E, 143-178 m, 26 March 1976 : 1 ♂, cl 44.6, cw 55.2, mcw 71; 1 ♀, cl 26.5, cw 31.7, mcw 43 (MNHN-B 22371). Paratypes. — Stn 71, 14°09.3'N, 120°26.2'E, 174-204 m, 28 March 1976 : 1 ♀, cl 37.8, cw 45.2, mcw 60.2 (MNHN-B 22368).

MUSORSTOM 2 : stn 59, 14°00'N, 120°17'E, 186-190 m, 28 November 1980 : 1 ♂, cl 46.1, cw 56.5, mcw 75.4; 2 ♀ juv., cl 27.3, 13.3, cw 32, mcw 45.1 (MNHN-B 22366).

MUSORSTOM 3 : stn 88, 14°01'N, 120°17'E, 183-187 m, 31 May 1985 : 1 ♀, cl 37.1, cw 44.2, mcw 56.9 (MNHN-B 22367).

DESCRIPTION. — Carapace 1.2 wide as long, surface granulose. Radial tubercules prominent, minutely granulate. Median frontal lobe triangular, projecting beyond triangulate lateral lobes. Supraorbital margin unifissured. Suborbital sinus v-shaped, suborbital tooth triangulate pointing distad. Anterolateral margins distinctly dentate, teeth diminishing in size anteriorly, posteriorly. Lateral spine reaching one seventh carapace width, minutely granulate, curved upwards. Posterolateral margins beaded, angled medially. Posterior margin with lateral teeth, triangular, flattened, projecting further than median lobe. Chelipeds externally granulate. Merus of cheliped quadrispinose, distal spine largest, half as long as lateral spine. Outer surface of chela with nine tubercles in three oblique rows and two tubercles near base of serrate upper crest; lowest row with proximal tubercle acuminate, keel-like, median and distal tubercles rounded, with subsidiary denticles between teeth. Lower margin prominently serrate, teeth smaller proximally. Dactylus minutely granulate proximally on anterior margin. Upper margin of pereiopods nearly rounded, minutely granulate. Abdominal crest with flattened lobes, median lobe subquadrate, lateral lobes rounded. Cornute distal portion of second male pleopod somewhat beta-shaped.

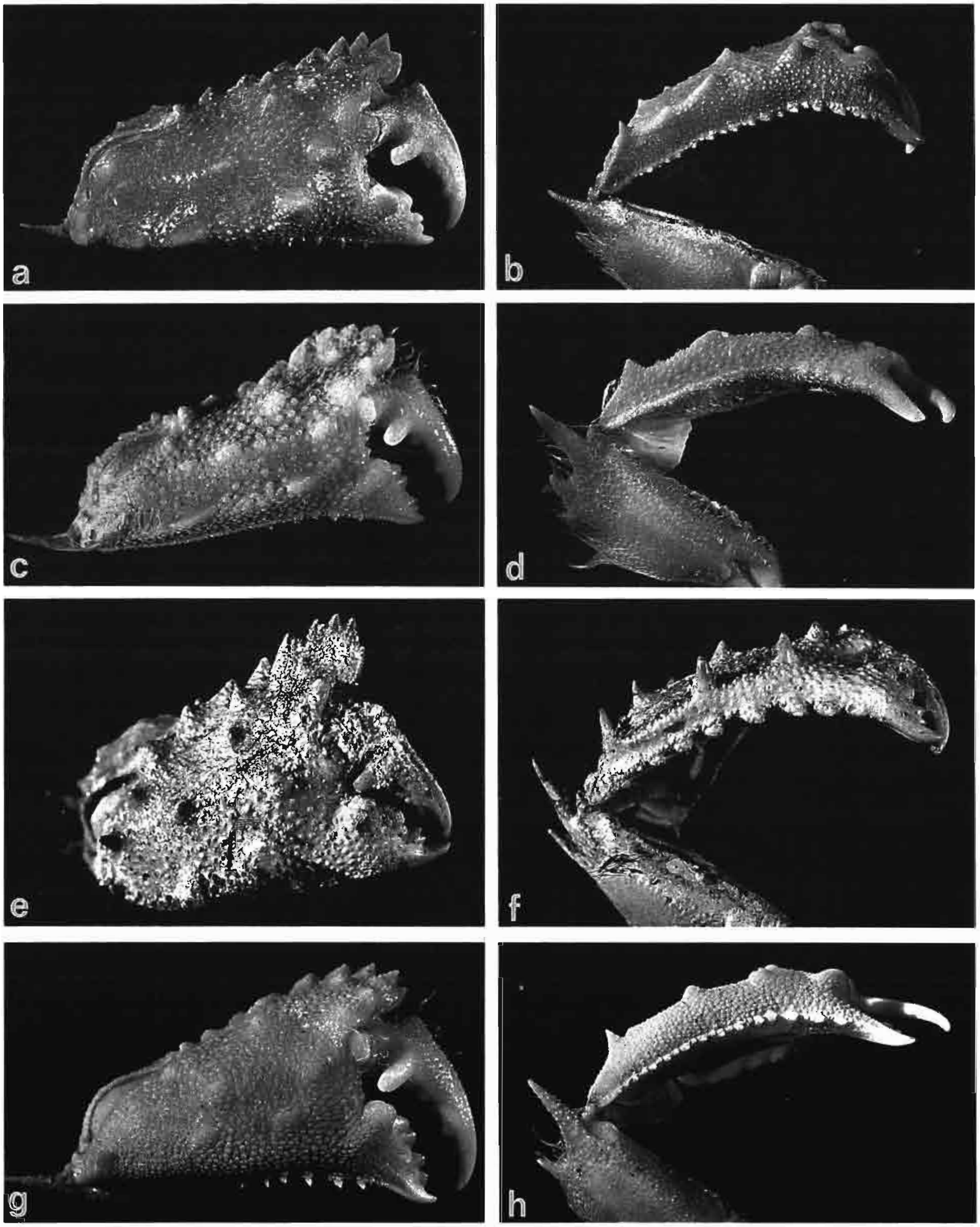
Color (in alcohol). - Inner palmar face with elongate vertical red patch at base of dactylus. Four red dots on distal margin of buccal cavity.

ETYMOLOGY. — The specific name was chosen in recognition of the valuable assistance extended during several of the MUSORSTOM cruises by Adolphe DANIGO, engineer on the research vessels "*Vauban* " and "*Alis*".

REMARKS. — *M. danigoi* sp. nov. resembles *M. africana, M. mcdowelli* and *M. spinimanus* in general body shape, however it is easily distinguished from each. *M. africana* differs in having a bispinose merus of cheliped and hook-shaped second male pleopod. *M. mcdowelli* differs in having a bifissured supraorbital margin, trispinose merus of cheliped and coarse granulation of carapace and chelipeds. *M. spinimanus* differs in having a wider carapace, longer lateral carapace spine, minute anterolateral teeth and fine granulation on the carapace and chelipeds.

DISTRIBUTION. — Known only from the type locality, Philippines; 143-204 m.

FIG. 5. — Cheliped, external and ventral views : **a-b**, *Mursia danigoi* sp. nov., ♂, holotype, cl 45 mm, Philippines, 143-178 m (MNHN-B 22369). — **c-d**, *Mursia bicritimana* Alcock & Anderson, 1894, ♂, syntype, cl 19.1 mm, Nicobar Ids, 124-271 m (BM 1898.8.26.3). — **e-f**, *Mursia cristiata* H. Milne Edwards, 1837, ♂ cl 27.4 mm, South Africa, Simon's Bay, 9-33 m (BM 1884.31). — **g-h**, *Mursia curtispina* Miers, 1886, ♀, holotype, cl 29.5 mm, Fiji Ids, 576 m (BM 1884.31).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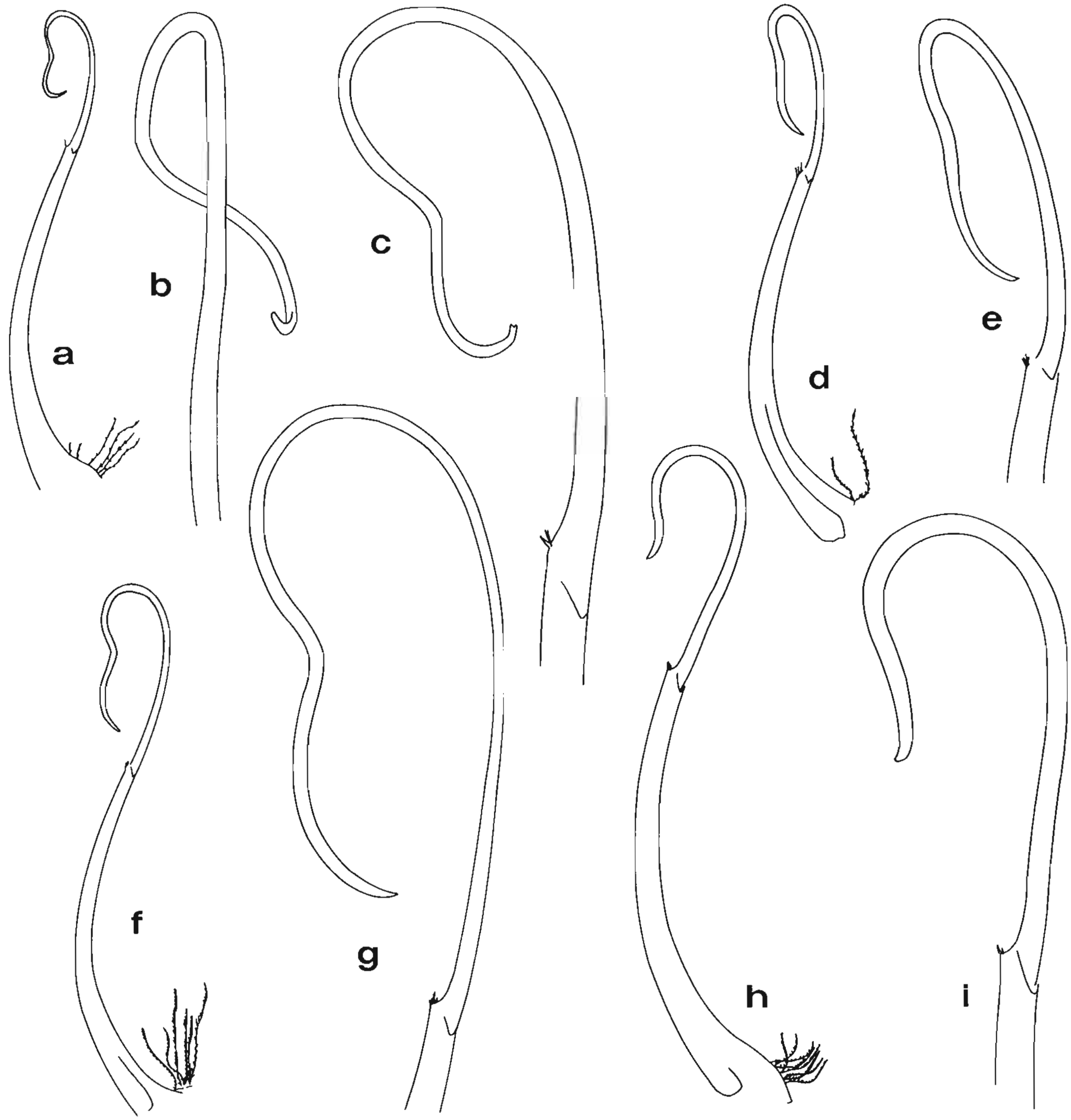

FIG. 6. — Second pleopod male with enlargement of distal part : **a-c**, *Mursia cristiata* H. Milne Edwards, 1837, ♂ cl 27.4 mm, South Africa, Simon's Bay, 9-33 m (BM 1884.31). — **d-e**, *Mursia hawaiiensis* Rathbun, 1893, ♂ cl 22.9 mm, Hawaiian Ids, 386-463 m (USNM 29903). — **f-g**, *Mursia mcdowelli* Manning & Chace, 1990, ♂, holotype, cl 37.5 mm, Ascension Id., 120-150 m (USNM 221893). — **h-i**, *Mursia microspina* Davie & Short, 1989, ♂ cl 24.5 mm, New Caledonia, 385-420 m (MNHN-B 24390).

Mursia flamma sp. nov.

Fig. 7 a, 9 a-b, 10 c-d

Mursia armata curtispina - GRINDLEY 1961 : 132, fig. 4.
Mursia curtispina - SANKARANKUTTY & SUBRAMANIAN, 1976 : 21.

MATERIAL EXAMINED AND TYPES. — **Madagascar**. *"Vauban"*: stn 8, 12°43'S, 48°14'E, 370 m, 14 April 1971 : 1 ♂, cl 57.9, cw 68.2, mcw 76.6, Holotype; 1 juv., cl 32.1, cw 37.6 (MNHN-B 24371). — Stn 4, 12°52'S, 48°10'E, 400-410 m, 4 March 1971 : 1 juv., cl 20.8, cw 25.1 (MNHN-B 24370). — Stn 10, 12°43'S, 48°15'E, 348-360 m, 14 April 1971 : 3 ♀, cl 48.3-66.7, cw 48.6-68.6, mcw 48.6-68.6 (MNHN-B 24373). — Stn 23, 12°42.9'S, 48°12.1'E, 445-455 m, 12 September 1972 : 1 ♂, cl 32.7, cw 38.3 (MNHN-B 24375). — Stn 31, 12°34.1'S, 48°18.3'E, 310-320 m, 13 September 1972 : 1 ♂, cl 15.6, cw 17.9, mcw 24.3; 2 juv., cl 16.3, 30.3, cw 18.7, 35.5, mcw 25.7, 45.5 (MNHN-B 24411).

"FAO 60": stn 73/43, 15°19'S, 46°15'E, 370 m, 11 May 1973 : 1 ♀, cl 48.7, cw 56.2, mcw 67.7 (MNHN-B 24377).

"Mascareignes III" : stn 1, 22°12.3'S, 43°08.2'E, 300-320 m, 20 December 1985 : 4 ♀, cl 44.1-50.4, cw 50.6-58.7, mcw 50.4-69.3 (MNHN-B 24378). — Stn 2, 22°20.5'S, 43°06'E, 400 m, 20 December 1985 : 2 ♂, cl 57.6, 53.9, cw 68.6, 64.2, mcw 78.8, 74.2; 1 juv., cl 21.9, cw 25.8 (MNHN-B 24379). — Stn 3, 22°27.3'S, 43°07'E, 35 m, 20 December 1985 : 1 ♂, cl 55.7, cw 65.2, mcw 74.8 (MNHN-B 24380) . — Stn 4, 22°19.2'S, 43°06.8'E, 400-410 m, 20 December 1985 : 1 ♂, cl 24.2, cw 28.3, mcw 38.7; 1 ♀, cl 23.2, cw 27.0, mcw 34.9 (MNHN-B 24381). — Stn 6, 22°17.3'S, 43°04.3'E, 425-450 m, 21 December 1985 : 1 juv., cl 23.1, cw 26.8, mcw 38.0 (MNHN-B 24382). — Stn 13, 22°17.8'S, 43°04.8'E, 425 m, 23 December 1985: 1 ♂, cl 55.9, cw 65.3, mcw 74.9 (MNHN-B 24479). — Stn 15, 22°25.2'S, 43°05'E, 425-460 m, 1 January 1986 : 1 ♀, cl 46.7, cw 53.9, mcw 64.2; 1 juv., cl 33.6, cw 40.2, mcw 51.0 (MNHN-B 24383). — Stn 45, 22°25.6'S, 43°05.3'E, 475-510 m, 23 January 1986 : 1 ♀, cl 47.2, cw 55.1, mcw 63.0 (MNHN-B 24384). — Stn 57, 22°26'S, 43°05.8'E, 460 m, 17 October 1986 : 2 juv., cl 31.5, 33.6, cw 36.9, 39.5, mcw 47.1, 51.7 (MNHN-B 24385). — Stn 69, 22°21.9'S, 43°04.8'E, 350-420 m, 21 October 1986 : 1 ♂, cl 50.1, cw 65.3, mcw 73.9; 1 ♀, cl 46.6, cw 54.3, mcw 63.6 (MNHN-B 24386). — Stn 117, 22°15'S, 43°06.5'E, 370 m, 28 November 1986 : 1 juv., cl 25, cw 29.9, mcw 36.6 (MNHN-B 24387).

South Africa. Off Natal, between Durban and Tugela mouth, October 1960, coll. P. A. CLANCEY : 1 ♂, cl 58.3, cw 70.7, mcw 79.7 (SAM A.10582).

TYPE LOCALITY. — Madagascar.

DESCRIPTION. — Carapace 1.2 wide as long, surface distinctly granulate. Radial tubercles prominent, granulate. Front with triangular median lobe projecting beyond lateral lobes. Supraorbital margin unifissured. Anterolateral margin with nine, nearly effaced, granulate teeth. Lateral spine short, about 0.07 carapace width, granular. Posterolateral margin beaded, sinuous. Posterior margin with sharply triangular teeth. Merus of cheliped trispinose, distalmost spine as long as lateral spine. External surface of palm with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest. Lowest row with proximal tubercle slender, acuminate, median and distal tubercles thickset, triangular. Lower margin strongly serrate, teeth smaller proximally. Dactylus basally granulose on exterior surface. Upper margin of pereiopodal meri, carpi distinctly granulose. Upper margin of propodi unicristate. Median lobe of abdominal crest wider than lateral lobes, slightly emarginate. Second male pleopod distally crook-shaped, tip slightly outcurved.

ETYMOLOGY. — The specific name is from the Latin and refers to GRINDLEY's specimen which was painted a flame-red, presumably imitating its natural hues.

REMARKS. — *M. flamma* closely resembles *M. curtispina* in carapace shape, however it differs from it in having a shorter lateral spine on carapace and distal spine on cheliped merus, and distinctly granulose meri and carpi of pereiopods.

DISTRIBUTION. — Tanzania, South Africa, Madagascar; 35-510 m.

Mursia hawaiiensis Rathbun, 1893

Fig. 4 c, 6 d-e, 8 a-b

Mursia hawaiiensis Rathbun, 1893 : 252; 1906 : 887, pl. 18, figs 3-4. — TAKEDA & KOYAMA, 1974 : 105.
Mursia armata hawaiiensis - DOFLEIN, 1904 : 41.
Not *Mursia armata hawaiiensis* - IHLE, 1918 : 180.
Not *Mursia curtispina hawaiiensis* - SAKAI, 1965 : 54, textfigs 8d-d'.
Not *Mursia hawaiiensis* - SAKAI, 1976 : 137, textfigs 74d-d', pl. 42 fig. 1. — MIYAKE, 1983 : 199 (list).

MATERIAL EXAMINED. — **Hawaiian Ids.** "*Albatross*", stn 3472, Kaiwi Channel, 21°12'N, 157°49'W, 540 m, 4 December 1891 : 1 ♂, cl 29.1, cw 36.2, mcw 38.7 (USNM 17515). Holotype. — Stn 3810, Ohau Id., off Honolulu Light, 386-463 m, 27 March 1902 : 1 ♂, cl 22.9, cw 28.4, mcw 30.6 (USNM 29903). — Stn 3919, Ohau Id., off Diamond Head, 470-402 m, 6 May 1902 : 1 ♂, cl 29.6, cw 36.3, mcw 39.5; 1 ♀, cl 29.1, cw 36.2, mcw 39.3 (USNM 29905). — Stn 4081, Maui Id., off Puniawa Point, 370-402 m, 21 July 1902 : 1 ♀ juv., cl 22.5, cw 27.0, mcw 30.6 (USNM 29910). — Stn 4114, Ohau Id., off Kahuku Point, 282-357 m, 25 July 1902 : 1 ♂, cl 32.2, cw 39.8, mcw 43.6; 1 juv., cl 16.3 (USNM 29911). — Stn 4115, Ohau Id., off Kahuku Point, 357-441 m, 25 July 1902 : 1 ♂, cl 34.3, cw 42.7, mcw 46.9; 1 ♀, cl 28.7, cw 35.0, mcw 37.9 (USNM 29912). — Stn 4116, Ohau Id., off Kahuku Point, 441-516 m, 25 July 1902 : 2 ♀, cl 28.5, 35.9, cw 29.4, 38.2, mcw 36.0, 38.6 (USNM 29913). — Stn 4121, Ohau Id., off Kahuku Point, 395-459 m, 25 July 1902 : broken shell (USNM 29915). — Stn 4122, Ohau Id., off Barbers Point, 351-644 m, 26 July 1902 : 1 ♂, cl 26.6, cw 32.6, mcw 36.3; 1 ♀, cl 29.3, cw 36.0, mcw 38.1 (USNM 29916). — Stn 4130, Kauai Id., off Hanamaulu warehouse, 518-565 m, July 1902 : 2 ♀, cl 30.6, 37.1, cw 37.8, 40.0, mcw 39.6, 41.4 (USNM 29917).

Polynesia. Paumotu Archipelago, Rahiroa Atoll, 1252 m, 24 September 1899, id. M. J. RATHBUN : 1 ♂ yg, cl 21.7, cw 26.4, mcw 30.6 (USNM 6907).

N.E. Pacific Ocean. "*Prof. Stockman*", cruise 18, stn 1920, 25°44.04'S, 85°24.93'W, 220 m, trap, coll. N. ZARENKOV : 2 ♀, cl 30.4, 45.8, cw 36.1, 48.1, mcw 40.7, 53.9 (information possibly inaccurate).

TYPE LOCALITY. — Hawaiian Islands (RATHBUN 1893).

DESCRIPTION. — Carapace 1.2 wide as long, surface closely covered with minute granules. Radial tubercles indistinct. Median frontal lobe projecting forward beyond rounded lateral lobes. Supraorbital margin unifissured. Suborbital sinus v-shaped, suborbital tooth triangular, apex pointing inward. Anterolateral margins cristate, tubercles indistinct. Lateral spine short, about 0.04 carapace width, minutely granulate, curved upwards. Posterolateral margin beaded, sinuous. Lateral lobes of posterior margin triangular, flattened, upcurved. Chelipeds externally granulate. Merus of cheliped trispinose. Outer surface of chela with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest, lowest row with proximal tubercle acuminate, keel-shaped; median, distal tubercles elongate, crested. Lower margin serrate, teeth smaller proximally. Dactylus minutely granulate on anterior margin. Upper margin of pereiopodal meri nearly rounded, granulate. Abdominal crest deeply cut, median lobe widest. Cornute distal portion of second male pleopod somewhat beta-shaped.

Color (in alcohol). - "tinges of red on the carapace and chelipeds and an elongated patch of red on the inner surface of the hand, near the dactyl" (RATHBUN, 1893).

REMARKS. — *M. aspera*, *M. microspina*, *M. flamma* and *M. hawaiiensis* alone among their congeners possess a lateral spine shorter than 0.07 carapace width. *M. aspera* differs from the rest in having conical tubercles on external surface of chelipeds and on upper margin of pereiopodal meri. *M. hawaiiensis* differs from *M. microspina* in having nearly effaced granules on carapace, median lobe of abdominal crest wider than lateral lobes and second male pleopod beta-shaped distally and from *M. flamma* in lacking median lobe on posterior margin of carapace.

IHLE (1918) specimen differs from *M. hawaiiensis* in the number of tubercular radial lines on carapace and number of spines on ischium. The species described and depicted by SAKAI (1965, 1976) differs from *M. hawaiiensis* in having the second male pleopod crook-shaped, in the form of the inferior tubercles externally on palm and in the prominent radial tubercles on carapace. MIYAKE (1983) followed SAKAI's list.

DISTRIBUTION. — Hawaiian Islands, Paumotu Archipelago, East Pacific (W of San Felix Id, 25°44.04'S, 85°24.93'W); 97-1252 m.

Mursia mcdowelli Manning & Chace, 1990

Fig. 4 d, 6 f-g, 8 c-d

Mursia mcdowelli Manning & Chace, 1990 : 45, figs 26-27.

MATERIAL EXAMINED. — **South Atlantic Ocean** : Ascension Id., off Georgetown Pierhead, 120-150 m, March 1980, coll. M. MCDOWELL : 1 ♂, cl 37.5, cw 47.3, mcw 60.4 (USNM 221893). Holotype.

DESCRIPTION. — Carapace 1.25 wide as long, surface covered with granules, smaller and more closely set posteriorly. Radial tubercules distinct. Median frontal lobe acuminate, projecting forward beyond lateral lobes. Supraorbital margin bifissured. Suborbital sinus v-shaped, suborbital tooth triangular, apex pointing inward. Anterolateral margins cristate, irregularly granulate. Lateral spine 0.14 carapace width, minutely granulate, straight. Posterolateral margin beaded, sinuous. Lateral lobes of posterior margin rounded, projecting beyond median lobe. Chelipeds externally with conic granules. Merus of cheliped trispinose, distal spine as long as lateral spine. External surface of chela with tubercles in three oblique rows, median ridge granulose, unidentate proximally, interrupted distally. Palmar crest deeply serrate. Lower margin serrulate, teeth smaller proximally. Dactylus minutely granulate proximally on anterior margin. Upper margin of pereiopodal carpi nearly rounded, granulate. Abdominal crest with wide median lobe. Cornute distal portion of second male pleopod shaped like the Greek letter beta.

REMARKS. — Among their congeners only *M. mcdowelli* and *M. bicristimana* possess a granulose median ridge proximally on external surface of chela. However, *M. mcdowelli* differs from *M. bicristimana* in having a bifissured supraorbital margin, smaller granules posteriorly on carapace and a beta-shaped second male pleopod.

DISTRIBUTION. — Known only from the type locality, Ascension Island, South Atlantic Ocean (MANNING & CHACE, 1990); 120-150 m.

Mursia microspina Davie & Short, 1989

Fig. 4 e, 6 h-i, 8 e-f, 12

Mursia microspina Davie & Short, 1989 : 172, figs 9a-g, 10.
Mursia aspera - BABA, 1986 : 221, pl. 165.

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 5 : stn 273, 24°43.02'S, 159°43.26'E, 290 m, 9 October 1986 : 1 ♀, cl 23.1, cw 25.5, mcw 28.1 (MNHN-B 24388). — Stn 299, 22°47.70'S, 159°23.70'E, 360-390 m, 11 October 1986 : 1 ♂, cl 19.7, cw 22.1, mcw 25.7 (MNHN-B 24389). — Stn 304, 22°10.34'S, 159°25.51'E, 385-420 m, 12 October 1986 : 1 ♂, cl 24.5, cw 27.8, mcw 30.5 (MNHN-B 22372).

SMIB 6 : stn 124, 18°56.0'S, 163°24.5'E, 360-405 m, 3 March 1991 : 1 ♀, cl 25.1, cw 28.5, mcw 30.2 (MNHN-B 22373).

Loyalty Islands. MUSORSTOM 6 : stn 457, 21°00'S, 167°28.71'E, 353 m, 20 February 1989 : 1 juv., cl 11.2, cw 12.2, mcw 13.0 (MNHN-B 24391). — Stn 464, 21°02.30'S, 167°31.60'E, 430 m, 21 February 1989 : 1 ♀, cl 30.9, cw 35.5, mcw 39.2 (MNHN-B 24392). — Stn 480, 21°08.50'S, 167°55.98'E, 380 m, 22 February 1989 : 1 juv., cl 9.5 (MNHN-B 24393).

TYPE LOCALITY. — Southeast Queensland (DAVIE & SHORT, 1989).

DESCRIPTION. — Carapace 1.1 wide as long, surface closely covered with granules, effaced anteriorly. Radial tubercles distinct. Median frontal lobe projecting forward beyond lateral lobes. Supraorbital margin unifissured. Suborbital sinus v-shaped, suborbital tooth triangular, apex pointing inward. Anterolateral margins cristate, indistinctly tuberculate. Lateral spine short, 0.05 carapace width, minutely granulate, curved upwards. Posterolateral margin beaded, angled medially. Lateral lobes of posterior margin triangular, curved, median lobe nearly indistinct. Chelipeds externally granulate. Merus of cheliped trispinose, distal spine longer than lateral spine. Outer surface of chela with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest, lowermost row with proximal tubercle acuminate. Lower margin minutely serrate. Dactylus minutely granulate proximally on anterior margin. Upper margin of pereiopodal carpi nearly rounded, not granulate. Abdominal crest deeply cut, lobes rounded. Cornute distal portion of second male pleopod crook-shaped, tip outcurved.

Color (in alcohol). - Branchial regions tinged red. Distal margin of buccal cavity with two red spots. Chelipeds pale coral, fingers white. Inner palmar face with a large oculus-shaped coral-colored patch.

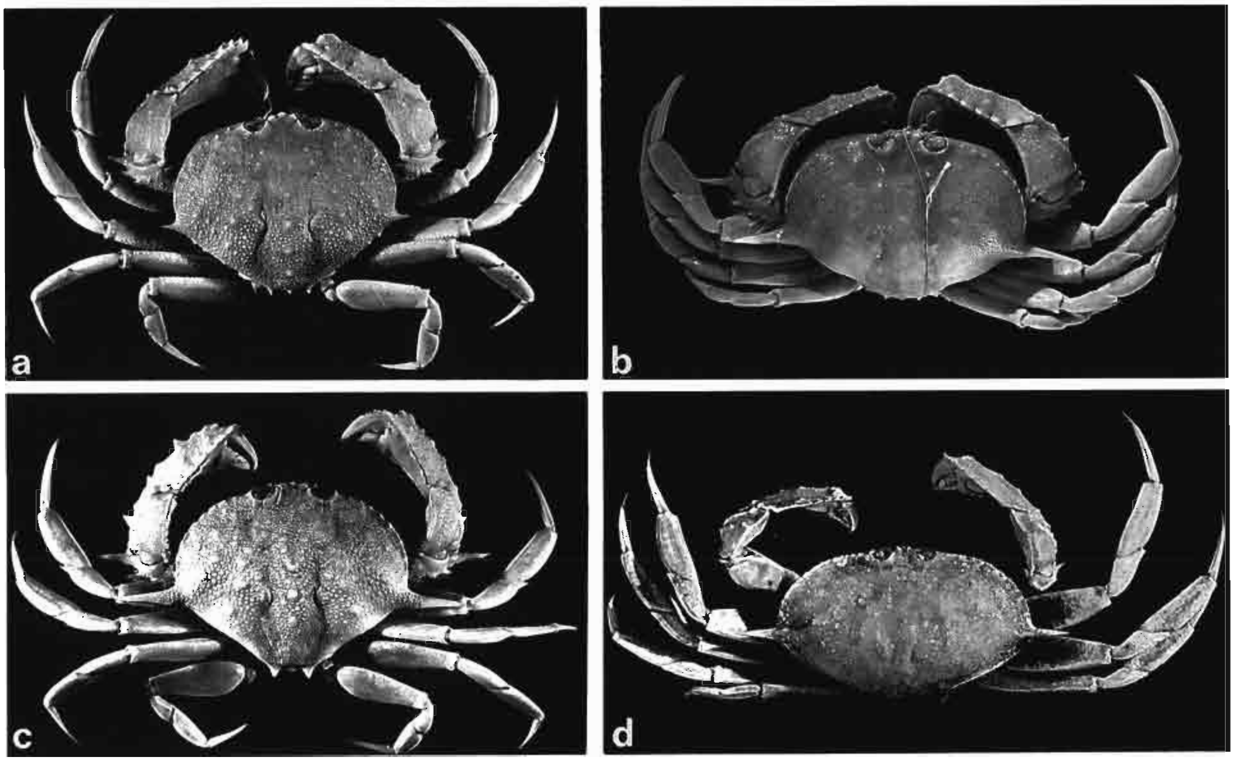

FIG. 7. — Dorsal view : **a**, *Mursia flamma* sp. nov., ♂, cl 57.9 mm, holotype, Madagascar, 370 m (MNHN-B 24371). — **b**, *Mursia spinimanus* Rathbun, 1906, ♂, holotype, cl 35.8 mm, Hawaiian Ids, 232 m (USNM 29922). — **c**, *Mursia trispinosa* Parisi, 1914, ♂ cl 42.5 mm, Philippines, 170 m (MNHN-B 24428). — **d**, *Platymera gaudichaudii* H. Milne Edwards, 1837, ♂ cl 45.9 mm, Mexico (MNHN-B 88).

REMARKS. — *M. microspina* bears resemblance to *M. hawaiiensis* in having a short lateral spine but differs in having a more prominent granulation on carapace, lobes of abdominal crest rounded, coequal and distal portion of second male pleopod crook-shaped.

DISTRIBUTION. — Australia, New Caledonia, Japan; 200-420 m.

Mursia musorstomia sp. nov.

Fig. 4 f, 8 g-h, 10 a-b, 13

MATERIAL EXAMINED AND TYPES. — **New Caledonia**. MUSORSTOM 4 : stn 179, 18°56.6'S, 163°13.7'E, 475 m, 18 September 1985 : 1 ♂, cl 19.7, cw 23.5, mcw 29.0 (MNHN-B 22374) Holotype; 1 ♀, cl 18.0, cw 21.2, mcw 25.1 (MNHN-B 24396) Paratype. — Stn 170, 18°57.0'S, 163°12.6'E, 480 m, 17 September 1985 : 1 ♀, cl 19.7, cw 23.3, mcw 27.6 (MNHN-B 24394). — Stn 171, 18°57.8'S, 163°14.0'E, 425 m, 17 September 1985 : 1 ♀, cl 18.4, cw 21.7, mcw 25.5; 1 juv. (MNHN-B 24395). — Stn 201, 18°35.8'S, 163°13.9'E, 490 m, 20 September 1985 : 1 ♀, cl 19.0, cw 22.7, mcw 28.5 (MNHN-B 24397). — Stn 236, 22°11.3'S, 167°15'E, 495-550 m, 2 October 1985 : 1 ♀, cl 19.2, cw 21.9, mcw 25.8; 1 juv. (MNHN-B 24398). — Stn 239, 22°14.8'S, 167°15.7'E, 470-475 m, 2 October 1985 : 1 ♀, cl 19.2, cw 21.9, mcw 25.8 (MNHN-B 24399). — Stn 241, 22°09.0'S, 167°12.2'E, 470-480 m, 3 October 1985 : 1 ♀, cl 12.7, cw 15.4, mcw 20.4 (MNHN-B 24400). — Stn 247, 22°09'S, 167°13.3'E, 435- 460 m, 4 October 1985 : 1 ♂, cl 14.4, cw 17.1, mcw 22.2 (MNHN-B 24401).

MUSORSTOM 5 : stn 380, 19°37.70'S, 158°43.90'E, 555-570 m, 21 October 1986 : 1 ♀, cl 20.4, cw 23.8, mcw 28.6 (MNHN-B 24402).

Chesterfield Islands. CORAIL 2 : stn 16, 20°47.75'S, 160°55.87'E, 500 m, 21 July 1988 : 1 ♀, cl 19.3, cw 22.5, mcw 28.4 (MNHN).

Loyalty Islands. MUSORSTOM 6 : stn 411, 20°40.65'S, 167°03.35'E, 424 m, 15 February 1989 : 1 ♀, cl 17.5 (MNHN-B 24403). — Stn 413, 20°40.10'S, 167°03.50'E, 463 m, 15 February 1989 : 1 ♂, cl 18.4, cw 21.7, mcw 25.8;

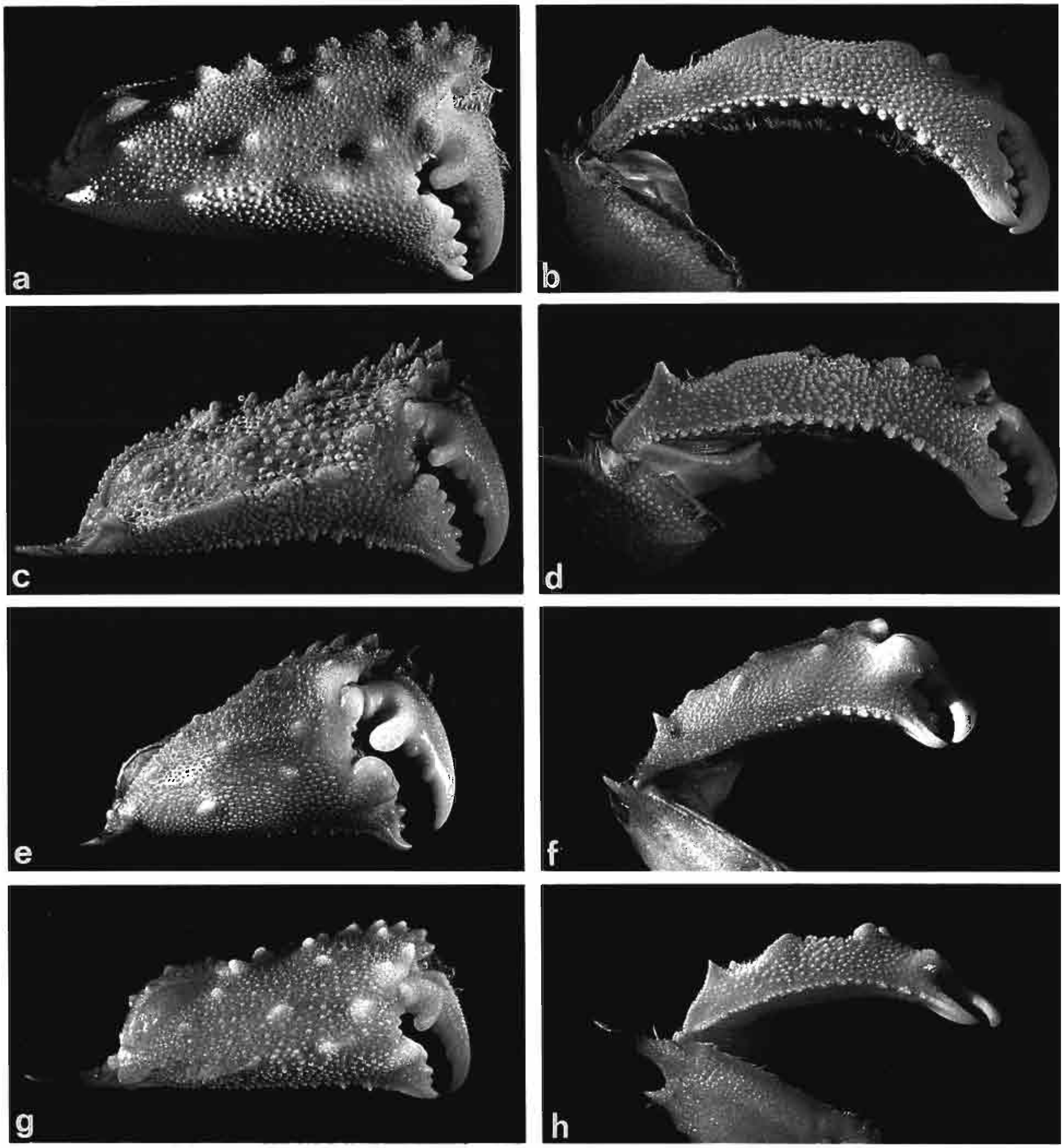

FIG. 8. — Cheliped, external and ventral views : **a-b**, *Mursia hawaiiensis* Rathbun, 1893, ♂ cl 22.9 mm, Hawaiian Ids, 386-463 m (USNM 29903). — **c-d**, *Mursia mcdowelli* Manning & Chace, 1990, ♂, holotype, cl 37.5 mm, Ascension Id., 120-150 m (USNM 221893). — **e-f**, *Mursia microspina* Davie & Short, 1989, ♂ cl 24.5 mm, New Caledonia, 385-420 m (MNHN-B 24392). — **g-h**, *Mursia musorstomia* sp. nov., ♂, holotype, cl 19.7 mm, New Caledonia, 475 m (MNHN-B 24396).

1 ♀, cl 16.6, cw 20.0, mcw 23.9; 3 juv. (MNHN-B 24404). — Stn 415, 20°40.20'S, 167°03.50'E, 461 m, 15 February 1989 : 2 ♂, cl 19.2, 22.0, cw 22.7, 26.4, mcw 27.3, 34.7; 2 ♀, cl 15.5, 16.1, cw 18.5, 19.1, mcw 22.6, 22.9 (MNHN-B 24405). — Stn 428, 20°23.54'S, 166°12.57'E, 420 m, 17 February 1989 : 2 ♂, cl 19.4, 21.1, cw 23.5, 25.1, mcw 29.2, 31.3; 3 ♀, cl 18.0-18.1, cw 21.4-22.1 (MNHN-B 24406). — Stn 464, 21°02.30'S, 167°31.60'E, 430 m, 21 February

1989 : 1 ♂, cl 20.6, cw 24.9, mcw 30.02 (MNHN-B 24407). — Stn 465, 21°03.55'S, 167°32.25'E, 480 m, 21 February 1989 : 1 ♂, cl 17.2, cw 21.6, mcw 26.6; 1 ♀, cl 18.8, cw 22.0, mcw 26.5 (MNHN-B 24408). — Stn 467, 21°05.13'S, 167°32.11'E, 575 m, 21 February 1989 : 1 ♀, cl 19.3, cw 22.8, mcw 27.6 (MNHN-B 24409).

DESCRIPTION. — Carapace 1.2 wide as long, surface densely setose, granulose. Radial tubercles prominent. Median frontal lobe triangular, projecting beyond lateral lobes. Supraorbital margin bifissured. Suborbital sinus wide, U-shaped, suborbital tooth triangular, apex pointing inward. Anterolateral margins cristate, with ten granulose teeth, diminishing in size posteriorly. Lateral spine 0.1 carapace width, minutely granulate, curved upwards. Posterolateral margin beaded, angled medially. Lateral lobes of posterior margin triangular, laminar, curved. Chelipeds externally granulose, setose. Merus of cheliped trispinose, distal spine longer than lateral spine. Outer surface of chela set with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest, tubercles in lowest row laminar, proximalmost triangular, keel-like, distalmost smallest, rounded. Lower margin serrate, teeth smaller proximally. Dactylus minutely granulate proximally on anterior margin. Upper margin of pereiopodal carpi crested, granulate. Abdominal crest with rounded lateral lobes, subquadrate median lobe. Cornute distal portion of second male pleopod curved, hook-shaped.

Color (in alcohol). - Two red spots on distal margin of buccal area. Small red spot on inner palm near dactylar base.

ETYMOLOGY. — The specific name is derived from the expedition acronym - MUSORSTOM.

REMARKS. — Superficially resembling *M. australiensis* in its rounded, granulose carapace and elongate distal spine on cheliped merus, *M. musorstomia* is easily distinguished by its setose carapace, shorter lateral spines, bifissured suborbital margins, granulate last ambulatory meri and hook-shaped second male pleopod.

DISTRIBUTION. — Known only from the type locality, New Caledonia; 420-575 m.

Mursia spinimanus Rathbun, 1906

Fig. 7 b, 9 c-d, 10 e-g

Mursia spinimanus Rathbun, 1906 : 888, pl. 16 fig. 1. — SAKAI, 1965 : 51 (list).
Not *Mursia spinimanus* - RATHBUN, 1911 : 198, pl. 15 fig. 3.

MATERIAL EXAMINED. — **Hawaiian Islands.** "*Albatross*" : stn 3856, Pailolo Channel, between Molokai and Maui, 232 m, 9 April 1902 : 1 ♂, cl 35.8, cw 46.4, mcw 65.7, Holotype; 1 ♀, cl 27.6, cw 34.2, mcw 46.6, Paratype (USNM 29922). — Stn 3811, Ohau Id., off Honolulu Lt., 435-461 m, 27 March 1902 : 1 ♂ yg, cl 18.8, cw 23.5, mcw 32.9 (USNM 29919).

TYPE LOCALITY. — Pailolo Channel, Hawaiian Islands (RATHBUN, 1906).

DESCRIPTION. — Carapace 1.3 wide as long, surface minutely granulate. Radial tubercules indistinct. Median frontal lobe triangular, projecting forward beyond rounded lateral lobes. Supraorbital margin unifissured. Suborbital sinus v-shaped, suborbital tooth triangular, apex pointing inward. Anterolateral margins cristate, with ten minute teeth. Lateral spine one fifth carapace width, minutely granulate, slanting upwards. Posterolateral margin beaded, sinuous. Lateral lobes of posterior margin triangular, laminar, upcurved. Chelipeds externally granulate. Merus of cheliped trispinose, distal spine largest. Outer surface of chela closely granulate, with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest, proximal tubercle in lowest row acuminate, keel-like, median tubercle crested. Lower margin serrate, teeth smaller proximally. Dactylus granulate proximally on anterior margin. Upper margin of pereiopodal carpi rounded, minutely granulate. Abdominal crest deeply cut, median lobe quadrate. Cornute tip of second male pleopod beta-shaped.

REMARKS. — *M. spinimanus* resembles *M. hawaiiensis* in having a minutely granulate carapace with indistinct radial tubercles, minutely dentate, cristate anterolateral margins and a keel-like tubercle proximally on outer surface of chela. However, it is easily distinguished by its much longer lateral spines on carapace and distally on merus of cheliped and in having three triangular lobes on posterior margin of carapace.

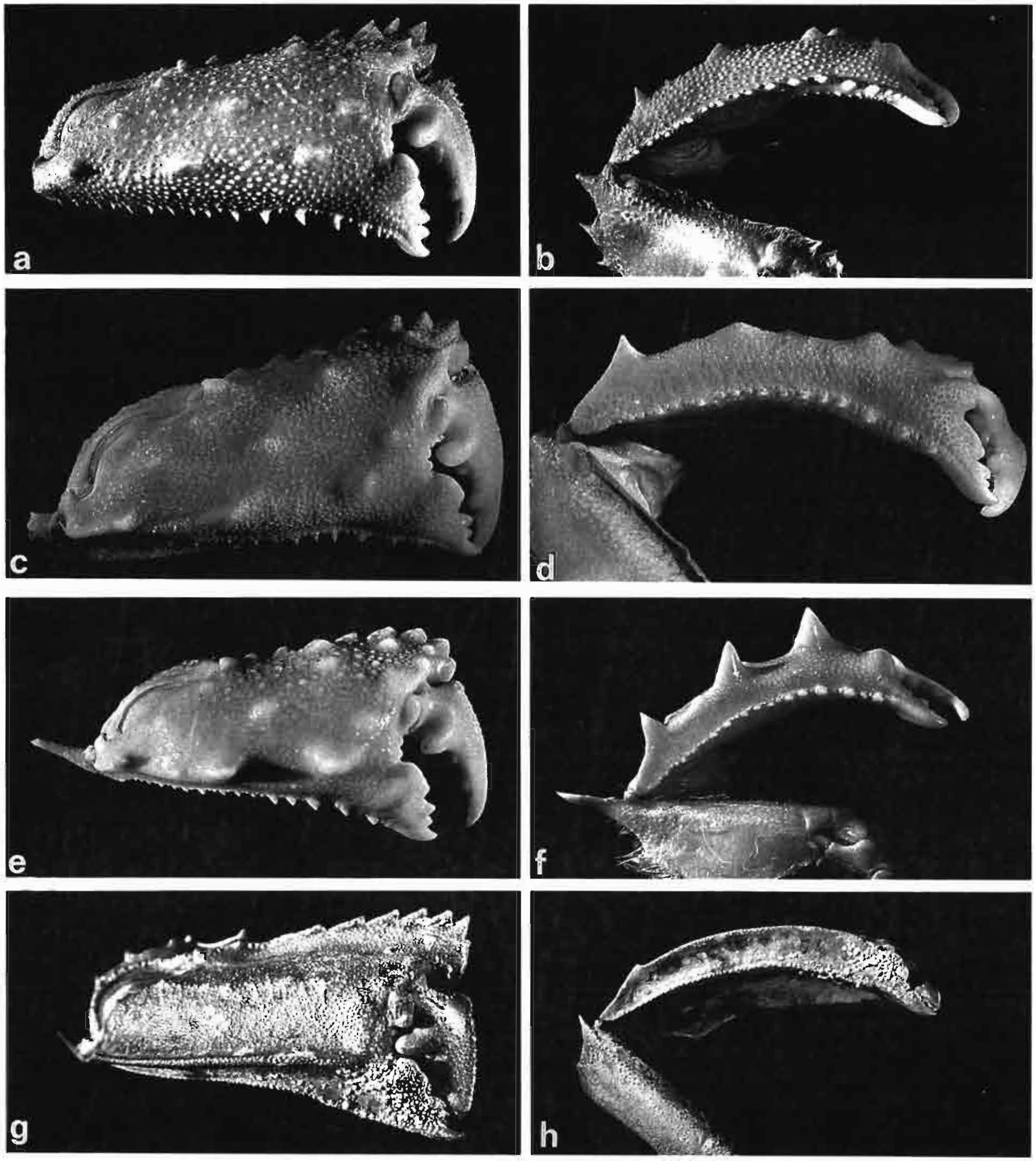

FIG. 9. — Cheliped, external and ventral views : **a-b**, *Mursia flamma* sp. nov., ♂, holotype, cl 57.9 mm, Madagascar, 370 m (MNHN-B 24371). — **c-d**, *Mursia spinimanus* Rathbun, 1906, ♂, holotype, cl 35.8 mm, Hawaiian Ids, 232 m (USNM 29922). — **e-f**, *Mursia trispinosa* Parisi, 1914, ♂ cl 42.5 mm, Philippines, 170-174 m (MNHN-B 24428). — **g-h**, *Platymera gaudichaudii* H. Milne Edwards, 1837, ♂ cl 45.9 mm, Mexico (MNHN-B 88).

The species described and depicted by RATHBUN (1911) differs from *M. spinimanus* in having a rugose carapace with more prominent radial tubercles, backwards slanting lateral spines and quadrispinose cheliped merus.

DISTRIBUTION. — Hawaiian Islands; 95-461 m.

Mursia trispinosa Parisi, 1914

Fig. 7 c, 9 e-f, 10 h-i

Mursia armata trispinosa Parisi, 1914 : 290, pl. 12.
Mursia armata curtispina - SAKAI, 1936 : 48, pl. 7 fig. 3; 1937 : 87 (part), pl. 11 fig. 4. Non Miers, 1886.
Mursia curtispina trispinosa - SAKAI, 1965 : 53, textfig. 8a-a', pl. 21 fig. 2. — KIM & PARK, 1972 : 57, textfig. 1 a-b, pl. 1 fig. 1.
Mursia trispinosa - TAKEDA & KOYAMA, 1974 : 105. — SAKAI, 1976 : 137, textfig. 74b-b', pl. 43 fig. 4. — MIYAKE, 1983 : 24, pl. 8 fig. 6. — DANG *et al.*, 1986 : 204.

MATERIAL EXAMINED. — **Japan**. Mie Prefecture, Kii, 1978-1979, coll. M. YAMASHITA : 1 ♂, cl 38.5, cw 46.0, mcw 64.4 (NMM 32070). — Shikoku Id., Tosa Bay, April 1961, id. T. SAKAI : 1 ♂, cl 41, cw 48, mcw 68 (BMNH 1961.6.5.23). — November 1965, id. T. SAKAI : 1 ♂, cl 43.5, cw 51.9, mcw 73.0 (USNM 268057). — Misaki, id. M. J. RATHBUN : 1 ♂, cl 39.0, cw 45.8, mcw 73.7 (USNM 63690).

Philippines. MUSORSTOM 1 : stn 12, 14°00.8'N, 120°20.5'E, 210-187 m, 20 March 1976 : 1 ♂, cl 42.7, cw 52.1, mcw 74.8; 4 ♀, cl 25.3-36.7, cw 30.3-43.3, mcw 45.3-64.6 (MNHN-B 24410). — Stn 25, 14°02.7'N, 120°20.3'E, 200-191 m, 22 March 1976 : 1 ♂, cl 46.8, cw 56.7, mcw 79.7; 2 ♀, cl 36.4, 37.0, cw 44.2, 44.5, mcw 64.5, 66.1 (MNHN-B 24412). — Stn 26, 14°02.9'N, 120°16.8'E, 189 m, 22 March 1976 : 2 ♂, cl 11.5-23.7, cw 13.5-28.4, mcw 18.9-41.7; 2 ♀, cl 33.8-35.2, cw 40.4-42.6, mcw 62.8-63.1 (MNHN-B 24413). — Stn 34, 14°01.0'N, 120°15.8'E, 191-188 m, 23 March 1976 : 1 juv. (MNHN-B 24414). — Stn 51, 13°49.4'N, 120°04.2'E, 200-170 m, 25 March 1976 : 1 ♀, cl 37.2, cw 45.6, mcw 67.9; 1 juv. (MNHN-B 24415). — Stn 62, 13°59.5'N, 120°15.6'E, 179-194 m, 27 March 1976 : 1 juv. (MNHN-B 24416). — Stn 63, 14°00.8'N, 120°15.8'E, 191-195 m, 27 March 1976 : 1 ♂, cl 21.4, cw 25.2; 1 ♀, cl 36.0, cw 43.3, mcw 65.0 (MNHN-B 24417). — Stn 65, 14°00'N, 120°19.2'E, 202-194 m, 27 March 1976 : 1 ♀, cl 35.7, cw 43.4, mcw 62.6 (MNHN-B 24418).

MUSORSTOM 2 : stn 1, 14°00.3'N, 120°19'E, 188-198 m, 20 November 1980 : 1 ♀, cl 37.5, cw 44.6, mcw 65.5 (MNHN-B 24419). — Stn 2, 14°01'N, 120°17.1'E, 184-186 m, 20 November 1980 : 2 juv. (MNHN-B 24420). — Stn 10, 14°00.1'N, 120°18.5'E, 188-195 m, 21 November 1980 : 5 ♂, cl 11.8-24.0, cw 13.8-29.5, mcw 21.5-44.1; 7 ♀, cl 12.0-36.8, cw 14.0-44.3, mcw 20.5-64.7 (MNHN-B 24421). — Stn 18, 14°00'N, 120°18.6'E, 188-195 m, 22 November 1980 : 6 ♂, cl 16.7-42.8, cw 19.9-53.5, mcw 30.8-81.0; 5 ♀, cl 11.5-38.9, cw 13.5-47.2, mcw 20.0-71.3; 2 juv. (MNHN-B 24422). — Stn 19, 14°00.5'N, 120°16.5'E, 189-192 m, 22 November 1980 : 1 ♂, cl 16.5, cw 19.7, mcw 29.1; 2 ♀, cl 12.3, 35.8, cw 14.4, 43.3, mcw 20.8, 65.2 (MNHN-B 24423). — Stn 20, 14°00.9'N, 120°18.1'E, 192-185 m, 22 November 1980 : 2 ♂, cl 26.9, 42.8, cw 31.3, 52.4, mcw 47.6, 76.4; 4 ♀, cl 17.3-37.2, cw 20.7-45.0, mcw 29.6- 69.8; 3 juv. (MNHN-B 24424). — Stn 21, 14°00.2'N, 120°17.8'E, 191-192 m, 22 November 1980 : 1 ♂, cl 33.8, cw 41.6, mcw 63.5; 7 ♀, cl 18.7-37.7, cw 22.0-45.5, mcw 34.5-67.1 (MNHN-B 24425). — Stn 35, 13°27.9'N, 121°11.6'E, 160-198 m, 24 November 1980 : 1 ♀, cl 30.4, cw 36.7, mcw 55.0 (MNHN-B 24426). — Stn 51, 13°59.3'N, 120°16.4'E, 170-187 m, 27 November 1980 : 2 ♂, cl 17.5, 33.9, cw 20.6, 40.8, mcw (broken), 62.3; 1 ♀, cl 36.4, cw 43.9, mcw 65.7 (MNHN-B 24427). — Stn 54, 13°59.5'N, 120°09.3'E, 170-174 m, 27 November 1980 : 1 ♂, cl 42.5, cw 52.3, mcw 77.5; 1 ♀, cl 24.5, cw 29.0, mcw 39.4 (MNHN-B 24428). — Stn 62, 14°00.4'N, 120°17'E, 186-189 m, 29 November 1980 : 2 ♀, cl 34.6, 35.3, cw 42.0, 42.3, mcw 64.0, 64.6; 2 juv. (MNHN-B 24429). — Stn 64, 14°01.5'N, 120°18.9'E, 191-195 m, 29 November 1980 : 1 ♂, cl 17.3, cw 20.9, mcw 32.3; 3 ♀, cl 17.8-37.9, cw 21.6-45.5, mcw 32.3-67.2 (MNHN-B 24430). — Stn 68, 14°01.9'N, 120°18.8'E, 195-199 m, 29 November 1980 : 1 ♂, cl 23.8, cw 29.4, mcw 43.2; 4 ♀, cl 33.2-36.1, cw 39.8-43.5, mcw 52.9 (broken)-63.8 (MNHN-B 24431). — Stn 72, 14°00.1'N, 120°17.8'E, 189-197 m, 30 November 1980 : 2 ♂, cl 32.5-45.6, cw 40.3-57.0, mcw 59.8-84.9; 5 ♀, cl 36.3-38.2, cw 44.9-45.7, mcw 64.9-70.7; 4 juv. (MNHN-B 24432).

MUSORSTOM 3 : stn 86, 14°00.4'N, 120°17.8'E, 187-192 m, 31 May 1985 : 2 ♂, cl 12.5, 33.4, cw 14.4, 41.0, mcw 21.4, 63.3 (MNHN-B 24433). — Stn 88, 14°00.5'N, 120°17.4'E, 183-187 m, 31 May 1985 : 11 juv. (MNHN-B 24434). — Stn 90, 14°00.1'N, 120°18.6'E, 195 m, 31 May 1985 : 2 ♀, cl 9.2, 35.7, cw 10.7, 43.7, mcw 15.7, 60.1 (MNHN-B 24435). — Stn 91, 14°00.1'N, 120°17.8'E, 190-203 m, 31 May 1985: 2 ♀, cl 34.4 34.6, cw 41.2, 42.2, mcw 60.4, 62.6 (MNHN-B 24436). — Stn 96, 14°00.3'N, 120°17.3'E, 190-194 m, 1 June 1985 : 2 ♀, cl 34.8, 35.7, cw 41.5, 42.4, mcw 60.5, 63.9; 5 juv. (MNHN-B 24437). — Stn 97, 14°00.7'N, 120°18.8'E, 189-194 m, 1 June 1985 : 2 ♀, cl 36.1, 36.2, cw 43.0, 44.1, mcw 64.1, 65.8 (MNHN-B 24438). — Stn 98, 14°00.2'N, 120°17.9'E, 194-205 m, 1 June 1985 : 1 juv. (MNHN-B 24439). — Stn 100, 14°00'N, 120°17.6'E, 189-199 m, 1 June 1985 : 1 ♂, cl 45.7, cw 56.8, mcw 82.9; 2 ♀, cl 24.7, 36.2, cw 30.4, 42.7, mcw 44.4, 64.6; 3 juv. (MNHN-B 24440). — Stn 103, 14°00.4'N, 120°18.15'E, 193-200 m, 1 June 1985 : 1 ♀, cl 35.8, cw 43.1, mcw 64.5 (MNHN-B 24441). — Stn 109, 14°00.2'N, 120°17.6'E, 190-198 m, 2 June 1985 : 2 ♂, cl 43.7, 44.3, cw 54.4, 54.6, mcw 77.3, 82.2 (MNHN-B 24442).

"*Albatross*" : stn 5278, Malavatuan Id., nr Luzon, 14°00.10'N, 120°17.15'E, 187 m, 17 July 1908 : 1 ♀ ovig., cl 34.6, cw 41.8, mcw 63.0; 1 ♀, cl 34.2, cw 41.0, mcw 60.3 (parasitized) (USNM).

New Caledonia. SMIB 6 : stn 114, 19°01.2'S, 163°28.8'E, 355-265 m, 2 March 1991 : 1 ♀, cl 33.2, cw 39.2, mcw 50.5 (tips broken) (MNHN-B 22375).

Loyalty Islands. MUSORSTOM 6 : stn 421, 20°26.27'S, 166°40.17'E, 245 m, 16 February 1989 : 1 ♀, cl 32.9, cw 39.1, mcw 56.0 (MNHN-B 24483).

TYPE LOCALITY. — Sagami Bay, Japan (PARISI, 1914).

DESCRIPTION. — Carapace 1.2 wide as long, surface granulate, granules diminishing in size anteriorly, posteriorly. Radial tubercules distinct. Median frontal lobe triangular, projecting forward beyond rounded lateral lobes. Supraorbital margin unifissured. Suborbital sinus v-shaped, suborbital tooth triangular, apex pointing inward. Anterolateral margins cristate, with ten nearly effaced, rounded teeth. Lateral spine 0.2 carapace width, minutely granulate, curved upwards. Posterolateral margin beaded, sinuous. Lateral lobes of posterior margin triangular, laminar, upcurved. Merus of cheliped trispinose, distal spine largest. Outer surface of chela closely granulate, with nine tubercles in three oblique rows and three tubercles near base of serrate upper crest, tubercles in lower row large, triangular, distalmost largest. Lower margin serrate, teeth smaller proximally. Dactylus granulate proximally on anterior margin. Upper margin of pereiopodal meri rounded, minutely granulate. Abdominal crest deeply cut, median lobe quadrate. Second male pleopod hook-shaped distally, tip upcurved.

Color. - Carapace and chelipeds orange-red, tubercles buff colored. Lateral spine on carapace and distalmost meral spine on cheliped dark red. Ambulatory legs pale coral. Interior palmar surface, near dactylar base with small red spot.

REMARKS. — *M. trispinosa* was described by PARISI (1914) as *M. armata trispinosa*, differing from *M. armata* in having three robust, aequidistant, triangular teeth on lower external surface of chela and shorter lateral spines on carapace. SAKAI'S illustrations of *M. armata curtispina* (1936, 1937) are identical with PARISI'S depiction, as indeed SAKAI acknowledged in later publications (1965, 1976).

DISTRIBUTION. — Korea, Japan, East China Sea, Philippines, New Caledonia; 70-355 m.

Genus *PLATYMERA* H. Milne Edwards, 1837

Platymera H. Milne Edwards, 1837b : 107. — LUCAS, 1840 : 109. — MILNE EDWARDS & LUCAS, 1844 : 28. — ALCOCK, 1899a : 24. — HOLMES, 1900 : 98. — RATHBUN, 1906 : 888.

TYPE SPECIES. — *Platymera gaudichaudii*, H. Milne Edwards, 1837, by monotypy.

DIAGNOSIS. — Carapace transversely oval, convex, regions poorly marked. Front as wide as orbit, tridentate. Anterolateral margin arcuate, carinate, dentate. Posterolateral margin sinuously diagonal, carinate. Posterior margin entire. Lateral spine well developed. Eye with stout calcareous stalk, hemispherical cornea. Antennules fold obliquely into subfrontal grooves. Basal article of antennae cylindrical, lying between antennular groove and quadrate suborbital tooth. Supraorbital margin fissured, setose. Suborbital margin medially interrupted by sinus opening unto obliquely set subhepatic canal. External maxilliped granulate, not reaching to anterior margin of buccal frame. Exognath columnar, its internal margin with small tooth. Ischium of endognath parallelogram, its internal margin dentate; merus deeply excavate at internal distal angle; endognathal palp triarticulate, setose, its basal segment fitting into meral excavation. Chelipeds massive, nearly equal. Merus anteriorly bispinose. Upper margin of palm crested, dentate. External surface of palm with a prominent ridge above cristate, granulate lower margin. Internal surface of dactylus granulose. Larger dactylus with proximal tooth fitting unto molariform process on immovable finger. Pereiopods long, laterally compressed, dactyls styliform. Sternum, near base of chelipeds, bearing a prominent triangular projection. Male abdomen five segmented, second abdominal segment prominently carinate. First male pleopod short, outcurved, tapering distally. Second male pleopod long, slender, distally cornute.

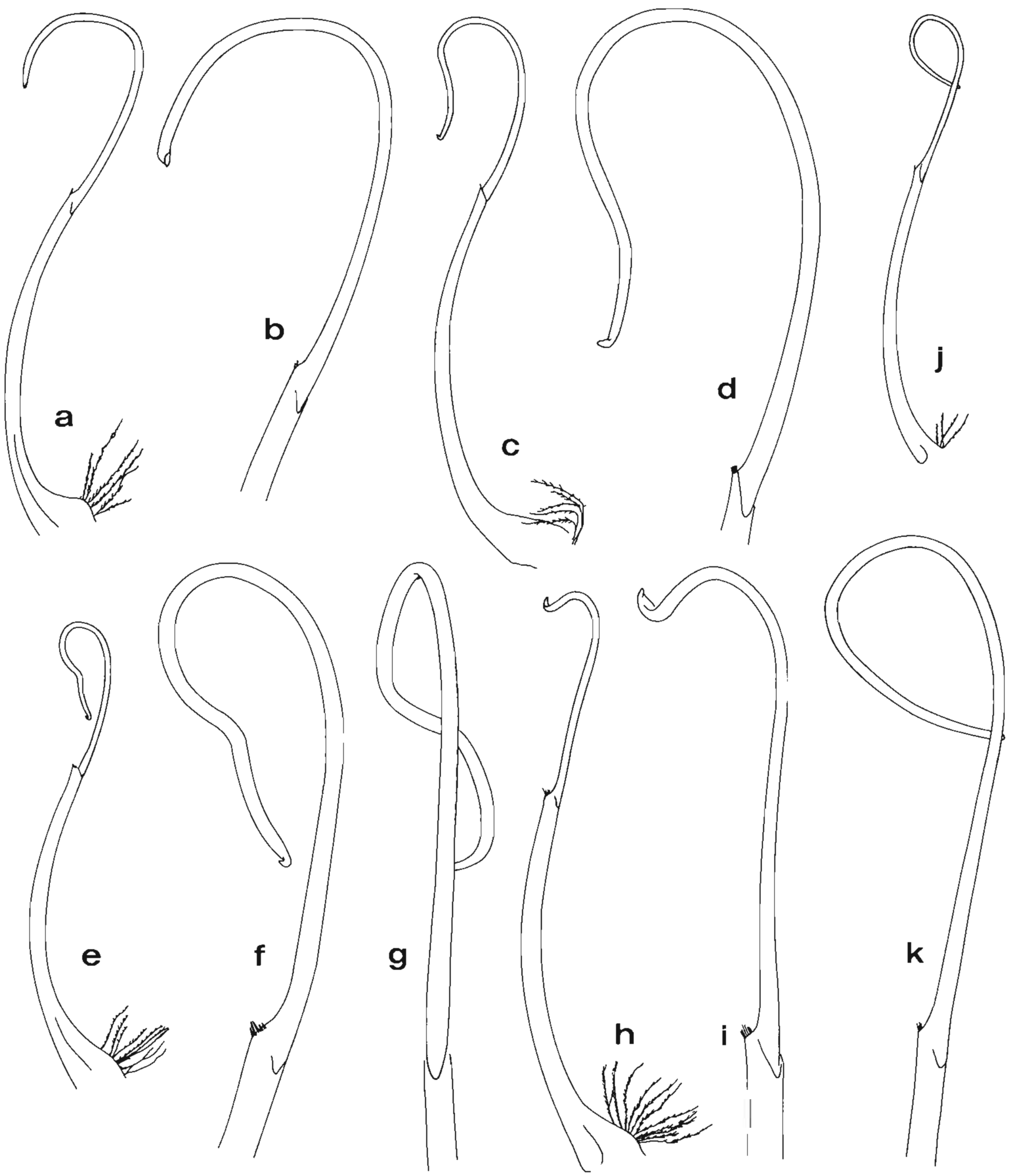

FIG. 10. — Second pleopod male with enlargement of distal part : **a-b**, *Mursia musorstomia* sp. nov., ♂, holotype, cl 19.7 mm, New Caledonia, 475 m (MNHN-B 24396). — **c-d**, *Mursia flamma* sp. nov., ♂, holotype, cl 57.9 mm, Madagascar, 370 m (MNHN-B 24371). — **e-g**, *Mursia spinimanus* Rathbun, 1906, ♂, holotype, cl 35.8 mm, Hawaiian Ids, 232 m (USNM 29922). — **h-i**, *Mursia trispinosa* (Parisi, 1914), ♂ cl 42.5 mm, Philippines, 170 m (MNHN-B 24428). — **j-k**, *Platymera gaudichii* H. Milne Edwards, 1837, ♂ cl 29.6 mm Mexico, (MNHN-B 20859).

REMARKS. — H. MILNE EDWARDS (1837b : 107) erected *Platymera* for a single specimen collected in Chile, which he described as "un crustacé très remarquable qui lie entre eux les Calappes et les Mursies". ALCOCK (1899a), discussing *M. bicristimana*, wrote "a comparison of this species (*M. bicristimana*) with specimens of *M. armata* and *Platymera gaudichaudii* leads to the belief that all three are congeneric". RATHBUN (1906) concurred : "I agree with Maj. ALCOCK that *Platymera* should be united with *Mursia*", and it was thus accepted by subsequent authors. *Platymera*, though closely allied to *Mursia*, differs from it in having the abdominal carina undivided into three lobes, a unidentate carinate ridge on the external surface of the palm, the third maxilliped merus deeply excavate anteriorly and lacking the stridulating organ formed by the dactylar milled ridge of the chela and the beaded row anteriorly on ischium of third maxilliped. Examination of these features led to reevaluation of its status - *Platymera* is herein reinstated as a distinct genus.

Platymera gaudichaudii H. Milne Edwards, 1837

Fig. 7 d, 9 g-h, 10 j-k

Platymera gaudichaudii H. Milne Edwards, 1837b : 108. — LUCAS, 1840 : 109. — H. MILNE EDWARDS & LUCAS, 1842, pl. 13 fig 1; 1844 : 28. — WHITE, 1847 : 45. — NICOLET, 1849 : 172. — CUNNINGHAM, 1871 : 493. — RATHBUN, 1898 : 610; 1904 : 170; 1910 : 593. — CANO, 1889a : 94; 1889b : 250. — FAXON, 1895 : 32. — HOLMES, 1900 : 99. — RATHBUN, 1904 : 170; 1910 : 593.

Platymera gaudichaudi - MIERS, 1881 : 71. — ORTMANN, 1892 : 563. — LENZ, 1902 : 750. — PORTER, 1906 : 132; 1921 : 422, pl. 38; 1925 : 318; 1936a : 153; 1936b : 338.

Platymera californiensis Rathbun, 1893 : 253.

Mursia gaudichaudii - WEYMOUTH, 1910 : 19. — SCHMITT, 1921 : 190, textfig. 118. — CRANE, 1937 : 99. — RATHBUN, 1937 : 220, pl. 66 figs 1-3, pl. 67 figs 1-6. — GARTH, 1946 : 361, pl. 62 figs 3-4; 1966 : 13. — HAIG, 1968 : 24.

Mursia gaudichaudi - PORTER, 1940a : 146; 1940b : 312; 1941 : 459. — GARTH, 1957 : 16.

MATERIAL EXAMINED. — **United States.** *"California"*. San Clemente Id., 35°25'N, 119°09'W, 91-110 m, 6 May 1976, id. M. WICKSTEN : 1 ♂, cl 50.3, cw 72.7, mcw 94.7; 1 juv., cl 15.0 (USNM 170405).

Mexico. Sinaloa, off Punta Piaxtla, 16 January 1982, coll. Estacion Mazatlan UNAM : 2 ♂ cl 28.5, 29.8, cw 43.0, 43.5, mcw 56.6, 57.7 (MNHN-B 20859).

Panama. Gulf of Tanama, *"Pillsbury"*, stn 513, 7°40.9'N, 79°42'W, 4 May 1967 : 3 ♂, cl 42-63; 18 juv. (NNM 23547). — Stn 515, 8°00.4'N, 79°40.8'W, 4 May 1967 : 1 ♂, cl 45.6; 8 juv. (NNM 25369). — Stn 531, 8°25.5'N, 79°10.7'W, 6 May 1967 : 3 ♂, cl 38-49 (NNM 23544).

Peru. San Lorenzo Id., nr Callao, 10 March 1952, coll. W. R. WEYRAUCH : 1 ♀, cl 28.9 (NNM 11061).

Chile. Coll. M. GAY : 1 ♂, cl 62.9, cw 92.4, mcw 119.7 (MNHN-B 87). — Coll. M. GAUDICHAUD : 1 ♂, cl 72.4, cw 112.7, mcw 135.8 (MNHN-B 3989); 1 ♀, cl 68, cw 95, mcw 116 (MNHN-B 85); 1 ♂, cl 45.9, cw 70.0, mcw 90.4 (MNHN-B 88). — Coll. M. FONTAINIER : 1 ♂, cl 62.7 (MNHN-B 86) (labelled Chine). — Valparaiso, coll. M. GAUDICHAUD : 1 ♂, cl 14.6, cw 20.7, mcw 31.6 (MNHN-B 91); 2 ♀, cl 19.4, 20.0, cw 27.3, 27.9 (MNHN); 2 juv. (MNHN-B 90). — 1878, id. H. MILNE EDWARDS : 1 ♂ (NNM). — Valparaiso, 22 January 1956 : 1 ♀, cl 41 (NNM 15622). — 200-300 m, July 1963, id. J. GARTH : 5 ♀, 19.6-41.1, cw 28.9-59.8, mcw 40.5-broken (USNM 156201).

TYPE LOCALITY. — Chile (H. MILNE EDWARDS, 1837).

DESCRIPTION. — Carapace 1.4-1.5 wide as long, shagreened, with seven nearly obsolescent radial ridges, bearing tubercles in juvenile specimens. Front, minutely granulate, lateral lobes triangular, divergent, projecting forward of rostrum. Anterolateral margins carinate, scalloped, with fifteen minute teeth. Lateral spine granulate, nearly one seventh carapace width, longer in young specimens. Posterolateral margin prominently carinate, granulate. Posterior margin minutely beaded. Supraorbital margin barely fissured, granulate. Suborbital tooth subquadrate, its anterior margin granulate, oblique. Subhepatic and pterygostomial regions granulate, densely setose. Proximal meral spine small, distal spine acuminate. External surface of carpus granulate, with beaded carinae proximally and three equidistant tubercles medially. External surface of palm granulate. Crest with six distad granular teeth. Medially on palm row of nearly effaced tubercles. Above lower margin a prominent granulous ridge, proximally unidentate. Lower margin beaded, crested. Dactylus granulate both on exterior and interior surfaces, with granulate crest anteriorly. Pereiopods with superior margin of meri granular, carpi and propodi bicristate, beaded, dactyls carinate. First male pleopod densely spinose. Second male pleopod distally looped.

Color. - "Rougeâtre" (H. MILNE EDWARDS, 1837b). "Broccoli brown with spines and tubercles ochraceous. Hands lighter than carapace, lower margin white" (SCHMITT, 1921).

REMARKS. — RATHBUN (1893) established *P. californiensis* for specimens collected off the coast of California, differing only in insignificant details from H. MILNE-EDWARDS & LUCAS' not entirely accurate figure (1844). However, RATHBUN later (1937) recognized its similarity to *P. gaudichaudii* and placed *californiensis* as its junior synonym.

DISTRIBUTION. — Along the West coast of America from the Farrallone Islands, California to Chile; 22-399 m.

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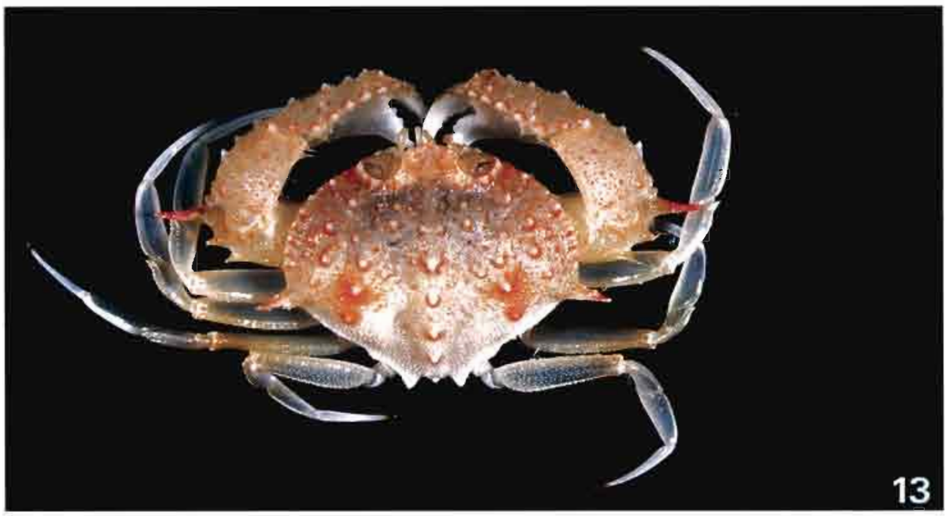
LÉGENDE DE LA PLANCHE EN COULEURS

FIG. 11. — *Mursia australiensis* Campbell, 1971. New Caledonia, MUSORSTOM 5, stn 261, 25°26.58'S, 159°45.88'E, 300 m. Photograph P. LABOUTE. ORSTOM.

FIG. 12. — *Mursia microspina* Davie & Short, 1989. New Caledonia, MUSORSTOM 5, stn 304, 22°10.34'S, 159°25.51'E, 385-400 m. Photograph P. LABOUTE ORSTOM.

FIG. 13. — *Mursia musorstomia* sp. nov. Loyalty Island, MUSORSTOM 6, stn 415, 20°40.32'S, 167°03.50'E, 461 m. Photograph P. LABOUTE ORSTOM.



9

Crustacea Decapoda : *Munida japonica* Stimpson, 1858, and related species (Galatheidae)

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ABSTRACT

In order to clarify the systematic status of *Munida japonica* Stimpson, 1858, which has been mixed with several other species constituting a complex, a neotype of this species from Kagoshima, Japan, is selected and described. Examination of the type materials of *M. heteracantha* Ortmann, 1892, *M. semoni* Ortmann, 1894 (previously merged with *M. heteracantha*) and *M. honshuensis* Benedict, 1902 (previously considered synonymous with *M. japonica*), discloses that they are valid species. Comparison of these species with numerous specimens from the Philippines, Indonesia, Japan, and the western Indian Ocean yields 13 new relatives species to be described.

RÉSUMÉ

Crustacea Decapoda : *Munida japonica* Stimpson, 1858, et les espèces apparentées (Galatheidae)

Afin de clarifier la position systématique de *Munida japonica* Stimpson, 1858, qui a été confondue avec plusieurs autres espèces formant un complexe, un néotype de cette espèce, en provenance de Kagoshima au Japon, est désigné et décrit. L'examen des types de *M. heteracantha* Ortmann, 1892, de *M. semoni* Ortmann, 1894 (précédemment mise en synonymie avec *M. heteracantha*) et de *M. honshuensis* Benedict, 1902 (précédemment considérée comme synonyme de *M. japonica*), montre que toutes ces espèces sont valides. La comparaison de ces diverses espèces avec de nombreux spécimens récoltés aux Philippines, en Indonésie, au Japon et dans l'océan Indien occidental, conduit à la description de 13 espèces nouvelles, proches des précédentes.

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INTRODUCTION

The genus *Munida* Leach is represented in the Indo-West Pacific region by about 50 species (BABA, 1988; 1990). Differences among the species are often so slight and some of the distinct characters are often so variable that confusion has appeared in determination of the species (see below). One of the most unwieldy species may be *M. japonica* Stimpson, 1858 (see BALSS, 1913; YANAGITA, 1943; MIYAKE & BABA, 1967; HAIG, 1973; BABA, 1988), which is believed to occur most commonly in Japanese waters, ranging from the eastern Indian Ocean including the Red Sea eastward to the Bonin Islands, via the Indo-Malayan region. This species was described first by STIMPSON (1858) from one male collected in Kagoshima Bay, Japan, in 36 m, subsequently by MIERS (1879) in Korea Strait, ORTMANN (1892) in Sagami Bay, Japan, BORRADAILE (1900) in New Britain, DOFLEIN (1902) in Sagami Bay, DE MAN (1902) in Halmahera, STIMPSON (1907) in Kagoshima Bay, BALSS (1913) in Japan and Taiwan (as *Munida japonica typica*), BALSS (1915) in the Red Sea, PARISI (1917) in Sagami Bay, LAURIE (1926) in Providence and Mauritius Islands, YOKOYA (1933) and YANAGITA (1943) in several localities of Japan, MELIN (1939) in the Bonin Islands, TIRMIZI (1966) in the Red Sea and Zanzibar, MIYAKE and BABA (1967) in the East China Sea, LEWINSOHN (1969) in the Red Sea, KIM (1973) in Korea, HAIG (1973, 1974) in Western Australia, MIYAKE (1982) and BABA (in BABA *et al.*, 1986) in Japan, TÜRKAY (1986) in the Red Sea, BABA (1988) in the Philippines and Indonesia, and BABA (1990) in Madagascar. In the meanwhile, *Munida honshuensis* described by BENEDICT (1902) off Honshu, Japan, was merged with *M. japonica* (see BALSS, 1913; BABA, 1988).

One of the closest relatives of *M. japonica* seemed to be *M. heteracantha* Ortmann which was described from one male and one female taken in Kadsiyama (= ? Katsuyama) and Sagami Bay, respectively (ORTMANN, 1892). The species was subsequently reported by the following authors : DOFLEIN (1902) without locality, BALSS (1913) (as *Munida japonica* var. *heteracantha*) and YANAGITA (1943) (as *Munida japonica heteracantha*), in several localities of Japan, MELIN (1939) in the Bonin Islands (as *Munida japonica* var. *heteracantha*), BABA (1969) in the East China Sea, and BABA (1988) in the Philippines.

Munida sagamiensis Doflein, 1902, described from Sagami Bay, has been synonymized with *M. heteracantha* (see BALSS, 1913; BABA, 1988). Also merged with that species was *M. semoni* Ortmann, 1894, from Ambon, Indonesia (BABA, 1988).

Munida japonica and *M. heteracantha* belong to the group of species which have the lateral margin of the carapace with five spines behind the cervical groove, the eyes large, the epigastric region with row of 10-14 spines, the merus of the third maxilliped with two or more spines on the flexor margin, the third abdominal segment unarmed, the chelipeds relatively long and slender (more than twice the postorbital carapace length), and the male gonopods present on the first and second abdominal segments. Also referred to this group is *M. inornata* Henderson, 1885, previously known from off the Admiralty Islands. *Munida compressa* Baba, 1988, *M. militaris* Henderson, 1885 and *M. curvirostris* Henderson, 1885 (= *M. andamanica* Alcock, 1894) seem to be other relatives, but apparently differ from this group in the short and massive chelipeds (see BABA, 1988, 1990; BABA & MACPHERSON, 1991).

Munida japonica is usually distinguished from *M. heteracantha* by the presence of the distal spine on the extensor margin of the merus of the third maxilliped (BABA, 1988), whereas some authors believed this difference to be of subspecific importance (BALSS, 1913; YANAGITA, 1943). The previous species definition, supported recently by BABA (1988), may allow wide morphological variations, for instance, the second abdominal segments unarmed or armed with a few to about 10 spines, the supraocular spines ranging from very short to well developed, the walking legs from slender to stout, especially the dactylus, and the extensor margin of the merus of the third maxilliped bearing a prominent, moderate, or sometimes reduced spine distally, and sexual maturity attained from a small to good size (MIYAKE & BABA, 1967; HAIG, 1973; BABA, 1988). According to TÜRKAY (1986), however, there is a difference in colour pattern between specimens from Japan and the Red Sea. Very recently, BABA and MACPHERSON (1991) pointed out the possibility that several species have been mixed up under *M. japonica* (therein called the *M. japonica* complex), suggesting the necessity of a revision of the material reported by the previous authors under *M. japonica*.

Considering this controversy in this paper, we examine selected material from the collections of MUSORSTOM 1, 2, 3 and CORINDON cruises made in the Philippines and Indonesia respectively, and all or part of the material of *M. japonica* reported from the East China Sea (MIYAKE & BABA, 1967), the Red Sea (TÜRKAY, 1986), and

Madagascar (BABA, 1990). In addition, specimens from Japan were sorted out from the collection of the Muséum national d'Histoire naturelle, Paris. Michael TÜRKAY kindly selected material for us from the collection of the Senckenberg Museum, from Japan, the Red Sea and the Gulf of Aden. At our request, Kyoichiro UEDA of Kitakyushu Museum of Natural History, kindly arranged a loan of material from the collection under his care, which was recently transferred from Kyushu University Zoological Laboratory. Unfortunately, no specimen of *M. japonica* from the type-locality (Kagoshima, Japan) was found to exist in any institution. Then, at our request, great efforts were made by Hiroshi SUZUKI of Kagoshima University to collect specimens from the type-locality; however, the substrates of Kagoshima Bay have been changed since 1858, so it seemed impossible to obtain topotypic material. He sent us three lots of four specimens of "*M. japonica*" collected from three different locations off Makura-zaki near Kagoshima Bay.

We propose here the selection of a neotype, since the type of *M. japonica* was lost during the great fire of Chicago in 1871 (EVANS, 1967). The three lots made available by H. SUZUKI, however, prove to comprise three different, closely related species; one of them is chosen as the neotype of *M. japonica* (see below), one is referable to *M. honshuensis*, and the remaining one is described as *M. agave* sp. nov. (see below). We also examined the type materials of *M. heteracantha, M. semoni* and *M. honshuensis*. As will be discussed below, these three species proved to be valid species. Unfortunately, since most of the specimens of *M. japonica* reported by previous workers are unidentifiable from their descriptions and figures, their systematic status remain unresolved. The material from Madagascar reported by BABA (1990) as *M. japonica* is divided into two new species (*M. sphinx* and *M. limula*) and the "*Valdivia*" and "*Sonne*" material reported by TÜRKAY (1986) from the Red Sea is referred to *M. dispar* sp. nov.

The type material of another problematic species, *M. sagamiensis*, seems to have been lost (M. TÜRKAY, pers. comm.). According to the description made by DOFLEIN (1902), this species has the rostrum very short (less than one-third the remaining carapace length), the second abdominal segment with dorsal spines and the merus of the third maxilliped with only one spine on the flexor margin. These characters seem to support BALSS (1913) that *M. sagamiensis* be merged with *M. heteracantha*, but the systematic status of this species remains unresolved. The Philippine and Japanese material of *M. exigua* Baba, 1988, is now synonymized with *M. heteracantha*, and the Philippine material identified as *M. heteracantha* by BABA (1988) is referred to *M. oritea* sp. nov. (see below).

Several characters used to distinguish species of the genus *Munida* (e.g. spination of the abdominal segments, size of the distal spine on the extensor margin of the merus of the third maxilliped) vary (RICE & DE SAINT LAURENT, 1986) so they should be treated carefully. As shown in this paper, presence or absence of spines on the second abdominal segment proves to be relatively constant in most species. However, in several species, the two spines on each lateral part of the anterior ridge are variably present or absent. In those species having spines, the spines are consistently present, either all along the anterior ridge (e.g. *M. melite* sp. nov., *M. nesaea* sp. nov.), in the middle (e.g. *M. inornata* Henderson) or on the lateral part of the ridge (e.g. *M. pherusa* sp. nov.), only their number being subject to variation. Considering these problems, the presence of dorsal spines on the second abdominal segment is carefully taken into consideration and used only to separate close species.

We discuss here 18 species including 13 new species. The differences among them are often so slight that all the species other than the previously misunderstood species (*M. heteracantha, M. honshuensis, M. japonica* and *M. semoni*) are defined by only a diagnosis in order to avoid a repetitious description. Most of the characters for the species are apparent from the accompanying figures.

Species are arranged alphabetically. Measurements given in this paper refer to the postorbital carapace length. The rostrum is measured from its tip to the level of the sinus formed by the rostrum and supraocular spine. The materials studied are deposited in the collections of the following institutions :

KU : Kagoshima University, Kagoshima.

MNHN : Muséum national d'Histoire naturelle, Paris.

SAM : South African Museum, Cape Town.

SM : Musée Zoologique, Strasbourg.

SMF : Senckenberg Museum, Frankfurt a. M.

USNM : National Museum of Natural History (Smithsonian Institution), Washington, D.C.

ZLKU : Kitakyushu Museum of Natural History, Kitakyushu (material transferred from Zoological Laboratory, Kyushu University, Fukuoka; registration numbers unchanged).

LIST OF STATIONS

Most of the species of *Munida* here treated have been collected at the stations of MUSORSTOM 1, 2 and 3 and CORINDON 2 cruises listed below.

The gear used at each station is indicated by two capital letters. CP = Beam Trawl; CC = Otter Trawl; DR = Rectangular Dredge; DG = Geological Dredge.

MUSORSTOM 1. **Philippines.**

Station CP 5. — 19.03.1976, 14°01.5'N, 120°23.5'E, 200-215 m : *M. heteracantha, M. philippinensis.*
Station CP 9. — 19.03.1976, 14°01.8'N, 120°17.6'E, 150-194 m : *M. heteracantha, M. philippinensis, M. nesaea.*
Station CP 10. — 19.03.1976, 13°59.8'N, 120°18.2'E, 187-205 m : *M. heteracantha, M. nesaea.*
Station CC 11. — 20.03.1976, 13°59.8'N, 120°23.7'E, 217-230 m : *M. oritea.*
Station DR 14. — 20.03.1976, 14°00.2'N, 120°17.2'E, 190 m : *M. philippinensis.*
Station CP 18. — 21.03.1976, 13°56.3'N, 120°17.2'E, 150-159 m : *M. philippinensis.*
Station CP 20. — 21.03.1976, 13°59.2'N, 120°20.3'E, 208-222 m : *M. heteracantha, M. oritea.*
Station CP 21. — 21.03.1976, 14°01.0'N, 120°22.8'E, 174-223 m : *M. oritea.*
Station CP 24. — 22.03.1976, 14°00.0'N, 120°18.2'E, 189-209 m : *M. heteracantha, M. nesaea.*
Station CP 25. — 22.03.1976, 14°02.7'N, 120°20.3'E, 191-200 m : *M. heteracantha, M. nesaea.*
Station CP 26. — 22.03.1976, 14°00.9'N, 120°16.8'E, 189 m : *M. oritea.*
Station CP 27. — 22.03.1976, 13°59.8'N, 120°18.6'E, 188-192 m : *M. philippinensis.*
Station CP 30. — 22.03.1976, 14°01.3'N, 120°13.5'E, 177-186 m : *M. heteracantha.*
Station CP 31. — 22.03.1976, 14°00.0'N, 120°16.0'E, 187-195 m : *M. heteracantha, M. philippinensis.*
Station CP 32. — 23.03.1976, 14°02.2'N, 120°17.7'E, 184-193 m : *M. heteracantha.*
Station CP 34. — 23.03.1976, 14°01.0'N, 120°15.8'E, 188-191 m : *M. philippinensis.*
Station CP 35. — 23.03.1976, 13°59.0'N, 120°18.5'E, 186-187 m : *M. philippinensis.*
Station CP 36. — 23.03.1976, 14°01.2'N, 120°20.2'E, 187-210 m : *M. nesaea, M. philippinensis.*
Station CP 40. — 24.03.1976, 13°57.4'N, 120°27.8'E, 265-287 m : *M. oritea.*
Station CP 51. — 25.03.1976, 13°49.4'N, 120°04.2'E, 170-200 m : *M. melite, M. japonica.*
Station CP 57. — 26.03.1976, 13°53.1'N, 120°13.2'E, 96-107 m : *M. pherusa.*
Station CP 62. — 27.03.1976, 13°59.5'N, 120°15.6'E, 179-194 m : *M. heteracantha, M. philippinensis.*
Station CP 63. — 27.03.1976, 14°00.8'N, 120°15.8'E, 191-195 m : *M. japonica, M. philippinensis, M. laevis, M. nesaea.*
Station CC 64. — 27.03.1976, 14°00.5'N, 120°16.3'E, 194-195 m : *M. heteracantha, M. philippinensis.*
Station CC 68. — 27.03.1976, 14°00.8'N, 120°17.4'E, 183-199 m : *M. heteracantha.*
Station CP 71. — 28.03.1976, 14°09.3'N, 120°26.2'E, 174-204 m : *M. heteracantha, M. laevis.*

MUSORSTOM 2. **Philippines.**

Station CP 1. — 20.11.1980, 14°00.3'N, 120°19.3'E, 188-198 m : *M. philippinensis.*
Station CP 2. — 20.11.1980, 14°01.0'N, 120°17.1'E, 184-186 m : *M. philippinensis.*
Station CP 6. — 20.11.1980, 13°56.5'N, 120°20.7'E, 136-152 m : *M. pherusa.*
Station CP 10. — 21.11.1980, 14°00.1'N, 120°18.5'E, 188-195 m : *M. heteracantha, M. philippinensis.*
Station CP 11. — 21.11.1980, 14°00.4'N, 120°19.7'E, 194-196 m : *M. philippinensis.*
Station CP 13. — 21.11.1980, 14°00.5'N, 120°20.7'E, 193-200 m : *M. heteracantha.*
Station CP 26. — 23.11.1980, 13°49.6'N, 120°51.0'E, 95-100 m : *M. oritea.*
Station DG 32. — 24.11.1980, 13°40.5'N, 120°53.9'E, 192-220 m : *M. japonica.*
Station DR 33. — 24.11.1980, 13°32.3'N, 121°07.5'E, 130-137 m : *M. agave.*
Station CP 51. — 27.11.1980, 13°59.2'N, 120°16.4'E, 170-187 m : *M. philippinensis, M. agave.*
Station CP 62. — 29.11.1980, 14°00.4'N, 120°17.0'E, 186-189 m : *M. philippinensis.*
Station CP 63. — 29.11.1980, 14°07.3'N, 120°15.0'E, 215-230 m : *M. laevis, M. philippinensis.*

Station CP 64. — 29.11.1980, 14°01.5'N, 120°18.9'E, 191-195 m : *M. nesaea*.
Station CP 67. — 29.11.1980, 14°00.1'N, 120°18.5'E, 193-199 m : *M. nesaea*, *M. philippinensis*.
Station CP 68. — 29.11.1980, 14°01.9'N, 120°18.8'E, 195-199 m : *M. heteracantha*, *M. philippinensis*.
Station CP 71. — 30.11.1980, 14°00.1'N, 120°17.8'E, 189-197 m : *M. philippinensis*.
Station CP 72. — 30.11.1980, 14°00.7'N, 120°19.4'E, 182-197 m : *M. philippinensis*.
Station CP 75. — 01.12.1980, 13°50.5'N, 120°30.3'E, 300-330 m : *M. oritea*.
Station CP 80. — 01.12.1980, 13°45.1'N, 120°37.7'E, 178-205 m : *M. philippinensis*, *M. nesaea*.
Station CP 83. — 02.12.1980, 13°55.2'N, 120°30.5'E, 318-320 m : *M. oritea*.

MUSORSTOM 3. **Philippines.**

Station CP 87. — 31.05.1985, 14°00.6'N, 120°19.6'E, 191-197 m : *M. heteracantha*, *M. philippinensis*.
Station CP 92. — 31.05.1985, 14°03.0'N, 120°11.5'E, 224 m : *M. oritea*.
Station CP 97. — 01.06.1985, 14°00.7'N, 120°18.8'E, 189-194 m : *M. heteracantha*.
Station CP 98. — 01.06.1985, 14°00.2'N, 120°17.9'E, 194-195 m : *M. nesaea*.
Station CP 99. — 01.06.1985, 14°01.0'N, 120°19.5'E, 196-204 m : *M. heteracantha*.
Station CP 101. — 01.06.1985, 14°00.15'N, 120°19.25'E, 194-196 m : *M. heteracantha*, *M. philippinensis*.
Station CP 103. — 01.06.1985, 14°00.4'N, 120°18.15'E, 193-200 m : *M. heteracantha*, *M. philippinensis*, *M. nesaea*.
Station CP 108. — 02.06.1985, 14°01.1'N, 120°17.9'E, 188-195 m : *M. philippinensis*.
Station CP 116. — 03.06.1985, 12°32.2'N, 120°46.4'E, 804-812 m : *M. nesaea*.
Station CP 120. — 03.06.1985, 12°05.6'N, 121°15.6'E, 219-220 m : *M. philippinensis*.
Station CP 121. — 03.06.1985, 12°08.3'N, 121°17.3'E, 73-84 m : *M. pherusa*.
Station DR 130. — 05.06.1985, 11°36.7'N, 121°43.5'E, 178-195 m : *M. laevis*, *M. philippinensis*.
Station CP 133. — 05.06.1985, 11°57.8'N, 121°52.25'E, 334-390 m : *M. caesura*.
Station CP 134. — 05.06.1985, 12°01.1'N, 121°57.3'E, 92-95 m : *M. agave*.
Station CP 143. — 07.06.1985, 11°28.3'N, 124°11.6'E, 205-214 m : *M. oritea*.

CORINDON 2. **Indonesia.**

Station 206. — 30.10.1980, 01°05.0'S, 117°45.2'E, 79-85 m : *M. pherusa*.
Station 215. — 10.11.1980, 00°39.5'N, 117°52.3'E, 93 m : *M. sphinx*.
Station 267. — 07.11.1980, 01°56.6'S, 119°16.7'E, 134-186 m : *M. heteracantha*.
Station 271. — 07.11.1980, 01°57.8'S, 119°15.0'E, 215 m : *M. striola*.
Station 273. — 07.11.1980, 01°56.0'S, 119°16.0'E, 180-220 m : *M. sphinx*.

SYSTEMATIC ACCOUNT

Key to *Munida japonica* and its relatives

1. Lateral parts of seventh thoracic sternite with numerous granules 2
— Lateral parts of seventh thoracic sternite without granules 4

2. Distal spines of antennular basal segment subequal. Merus of third maxilliped unarmed on extensor margin .... ***M. heteracantha***
— Distomesial spine of antennular basal segment longer than distolateral spine. Merus of third maxilliped with distal spine on extensor margin 3

3. Distomesial spine of antennal basal segment distinctly overreaching third antennal segment .... ***M. honshuensis***
— Distomesial spine of antennal basal segment only slightly overreaching second antennal segment .... ***M. limula***

4. Distal spines of antennular basal segment unequal in size 5
— Distal spines of antennular basal segment subequal 6

5. Distomesial spine of antennular basal segment shorter than distolateral spine .... *M. dispar*
— Distomesial spine of antennular basal segment longer than distolateral spine .... *M. agave*

6. Merus of third maxilliped unarmed on extensor margin 7
— Merus of third maxilliped with distal spine on extensor margin 9

7. Distomesial spine of basal antennal segment only slightly overreaching second antennal segment; sternal plastron feebly strigose .... *M. semoni*
— Distomesial spine of antennal basal segment distinctly overreaching third antennal segment; sternal plastron very strigose 8

8. Dactylus of walking legs with spinules along ventral margin, unarmed on distal fourth of its length .... *M. oritea*
— Dactylus of walking legs unarmed on distal half of ventral margin .... *M. striola*

9. Fourth to seventh thoracic sternites with numerous striae (Fig. 16) 10
— Few striae in the fourth and fifth thoracic sternites (Fig. 9) 14

10. Second abdominal segment with 2 median dorsal spines .... *M. philippinensis*
— Second abdominal segment usually unarmed or with 4–9 dorsal spines 11

11. Distomesial spine of antennal basal segment not reaching end of third antennal segment 12
— Distomesial spine of antennal basal segment distinctly overreaching third antennal segment 13

12. Second abdominal segment unarmed. Third thoracic sternite as wide as anterior margin of following sternite .... *M. pherusa*
— Second abdominal segment with 6–8 dorsal spines. Third thoracic sternite wider than anterior margin of following sternite .... *M. nesaea*

13. Posterior stria on carapace interrupted by median scale on intestinal region. Merus of third maxilliped with short distal spine on extensor margin. Second abdominal segment unarmed .... *M. caesura*
— Posterior stria on carapace uninterrupted in intestinal region. Merus of third maxilliped with well-developed distal spine on extensor margin. Second abdominal segment usually with 6 spines .... *M. eudora*

14. Second abdominal segment with 2 median dorsal spines .... *M. inornata*
— Second abdominal segment usually unarmed or with 4–9 dorsal spines 15

15. Distomesial spine of basal antennal segment distinctly overreaching third antennal segment 16
— Distomesial spine of basal antennal segment not reaching third antennal segment 17

16. Second abdominal segment with 8 dorsal spines. Posteriormost stria of carapace interrupted on intestinal region .... *M. melite*
— Second abdominal segment with 2 dorsal spines on each side. Posteriormost stria of carapace uninterrupted .... *M. japonica*

17. Movable finger of cheliped with a few spines between basal and distal spines on mesial margin. Second abdominal segment with 5–9 dorsal spines .... *M. sphinx*
— Movable finger of chelipeds without spines between basal and distal spines on mesial margin. Second abdominal segment unarmed .... *M. laevis*

Munida agave sp. nov.

Figs 1-2

MATERIAL EXAMINED. — **Japan**. Off Makura-zaki, Kagoshima Pref., 31°11.6'N, 130°26.4'E, 89 m : 1 ♂ 8.6 mm; 1 ov. ♀ 7.8 mm (KU).

Philippines. MUSORSTOM 2 : stn 33, 130-137 m : 1 ♂ 4.9 mm; 4 ov. ♀ 5.3-8.9 mm; 2 ♀ 3.7, 4.9 mm; 2 juv. 3.4, 3.9 mm (MNHN-Ga 2291 and 3221). — Stn 51, 170-187 m : 1 ♂ 11.1 mm (MNHN-Ga 2290).

MUSORSTOM 3 : stn 134, 92-95 m : 11 ♂ 7.6-12.7 mm; 4 ov. ♀ 8.2-9.4 mm; 7 ♀ 5.6-9.7 mm (MNHN-Ga 2292 and USNM).

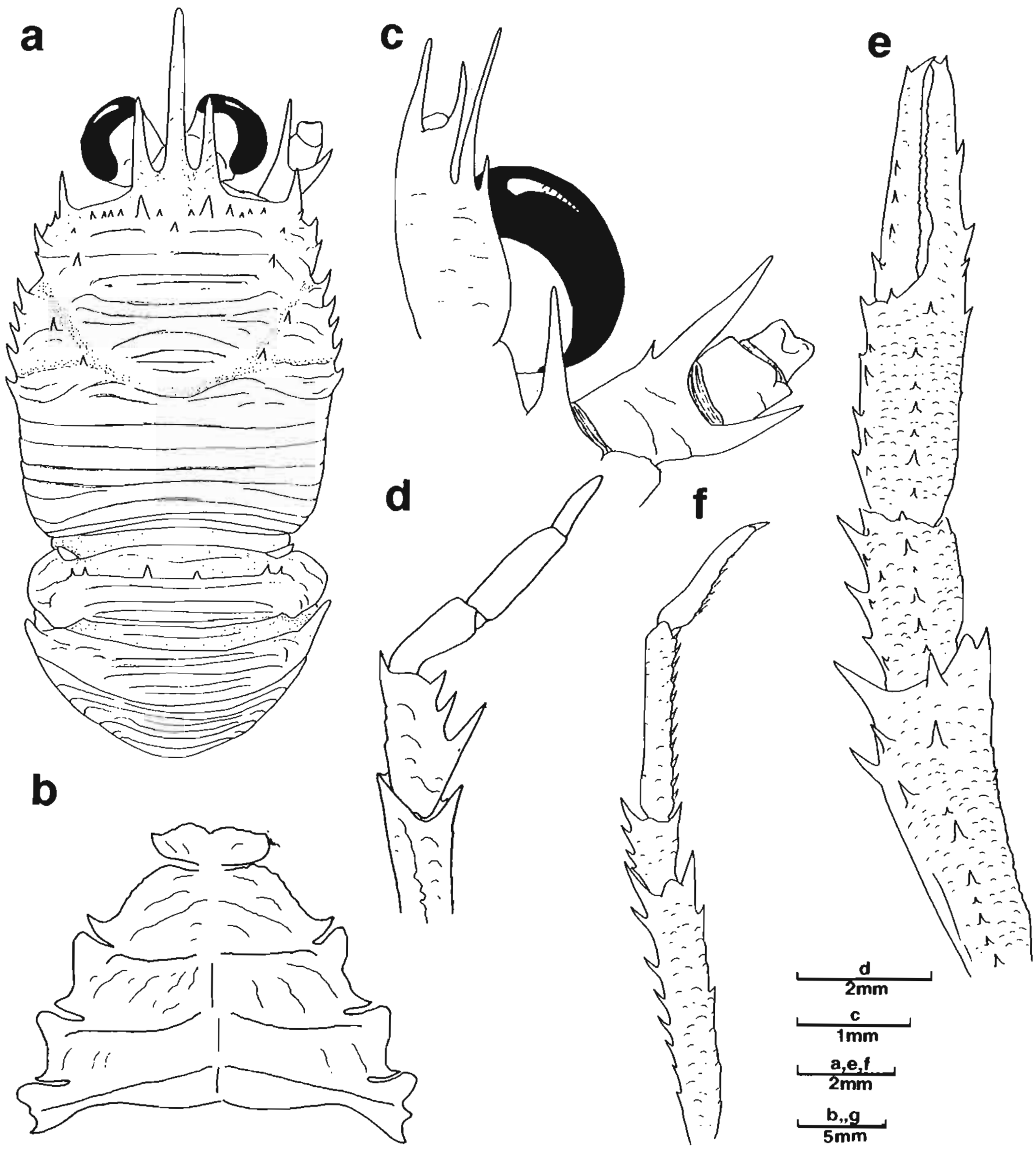

FIG. 1. — *Munida agave* sp. nov., holotype ov. ♀ 8.6 mm, from the Philippines, MUSORSTOM 2, Stn 33, 130-137 m (MNHN-Ga 3221) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, endopod of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view.

TYPES. — One of the ovigerous females (8.6 mm) from MUSORSTOM 2 : stn 33 (MNHN-Ga 3221) is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (*Agave*).

DESCRIPTION. — Front margins of carapace somewhat oblique. Posteriormost main stria not interrupted. Thoracic sternites with some arcuate striae; lateral parts of seventh sternite without granules. Second abdominal segment with row of 3 pairs of spines on anterior ridge, but rarely median 2 pairs absent; second to fourth segments with several uninterrupted striae. Eyes moderately large. Basal segment of antennule (terminal spines excluded) slightly overreaching corneae, distomesial spine longer than distolateral. First antennal segment with distomesial spine, slightly overreaching second segment; second segment with distomesial spine overreaching antennal peduncle. Extensor margin of merus of third maxilliped with sharp distal spine. Cheliped having fixed finger with 4 lateral spines including subterminal one; movable finger mesially with 1 medium-sized basal and 4 other spines on proximal half. Dactylus of walking legs with movable small spines along ventral margin, distal third unarmed.

REMARKS. — The supraocular spines usually overreach the corneae, except in the smallest juvenile specimen (3.4 mm carapace length) in which the second abdominal segment is unarmed. The male from MUSORSTOM 2, stn 51 (Fig. 2), differs from the others in the antennular basal segment distinctly overreaching the corneae, the posteriormost dorsal stria of the carapace interrupted in the intestinal region, the second abdominal segment unarmed, and the sternites bearing few striae. However, this specimen is referred to *M. agave* for the time being until more specimens become available.

The closest relative of this species seems to be *Munida dispar* sp. nov. from the Red Sea, both having the antennular basal segment with unequal-sized terminal spines. The species are readily distinguished by the size of the terminal spines on the basal antennular segment : the lateral terminal one is larger in *M. dispar*, shorter in *M. agave*.

SIZE. — Males, 4.9-12.7 mm; females, 3.7-9.7 mm; ovigerous females from 5.3 mm.

DISTRIBUTION. — Japan and the Philippines, in 89-187 m.

Munida caesura sp. nov.

Fig. 3

MATERIAL EXAMINED. — **Japan.** North of Kyushu, 14.04.1934, coll. H. IKEDA and K. YASUMOTO : 1 ov. ♀ 9.4 mm. (ZLKU 4324). —Tosa Bay, 250-300 m, 3-14.11.1963, coll. K. SAKAI : 9 ♂ 6.2-12.8 mm; 2 ♀ 8.0, 8.4 mm (MNHN-Ga 1066, 1068, 1069, 1071, 2329 and USNM). — Tosa Bay, 1.05.1964, coll. K. SAKAI : 2 ♂ 11.6, 13.0 mm; 1 ov. ♀ 11.2 mm (SMF 21170).
Philippines. MUSORSTOM 3 : stn 133, 334-390 m : 1 ♀ 10.8 mm (MNHN-Ga 2328).

TYPES. — One of the males (10.7 mm) from Tosa Bay (MNHN-Ga 2329) is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — Derived from the Latin *caesura*, pause, break, referring to the interruption in the posteriormost dorsal stria of the carapace.

DESCRIPTION. — Front margins of carapace somewhat oblique. Posteriormost principal stria interrupted on intestinal region with one scale. Sternum with numerous arcuate striae; no granules on lateral parts of seventh sternite. Abdominal segments unarmed, second to fourth segments with several striae. Eyes large. Basal antennular segment (terminal spines excluded) not overreaching corneae; 2 terminal spines subequal in size. First antennal segment with strong distomesial spine overreaching third segment; second segment with long distomesial spine overreaching antennal peduncle. Extensor margin of merus of third maxilliped with small distal spine. Cheliped having fixed finger with several spines along lateral border; movable finger with 4 mesial spines : 3 on proximal half of length and 1 subterminal. Dactylus of walking legs with movable small spines along ventral margin, but unarmed on distal fourth.

REMARKS. — In the specimen from the Philippines (MNHN-Ga 2328), the secondary striae are more numerous and the mesial spine of the basal antennal segment distinctly overreaches the third antennal segment.

Munida caesura is close to *M. eudora* sp. nov. from the Red Sea. Their relationships are discussed below under "Remarks" of the latter.

SIZE. — Males, 6.2-13.0 mm; females, 8.0-11.2 mm; ovigerous females from 9.4 mm.

DISTRIBUTION. — Japan from Tosa Bay and north of Kyushu, and the Philippines, in 250-390 m.

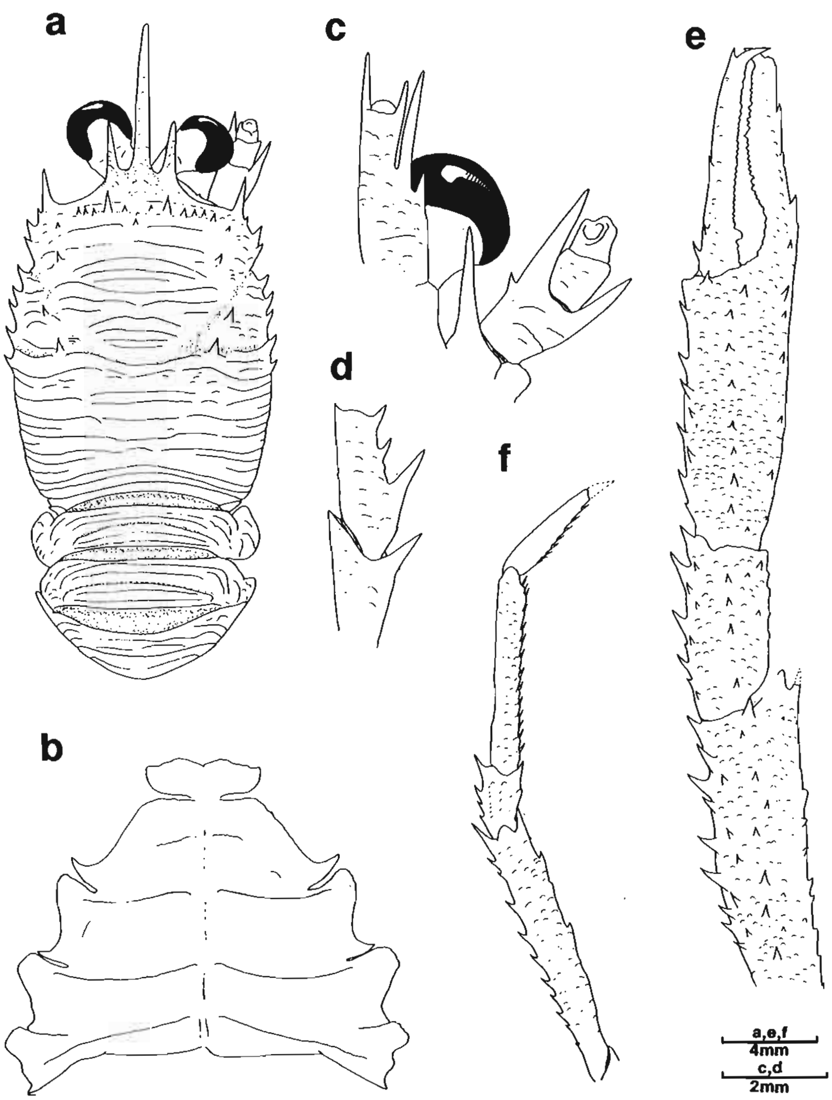

FIG. 2. — *Munida agave* sp. nov., paratype ♂ 11.1 mm, from the Philippines, MUSORSTOM 2, Stn 51, 170-187 m (MNHN-Ga 2290) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view.

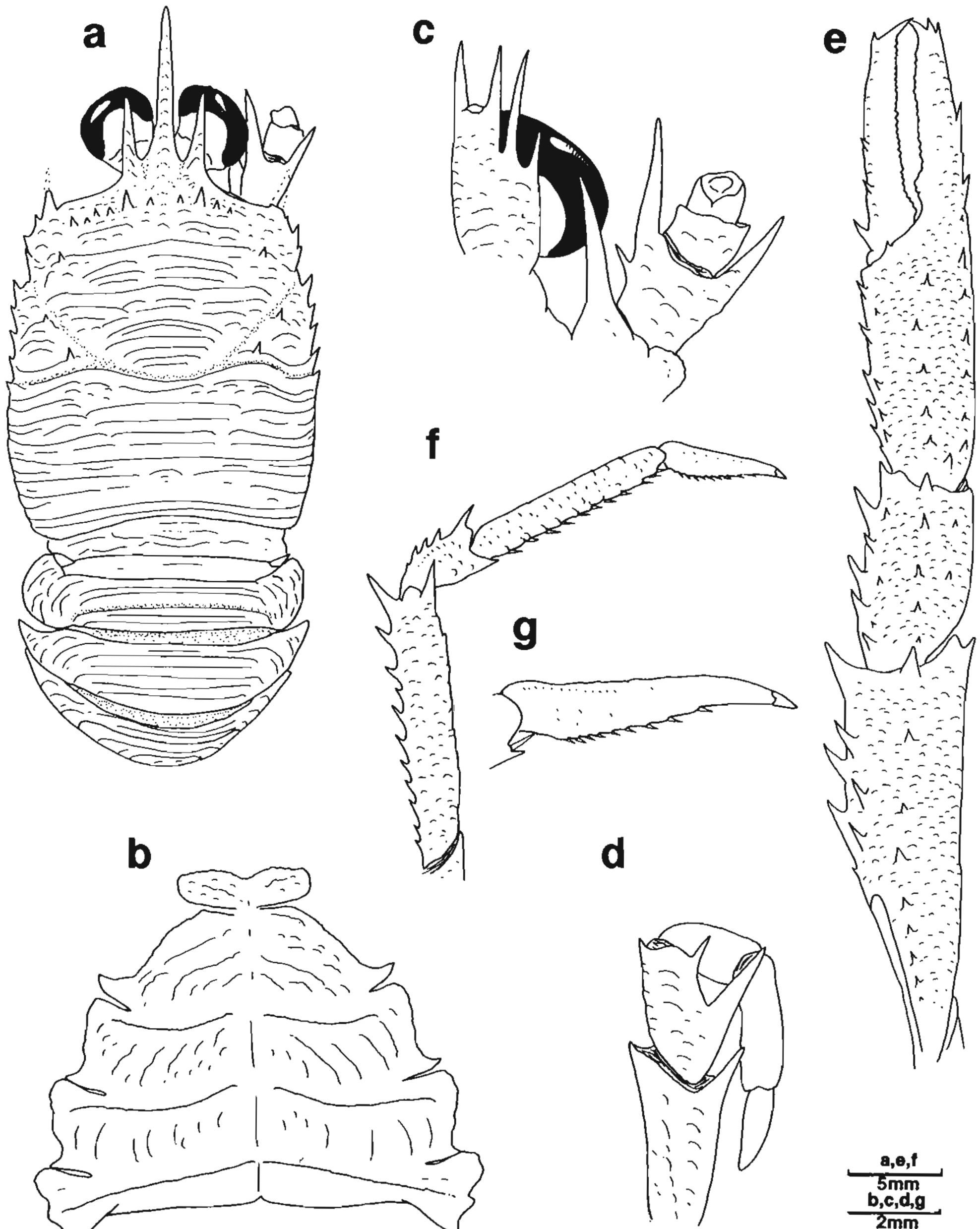

FIG. 3. — *Munida caesura* sp. nov., holotype ♂ 10.7 mm, from Tosa Bay, Japan, 250-300 m (MNHN-Ga 2329) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, endopod of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

Munida dispar sp. nov.

Fig. 4

Munida japonica - TÜRKAY, 1986 : 130. Not *M. japonica* Stimpson, 1858.

MATERIAL EXAMINED. — **Red Sea.** *"Sonne"* : stn 203, 20°52.5'N, 37°25.2'E, 490-588 m, 17.10.1977 : 2 ♂ 5.3, 6.0 mm; 3 ♀ 4.5-9.2 mm (SMF 21162, 21168).

"Valdivia" : stn 238, 21°22'N, 39°04'E, 363-383 m, 17.04.1979 : 1 ov. ♀ 9.6 mm; 1 ♀ 6.8 mm (SMF 21163). — Stn 245, 26°54.6'N, 35°27.2'E, 542-547 m, 10.03.1981 : 2 ♂ 6.6, 7.8 mm; 1 ov. ♀ 8.0 mm; 1 ♀ 7.4 mm (SMF 21164).

"Meteor" : stn 84, 22°52.7'N, 37°03.4'E, 880-884 m, 07.02.1987 : 1 ♀ 5.3 mm (SMF 21165). — Stn 96, 22°04.2'N, 37°10'E, 600 m, 09.02.1987 : 2 ♂ 5.5, 7.2 mm; 4 ov. ♀ 6.3-6.6 mm; 1 ♀ 7.1 mm (SMF 21166). — Stn 99, 22°08.4'N, 37°28.9'E, 827-863 m, 09.02.1987 : 1 ov. ♀ 6.8 mm; 2 ♀ 6.3, 6.6 mm (SMF 21167). — Stn 148, 19°43.3'N, 37°40.5'E, 517-583 m, 20.02.1987 : 1 ♂ 8.1 mm (SMF).

TYPES. — One of the females (9.2 mm) from *"Sonne"*, stn 203 (SMF 21168), is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The Latin *dispar*, dissimilar, alludes to the different size of the distal spines of the basal antennular segment.

DESCRIPTION. — Front margins of carapace somewhat oblique. Posteriormost principal stria not interrupted on intestinal region. Fourth thoracic sternite with some arcuate striae; fifth to seventh sternites without striae and granules. Second abdominal segment with row of 6 spines on anterior ridge. Second to fourth segments each with several transverse uninterrupted striae. Eyes large. Basal segment of antennule (terminal spines excluded) overreaching corneae, distomesial spine shorter than distolateral. First antennal segment with distomesial spine overreaching second segment; second segment with distomesial spine overreaching antennal peduncle. Extensor border of merus of third maxilliped with small but distinct distal spine. Cheliped having fixed finger with row of dorsolateral spines; movable finger mesially with 3 spines on proximal half and 1 subterminal spine. Dactylus of walking legs with movable small spines along ventral margin, distal fourth unarmed.

REMARKS. — *Munida dispar* is closely related to *M. agave* sp. nov. described above from Japan and the Philippines. Their relationships are discussed under "Remarks" of the latter.

SIZE. — Males, 5.3-8.1 mm; females, 5.3-9.6 mm; ovigerous females from 6.8 mm.

DISTRIBUTION. — Red Sea, in 363-884 m.

Munida eudora sp. nov.

Fig. 5

MATERIAL EXAMINED. — **Red Sea.** *"Meteor"* : stn 230 (KD1), 12°43.7'N, 43°15'E, 228-235 m, 5.03.1987 : 29 ♂ 4.0-9.0 mm; 1 ov. ♀ 8.2 mm; 31 ♀ 4.5-7.9 mm (SMF 21171, 21172). — Stn 230 (KD2), 12°43.5'N, 43°14.8'E, 214-237 m, 5.03.1987 : 2 ♂ 5.7, 7.8 mm; 1 ♀ 7.8 mm (SMF 21173). — Stn 232, 12°36.8'N, 43°15.7'E, 276-296 m, 6.03.1987 : 1 ♀ 5.3 mm (SMF 21174).

TYPES. — One of the females (7.5 mm) from *"Meteor"*, stn 230 (KD1) (SMF 21171), is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (*Eudora*).

DESCRIPTION. — Front margins of carapace nearly transverse. Posteriormost principal stria not interrupted. Thoracic sternites with numerous arcuate striae; no granules on lateral parts of seventh sternite. Second to fourth abdominal segments with several transverse uninterrupted striae; row of 3 pairs (one median and 2 lateral) of spines on anterior ridge of second segment, median pair occasionally absent, or rarely (only in 1 specimen) all of these obsolescent. Eyes large. Basal antennular segment (distal spines excluded) slightly overreaching corneae; 2 terminal spines subequal in size. First antennal segment with long distomesial spine slightly overreaching antennal peduncle; second segment with long distomesial spine overreaching antennal peduncle. Extensor margin of merus of third maxilliped with prominent distal spine accompanied by small spine at its base. Fixed finger of cheliped with row of dorsal spines near lateral border; movable finger with row of 5 spines along whole mesial border. Dactylus of walking legs with row of movable spines along ventral margin, but unarmed on distal fourth.

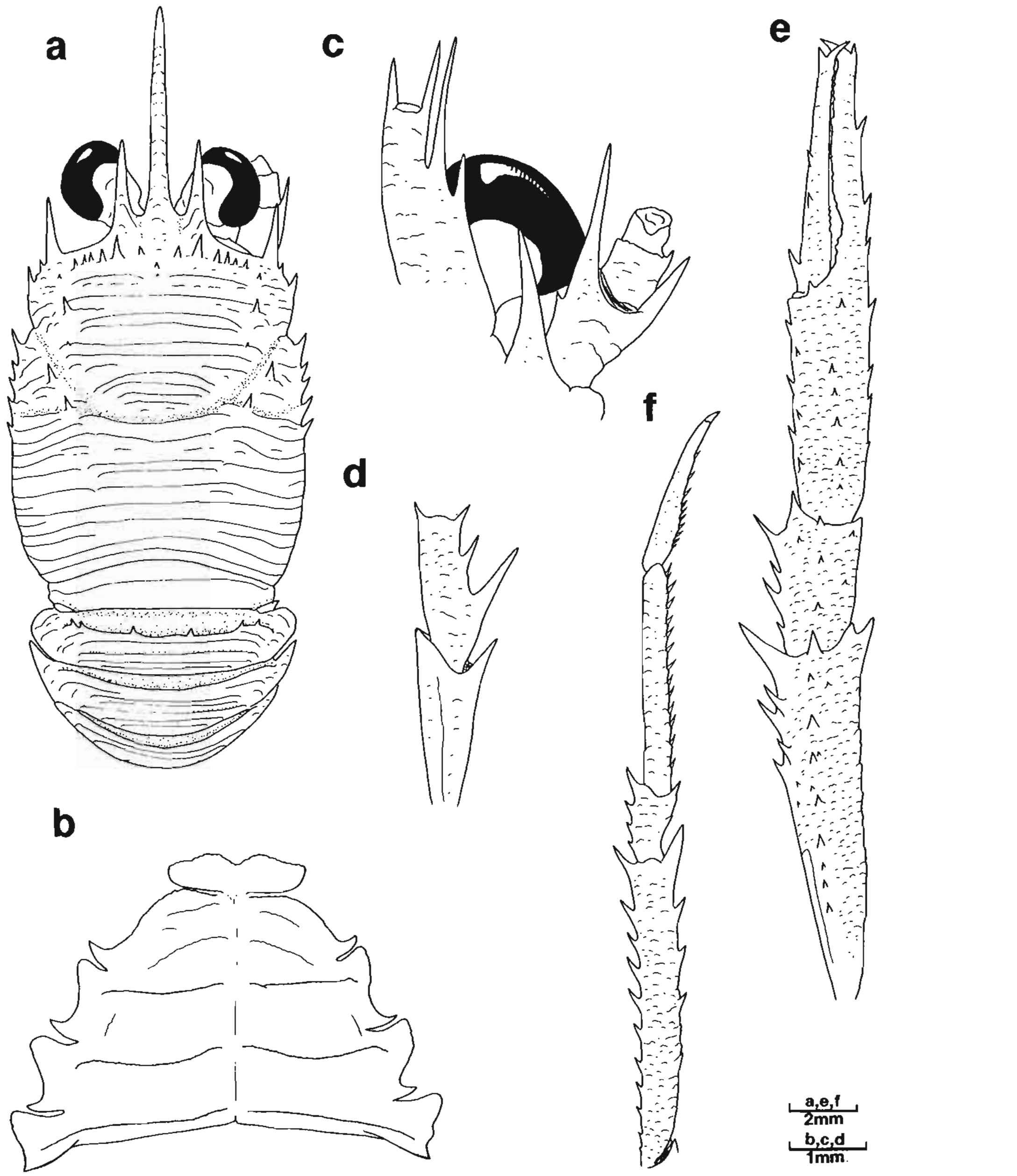

FIG. 4. — *Munida dispar* sp. nov., holotype ♀ 9.2 mm, from the Red Sea, *"Valdivia"*, Stn 203, 490-588 m (SMF 21168) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view.

REMARKS. — *Munida eudora* is closely related to *M. caesura* sp. nov. described above from Japan and the Philippines in the antennular basal segment bearing equal sized terminal spines, the merus of the third maxilliped bearing a distal spine on the extensor margin, and the sternum bearing numerous striae, but they are distinguished by the following :

— The posteriormost stria of the carapace is interrupted in the intestinal region by a distinct scale in *M. caesura*, uninterrupted in *M. eudora*.

— The front margin is somewhat oblique in *M. caesura*, transverse in *M. eudora*.
— The second abdominal segment is unarmed in *M. caesura*, armed with four or more spines in *M. eudora*.
— The merus of the third maxilliped has the distal spine of flexor border relatively much shorter in *M. caesura* than in *M. eudora*.

SIZE. — Males, 4.0-9.0 mm; females, 4.5-8.2 mm; ovigerous female, 8.2 mm.

DISTRIBUTION. — South of the Red Sea, in 214-296 m.

Munida heteracantha Ortmann, 1892

Fig. 6

Munida heteracantha Ortmann, 1892 : 255, pl. 11, figs 12, 12i, 12k.
Munida exigua Baba, 1988 : 83 (key), 98, fig. 36.
Not *Munida heteracantha* - BABA, 1988 : 104, fig. 38 (= *Munida oritea* sp. nov.).

MATERIAL EXAMINED. — **Japan**. Sagami Bay : 1 ov. ♀ 7.3 mm, lectotype (herein selected) (SM). — Kami-Kawaguchi, Kochi Prefecture, 33°01.7'N, 133°02.3'E, 120 m, 29.10.1979, coll. ♂. TÜRKAY : 1 ♂ 9.5 mm (SMF 21160).

Philippines. MUSORSTOM 1 : stn 5, 200-215 m : 1 ♀ 6.0 mm, (MNHN-Ga 3231). — Stn 9, 180-194 m : 4 ♂ 5.0-7.3 mm (MNHN-Ga 2271). — Stn 10, 187-205 m : 1 ♀ 4.5 mm (MNHN-Ga 2272). — Stn 20, 208-222 m : 1 ov. ♀ 5.6 mm (MNHN-Ga 2273). — Stn 24, 189-209 m : 2 ♂ 6.1, 8.5 mm; 1 ♀ 8.0 mm (MNHN-Ga 2274). — Stn 25, 191-200 m : 4 ♂ 5.4-8.2 mm; 4 ♀ 4.3-5.2 mm (MNHN-Ga 2275). — Stn 30, 177-186 m : 2 ♂ 5.6, 7.7 mm; 1 ov. ♀ 6.3 mm; 1 ♀ 5.3 mm (MNHN-Ga 2276). — Stn 31, 187-195 m : 2 ♂ 5.3, 8.2 mm; 1 ov. ♀ 6.0 mm (MNHN-Ga 2277). — Stn 32, 184-193 m : 2 ♂ 4.5, 5.9 mm; 2 ov. ♀ 6.0, 7.3 mm (MNHN-Ga 2278). — Stn 62, 179-194 m : 1 ♂ 7.6 mm (MNHN-Ga 2279). — Stn 64, 194-195 m : 1 ♂ 6.3 mm (MNHN-Ga 2280). — Stn 68, 195-198 m : 1 ♂ 5.0 mm (MNHN-Ga 3232). — Stn 71, 174-204 m : 1 ♂ 6.1 mm (MNHN-Ga 2281).

MUSORSTOM 2 : stn 10, 188-195 m : 1 ♂ 6.2 mm (MNHN-Ga 2282). — Stn 13, 193-200 m : 1 ov. ♀ 8.0 mm (MNHN-Ga 2283).

MUSORSTOM 3 : stn 87, 191-197 m : 2 ♂ 6.9, 8.7 mm; 1 ov. ♀ 6.0 mm (MNHN-Ga 2284). — Stn 97, 189-194 m : 1 ♀ 6.4 mm (MNHN-Ga 2285). — Stn 99, 196-204 m : 3 ♂ 7.7-8.9 mm; 1 ov. ♀ 8.0 mm; 1 ♀ 7.0 mm (MNHN-Ga 2286). — Stn 101, 194-196 m : 2 ♂ 7.8, 8.9 mm; 1 ov. ♀ 6.7 mm (MNHN-Ga 2287). — Stn 103, 193-200 m : 2 ♂ 7.8, 8.5 mm (MNHN-Ga 2288).

Indonesia. CORINDON 2 : stn 267, 134-186 m : 1 ♂ 5.3 mm (MNHN-Ga 2289).

DESCRIPTION. — (Lectotype). Carapace, excluding rostrum, slightly longer than wide. Transverse ridges mostly interrupted. Secondary striae present. Gastric region with row of 11 epigastric spines, largest spines directly behind supraocular spines. Small parahepatic and postcervical spines on each side.

Front margins somewhat oblique. Lateral margins slightly convex, bearing 4 spines in front of, and 5 spines behind cervical groove. First spine well developed, situated on anterolateral angle, not overreaching level of sinus between rostrum and supraocular spine; second and fourth very small, third larger than second but much smaller than first. Spines behind cervical groove subequal in size.

Rostrum spiniform, half as long as remaining carapace, slightly sinuous in profile and horizontal. Supraocular spines very short, not reaching end of corneae, slightly convergent and directed upwards.

Fourth thoracic sternite with some arcuate striae; fifth and sixth sternites without striae; lateral parts of seventh sternite with distinct granules.

Second abdominal segment with row of 7 spines on anterior ridge. Second and third segments each with 3 transverse striae, 2 anterior striae uninterrupted, third stria less conspicuous and interrupted medially on third segment. Fourth segment with 2 uninterrupted striae, fifth with one such stria.

Eyes moderately large, maximum corneal diameter about one-third distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) about one-quarter carapace length, elongate, ending at level of corneae, with 2 subequal terminal and 2 lateral spines, proximal of latter short, located at midlength of segment, distal long, reaching end of terminal spines.

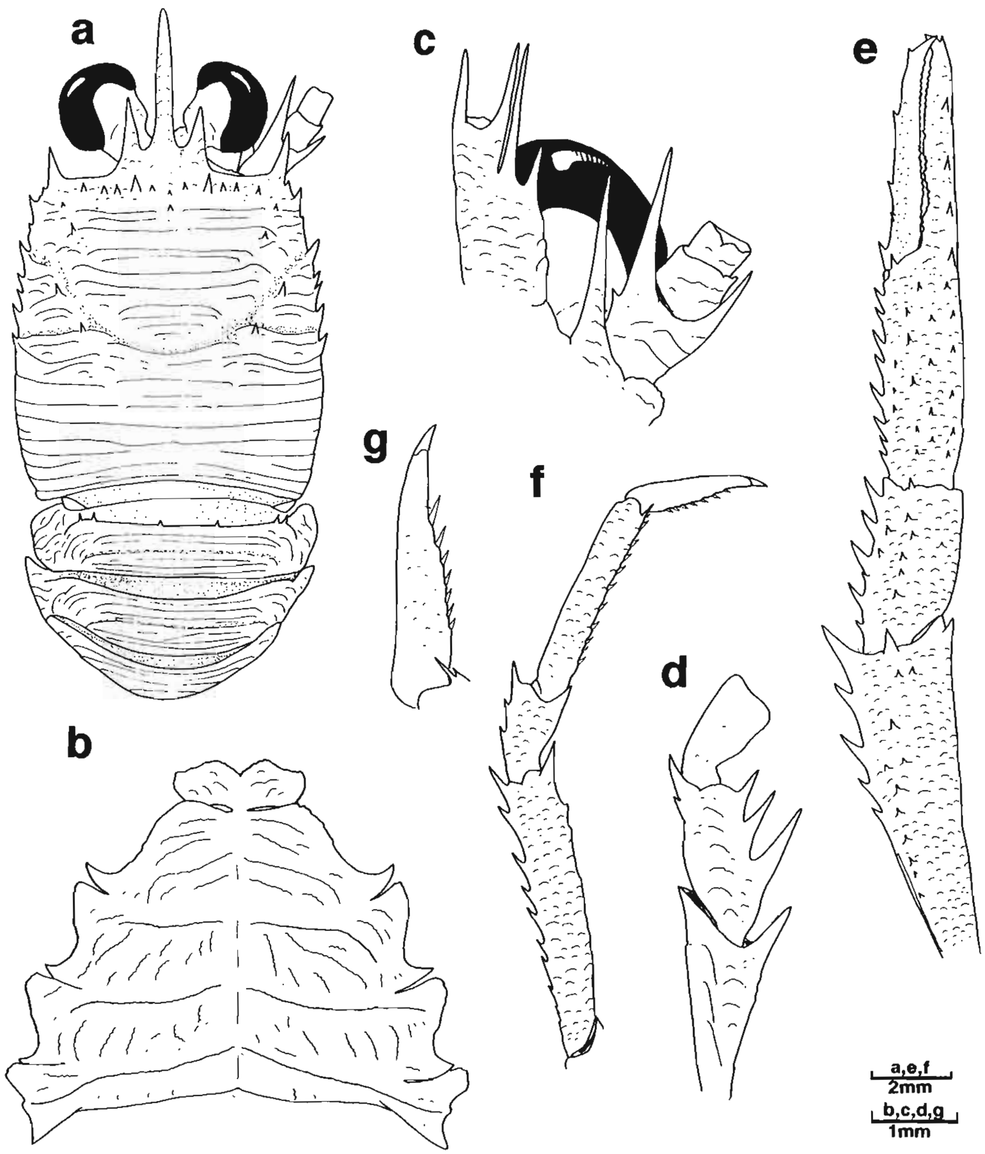

FIG. 5. — *Munida eudora* sp. nov., holotype ♀ 7.5 mm, from the Red Sea, *"Meteor"*, Stn 230 (KD1), 228-235 m (SMF 21171) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, carpus, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

First segment of antennal peduncle with distomesial spine only reaching end of second segment; second segment with 2 distal spines, mesial spine longer than lateral spine and almost reaching end of antennal peduncle; third segment unarmed.

Third maxilliped having merus with 2 well-developed spines on flexor margin, proximal longer than distal; extensor margin produced distally, without spine.

Left cheliped (right missing) squamate, with some iridescent setae more dense on mesial borders; about 3 times as long as carapace; merus with 4 rows of spines on mesial, dorsal and ventral borders and distal spine on lateral margin; carpus with row of spines on mesial side and several scattered spines on dorsal and ventral sides; palm with some mesial spines, and row of dorsolateral spines; fixed finger laterally with 3 spines on proximal half and 2 near tip; movable finger with 1 basal and 1 subterminal spine; fingers distally curving and crossing, ending in sharp point; cutting edges with small teeth of different sizes.

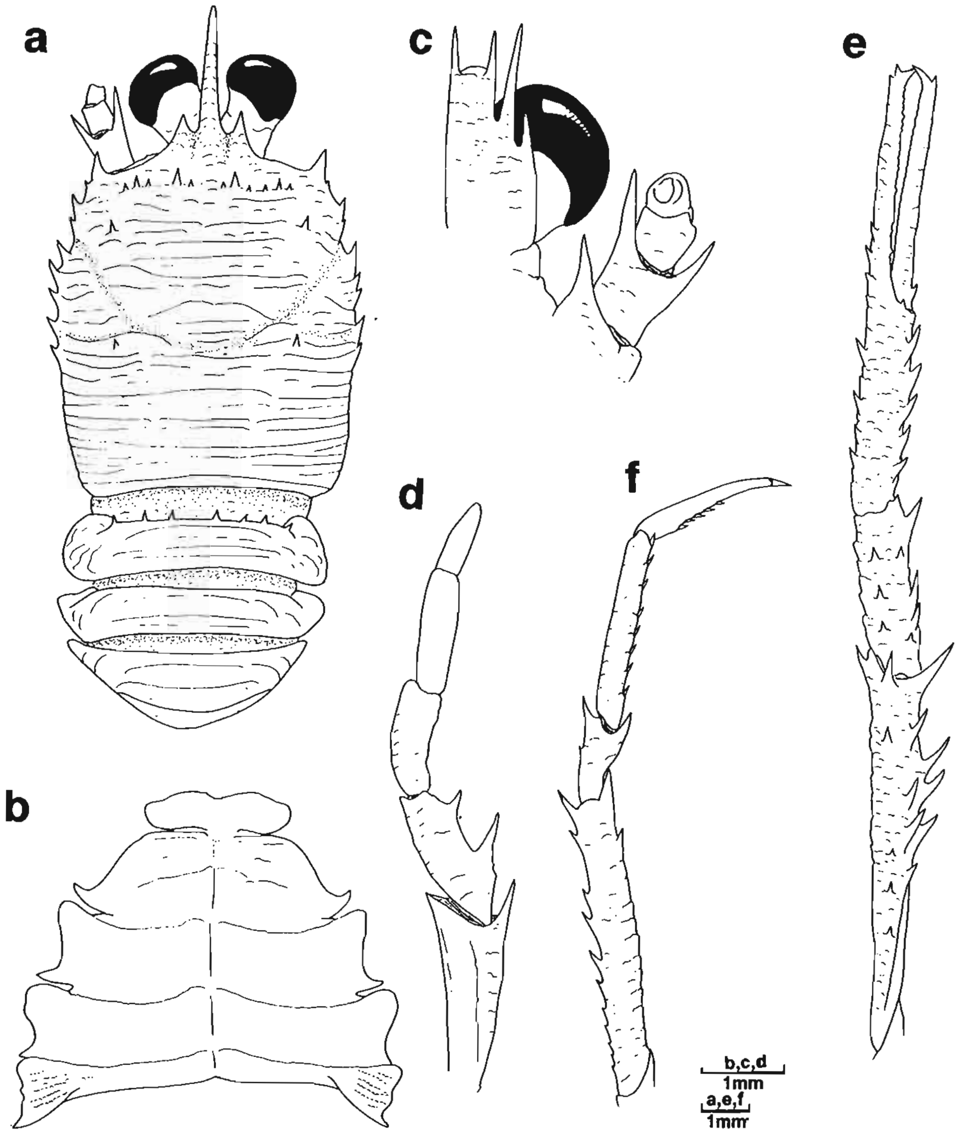

FIG. 6. — *Munida heteracantha* Ortmann, 1892, lectotype ov. ♀ 7.3 mm, from Japan (SM) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, endopod of right third maxilliped, lateral view; **e**, left cheliped, dorsal view; **f**, right first walking leg, lateral view.

Walking legs slender, furnished with long, plumose and iridescent setae on dorsal margins and short setae on lateral borders. First walking legs twice length of carapace; merus with row of 11 spines on dorsal border increasing in size distally, and 2 spines on distal third of ventral margin, both distal spines prominent. Carpus with long distal spines each on dorsal and ventral borders and additional small spine on dorsal margin; propodus with row of 8 movable spines on ventral margin; dactylus as long as propodus, with dorsal margin straight, slightly curving distally, ventral margin with 5 movable spinules on proximal half. Second walking legs similar to first. Third walking legs shorter than first and second, with less pronounced spinulation; merus about three-quarters that of first walking legs. Epipods absent from all pereopods.

REMARKS. — In several lots there are specimens with and without 2 small median spines on the third abdominal segment. This variability suggests that the spinulation on that segment should be considered carefully. The second abdominal segment bears 7-8 dorsal spines.

Examination of the lectotype of this species discloses that *M. exigua* Baba, 1988, is a junior synonym of *M. heteracantha*, the fact confirmed by examining the specimens of *M. exigua* previously reported from the Philippines, Indonesia and Japan. *Munida heteracantha* is closer to *M. roshanei* Tirmizi, 1966, *M. kuboi* Yanagita, 1943, and *M. spinulifera* Miers, 1884, than to *M. japonica* Stimpson, 1858, in the inclined front margin (see BABA, 1988). However, the occurrence of granules on the seventh thoracic sternite apparently separates *M. heteracantha* from these species. This character also links *M. heteracantha* strongly to *M. honshuensis* Benedict, 1902, from Japan and *M. limula* sp. nov. described below from Madagascar, and clearly differentiates this species from the *M. japonica* complex (see BABA & MACPHERSON, 1991; see below).

SIZE. — Males, 4.5-8.9 mm; females, 4.3-8.0 mm; ovigerous females from 5.6 mm.

DISTRIBUTION. — Philippines, Indonesia, off Hong Kong and Sagami Bay, Japan, in 68-222 m.

Munida honshuensis Benedict, 1902

Fig. 7

Munida honshuensis Benedict, 1902 : 261, fig. 11.

MATERIAL EXAMINED. — **Japan.** *"Albatross"* : stn 3708, off Honshu, 111-130 m : 1 ♀ 9.5 mm (holotype) (USNM 25472).

Tosa Bay, 250-300 m, 3-14.11.1963 : 1 ♂ 15.0 mm; 1 ov. ♀ 9.8 mm (MNHN-Ga 1071). — Off Makura-zaki, Kagoshima Pref., 31°11.1'N, 130°25.4'E, 120-128 m, coll. H. SUZUKI : 1 ♂ 11.8 mm (MNHN-Ga 3220).

DESCRIPTION. — (Holotype). Carapace, excluding rostrum, slightly longer than wide. Transverse ridges mostly interrupted. Secondary striae present. Epigastric region with row of 6 pairs of spines, largest pair directly behind supraocular spines. Small parahepatic and hepatic spine on each side. Anterior branchial region with distinct spine behind midlength of anterior bifurcation of cervical groove. Postcervical spine on each side.

Front margins somewhat oblique. Lateral margins slightly convex; first lateral spine well developed, situated on anterolateral angle, distinctly overreaching level of sinus between rostrum and supraocular spines, followed by very small second spine, third spine in front of cervical groove much smaller than first one, 5 spines behind cervical groove subequal in size.

Rostrum spiniform, half as long as remaining carapace, slightly sinuous in profile and horizontal. Supraocular spines reaching end of corneae, subparallel and directed slightly upwards.

Thoracic sternites with some arcuate striae; lateral parts of seventh sternite with numerous coarse granules. Second abdominal segment with row of 9 spines on anterior ridge. Second to fourth segments with one transverse furrow and several uninterrupted striae. Fifth segment with several continuous striae.

Eyes moderately large, maximum corneal diameter about one-third distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) about one-third carapace length, elongate, ending at level of corneae, with 2 terminal (mesial one longer than lateral) and 2 lateral spines (proximal one short, located at midlength of segment, distal long and reaching end of terminal spines).

First segment of antennal peduncle with strong distomesial spine slightly overreaching antennal peduncle; second segment with 2 long distal spines (mesial longer than lateral, overreaching antennal peduncle) and small median spine at midpoint of mesial margin; third segment unarmed.

Merus of third maxilliped with 2 well-developed spines on flexor margin, proximal longer than distal; extensor margin with small but distinct distal spine.

Chelipeds squamate, subequal, with iridescent setae more dense on mesial border. Right cheliped about 2.5 times as long as carapace; merus with rows of spines on mesial, dorsal and ventral borders and 1 distal spine on lateral margin; carpus with row of spines on mesial margin and several spines scattered on dorsal side; palm with 2 rows of mesial spines, 1 row of small dorsal spines, 1 row of dorsolateral spines continued onto fixed finger and reaching tip; movable finger with row of spines along whole mesial border; fingers distally curving and crossing, ending in sharp point; cutting edges with small teeth of different sizes.

Walking legs slender, furnished with long, plumose and iridescent setae on dorsal margins and short setae on lateral borders. First walking legs twice as long as carapace, propodus about 5.5 times as long as high and 1.5 times dactylus length; merus with row of 9-10 dorsal spines increasing in size distally, and 2 spines on distal half of ventral margin, distal spines of these prominent and nearly subequal in size; carpus having dorsal and ventral borders distally produced into long spines, dorsal margin with 3 additional spines; propodus with row of 11-12 movable spines on ventral margin; dactylus relatively stout, moderately curving distally, with 8 movable spines along ventral margin. Second walking legs similar to first. Third walking legs shorter than first and second, with less pronounced spinulation, merus about three-quarter that of first walking legs. Epipods absent from all pereopods.

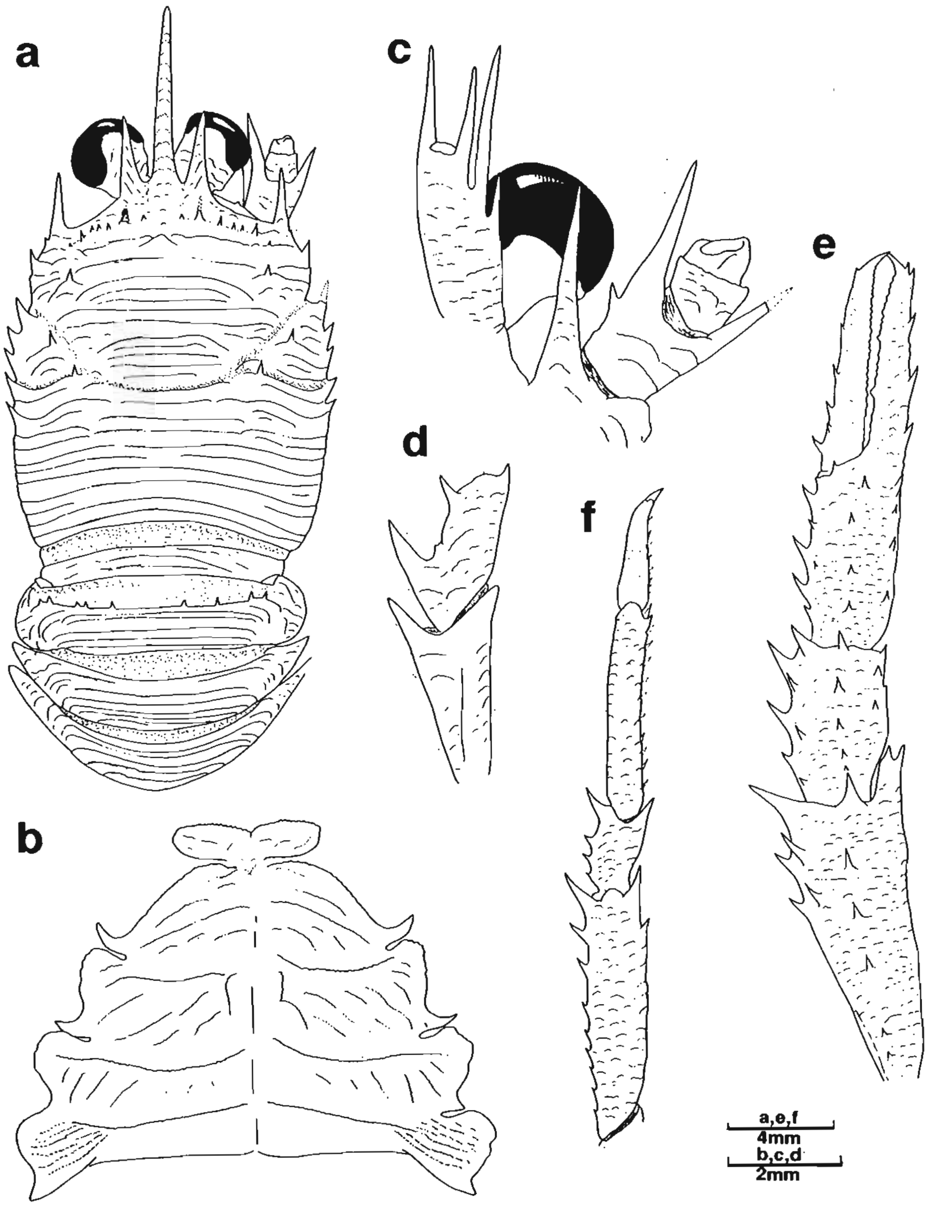

FIG. 7. — *Munida honshuensis* Benedict, 1902, holotype ♀ 9.5 mm, from Japan (USNM 25472) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of left third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view.

REMARKS. — No significant differences were observed among the specimens studied.

The species has been considered to be synonymous with *M. japonica* (see BALSS, 1913; BABA, 1988), but examination of the holotype of this species (USNM 25472) revealed that *M. honshuensis* is a good species, differentiated from by the presence of granules on the lateral parts of the seventh thoracic sternite.

The closest species which share the characteristic granules on the thoracic plastron may be *M. heteracantha* Ortmann from Japan, the Philippines and Indonesia, and *M. limula* sp. nov. from Madagascar.

Munida honshuensis can be distinguished from *M. heteracantha* by :

— The supraocular spines never overreach the eyes in *M. heteracantha*, distinctly extend beyond them in *M. honshuensis*.

— The thoracic sternites are more squamate in *M. honshuensis*.

— The distal spines of the basal antennular segment are subequal in *M. heteracantha*, whereas the distomesial spine is longer than the distolateral in *M. honshuensis*.

— The merus of the third maxilliped is unarmed on the extensor margin in *M. heteracantha*, instead of having a distinct distal spine as in *M. honshuensis*.

— The fingers of the chelipeds in *M. honshuensis* bear spines along the entire length of both the mesial and lateral margins, whereas the spines are less numerous, a few spines being restricted to the proximal and distal portions, in *M. heteracantha*.

— The dactylus of the walking legs bears small spines along the whole ventral border in *M. honshuensis*, whereas in *M. heteracantha* the terminal third of the segment is unarmed.

The relationships between *M. honshuensis* and *M. limula* are discussed under "Remarks" of the latter (see below).

DISTRIBUTION. — Japan off Honshu and Tosa Bay, in 111-300 m.

Munida inornata Henderson, 1885

Fig. 8

Munida inornata Henderson, 1885 : 411; 1888 : 140, pl. 14, figs 6 a-b. — BABA & MACPHERSON, 1991 : 543, fig. 3.

MATERIAL EXAMINED. — **Admiralty Islands**. *"Challenger"*: stn 219, 1°54'S, 146°39'40"E, 278 m, 10.03.1875 : 1 ♂ 8.0 mm; 2 ♀ 7.8 and 8.2 mm (types : BM 88:33).

New Caledonia. BIOCAL : stn 105, 21°30.71'S, 166°21.72'E, 330-335 m, 8.09.1985 : 2 ♂ 6.6, 6.9 mm (MNHN-Ga 3227).

REMARKS. — The material collected from New Caledonia agrees quite well with the type specimens. All the specimens examined bear two small median spines on the anterior ridge of the second abdominal segment. Therefore, this character seems to be useful in discriminating *M. inornata* from the other related species.

BABA and MACPHERSON (1991) identified one of the specimens (V 6.3 mm) of *M. militaris* Henderson, collected by the *Challenger* Expedition at station 192 off Little Kai Island, Indonesia (HENDERSON, 1885), as *M. inornata*. The abdomen of this specimen has very obsolete spinules, but most of the features fit the definition of *M. inornata*.

M. inornata is very close to *M. philippinensis* sp. nov. from the Philipines in having two median spines on the anterior border of the second abdominal segment. However, it may be distinguished by the following differences :

— The rostrum is more spiniform and nearly horizontal in *M. inornata*, whereas it is relatively shorter, distinctly compressed distally and directed upwards in *M. philippinensis*.

— The sternum in *M. inornata* has fewer arcuate striae than in *M. philippinensis*.

The specimen reported by BABA (1988) under the name of *M. inornata* from the Philippines is now removed from the synonymy of this species, because of the lack of spines on the second abdominal segment. It may belong to another species, but additional material would be desirable to confirm its identity.

SIZE. — Males, 6.6-6.9 mm; females, 7.8-8.2 mm.

DISTRIBUTION. — New Caledonia and Admiralty Islands, in 278-335 m.

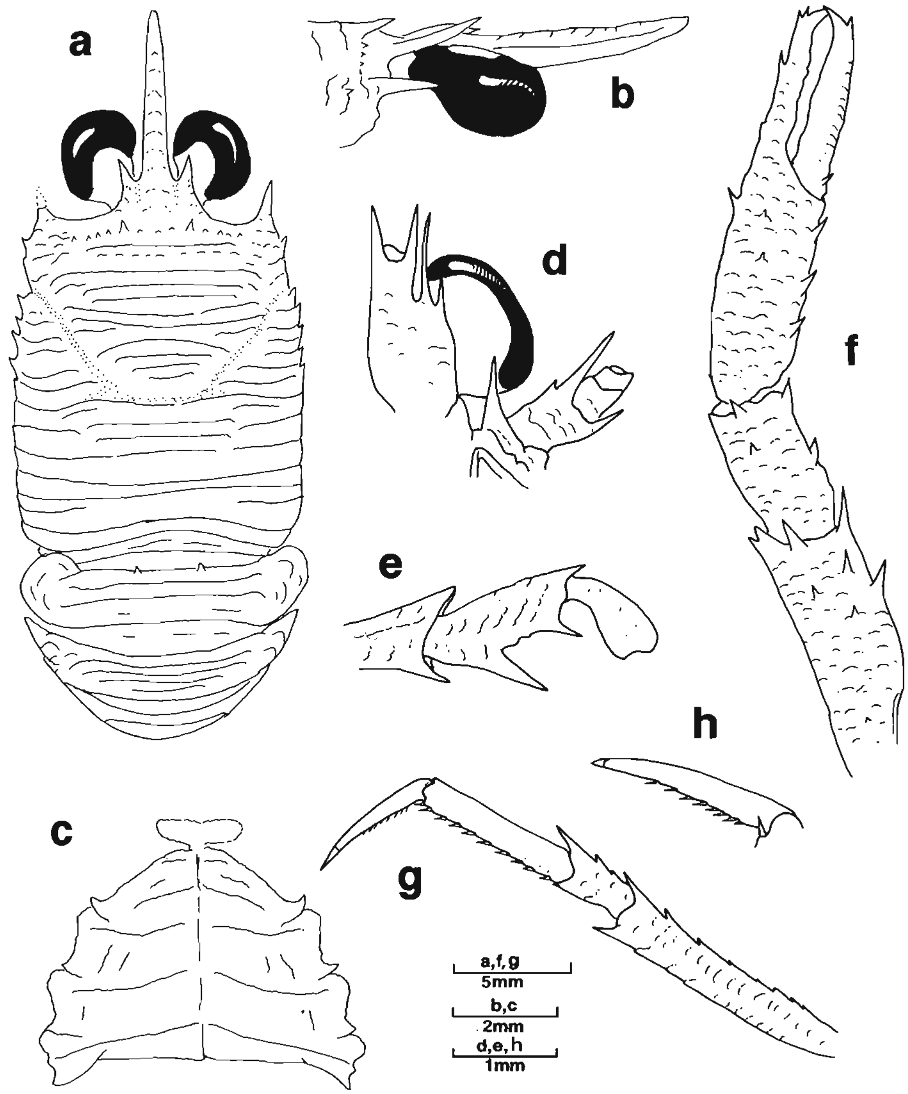

FIG. 8. — *Munida inornata* Henderson, 1885, types, from the Admiralty Islands, *"Challenger"*, Stn 219, 278 m (BM) : **a-e**, M 8.0 mm; **f–h**, ♀ 8.2 mm : **a**, carapace, dorsal view; **b**, anterior part of cephalotorax, lateral view; **c**, sternal plastron; **d**, ventral view of cephalic region, showing antennular and antennal peduncles; **e**, merus and distal part of ischium of right third maxilliped, lateral view; **f**, left cheliped, dorsal view; **g**, left first walking leg, lateral view; **h**, dactylus, left first walking leg.

Munida japonica Stimpson, 1858

Fig. 9

Munida japonica Stimpson, 1858 : 252. — MIYAKE & BABA, 1967 : 240, figs 11, 12 (part).
Not *M. japonica* - TÜRKAY, 1986 : 130 (= *M. dispar*).
Not *M. japonica* - BABA, 1990 : 964 (= *M. sphinx* and *M. limula*).

MATERIAL EXAMINED. — **Japan**. 33°59.4'N, 128°48'E, 102 m, 19.06.1964 : 4 ♂ 7.7-10.5 mm; 1 ov. ♀ 7.4 mm; 1 ♀ 8.0 mm (ZLKU 10771).

Off Makura-zaki, Kagoshima Pref., 31°04.6'N, 130°35.1'E, 145 m : 1 ov. ♀ 7.4 mm (MNHN-Ga 2337).

Philippines. MUSORSTOM 1 : stn 51, 170-200 m : 1 ♂ 8.9 mm (MNHN-Ga 2322). — Stn 63, 191–195 m : 1 ov. ♀ 6.1 mm (MNHN-Ga 2323).

MUSORSTOM 2 : stn 32, 192-220 m : 1 ♀ 5.7 mm (USNM).

TYPES. — The ovigerous female (7.4 mm) from Japan, Makura-zaki, Kagoshima Pref. (MNHN-Ga 2337) is selected as neotype.

DESCRIPTION. — (Neotype). Carapace, excluding rostrum, slightly longer than wide. Transverse ridges mostly interrupted. Posteriormost principal stria interrupted on intestinal region. Secondary striae present. Row of 14 spines flanking 2 unpaired spines in midline behind rostrum. Small parahepatic spine on each side. Anterior branchial region with spine directly behind midlength of anterior bifurcation of cervical groove. Postcervical spine present on each side.

Front margins somewhat oblique. Lateral margins slightly convex; first lateral spine well developed, situated on anterolateral angle, distinctly overreaching level of sinus between rostrum and supraocular spine, second spine very small, third spine somewhat larger than preceding. Anterior branchial margin with 5 lateral spines.

Rostrum spiniform, broken. Supraocular spine not reaching end of corneae, slightly divergent anteriorly and directed upwards.

Thoracic sternites scarcely squamate. Fourth sternite with several transverse striae; no granules on lateral parts of seventh sternite.

Anterior ridge of second abdominal segment with 2 small spines on each side, unarmed medially. Second to fourth segments with transverse furrow and several uninterrupted striae. Fifth segment with several uninterrupted striae.

Eyes moderately large, maximum corneal diameter about one-third distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) about one-third to one-quarter carapace length, elongate, reaching end of corneae, with 2 subequal terminal and 2 lateral spines, proximal lateral short, located at midlength of segment, distal lateral relatively long, overreaching terminal spines.

First segment of antennal peduncle with long distomesial spine overreaching third segment; second segment with 2 long distal spines (mesial one longer than lateral, distinctly overreaching antennal peduncle) and small but distinct median spine on mesial margin; third segment unarmed on left appendage, armed with small distolateral spine on right appendage.

Ischium of third maxilliped about 1.5 times length of merus, distoventrally bearing strong spine; merus with 3 (on left appendage) or 2 (on right) spines on flexor border, proximal one much longer; extensor margin with distinct distal spine.

Chelipeds squamate, subequal, with iridescent setae more dense on mesial borders of articles. Right cheliped about 3 times as long as carapace; merus with rather large spines on mesial, dorsal and ventral borders; carpus with mesial row of spines much larger than several spines scattered in rows on dorsal and ventral sides; palm with 2 spaced lateral spines, distal 2 small; movable finger mesially with 3 spines on proximal half of length and 1 subterminal spine; fingers distally curving and crossing, ending in sharp point; cutting edges nearly straight on movable finger, somewhat sinuous on fixed finger.

Walking legs slender, furnished with long, plumose and iridescent setae on dorsal margins and short setae on lateral borders. First walking legs about twice carapace length; propodus 4.5 times as long as high and 1.5 times dactylus length; merus with row of 9 dorsal spines increasing in size distally, 2 spines on distal half of ventral margin; distal spines of these prominent and subequal in size; carpus with long distal spine on dorsal and ventral borders and 3 additional spines on dorsal margin; propodus with row of 11 movable ventral spines; dactylus slender, slightly curving distally, with 6 movable small spines along ventral margin, unarmed on nearly distal third of length. Second walking legs similar to first. Third walking legs shorter than first and second, with less pronounced spinulation; merus about one-third that of first walking leg. Epipods absent from all pereopods.

REMARKS. — The rostrum in the intact specimens is nearly straight, directed upwards, its length varying from one-half to two-thirds the postorbital carapace length.

Munida japonica strongly resembles *M. melite* sp. nov. from the Philippines where they have been collected together, in having the basal antennular segment with subequal terminal spines, the sternum with fewer striae, and the merus of the third maxilliped with a distinct distal spine on the extensor margin. They may be distinguished by the following differences :

— The posteriormost stria in the intestinal region of the carapace is interrupted in *M. japonica*, uninterrupted in *M. melite*.

— The second abdominal segment in *M. japonica* bears dorsal spines that are restricted to the lateral portions of the anterior ridge, whereas in *M. melite* there are 8 spines distributed along the whole dorsal ridge.

— The antennular basal segment, excluding spines, in *M. melite* distinctly overreaches the cornea, instead of reaching end of cornea, as in *M. japonica*.

In this paper, we do not revised all the material identified as *M. japonica* by previous workers, only that of MIYAKE and BABA (1967), TÜRKAY (1986) and BABA (1990). The wider revision will be considered later.

SIZE. — Males, 7.7-10.5 mm; females, 5.7-8.0 mm; ovigerous females from 6.1 mm.

DISTRIBUTION. — Japan and the Philippines, in 102-220 m.

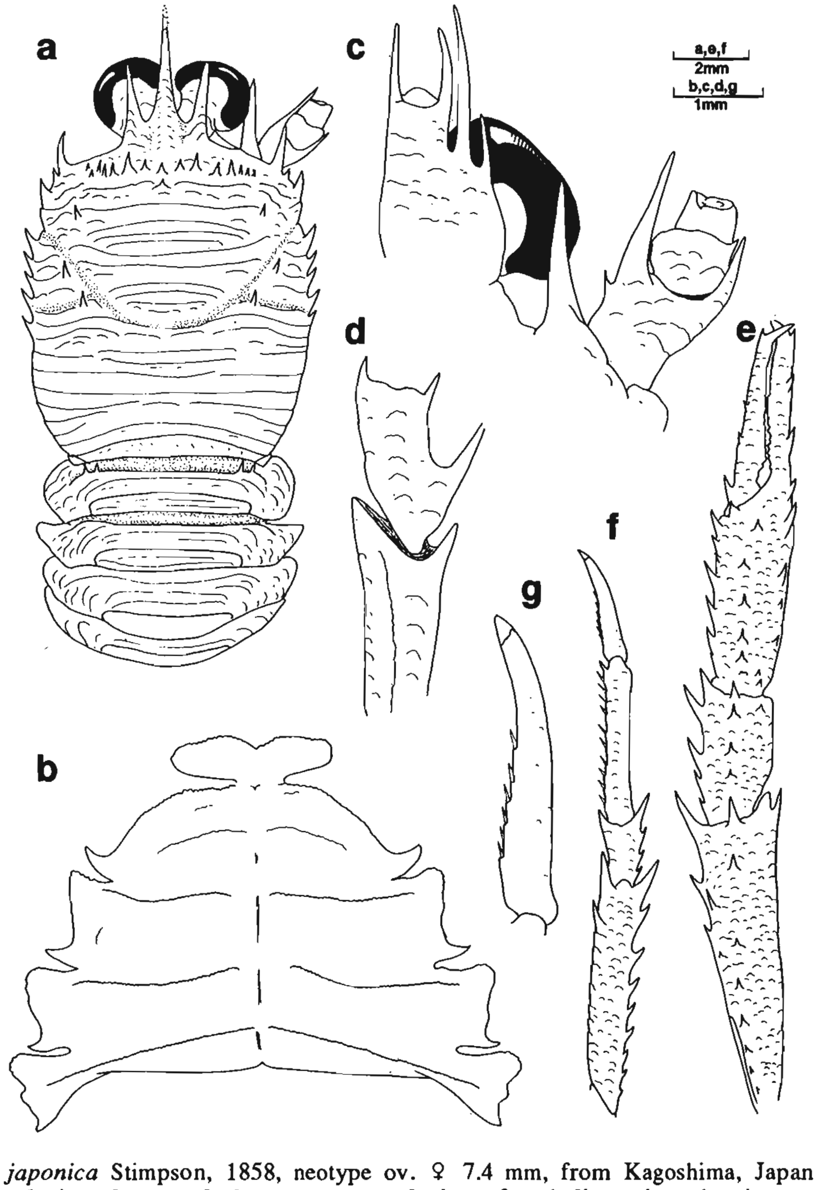

FIG. 9. — *Munida japonica* Stimpson, 1858, neotype ov. ♀ 7.4 mm, from Kagoshima, Japan (MNHN-Ga 2337) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, left first walking leg, lateral view; **g**, dactylus, left first walking leg.

Munida laevis sp. nov.

Fig. 10

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 63, 191-195 m : 1 ov. ♀ 5.7 mm; 2 ♀ 4.7, 5.7 mm (MNHN-Ga 2333). — Stn 71, 174-204 m : 1 ov. ♀ 6.7 mm (MNHN-Ga 2334).
MUSORSTOM 3 : stn 130, 178-195 m : 1 ♂ 5.8 mm (MNHN-Ga 2336).

TYPES. — The ovigerous female from MUSORSTOM 1, stn 71 (MNHN-Ga 2334), is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The Latin *laevis*, smooth, polished, refers to the smooth thoracic sternites.

DESCRIPTION. — Frontal margins of carapace nearly transverse. Posteriormost principal stria not interrupted. Fourth thoracic sternite with several arcuate striae; fifth to seventh sternites without striae; no granules on lateral parts of seventh sternite. Abdominal segments unarmed, second to fourth segments with several striae. Eyes large. Basal antennular segment (distal spines excluded) slightly overreaching corneae; 2 terminal spines subequal in size. First antennal segment with distomesial spine reaching second segment; second segment with long distomesial spine overreaching antennal peduncle. Extensor border of merus of the third maxilliped with small distal spine. Cheliped having fixed finger with several spines along lateral border, movable finger with 1 basal and 1 distal spine on mesial border. Dactylus of walking legs with movable small spines along ventral margin, but unarmed on distal third of length.

REMARKS. — *Munida laevis* sp. nov. is closely related to *M. sphinx* sp. nov. from Madagascar and Indonesia in the basal antennular segment bearing the terminal spines of subequal size, the merus of the third maxilliped bearing a distal spine on the extensor margin, and the sternum bearing few striae. These two species are differentiated by the following particulars :
— The movable finger of the cheliped in *M. sphinx* bears two or three spines between the basal and distal spines, which are absent in *M. laevis*.
— The second abdominal segment bears five to nine dorsal spines in *M. sphinx*, none in *M. laevis*.

SIZE. — Male, 5.8 mm; females, 4.7-6.7 mm; ovigerous females from 5.7 mm.

DISTRIBUTION. — Philippines, in 174-204 m.

Munida limula sp. nov.

Fig. 11

Munida japonica - BABA, 1990 : 925 (key), 964 (part). Not *M. japonica* Stimpson, 1858.

MATERIAL EXAMINED. — **Madagascar.** *"Vauban"* : stn CH 71, 25°13.1'S, 47°17.8'E, 105-115 m, 3.03.1973 : 4 ♂ 4.6–7.0 mm; 1 ov. ♀ 5.3 mm (MNHN-Ga 1471). — Stn CH 72, 25°11.2'S, 47°14.7'E, 85-90 m, 3.03.1973 : 1 ♂ 3.6 mm; 2 ov. ♀ 4.8, 5.5 mm (MNHN-Ga 1479 and 2335). — Stn CH 75, 25°06.1'S, 46°56.2'E, 42 m, 4.03.1973 : 1 ov. ♀ 3.8 mm (MNHN-Ga 1472). — Ste Luce, S coast, 50 m, 10.1958 : 1 ov. ♀ 4.6 mm (MNHN-Ga 2259).

TYPES. — One of the ovigerous females (4.8 mm) from stn CH 72 (MNHN-Ga 2335) is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — From the Latin *limulus*, oblique, referring to the oblique front margins.

DESCRIPTION. — Front margins of carapace moderately oblique. Posteriormost principal stria interrupted on intestinal region. Secondary striae present. Branchial margin with usually 5, rarely 6 spines. Parahepatic spines 1–3 in number. Fourth and fifth thoracic sternites with several short arcuate striae; sixth and seventh sternites

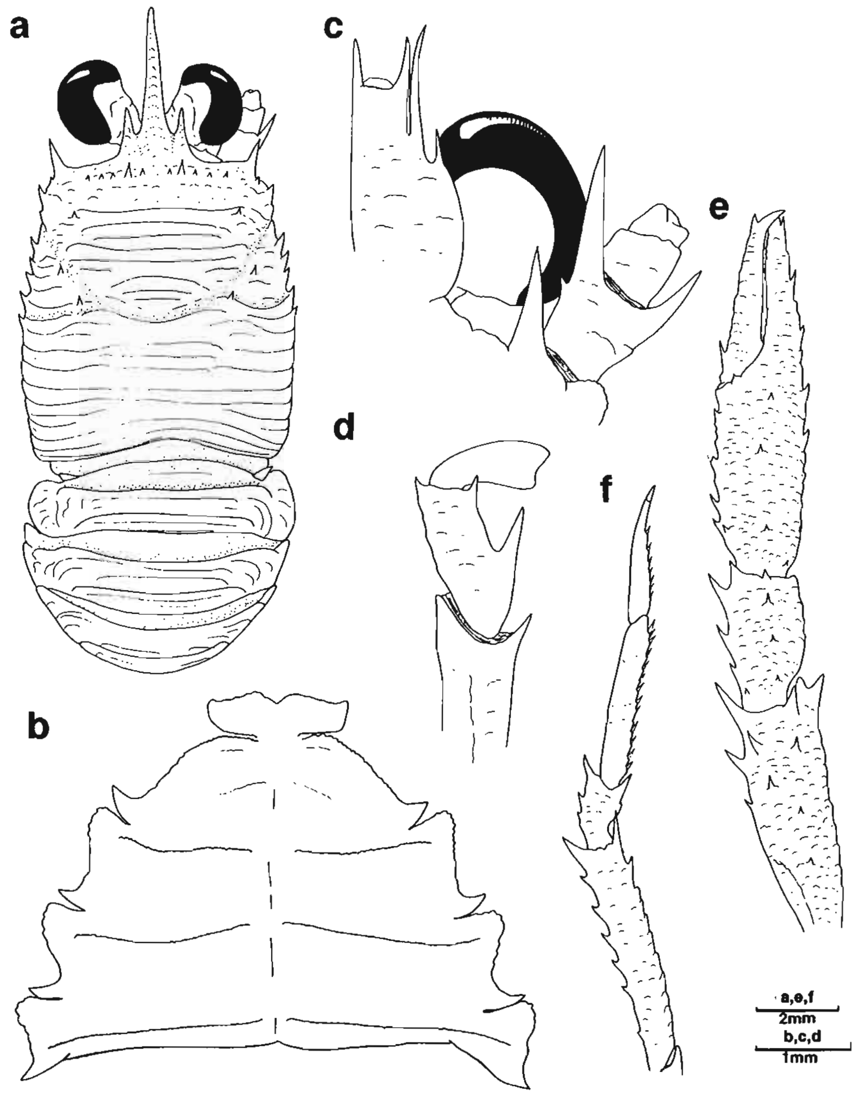

FIG. 10. — *Munida laevis* sp. nov., holotype ov. ♀ 6.7 mm, from the Philippines, MUSORSTOM 1, Stn 71, 174-204 m (MNHN-Ga 2334) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, carpus, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view.

without striae; lateral parts of seventh sternite with granules. Second abdominal segment with row of 8 spines on anterior ridge. Second to fourth segments with several transverse uninterrupted striae. Eyes large. Basal segment of antennule (terminal spines excluded) not overreaching corneae, distomesial spine longer than distolateral. First antennal segment with distomesial spine slightly overreaching second segment; second segment with distomesial spine slightly overreaching antennal peduncle. Extensor border of merus of third maxilliped with one distal spine. Cheliped having fixed finger with row of spines along lateral border; movable finger mesially with basal and distal spines, and 4 additional spines on proximal half of length. Dactylus of walking legs with 7 movable spinules along nearly whole ventral margin.

REMARKS. — The presence of granules on the lateral parts of the seventh sternite and the antennular basal segment bearing a distomesial spine longer than the distolateral link the new species to *M. honshuensis* Benedict from Japan, but they differ in the following respects :

— The front margins are more oblique in the new species.

— The first lateral spine of the carapace in *M. limula* is short, not reaching the level of the sinus between the rostrum and the supraocular spine. In *M. honshuensis*, this spine is long, overreaching the sinus.

— The posteriormost principal stria on the dorsal surface of the carapace is interrupted on the intestinal region in *M. limula*, uninterrupted in *M. honshuensis*.

— The mesial spine of the first antennal segment in *M. honshuensis* slightly overreaches the antennal peduncle, instead of slightly overreaching the second segment as in *M. limula*.

SIZE. — Males, 3.6-7.0 mm; females, 3.8-5.5 mm; ovigerous females from 3.8 mm.

DISTRIBUTION. — Madagascar, in 42-115 m.

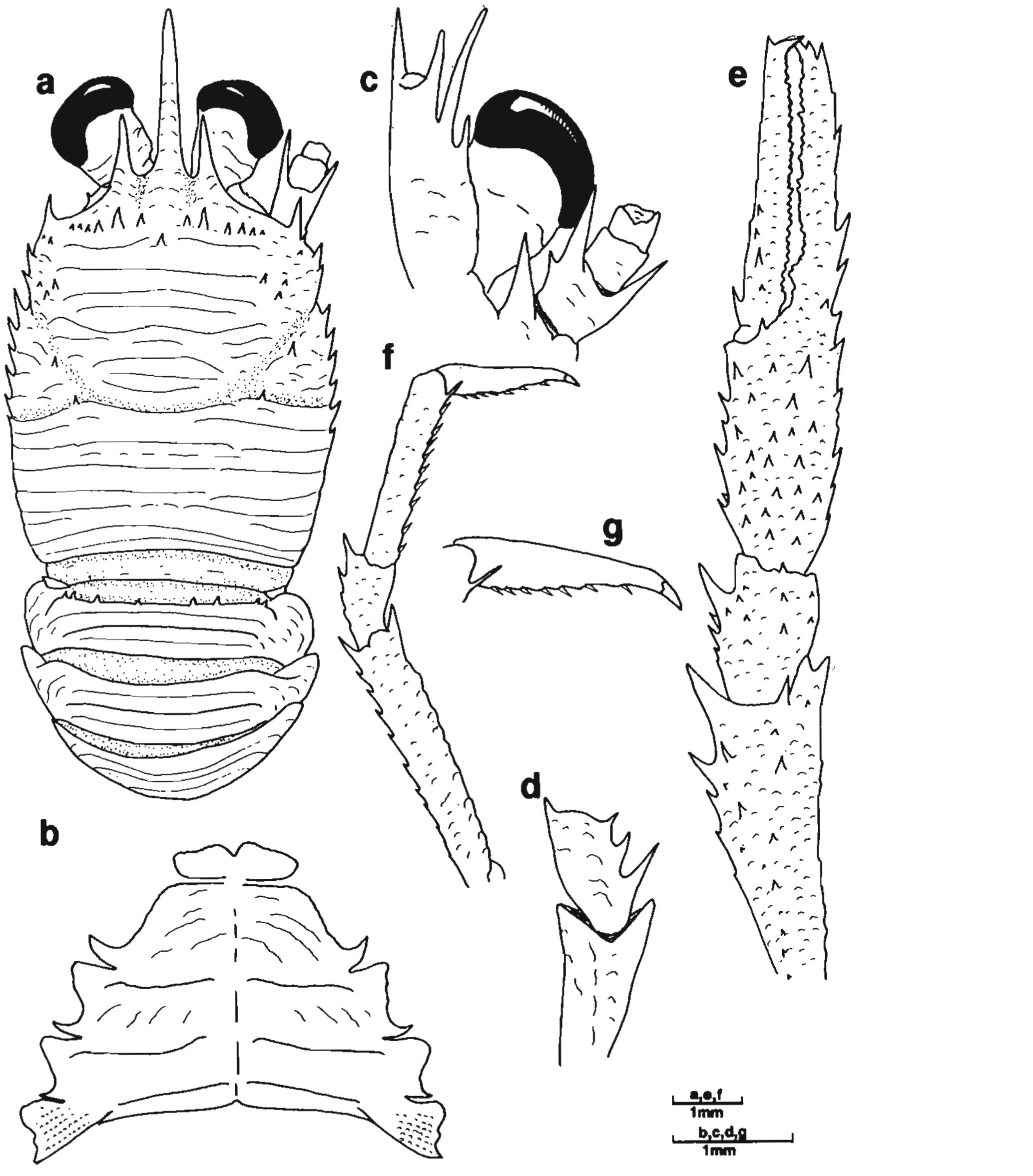

FIG. 11. — *Munida limula* sp. nov., holotype ov. ♀ 4.8 mm, from Madagascar, *"Vauban"*, Stn CH 72, 85-90 m (MNHN-Ga 2335) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

Munida melite sp. nov.

Fig. 12

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 51, 170-200 m : 1 ♂ 8.9 mm (holotype, MNHN-Ga 2320); 1 ♂ 15.8 mm; 1 ♀ 7.9 mm (paratypes, MNHN-Ga 2321).

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (*Melite*).

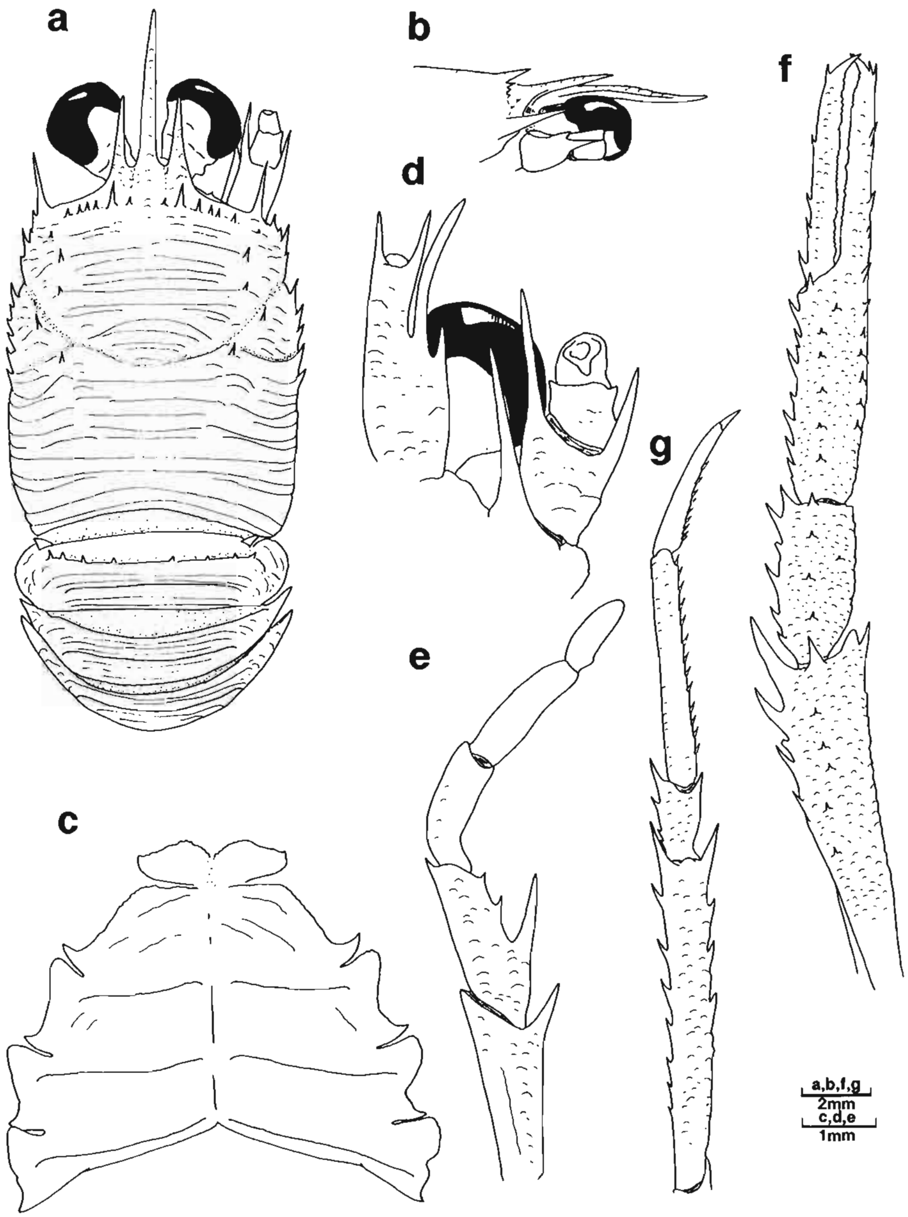

FIG. 12. — *Munida melite* sp. nov., holotype ♂ 8.9 mm, from the Philippines, MUSORSTOM 1, Stn 51, 170-200 m (MNHN-Ga 2320) : **a**, carapace, dorsal view; **b**, anterior part of carapace, lateral view; **c**, sternal plastron; **d**, ventral view of cephalic region, showing antennular and antennal peduncles; **e**, endopod of right third maxilliped, lateral view; **f**, right cheliped, dorsal view; **g**, right first walking leg, lateral view.

DESCRIPTION. — Front margins of carapace somewhat oblique. Posteriormost principal stria not interrupted. Secondary striae present. Fourth thoracic sternite with several short arcuate striae; fifth to seventh sternites with several longitudinal oblique striae; lateral parts of seventh sternite without granules. Second abdominal segment with row of 8 spines on anterior ridge. Eyes large. Basal antennular segment (distal spines excluded) overreaching corneae; 2 terminal spines subequal in size. First antennal segment with strong distomesial spine overreaching third segment; second segment with long distomesial spine overreaching antennal peduncle. Fixed finger of cheliped with row of spines along lateral margin; movable finger with row of spines along whole mesial border. Dactylus of walking legs with movable small spines along proximal two-thirds of ventral margin.

REMARKS. — *Munida melite* is found together with the closely related *M. japonica* Stimpson from Japan and the Philippines. Their relationships are discussed under "Remarks" of *M. japonica* (see above).

DISTRIBUTION. — Philippines, in 170-200 m.

Munida nesaea sp. nov.

Fig. 13

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 1 : stn 9, 180-194 m : 1 ♂ 8.8 mm (MNHN-Ga 3251). — Stn 10, 178-205 m : 2 ♂ 8.1, 13.8 mm; 1 ♀ 11.2 mm (MNHN-Ga 3228). — Stn 24, 189-209 m : 2 ♂ 8.3, 12.0 mm; 3 ♀ 10.1-12.4 mm (MNHN-Ga 2314). — Stn 25, 191-200 m : 2 ♂ 11.5, 13.6 mm (MNHN-Ga 3229). — Stn 36, 187-210 m : 1 ov. ♀ 11.2 mm (MNHN-Ga 2315). — Stn 63, 191-195 m : 1 ♂ 8.6 mm (MNHN-Ga 3250). — Stn 64, 194-195 m : 1 ♂ 6.2 mm (MNHN-Ga 2316).

MUSORSTOM 2 : stn 64, 191-195 m : 1 ♂ 5.7 mm (MNHN-Ga 3241). — Stn 67, 193-199 m : 1 ♂ 11.3 mm (MNHN-Ga 2317). — Stn 80, 178-205 m : 5 ♂ 9.5-11.8 mm; 2 ov. ♀ 8.3, 11.7 mm (MNHN-Ga 2318 and 2319).

MUSORSTOM 3 : stn 98, 194-205 m : 1 ♂ 8.5 mm (USNM). — Stn 103, 193-200 m : 1 ♀ 8.5 mm (USNM). — Stn 116, 804-812 m : 1 ♂ 12.0 mm (MNHN-Ga 3230).

TYPES. — One of the ovigerous females (11.7 mm) from MUSORSTOM 2, stn 80 (MNHN-Ga 2319) is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (*Nesaea*).

DESCRIPTION. — Front margins of carapace slightly oblique. Posteriormost stria not interrupted. Secondary striae present. Branchial dorsal spines behind anterior bifurcation of cervical groove occasionally absent. Thoracic sternites squamate, with numerous arcuate striae; no granules on lateral parts of seventh sternite; third thoracic sternite wider than anterior margin of following sternite. Second to fourth abdominal segments with several transverse striae; second abdominal segment with row of usually 6, rarely 8 spines on anterior ridge. Eyes moderately large. Basal antennular segment (terminal spines excluded) reaching corneae, 2 terminal spines subequal in size. First antennal segment with distomesial spine overreaching second segment; second segment with long distomesial spine overreaching third segment. Extensor margin of merus of third maxilliped with small distal spine. Fixed finger of cheliped with several spines along lateral margin; movable finger with 3 spines on mesial border. Dactylus of walking legs with movable spinules along ventral margin, distal third unarmed.

REMARKS. — The sternum bearing numerous striae, the two terminal spines of the antennular basal segment subequal in size, the relatively short distomesial spine of the antennal segment, falling far short of the third segment, and the merus of the third maxilliped bearing a distinct distomesial spine on the extensor margin, link the species to *M. pherusa* sp. nov. from Japan, the Philippines and Indonesia. But they differ in the following particulars :

— The second abdominal segment is unarmed in *M. pherusa*, armed with 6-8 dorsal spines in *M. nesaea*.

— The third thoracic sternite is as wide as the of the anterior border of the following sternite in *M. pherusa*, wider in *M. nesaea*.

SIZE. — Males, 5.7-12.5 mm; females, 8.3-12.4 mm; ovigerous females from 8.3 mm.

DISTRIBUTION. — Philippines, in 178-812 m.

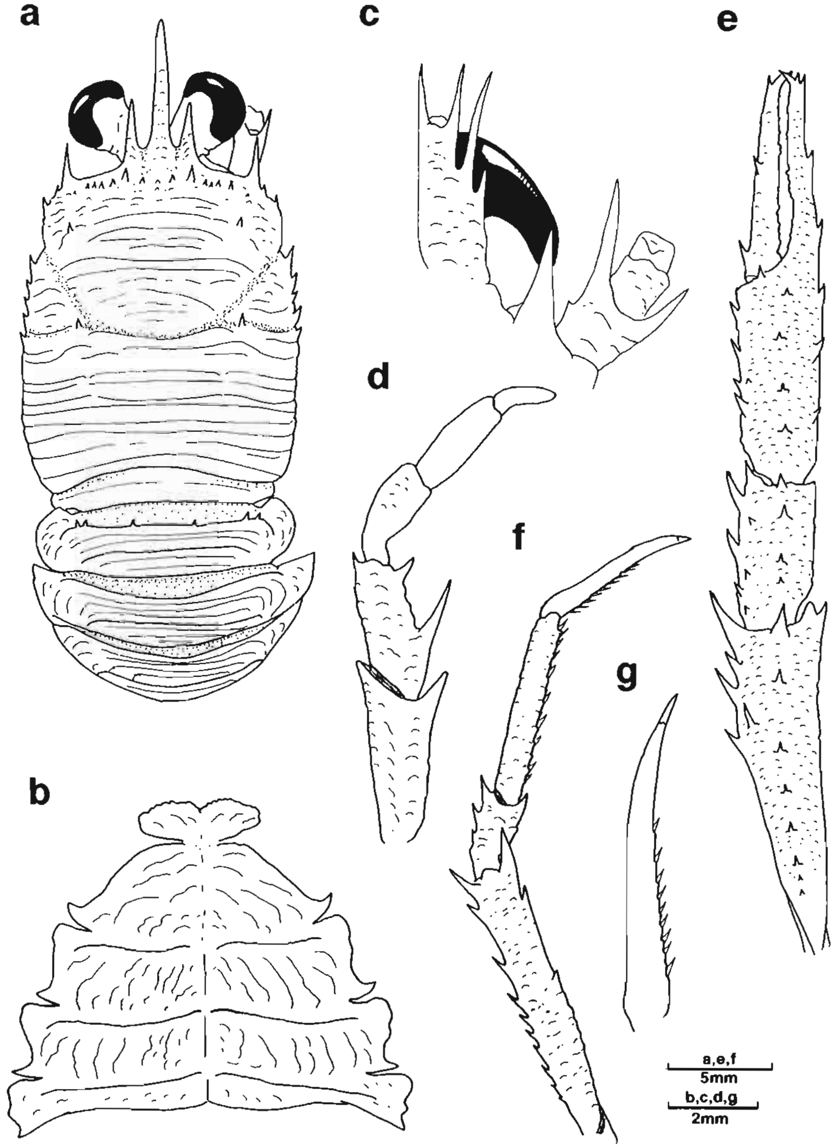

FIG. 13. — *Munida nesaea* sp. nov., holotype ov. ♀ 11.7 mm, from the Philippines, MUSORSTOM 2, Stn 80, 178-205 m (MNHN-Ga 2319) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, endopod of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

Munida oritea sp. nov.

Fig. 14

Munida heteracantha - BABA, 1988 : 104, fig. 38. Not *M. heteracantha* Ortmann, 1892.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 11, 217-230 m : 1 ov. ♀ 15.9 mm (MNHN-Ga 2293). — Stn 20, 208-222 m : 1 ov. ♀ 14.3 mm (MNHN-Ga 2294). — Stn 21, 174-223 m : 2 ♀ 12.0, 14.7 mm (MNHN-Ga 2295). — Stn 26, 189 m : 2 ov. ♀ 12.6, 13.3 mm (MNHN-Ga 2296). — Stn 40, 265-287 m : 7 ♂ 8.2–15.1 mm; 1 ov. ♀ 11.4 mm; 4 ♀ 7.7-9.0 mm (USNM).

MUSORSTOM 2 : stn 26, 299-320 m : 11 ♂ 11.0-16.1 mm; 5 ov. ♀ 12.5-13.5 mm (MNHN-Ga 2297). — Stn 75, 300-320 m : 1 ov. ♀ 11.5 mm (MNHN-Ga 2298). — Stn 83, 318-320 m : 10 ♂ 6.3-14.4 mm : 10 ov. ♀ 11.0-14.6 mm (MNHN-Ga 2299).
MUSORSTOM 3 : stn 92, 224 m : 3 ♂ 7.0-9.0 mm; 3 ♀ 7.5-9.5 mm (MNHN-Ga 2300). — Stn 143, 205-214 m : 1 ♂ 14.5 mm (MNHN-Ga 2301).

TYPES. — The ovigerous female from MUSORSTOM 1, stn 20 (MNHN-Ga 2294) is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (*Oritea*).

DESCRIPTION. — Front margins of carapace slightly oblique. Posteriormost principal stria interrupted on intestinal region. Numerous secondary striae. Parahepatic and anterior branchial dorsal spines occasionally absent. Thoracic sternites with numerous striae; lateral parts of seventh sternite without granules. Second to fourth abdominal segments with several transverse striae; row of 10-11 spines on anterior ridge of second segment. Eyes moderately large. Basal antennular segment (terminal spines excluded) distinctly overreaching corneae, bearing 2 subequal distal spines. First antennal segment with long distomesial spine overreaching third segment; second segment with distomesial spine overreaching antennal peduncle. Extensor border of merus of third maxilliped lacking spine. Cheliped having fixed finger with row of spines along lateral border; movable finger mesially with 1 proximal and 1 distal spine. Dactylus of walking legs with movable small spines along nearly whole ventral margin.

REMARKS. — The new species is related to *M. semoni* Ortmann from Indonesia and *M. striola* sp. nov. from Japan and Indonesia in the merus of the third maxilliped unarmed on the extensor margin. Their relationships are discussed under "Remarks" of *M. striola* (see below).

SIZE. — Males, 6.3-16.1 mm; females, 7.5-15.9 mm; ovigerous females from 11.0 mm.

DISTRIBUTION. — Philippines, in 174-320 m.

Munida pherusa sp. nov.

Fig. 15

MATERIAL EXAMINED. — **Japan**. 33°59.4'N, 128°48'E, 102 m, 19.06.1964 : 1 ♂ 6.0 mm; 1 ♀ 7.2 mm (ZLKU 10771). — 34°00.7'N, 129°19.4'E, 110 m, 20.06.1964 : 2 ♂ 6.5, 8.5 mm; 1 ov. ♀ 5.7 mm; 1 ♀ (broken) (ZLKU 10637).
Philippines. MUSORSTOM 1 : stn 57, 96-107 m : 1 ♂ 5.0 mm (MNHN-Ga 2330).
MUSORSTOM 2 : stn 6, 136-152 m : 1 ♂ 6.0 (MNHN-Ga 2338).
MUSORSTOM 3 : stn 121, 73-84 m : 1 ♂ 8.7 mm; 1 ♀ 9.0 mm (MNHN-Ga 2331).
Indonesia. CORINDON 2 : stn 206, 85 m : 1 ♂ 7.0 mm (MNHN-Ga 2332).

TYPES. — The male from MUSORSTOM 2, stn 6 (MNHN-Ga 2338), is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (*Pherusa*).

DESCRIPTION. — Front margins of carapace slightly oblique. Posteriormost principal stria not interrupted. Secondary striae present. Thoracic sternites with numerous short arcuate and transverse oblique striae; lateral parts of seventh sternite lacking granules; third thoracic sternite as wide as anterior margin of following sternite. Abdominal segments unarmed; second to fourth segments with several striae. Eyes large. Basal antennular segment (distal spines excluded) ending at level of corneae; 2 terminal spines subequal in size. First antennal segment with distomesial spine overreaching second segment but falling short of end of third segment; second segment with long distomesial spine slightly overreaching antennal peduncle. Extensor border of merus of third maxilliped with distinct distal spine. Fixed finger of cheliped with row of spines along lateral margin, movable finger with basal

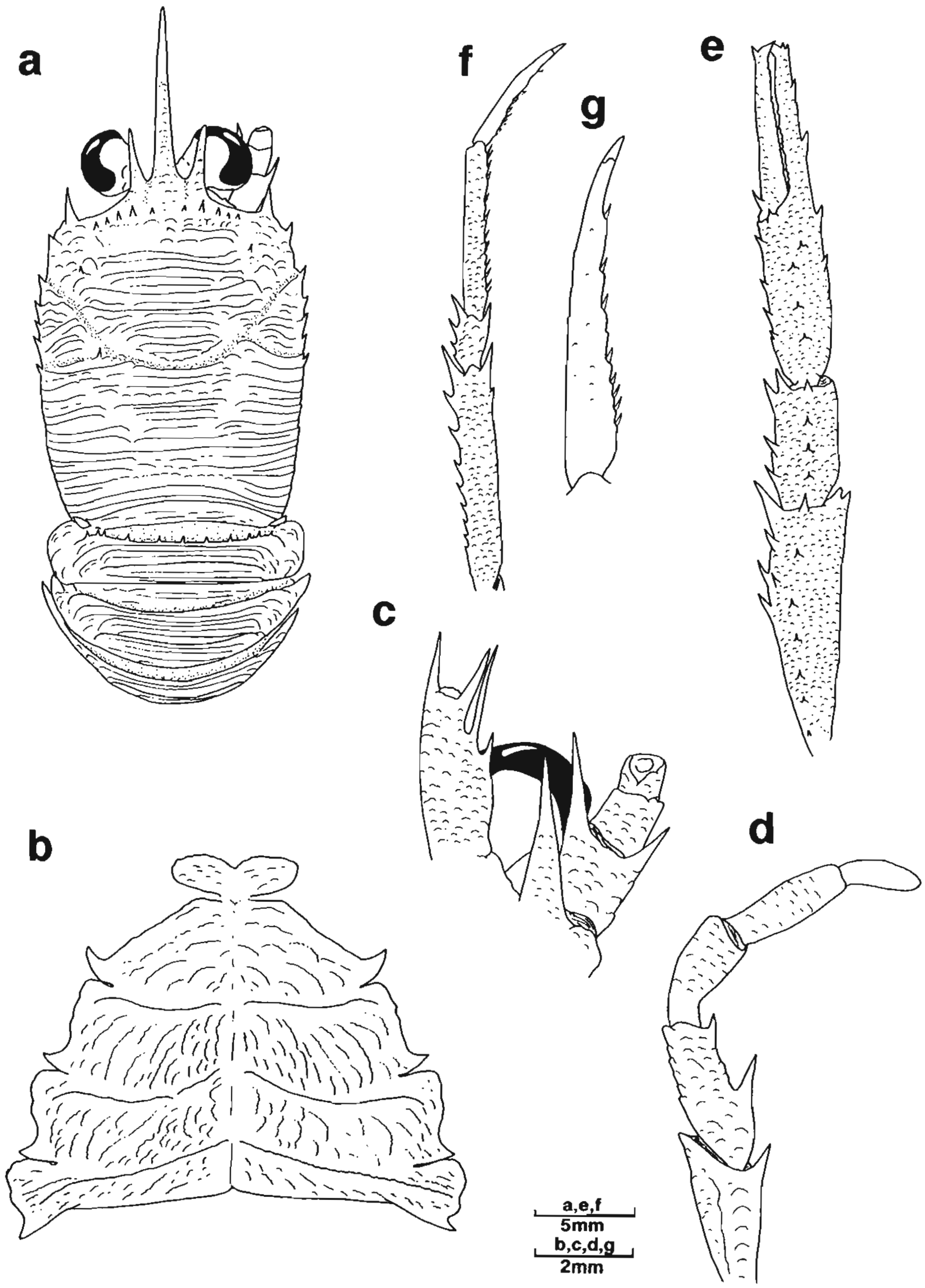

FIG. 14. — *Munida oritea* sp. nov., holotype ov. ♀ 14.3 mm, from the Philippines, MUSORSTOM 1, Stn 20, 208-222 m (MNHN-Ga 2294) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, endopod of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

and subterminal spines on mesial margin and another 2 small ones on proximal half slightly dorsal to mesial margin. Dactylus of walking legs with 6 movable small spines along ventral margin, terminal third unarmed.

REMARKS. — The new species is close to *M. nesaea* sp. nov. from the Philippines in having the sternum with numerous striae and the merus of the third maxilliped bearing a distinct distal spine on the extensor margin. The relationships between the two are discussed under the Remarks of *M. nesaea* (see above).

SIZE. — Males, 5.0-8.7 mm; females, 5.7-9.0 mm; ovigerous females from 5.7 mm.

DISTRIBUTION. — Japan, the Philippines and Indonesia, in 73-152 m.

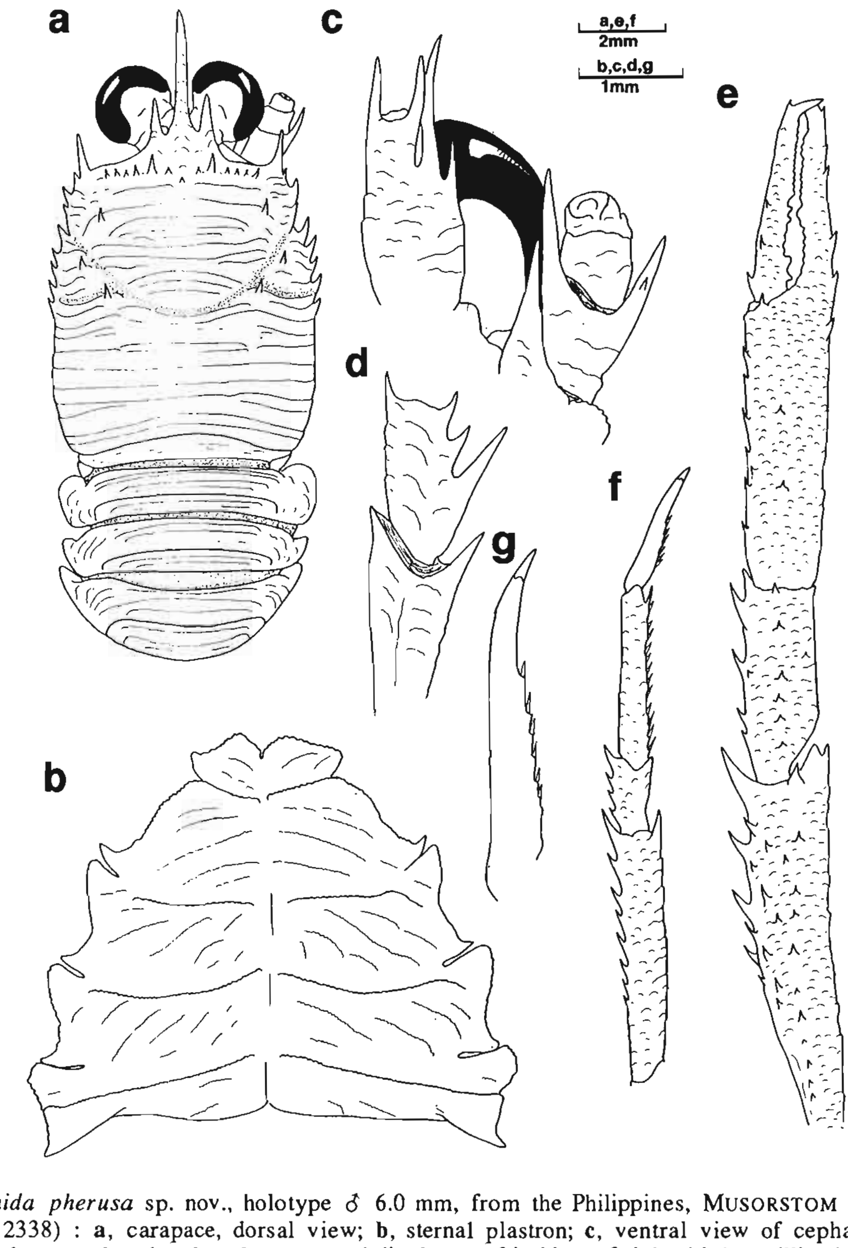

FIG. 15. — *Munida pherusa* sp. nov., holotype ♂ 6.0 mm, from the Philippines, MUSORSTOM 2, Stn 6, 136-152 m (MNHN-Ga 2338) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

Munida philippinensis sp. nov.

Fig. 16

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 1 : stn 5, 186-187 m : 1 ♀ 5.3 mm (MNHN-Ga 2303). — Stn 9, 180-194 m : 1 ♂ 4.9 mm; 1 ov. ♀ 6.8 mm (MNHN-Ga 2304). — Stn 10, 187-205 m : 1 ♀ 4.9 mm (MNHN-Ga 3246). —

Stn 14, 190 m : 1 ♀ 6.3 mm (MNHN-Ga 3236). — Stn 18, 150-159 m : 2 ♀ 4.7, 6.0 mm (MNHN-Ga 3245). — Stn 27, 188-192 m : 1 ♀ 4.0 mm (MNHN-Ga 2305). — Stn 31, 187-195 m : 1 ov. ♀ 6.5 mm (MNHN-Ga 3247). — Stn 34, 188-191 m : 3 ♂ 5.1-5.3 mm; 2 ov. ♀ 5.4, 5.6 mm; 1 ♀ 5.2 mm (MNHN-Ga 3222). — Stn 35, 186-187 m : 1 ♀ 5.2 mm (MNHN-Ga 3223). — Stn 36, 187-210 m : 1 ov. ♀ 6.0 mm (MNHN-Ga 3243). — Stn 62, 179-194 m : 1 ♂ 4.8 mm; 2 ♀ 5.0, 5.3 mm (MNHN-Ga 3245). — Stn 63, 191-193 m : 1 ♂ 6.0 mm; 1 ov. ♀ 5.3 mm (MNHN-Ga 3243). — Stn 64, 194-195 m : 4 ♂ 5.0-6.8 mm; 4 ov. ♀ 5.3-6.6 mm (MNHN-Ga 2306, 3312).

MUSORSTOM 2 : stn 1, 188-198 m : 2 ♂ 5.5, 5.7 mm (MNHN-Ga 3233). — Stn 2, 184-186 m : 1 ♂ 3.3 mm; 1 ov. ♀ 6.1 mm (MNHN Ga 3224). — Stn 10, 188-195 m : 3 ♂ 6.2 -6.4 mm; 3 ov. ♀ 6.4-7.6 mm (USNM). — Stn 11, 194-196 m : 1 ♂ 4.8 mm (MNHN-Ga 3240). — Stn 21, 191-192 m : 1 ♂ 5.3 mm; 1 ov. ♀ 6.7 mm (MNHN-Ga 3225). — Stn 51, 170-187 m : 1 ov. ♀ 6.9 mm (MNHN-Ga 2307). — Stn 62, 196-189 m : 1 ov. ♀ 5.3 mm (MNHN-Ga 3226). — Stn 63, 215-230 m : 1 ♂ 6.6 mm (MNHN-Ga 3237). — Stn 67, 193-199 m : 1 ov. ♀ 6.0 mm (MNHN-Ga 3239). — Stn 68, 195-199 m : 1 ♂ 5.0 mm (MNHN-Ga 3234). — Stn 71, 189-197 m : 1 ♂ 5.7 mm; 1 ov. ♀ 6.2 mm (MNHN-Ga 3235). — Stn 72, 182-197 m : 3 ♂ 5.4-6.1 mm; 1 ov. ♀ 5.3 mm; 1 ♀ 6.4 mm (MNHN-Ga 3238). — Stn 80, 178-205 m : 2 ♂ 5.9, 6.4 mm; 6 ov. ♀ 5.3-8.1 mm (MNHN-Ga 2308).

MUSORSTOM 3 : stn 87, 191-197 m : 1 ♀ 7.2 mm (MNHN-Ga 2309). — Stn 101, 194-196 m : 1 ov. ♀ 6.8 mm (MNHN-Ga 3248). — Stn 103, 193-200 m : 1 ♂ 5.3 mm (MNHN-Ga 2310). — Stn 108, 188-195 m : 3 ov. ♀ 5.6-7.4 mm (MNHN-Ga 2311). — Stn 120, 219-220 m : 1 ov. ♀ 6.9 mm (MNHN-Ga 2312). — Stn 130, 178-195 m : 1 ov. ♀ 4.9 mm (MNHN-Ga 3249).

TYPES. — One of the males (6.8 mm) from MUSORSTOM 1, stn 64 (MNHN-Ga 3312) is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The specific name is suggested by the type-locality of the species.

DESCRIPTION. — Front margins of carapace slightly oblique. Posteriormost stria not interrupted. Secondary striae present. No spine other than 5 or 6 pairs of epigastric spines. Thoracic sternites squamate, with numerous arcuate striae; no granules on lateral parts of seventh sternite. Second to fourth abdominal segments with several transverse striae; second abdominal segment with 2 submedian spines on anterior ridge. Eyes moderately large. Basal antennular segment (terminal spines excluded) not overreaching corneae, 2 terminal spines subequal in size. First antennal segment with distomesial spine slightly overreaching second segment; second segment with long distomesial spine overreaching third segment. Merus of third maxilliped with 2 spines on flexor margin; extensor margin with distal spine. Movable and fixed fingers of cheliped each with one proximal and one distal spine. Dactylus of walking legs with small movable spines along ventral margin, terminal third unarmed.

REMARKS. — *Munida philippinensis* is very close to *M. inornata* Henderson, 1885, in having the second abdominal segment with 2 median spines on the anterior border, the distal spines of the antennular basal segment subequal and the merus of the third maxilliped with a distal spine on the extensor margin. The differences between the two are discussed under "Remarks" of *M. inornata* (see above).

SIZE. — Males, 3.3-12.5 mm; females, 8.3-12.4 mm; ovigerous females from 4.9 mm.

DISTRIBUTION. — Philippines, in 170-220 m.

Munida semoni Ortmann, 1894

Fig. 17

Munida semoni Ortmann, 1894 : 24, pl. 1, figs 4, 4i.
Not *Munida semoni* - BARNARD, 1950 : 491, fig. 92c (= *Munida* sp., see below).

MATERIAL EXAMINED. — **Indonesia.** Ambon : 1 ♂ 5.5 mm, lectotype (SM).

DESCRIPTION. — (Lectotype). Carapace, excluding rostrum, slightly longer than wide. Transverse ridges mostly interrupted. Secondary striae present. Epigastric region with row of 6 pairs of spines flanking 2 unpaired spines behind rostrum, largest pair directly behind supraocular spines. Parahepatic and hepatic spines distinct

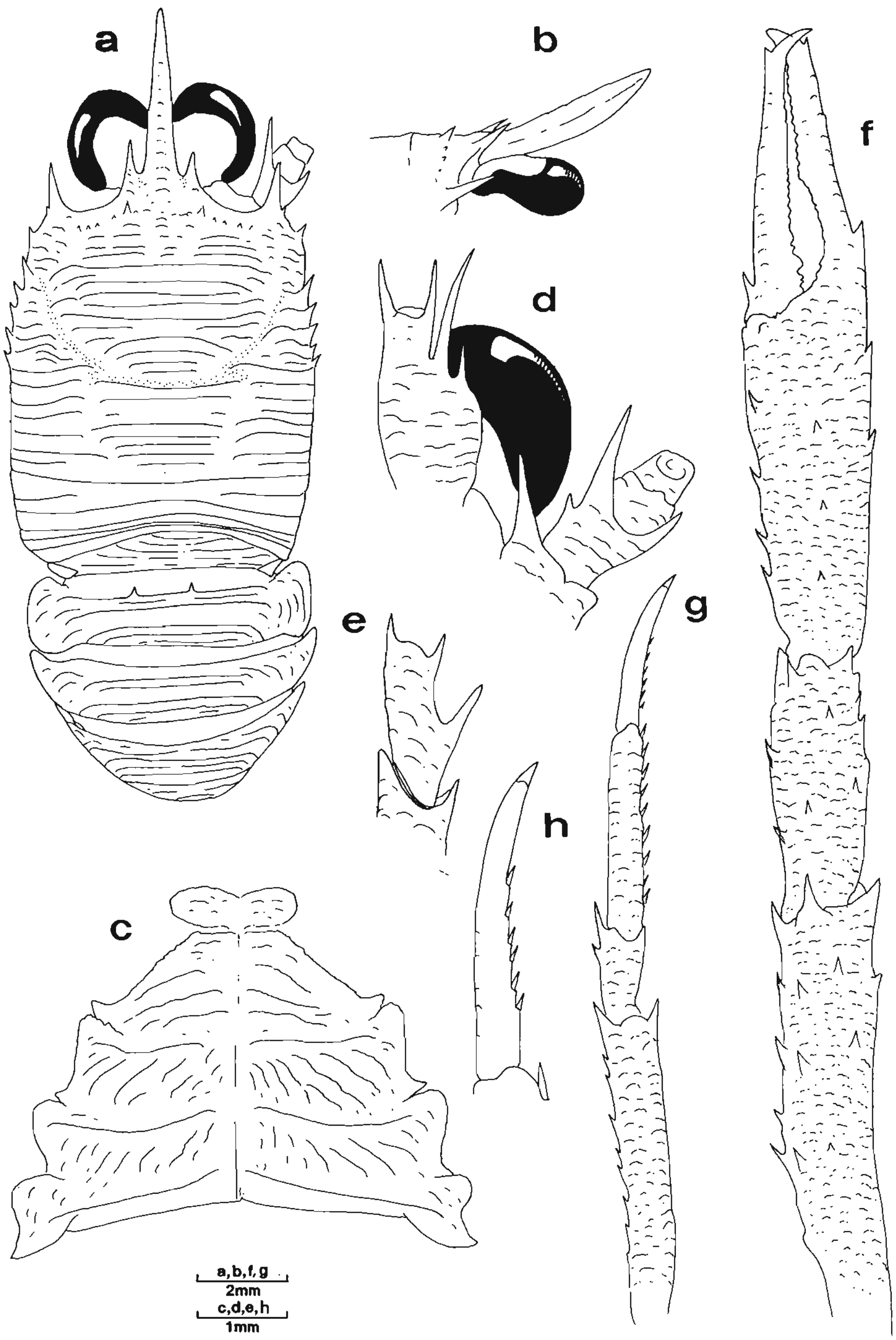

FIG. 16. — *Munida philippinensis* sp. nov., holotype ♂ 6.8 mm, from the Philippines, MUSORSTOM 1, Stn 64, 194-195 m (MNHN Ga-3312) : **a**, carapace, dorsal view; **b**, anterior part of cephalothorax, lateral view; **c**, sternal plastron; **d**, ventral view of cephalic region, showing antennular and antennal peduncles; **e**, merus and distal part of ischium of right third maxilliped, lateral view; **f**, right cheliped, dorsal view; **g**, right first walking leg, lateral view; **h**, dactylus, right first walking leg.

on each side. Anterior branchial region with spine behind midlength of anterior bifurcation of cervical groove. Postcervical spine on each side.

Front margins transverse. Lateral margins slightly convex (right side more convex due to bopyrid parasite); first lateral spine well developed, situated on anterolateral angle, reaching level of sinus between rostrum and supraocular spine, followed by 2 (right) or 3 (left) small spines in front of cervical groove. Anterior branchial margin with 5 spines of subequal size.

Rostrum spiniform, one-half as long as remaining carapace, slightly sinuous in profile and horizontal. Supraocular spines long, nearly reaching end of cornea, subparallel and directed slightly upwards.

Fourth thoracic sternite with several short arcuate striae; fifth to seventh sternites without striae and granules.

Second abdominal segment with row of 6 spines on anterior ridge and 3 uninterrupted striae; third and fourth segments with 3 transverse striae : anterior first and second uninterrupted, third less pronounced and interrupted medially; fifth segment with 2 uninterrupted striae.

Eyes large, maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) about one-quarter carapace length, elongate, ending in level of corneae, with 2 subequal terminal and 2 lateral spines, proximal lateral short, located at midlength of segment, distolateral long, overreaching terminal spines. First segment of antennal peduncle with strong distomesial spine slightly overreaching second segment; second segment with 2 long distal spines, mesial one longer than lateral, overreaching antennal peduncle; third segment unarmed.

Ischium of third maxilliped about 1.5 times length of merus, with distoventral spine; merus with 3 well-developed spines on flexor border, proximal spine strongest, extensor margin lacking distinct spine.

Chelipeds and several walking legs missing. Right second walking leg slender, twice as long as carapace, bearing long, plumose and iridescent setae on dorsal margins and short setae on lateral borders; dactylus broken, slightly shorter than propodus; merus with row of 7 dorsal spines increasing in size distally, and long ventral spine distally; carpus with distal spine on dorsal and ventral borders, and 2 other spines on dorsal margin; propodus with row of 10 movable spines on ventral margin; dactylus relatively slender, slightly curving distally, with 6 movable small spines along proximal half of ventral margin, distal third unarmed. Epipods absent from all pereopods.

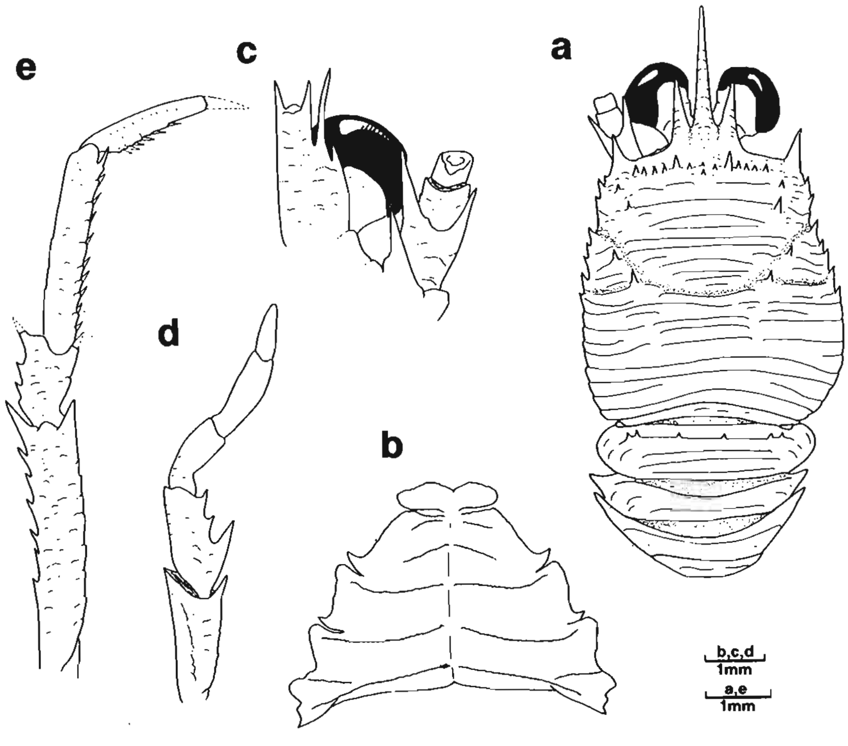

FIG. 17. — *Munida semoni* Ortmann, 1894, lectotype ♂ 5.5 mm, from Indonesia (SM) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, endopod of right third maxilliped, lateral view; **e**, right first walking leg, lateral view.

REMARKS. — This species was considered by BABA (1988) identical to *Munida heteracantha* Ortmann. In the type material examined of *M. semoni*, however, the granules on the seventh thoracic sternite, characteristic of *M. heteracantha* (see above), are absent.

Munida semoni is close to *M. oritea* sp. nov. from the Philippines and *M. striola* sp. nov. from Japan and Indonesia. Their relationships are discussed under "Remarks" of *M. striola* (see below).

Examination of the specimens identified by BARNARD (1950) as *M. semoni* (1 ♂ 6.3 mm; 2 ov. ♀ 6.5 and 7.8 mm; 1 ♀ broken, collected off Scottburgh and Umhlangakulu River, Natal, South Africa, 170 m, SAM A900), discloses that they are apparently a different species. They show the second abdominal segment unarmed (except for one specimen that bears two spines on each side of the anterior ridge), the thoracic sternites moderately squamate, the distomesial spine of the basal antennal segment overreaching the third segment, and the merus of the third maxilliped bearing a distinct spine on the extensor distal margin. Unfortunately, these specimens are not intact, lacking pereopods, so their systematic status remains unresolved and awaits future discovery of more specimens.

DISTRIBUTION. — Only known from the type locality, Ambon, Indonesia, depth unrecorded.

Munida sphinx sp. nov.

Figs 18-19

Munida japonica - BABA, 1990 : 925 (key), 964 (part). Not *M. japonica* Stimpson, 1858.

MATERIAL EXAMINED. — **Madagascar**. *"Vauban"*: stn CH 44, 15°25.7'S, 46°01.0'E, 200-210 m, 7.11.1972 : 1 ♂ 5.4 mm (MNHN-Ga 1480). — Stn CH 47, 15°20.0'S, 46°11.8'E, 245-250 m, 7.11.1972 : 1 ♂ 10.2 mm (MNHN-Ga 1478). — Stn CH 52, 15°21.0'S, 46°12.5'E, 150 m, 8.11.1972 : 24 ♂ 3.1-8.9 mm; 16 ov. ♀ 7.2-9.7 mm; 11 ♀ 3.9-7.8 mm (MNHN-Ga 1473). — Stn CH 53, 15°21.7'S, 46°12.6'E, 90-130 m, 8.11.1972 : 2 ♂ 8.8, 10.3 mm (MNHN-Ga 1483). — Stn CH 86, 18°55.0'S, 43°56.5'E, 195-205 m, 24.11.1973 : 2 ♂ 8.6, 8.7 mm (MNHN-Ga 840). — Stn CH 101, 22°18.0'S, 43°06.9'E, 300 m, 28.11.1973 : 1 ♂ 10.0 mm (MNHN-Ga 1492). — Stn CH 130, 15°20.0'S, 46°11.5'E, 170-175 m, 19.01.1975 : 15 ♂ 5.9-10.3 mm; 7 ov. ♀ 7.5-9.1 mm; 2 ♀ 8.5, 9.8 mm (MNHN-Ga 1490, 2324, 2325 and USNM).

Indonesia. CORINDON 2 : stn 215, 93 m : 1 ov. ♀ 8.0 mm (MNHN-Ga 2326). — Stn 273, 220 m : 13 ♂ 10.2-12.4 mm; 3 ov. ♀ 8.3-9.8 mm; 1 ♀ 8.6 mm (MNHN-Ga 2327).

TYPES. — One of the males (9.0 mm) from stn CH 130 (MNHN-Ga 2324) is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The specific name is derived from the Greek *Sphinx*, the female monster of Thebes who pronounced riddles, in reference to the confusion involved in this group of species.

DESCRIPTION. — Front margins of carapace somewhat oblique. Posteriormost stria not interrupted. Secondary striae present. Fourth and fifth thoracic sternites with some arcuate striae; sixth and seventh sternites without striae and granules. Second to fourth segments with uninterrupted striae; row of 5-9 spines on anterior ridge of second segment. Eyes large. Basal antennular segment (distal spines excluded) slightly overreaching corneae; 2 terminal spines subequal in size. First antennal segment with distomesial spine overreaching second segment; second segment with long distomesial spine distinctly overreaching antennal peduncle. Extensor margin of merus of third maxilliped with small distal spine. Cheliped having fixed finger with spines along lateral border; movable finger with 4 mesial spines, distal one subterminal. Dactylus of walking legs with movable small spines along ventral margin but unarmed on distal fourth of length.

REMARKS. — Indonesian specimens (Fig. 19) are somewhat different from Madagascar material : the distomesial spine of the basal antennal segment is slightly shorter and the walking legs are more slender in the specimens from Indonesia. In spite of these differences and their disjunct distribution, we consider that all the specimens be referred to the same species.

This species is closely related to *M. laevis* sp. nov. from the Philippines. Their relationships are discussed below under the "Remarks" of the latter (see above).

SIZE. — Males, 3.1-12.4 mm; females, 3.9-9.8 mm; ovigerous females from 7.2 mm.

DISTRIBUTION. — Madagascar and Indonesia, in 90-300 m.

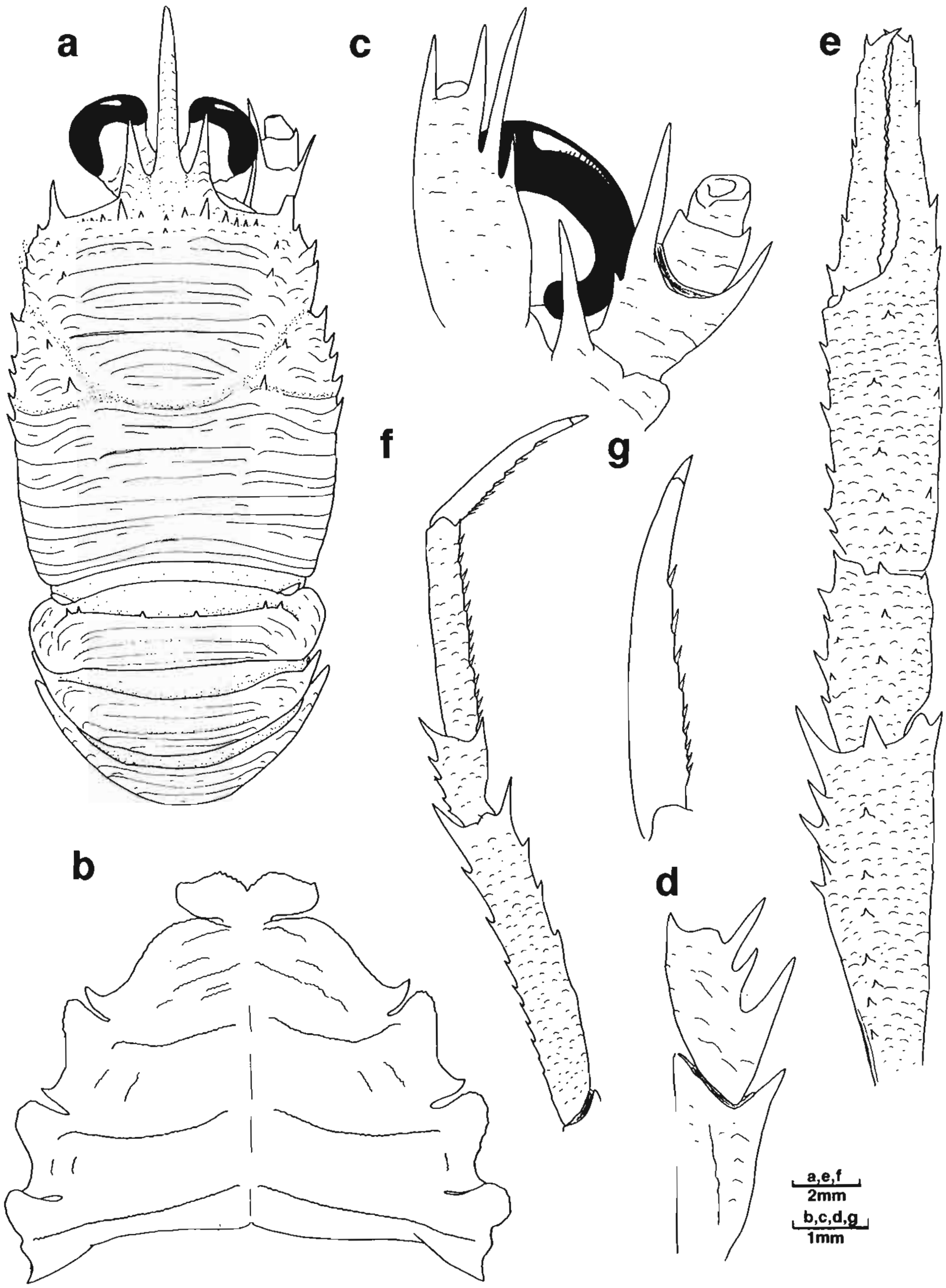

FIG. 18. — *Munida sphinx* sp. nov., holotype ♂ 9.0 mm, from Madagascar, *"Vauban"*, Stn CH 130, 170-175 m (MNHN-Ga 2324) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

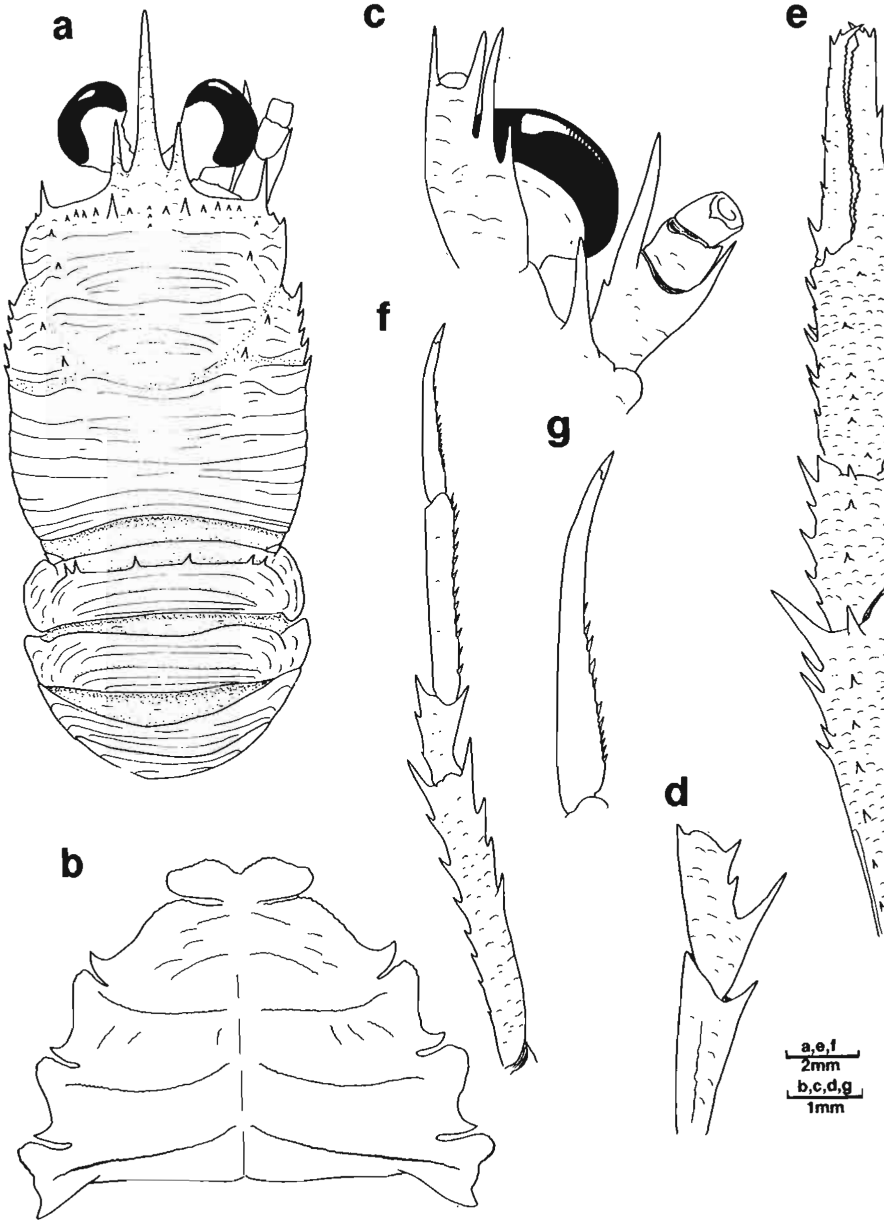

FIG. 19. — *Munida sphinx* sp. nov., paratype ♂ 11.8 mm, from Indonesia, CORINDON 2, Stn 273, 220 m (MNHN-Ga 2327) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

Munida striola sp. nov.

Fig. 20

MATERIAL EXAMINED. — **Japan**. Tosa Bay, 10.01.1961, coll. K. SAKAI : 2 ♂ 13.3, 13.8 mm; 2 ov. ♀ 12.0, 13.0 mm (ZLKU 11018). — Tosa Bay, 250-300 m, 3-14.11.1963, coll. K. SAKAI : 3M 6.0-12.3 mm; 3 ov. ♀ 7.2-9.2 mm; 1 ♀ 10.5 mm (MNHN-Ga 1019 and SMF 21169). — Tosa Bay, 02.1966, coll. K. SAKAI : 1 ♀ 9.6 mm (MNHN-Ga 1065, 1067). — Tosa Bay, 04.1968, coll. K. SAKAI : 1 ♂ 13.8 mm; 2 ov. ♀ 12.5, 12.6 mm; 1 ♀ 8.3 mm (MNHN-Ga 2213). — North of Kyushu, 14.04.1934, coll. H. IKEDA and K. YASUMOTO : 1 ♂ 10.8 mm; 1 ov. ♀ 9.8 mm (ZLKU 4324).
Indonesia. CORINDON 2 : stn 271, 215 m : 2 ♂ 14.4, 17.9 mm; 2 ♀ 9.4, 10.8 mm (MNHN-Ga 2302).

TYPES. — The male (13.8 mm) from Tosa Bay, Japan (ZLKU 11018) is selected as the holotype. The other specimens are paratypes.

ETYMOLOGY. — The specific name is derived from the Latin *striola*, dim, referring to the numerous striae on the thoracic sternites.

DESCRIPTION. — Front margins of carapace somewhat oblique. Posteriormost principal stria interrupted on intestinal region. Secondary striae present. Thoracic sternites squamate, with numerous striae; no granules on lateral parts of seventh sternite. Second to fourth abdominal segments with several uninterrupted striae; row of 8-9 spines on anterior ridge of second abdominal segment. Eyes moderately large. Basal antennular segment (terminal spines excluded) reaching end of corneae, 2 terminal spines subequal in size. First antennal segment with strong

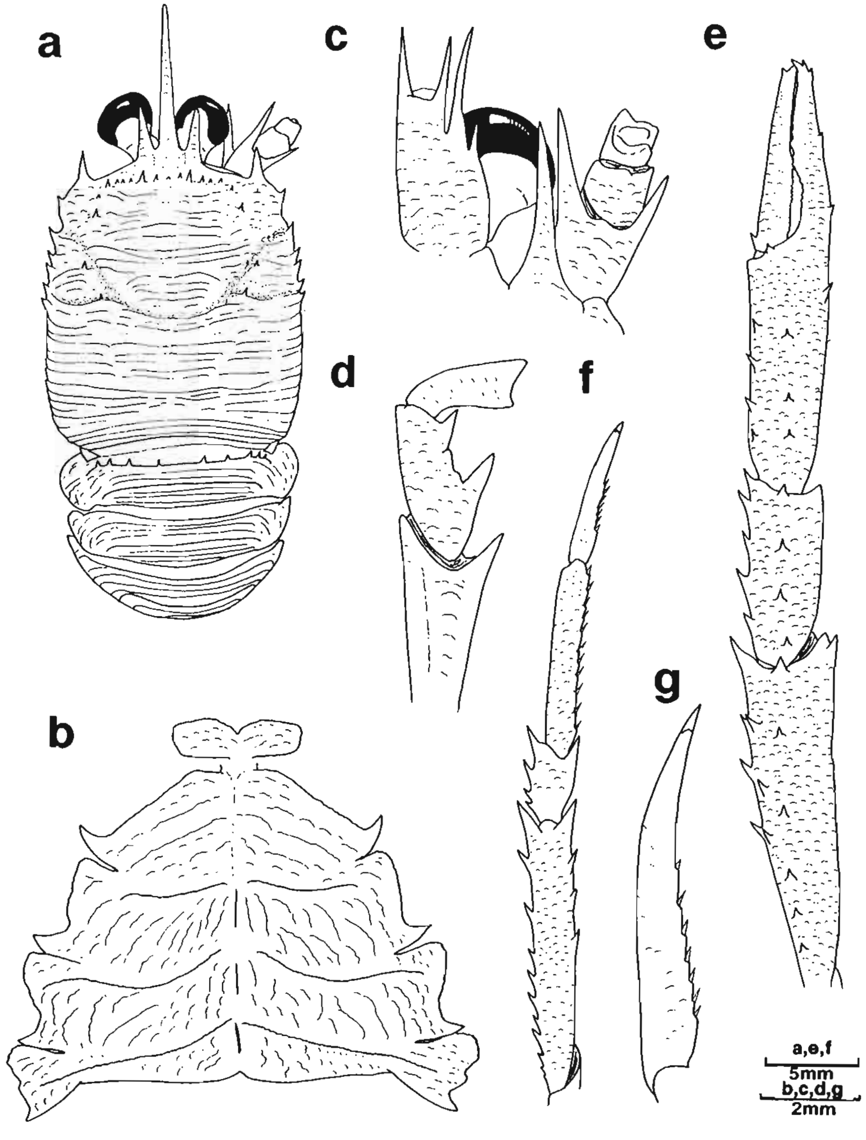

FIG. 20. — *Munida striola* sp. nov., holotype ♂ 13.8 mm, from Tosa Bay, Japan (ZLKU) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennular and antennal peduncles; **d**, merus and distal part of ischium of right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus, right first walking leg.

distomesial spine distinctly overreaching third segment; second segment with long distomesial spine overreaching antennal peduncle. Flexor margin of merus of third maxilliped unarmed. Cheliped having fixed finger with row of a few spines along lateral margin, movable finger with basal and subterminal spine on mesial border. Dactylus of walking legs with movable spinules along proximal 1/2-2/3 of ventral margin, distal part unarmed.

REMARKS. — Indonesian specimens seem to be somewhat different from Japan material. In the Indonesian material the supraocular spines always overreach the corneae and the dactylus of the walking legs is slightly more slender than in the Japanese specimens. Discovery of more material would be desirable in helping to determine whether these small differences can be considered as specific.

The absence of spines from the extensor margin of the merus of the third maxilliped links the species to *Munida oritea* sp. nov. from the Philippines and *M. semoni* Ortmann from Indonesia, but they are easily distinguished by the length of the distomesial spine of the basal antennal segment and the striation of the thoracic sternites. In *M. semoni*, this spine is short, slightly overreaching the second antennal segment, whereas in *M. oritea* and *M. striola* it is very long, extending as far beyond as the third antennal segment. The thoracic sternites have numerous striae in *M. oritea* and *M. striola*, whereas in *M. semoni* the striae are practically absent.

The differences between *M. striola* and *M. oritea* are so slight that careful examination of the following characters is needed for discrimination : the ventral spines on the dactylus of the walking legs are present along the whole length of the segment in *M. oritea*, but absent from the distal half in *M. striola*. The basal antennular segment terminates opposite the end of the corneae in *M. striola*, but distinctly overreaches them in *M. oritea*.

SIZE. — Males, 6.0-17.9 mm; females, 7.2-13.0 mm; ovigerous females from 7.2 mm.

DISTRIBUTION. — Japan from Tosa Bay and North of Kyushu, and Indonesia, in 215-300 m.

ACKNOWLEDGEMENTS

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10

Crustacea Decapoda : Species of the genus *Munida* Leach, 1820 (Galatheidae) collected during the MUSORSTOM and CORINDON cruises in the Philippines and Indonesia

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ABSTRACT

Fifteen species of galatheid crustaceans belonging to the genus *Munida* Leach, 1820 are reported from the Philippines and Indonesia. Six of these species are described as new : *M. analoga, M. gilii, M. minuta, M. parvula, M. pusiola* and *M. sacksi*.

RÉSUMÉ

Crustacea Decapoda : Espèces du genre *Munida* Leach, 1820 (Galatheidae) récoltées lors des campagnes MUSORSTOM et CORINDON aux Philippines et en Indonésie.

Quinze espèces de crustacés Galathéides, appartenant au genre *Munida*, sont signalées des Philippines et d'Indonésie. Six d'entre elles sont nouvelles : *M. analoga*, proche de *M. squamosa* Henderson, 1885, s'en distingue par l'armature des antennes et la forme des dactyles des pattes ambulatoires. *M. gilii*, proche de *M. babai* Tirmizi & Javaid, 1976, se caractérise par l'armature des doigts des chélipèdes. *M. sacksi* se distingue de *M. africana* Doflein & Balss, 1913, par le bord frontal, la taille et le nombre des épines des antennes et les troisièmes maxillipèdes. *M. pusiola* et *M. minuta* se différencient des autres espèces par l'ornementation des chélipèdes. *M. parvula*, proche de *M. inornata* Henderson, 1885, s'en distingue par l'armature des segments abdominaux et des sternites thoraciques et par les épines des doigts des chélipèdes.

MACPHERSON, E., 1993. — Crustacea Decapoda : Species of the genus *Munida* Leach, 1820 (Galatheidae) collected during the MUSORSTOM and CORINDON cruises in the Philippines and Indonesia. *In* : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, Volume 10. *Mém. Mus. natn. Hist. nat.*, **156** : 421-442. Paris ISBN 2-85653-206-3.

INTRODUCTION

The genus *Munida* Leach, 1818, is represented in the Philippines and adjacent waters by more than 30 species (BABA, 1988). This genus has received some attention during recent years (MACPHERSON & DE SAINT-LAURENT, 1991; MACPHERSON, 1991; TIRMIZI & JAVED, 1992) and the description of some new species has pointed out its high diversity and the necessity for a thorough revision of several problematic species (e. g. *M. japonica, M. curvirostris*). During the MUSORSTOM and CORINDON cruises to the Philippines and Indonesia (FOREST, 1981, 1986, 1989; MOOSA, 1984), numerous representatives of this genus were collected. This abundant material is published in two parts. The first part, by MACPHERSON & BABA, 1992, includes those species belonging to the *japonica* and *heteracantha* complex. The second part, presented here, includes 9 species previously known from the area and 6 new species.

The types of the new species and other material are deposited in the collections of the Muséum national d'Histoire naturelle de Paris (MNHN). Duplicates are deposited in the Pusat Penelitian dan Pengembangan Oseanologi LIPI in Djakarta and in the National Museum of Natural History in Washington (NMNH)

Measurements given are of carapace length, excluding rostrum. The terminology used mainly follows ZARIQUIEY ALVAREZ (1952) and MACPHERSON & DE SAINT-LAURENT (1991). The term "overreaching" is used in the sense of reaching beyond the end of the extremity of the quoted segment of appendage.

LIST OF STATIONS

MUSORSTOM 1. **Philippines.**

Station 5. — 19.03.1976, 14°01.5'N, 120°23.5'E, 200-215 m : *M. analoga.*
Station 6. — 19.03.1976, 14°01.2'N, 120°20.0'E, 182-200 m : *M. analoga, M. armata.*
Station 7. — 19.03.1976, 14°01.0'N, 120°20.0'E, 185-200 m : *M. analoga.*
Station 10. — 19.03.1976, 13°59.8'N, 120°18.2'E, 187-205 m : *M. analoga, M. kuboi.*
Station 11. — 20.03.1976, 13°59.8'N, 120°23.7'E, 217-230 m : *M. analoga.*
Station 12. — 20.03.1976, 14°00.8'N, 120°20.5'E, 187-210 m : *M. analoga.*
Station 18. — 21.03.1976, 13°56.3'N, 120°16.2'E, 150-159 m : *M. kuboi.*
Station 20. — 21.03.1976, 13°59.2'N, 120°20.3'E, 208-222 m : *M. analoga.*
Station 21. — 21.03.1976, 14°01.0'N, 120°22.8'E, 174-223 m : *M. analoga.*
Station 24. — 22.03.1976, 14°00.0'N, 120°18.0'E, 189-209 m : *M. analoga, M. kuboi.*
Station 25. — 22.03.1976, 14°02.7'N, 120°20.3'E, 191-200 m : *M. analoga, M. armata, M. kuboi.*
Station 26. — 22.03.1976, 14°00.9'N, 120°16.8'E, 189 m : *M. analoga.*
Station 30. — 22.03.1976, 14°01.3'N, 120°18.7'E, 177-186 m : *M. analoga, M. kuboi.*
Station 31. — 22.03.1976, 14°00.0'N, 120°16.0'E, 187-195 m : *M. armata.*
Station 34. — 23.03.1976, 14°01.0'N, 120°15.8'E, 188-191 m : *M. kuboi.*
Station 36. — 23.03.1976, 14°01.2'N, 120°20.2'E, 187-210 m : *M. analoga.*
Station 40. — 24.03.1976, 13°57.4'N, 120°27.8'E, 265-287 m : *M. analoga, M. kuboi.*
Station 41. — 24.03.1976, 13°58.1'N, 120°31.4'E, 208-236 m : *M. kuboi.*
Station 42. — 24.03.1976, 13°55.1'N, 120°28.6'E, 379-407 m : *M. analoga, M. compressa.*
Station 43. — 24.03.1976, 13°50.5'N, 120°28.0'E, 448-484 m : *M. compressa, M. curvirostris.*
Station 49. — 25.03.1976, 13°49.1'N, 119°59.8'E, 750-925 m : *M. fortiantennata.*
Station 50. — 25.03.1976, 13°49.2'N, 120°01.8'E, 415-510 m : *M. analoga, M. curvirostris.*
Station 51. — 25.03.1976, 13°49.4'N, 120°04.2'E, 170-200 m : *M. analoga.*
Station 56. — 26.03.1976, 13°53.1'N, 120°08.9'E, 129-134 m : *M. gilii.*
Station 61. — 27.03.1976, 14°02.2'N, 120°18.1'E, 184-202 m : *M. analoga.*
Station 65. — 27.03.1976, 14°00.0'N, 120°19.2'E, 194-202 m : *M. analoga.*
Station 72. — 28.03.1976, 14°11.8'N, 120°28.7'E, 122-127 m : *M. gilii.*

MUSORSTOM 2. **Philippines.**

Station 1. — 20.11.1980, 14°00.3'N, 120°19.3'E, 188-198 m : *M. analoga, M. kuboi.*
Station 10. — 21.11.1980, 14°00.1'N, 120°18.5'E, 188-195 m : *M. analoga, M. kuboi.*
Station 11. — 21.11.1980, 14°00.4'N, 120°19.7'E, 194-196 m : *M. analoga, M. kuboi.*
Station 12. — 21.11.1980, 14°01.0'N, 120°19.7'E, 197-210 m : *M. analoga.*
Station 13. — 21.11.1980, 14°00.5'N, 120°20.7'E, 193-200 m : *M. analoga, M. kuboi.*
Station 15. — 21.11.1980, 13°55.1'N, 120°28.4'E, 326-330 m : *M. compressa.*
Station 20. — 22.11.1980, 14°00.9'N, 120°18.1'E, 185-192 m : *M. analoga.*
Station 21. — 22.11.1980, 14°00.2'N, 120°17.8'E, 191-192 m : *M. analoga.*
Station 26. — 23.11.1980, 13°49.6'N, 120°51.0'E, 299-320 m : *M. analoga.*
Station 36. — 24.11.1980, 13°31.4'N, 121°23.9'E, 569-595 m : *M. curvirostris, M. longispinata, M. variabilis.*
Station 38. — 25.11.1980, 12°53.5'N, 122°26.6'E, 1650-1660 m : *M. major.*
Station 39. — 25.11.1980, 13°02.8'N, 122°37.1'E, 1030-1190 m : *M. curvirostris.*
Station 40. — 25.11.1980, 13°07.7'N, 122°39.1'E, 280-440 m : *M. analoga, M. curvirostris.*
Station 44. — 26.11.1980, 13°23.2'N, 122°20.7'E, 760-820 m : *M. curvirostris, M. variabilis.*
Station 46. — 26.11.1980, 13°25.7'N, 122°17.0'E, 445-520 m : *M. curvirostris, M. longispinata, M. variabilis.*
Station 49. — 26.11.1980, 13°38.4'N, 121°44.1'E, 416-425 m : *M. curvirostris, M. longispinata.*
Station 55. — 27.11.1980, 13°53.7'N, 119°58.5'E, 865-866 m : *M. curvirostris, M. fortiantennata.*
Station 63. — 29.11.1980, 14°07.3'N, 120°15.0'E, 215-230 m : *M. analoga, M. kuboi.*
Station 64. — 29.11.1980, 14°01.5'N, 120°18.9'E, 191-195 m : *M. analoga.*
Station 66. — 29.11.1980, 14°00.6'N, 120°20.3'E, 192-209 m : *M. analoga, M. armata.*
Station 75. — 01.12.1980, 13°50.5'N, 120°30.3'E, 300-330 m : *M. analoga, M. compressa, M. curvirostris, M. kuboi, M. sacksi.*
Station 80. — 01.12.1980, 13°45.1'N, 120°37.7'E, 178-205 m : *M. kuboi.*
Station 83. — 02.12.1980, 13°55.2'N, 120°30.5'E, 318-320 m : *M. analoga, M. compressa, M. kuboi, M. pilorhyncha.*

MUSORSTOM 3. **Philippines.**

Station 87. — 31.05.1985, 14°00.6'N, 120°19.6'E, 191-197 m : *M. analoga, M. kuboi.*
Station 92. — 31.05.1985, 14°03.0'N, 120°11.5'E, 224 m : *M. analoga, M. compressa.*
Station 98. — 01.06.1985, 14°00.2'N, 120°17.9'E, 194-205 m : *M. analoga.*
Station 99. — 01.06.1985, 14°01.0'N, 120°19.5'E, 196-204 m : *M. analoga, M. kuboi.*
Station 101. — 01.06.1985, 14°00.15'N, 120°19.25'E, 194-196 m : *M. analoga, M. armata, M. kuboi, M. variabilis.*
Station 103. — 01.06.1985, 14°00.4'N, 120°18.15'E, 193-200 m : *M. analoga, M. kuboi.*
Station 105. — 01.06.1985, 13°52.6'N, 120°29.6'E, 398-417 m : *M. compressa.*
Station 106. — 02.06.1985, 13°47.0'N, 120°30.3'E, 640-668 m : *M. compressa.*
Station 117. — 03.06.1985, 12°31.2'N, 120°39.3'E, 92-97 m : *M. minuta, M. pusiola.*
Station 118. — 03.06.1985, 11°58.6'N, 121°05.5'E, 448-466 m : *M. prominula.*
Station 119. — 03.06.1985, 11°59.7'N, 121°12.7'E, 320-337 m : *M. analoga, M. compressa, M. curvirostris, M. prominula.*
Station 120. — 03.06.1985, 12°05.6'N, 121°15.6'E, 219-220 m : *M. analoga, M. kuboi.*
Station 121. — 03.06.1985, 12°08.3'N, 121°17.3'E, 73-84 m : *M. parvula.*
Station 122. — 04.06.1985, 12°20.0'N, 121°41.6'E, 673-675 m : *M. curvirostris, M. longispinata.*
Station 123. — 04.06.1985, 12°10.6'N, 121°45'E, 700-702 m : *M. longispinata, M. variabilis.*
Station 125. — 04.06.1985, 11°57.7'N, 121°28.5'E, 388-404 m : *M. analoga, M. curvirostris.*
Station 127. — 04.06.1985, 11°47.7'N, 121°28.8'E, 464-475 m : *M. longispinata.*
Station 128. — 05.06.1985, 11°49.7'N, 121°41.2'E, 815-821 m : *M. curvirostris.*
Station 133. — 05.06.1985, 11°57.8'N, 121°52.25'E, 334-390 m : *M. analoga, M. curvirostris.*
Station 135. — 05.06.1985, 11°58.6'N, 122°01.8'E, 486-551 m : *M. curvirostris, M. longispinata.*

Station 138. — 06.06.1985, 11°53.8'N, 122°15'E, 252-370 m : *M. longispinata.*
Station 139. — 06.06.1985, 11°52.9'N, 122°14.7'E, 240-267 m : *M. analoga.*
Station 145. — 07.06.1985, 11°01.6'N, 124°04.2'E, 214-246 m : *M. longispinata.*

CORINDON. **Indonesia.**

Station 209. — 31.10.1980, 00°07.3'S, 117°53.8'E, 490 m : *M. curvirostris.*
Station 228. — 03.11.1980, 00°01.5'S, 119°35.0'E, 300 m : *M. analoga.*
Station 240. — 05.11.1980, 00°37.6'S, 119°33.5'E, 675 m : *M. curvirostris.*
Station 268. — 06.11.1980, 01°57.0'S, 119°16.0'E, 200 m : *M. spinulifera.*
Station 271. — 07.11.1980, 01°57.8'S, 119°15.0'E, 215 m : *M. kuboi.*
Station 276. — 08.11.1980, 01°54.6'S, 119°13.8'E, 456-395 m : *M. curvirostris, M. prominula.*

SYSTEMATIC ACCOUNT

Munida analoga sp. nov.

Fig. 1 a-g

Munida squamosa - BABA, 1988 : 83 (key), 133 (not *Munida squamosa* Henderson, 1885).

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 5, 200-215 m : 4 ♀ 9.8-13.3 mm (MNHN-Ga 2401). — Stn 6, 182-200 m : 4 ♂ 11.3-19.6 mm; 3 ov. ♀ 14.7-17.2 mm; 2 ♀ 14.0, 14.5 mm (MNHN-Ga 2402). — Stn 7, 185-200 m : 3 ♂ 12.8-19.0 mm; 1 ov. ♀ 18.1 mm; 1 ♀ 15.4 mm (MNHN-Ga 2403). — Stn 10, 187-205 m : 1 ♂ 18.0 mm; 1 ov. ♀ 17.5 mm (MNHN-Ga 2404). — Stn 11, 217-230 m : 15 ♂ 11.2-20.5 mm; 1 ov. ♀ 15.7 mm; 7 ♀ 10.0-16.9 mm (MNHN-Ga 2405). — Stn 12, 187-210 m : 2 ♂ 19.3, 19.8 mm; 1 ov. ♀ 17.5 mm; 1 ♀ 19.0 mm (MNHN-Ga 2406). — Stn 20, 208-222 m : 3 ♂ 14.1-19.6 mm; 1 ov. ♀ 14.1 mm; 3 ♀ 13.5-15.4 mm (MNHN-Ga 2407). — Stn 21, 174-223 m : 2 ♂ 7.0, 9.3 mm (MNHN-Ga 2408). — Stn 24, 189-209 m : 4 ov. ♀ 12.8-16.5 mm; 2 ♀ 12.8, 17.6 mm (MNHN-Ga 2408). — Stn 25, 191-200 m : 4 ♂ 17.8-19.2 mm; 1 ov. ♀ 19.8 mm; 1 ♀ 11.9 mm (MNHN-Ga 2409). — Stn 26, 189 m : 1 ♂ 8.5 mm (MNHN-Ga 2410). — Stn 30, 177-186 m : 1 ov. ♀, 16.4 mm (MNHN-Ga 2411). — Stn 36, 187-210 m : 19 ♂ 14.0-20.5 mm; 10 ov. ♀ 14.3-17.8 mm; 6 ♀ 12.3-16.3 mm (MNHN-Ga 2412). — Stn 40, 265-287 m : 3 ♂ 6.3-20.9 mm; 4 ♀ 9.4-12.0 mm; 1 juv. 4.9 mm (MNHN-Ga 2413). — Stn 42, 379-407 m : 1 ♂ 13.0 mm; 1 ♀ 13.0 mm (MNHN-Ga 2414). — Stn 50, 415-510 m : 1 ♀ 15.7 mm; 1 juv. 3.6 mm (MNHN-Ga 2415).— Stn 51, 170-200 m : 24 ♂ 11.1-18.0 mm; 5 ov. ♀ 12.2-15.8 mm; 8 ♀ 10.6-14.1 mm (MNHN-Ga 2416). — Stn 61, 184-202 m : 2 ♂ 16.2, 17.3 mm (MNHN-Ga 2417). — Stn 65, 194-202 m : 2 ♂ 18.0, 19.7 mm (MNHN-Ga 2418).

MUSORSTOM 2 : stn 1, 188-198 m : 1 ♂ 19.0 mm (MNHN-Ga 2419). — Stn 10, 188-195 m : 1 ♂ 15.8 mm (MNHN-Ga 2420). — Stn 11, 194-196 m : 10 ♂ 15.3-21.0 mm; 3 ov. ♀ 17.4-19.2 mm (MNHN-Ga 2421). — Stn 12, 197-210 m : 12 ♂ 17.4-22.0 mm; 14 ov. ♀ 17.4-21.8 mm; 1 ♀ 16.0 mm (MNHN-Ga 2422). — Stn 13, 193-200 m : 6 ♂ 18.7-20.5 mm; 6 ov. ♀ 18.1-22.0 mm (MNHN-Ga 2423). — Stn 20, 185-192 m : 1 ♂ 19.8 mm; 1 ov. ♀ 20.3 mm (MNHN-Ga 2424). — Stn 21, 191-192 m : 1 ♂ 20.3 mm; 1 ov. ♀ 19.4 mm (MNHN-Ga 2425). — Stn 26, 299-320 m : 7 ♂ 9.7-17.6 mm; 5 ♀ 9.7-15.8 mm (MNHN-Ga 2426). — Stn 40, 280-440 m : 1 ♂ 22.9 mm (MNHN-Ga 2427). — Stn 63, 215-230 m : 1 ov. ♀ 16.2 mm (MNHN-Ga 2428). — Stn 64, 191-195 m : 1 ♂ 20.4 mm; 1 ov. ♀ 19.5 mm (MNHN-Ga 2429). — Stn 66, 192-209 m : 20 ♂ 15.1-20.8 mm; 24 ov. ♀ 13.4-19.1 mm; 2 ♀ 15.7, 18.7 mm (MNHN-Ga 2430). — Stn 75, 300-330 m : 2 ♀ 6.4, 8.0 mm (MNHN-Ga 2431). — Stn 83, 318-320 m : 12 ♂ 6.7-16.3 mm; 7 ♀ 5.8-11.9 mm (MNHN-Ga 2432).

MUSORSTOM 3 : stn 87, 191-197 m : 1 ov. ♀ 17.5 mm (MNHN-Ga 2433). — Stn 92, 224 m : 1 ♂ 14.2 mm; 7 ♀ 5.7-13.6 mm (MNHN-Ga 2434). — Stn 98, 194-205 m : 2 ov. ♀ 13.6, 16.4 mm; 1 ♀ 19.5 mm (MNHN-Ga 2435). — Stn 99, 196-204 m : 4 ♂ 15.7-20.5 mm; 4 ov. ♀ 15.8-19.7 mm; 1 ♀ 17.7 mm (MNHN-Ga 2436). — Stn 101, 194-196 m : 2 ♂ 17.7, 18.0 mm; 3 ov. ♀ 16.7-17.2 mm (MNHN-Ga 2437). — Stn 103, 193-200 m : 4 ♂ 18.2-19.4 mm; 3 ov. ♀ 18.9-19.0 mm (MNHN-Ga 2438). — Stn 119, 320-337 m : 3 ♂ 12.0-18.3 mm; 2 ♀ 12.4, 14.7 mm (MNHN-Ga 2439). — Stn 120, 219-220 m : 9 ♂ 14.8-19.6 mm; 5 ov. ♀ 17.1-18.3 mm; 1 ♀ 18.6 mm (MNHN-Ga 2440, 2441). — Stn 125, 388-404 m : 10 ♂ 7.6-18.2 mm; 4 ov. ♀ 15.2-19.4 mm; 2 ♀ 9.3, 16.4 mm (MNHN-Ga 2442). — Stn 133, 334-390 m : 2 ♂ 7.4, 10.4 mm; 1 ov. ♀ 14.5 mm; 2 ♀ 7.4, 10.4 mm (MNHN-Ga 2443). — Stn 139, 240-267 m : 2 ♂ 13.0, 14.7 mm; 2 ov. ♀ 15.0, 17.2 mm; 1 ♀ 11.3 mm (MNHN-Ga 2445).

Indonesia. CORINDON 2 : stn 228, 300 m : 1 ♀ 8.2 mm (MNHN-Ga 2446). — Stn 271, 215 m : 19 ♂ 9.8-20.3 mm; 1 ov. ♀ 17.2 mm; 14 ♀ 6.8-17.3 mm (MNHN-Ga 2447).

TYPES. — The male from MUSORSTOM 3, Stn 120, 19.0 mm (MNHN-Ga 2441) has been selected as holotype; the other specimens are paratypes.

ETYMOLOGY. — From the Greek, *analogos*, resembling, in reference to its similarity to *M. squamosa* Henderson, 1885, and *M. similis* Baba, 1988.

DESCRIPTION (Holotype). — Carapace, excluding rostrum, as long as wide, with numerous transverse striae minutely granulate. Secondary striae between principal striae. Gastric region feebly convex with 2 epigastric spines behind supraoculars. Moderate-sized postcervical spine on each side. Cardiac region distinctly circumscribed. Posterior transverse ridge with 2 spines.

Frontal margins transverse. Lateral margins convex. Anterolateral spine well developed, overreaching level of sinus between rostrum and supraocular spine. Second small lateral spine in front of cervical groove. Branchial margins with 4 small spines of similar size.

Rostrum spiniform, slender, as stout as supraocular spines, upwardly directed, slightly less than half as long as remaining carapace. Supraocular spines widely separated from rostrum, slightly divergent, overreaching corneae.

Thoracic sternites with numerous arcuate striae.

Second and third abdominal segments dorsally squamate, each with 2 elevated transverse ridges, anterior ridge with 4 spines, median 2 well developed; fourth segment with 2 spines on anterior ridge, strong median spine on posterior ridge.

Gonopods absent from first abdominal segment.

Eyes moderately large, maximum corneal diameter one-third length of anterior border of carapace between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) reaching beyond end of corneae, with 2 distal (distolateral clearly longer than distomesial) and 2 lateral spines.

First segment of antennal peduncle with moderate-sized distomesial process, reaching distal border of second segment. Second segment with distomesial angle unarmed, distolateral angle with small spine; third segment with distomesial well developed spine.

Merus of third maxilliped with median spine on flexor border; extensor margin with distal spine.

Chelipeds squamate, subequal, 6 times carapace length; merus with 3 rows of spines; carpus with 2 spines on mesial and ventral sides, several spines on distal margin; palm cylindrical, with spines scattered in rows on mesial and ventral margins; fixed finger bifid distally.

Walking legs slender, depressed. First walking leg 3.5 times carapace length; merus with 12 spines on dorsal margin and 5 spines on ventral border; carpus with long distal spine on dorsal and ventral borders; propodus with 4 movable spines on ventral border; dactylus one-half propodus length, with dorsal border finely denticulate, concave proximally, ventral border with 33-35 movable spinules situated on proximal half, distal half unarmed. Spinulation of second and third walking legs similar to first. Third walking leg shorter than first and second, with merus about 3/4 that of first walking leg.

Epipods absent from pereiopods.

VARIATIONS. — No significant variation in the main characters have been observed between specimens examined. Spines of antennal peduncle remain constant in all specimens examined.

REMARKS. — *M. analoga* is very close to *M. squamosa* Henderson, 1885, from Admiralty Islands and New Caledonia. In particular, both species have one median spine on the cardiac region, one spine on the posterior ridge of the fourth abdominal segment and the first segment of the antennal peduncle with a moderated size process. A comparison with the type material and numerous specimens of *M. squamosa* from New Caledonia showed that they can be easily distinguished by the following characters (Fig. 1 h-i) :

— The cardiac spine is more prominent in *M. squamosa* than in *M. analoga*.

— The second segment of antennal peduncle has a distinct mesiodistal spine in *M. squamosa*, none in *M. analoga*.

— The dactylus of the walking legs is longer and more slender in *M. analoga* than in *M. squamosa*.

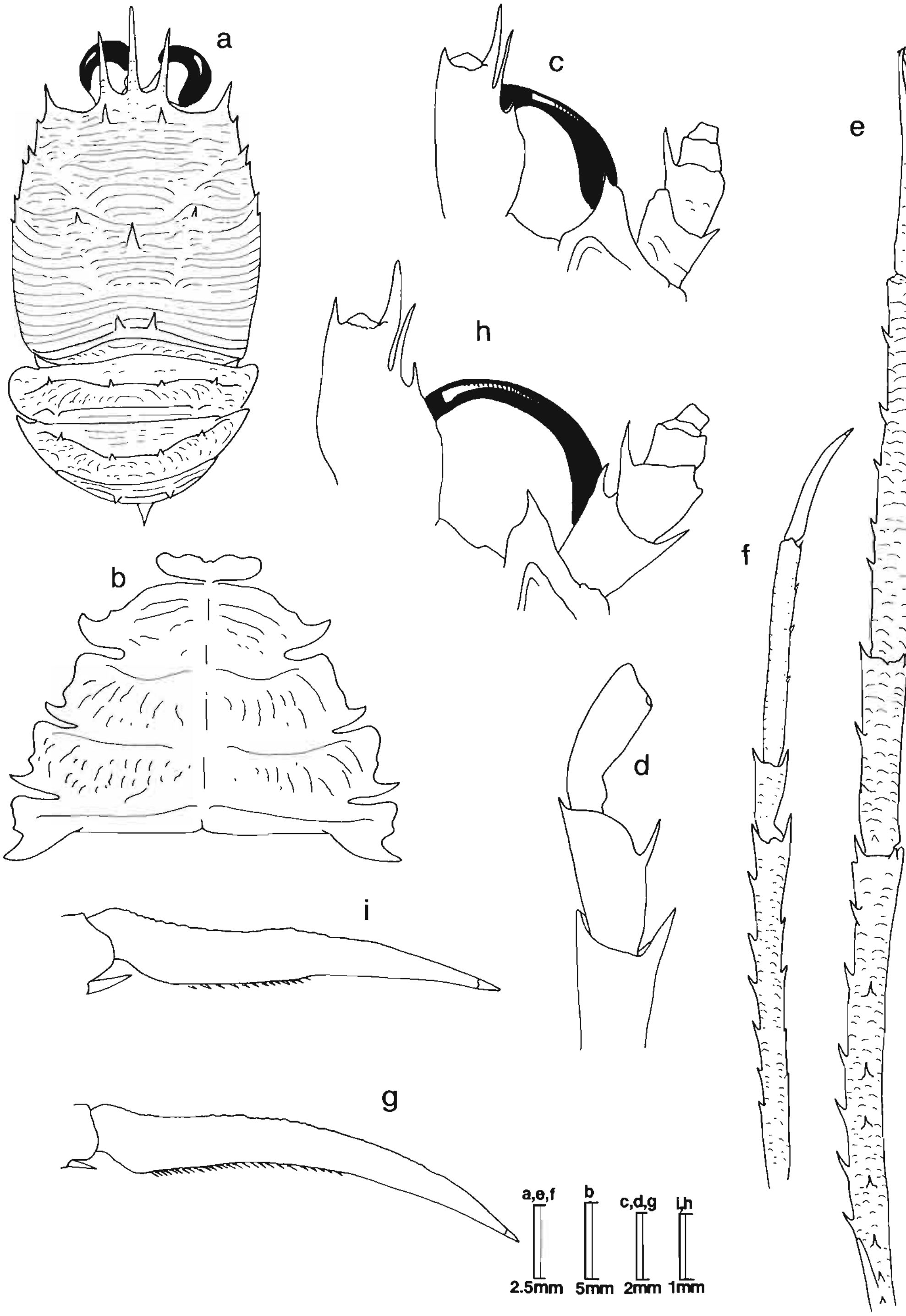

FIG. 1 a-g. — *Munida analoga* sp. nov., ♂, 19.0 mm, holotype from Stn 120 (MUSORSTOM 3) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennula and antennal peduncles; **d**, right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus of right first walking leg, lateral view.

FIG. 1 h-i. — *Munida squamosa* Henderson, 1885, ov. ♀, 10.8 mm, type, from Stn 219 ("*Challenger*") : **h**, ventral view of cephalic region, showing antennula and antennal peduncles; **i**, dactylus of right first walking leg, lateral view.

ALCOCK (1894, 1901) and ALCOCK and ANDERSON (1895) cited *M. squamosa* var. *prolixa* in Andaman and Arabian Seas. The examination of two specimens from the "*Investigator*" collected in the the Indian ocean (USNM 42708, 1 M 15.5 mm, 1 ov. V 14.3 mm, 06°50'20"N, 29°36'20"E, 336-401 m) shows that this variety also presents a distal spine (less acute than in the types of *M. squamosa* and absent in *M. analoga*) on the mesial border of the second antennal segment and the branchial margins have 3 spines of similar size (4 spines in *M. squamosa* and *M. analoga*). These characters suggest that *M. squamosa* var. *prolixa* is closer to *M. squamosa* than to the new species. However, although this variety may belong to a different species, additional material would be desirable to confirm its identity.

M. analoga is also close to *M. similis* Baba, 1988, from the Philippines (BABA, 1988). They differ in the following characters :

— In *M. similis* the rostrum is more slender than the supraocular spines, while they are about the same size in *M. analoga*.

— The lateral border of the basal antennular segment has one spine in *M. similis*, two in *M. analoga*.

— The distomesial margin of the basal antennal segment is blunty produced in *M. similis*, ending in a sharp spine in *M. analoga*; on the other hand, the third antennal segment has a well developed distomesial spine in *M. analoga*, none in *M. similis*.

SIZE. — The males examined ranged between 6.3 and 22.9 mm, females between 5.7 and 19.8 mm; ovigerous females from 12.2 mm.

DISTRIBUTION. — Philippines, Indonesia, north of Sulawesi, between 170 and 510 m.

Munida armata Baba, 1988

Munida armata Baba, 1988 : 84 (key), 86, fig. 31.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 6, 182-200 m : 1 ♂ 17.9 mm (MNHN-Ga 3394). — Stn 25, 191-200 m : 1 ov. ♀ 10.9 mm (MNHN-Ga 3395). — Stn 31, 187-195 m : 3 ♂ 9.0-14.6 mm; 2 ♀ 9.0, 10.2 mm (MNHN-Ga 2444).

MUSORSTOM 2 : stn 66, 192-209 m : 1 ov. ♀ 14.6 mm (MNHN-Ga 3396).

MUSORSTOM 3 : stn 101, 194-196 m : 1 ♂ 11.7 mm (MNHN-Ga 3397).

REMARKS. — The specimens examined agree with the original description and illustrations provided by BABA (1988). The lateral parts of the seventh thoracic sternite have numerous coarse granules.

SIZE. — The males examined ranged between 9.0 and 17.9 mm, females between 9.0 and 14.6 mm; ovigerous females from 10.9 mm.

DISTRIBUTION. — South China Sea off southwestern Luzon, between 183 and 216 m (BABA, 1988). The specimens from MUSORSTOM cruises were collected in the same areas, between 182 and 209 m.

Munida compressa Baba, 1988

Munida compressa Baba, 1988 : 84 (key), 91, figs 33-34.

MATERIAL EXAMINED — **Philippines.** MUSORSTOM 1 : stn 42, 379-407 m : 2 ♂ 9.9, 14.8 mm; 1 ov. ♀ 12.8 mm; 1 ♀ 11.4 mm (MNHN-Ga 2467). — Stn 43, 448-484 m : 1 ov. ♀ 12.6 mm (MNHN-Ga 2468).

MUSORSTOM 2 : stn 15, 326-330 m : 7 ♂ 7.8-10.3 mm; 3 ov. ♀ 9.6-11.8 mm; 3 ♀ 5.3-9.0 mm (MNHN-Ga 2469). — Stn 75, 300-330 m : 6 ♂ 8.3-12.4 mm; 6 ov. ♀ 9.5-11.8 mm; 1 ♀ 4.6 mm (MNHN-Ga 2470). — Stn 83, 318-320 m : 5 ♂ 8.5-11.9 mm; 10 ov. ♀ 10.5-13.0 mm; 6 ♀ 6.0-10.0 mm (MNHN-Ga 2471).

MUSORSTOM 3 : stn 92, 224 m : 1 ♂ 5.7 m; 1 ♀ 7.0 mm (MNHN-Ga 2472). — Stn 105, 398-417 m : 7 ♂ 10.2-15.1 mm; 2 ♀ 9.5, 11.2 mm (MNHN-Ga 2473). — Stn 106, 640-668 m : 1 ♂ 9.8 mm (MNHN-Ga 2474). — Stn 119, 320-337 m : 2 ♂ 11.8, 12.6 mm (MNHN-Ga 2475).

REMARKS. — The specimens examined agree with the original description and illustrations provided by BABA (1988). The lateral parts of the seventh thoracic sternite have no granules or ridges.

SIZE. — The males examined ranged between 5.7 and 15.1 mm, females between 4.6 and 13.0 mm; ovigerous females from 9.5 mm.

DISTRIBUTION. — Philippines, south China Sea, Japan, between 180 and 545 m (BABA, 1988). The present material was collected southwest of Luzon and south of Mindoro, between 224 and 668 m.

Munida curvirostris Henderson, 1885

Munida curvirostris Henderson, 1885 : 412.
Munida militaris var. *curvirostris* - HENDERSON, 1888 : 139, pl. 3, figs 7a, 7b.
Munida militaris var. *andamanica* Alcock, 1894 : 321. — ALCOCK & ANDERSON, 1895, pl. 13, fig. 2.
Munida andamanica - BABA, 1988 : 85.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 43, 448-484 m : 1 ov. ♀ 10.1 mm; 1 ♀ 10.1 mm (MNHN-Ga 3398). — Stn 50, 415-510 m : 2 ♂ 7.7, 13.7 mm; 2 ov. ♀ 10.2, 14.7 mm; 1 ♀ 14.0 mm (MNHN-Ga 2448).

MUSORSTOM 2 : stn 36, 569-595 m : 2 ♂ 13.7, 16.0 mm; 1 ov. ♀ 17.0 mm; 2 ♀ 10.0, 11.3 mm (MNHN-Ga 2449). — Stn 39, 1030-1190 m : 2 ♂ 12.5, 13.2 mm; 3 ov. ♀ 13.8, 18.6 mm; 5 ♀ 6.1-16.7 mm (MNHN-Ga 2450). — Stn 40, 280- 440 m : 1 ♂ 15.0 mm (MNHN-Ga 2451). — Stn 44, 760-820 m : 1 ov. ♀ 12.0 mm (MNHN-Ga 2452). — Stn 46, 445-520 m : 5 ♂ 7.1-15.5 mm (MNHN-Ga 2453). — Stn 49, 416-425 m : 6 ♂ 11.0-17.8 mm; 1 ov. ♀ 20.3 mm; 5 ♀ 11.3-15.0 mm (MNHN-Ga 2454). — Stn 55, 865 m : 1 ♀ 10.6 mm (MNHN-Ga 2455). — Stn 75, 300-330 m : 1 ♂ 16.2 mm; 1 ♀ 13.5 mm (MNHN-Ga 2456).

MUSORSTOM 3 : stn 119, 320-337 m : 2 ♀ 12.5, 15.7 mm (MNHN-Ga 2457). — Stn 122, 673-675 m : 8 ♂ 9.4-18.9 mm; 3 ♀ 9.4-14.0 mm (MNHN-Ga 2458). — Stn 123, 700-702 m : 5 ♂ 10.5-18.2 mm; 5 ♀ 9.5-17.0 mm (MNHN-Ga 2459). — Stn 125, 388-404 m : 1 ♂ 16.0 mm; 3 ♀ 9.5-14.6 mm (MNHN-Ga 2460). — Stn 128, 815-820 m : 2 ♂ 16.7, 17.8 mm; 5 ♀ 10.2-20.8 mm (MNHN-Ga 2461). — Stn 133, 334-390 m : 1 ♂ 12.9 mm; 1 ♀ 9.0 mm (MNHN-Ga 2462). — Stn 135, 486-551 m : 3 ♂ 7.9-11.2 mm; 1 ♀ 9.5 mm (MNHN-Ga 2463).

Indonesia. CORINDON 2 : stn 209, 490 m : 3 ♂ 15.5, 16.4 mm; 9 ♀ 10.6-16.8 mm (MNHN-Ga 2464). — Stn 240, 675 m : 4 ♂ 11.4-12.0 mm; 3 ov. ♀ 14.3-14.6 mm; 4 ♀ 11.2-15.3 mm (MNHN-Ga 2465). — Stn 276, 395-450 m : 2 ♂ 8.2, 13.0 mm; 6 ♀ 8.8-16.0 mm (MNHN-Ga 2466).

REMARKS. — BABA (personnal communication) believes that *M. curvirostris* Henderson, 1885, and *M. andamanica* Alcock, 1894, are synonymous (see also BABA & MACPHERSON, 1991). A complete revision of this species will be given by this author. The species is characterized by the moderately short cheliped, with strong spines on the distal part of the merus. The lateral parts of the seventh thoracic sternite have no granules or ridges.

SIZE. — The males examined ranged between 7.1 and 18.9 mm; females between 6.1 and 20.8 mm; ovigerous females from 10.1 mm.

DISTRIBUTION. — BABA (1988) reported this species from the east coast of Africa, Arabian Sea, Maldives, Andaman Sea, Indonesia (north of Sulawesi), the Philippines and south of Japan, between 141 and 1360 m. The present material was collected from south and southwest of Luzon, south of Mindoro, north of Panay and north of Sulawesi, between 280 and 1190 m.

Munida fortiantennata Baba, 1988

Munida fortiantennata Baba, 1988 : 82 (key), 101, fig. 37.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 49, 750-925 m : 1 ♂ 14.7 mm (MNHN-Ga 2476).
MUSORSTOM 2 : stn 55, 865 m : 1 ♂ 16.2 mm; 3 ov. ♀ 13.2 to 17.0 mm (MNHN-Ga 2477).

REMARKS. — The number of spines on the posterior border of the carapace ranged between 2 and 5 (4 in the holotype) and the males have only one pair of gonopods. BABA (1988) described this species from an unique specimen caught in the Molucca Sea, 763 m. The present specimens were taken from southwest of Luzon, between 750 and 925 m.

Munida gilii sp. nov.

Fig. 2

Munida babai - BABA, 1988 : 82 (key), 89, fig. 32 (not *Munida babai* Tirmizi & Javed, 1976).

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 56, 129-134 m : 5 ♂ 4.3-5.9 mm; 3 ov. ♀ 5.3-5.4 mm; 1 ♀ 5.1 mm (MNHN-Ga 2478, 2479). — Stn 72, 122-127 m : 1 ♂ 4.5 mm; 2 ov. ♀ 4.6, 5.3 mm (MNHN-Ga 2480).

TYPES. — The male of 5.9 mm from MUSORSTOM 1, Stn 56 (MNHN-Ga 2479) has been selected as holotype; the other specimens are paratypes.

ETYMOLOGY. — This species is dedicated to J.M. GILI from the Instituto de Ciencias del Mar, for his important contribution to the systematic of marine invertebrates and support in my studies.

DESCRIPTION (Holotype). — Carapace, excluding rostrum, slightly longer than wide. Secondary striae present between main striae. Gastric region with row of 13 epigastric spines. One postcervical spine on each side.

Frontal margins slightly oblique. Anterolateral spine situated at anterolateral angle, not reaching level of sinus between rostrum and supraocular spine. Second marginal spine before cervical groove smaller than preceding one. Branchial margins with 5 small spines quite similar in size.

Rostrum spiniform, dorsally carinated, half as long as remaining carapace, slightly sinuous and downwardly directed distally. Supraocular spines short, clearly not reaching end of corneae, subparallel and upwardly directed.

Fourth to sixth thoracic sternites each with some arcuate striae.

Anterior ridge of second, third and fourth abdominal segments with 4, 2 and 1 pairs of spines, respectively. Second to fifth segments each with several transverse continuous striae.

First and second abdominal segments each with pair of gonopods.

Eyes large, maximum corneal diameter about one-half length of anterior border of carapace between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) overreaching corneae, with 2 distal spines; mesial one longer than lateral; 2 spines on lateral margin.

First segment of antennal peduncle with distomesial spine reaching end of second segment; second segment with 2 long distal spines, mesial longer than lateral and slightly overreaching antennal peduncle; third segment unarmed.

Merus of third maxilliped bearing 2 well developed spines on flexor margin, proximal longer than distal; extensor margin with distal spine.

Chelipeds squamate, right longer and stouter than left. Right cheliped about 5 times as long as carapace; merus and carpus with spines on mesial, dorsal and lateral borders; palm with several small spines on mesial and dorsal sides, and distal spine on lateral border; movable finger with one basal and one distal spine; fixed finger with one basal and 2 distal spines.

Walking legs slender. First walking leg 2.5 times carapace length; merus with row of 11-12 spines on dorsal border increasing in size distally, long distal spine and 2-5 projected striae on distal half of ventral margin; carpus with long distal spine on dorsal and ventral borders, 2-3 additional spines on dorsal margin; propodus with row of 14-16 movable spines on ventral margin; dactylus long, slightly shorter than propodus, with 7 movable spinules along proximal half of ventral margin. Second walking leg similar to first. Third walking leg shorter than first and second; merus about one-half that of first walking leg.

Epipods absent from all pereiopods.

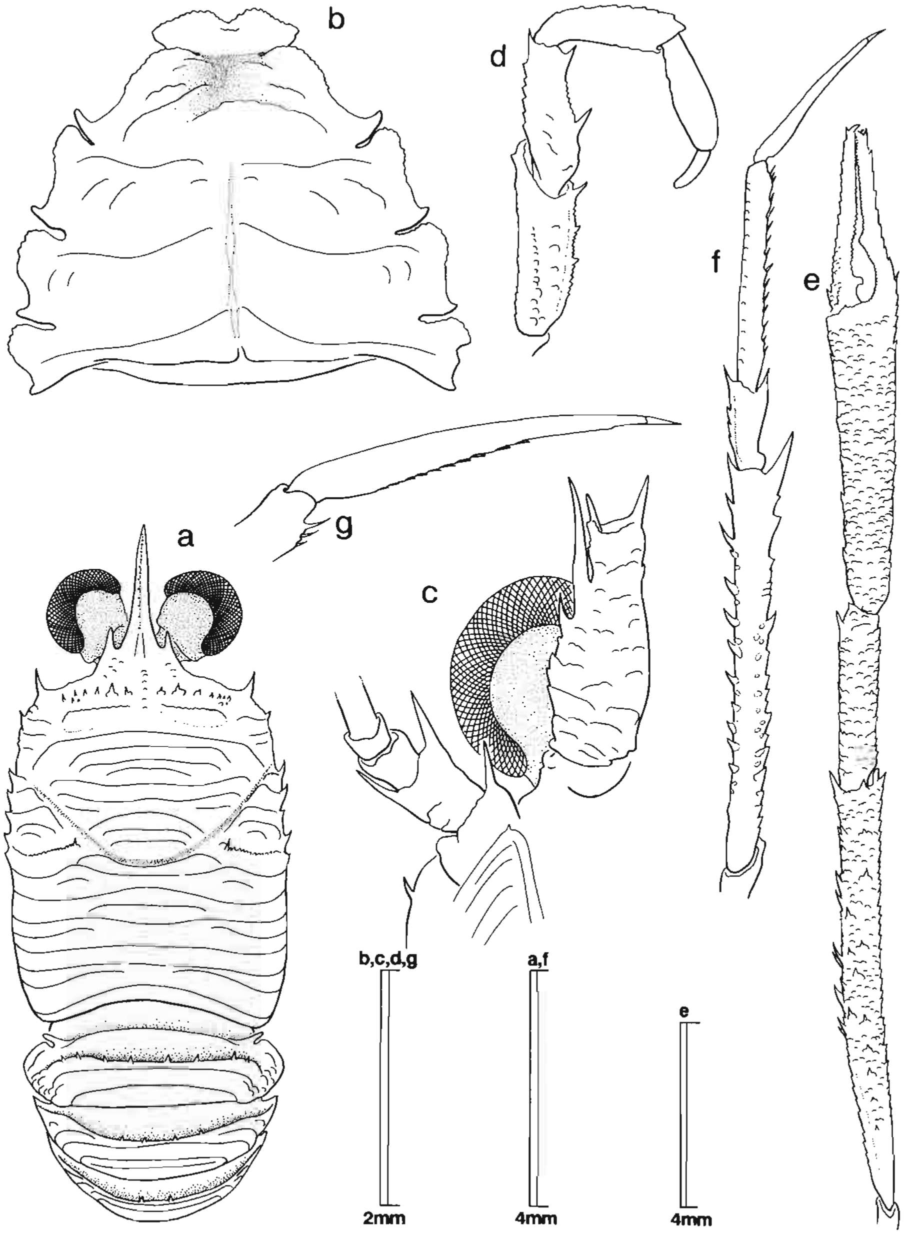

FIG. 2. — *Munida gilii* sp. nov., ♂, 5.9 mm, holotype from Stn 56 (MUSORSTOM 1) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennula and antennal peduncles; **d**, right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus of right first walking leg, lateral view.

VARIATIONS. — The number of spines on the anterior ridge of the second, third and fourth abdominal segments ranges between 8-13, 2-4 and 2-4, respectively (see also BABA, 1988). The fixed finger of the chelipeds always has 1-3 proximal spines. The other main characters remain constant.

REMARKS. — *Munida gilii* sp. nov. is very close to *M. babai* Tirmizi & Javed, 1976 from South Africa, off Natal (118-150 m) in having spines on the anterior ridge of the second, third and fourth abdominal segments. The examination of the type specimens (1 ♂ 4.0 mm; 2 ♀ 2.0, 2.5 mm, National Museum of Natural History, Washington) and additional material from Madagascar (2 ♂ 3.4, 4.5 mm; 1 ♀ 4.0 mm, MNHN, see BABA, 1990) shows several constant differences between the two :

— The distomesial spine of the basal antennular segment is longer than the distolateral in *M. gilii*, being shorter in *M. babai*.

— The fixed finger of the chelipeds in *M. babai* is unarmed (except distal spines), instead of bearing 1-3 spines on the proximal half as in *M. gilii*.

SIZE. — The males examined ranged between 4.3 and 5.9 mm, females between 4.6 and 5.4 mm; ovigerous females from 4.6 mm.

DISTRIBUTION. — Hong Kong and Philippines, between Samar and Leyte, 112-113 m (BABA, 1988). The specimens collected during MUSORSTOM cruises were caught west of Luzon, between 122 and 134 m.

Munida kuboi Yanagita, 1943

Munida kuboi Yanagita, 1943 : 20, figs 5-6. — BABA, 1988 : 83 (key), 109, fig. 40; 1990 : 925 (key), 964.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 10, 187-205 m : 1 ♂ 10.6 mm; 1 ov. ♀ 12.4 mm (MNHN-Ga 2481). — Stn 18, 150-159 m : 1 ♀ 6.7 mm (MNHN-Ga 2482). — Stn 24, 189-209 m : 1 ♂ 10.9 mm (MNHN-Ga 2483). — Stn 25, 191-200 m : 1 ov. ♀ 7.4 mm (MNHN-Ga 2484). — Stn 30, 177-186 m : 1 ♂ 12.4 mm (MNHN-Ga 2485). — Stn 34, 188-191 m : 2 ♂ 10.6, 12.6 mm (MNHN-Ga 2486). — Stn 40, 265-287 m : 1 ♂ 10.4 mm (MNHN-Ga 2487). — Stn 41, 208-236 m : 1 ♂ 10.1 mm (MNHN-Ga 2488).

MUSORSTOM 2 : stn 1, 188-198 m : 1 ov. ♀ 11.7 mm (MNHN-Ga 2489). — Stn 10, 188-195 m : 2 ♂ 9.7, 11.7 mm; 1 ov. ♀ 10.4 mm (MNHN-Ga 2490). — Stn 11, 194-196 m : 2 ♂ 9.8, 12.8 mm (MNHN-Ga 2491). — Stn 13, 193-200 m : 1 ♂ 10.6 mm; 1 ♀ 7.0 mm (MNHN-Ga 2492). — Stn 63, 215-230 m : 1 ♂ 8.0 mm (MNHN-Ga 2493). — Stn 75, 300-330 m : 1 ♂ 11.4 mm (MNHN-Ga 2494). — Stn 80, 178-205 m : 1 ♂ 7.7 mm (MNHN-Ga 2495). — Stn 83, 318-320 m : 1 ♂ 13.5 mm (MNHN-Ga 2496).

MUSORSTOM 3 : stn 87, 191-197 m : 3 ♂ 8.5-10.1 mm; 1 ov. ♀ 11.5 mm (MNHN-Ga 2497). — Stn 99, 196-204 m : 6 ♂ 9.8-14.7 mm; 1 ov. ♀ 13.6; 1 ♀ 10.1 mm (MNHN-Ga 2498). — Stn 101, 194-196 m : 1 ♂ 9.2 mm; 3 ♀ 9.0-9.6 mm (MNHN-Ga 2499). — Stn 103, 193-200 m : 2 ♂ 9.3, 10.0 mm; 1 ♀ 9.7 mm (MNHN-Ga 2500). — Stn 120, 219-220 m : 1 ♂ 7.2 mm (MNHN-Ga 2501).

Indonesia. CORINDON 2 : stn 271, 215 m : 4 ♂ 9.2-12.0 mm ; 1 ♀ 9.3 mm (MNHN-Ga 2502).

REMARKS. — The specimens examined agree with the original description (YANAGITA, 1943) and comments made by BABA (1988). The lateral parts of the seventh thoracic sternites have no granules or ridges.

SIZE. — The males examined ranged between 4.9 and 14.7 mm, females between 5.1 and 13.6 mm; ovigerous females from 10.1 mm.

DISTRIBUTION. — The type locality of this species is Toyama Bay (Japan) between 78 and 148 m. It was subsequently reported from the Philippines and Madagascar between 216 and 405 m (BABA, 1988; 1990). The present material was collected from southwest of Luzon, south of Mindoro and north of Sulawesi, between 129 and 330 m.

Munida longispinata Baba, 1988

Munida longispinata Baba, 1988 : 82 (key), 114, figs 43-44.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 2 : stn 36, 569-595 m : 1 ♂ 12.8 mm (MNHN-Ga 2503). — Stn 46, 445-520 m : 4 ♂ 8.2-13.8 mm; 1 ov. ♀ 14.0 mm; 1 ♀ 12.2 mm (MNHN-Ga 2504). — Stn 49, 416-425 m : 1 ♂ 14.3 mm; 1 ♀ 7.8 mm; 1 ov. ♀ 13.5 mm (MNHN-Ga 2505).

MUSORSTOM 3 : stn 122, 673-675 m : 1 ♂ 8.6 mm; 2 ov. ♀ 13.0, 13.8 mm (MNHN-Ga 2506). — Stn 123, 700-702 m : 2 ov. ♀ 15.5, 15.8 mm (MNHN-Ga 2507). — Stn 127, 464-475 m : 1 ov. ♀ 15.0 mm (MNHN-Ga 2508). —

Stn 135, 486-551 m : 1 ♂ 11.4 mm; 2 ov. ♀ 15.2, 17.7 mm (MNHN-Ga 2509). — Stn 138, 252-370 m : 1 ov. ♀ 14.6 mm (MNHN-Ga 2510). — Stn 145, 214-246 m : 1 ♀ 15.2 mm (MNHN-Ga 2511).

SIZE. — The males examined ranged between 8.2 and 14.3 mm, females between 7.8 and 17.7 mm; ovigerous females from 13.0 mm.

DISTRIBUTION. — Previously known from off southwestern Luzon and east coast of Mindoro and Mindanao Sea, Philippines (392-619 m). The present material was taken from south and southwest of Luzon, south of Mindoro and north of Panay, between 214 and 702 m.

Munida major Baba, 1988

Munida major Baba, 1988 : 83 (key), 118, figs 45-46.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 2 : stn 38, 1650-1660 m : 1 ♂ 10.8 mm; 1 ov. ♀ 14.3 mm (MNHN-Ga 2512).

REMARKS. — The specimens examined agree quite well with the description and figures provided by BABA (1988). This species was recorded from the Sulu Sea and eastern Mindanao Sea, between 906 and 1350 m. The specimens from MUSORSTOM cruises were collected from south of Luzon, between 1650 and 1660 m.

Munida minuta sp. nov.

Fig. 3

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn 117, 92-97 m : 4 ♂ 2.5-2.7 mm; 3 ov. ♀ 2.3-2.7 mm; 1 ♀ 2.7 mm (MNHN-Ga 2513, 2514).

TYPES. — The male of 2.7 mm from MUSORSTOM 3, Stn 117 (MNHN-Ga 2514) has been selected as holotype; the other specimens are paratypes.

ETYMOLOGY. — From the Latin, *minutus*, small.

DESCRIPTION (Holotype). — Carapace, without rostrum, slightly longer than wide. Secondary striae almost absent. Gastric region with row of 5 pairs of epigastric spines. One parahepatic spine on each side.

Frontal margins transverse. Anterolateral spine short, situated at anterolateral angle, not reaching sinus between rostrum and supraocular spines. Second marginal spine in front of cervical groove smaller than preceding one. Branchial margins with 4 spines quite similar in size.

Rostrum spiniform, less than half as long as remaining carapace, dorsally carinated, slightly curved and horizontal. Supraocular spines short not reaching end of corneae, subparallel and upwardly directed.

Thoracic sternites without striae.

Abdominal segments unarmed and without striae.

First and second abdominal segments each with pair of gonopods.

Eyes moderately large, maximum corneal diameter about one-third length of anterior border of carapace between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) overreaching corneae, with 2 subequal distal spines and 2 spines on lateral margin.

First segment of antennal peduncle with strong distomesial spine, slightly overreaching second segment; second segment with 2 distal spines, mesial longer than lateral and slightly overreaching third segment, one small median spinule on mesial margin; third segment unarmed.

Merus of third maxilliped bearing 2 well developed spines on flexor margin, proximal longer than distal; extensor margin with distal spine.

Chelipeds subequal, about 2.5 times as long as carapace; merus and carpus armed with rows of spines on mesial, dorsal and ventral borders; palm with row of mesial spines, numerous small spines on dorsal side, row of dorsolateral spines continuing onto fixed finger and reaching tip; movable finger with row of mesial spines reaching tip.

Walking legs slender. First walking leg nearly twice carapace length; merus with row of spines along dorsal border increasing in size distally, lông distal spine and several projected striae on distal half of ventral margin; carpus with long distal spine on dorsal and ventral borders, 2 additional dorsal spines; propodus with row of 7-8 movable spines along ventral margin; dactylus long, slightly shorter than propodus, with 8 movable spinules along ventral margin. Second walking leg similar to first. Third walking leg shorter than first and second and less spinulated; merus about 3/4 that of first walking leg.

Epipods absent from all pereiopods.

VARIATIONS. — No significant variations in the main characters have been observed among the specimens examined.

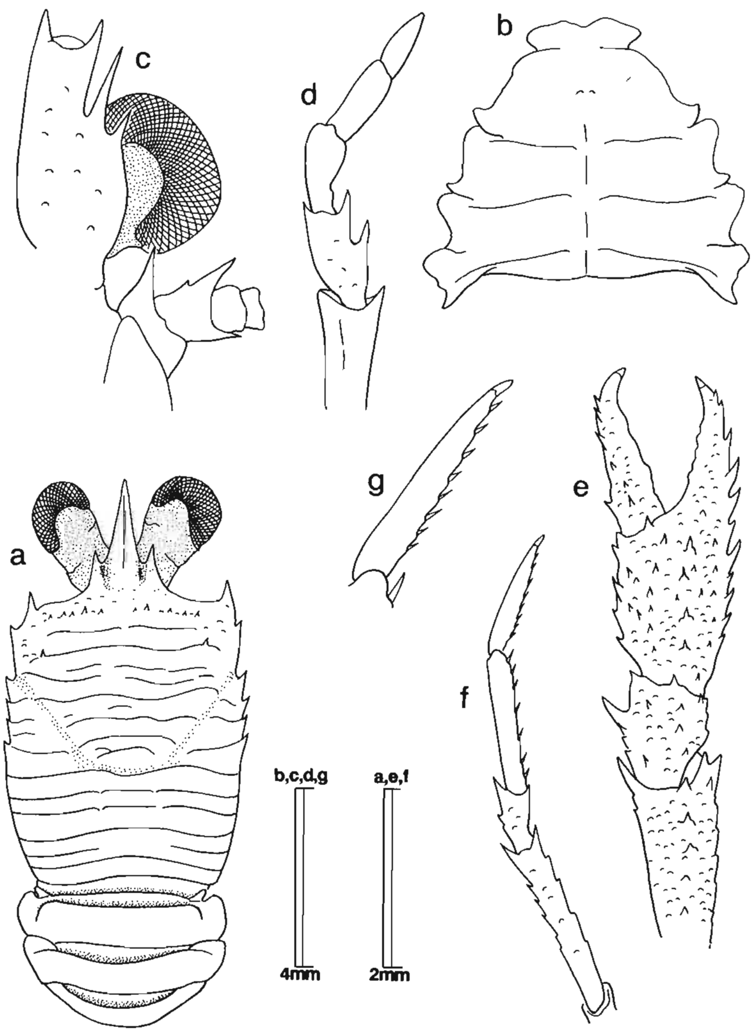

FIG. 3. — *Munida minuta* sp. nov., ♂, 2.7 mm, holotype from Stn 117 (MUSORSTOM 3) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennula and antennal peduncles; **d**, right third maxilliped, lateral view; **e**, left cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus of right first walking leg, lateral view.

REMARKS. — *M. minuta* is close to *M. pusiola* sp. nov. and *M. laevis* Macpherson & Baba, 1992, from the Philippines (MACPHERSON & BABA, 1992) in having the second abdominal segment unarmed, the sternum smooth and the extensor border of the merus of the third maxilliped with a distal spine. *M. minuta* and *M. pusiola* were collected in the same station but differ in several aspects :

— The frontal margins are transverse in *M. minuta*, oblique in *M. pusiola*.

— The branchial margins have 4 spines in *M. minuta*, 5 spines in *M. pusiola*.

— The second abdominal segment is smooth, without striae in *M. minuta*, with one transverse stria in *M. pusiola*.

— The palm of the chelipeds has more dorsal spines in *M. minuta* than in *M. pusiola*.

M. minuta can be differentiable from *M. laevis* by the following aspects :

— The branchial margins have 4 spines in *M. minuta*, 5 spines in *M. pusiola*.

— The movable finger of the cheliped has a row of lateral and mesial spines, respectively in *M. minuta*, one basal and one distal mesial spine in *M. laevis*.

— In *M. laevis* the dactyli of the walking legs are unarmed on the distal third of the ventral border, with spines along this border in *M. minuta*.

DISTRIBUTION. — Philippines, west coast of Mindoro, between 92 and 97 m.

Munida parvula sp. nov.

Fig. 4

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn 121, 73-84 m : 1 ♂ 4.2 mm, holotype (MNHN-Ga 2515).

ETYMOLOGY. — From the Latin, *parvulus*, very small, in reference to the small size of the species.

DESCRIPTION. — Carapace, without rostrum, slightly longer than wide. Secondary striae present between main striae. Gastric region with row of epigastric spines, several additional spines just behind rostrum. One hepatic, one parahepatic and one postcervical spine on each side.

Frontal margins transverse. Anterolateral spine well developed situated at anterolateral angle, not overreaching sinus between rostrum and supraocular spines. Second marginal spine before cervical groove clearly smaller than preceding one. One small spine on the base of anterolateral spine. Branchial margins with 5 small spines quite similar in size.

Rostrum spiniform, dorsally carinated, half as long as remaining carapace, slightly curved and downwardly directed in terminal third. Supraocular spines short, clearly not reaching end of corneae, convergent and upwardly directed.

Fourth thoracic sternite with several short arcuate striae; fifth to seventh sternites without striae.

Second abdominal segment unarmed. Second to fourth abdominal segments each with several continuous transverse striae.

First and second abdominal segments each with pair of gonopods.

Eyes large, maximum corneal diameter about one-half length of anterior border of carapace between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) not overreaching corneae, with 2 distal spines, distomesial shorter than distolateral; 2 spines on lateral margin.

First segment of antennal peduncle with distomesial spine reaching end of second segment; second segment with 2 distal spines, mesial longer than lateral and slightly overreaching third segment; third segment unarmed.

Merus of third maxilliped bearing 2 well developed spines on flexor margin, proximal longer than distal; extensor margin with distal spine.

Left cheliped (right is missing) squamate, about 3.5 times as long as carapace; merus and carpus armed with rows of spines on mesial, dorsal and ventral borders; palm with mesial spines, row of small dorsal spines, and row of lateral spines not continuing onto fixed finger; movable finger with basal and 2 distal spines; fixed finger with four distal spines.

Walking legs slender. First walking leg twice carapace length; merus with row of spines along dorsal border increasing in size distally, long distal spine and several projected striae on distal half of ventral margin; carpus with long distal spine on dorsal and ventral borders, 2 additional spines on dorsal margin; propodus with row of 14 movable spines along ventral margin; dactylus long, slightly shorter than propodus, with 11 movable spinules along ventral margin, distal fourth unarmed. Second walking leg similar to first. Third walking leg shorter than first and second and less spinulated; merus about one-half that of first walking legs.

Epipods absent from all pereiopods.

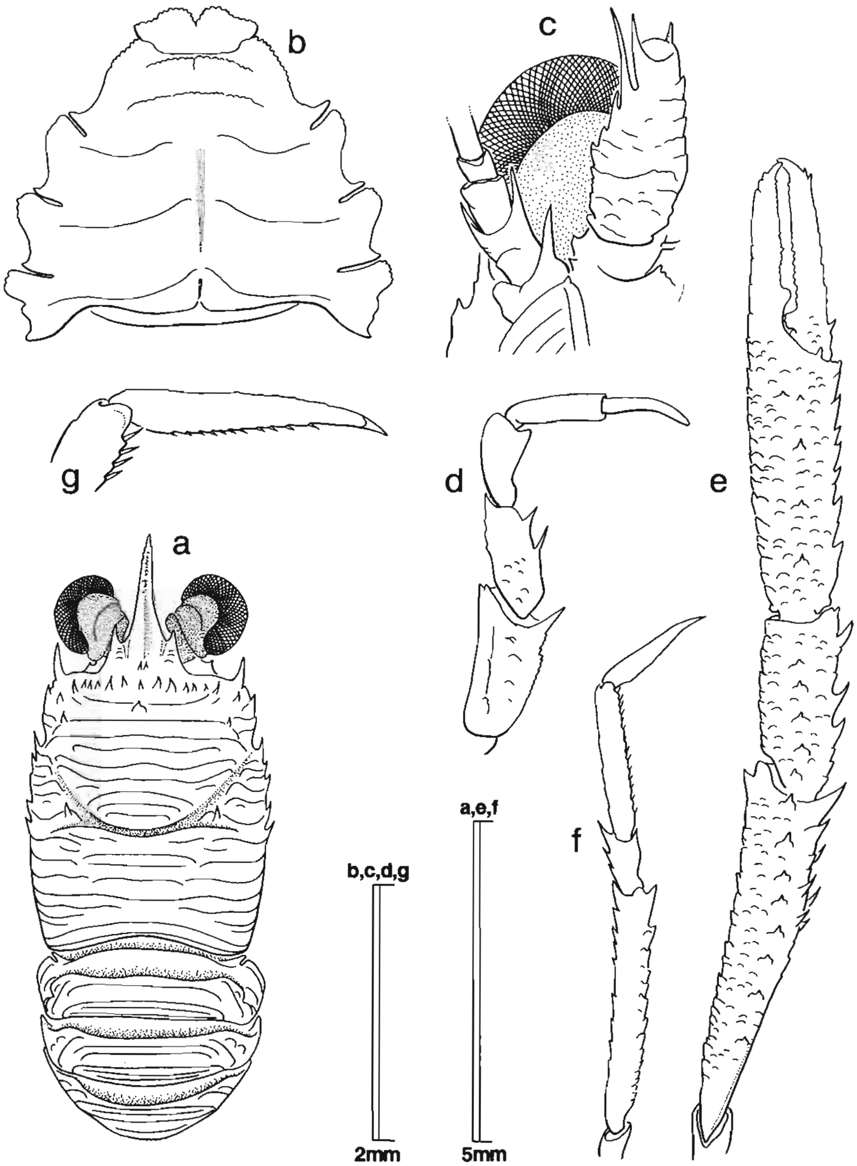

FIG. 4. — *Munida parvula* sp. nov., ♂, 4.2 mm, holotype from Stn 121 (MUSORSTOM 3) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennula and antennal peduncles; **d**, right third maxilliped, lateral view; **e**, left cheliped, dorsal view; **f**, right first walking leg, lateral view; **g**, dactylus of right first walking leg, lateral view.

REMARKS. — *M. parvula* is close to *M. laevis* Macpherson & Baba, 1992, from the Philippines, in having the second abdominal segment unarmed, the sternum smooth and the extensor border of the merus of the third maxilliped with a distal spine, but they differ in several aspects :

— The distomesial spine of the basal antennular segment is shorter than the distolateral in *M. parvula*, subequal in *M. laevis*.

— The distomesial spine of the second antennal segment clearly overreaches the antennal peduncle in *M. laevis*, only slightly overreaching the third antennal segment in *M. parvula*.

— The fixed finger of the chelipeds in *M. parvula* has only the terminal spines, instead of several spines along the lateral border in *M. laevis*.

DISTRIBUTION. — Philippines, south of Mindoro, between 73 and 84 m.

Munida pilorhyncha Miyake & Baba, 1966

Munida pilorhyncha Miyake & Baba, 1966 : 81, figs 1-2. — MIYAKE, 1982 : 149, pl. 50, fig 3. — BABA, 1988 : 82 (key), 122.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 2 : stn 83, 318-320 m : 1 ♂ 15.4 mm (MNHN-Ga 2516).

REMARKS. — The specimen was collected in the Philippines, south of Mindoro. It agrees with the descriptions and figures provided by MIYAKE and BABA (1966), MIYAKE (1982) and BABA (1988). The lateral parts of the seventh thoracic sternites have no granules or ridges. The species is previously known from Tosa Bay, Japan, southwestern Kyushu and the Philippines, off Luzon, between 200 and 366 m.

Munida prominula Baba, 1988

Munida prominula Baba, 1988 : 84 (key), 124, fig. 47.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn 118, 448-466 m : 1 ♀ 6.9 mm (MNHN-Ga 2517). — Stn 119, 320-337 m : 1 ♀ 12.0 mm (MNHN-Ga 2518).
Indonesia. CORINDON 2 : stn 276, 395-450 m : 1 ♂ 11.2 mm (MNHN-Ga 2519).

REMARKS. — The specimens examined agree with the type description made by BABA (1988). The lateral parts of the seventh thoracic sternite have no granules or ridges.

SIZE. — The male examined measures 11.2 mm, females between 6.9 and 12.0 mm.

DISTRIBUTION. — BABA (1988) reported this species from off southwestern Taiwan, 421 m. The specimens examined were collected south of Mindoro (Philippines) and north of Sulawesi (Indonesia), between 320 and 450 m.

Munida pusiola sp. nov.

Fig. 5

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn 117, 92-97 m : 9 ♂ 2.4-3.3 mm; 2 ov. ♀ 2.3, 2.8 mm; 11 ♀ 2.3-4.2 mm (MNHN-Ga 2520, 2521).

TYPES. — The male of 3.1 mm from MUSORSTOM 3, Stn 117 (MNHN-Ga 2521) has been selected as holotype; the other specimens are paratypes.

ETYMOLOGY. — From the Latin, *pusiola*, young girl, in reference to the small size of the species. The name is considered as a substantive in apposition.

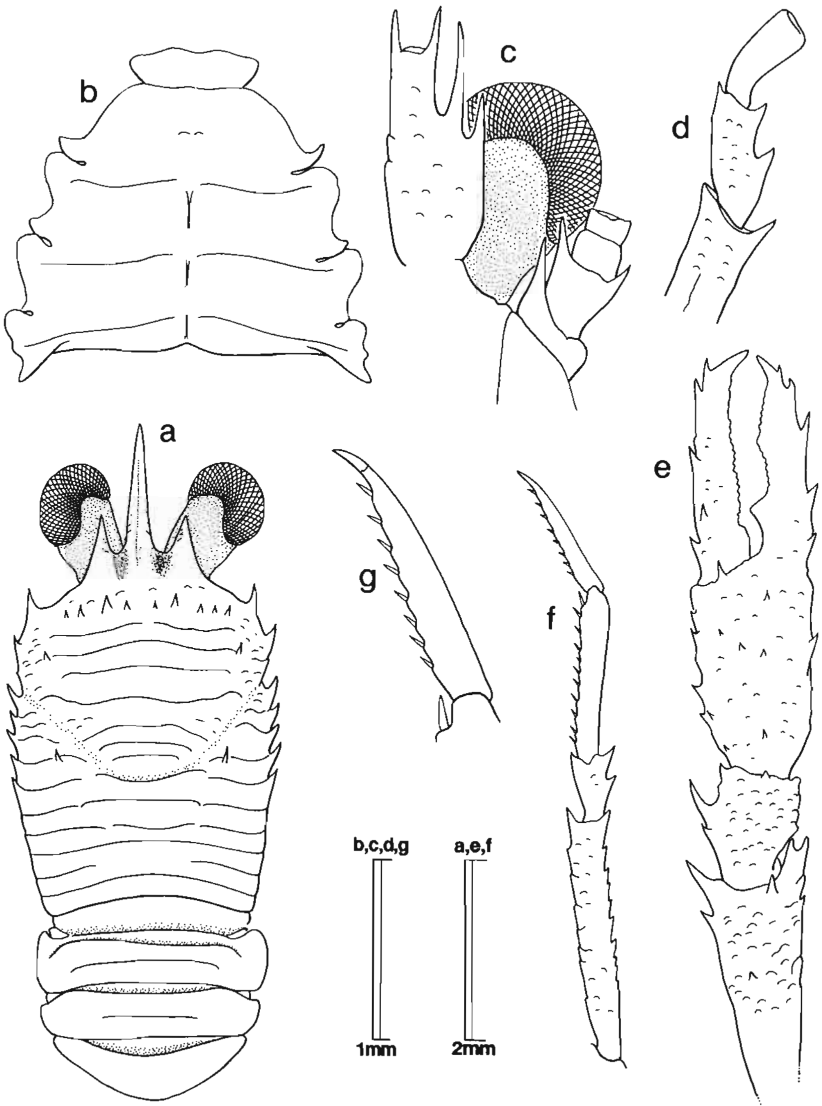

FIG. 5. — *Munida pusiola* sp. nov., ♂, 3.1 mm, holotype from Stn 117 (MUSORSTOM 3) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennula and antennal peduncles; **d**, right third maxilliped, lateral view; **e**, right cheliped, dorsal view; **f**, left first walking leg, lateral view; **g**, dactylus of left first walking leg, lateral view.

DESCRIPTION (Holotype). — Carapace, without rostrum, slightly longer than wide. Secondary striae between principal striae almost absent. Intestinal region without scales or striae. Gastric region with row of 9 epigastric spines. One parahepatic and one postcervical spine on each side.

Frontal margins oblique. Anterolateral spine well developed situated at anterolateral angle, not reaching sinus between rostrum and supraocular spines. Second marginal spine before cervical groove somewhat smaller than preceding one. Branchial margins with 5 spines quite similar in size.

Rostrum spiniform, dorsally carinated, half as long as remaining carapace, slightly curved, terminal third downwardly directed. Supraocular spines not reaching end of corneae, parallel and upwardly directed.

Fourth thoracic sternite with few short striae, other sternites without striae.

Second abdominal segment unarmed. Second and third segments each with one continuous transverse striae absent from fourth and fifth segments.

First and second abdominal segments each with pair of gonopods.

Eyes moderately large, maximum corneal diameter about one-third length of anterior border of carapace between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) slightly overreaching corneae, with 2 subequal distal spines and 2 lateral spines.

First segment of antennal peduncle with distomesial spine, slightly overreaching second segment; second segment with 2 distal spines, mesial longer than lateral, slightly overreaching third segment; third segment unarmed.

Merus of third maxilliped with 2 well developed spines on flexor margin, proximal longer than distal; extensor margin with distal spine.

Chelipeds subequal. Right cheliped about 2.5 times as long as carapace; merus and carpus armed with rows of spines on mesial, dorsal and ventral borders; palm with several mesial and dorsal spines, row of dorsolateral spines continuing onto fixed finger and reaching tip; movable finger with row of spines along mesial border reaching tip.

Walking legs slender. First walking leg slightly less than twice carapace length; merus with row of spines along dorsal border increasing in size distally, long distal spine on ventral margin; carpus with long distal spine on dorsal and ventral borders, additional spine on dorsal margin; propodus with 11-12 movable spines along ventral margin; dactylus long, slightly shorter than propodus, with 8 movable spinules along ventral margin. Second walking leg similar to first. Third walking leg shorter than first and second and less spinulated; merus about three-quarters that of first walking legs.

Epipods absent from all pereiopods.

VARIATIONS. — No significant differences in the main characters have been observed between the holotype and the paratypes.

REMARKS. — *M. pusiola* is close to *M. minuta* sp. nov. from the Philippines; their relationships are discussed under Remarks of the latter (see above).

DISTRIBUTION. — Philippines, west coast of Mindoro, between 92 and 97 m.

Munida sacksi sp. nov.

Fig. 6

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 2 : stn 75, 300-330 m : 1 ov. ♀ 13.4 mm (MNHN-Ga 2522).

New Caledonia. MUSORSTOM 4 : stn 241, 22°09.0'S, 167°12.2'E, 470-480 m, 03.10.1985 : 1 ♂ 9.1 mm; 1 ♀ 9.7 mm (MNHN-Ga 3399). — Stn 242, 22°05.8'S, 167°10.3'E, 500-550 m, 03.10.1985 : 1 ov. ♀ 10.7 mm; 3 ♀ 9.1-10.6 mm (MNHN-Ga 3400).

TYPES. — The ovigerous female of 13.4 mm from MUSORSTOM 2, Stn 75 (MNHN-Ga 2522) has been selected as holotype; the other specimens are paratypes.

ETYMOLOGY. — This species is dedicated to R. SACKS, from ICSEAF (International Commission for the Southeast Atlantic Fisheries), for his continuous and valuable assistance in my work.

DESCRIPTION (Holotype). — Carapace with numerous secondary striae between principal striae. Some scales on intestinal region. Gastric region with row of epigastric spines. One parahepatic and one postcervical spine on each side.

Frontal margins quite transverse. Anterolateral spine well developed situated on frontal margins near anterolateral angle, not reaching sinus between rostrum and supraocular spines. Second marginal spine on anterolateral angle somewhat smaller than preceding one. One small spine between both spines. Branchial margins with 5 spines decreasing in size posteriorly.

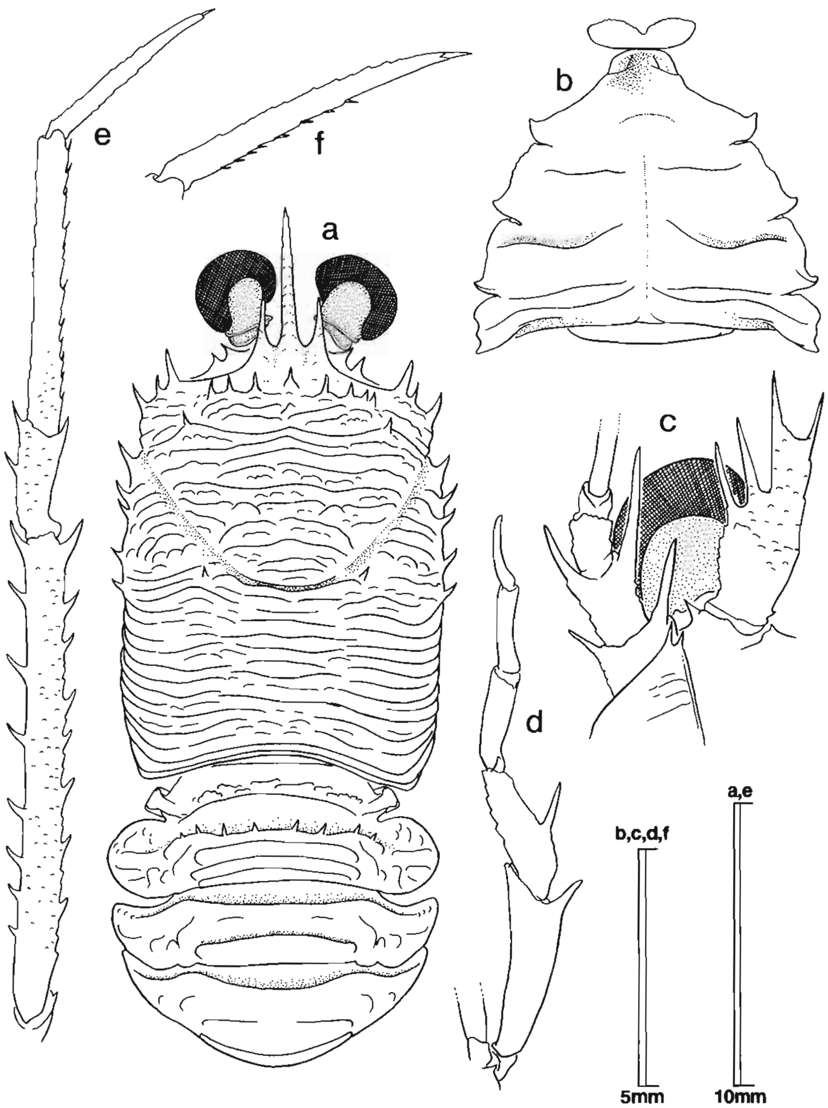

FIG. 6. — *Munida sacksi* sp. nov., ov. ♀, 13.4 mm, holotype from Stn 75 (MUSORSTOM 2) : **a**, carapace, dorsal view; **b**, sternal plastron; **c**, ventral view of cephalic region, showing antennula and antennal peduncles; **d**, right third maxilliped, lateral view; **e**, right first walking leg, lateral view; **f**, dactylus of right first walking leg, lateral view.

Rostrum spiniform, slightly less than half as long as remaining carapace, slightly sinuous and horizontal. Supraocular spines not reaching end of corneae, subparallel and upwardly directed.

Fourth thoracic sternite with few short arcuate striae; other sternites without striae.

Second abdominal segment with row of 8 spines on anterior ridge. Second to fourth abdominal segments each with several transverse striae.

Eyes large, maximum corneal diameter more than one-third length of anterior border of carapace between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) overreaching corneae, with 2 distal spines, distomesial slightly shorter than distolateral; 2 spines on lateral margin.

First segment of antennal peduncle with strong distal spine on mesial and lateral margins, mesial longer than lateral and overreaching second segment; second segment with 2 long distal spines, mesial longer than lateral, overreaching antennal peduncle; third segment unarmed.

Merus of third maxilliped with one well developed spine on flexor margin; extensor margin unarmed.

Chelipeds missing. Walking legs slender. First walking leg nearly 3 times carapace length; merus with row of spines on dorsal and ventral borders increasing in size distally; carpus with long distal spine on dorsal and ventral borders, several additional spines on dorsal margin; propodus with row of 11 movable spines on ventral margin; dactylus long, 2/3 propodus length, slightly curving distally, with 8 movable spinules along ventral margin, distal third unarmed. Second walking leg similar to first. Third walking leg shorter than first and second; merus about one-half that of first walking leg.

Epipods absent from all pereiopods.

VARIATIONS. — The male has the first and second abdominal segments each with 1 pair of gonopods. The chelipeds (broken) are present in one specimen, having a row of spines along the mesial and lateral borders of the movable and fixed fingers respectively.

REMARKS. — Additional specimens of this species were found in New Caledonia after its discovery in the Philippines.

M. sacksi is closely related to *M. africana* Doflein & Balss, 1913, from the south of Somalia (for the redescription of this species see MACPHERSON, 1991) in having five spines on the branchial margins of the carapace, the anterior ridge of the second abdominal segment with a row of spines and the extensor border of the merus of the third maxilliped unarmed. They differ in the following characters :

— The frontal margins are clearly more oblique in *M. africana* than in the new species.

— The distomesial spine of the second antennal segment in the new species clearly overreaches the antennal peduncle, whereas in *M. africana* this spine is shorter.

— The merus of the third maxilliped of *M. africana* has 2 well developed spines on the flexor margin, only one in the new species.

— In the new species, the dactylus of the walking legs are unarmed on the distal third of the ventral border. In *M. africana* the spines are present along the ventral margin.

SIZE. — The male examined measures 9.1 mm, females between 9.1 and 13.4 mm; ovigerous females from 10.7 mm.

DISTRIBUTION. — The Philippines, southwest coast of Luzon, New Caledonia, between 300 and 550 m.

Munida spinulifera Miers, 1884

Munida spinulifera Miers, 1884 : 279, pl. 31, fig. b. — TIRMIZI & JAVED, 1976 : 85, fig. 4. — BABA, 1988 : 83 (key).

MATERIAL EXAMINED. — **Indonesia.** CORINDON 2 : stn 268, 200 m : 2 ♂ 6.0, 7.8 mm (MNHN-Ga 3217).

REMARKS. — The specimens examined agree quite well with the redescription and figures provided by TIRMIZI & JAVED (1976). Some additional information on this species is here included : the fourth thoracic sternite has few striae, the other sternites are smooth; the number of dorsal spines on the second and third abdominal segments ranges between 8-9 and 4-6, respectively; the basal antennular segment clearly overreaches the cornea and the distolateral spine is longer than the distomesial; the chelipeds are long and slender, the fixed finger has a row of spines along the lateral border and the movable finger has one basal and one distal spine; the distal third of the ventral border of the dactylus of the walking legs is unarmed.

The species was previously known only from the type locality (Arafura Sea); these specimens were collected north of Sulawesi.

Munida variabilis Baba, 1988

Munida variabilis Baba, 1988 : 82 (key), 134, figs 51-52.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 2 : stn 36, 569-595 m : 2 ♂ 11.8, 15.0 mm (MNHN-Ga 2523). — Stn 44, 760-820 m : 1 ♂ 12.6 mm (MNHN-Ga 2524). — Stn 46, 445-520 m : 2 ♂ 9.7, 15.6 mm; 1 ov. ♀ 14.6 mm (MNHN-Ga 2525).

MUSORSTOM 3 : stn 101, 673-675 m : 7 ♂ 10.0-19.0 mm; 4 ♀ 5.8-9.3 mm; 4 ov. ♀ 14.5-17.3 mm (MNHN-Ga 2526). — Stn 123, 700-702 m : 2 ♂ 13.4, 14.7 mm; 1 ov. ♀ 19.2 mm; 5 ♀ 9.3-19.8 mm (MNHN-Ga 2527).

SIZE. — The males examined ranged between 9.7 and 19.0 mm, females between 5.8 and 19.8 mm; ovigerous females from 14.5 mm.

DISTRIBUTION. — The present material was collected in the Philippines, south and southwest of Luzon, south of Mindoro and north of Panay, between 445 and 820 m. BABA (1988) recorded this species from the same localities, between 514 and 924 m.

ACKNOWLEDGEMENTS

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11

Crustacea Decapoda : Species of the genus *Paramunida* Baba, 1988 (Galatheidae) from the Philippines, Indonesia and New Caledonia

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ABSTRACT

Galatheid crustaceans of the genus *Paramunida* Baba, 1988, collected in the Philippines, Indonesia and New Caledonia, have been studied. The collection contains 12 species, seven of which are described as new : *P. belone, P. evexa, P. pictura, P. polita, P. pronoe, P. stichas,* and *P. thalie*. An identification key for all of the species of the genus is provided.

RÉSUMÉ

Crustacea Decapoda : Les espèces du genre *Paramunida* (Galatheidae) récoltées aux Philippines, en Indonésie et en Nouvelle-Calédonie.

Douze espèces du genre *Paramunida* Baba, 1988, ont été récoltées au cours de campagnes dans l'Ouest-Pacifique (Philippines, Indonésie et Nouvelle-Calédonie). Sept sont décrites comme nouvelles (*P. belone, P. evexa, P. pictura, P. polita, P. pronoe, P. stichas* et *P. thalie*). Les épines des régions gastrique et cardiaque, la présence ou l'absence de stries sur les sternites thoraciques, la forme et la taille de l'épine mésiodistale du second segment antennaire, la coloration, sont les principaux caractèresde distinction entre les espèces. Une clé d'identification est proposée pour les 14 espèces reconnues dans le genre.

INTRODUCTION

The genus *Paramunida* was created by BABA (1988) to include those species described as belonging to the genus *Munida* Leach, 1820, having a very short rostrum, reduced transverse ridges on the carapace, male gonopods absent from the first abdominal segment, and a well developed anterolateral projection on the first segment of the antennal peduncle. The genus is restricted to the Indian and Pacific oceans, and BABA (1988) included 7 species : *P. granulata*

MACPHERSON, E., 1993. — Crustacea Decapoda : Species of the genus *Paramunida* Baba, 1988 (Galatheidae) from the Philippines, Indonesia and New Caledonia. *In* : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, Volume 10. *Mém. Mus. natn. Hist. nat.*, **156** : 443-473. Paris ISBN 2-85653-206-3.

(Henderson, 1885), *P. hawaiiensis* (Baba, 1981), *P. longior* Baba, 1988, *P. proxima* (Henderson, 1885), *P. scabra* (Henderson, 1885), *P. setigera* Baba, 1988, and *P. tricarinata* (Alcock, 1894) (see also ALCOCK, 1894, 1891; ALCOCK & ANDERSON, 1895; BABA, 1981).

The numerous representatives of this genus obtained during the expeditions to the Philippines, Indonesia and New Caledonian area revealed the existence of 12 species, 7 of them described here as new. Therefore, the genus is actually represented by 14 species. In this paper, the description and/or additional information for 13 species are provided, including an identification key for all the species of the genus. *P. tricarinata* (Alcock, 1894) collected in several localities of the Indian ocean, is also illustrated and included in the text due to its relationship with several species obtained in Indonesia, the Philippines and New Caledonian zone [e.g. *P. scabra* (Henderson, 1885), *P. thalie* sp. nov. from Loyalty Islands]. One species, *P. hawaiiensis* (Baba, 1981), only known from Hawaii, is not included in the systematic account of this paper. However, it is easily differentiated from the other species by the size of the supraocular spines and the shape of the rostrum and of the the antennular peduncle (see BABA, 1981; 1988).

The number of spines on the gastric and cardiac regions, the shape and size of the rostrum and supraocular spines, the presence/absence of striae on the thoracic sternites, the length of the basal segment of the antennular peduncle, the size and shape of the spines of the second segment of the antennal peduncle, the ratio propodus length/propodus height and propodus length/dactylus length of the walking legs and the colour pattern are the most relevant and constant aspects to differentiate the species. Some characters are rather constant in all the species considered and it seems that they have not systematic significance. Therefore, in order to avoid unnecessary repetitions they will be only included in the description of the first species considered (*P. belone*). These characters are : the armature of the abdominal tergites, the spinulation of the merus of the third maxilliped, and the armature of the chelipeds and walking legs. Finally, in this paper, the rostrum is considered from the sinus between supraocular spines until the tip of the rostral spine.

The types of the new species and other material are deposited in the collections of the Muséum national d'Histoire naturelle, Paris (MNHN), the Puslitbang Oseanologi - LIPI, Jakarta (POLIPI), and the National Museum of Natural History, Washington (NMNH). Abbreviations of other institutions are : The Natural History Museum, London (BM) and Senckenberg Museum, Frankfürt (SM). Measurements given in this paper are of the carapace length, excluding rostrum.

LIST OF STATIONS

The abbreviations of the devices used are : CC = Otter trawl; CP = Beam trawl; D = Dredge; DC = Charcot dredge; DW = Waren dredge.

MUSORSTOM 1. **Philippines.**

Station 5. — 19.03.1976, 14°01.5'N, 120°23.5'E, 200-215 m : *P. setigera.*
Station 10. — 19.03.1976, 13°59.8'N, 120°18.2'E, 187-205 m : *P. scabra.*
Station 19. — 21.03.1976, 13°57.8'N, 120°18.2'E, 167-187 m : *P. scabra.*
Station 21. — 21.03.1976, 14°01.0'N, 120°22.8'E, 174-223 m : *P. setigera.*
Station 27. — 22.03.1976, 13°59.8'N, 120°18.6'E, 188-192 m : *P. scabra.*
Station 30. — 22.03.1976, 14°01.3'N, 120°18.7'E, 177-186 m : *P. scabra.*
Station 31. — 22.03.1976, 14°00.0'N, 120°16.0'E, 187-195 m : *P. scabra.*
Station 34. — 23.03.1976, 14°01.0'N, 120°15,8'E, 188-191 m : *P. scabra.*
Station 40. — 24.03.1976, 13°57.4'N, 120°27.8'E, 265-287 m : *P. proxima.*
Station 42. — 24.03.1976, 13°55.1'N, 120°28.6'E, 379-407 m : *P. setigera.*
Station 51. — 25.03.1976, 13°49.4'N, 120°04.2'E, 170-200 m : *P. scabra, P. setigera.*
Station 54. — 26.03.1976, 13°54.2'N, 119°57.9'E, 975-1075 m : *P. scabra.*
Station 58. — 26.03.1976, 13°58.0'N, 120°13.7'E, 143-178 m : *P. scabra.*
Station 61. — 27.03.1976, 14°02.2'N, 120°18.1'E, 184-202 m : *P. scabra.*

Station 62. — 27.03.1976, 13°59.5'N, 120°15.6'E, 179-194 m : *P. scabra*.
Station 63. — 27.03.1976, 14°00.8'N, 120°15.8'E, 191-195 m : *P. scabra*.
Station 64. — 27.03.1976, 14°00.5'N, 120°16.3'E, 194-195 m : *P. scabra*.
Station 71. — 28.03.1976, 14°09.3'N, 120°26.2'E, 174-204 m : *P. scabra*.

MUSORSTOM 2. **Philippines.**

Station 1. — 20.11.1980, 14°00.3'N, 120°19.3'E, 188-198 m : *P. scabra*.
Station 2. — 20.11.1980, 14°01.0'N, 120°17.1'E, 184-186 m : *P. scabra*.
Station 4. — 20.11.1980, 14°01.2'N, 120°18.4'E, 183-190 m : *P. scabra*.
Station 10. — 21.11.1980, 14°00.1'N, 120°18.5'E, 188-195 m : *P. scabra*.
Station 31. — 24.11.1980, 13°40.5'N, 120°53.7'E, 204-230 m : *P. scabra*.
Station 35. — 24.11.1980, 13°27.9'N, 121°11.6'E, 160-198 m : *P. scabra*.
Station 51. — 27.11.1980, 13°59.3'N, 120°16.4'E, 170-187 m : *P. scabra*.
Station 54. — 27.11.1980, 13°59.5'N, 120°09.3'E, 170-174 m : *P. scabra*.
Station 55. — 27.11.1980, 13°53.7'N, 119°58.5'E, 865-866 m : *P. setigera*.
Station 59. — 28.11.1980, 14°00.5'N, 120°16.5'E, 186-190 m : *P. scabra*.
Station 63. — 29.11.1980, 14°07.3'N, 120°15.0'E, 215-230 m : *P. stichas*.
Station 71. — 30.11.1980, 14°00.1'N, 120°17.8'E, 189-197 m : *P. scabra*.
Station 72. — 30.11.1980, 14°00.7'N, 120°19.4'E, 182-197 m : *P. scabra*.
Station 80. — 01.12.1980, 13°45.1'N, 120°37.7'E, 178-205 m : *P. scabra*.
Station 83. — 02.12.1980, 13°55.2'N, 120°30.5'E, 318-320 m : *P. scabra*.

MUSORSTOM 3. **Philippines.**

Station 86. — 31.05.1985, 14°00.4'N, 120°17.8'E, 187-192 m : *P. scabra*.
Station 87. — 31.05.1985, 14°00.6'N, 120°19.6'E, 191-197 m : *P. scabra*.
Station 88. — 31.05.1985, 14°00.5'N, 120°17.4'E, 183-187 m : *P. scabra*.
Station 90. — 31.05.1985, 14°00.1'N, 120°18.6'E, 195 m : *P. scabra*.
Station 95. — 01.06.1985, 13°55.8'N, 119°59.3'E, 865 m : *P. scabra*.
Station 120. — 03.06.1985, 12°05.6'N, 121°15.6'E, 219-220 m : *P. setigera*.
Station 133. — 05.06.1985, 11°57.8'N, 121°52.2'E, 334-390 m : *P. scabra*.
Station 143. — 07.06.1985, 11°28.3'N, 124°11.6'E, 205-214 m : *P. scabra*.

BIOCAL. **New Caledonia.**

Station CP 108. — 09.09.1985, 22°02.5'S, 167°05.6'E, 335 m : *P. setigera*.

MUSORSTOM 4. **New Caledonia.**

Station CC 173. — 17.09.1985, 19°02.5'S, 163°18.8'E, 250-290 m : *P. longior*.
Station DW 223. — 30.09.1985, 22°57.0'S, 167°30.0'E, 545-560 m : *P. stichas*.
Station CP 238. — 02.10.1985, 22°13.0'S, 167°14.0'E, 500-510 m : *P. stichas*, *P. pronoe*.
Station CP 243. — 03.10.1985, 22°02.8'S, 167°07.7'E, 435-450 m : *P. longior*.
Station CC 246. — 03.10.1985, 22°08.5'S, 167°11.5'E, 410-420 m : *P. setigera*

CHALCAL 2. **New Caledonia.**

Station DW 73. — 29.10.1986, 29°39.9'S, 168°38.1'E, 573 m : *P. stichas*.
Station DW 74. — 29.10.1986, 24°40.3'S, 168°38.3'E, 650 m : *P. granulata*.
Station DW 75. — 29.10.1986, 24°39.3'S, 168°39.6'E, 600 m : *P. granulata*, *P. pictura*.

SMIB 6. **New Caledonia.**

Station DW 115. — 02.03.1990, 19°00.1'S, 163°27.5'E, 280-285 m : *P. pictura*.

CHALCAL 1. **Chesterfield Islands.**

Station CP 4. — 16.07.1984, 19°33.9'S, 158°37.9'E, 350-370 m : *P. pictura.*
Station D 33. — 19.07.1984, 19°44.8'S, 158°25.8'E, 205 m : *P. pictura.*

MUSORSTOM 5. **Chesterfield Islands.**

Station CP 253. — 07.10.1986, 25°08.7'S, 159°55.2'E, 295 m : *P. pictura.*
Station CP 267. — 08.10.1986, 25°23.6'S, 159°47.2'E, 285 m : *P. pictura.*
Station CP 268. — 09.10.1986, 24°44.7'S, 159°39.2'E, 280 m : *P. pictura.*
Station CP 275. — 09.10.1986, 24°46.6'S, 159°40.3'E, 285 m : *P. pictura.*
Station CP 276. — 09.10.1986, 24°48.9'S, 159°40.9'E, 258-269 m : *P. pictura.*
Station CP 288. — 10.10.1986, 24°04.8'S, 159°36.8'E, 270 m : *P. pictura.*
Station CP 289. — 10.10.1986, 24°01.5'S, 159°38.4'E, 273 m : *P. pictura.*
Station CP 293. — 11.10.1986, 23°09.3'S, 159°30.8'E, 280 m : *P. pictura.*
Station DW 303. — 12.10.1986, 22°11.9'S, 159°23.2'E, 332 m : *P. pictura.*
Station CP 307. — 12.10.1986, 22°11.1'S, 159°24.1'E, 350-345 m : *P. pictura.*
Station CP 309. — 12.10.1986, 22°10.2'S, 159°22.8'E, 340 m : *P. pictura.*
Station CP 311. — 12.10.1986, 22°13.6'S, 159°23.9'E, 320 m : *P. pictura.*
Station CP 312. — 12.10.1986, 22°17.2'S, 159°24.8'E, 315-320 m : *P. pictura.*
Station DW 328. — 15.10.1986, 20°22.8'S, 158°43.6'E, 355-340 m : *P. pictura.*
Station DW 329. — 15.10.1986, 20°22.9'S, 158°46.6'E, 320 m : *P. pictura.*
Station DW 330. — 15.10.1986, 20°19.8'S, 158°48.4'E, 360-365 m : *P. pictura.*
Station DC 376. — 20.10.1986, 19°51.1'S, 158°29.8'E, 280 m : *P. pictura.*
Station DC 378. — 20.10.1986, 19°53.7'S, 158°38.3'E, 355 m : *P. pictura.*

MUSORSTOM 6. **Loyalty Islands.**

Station DW 392. — 13.02.1989, 20°47.3'S, 167°04.6'E, 340 m : *P. pictura.*
Station DW 397. — 13.02.1989, 20°47.3'S, 167°05.1'E, 380 m : *P. belone.*
Station DW 407. — 15.02.1989, 20°40.7'S, 167°06.6'E, 360 m : *P. pictura.*
Station DW 412. — 15.02.1989, 20°40.6'S, 167°03.7'E, 437 m : *P. belone.*
Station DW 417. — 16.02.1989, 20°41.8'S, 167°03.6'E, 283 m : *P. thalie.*
Station CP 419. — 16.02.1989, 20°41.6'S, 167°03.7'E, 283 m : *P. thalie.*
Station DW 421. — 16.02.1989, 20°26.2'S, 166°40.1'E, 245 m : *P. thalie.*
Station DW 422. — 16.02.1989, 20°26.2'S, 166°40.3'E, 257 m : *P. thalie.*
Station DW 453. — 20.02.1989, 21°00.5'S, 167°26.9'E, 250 m : *P. belone.*
Station CP 454. — 20.02.1989, 21°00.6'S, 167°26.5'E, 260 m : *P. thalie.*
Station DW 457. — 20.02.1989, 21°00.4'S, 167°28.7'E, 353 m : *P. pictura.*
Station CP 464. — 21.02.1989, 21°02.3'S, 167°31.6'E, 430 m : *P. belone.*
Station DW 468. — 21.02.1989, 21°05.8'S, 167°32.9'E, 600 m : *P. granulata.*
Station DW 483. — 23.02.1989, 21°19.8'S, 167°47.8'E, 600 m : *P. granulata.*
Station DW 486. — 23.02.1989, 20°21.4'S, 167°47.6'E, 370 m : *P. pictura.*

VOLSMAR. **Matthew and Hunter Islands.**

Station DW 17. — 03.06.1989, 22°23.2'S, 171°41.7'E, 260-300 m : *P. pictura.*

CORINDON. **Indonesia.**

Station 267. — 07.11.1980, 01°56.6'S, 119°16.7'E, 134-186 m : *P. setigera.*
Station 271. — 07.11.1980, 01°57.8'S, 119°15.0'E, 215 m : *P. setigera.*
Station 273. — 07.11.1980, 01°56.0'S, 119°16.0'E, 180-220 m : *P. setigera.*

KARUBAR. **Indonesia.**

Station CP 5. — 22.10.1991, 05°46'39"S, 132°20'04"E, 285-323 m : *P. proxima, P. scabra.*
Station CP 6. — 22.10.1991, 05°47'11"S, 132°20'40"E, 286-306 m : *P. scabra, P. proxima, P. polita.*
Station CP 15. — 24.10.1991, 05°17'38"S, 132°40'51"E, 214-221 m : *P. scabra, P. stichas.*
Station CP 16. — 24.10.1991, 05°17'06"S, 132°51'19"E, 315-348 m : *P. polita.*
Station CP 17. — 24.10.1991, 05°17'03"S, 133°00'24"E, 439-459 m : *P. granulata.*
Station CP 25. — 26.10.1991, 05°31'30"S, 132°50'40"E, 318-352 m : *P. polita.*
Station CP 33. — 27.10.1991, 06°02'10"S, 132°38'21"E, 281-311 m : *P. scabra, P. polita.*
Station CP 35. — 27.10.1991, 06°07'22"S, 132°43'45"E, 390-502 m : *P. longior, P. polita.*
Station CP 36. — 27.10.1991, 06°05'50"S, 132°44'29"E, 210-268 m : *P. scabra, P. proxima, P. stichas.*
Station CP 47. — 29.10.1991, 08°01'04"S, 132°54'07"E, 235-246 m : *P. scabra.*
Station CP 63. — 01.11.1991, 08°59'59"S, 132°56'40"E, 213-214 m : *P. setigera.*
Station CP 65. — 01.11.1991, 09°14'01"S, 132°28'28"E, 174-176 m : *P. setigera, P. evexa, P. proxima.*
Station CP 66. — 01.11.1991, 09°02'19"S, 132°10'49"E, 211-217 m : *P. evexa, P. setigera.*
Station CP 67. — 01.11.1991, 08°58'59"S, 132°07'20"E, 233-246 m : *P. scabra, P. setigera.*
Station CP 79. — 03.11.1991, 09°13'34"S, 131°22'35"E, 239-250 m : *P. setigera.*
Station DW 80. — 04.11.1991, 09°37'00"S, 131°02'00"E, 199-201 m : *P. evexa.*
Station CP 84. — 04.11.1991, 09°22'41"S, 131°07'17"E, 246-275 m : *P. proxima.*
Station CP 85. — 04.11.1991, 09°22'51"S, 131°12'04"E, 239-244 m : *P. scabra.*
Station CP 86. — 04.11.1991, 09°23'59"S, 131°14'29"E, 222-226 m : *P. scabra, P. evexa.*

Key to species of *Paramunida*

1. Rostral spine smaller than supraocular spines **2**
— Rostral spine larger than supraocular spines **3**

2. Base of rostrum strongly excavated. Basal segment of antennula gradually narrowed distally, with 2 more or less reduced terminal spines. No bundle of setae at base of carpus of cheliped .... ***P. hawaiiensis*** (Baba, 1981)
— Base of rostrum moderately excavated. Basal segment of antennule narrowed in distal 1/3, with 2 distinct terminal spines. Carpus of cheliped with bundle of setae at base .... ***P. setigera*** Baba, 1988

3. Distomesial spine of second segment of antennal peduncle almost reaching end of anterior prolongation of first segment .... ***P. granulata*** (Henderson, 1885)
— Distomesial spine of second segment of antennal peduncle clearly not reaching end of anterior prolongation of first segment **4**

4. Propodi of walking legs particularly slender, about 20 times as long as wide .... ***P. longior*** Baba, 1988
— Propodi of walking legs about 7 to 11 times as long as wide **5**

5. Thoracic sternites with numerous striae **6**
— Fourth thoracic sternite with few striae; fifth to seventh sternites usually without striae **11**

6. Median gastric region with a row of 3-4 strong spines **7**
— Median gastric region with 1 (rarely 2) spine of moderate size **9**

7. Second segment of antennal peduncle bluntly produced distomesially .... ***P. evexa*** sp. nov.
— Second segment of antennal peduncle with well developed distomesial spine **8**

8. Basal antennular segment exceeding corneae by distal 1/3. Propodus of walking legs slightly longer than dactylus .... ***P. thalie*** sp. nov.
— Basal antennular segment exceeding corneae by distal 1/5 at most. Propodus of walking legs more than 1.5 times dactylus length .... ***P. tricarinata*** (Alcock, 1894)

9. Median cardiac region with 1 spine .... ***P. pronoe*** sp. nov.
— Median cardiac region with a row of 3-4 spines **10**

10. Mesiodistal spine of second antennal segment not evenly tapering, distally indented to form a spine-like process. Third and fourth segments of antennal peduncle reduced in size.. .... ***P. proxima*** (Henderson, 1885)
— Mesiodistal spine of second antennal segment. evenly tapering to a sharp tip. Third and fourth segments of antennal peduncle well developed .... ***P. scabra*** (Henderson, 1885)

11. Median gastric region with 1-2 spines of moderate size **12**
— Median gastric region with a row of 3-4 strong spines **13**

12. Mesiodistal spine of second antennal segment exceeding antennal peduncle.................... .... ***P. belone*** sp. nov.
— Mesiodistal spine of second antennal segment clearly not reaching end of antennal peduncle .... ***P. polita*** sp. nov.

13. Mesiodistal spine of second antennal segment evenly tapering to a sharp tip, only reaching end of third segment .... ***P. pictura*** sp. nov.
— Mesiodistal spine of second antennal segment not evenly tapering, distally indented to form a spine-like process, reaching end of antennal peduncle .... ***P. stichas*** sp. nov.

SYSTEMATIC ACCOUNT

Paramunida belone sp. nov.

Figs 1, 12

MATERIAL EXAMINED. — **Loyalty Islands.** MUSORSTOM 6 : stn 397, 380 m : 1 ♂ 5.5 mm (MNHN-Ga 2774). — Stn 412, 437 m : 1 ♂ 13.5 mm (MNHN-Ga 2825). — Stn 453, 250 m : 1 juv. 3.1 mm (MNHN-Ga 2834). — Stn 464, 430 m : 2 ♂ 15.0 mm (MNHN-Ga 2853) and 17.8 mm (MNHN-Ga 3014).

TYPES. — The male of 15.0 mm from Loyalty Islands, MUSORSTOM 6, stn 464 (MNHN-Ga 2853) has been selected as the holotype; the other specimens are paratypes.

ETYMOLOGY. — From the Greek, *bĕlone*, needle, in reference to the long distomesial spine of the second antennal segment.

DESCRIPTION. — Carapace as long as broad. Dorsal surface covered with spinules, lacking scaly striae. Gastric and cardiac regions indistinctly circumscribed and moderately convex. Gastric region with 2 epigastric spines just behind supraocular spines; 1 median mesogastric spine. Cardiac region with a median row of 3 well developed spines, first spine stronger than others; each branchiocardiac boundary with a row of 3 spines. Posterior margin with numerous small spines.

Frontal margins moderately concave behind eyes. Anterolateral spines long, situated at anterolateral angles, exceeding the level of sinus between rostrum and supraocular spines. Branchial margins slightly convex, with 5-7 spines of about similar size.

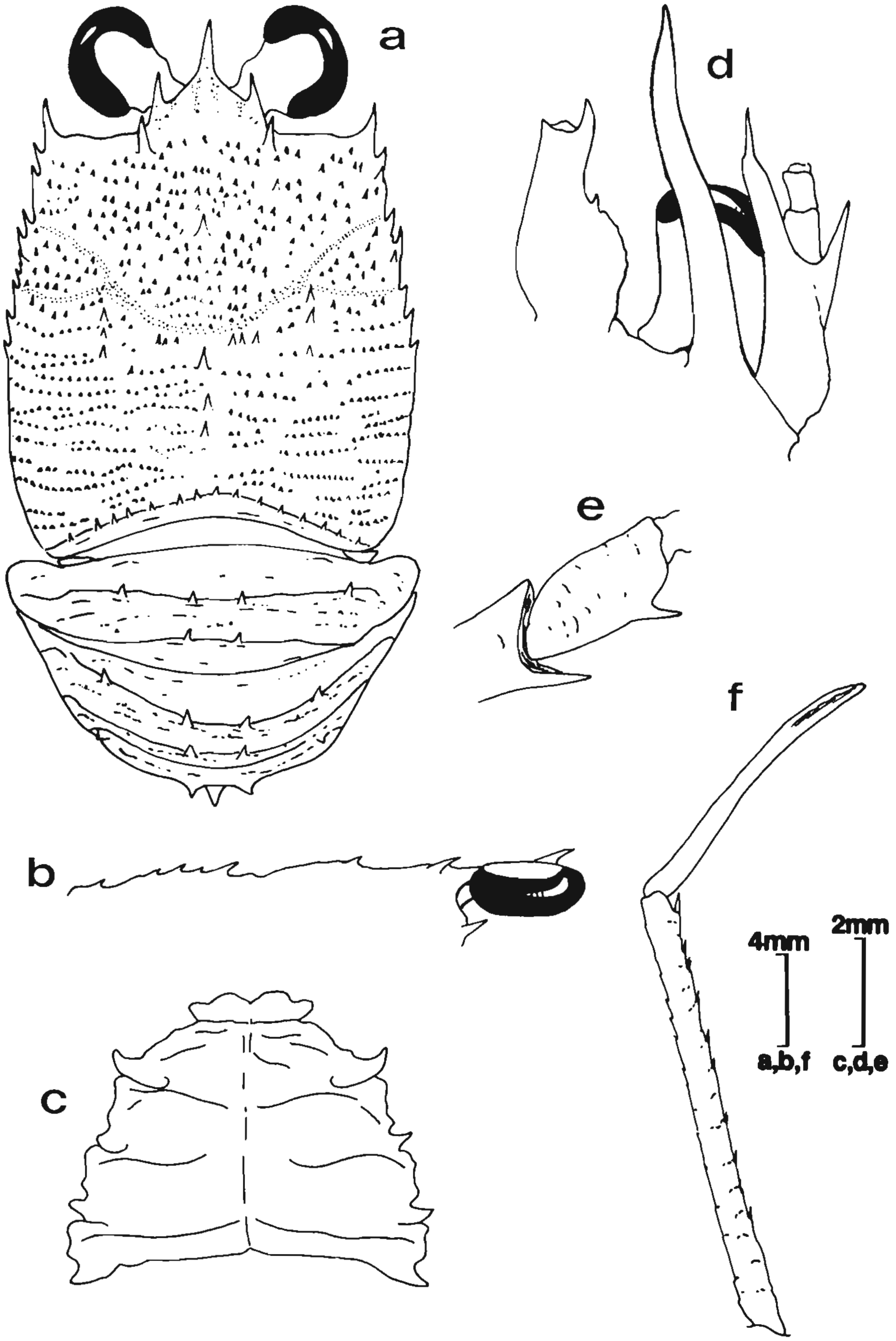

FIG. 1. — *Paramunida belone* sp. nov., ♂, 15.0 mm, holotype from stn 464 (MUSORSTOM 6) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, propodus and dactylus of right first walking leg, lateral view.

Rostrum wide at base, spiniform and upturned distally, stouter and about 3 times as long as supraocular spines; around one-fifth remaining carapace. Supraocular spines more slender than rostrum, not reaching to its midlength and falling short the end of corneae.

Fourth thoracic sternite with some arcuate striae, fifth to seventh sternites without striae.

Second and third abdominal segments each with one row of 4 spines on anterior border and 2-4 small spines on posterior margin; fourth segment with 2-4 spines on anterior border and one median spine on posterior margin.

Eyes large, maximum corneal diameter about one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) exceeding corneae, with 2 distal spines, distomesial shorter than distolateral; lateral margin with 1 small spine.

Anterior prolongation of first segment of antennal peduncle clearly reaching past the antennular peduncle, with long setae on lateral margin; second segment long and slender, with 2 distal spines, mesial longer than lateral, not evenly tapering, distally indented to form a spine-like process and clearly exceeding antennal peduncle.

Ischium of third maxilliped strongly produced distally; merus bearing 1 (rarely 2) well developed spine on flexor border; extensor margin unarmed.

Chelipeds long and slender, squamate, subcylindrical, furnished with iridiscent setae more dense on mesial borders of articles, lacking tuft of setae at base of carpus; merus with several rows of spines; carpus with some spines on dorsal and inner sides; palm as long as fingers, with some spines on inner marginal border.

Walking legs slender, with scales and granules more numerous on posterior side of articles; plumose, iridiscent setae on dorsal margin; merus with a row of spines along dorsal and ventral borders, both terminal spines produced; carpus with strong terminal spines on dorsal and ventral borders, some additional spines on dorsal margin; propodus with a row of movable spines along ventral border; dactylus long and slender, without spinules along ventral margin. First walking leg with propodus about 13 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along terminal third of each lateral side.

COLOUR. — Ground colour of carapace and abdominal segments light orange, with numerous small red and white spots. Yellow spots present on mesogastric and cardiac regions; yellow band bordering anterior half of cardiac region; one white spot near the bifurcation of the cervical groove; one red spot on each anterolateral angle and on lateral margins of carapace. Ground colour of chelipeds and walking legs whitish, with red bands. Fingers of chelipeds whitish, with scattered red spots.

REMARKS. — This new species is closely related to *P. polita* sp. nov. from Indonesia and *P. stichas* sp. nov. from New Caledonia, Matthews and Hunter Islands, Fiji, Indonesia, Philippines and Japan (see remarks under these species).

SIZE. — The males examined ranged between 5.5 and 7.8 mm, no females were collected.

DISTRIBUTION. — Loyalty Islands, between 250 and 437 m.

Paramunida evexa sp. nov.

Fig. 2

MATERIAL EXAMINED. — **Indonesia.** KARUBAR : stn 65, 174-176 m : 2 ♂ 7.5 and 7.9 mm; 1 ♀ 5.3 mm (MNHN-Ga 3016). — Stn 66, 211-217 m : 1 ov. ♀ 7.5 mm; 1 ♀ 7.1 mm (USNM). — Stn 80, 198-201 m : 2 ♂ 9.2 and 10.0 mm; 1 ov. ♀ 11.2 mm; 1 ♀ 9.4 mm (POLIPI). — Stn 86, 222-226 m : 1 ♀ 10,4 mm (MNHN-Ga 3214); 2 ov. ♀ 11.5 and 11.7 mm, 1 ♀ 12.7 mm (MNHN-Ga 3400).

TYPES. — The female of 10.4 mm from KARUBAR, stn 86 (MNHN-Ga 3214) has been selected as the holotype; the other specimens are paratypes.

ETYMOLOGY. — From the Latin, *evexus*, rounded at the top, in reference to the second antennal segment, being bluntly produced distomesially.

DESCRIPTION. — Carapace slightly longer than wide. Dorsal surface covered with spinules, without transverse ridges. Gastric and cardiac regions not distinctly circumscribed and moderately prominent. Gastric region with 2 small epigastric spines behind supraocular spines; a row of 3 median mesogastric spines, first spine more prominent than others. Cardiac region with a median row of 3-4 well developed spines, decreasing in size posteriorly; each branchiocardiac boundary with a row of 2-4 spines. Posterior margin of carapace with 1 median spine and numerous additional small spines.

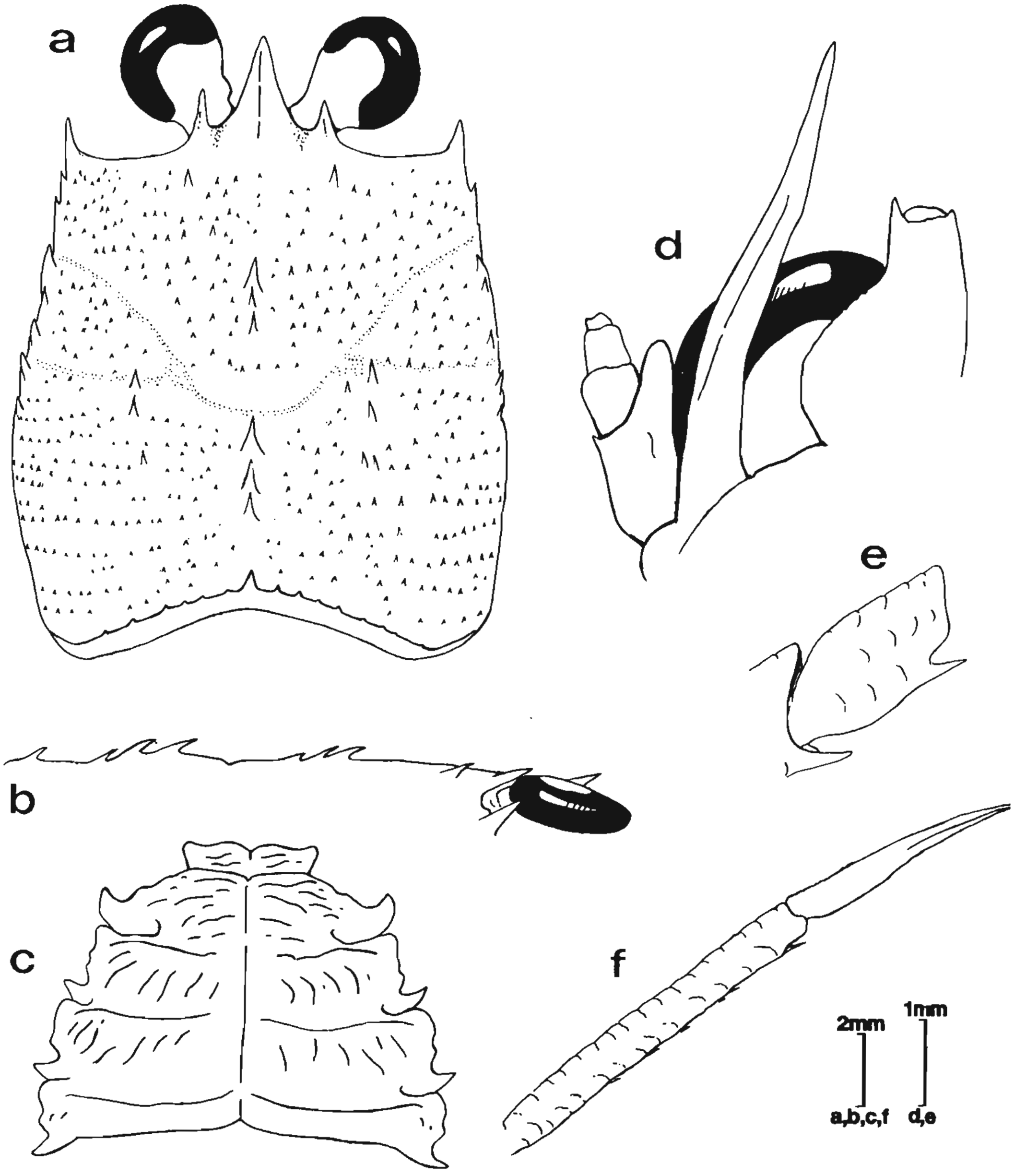

FIG. 2. — *Paramunida evexa* sp. nov., ♀, 10.4 mm, holotype from stn 86 (KARUBAR) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, propodus and dactylus of right first walking leg, lateral view.

Frontal margins transverse, lateral margins slightly convex. Anterolateral spines well developed, situated at anterolateral angles, slightly overreaching the level of sinus between rostrum and supraocular spines. Branchial margins with 5 small spines.

Rostrum triangular, upturned distally, clearly stouter than supraocular spines and one-fifth as long as remaining carapace. Supraocular spines not reaching midlength of rostrum and end of corneae.

Thoracic sternites with numerous arcuate striae.

Eyes moderately large, maximum corneal diameter about one-fourth the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) slightly exceeding corneae, with 2 short distal spines, distomesial very small and shorter than distolateral; lateral margin unarmed.

Anterior prolongation of first segment of antennal peduncle distinctly exceeding antennular peduncle, with long setae on ventrolateral border; second segment blunty produced distomesially, distolateral angle with a small spine.

First walking leg with propodus about 8 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along distal half of each lateral side.

REMARKS. — *Paramunida evexa* is closely related to *P. thalie* sp. nov. from Loyalty Islands (see remarks under that species).

SIZE. — The 2 males examined measured 7.5 and 7.9 mm, the females ranged between 5.3 and 12.7 mm; ovigerous females from 7.5 mm.

DISTRIBUTION. — Indonesia (Kai Islands), between 174 and 225 m.

Paramunida granulata (Henderson, 1885)

Figs 3, 13

Munida granulata Henderson, 1885 : 409; 1888 : 133, pl. 14, fig. 3a-b (in part).
Paramunida granulata – BABA, 1988 : 175 (key), 176, fig. 72.

MATERIAL EXAMINED. — **New Caledonia.** CHALCAL 2 : stn 74, 650 m : 2 ♂ 6.0 and 8.7 mm (MNHN-Ga 3216). — Stn 75, 600 m : 1 ♀ 9.7 mm (MNHN-Ga 3217).

Loyalty Islands. MUSORSTOM 6 : stn 468, 600 m : 1 ♂ 11.5 mm (MNHN-Ga 3218). — Stn 483, 600 m : 2 ♂ 10.3 and 10.6 mm; 1 ♀ 9.4 mm (USNM).

Fiji. "*Challenger*" : stn 173, 19°09'35"S, 179°41'50"E, 583 m, 24.07.1874: 5 ♂ 6.1 to 11.0 mm; 1 ov. ♀ 10.7 mm; 1 ♀ 7.7 mm, syntypes (BM).

Indonesia. KARUBAR : stn 17, 439-459 m : 4 ♂ 8.6 to 12.7 mm [2 ♂ (POLIPI); 2 ♂ (MNHN-Ga 3220)].

TYPES. — The male of 10.8 mm from Indonesia, "*Challenger*", stn 173 has been selected as the lectotype; the other specimens from the same station are paralectotypes.

DESCRIPTION. — Carapace as long as wide. Dorsal surface granulose, with scattered small spines, without transverse ridges. Gastric region not circumscribed and slightly prominent. Gastric region with 2 small epigastric spines behind supraocular spines; 1 strong mesogastric spine. Cardiac region distinctly circumscribed and moderately prominent, with a median row of 3-4 well developed spines, first spine clearly stronger than others; each branchiocardiac boundary with 2 spines. Posterior margin of carapace with numerous, small spines.

Frontal margins moderately concave. Lateral margins feebly convex. Anterolateral spines well developed, situated at front near anterolateral angles, reaching the level of sinus between rostrum and supraocular spines. Branchial margins with 4-5 small spines.

Rostrum spiniform, upturned distally, stouter than supraocular spines, one-fifth as long as remaining carapace. Supraocular spines small, clearly not reaching midlength of rostrum and falling short the end of corneae.

Thoracic sternites with numerous arcuate striae.

Eyes large, maximum corneal diameter about half the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) slightly exceeding corneae, with 2 distal spines, mesial slightly longer than lateral; lateral margin with 1-2 spines.

Anterior prolongation of first segment of antennal peduncle granulate, exceeding antennular peduncle, with long setae on ventrolateral border; second segment granulate, with 2 distal spines, mesial very long, almost reaching end of anterior prolongation of first segment, lateral spine well developed reaching end of third segment.

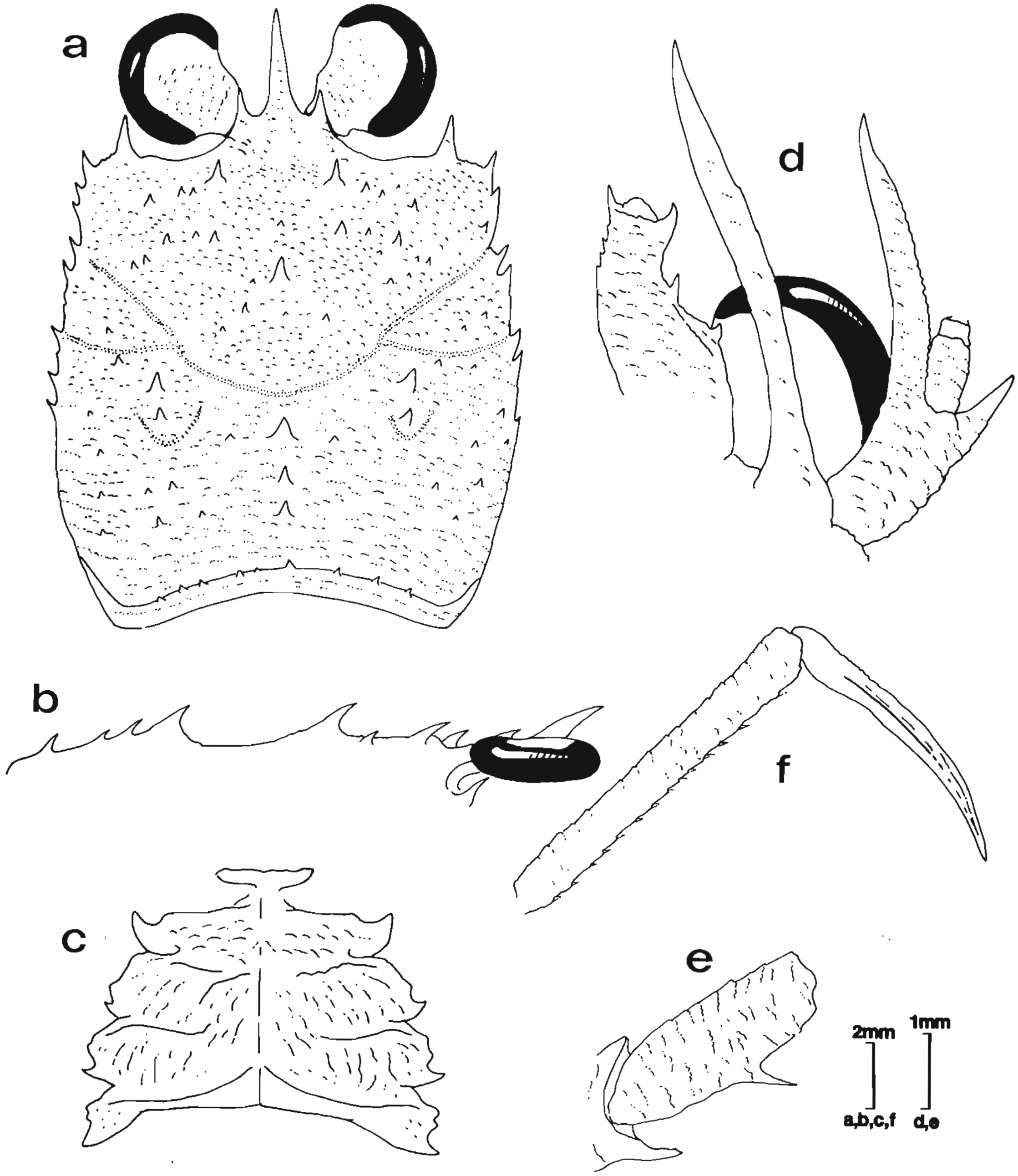

FIG. 3. — *Paramunida granulata* (Henderson, 1885), ♂ lectotype, 10.8 mm, from stn 173 (*"Challenger"*) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, propodus and dactylus of right first walking leg, lateral view.

First walking leg with propodus about 7 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along each lateral side.

COLOUR. — Ground colour of carapace and abdominal segments pinkish, 2 red spots on posterior border of carapace. One red spot at base of each anterolateral spine of carapace. Chelipeds and walking legs pinkish, with reddish scales.

REMARKS. — No significant differences were observed between the types and the other examined material. The species is easily differentiable from the other species of the genus by the long distomesial spine of the second segment of the antennal peduncle, which reaches the end of the anterior prolongation of the first segment. One male from the "*Challenger*" Expedition (Stn 173) belongs to an another species (see *P. stichas* sp. nov.).

SIZE. —The males examined ranged between 6.0 and 12.7 mm, females between 7.7 and 10.7 mm; ovigerous females from 10.7 mm.

DISTRIBUTION. — New Caledonia, Loyalty Islands, Fiji and Indonesia (Kai Islands), between 439 and 650 m.

Paramunida longior Baba, 1988

Paramunida longior Baba, 1988 : 176 (key), 177, fig. 73.

MATERIAL EXAMINED. — **New Caledonia.** MUSORSTOM 4 : stn 173, 250-290 m : 1 ♂ 5.5 mm (MNHN-Ga 3221). — Stn 243, 435-450 m : 5 ♂ 7.1 to 8.0 mm; 10 ov. ♀ 7.7 to 8.6 mm; 7 ♀ 4.8 to 6.7 mm (MNHN-Ga 3222).
Indonesia. KARUBAR : stn 35, 390-502 m : 1 ♂ 10.0 mm (MNHN-Ga 3223).

REMARKS. — As BABA (1988) pointed out, *Paramunida longior* is very close to *P. setigera* Baba, 1988, from the Philippines, Indonesia and New Caledonia. The differences between both species provided by BABA are quite constant in the material examined. An additional difference is the presence or absence of striae on the thoracic sternites : in *P. longior* the fourth thoracic sternite has few striae and the fifth to seventh sternites are smooth; whereas in *P. setigera* the thoracic sternites have numerous striae.

SIZE. — The males examined ranged between 5.5 and 10.0 mm, females between 4.8 and 8.6 mm; ovigerous females from 7.7 mm.

DISTRIBUTION. — New Caledonia, Indonesia (Kai Islands) and the Philippines, between 250 and 502 m.

Paramunida pictura sp. nov.

Figs 4, 14

MATERIAL EXAMINED. — **Chesterfield Islands.** CHALCAL 1 : stn 4, 350-370 m : 8 ♂ 8.4 to 11.6 mm; 14 ov. ♀ 7.7 to 12.2 mm; 1 ♀ 8.0 mm (USNM). — Stn 33, 205 m : 2 ♂ 5.6 to 6.7 mm; 4 ov. ♀ 6.2 to 6.8 mm; 3 ♀ 5.6 to 6.3 mm (MNHN-Ga 3225).
MUSORSTOM 5 : stn 253, 295 m : 1 ov. ♀ 8.0 mm (MNHN-Ga 3226). — Stn 267, 285 m : 1 ♂ 7.0 mm; 1 ov. ♀ 7.7 mm (MNHN-Ga 3227). — Stn 268, 280 m : 3 ♂ 8.4 to 9.0 mm; 5 ov. ♀ 7.1 to 8.4 mm; 1 ♀ 8.0 mm (MNHN-Ga 3228). — Stn 275, 285 m : 4 ♂ 7.6 to 8.7 mm; 6 ov. ♀ 6.5 to 7.0 mm; 2 ♀ 6.0 and 8.0 mm (MNHN-Ga 3229). — Stn 276, 258-269 m : 3 ♀ 7.7 to 8.3 mm (MNHN-Ga 3230). — Stn 288, 270 m : 3 ov. ♀ 6.6 to 7.1 mm (MNHN-Ga 3231). — Stn 289, 273 m : 2 ♂ 6.7 and 7.6 mm; 5 ov. ♀ 6.0 to 7.3 mm; 1 ♀ 6.9 mm (MNHN-Ga 3232). — Stn 293, 280 m : 1 ♀ ov. 8.3 mm (MNHN-Ga 3233). — Stn 303, 332 m : 1 ov. ♀ 8.1 mm (MNHN-Ga 3234). — Stn 307, 345-350 m : 1 ♂ 9.5 mm (MNHN-Ga 3235); 14 ♂ 6.8 to 9.5 mm; 14 ov. ♀ 7.3 to 7.7 mm; 8 ♀ 6.8 to 7.2 mm (MNHN-Ga 3236). — Stn 309, 340 m : 8 ♂ 3.8 to 9.4 mm; 7 ov. ♀ 6.5 to 7.7 mm; 6 ♀ 3.7 to 8.4 mm (MNHN-Ga 3237). — Stn 311, 320 m : 1 ♂ 7.2 mm (MNHN-Ga 3238). — Stn 312, 315-320 m : 7 ♂ 7.1 to 8.5 mm; 7 ov. ♀ 7.0 to 8.8 mm; 1 ♀ 7.0 mm (MNHN-Ga 3239). — Stn 328, 355-340 m : 1 ♂ 5.5 mm (MNHN-Ga 3240). — Stn 329, 320 m : 1 ♀ 5.5 mm (MNHN-Ga 3241). — Stn 330, 360-365 m : 1 ov. ♀ 8.1 mm (MNHN-Ga 3242). — Stn 332, 400 m : 1 ♂

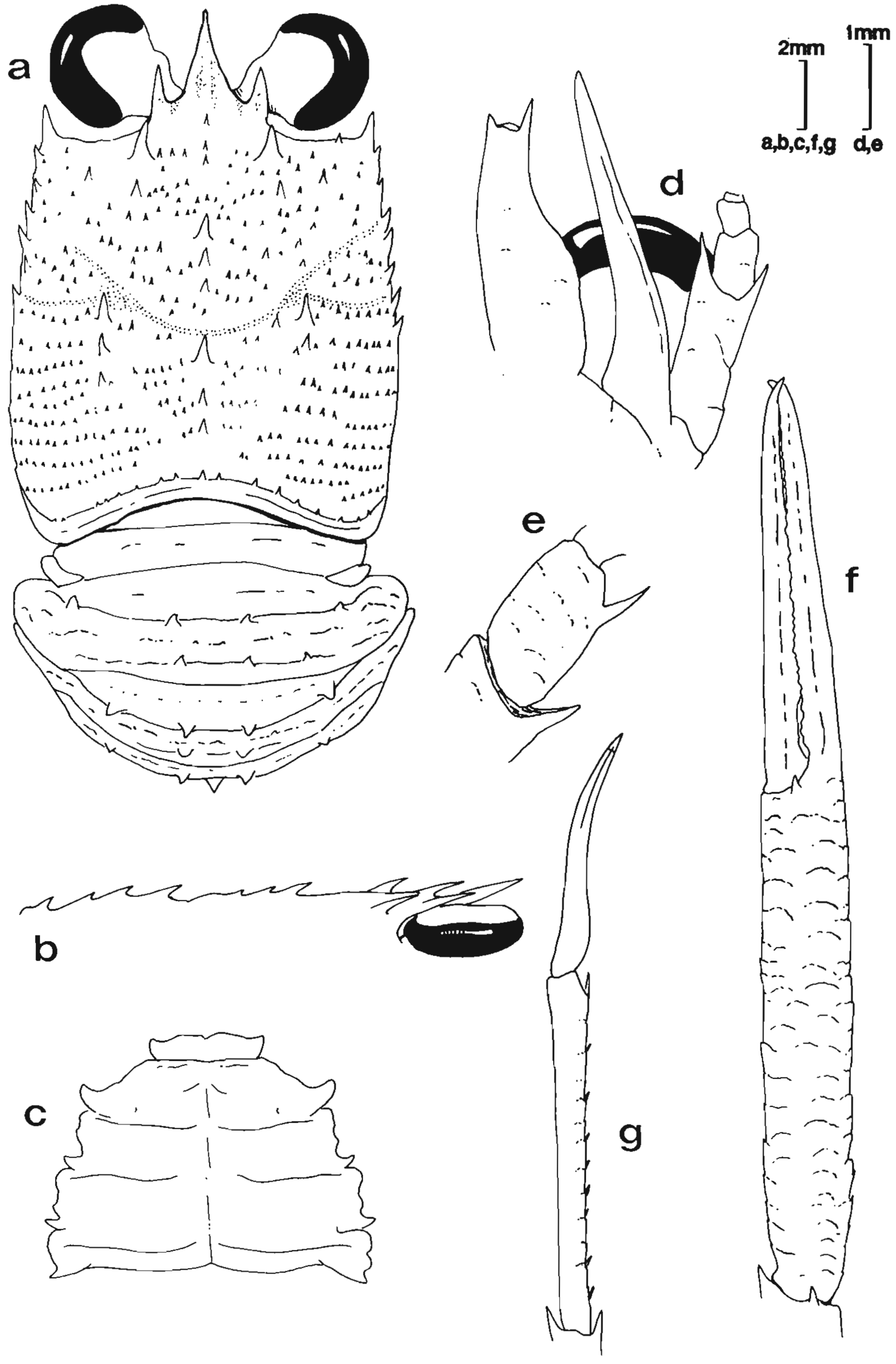

FIG. 4. — *Paramunida pictura* sp. nov., ♂, 9.5 mm, holotype from stn 307 (MUSORSTOM 5) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, hand and fingers of right cheliped, lateral view; **g**, propodus and dactylus of right first walking leg, lateral view.

9.5 mm; 1 ov. ♀ 8.3 mm (MNHN-Ga 3243). — Stn 376, 280 m : 1 ♀ 5.4 mm (MNHN-Ga 3244). — Stn 378, 355 m : 1 ♂ 8.4 mm; 1 ♀ 6.6 mm.

New Caledonia. CHALCAL 2 : stn 75, 600 m : 1 ♂ 8.7 mm (MNHN-Ga 3246).

SMIB 6 : stn 115, 280-285 m : 1 ♀ 7.5 mm (MNHN-Ga 3247).

Loyalty Islands. MUSORSTOM 6 : stn 392, 340 m : 1 ♂ 10.0 mm (MNHN-Ga 3248). — Stn 407, 360 m : 1 ♀ 5.5 mm (MNHN-Ga 3249). — Stn 457, 353 m : 1 ♀ 6.5 mm (MNHN-Ga 3250). — Stn 486, 370 m : 1 ♀ 6.0 mm (MNHN-Ga 3251).

Matthew and Hunter Islands. VOLSMAR : stn 17, 260-300 m : 1 ov. ♀ 7.6 mm (MNHN-Ga 3312).

TYPES. — The male of 9.5 mm from Chesterfield Islands, MUSORSTOM 5, stn 307 (MNHN-Ga 3235) has been selected as the holotype; the other specimens are paratypes.

ETYMOLOGY. — From the Latin, *pictura*, a painting, in reference to the nice colour of the species.

DESCRIPTION. — Carapace as long as wide, dorsally covered with numerous spinules, without transverse ridges. Gastric and cardiac regions moderately circumscribed and feebly convex. Gastric region with 2 well developed epigastric spines behind supraocular spines and a median row of 3 mesogastric spines, decreasing in size posteriorly. Cardiac region with a median row of 3 spines, first spine clearly stronger than others; each branchiocardiac boundary with a row of 2-3 spines. Posterior margin of carapace with numerous spinules.

Frontal margins feebly concave. Lateral margins slightly convex. Anterolateral spines well developed, situated at anterolateral angles, almost reaching the level of sinus between rostrum and supraocular spines. Branchial margins with 4-5 spines.

Rostrum triangular, upturned distally, clearly stouter than supraocular spines, one-fifth as long as remaining carapace. Supraocular spines reaching midlength of rostrum and not reaching the end of corneae.

Fourth thoracic sternite with several very small arcuate striae; fifth to seventh sternites smooth.

Eyes moderately large, maximum corneal diameter about one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) clearly overreaching corneae, slender, with 2 small distal spines, mesial longer than lateral; lateral margin unarmed.

Anterior prolongation of first segment of antennal peduncle slightly overreaching antennular peduncle, with long setae on ventrolateral border; second segment long and slender, with 2 distal spines, mesial slightly longer than lateral, slightly exceeding the end of third antennal segment.

First walking leg with propodus about 8 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along terminal third of each lateral side.

COLOUR. — Ground colour of carapace and abdominal segments light orange, with scattered red spots. Rostrum whitish. Chelipeds and walking legs whitish, with red spots around articulations of articles.

REMARKS. — *Paramunida pictura* is close to *P. stichas* sp. nov. from New Caledonia, Fiji, Indonesia and Japan (see remarks under that species).

SIZE. — The males examined ranged between 3.8 and 11.6 mm, females between 5.5 and 12.2 mm; ovigerous female from 6.0 mm.

DISTRIBUTION. — New Caledonia, Chesterfield, Loyalty, Matthew and Hunter Islands, between 205 and 600 m.

Paramunida polita sp. nov.

Fig. 5

MATERIAL EXAMINED. — **Indonesia**. KARUBAR : stn 6, 286-306 m : 1 ♀ 12.0 mm (MNHN-Ga 3354); 7 ♀ 8.2 to 13.0 mm (MNHN-Ga 3399). — Stn 16, 315-349 m : 2 ♀ 10.0 and 12.8 mm (USNM). — Stn 25, 318-352 m : 1 ♂ 14.6 mm; 3 ♀ 10.0 to 11.5 mm (POLIPI). — Stn 33, 281-311 m : 1 ♀ 11.4 mm (POLIPI). — Stn 35, 390-502 m : 1 ♀ 10.4 mm (MNHN-Ga 3405).

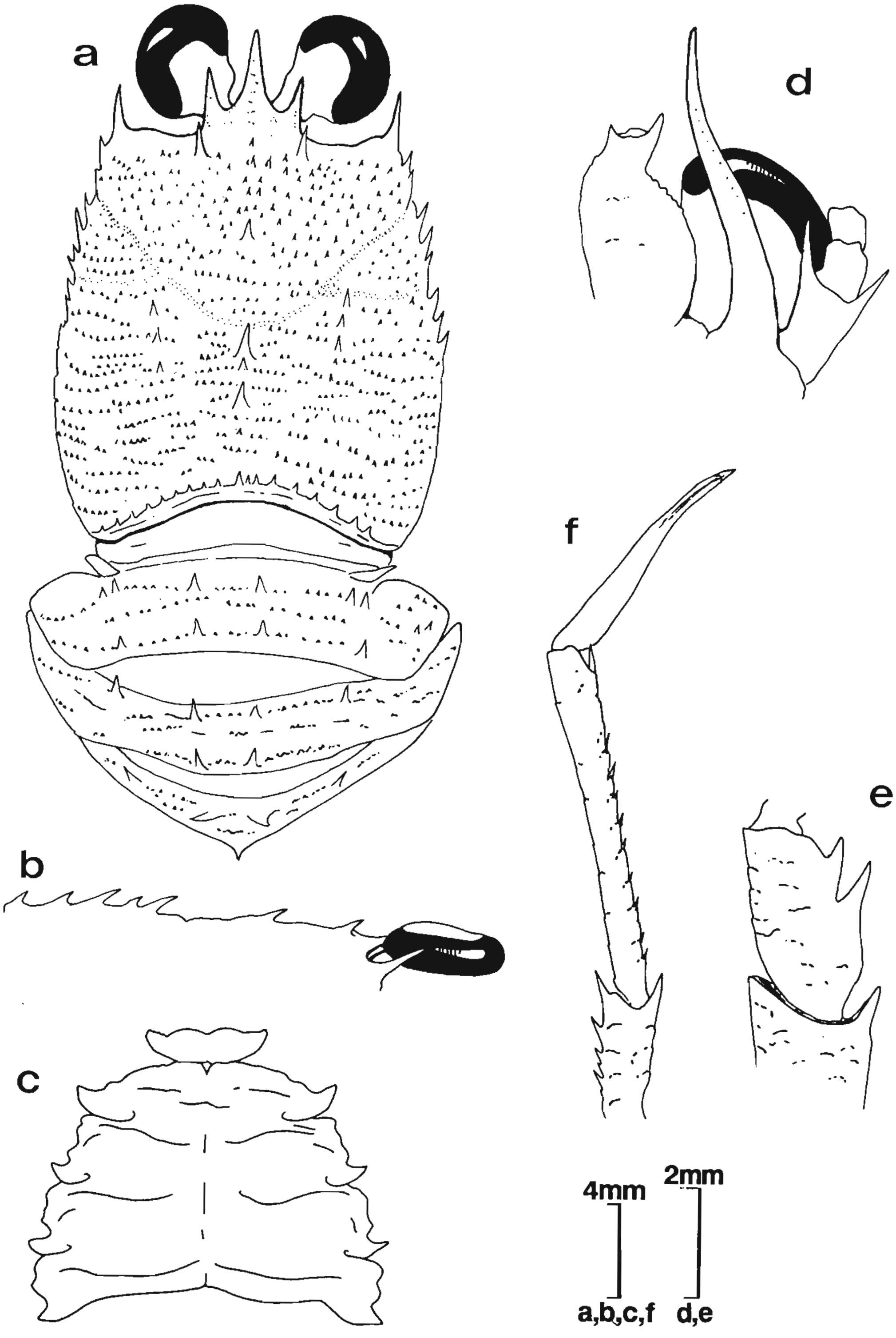

FIG. 5. — *Paramunida polita* sp. nov., ♀, 12.0 mm, holotype from stn 6 (KARUBAR) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, propodus and dactylus of right first walking leg, lateral view.

TYPES. — The female of 12.0 mm from Indonesia (Kai Islands), KARUBAR, stn 6 (MNHN-Ga 3354) has been selected as the holotype; the other specimens are paratypes.

ETYMOLOGY. — From the Latin, *politus*, smooth, in reference to the absence of striae on the thoracic sternites.

DESCRIPTION. — Carapace slightly wider than long. Dorsal surface densely covered with spinules, not forming transverse ridges. Gastric and cardiac regions moderately circumscribed and not prominent. Gastric region with 2 epigastric spines of moderate size, just behind supraocular spines and 1 median mesogastric spines. Cardiac region with a median row of 3-4 spines, first and third spines stronger than others; each branchiocardiac boundary with a row of 3 spines of moderate size. Posterior margin of carapace with numerous spinules.

Frontal margins feeble concave behind eyes. Lateral margins slightly convex. Anterolateral spines long, situated at anterolateral angles, clearly exceeding the level of sinus between rostrum and supraocular spines. Branchial margins with 6-7 spines.

Rostrum spiniform, horizontal, clearly stouter than supraocular spines, one-fifth as long as remaining carapace. Supraocular spines exceeding midlength of rostrum and clearly not reaching the end of corneae.

Fourth thoracic sternite with few arcuate striae; fifth to seventh sternites smooth.

Eyes large, maximum corneal diameter slightly more than one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) slightly exceeding corneae, with 2 small distal spines, mesial longer than lateral; lateral margin unarmed.

Anterior prolongation of first segment of antennal peduncle clearly exceeding antennular peduncle, with long setae on ventrolateral border; second segment moderately slender, with 2 distal spines, mesial longer than lateral, slightly exceeding the end of third antennal segment.

First walking leg with propodus about 6 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along terminal third of each lateral side.

REMARKS. — *Paramunida polita* is close to *P. belone* sp. nov. from Loyalty Islands. Both species have the thoracic sternites with few striae, and the gastric region with 1-2 spines of moderate size, however, they differ in several constant characters :

– *P. polita* has the rostrum spiniform; in *P. belone* the rostrum is clearly more triangular.

– The second segment of the antennal peduncle is long and slender in *P. belone*, having the mesiodistal spine not evenly tapering, distally indented to form a long spine-like process and clearly overreaching the antennal peduncle; in *P. polita* the second segment is moderately slender, the mesiodistal spine is evenly tapering to a sharp tip and clearly not reaching end of antennal peduncle.

SIZE. — The male examined measured 14.6 mm, the females ranged between 8.0 and 13.0 mm; no ovigerous females were collected.

DISTRIBUTION. — Indonesia (Kai Islands), between 287 and 502 m.

Paramunida pronoe sp. nov.

Fig. 6

MATERIAL EXAMINED. — **New Caledonia.** MUSORSTOM 4 : stn 238, 500-510 m : 1 ♂ 7.8 mm; 1 ov. ♀ 11.0 mm; 4 ♀ 6.1 to 11.5 mm (MNHN-Ga 3411); 1 ♀ 7.0 mm (MNHN-Ga 3410).

TYPES. — The female of 7.0 mm from New Caledonia, MUSORSTOM 4, stn 238 (MNHN-Ga 3410) has been selected as the holotype; the other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of Greek mythology (*Pronoe*).

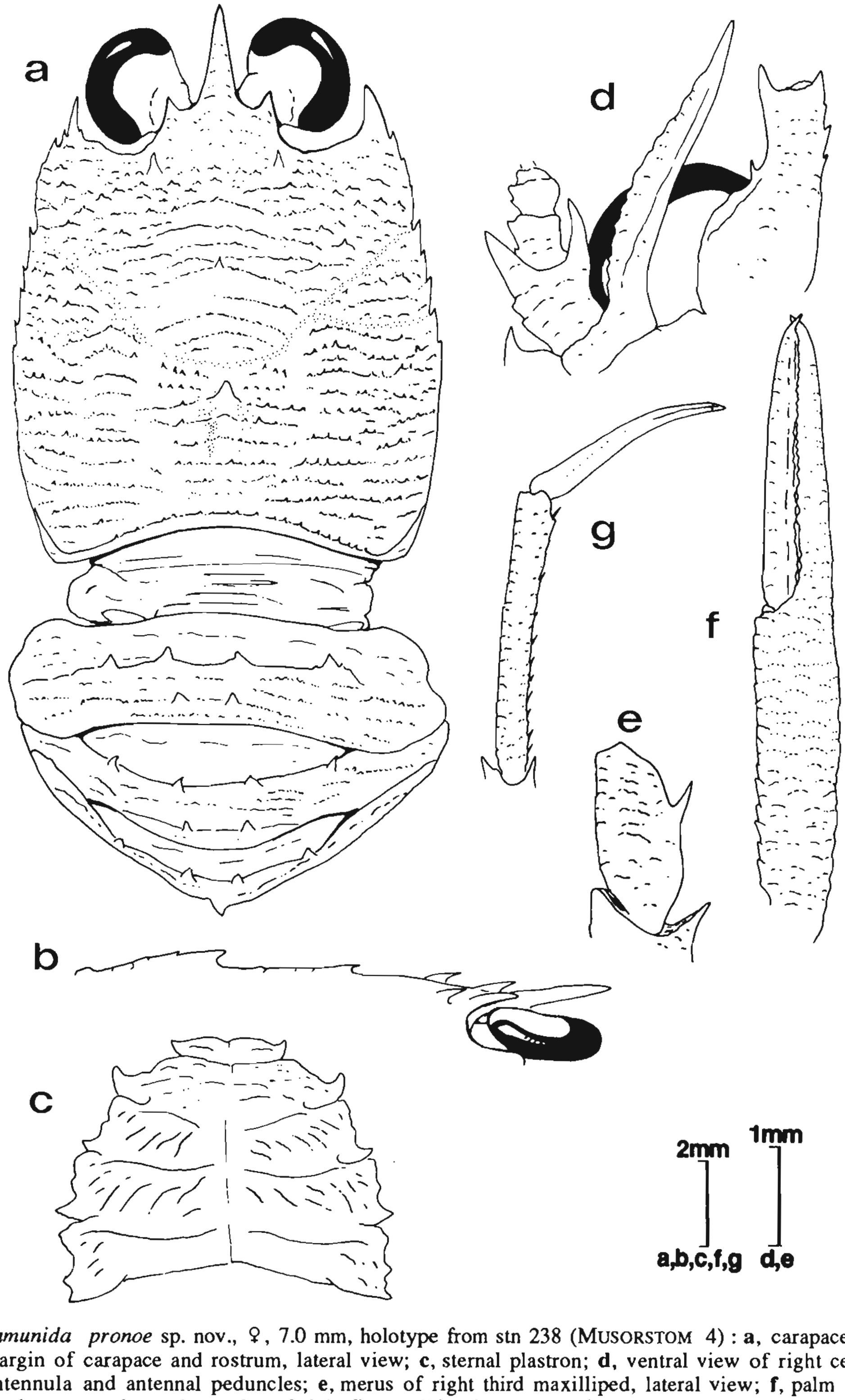

FIG. 6. — *Paramunida pronoe* sp. nov., ♀, 7.0 mm, holotype from stn 238 (MUSORSTOM 4) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, palm and fingers of right cheliped; **g**, propodus and dactylus of right first walking leg, lateral view.

DESCRIPTION. — Carapace slightly wider than long. Dorsal surface with numerous spinules, arranged in transverse incomplete rows, covered with numerous granules and small spinules. Gastric region indistinctly circumscribed; 2 epigastric spines of moderate size, just behind supraocular spines and 1 median small mesogastric spine. Cardiac region prominent, distinctly circumscribed and with 1 strong median spine; branchiocardiac spines absent. Posterior margin of carapace with numerous spinules.

Frontal margins concave behind eyes. Lateral margins slightly convex. Anterolateral spines strong, situated at anterolateral angles, spine placed on right angle stouter than left, both spines clearly exceeding the level of sinus between rostrum and supraocular spines. Branchial margins with 4-5 small spines.

Rostrum spiniform, slightly upturned distally, clearly stouter than supraocular spines, about one-fifth as long as remaining carapace. Supraocular spines short, clearly not reaching midlength of rostrum and end of corneae.

Thoracic sternites with numerous arcuate striae.

Eyes large, maximum corneal diameter nearly half the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) clearly exceeding corneae, with 2 small distal spines, mesial longer than lateral; lateral margin with 1 small spine.

Anterior prolongation of first segment of antennal peduncle granulate, exceeding antennular peduncle, with long setae on ventrolateral border; second segment moderately slender, with 2 well developed subequal distal spines, slightly exceeding the end of third antennal segment.

First walking leg with propodus about 8 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along terminal third of each lateral side.

REMARKS. — The characteristic spinulation of the cardiac region of the carapace of *Paramunida pronoe* distinguishes it easily from the other species of the genus *Paramunida*. It nearest relative appears to be *P. proxima* (Henderson, 1885) from Indonesia, Admiralty Islands and Japan (see remarks under that species).

SIZE. — The male examined measured 7.8 mm, the females ranged between 6.1 and 11.5 mm; ovigerous females from 11.0 mm.

DISTRIBUTION. — New Caledonia, between 500 and 510 m.

Paramunida proxima (Henderson, 1885)

Fig. 7

Munida proxima Henderson, 1885 : 410; 1888 : 135, pl. 13, fig. 2. — TIRMIZI, 1975 : 305, figs 1-8. — BABA, 1982 : 110, fig. 4; 1986 : 173, 291, fig. 124.
Paramunida proxima - BABA, 1988 : 176 (key).

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 1 : stn 40, 265-287 m : 1 ♂ 7.5 mm; 4 ov. ♀ 9.0 to 13.3 mm; 2 ♀ 8.4 and 8.6 mm (MNHN-Ga 3405).

Indonesia. KARUBAR stn 5, 285-323 m : 1 ♂ 10.5 mm (USNM). — Stn 6, 286-306 m: 1 ♂ 13.0 mm (MNHN-Ga 3407). — Stn 36, 210-268 m : 2 ♂ 10.3 to 12.0 mm (POLIPI). — Stn 84, 246-275 m : 1 ♂ 8.0 mm; 1 ♀ 11.2 mm (MNHN-Ga 3409).

Admiralty Islands. "*Challenger*": stn 219, 01°54'S, 146°39'40"E, 278 m, 10.03.1875 : 2 ♀ 6.8 and 8.2 mm, syntypes (BM).

DESCRIPTION. — Carapace covered with spinules dorsally. Gastric region with 1 pair of epigastric spines, 1 (rarely 2) small median mesogastric spine. Cardiac region with a median row of 3-4 well developed spines, first spine stronger than others; a row of 3 spines on both branchiocardiac boundaries. Posterior margin of carapace with numerous, small spines. Frontal margins transverse. Anterolateral spine long, situated at anterolateral angle, reaching sinus between rostrum and supraocular spines. Branchial margins with 5-7 spines. Rostrum spiniform, longer than supraocular spines. Thoracic sternites with numerous striae. Eyes large. Basal segment of antennule (distal spines excluded) exceeding corneae, with 2 distal spines, distomesial spine shorter than distolateral; lateral margin unarmed or with 1 small spine. Second segment of antennal peduncle long and slender, with 2 distal spines, mesial spine longer than lateral, not evenly tapering, distally indented to form a spine-like process, exceeding antennal peduncle. Merus of third maxilliped bearing 1 spine on flexor border; extensor margin unarmed. Chelipeds slender, lacking tuft of setae at base of carpus. First walking leg with propodus about 9 times as long as wide, and less than 1.5 times dactylus length; dactylus with a lateral keel along each side.

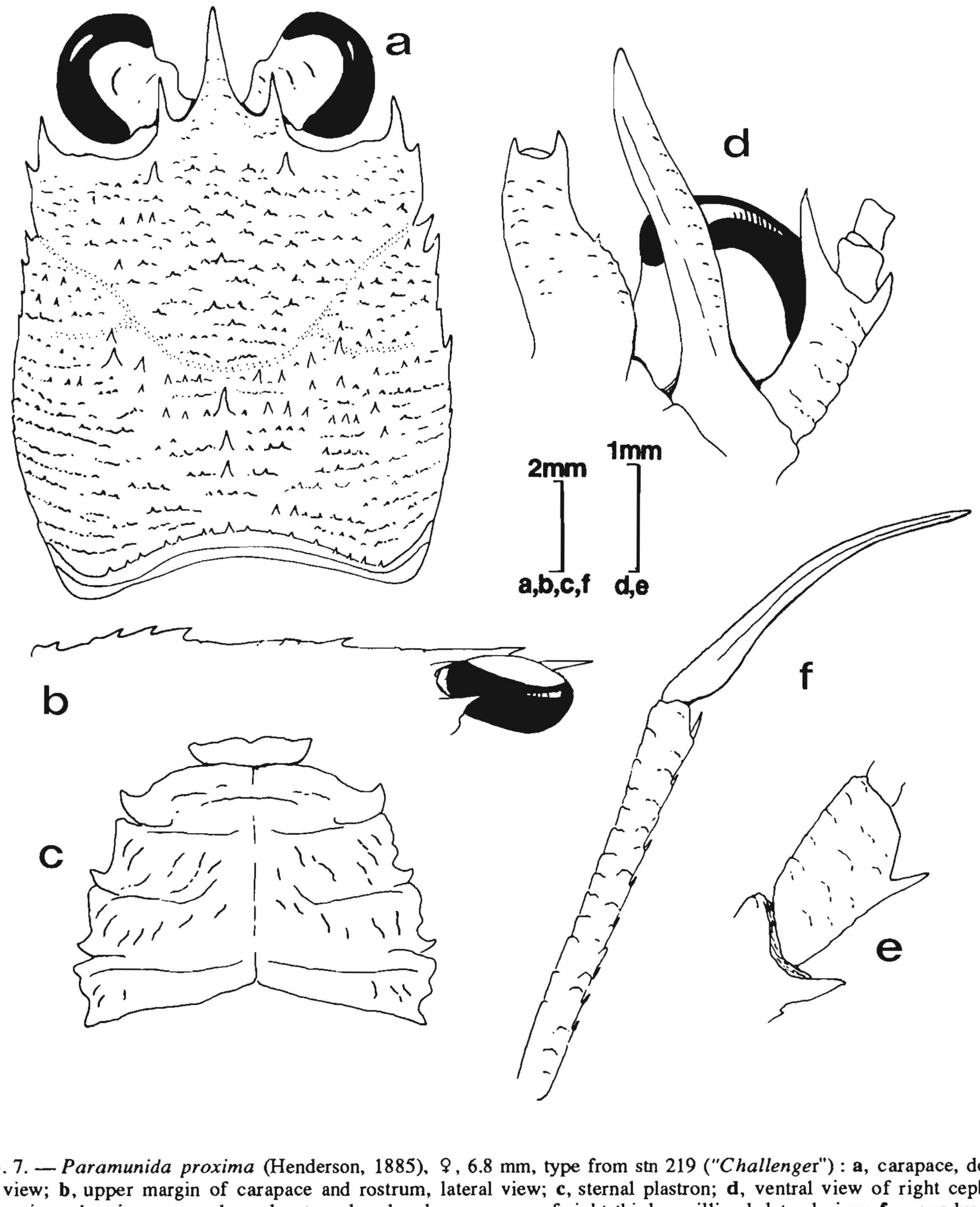

FIG. 7. — *Paramunida proxima* (Henderson, 1885), ♀, 6.8 mm, type from stn 219 (*"Challenger"*) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, propodus and dactylus of right detached walking leg, lateral view.

REMARKS. — The specimens collected in the Philippines and Indonesia agree with the type material from the Admiralty Islands and the description and illustrations provided by TIRMIZI (1975) and BABA (1982, 1986). The former author selected a lectotype (ovigerous female of 8.6 mm) from the type series (1 ovigerous female and 2 females) and gave a complete redescription of the species. In the present paper, several additional figures are provided in order to facilitate the comparison with the other species of the genus. *Paramunida proxima* belongs to the group of species with the rostral spine larger than the supraocular spines, numerous arcuate striae on the thoracic sternites, the median gastric region with 1 (rarely 2) spines and a median row of 3-4 spines on the cardiac region.

P. proxima is closely related to *P. pronoe* sp. nov. from New Caledonia. Both species can be easily distinguished by the following characters :

— The frontal margins are more concave in *P. pronoe*.

— The cardiac region has a median row of 3-4 spines and each branchiocardiac boundary has 3 spines in *P. proxima*; in *P. pronoe* the cardiac region has 1 strong median spine and the spines on the branchiocardiac boundaries are absent.

— The second segment of the antennal peduncle is more slender in *P. proxima* than in *P. pronoe*. On the other hand, the third and fourth segments are reduced in size in *P. proxima*, whereas they are well developed in *P. pronoe*.

— The mesiodistal spine of the second antennal segment is not evenly tapering, distally indented to form a small spine-like process, slightly exceeding the antennal peduncle in *P. proxima;* the mesiodistal spine is evenly tapering to a sharp tip, slightly exceeding the third segment, in *P. pronoe*.

Paramunida proxima is also close to *P. scabra* (Henderson, 1885) from Indonesia and the Philippines, however both are easily distinguishable by several characters (see remarks for *P. scabra*).

SIZE. — The males examined ranged between 8.0 and 10.5 mm, females between 6.8 and 11.2 mm; no ovigerous females were examined.

DISTRIBUTION. — Japan, the Philippines, Indonesia and Admiralty Islands, between 246 and 430 m.

Paramunida scabra (Henderson, 1885)

Fig. 8

Paramunida scabra - BABA, 1988 : 176 (key), 180 (references); 1990 : 968, fig. 15a.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 1 : stn 10, 187-205 m : 8 ♂ 8.0 to 10.0 mm; 2 ov. ♀ 9.4 and 10.5 mm; 2 ♀ 9.0 and 9.7 mm (MNHN-Ga 3412). — Stn 19, 167-187 m : 2 ov. ♀ 7.5 and 8.8 mm; 3 ♀ 5.4 to 7.5 mm (MNHN-Ga 3413). — Stn 27, 188-192 m : 1 ♂ 9.0 mm; 1 ov. ♀ 8.8 mm (MNHN-Ga 3414). — Stn 30, 177-186 m : 2 ov. ♀ 8.0 and 8.7 mm; 1 ♀ 7.6 mm (MNHN-Ga 3415). — Stn 31, 187-195 m : 1 ♂ 8.4 mm (MNHN-Ga 3416). — Stn 34, 188-191 m : 2 ♂ 8.0 and 8.7 mm; 1 ♀ 8.0 mm (MNHN-Ga 3417). — Stn 51, 170-200 m : 1 ♀ 9.1 mm (MNHN-Ga 3418). — Stn 54, 975-1075 m : 1 ♂ 10.0 mm (MNHN-Ga 3419). — Stn 58, 143-178 m : 1 ♂ 8.5 mm (MNHN-Ga 3420). — Stn 61, 184-202 m : 7 ♂ 7.6 to 9.8 mm; 2 ov. ♀ 8.1 and 9.0 mm (MNHN-Ga 3421). — Stn 62, 179-194 m : 1 ov. ♀ 7.2 mm; 1 ♀ 7.2 mm (MNHN-Ga 3422). — Stn 63, 191-195 m : 1 ♀ 9.0 mm (MNHN-Ga 3423). — Stn 64, 194-195 m : 1 ov. ♀ 9.5 mm (MNHN-Ga 3424). — Stn 71, 174-204 m : 1 ♂ 8.3 mm; 1 ov. ♀ 7.4 mm (MNHN-Ga 3425).

MUSORSTOM 2 : stn 1, 188-198 m : 20 ♂ 8.7 to 10.4 mm; 12 ov. ♀ 7.3 to 9.2 mm (MNHN-Ga 3426). — Stn 2, 184-186 m : 2 ♂ 8.0 and 9.6 mm; 2 ov. ♀ 8.2 and 10.0 mm; 1 ♀ 7.6 mm (MNHN-Ga 3427). — Stn 4, 183-190 m : 1 ♂ 8.0 mm (MNHN-Ga 3428). — Stn 10, 188-195 m : 3 ♂ 8.7 to 9.6 mm; 3 ov. ♀ 8.0 to 9.0 mm; 1 ♀ 9.2 mm (MNHN-Ga 3429). — Stn 31, 204-230 m : 5 ♂ 8.7 to 11.6 mm; 2 ov. ♀ 8.5 and 9.0 mm (MNHN-Ga 3430). — Stn 35, 160-198 m : 2 ♂ 7.7 and 9.0 mm; 3 ov. ♀ 9.0 to 9.6 mm; 1 ♀ 7.3 mm (MNHN-Ga 3431). — Stn 51, 170-187 m : 1 ♂ 8.7 mm (MNHN-Ga 3432). — Stn 54, 170-174 m : 3 ♂ 7.4 to 9.5 mm; 2 ov. ♀ 8.5 and 9.6 mm (MNHN-Ga 3433). — Stn 59, 186-190 m : 8 ♂ 8.2 to 10.6 mm (MNHN-Ga 3434). — Stn 71. 189-197 m : 2 ♂ 7.5 and 9.8 mm; 3 ov. ♀ 8.0 to 9.0 mm (MNHN-Ga 3435). — Stn 72, 182-197 m : 3 ♂ 9.6 to 10.0 mm; 2 ov. ♀ 8.2 and 9.5 mm (MNHN-Ga 3436). — Stn 80, 178-205 m : 7 ♂ 6.4 to 10.2 mm; 2 ov. ♀ 7.4 and 8.5 mm; 1 ♀ 6.0 mm (MNHN-Ga 3437). — Stn 83, 318-320 m : 3 ♂ 11.7 to 11.8 mm; 4 ov. ♀ 7.8 to 9.9 mm; 1 ♀ 8.6 mm (MNHN-Ga 3438).

MUSORSTOM 3 : stn 86, 187-192 m : 3 ♂ 7.7 to 9.0 mm; 1 ♀ 9.7 mm (MNHN-Ga 3439). — Stn 87, 191-197 m : 1 ♀ 7.7 mm (MNHN-Ga 3440). — Stn 88, 183-187 m : 8 ♂ 8.6 to 9.8 mm; 2 ♀ 9.5 and 9.8 mm (MNHN-Ga 3441). — Stn 90, 195 m : 13 ♂ 8.3 to 10.2 mm; 2 ♀ 9.6 and 9.8 mm (MNHN-Ga 3442). — Stn 95, 865 m : 1 ♀ 8.0 mm (MNHN-Ga 3443). — Stn 133, 334-390 m : 3 ♂ 8.0 to 11.2 mm; 1 ov. ♀ 8.6 mm (MNHN-Ga 3444). — Stn 143, 205-214 m : 1 ♂ 10.0 mm; 1 ov. ♀ 12.6 mm (MNHN-Ga 3445).

Indonesia. *"Challenger"* : stn 192, 05°49'15"S, 132°14'15"E, 259 m, 26.09.1874: 6 ♂ 11.2 to 13.7 mm; 1 ov. ♀ 13.8 mm; 8 ♀ 10.3 to 11.6 mm, types (BM).

KARUBAR : stn 5, 285-323 m : 7 ♂ 6.7 to 12.0 mm; 1 ov. ♀ 12.8 mm; 3 ♀ 9.2 to 11.0 mm (POLIPI). — Stn 6, 286-306 m : 2 ♀ 10.5 and 11.8 mm (POLIPI). — Stn 15, 212-221 m : 1 ♀ 9.1 mm (POLIPI). — Stn 33, 281-311 m : 2 ♂ 10.5 and 11.2 mm (POLIPI). — Stn 36, 210-268 m : 1 ♀ 10.4 mm (MNHN-Ga 3450). — Stn 47, 235-246 m : 1 ♂ 9.4 mm; 3 ♀ 10.0 to 11.4 mm (MNHN-Ga 3451). — Stn 67, 233-246 m : 1 ♂ 11.1 mm; 1 ov. ♀ 10.6 mm; 1 ♀ 10.8 mm (MNHN-Ga 3452). — Stn 85, 240-244 m : 1 ♂ 10.3 mm; 3 ov. ♀ 11.3 to 13.0 mm; 2 ♀ 7.0 and 11.0 mm (USNM). — Stn 86, 222-226 m : 3 ♂ 8.5 to 10.4 mm; 3 ♀ 9.7 to 10.8 mm (MNHN-Ga 3454).

TYPES. — The female of 11.8 mm from Indonesia, *"Challenger"*, stn 192, has been selected as lectotype; the other specimens from the same station are paralectotypes.

DESCRIPTION. — Carapace as long as wide, covered with numerous spinules and granules, lacking transverse ridges. Gastric region indistinctly circumscribed; 2 well developed epigastric spines behind supraocular spines and 1-2 median mesogastric spines. Cardiac region prominent, moderately circumscribed and with a row of 3-4 strong spines, decreasing in size posteriorly; a row of 3 spines on each branchiocardiac boundary. Posterior margin of carapace with 1 median spine and numerous small spinules.

Frontal margins slightly concave behind eyes. Lateral margins slightly convex. Anterolateral spines long, situated at anterolateral angles, clearly exceeding the level of sinus between rostrum and supraocular spines. Branchial margins with 5-7 small spines.

Rostrum spiniform, slightly upturned distally, clearly stouter than supraocular spines, about one-fifth as long as remaining carapace. Supraocular spines moderately long, reaching midlength of rostrum and clearly not reaching end of corneae.

Thoracic sternites with numerous arcuate striae.

Eyes moderately large, maximum corneal diameter about one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) slightly exceeding corneae, with 2 small distal spines, mesial smaller than lateral; lateral margin unarmed.

Anterior prolongation of first segment of antennal peduncle granulate, clearly exceeding antennular peduncle, with long setae on ventrolateral border; second segment moderately slender, with 2 distal spines, mesial longer than lateral and slightly exceeding the end of third antennal segment.

First walking leg with propodus about 8 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along terminal third of each lateral side.

REMARKS. — The specimens collected in the MUSORSTOM and KARUBAR Expeditions are very similar to the type material. *Paramunida proxima* (Henderson, 1885) from Indonesia, Admiralty Islands, Philippines and Japan is most closely allied to *P. scabra*. However, *P. scabra* is readily differentiated from *P. proxima* by such features as :

— The mesogastric spines and the median row of cardiac spines are clearly more developed in *P. scabra* than in *P. proxima*.

— The rostrum is usually horizontal in *P. proxima*; in *P. scabra* the rostrum is distinctly upturned distally.

— The second segment of the antennal peduncle is longer and more slender in *P. proxima* than in *P. scabra*. Furthermore, the third and fourth segments are well developed in *P. scabra*, whereas they are reduced in size in *P. proxima*.

— The mesiodistal spine is evenly tapering to a sharp tip, slightly exceeding the third segment in *P. scabra*. This spine is distally indented to form a small spine-like process, slightly exceeding the antennal peduncle in *P. proxima*.

P. scabra is also close to *P. tricarinata* (Alcock, 1894) from the Indian Ocean (see remarks under that species).

SIZE. — The males examined ranged between 6.4 and 13.7 mm, females between 5.4 and 13.8 mm; ovigerous females from 7.2 mm.

DISTRIBUTION. — The Philippines and Indonesia (Kai Islands), between 143 and 1075 m.

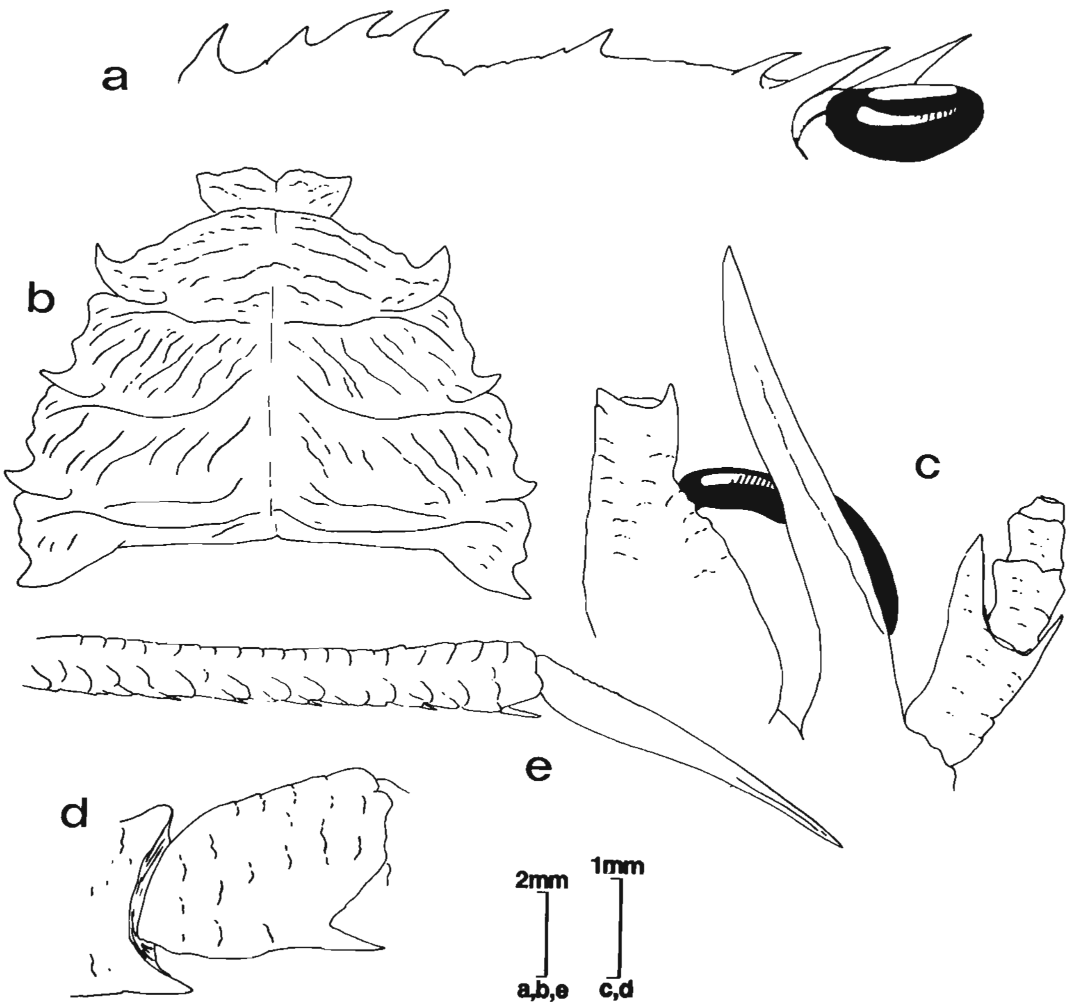

FIG. 8. — *Paramunida scabra* (Henderson, 1885), ♀ lectotype, 11.8 mm, from stn 192 ("*Challenger*") : **a**, upper margin of carapace and rostrum, lateral view; **b**, sternal plastron; **c**, ventral view of right cephalic region, showing antennula and antennal peduncles; **d**, merus of right third maxilliped, lateral view; **e**, propodus and dactylus of right first walking leg, lateral view.

Paramunida setigera Baba, 1988

Paramunida setigera Baba, 1988 : 176 (key), 181, figs 74, 75.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 1 : stn 5, 200-215 m : 1 ♂ 10.0 mm (MNHN-Ga 3455). — Stn 21, 174-223 m : 2 ♂ 7.5 and 8.6 mm; 1 ♀ 5.7 (MNHN-Ga 3456). — Stn 42, 379-407 m : 1 ♂ 7.3 mm (MNHN-Ga 3457). — Stn 51, 170-200 m : 5 ♂ 7.2 to 10.5 mm; 4 ♀ 4.8 to 7.0 mm (USNM).
MUSORSTOM 2 : stn 55, 866 m : 1 ♂ 4.0 mm (MNHN-Ga 3459).
MUSORSTOM 3 : stn 120, 219-220 m : 1 ♂ 7.4 mm; 4 ov. ♀ 7.9 to 9.0 mm; 3 ♀ 6.8 to 8.4 mm (MNHN-Ga 3460).

Indonesia. CORINDON : stn 267, 134-186 m : 8 ♂ 6.8 to 10.8 mm ; 4 ov. ♀ 7.8 to 9.1 mm (MNHN-Ga 3461). — Stn 271, 215 m : 1 ♂ 12.0 mm (MNHN-Ga 3462). — Stn 273, 180-220 m : 3 ♂ 9.5 to 9.7 mm; 4 ov. ♀ 7.9 to 9.0 mm; 4 ♀ 5.6 to 8.4 mm (MNHN-Ga 3463).

KARUBAR : stn 63, 213-214 m : 1 ♂ 9.7 mm; 1 ♀ 10.8 mm (MNHN-Ga 3464). — Stn 65, 174-176 m : 1 ov. ♀ 8.9 mm (MNHN-Ga 3465). — Stn 66, 211-217 m : 2 ♂ 8.1 and 9.5 mm (POLIPI). — Stn 67, 233-246 m : 1 ♂ 8.8 mm (POLIPI). — Stn 79, 239-250 m : 4 ♂ 10.2 to 11.3 mm (MNHN-Ga 3468).

New Caledonia. BIOCAL : stn 108, 335 m : 7 ov. ♀ 6.8 to 9.1 mm; 1 ♀ 5.4 mm (MNHN-Ga 3469).

MUSORSTOM 4 : stn 246, 410-420 m : 1 ov. ♀ 7.0 mm (MNHN-Ga 3470).

REMARKS. — The specimens examined agree with the original description and illustrations provided by BABA (1988). The closest species is *P. longior* Baba, 1988, from the Philippines, Indonesia and New Caledonia (see remarks under that species).

SIZE. — The males examined ranged between 4.0 and 12.0 mm, females between 4.8 and 9.1 mm; ovigerous females from 6.8 mm.

DISTRIBUTION. — The Philippines, Indonesia and New Caledonia, between 134 and 865 m.

Paramunida stichas sp. nov.

Figs 9, 15

Munida granulata Henderson, 1885 : 409; 1888 : 133 (in part).

MATERIAL EXAMINED. — **New Caledonia.** MUSORSTOM 4 : stn 223, 545-560 m : 1 ♂ 5.5 mm (MNHN-Ga 3471). — Stn 238, 500-510 m : 1 ♂ 6.9 mm; 2 ov. ♀ 6.2 and 7.0 mm; 1 ♀ 7.5 mm (MNHN-Ga 3472).

CHALCAL 2 : stn 73, 590 m : 1 ov. ♀ 8.1 mm (MNHN-Ga 3473).

Indonesia. KARUBAR : stn 15, 212-221 m : 1 ♂ 11.2 mm; 1 ♀ 9.5 mm (POLIPI). — Stn 36, 210-268 m : 1 ♂ 10.5 mm (MNHN-Ga 3476).

Philippines. MUSORSTOM 2 : stn 63, 215-230 m : 1 ♂ 10.3 mm (MNHN-Ga 3477).

Fiji. "*Challenger*" : stn 173, 19°09'35"S, 179°41'50"E, 583 m, 24.07.1874 : 1 ♂ 7.5 mm (BM).

Japan. Tosa Bay, 02.1966 (without position) : 1 ov. ♀ 9.8 mm (SM). — 3-14.11.1963, 250-300 m (without position) : 1 ♂ 8.8 mm (SM).

TYPES. — The ovigerous female of 8.1 mm from New Caledonia, CHALCAL 2, stn 73 (MNHN-Ga 3473) has been selected as the holotype; the other specimens are paratypes.

ETYMOLOGY. — From the Greek, *stichas*, row, line, in reference to the red bands of the carapace.

DESCRIPTION. — Carapace as long as wide, covered with numerous small granules and spinules, without complete transverse ridges. Gastric and cardiac regions indistinctly circumscribed; 2 epigastric spines just behind supraocular spines and a row of 3 mesogastric spines, decreasing in size posteriorly. Cardiac region slightly prominent, with a row of 3 well developed spines, first spine stronger than others; a row of 2-3 small spines on each branchiocardiac boundary. Posterior margin of carapace with one median spine and numerous additional small spinules.

Frontal margins moderately concave behind eyes. Lateral margins slightly convex. Anterolateral spines long, situated at anterolateral angles, exceeding the level of sinus between rostrum and supraocular spines. Branchial margins with 6-7 small spines.

Rostrum spiniform, horizontal, stouter than supraocular spines, about one-fifth as long as remaining carapace. Supraocular spines moderately long, not reaching midlength of rostrum and end of corneae.

Fourth thoracic sternite with a few small arcuate striae; fifth to seventh sternites smooth.

Eyes moderately large, maximum corneal diameter about one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) slightly exceeding corneae, with 2 distal spines, mesial clearly longer than lateral; lateral margin with 1 small spine.

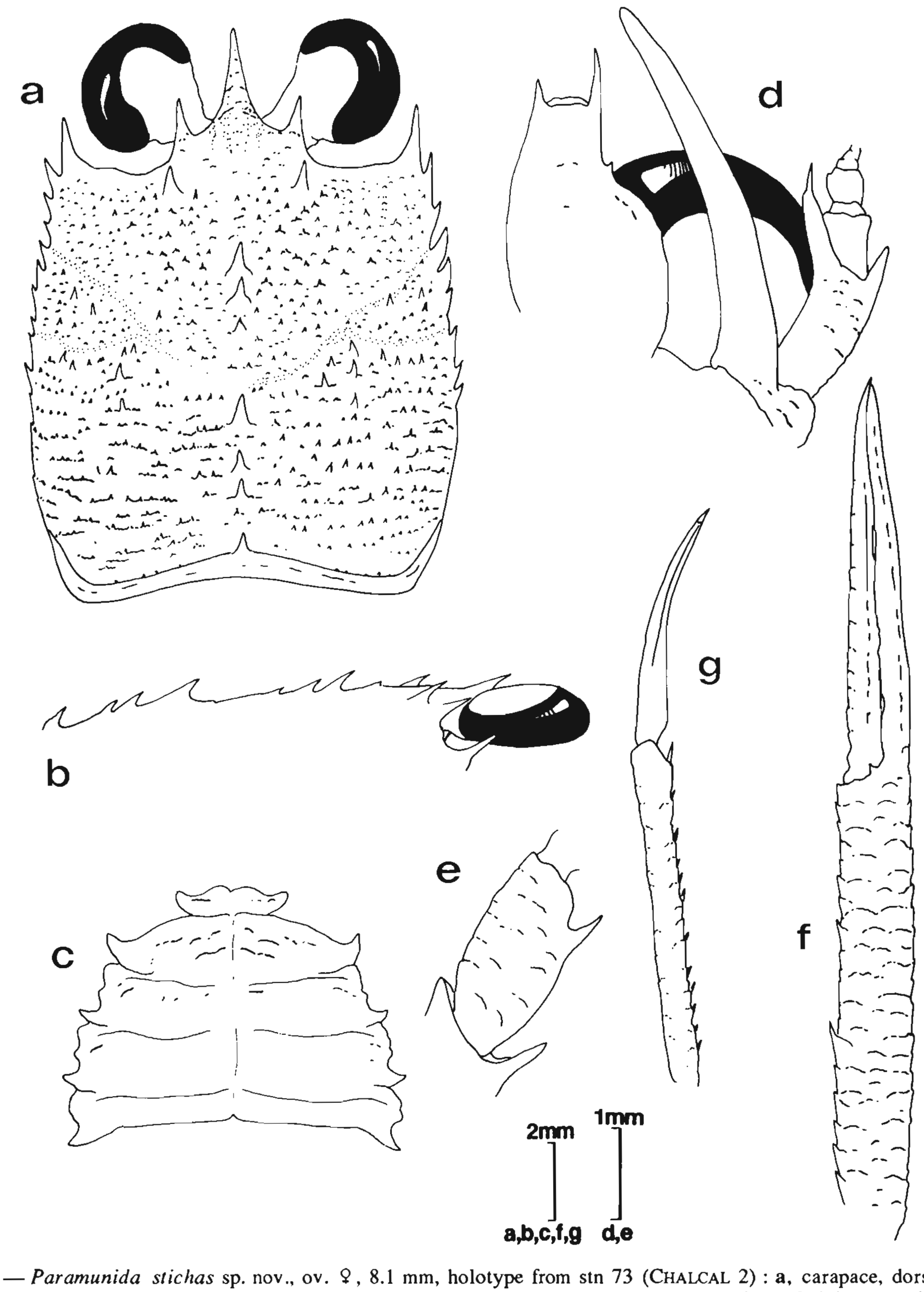

FIG. 9. — *Paramunida stichas* sp. nov., ov. ♀, 8.1 mm, holotype from stn 73 (CHALCAL 2) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, palm and fingers of second right cheliped; **g**, propodus and dactylus of right first walking leg, lateral view.

Anterior prolongation of first segment of antennal peduncle granulate, clearly exceeding antennular peduncle, with long setae on ventrolateral border; second segment long and slender, with 2 distal spines, mesial longer than lateral and not evenly tapering, distally indented to form a well developed spine-like process reaching the end of third antennal segment.

First walking leg with propodus about 9 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along terminal half of each lateral side.

COLOUR. — Ground colour of carapace and abdominal segments whitish. Epigastric region reddish; one longitudinal, red band on each side of carapace from supraocular spine to posterior border; branchial margins reddish; median gastric and cardiac spines red. Ground colour of chelipeds and walking legs whitish, with small, scattered, red spots. Chelipeds with red bands on articulations of articles.

REMARKS. — One male collected during the "*Challenger*" Expedition (stn 173) and classified by HENDERSON (1885; 1888) as *Munida granulata*, corresponds to this new species. The specimens from Indonesia have the distomesial spine of the second antennal segment slightly longer than in the other specimens. However, this difference is considered here to be a variation until more specimens are available.

This new species is closely related to *P. pictura* sp. nov. from New Caledonia and from Chesterfield, Loyalty, Matthew and Hunter Islands, but both are distinguishable by several characters :

— The basal segment of the antennular peduncle is slender and clearly exceeds the corneae in *P. pictura;* in *P. stichas* this segment is moderately slender and slightly exceeds the corneae.

— In *P. pictura* the distomesial spine of the second antennal segment is small, evenly tapering to a sharp tip, and reaching the third antennal segment; in *P. stichas* this spine is distally indented to form a spine-like process exceeding the antennal peduncle.

— The colour pattern of both species is different (see Figs 14 and 15).

Paramunida stichas is also related to *P. belone* sp. nov. from Loyalty Islands, but they differ in the following characters :

— The rostrum of *P. belone* is wider at base than in *P. stichas.*

— In *P. belone* there is only 1 mesogastric spine, whereas in *P. stichas* there is a row of 3 well developed mesogastric spines.

— The distomesial spine of the second antennal peduncle clearly exceeds the antennal peduncle in *P. belone*; in *P. stichas* this spine only reaches the end of the antennal peduncle.

— The colour pattern of both species is different (see Figs 12 and 15).

SIZE. — The males examined ranged between 5.5 and 11.2 mm, the females between 6.2 and 9.5 mm; ovigerous females from 6.2 mm.

DISTRIBUTION. — Japan, Philippines, Indonesia (Kai Islands), Fiji, New Caledonia, and Matthew and Hunter Islands, between 210 and 590 m.

Paramunida thalie sp. nov.

Figs 10, 16

MATERIAL EXAMINED. — **Loyalty Islands**. MUSORSTOM 6 : stn 417, 283 m : 1 ♀ 10.4 mm (MNHN-Ga 3478). — Stn 419, 283 m : 1 ♀ 8.8 mm (MNHN-Ga 3224). — Stn 421, 245 m : 1 ♀ 10.0 mm (USNM). — Stn 422, 257 m : 1 ♂ 7.7 mm (MNHN-Ga 3219). — Stn 454, 260 m : 3 ov. ♀ 4.0 to 9.4 mm (MNHN-Ga 3102).

TYPES. — The female of 10.4 mm from Loyalty Islands, MUSORSTOM 6, stn 417 (MNHN-Ga 3478) has been selected as the holotype; the other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of Greek mythology (*Thalie).*

DESCRIPTION. — Carapace as long as wide. Dorsal surface covered with numerous spinules, without transverse ridges. Gastric region not distinctly circumscribed and moderately prominent; 1-3 pairs of epigastric spines, largest pair just behind supraocular spines; a row of 3-4 median mesogastric spines decreasing in size posteriorly. Cardiac region prominent, with a median row of 3 well developed spines, first spine larger than second and third; each branchiocardiac boundary with a row of 2-3 small spines. Posterior margin of carapace with 1 median spine and numerous additional small spines.

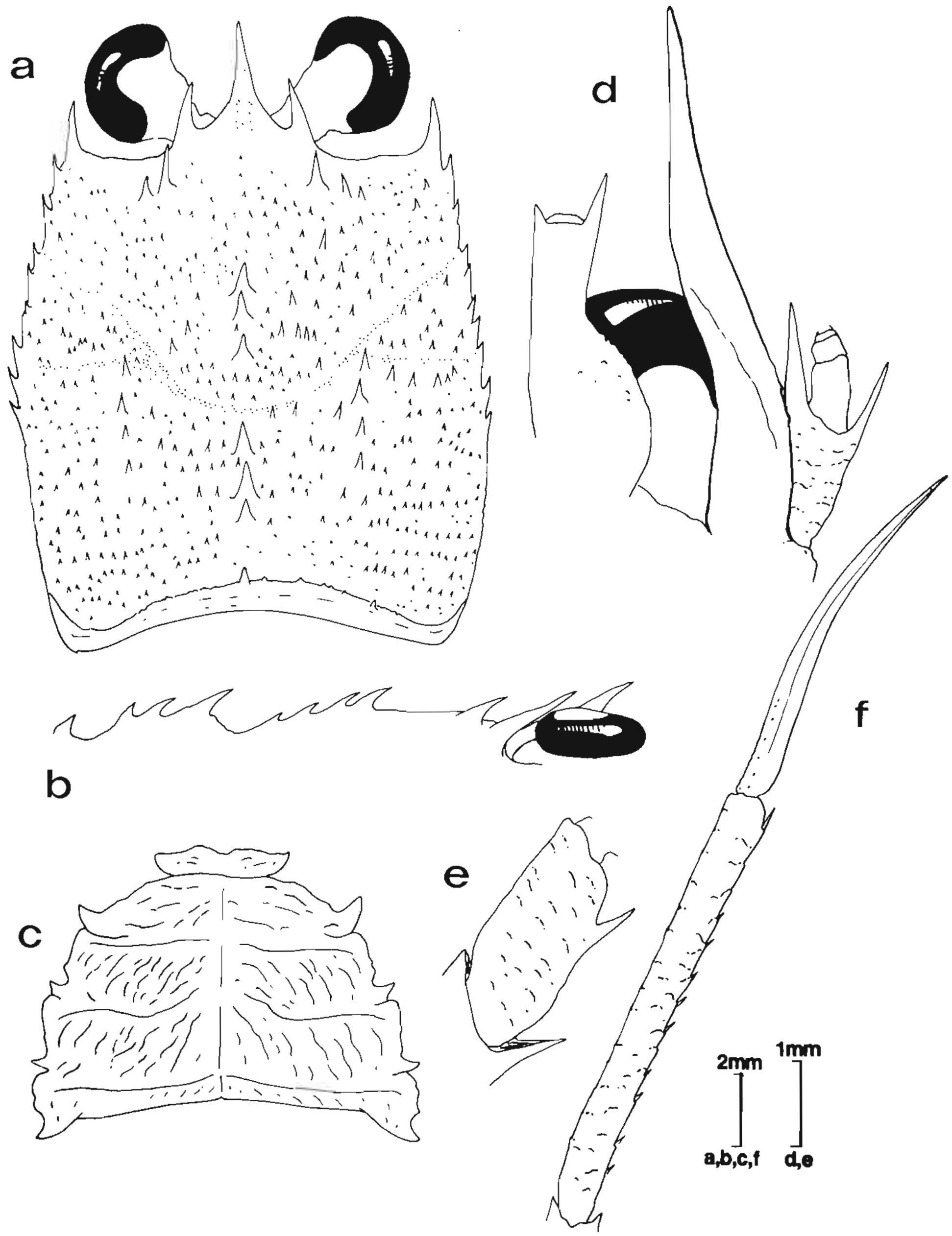

FIG. 10. — *Paramunida thalie* sp. nov., ♀, 10.4 mm, holotype from stn 417 (MUSORSTOM 6) : **a**, carapace, dorsal view; **b**, upper margin of carapace and rostrum, lateral view; **c**, sternal plastron; **d**, ventral view of right cephalic region, showing antennula and antennal peduncles; **e**, merus of right third maxilliped, lateral view; **f**, propodus and dactylus of right first walking leg, lateral view.

Frontal margins moderately concave behind eyes, lateral margins slightly convex. Anterolateral spines well developed, situated at anterolateral angles, exceeding the level of sinus between rostrum and supraocular spines. Branchial margins with 6-7 spines.

Rostrum spiniform, wide at base, upturned distally, stouter than supraocular spines and one-fifth as long as remaining carapace. Supraocular spines reaching midlength of rostrum and falling short the end of corneae.

Thoracic sternites with numerous arcuate striae.

Eyes moderately large, maximum corneal diameter about one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) long and slender, clearly exceeding corneae, with 2 distal spines, lateral longer than mesial; lateral margin unarmed

Anterior prolongation of first segment of antennal peduncle distinctly exceeding antennular peduncle, with long setae on ventrolateral border; second segment with 2 long distal spines, distomesial longer than distolateral and clearly exceeding antennal peduncle.

First walking leg with propodus about 9 times as long as wide, and less than 1.5 times dactylus length; dactylus with keel along each lateral side.

COLOUR. — Ground colour of carapace and abdominal segments orange, gastric region and anterior part of cardiac area reddish; a white spot on each bifurcation of cervical groove. A red spot on each side of first abdominal segment. Chelipeds and walking legs with red and white bands; ground colour of fingers of chelipeds whitish, proximal part red, some scattered red spots on distal part.

REMARKS. — *Paramunida thalie* resembles *P. evexa* sp. nov. from Indonesia, but they differ in the following aspects :

— The rostrum is triangular in *P. evexa*; in *P. thalie* it is clearly more spiniform.

— In *P. evexa* there is only one pair of epigastric spines, whereas in *P. thalie* there are 2-3 pairs.

— The basal segment of the antennular peduncle is more slender in *P. evexa*, clearly exceeding the corneae; in *P. thalie* this segment is shorter, slightly exceeding the corneae.

— The second antennal segment is blunty produced distomesially in *P. evexa*, whereas in *P. thalie* exists a long distomesial spine.

P. thalie is also close to *P. tricarinata* (Alcock, 1894) from the Indian Ocean (see remarks under that species).

SIZE. — The male examined measured 7.7 mm, the females between 4.0 and 10.4 mm; ovigerous females from 4.0 mm.

DISTRIBUTION. — Loyalty Islands, between 245 and 283 m.

Paramunida tricarinata (Alcock, 1894)

Fig. 11

Paramunida tricarinata – BABA, 1990 : 968, fig. 15b (references).

MATERIAL EXAMINED. — **Maldives Islands**. JOHN MURRAY EXP. : stn 149, 238 m : 1 ♂ 11.6 mm; 3 ov. ♀ 11.0 to 11.7 mm (BM).

Madagascar. 12°52.0'S, 48°10.3'E, 420-428 m : 1 ♂ 9.7 mm; 1 ov. ♀ 10.3 mm (NMNH).

DESCRIPTION. — Carapace as long as wide, dorsally covered with broken striae with numerous spinules. Gastric region not distinctly circumscribed and moderately prominent; 1 pair of epigastric spines just behind supraocular spines; a row of 3 median well developed mesogastric spines decreasing in size posteriorly. Cardiac region prominent, with a median row of 3-4 strong spines, first spine smaller than posterior spines; each branchiocardiac boundary with a row of 3-5 small spines. Posterior margin of carapace with 1 strong median spine and numerous additional small spines.

Frontal margins moderately concave behind eyes, lateral margins slightly convex. Anterolateral spines well developed, situated at anterolateral angles, clearly overreaching the level of sinus between rostrum and supraocular spines. Branchial margins with 6-7 spines.

Rostrum spiniform, wide at base, horizontal, stouter than supraocular spines and about one-fifth as long as remaining carapace. Supraocular spines exceeding midlength of rostrum and falling short the end of corneae.

Thoracic sternites with numerous arcuate striae.

Eyes moderately large, maximum corneal diameter about one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) slightly exceeding corneae, with 2 small distal spines, lateral longer than mesial; lateral margin unarmed.

Anterior prolongation of first segment of antennal peduncle clearly reaching past antennular peduncle, with long setae on ventrolateral border; second segment with 2 long distal spines, dismomesial longer than distolateral and clearly exceeding antennal peduncle.

First walking leg with propodus about 7 times as long as wide, and more than 1.5 times dactylus length; dactylus with keel along each lateral side.

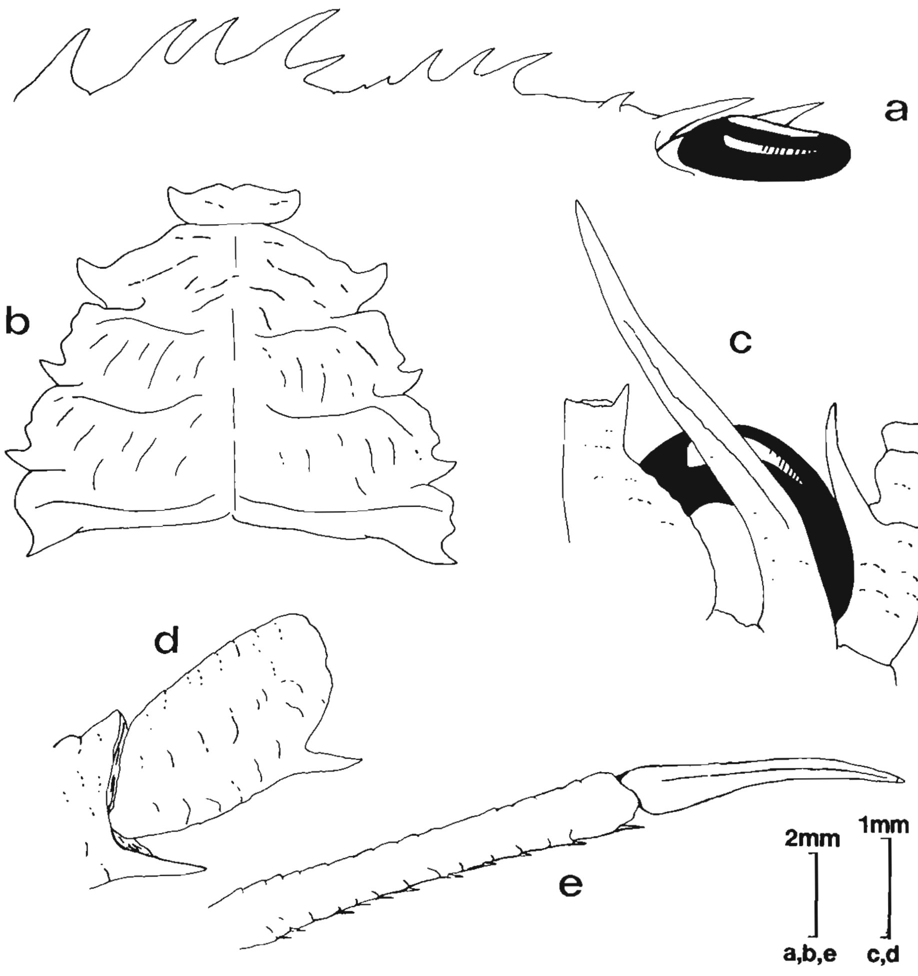

FIG. 11. — *Paramunida tricarinata* (Alcock, 1894) : **a**, ♂, 11.6 mm, **b-e**, ov. ♀, 10.0 mm, from stn 149 (JOHN MURRAY EXP.) : **a**, upper margin of carapace and rostrum, lateral view; **b**, sternal plastron; **c**, ventral view of right cephalic region, showing antennula and antennal peduncles; **d**, merus of right third maxilliped, lateral view; **e**, propodus and dactylus of right first walking leg, lateral view.

REMARKS. — *Paramunida tricarinata* was described by ALCOCK (1894) from specimens collected in the Andaman Sea, posteriorly the species was cited in the Maldives Islands, Arabian Sea, Zanzibar and Madagascar (ALCOCK, 1901; TIRMIZI, 1966; BABA, 1990). As BABA (1990) pointed out, *P. tricarinata* is close to *P. scabra* (Henderson, 1885) from the Philippines and Indonesia, but they are easily differentiated by the number and size of spines on the median row of the gastric region : 1-2 moderately-sized spines in *P. scabra* and 3-4 strong spines in *P. tricarinata*. On the other hand, the distomesial spine of the second segment of the antennal peduncle reaches the midlength of the fourth segment in *P. scabra*, whereas in *P. tricarinata* this spine always exceeds the antennal peduncle.

P. tricarinata also resembles *P. thalie* sp. nov. from Indonesia, but they differ in the following aspects :

— The mesogastric and cardiac spines are more stronger in *P. tricarinata* than in *P. thalie*.

— The basal segment of the antennular peduncle is more slender in *P. thalie*, clearly reaching past the corneae by distal one-third; in *P. tricarinata* this segment is shorter, slightly exceeding the corneae by distal one-fifth.

— The propodus of the walking legs are slightly longer than the dactylus in *P. thalie*, whereas in *P. tricarinata* the propodus is more than 1.5 times the dactylus length.

SIZE. — The males examined ranged between 8.8 and 11.6 mm, females between 9.8 and 11.7 mm; ovigerous females from 9.8 mm.

DISTRIBUTION. — Widely distributed in the Indian Ocean (Andaman Sea, Maldives Islands, Arabian Sea, Zanzibar and Madagascar), between 207 and 457 m.

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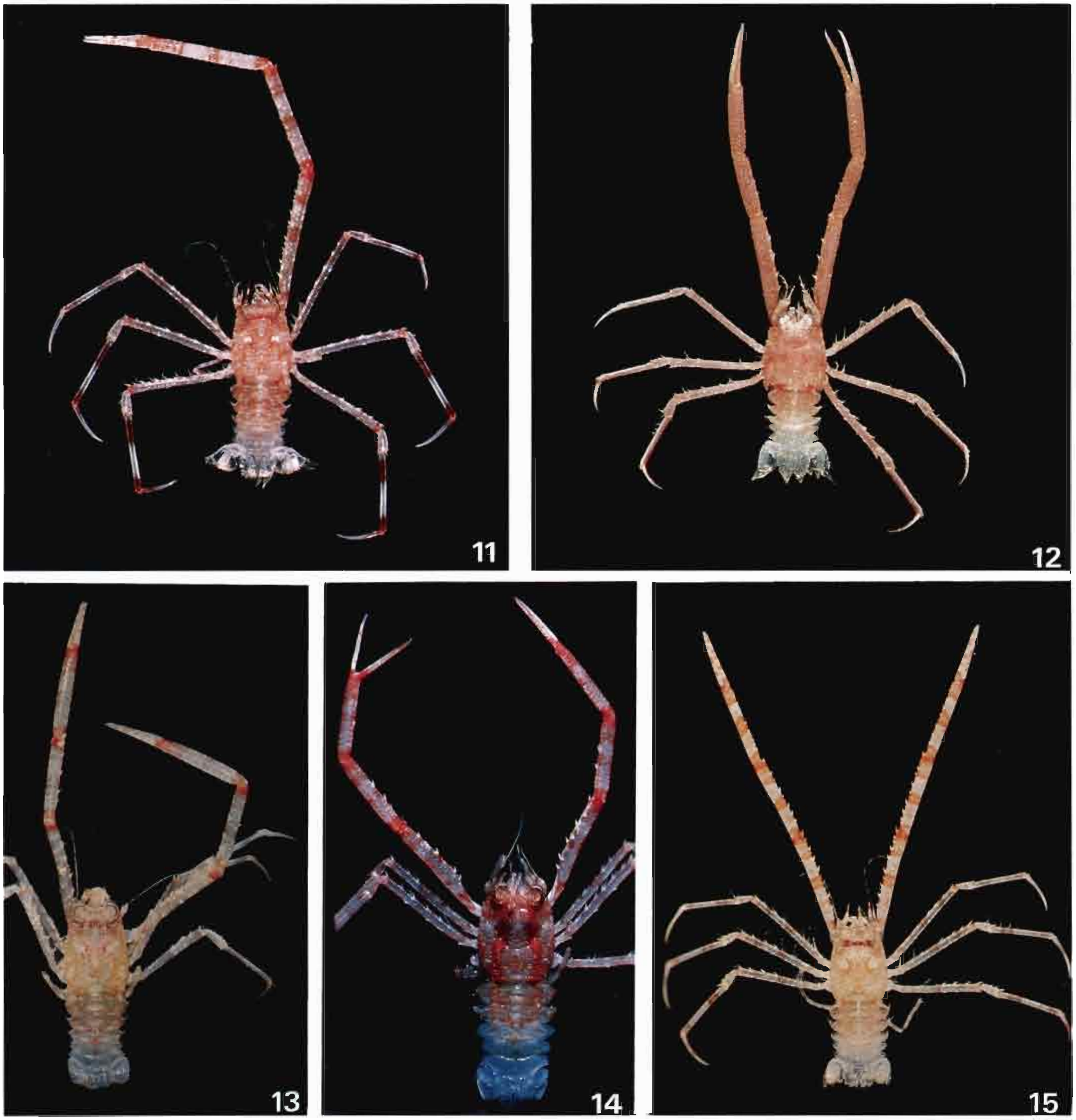

Due to an error, the numbers for the photographs of this plate should be increased by one in order to correspond to the legend. Photograph 11 becomes n°12, 12 n°13, etc...

FIG. 12, *Paramunida belone* sp. nov., ♂, 15.0 mm, holotype. MUSORSTOM 6, stn 464. — FIG. 13, *Paramunida granulata* (Henderson, 1885), ♂, 10.3 mm. MUSORSTOM 6, stn 483. — FIG. 14, *Paramunida pictura* sp. nov., ♂, 9.5 mm, holotype. MUSORSTOM 5, stn 307. — FIG. 15, *Paramunida stichas* sp. nov., ov. ♀, 8.1 mm, holotype. CHALCAL 2, stn 73. — FIG. 16, *Paramunida thalie* sp. nov., ♀, 10.4 mm, holotype (10.4 mm). MUSORSTOM 6, stn 417.

12

Liste bibliographique des travaux issus des campagnes d'exploration du benthos bathyal et abyssal en Nouvelle-Calédonie

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RÉSUMÉ

Les références de 276 travaux, publiés depuis que l'étude du benthos bathyal et abyssal a été entreprise, en 1978, en Nouvelle-Calédonie, sont rassemblées ici. Ces références sont regroupées sous six rubriques : Descriptif des campagnes ; Géomorphologie et Sédimentologie; Zoologie ; Biochimie et Pharmacologie ; Halieutique ; Articles de vulgarisation.

ABSTRACT

Bibliographic list of the papers resulting from the exploratory cruises of the bathyal and abyssal benthos of New Caledonia.

The references of 276 papers, published since the study of the bathyal and abyssal benthos undertaken in New Caledonia in 1978, are assembled here. These references are grouped under six headings : Description of cruises ; Geomorphology and Sedimentology ; Zoology ; Biochemistry and Pharmacology ; Halieutic ; Popular articles.

Les premières prospections concernant le benthos de profondeur de la Nouvelle-Calédonie ont été faites en 1978. Depuis, quatorze années se sont écoulées et de nombreuses campagnes ont eu lieu. Il nous a semblé qu'il pourrait être utile de donner une liste regroupant l'ensemble des 276 travaux publiés actuellement sur ce thème.

Pour en faciliter la consultation, cette liste bibliographique regroupe les articles par grands thèmes :

Descriptif des campagnes : 24 titres.
Géomorphologie et Sédimentologie: 28 titres.
Zoologie (Spongiaires : 11 titres ; Cnidaires : 10 titres ; Bryozoaires, Brachiopodes : 3 titres ; Crustacés: 63 titres ; Annélides, Siponcles, Échiuriens : 5 titres ; Mollusques : 50 titres ; Échinodermes : 16 titres ; Ascidies : 5 titres ; Poissons : 9 titres).
Biochimie, Pharmacologie : 18 titres.
Halieutique : 22 titres.
Articles de vulgarisation : 12 titres.

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