

## 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 : Dorippidae 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* - BOSCH, 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 pereopods (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.

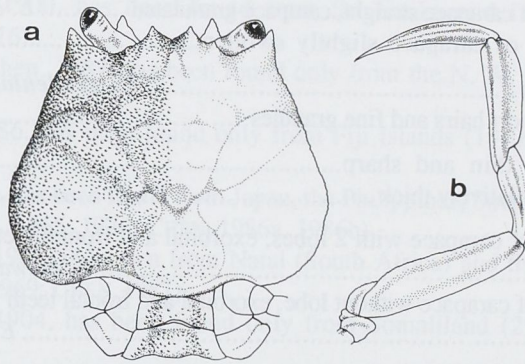


FIG. 1. — *Dorippoides facchino* (Herbst, 1785), juv. ♀ 7.0 x 8.0 mm (MNHN-B 19072) : a, carapace; b, third pereiopod.

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. hawaiiensis* 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 moderate 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 pereopods naked ..... *E. minuta* Sakai, 1937  
 — Second and third pereopods 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

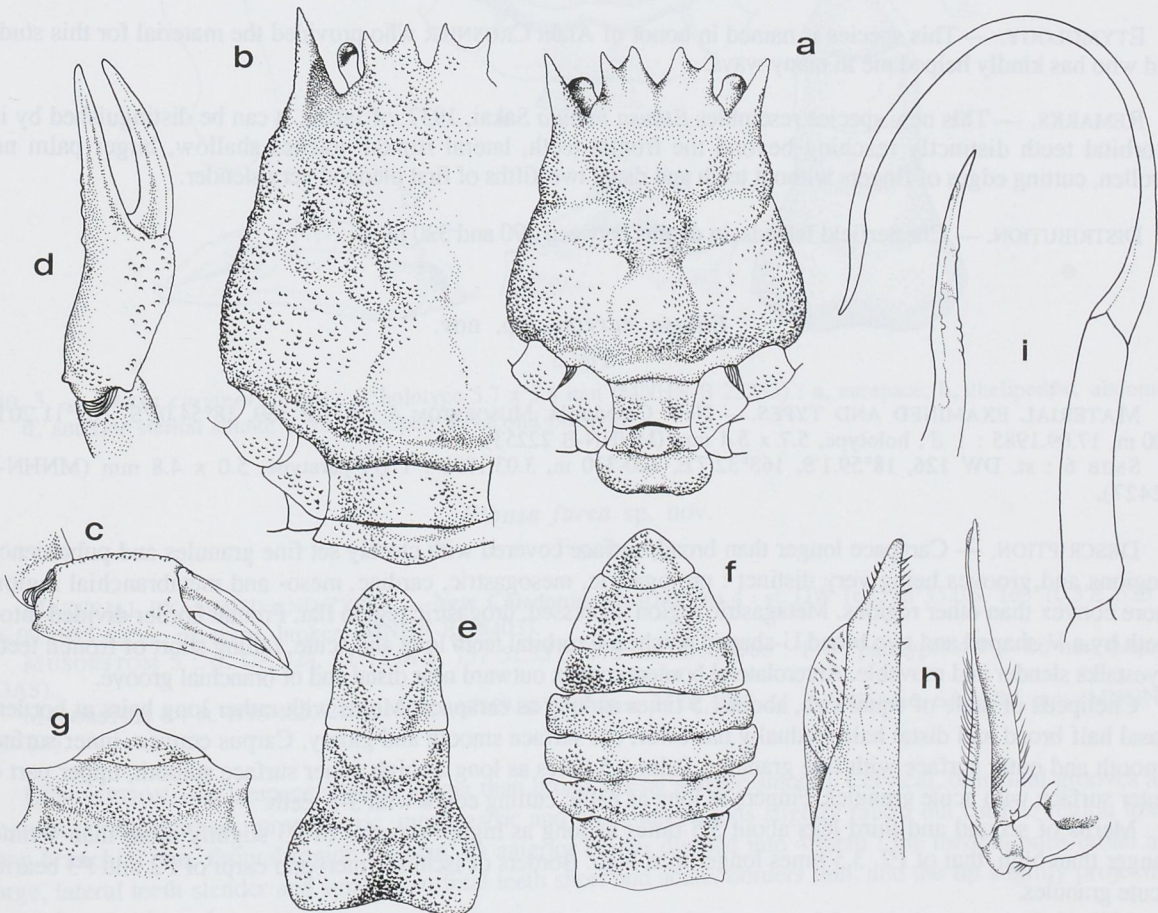


FIG. 2. — *Ethusa crosnieri* sp. nov., ♂ holotype 6.9 x 6.8 mm (MNH-B 19063); ♀ allotype 8.9 x 10.0 mm (MPHN-B 19068) : a, male carapace; b, female carapace; c, male cheliped; d, female cheliped; e, male abdomen; f, female abdomen; g, male anterior sternal shield; h, male first pleopod; i, male second 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 pereopods the longest. Second pereopods 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.

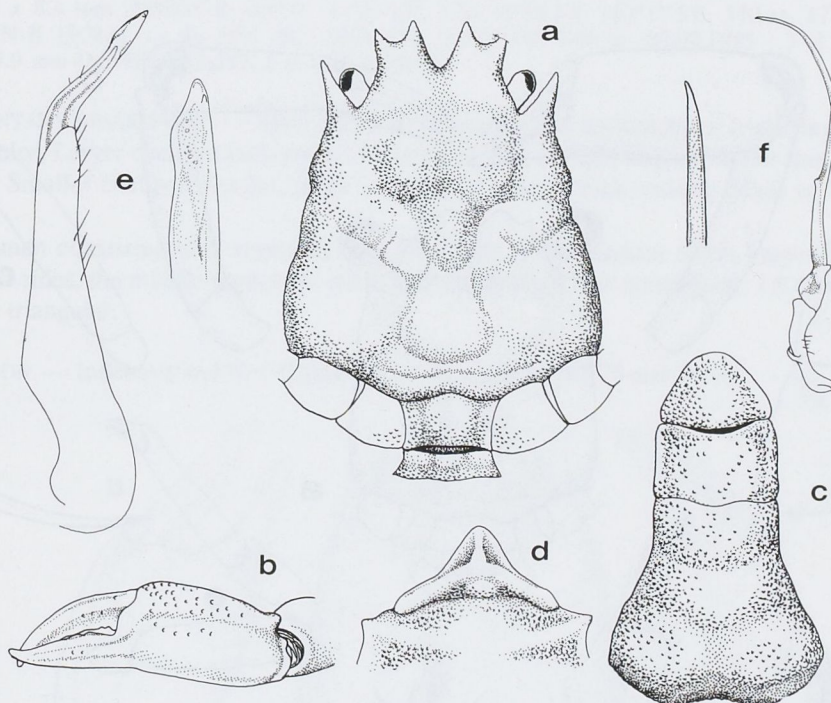


FIG. 3. — *Ethusa curvipes* sp. nov., ♂ holotype 5.7 x 5.4 mm (MNHN-B 22253) : a, carapace; b, cheliped; c, abdomen; d, anterior sternal shield; e, first pleopod; f, second pleopod.

*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 sideways.

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.

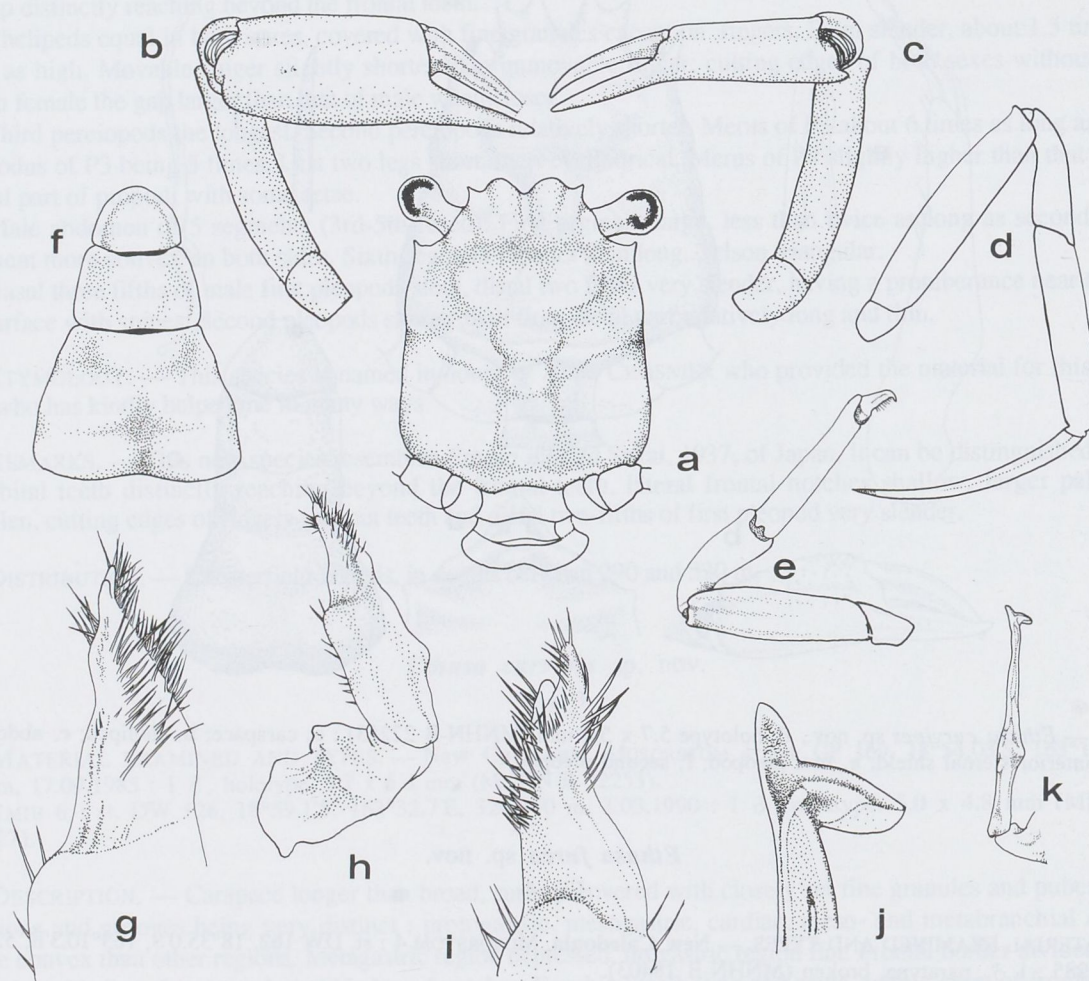


FIG. 4 — *Ethusa furca* sp. nov., ♂ holotype 6.0 x 5.1 mm (MNHN-B 21521) : a, carapace; b-c, chelipeds; d, third pereiopod; e, last pereiopod (another specimen); f, abdomen; g-i, first pleopod; j-k, second pleopod.

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.

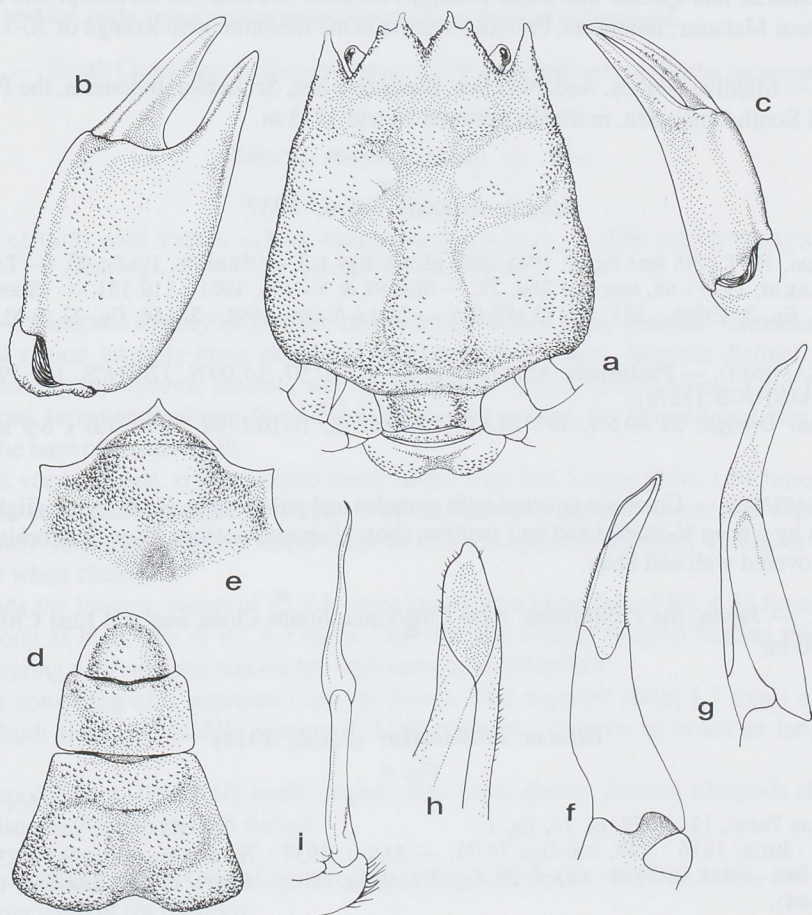


FIG. 5. — *Ethusa granulosa* Ihle, 1916, ♂ 9.4 x 8.8 mm (MNHN-B 19082) : a, carapace; b-c, chelipeds; d, abdomen; e, anterior sternal shield; f-h, first pleopod; i, second pleopod.

*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 & LOHAVANJAYA, 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.** — **Philippines.** 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).

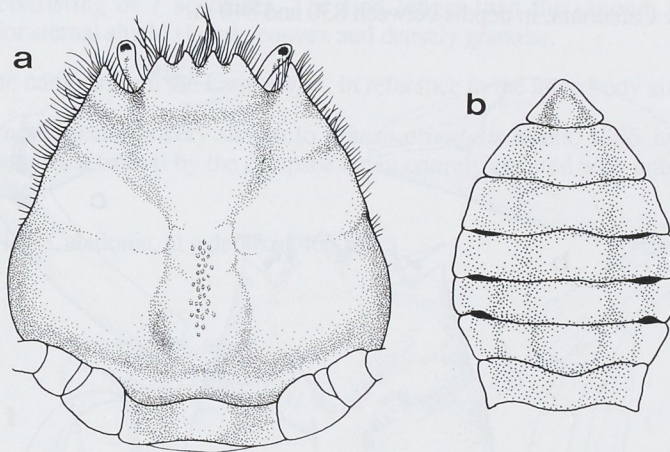


FIG. 6. — *Ethusa latidactylus* (Parisi, 1914), ♀ 13.0 x 14.0 mm (MNHN-B 19073) : a, carapace ; b, abdomen.

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.

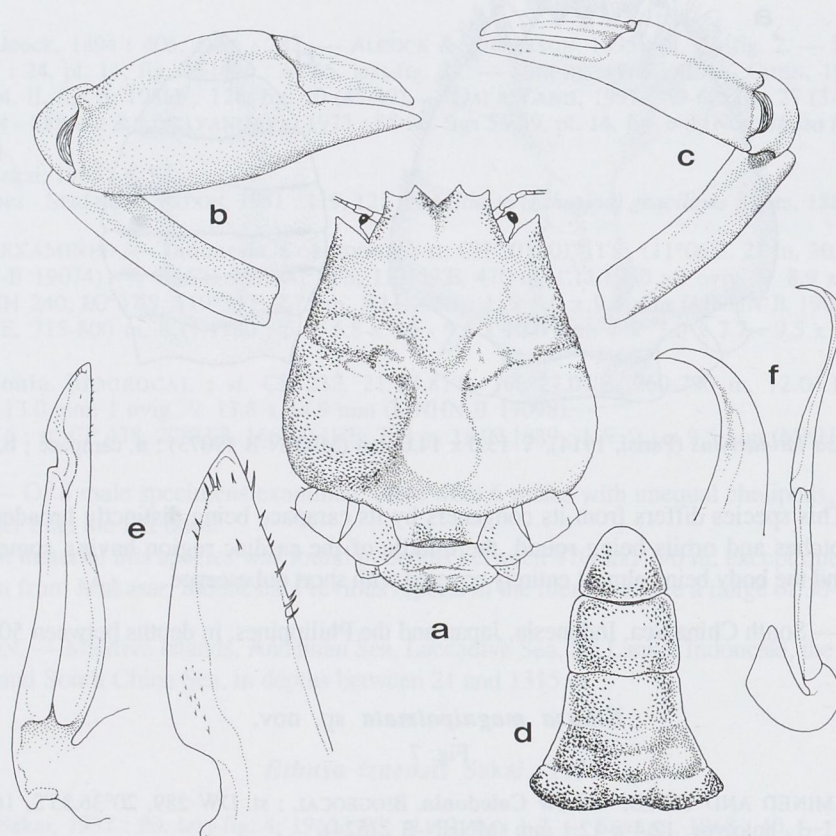


FIG. 7. — *Ethusa magnipalmata* sp. nov., ♂ holotype 12.4 x 12.1 mm (MNHN-B 21524) : a, carapace; b-c, chelipeds; d, abdomen; e, first pleopod; f, second pleopod.

*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.

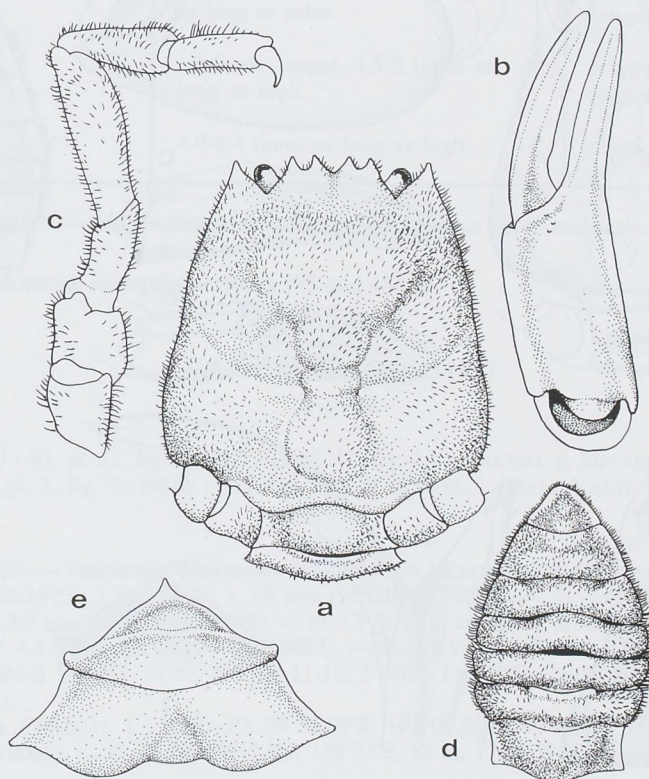


FIG. 8. — *Ethusa major* sp. nov., ♀ holotype 17.9 x 17.5 mm (MNHN-B 21520) : a. carapace; b. cheliped; c. last pereopod; d. abdomen; e. anterior sternal shield.

*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.

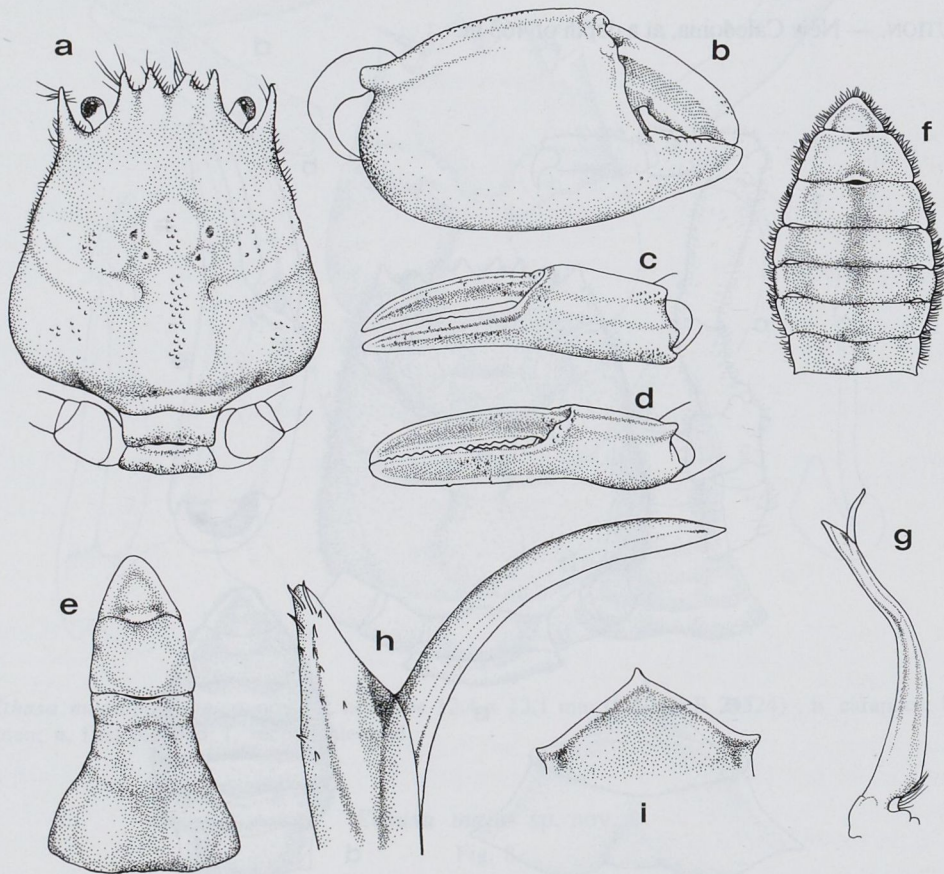


FIG. 9. — *Ethusa makasarica* sp. nov., ♂ holotype 7.9 x 7.6 mm (MNHN-B 19071); ♀ allotype 8.0 x 7.7 mm (MNHN-B 22251): a, male carapace; b-c, male chelipeds; d, female cheliped; e, male abdomen; f, female abdomen; g-h, male first and second pleopods; i, male anterior sternal shield.

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.

	<i>E. hirsuta</i>	<i>E. makasarica</i>
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-B 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.

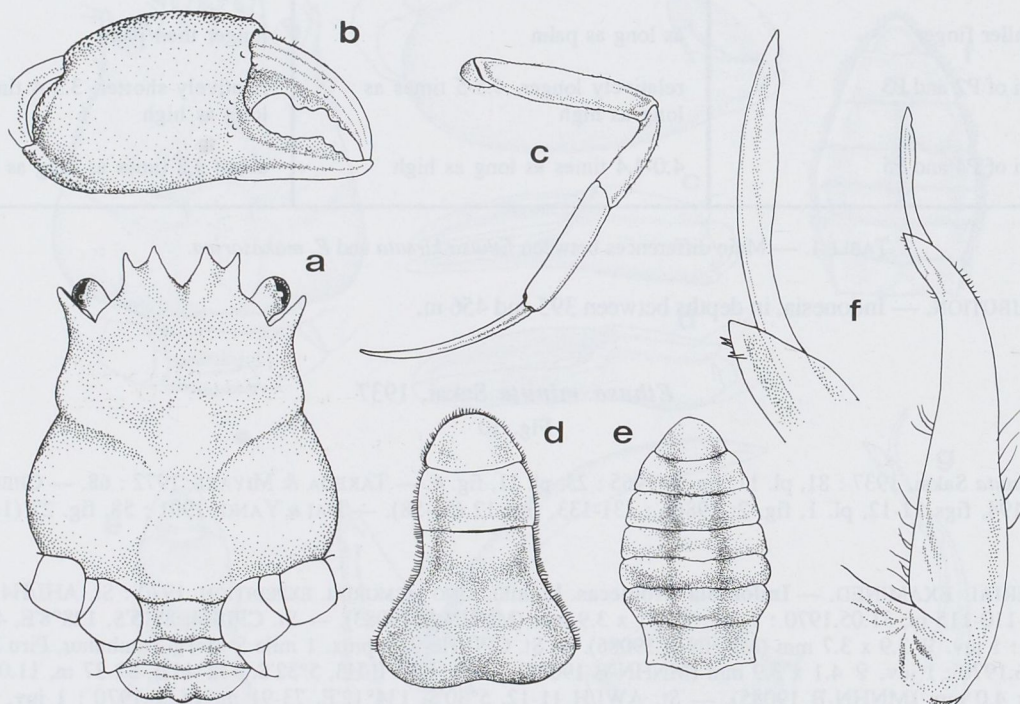


FIG. 10. — *Ethusa minuta* Sakai, 1937, ♂ 4.7 x 4.6 mm; ♀ 4.9 x 4.8 mm (MNHN-B 21530) : a, male carapace; b, male cheliped; c, male third pereiopod; d, male abdomen; e, female abdomen; f, male first and second pleopods.

*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.

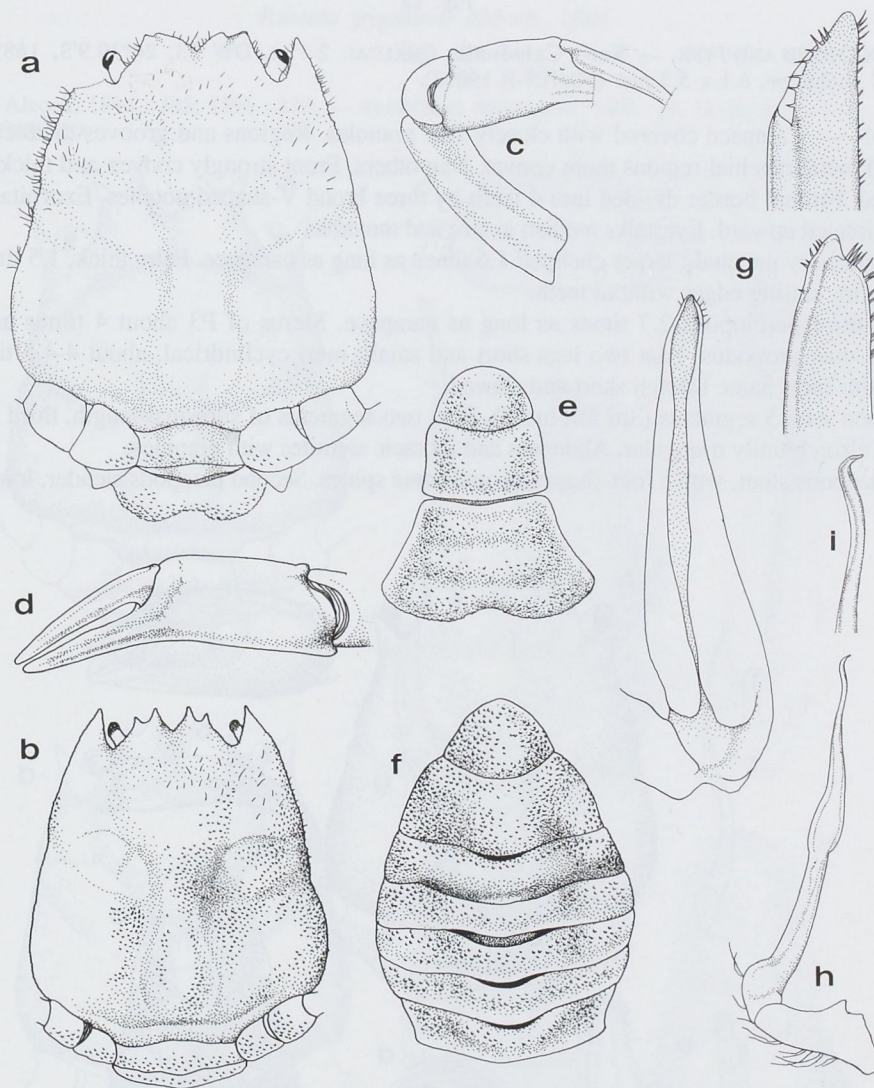


FIG. 11. — *Ethusa obliquidens* sp. nov., ♂ holotype 8.9 x 8.6 mm (MNHN-B 18420); ♀ allotype 11.3 x 11.0 mm (MNHN-B 18418) : a, male carapace; b, female carapace; c, male cheliped; d, female cheliped; e, male abdomen; f, female abdomen; g, male first pleopod; h-i, male second pleopod.

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. Eystalks 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 cyclindrical, 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.

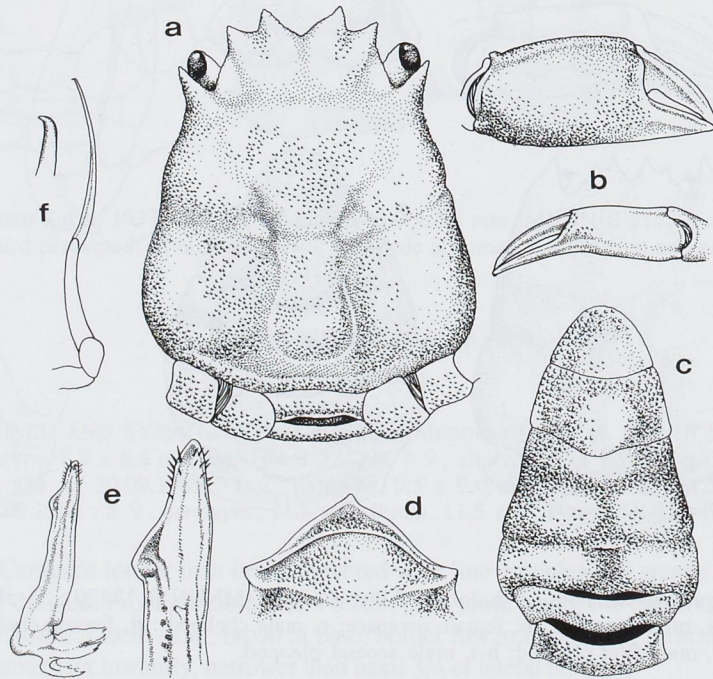


FIG. 12. — *Ethusa parapygmaea* sp. nov., ♂ holotype 6.1 x 5.5 mm (MNHN-B 19092) : a, carapace; b, chelipeds; c, abdomen; d, male anterior sternal shield; e, first pleopod; f, second pleopod.

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.

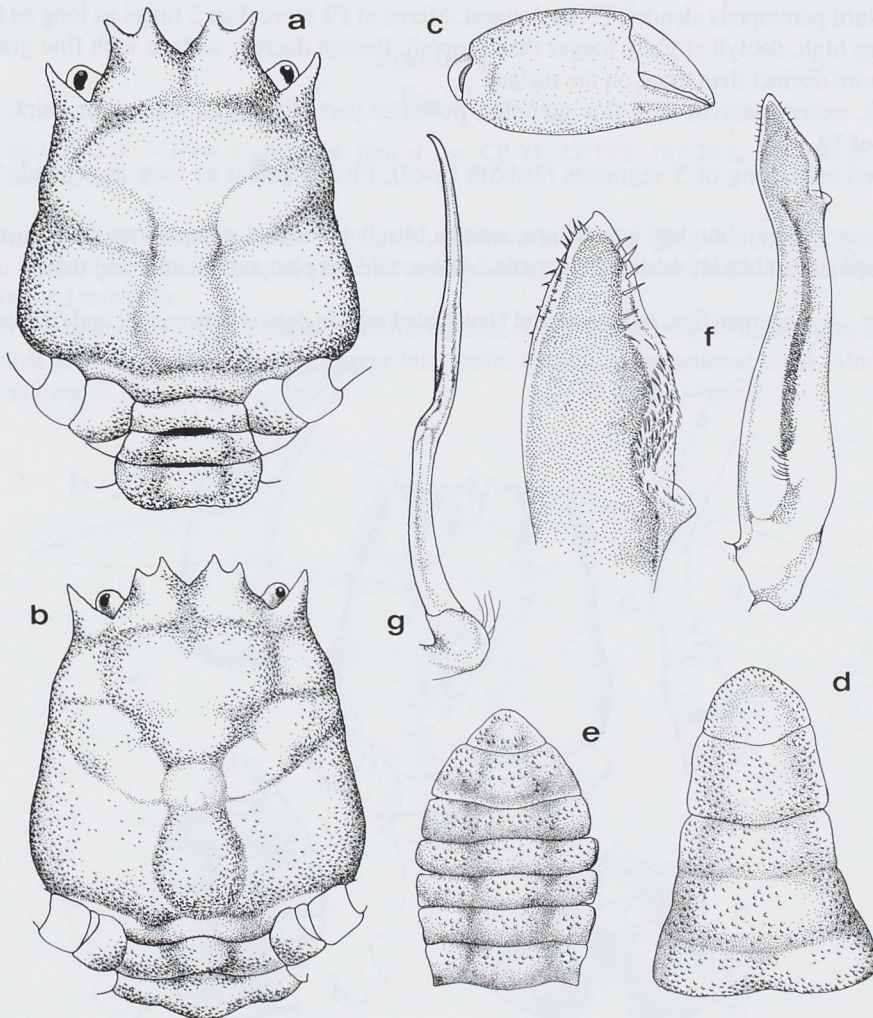


FIG. 13. — *Ethusa pygmaea* Alcock, 1894, ♂ 6.0 x 5.6 mm (MNHN-B 19089); ♀ 7.0 x 6.8 mm (IOAS) : a, male carapace; b, female carapace; c, male larger cheliped; d, male abdomen; e, female abdomen; f, male first pleopod; g, male second pleopod.

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. Proto gastric, 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. Eystalks 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 pereopods 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.

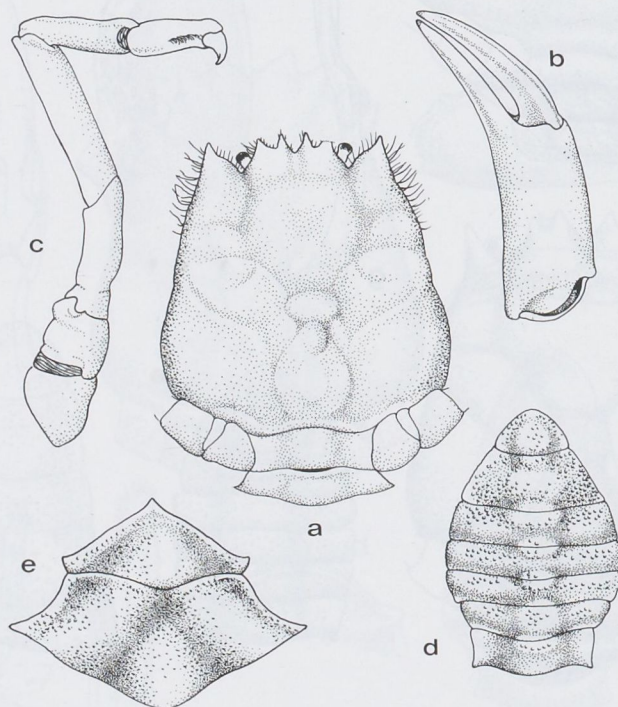


FIG. 14. — *Ethusa sexdentata* (Stimpson, 1858), ♀ 17.0 x 16.8 mm (MNHN-B 18929) : a, carapace; b, cheliped; c, last pereopod; d, abdomen; e, anterior sternal shield.

*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 1a, 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.

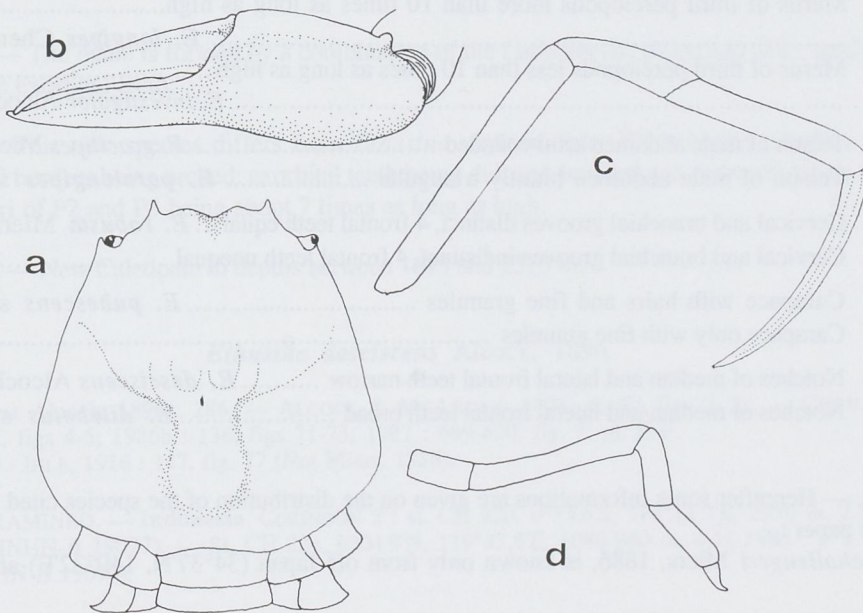
Fig. 15

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL : st. CP 75, 22°19'S, 167°23'E, 825-860 m : 1 juv. ♀ 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 challengerii* (Miers, 1886), but by other characters, it belongs to the genus *Ethusina*.

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. challengerii* 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 pereopods more than 10 times as long as high.....
- ..... *E. longipes* Chen, 1987
- Merus of third pereopods 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 challengerii* 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 pereopods 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 (except 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.

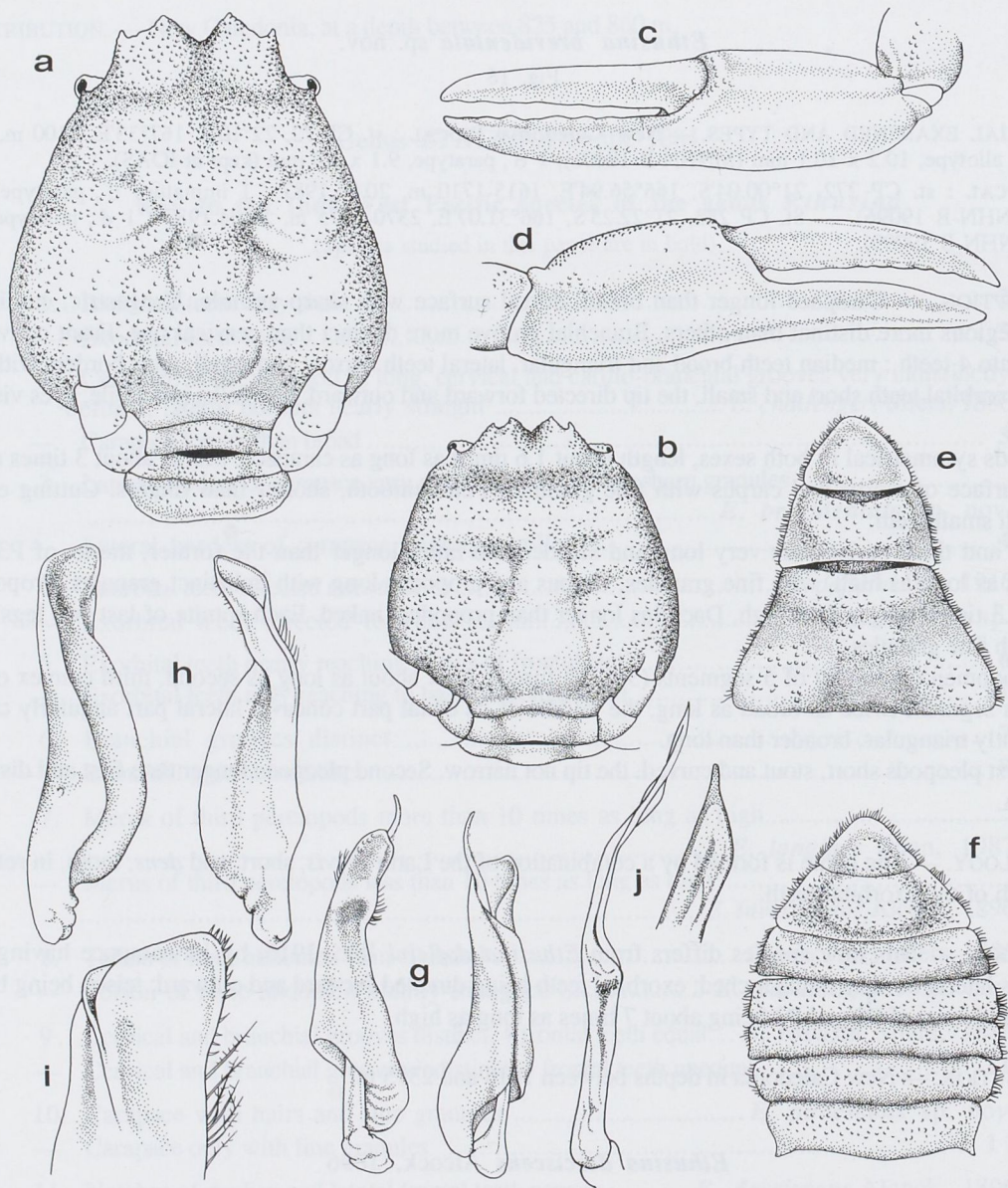


FIG. 16. — *Ethusina brevidentata* sp. nov., ♂ holotype 8.8 x 8.3 mm (MNHN-B 19099); ♀ allotype 10.2 x 10.1 mm (MNHN-B 18401) : a, male carapace; b, female carapace; c, male cheliped; d, female cheliped; e, male abdomen; f, female abdomen; g, male first and second pleopods; h-i, male first pleopod; j, 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.

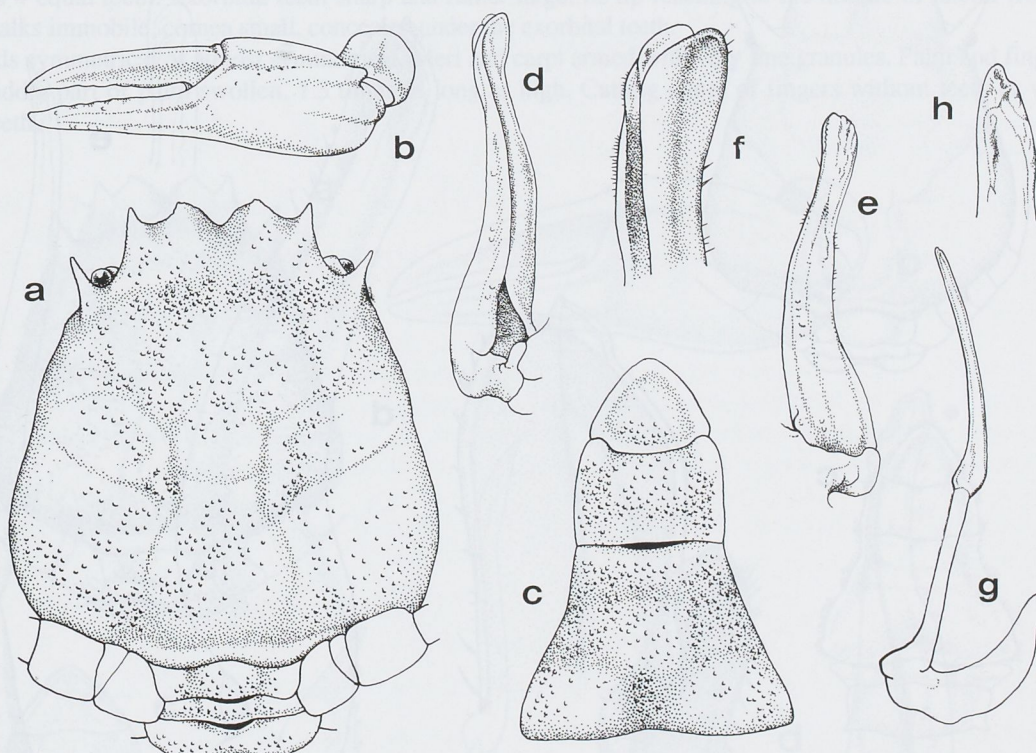


FIG. 17. — *Ethusina dilobotus* sp. nov., ♂ holotype 9.2 x 9.0 mm (MNHN-B 22428) : a, carapace; b, cheliped; c, abdomen; d-f, first pleopod; g-h, second pleopod.

*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 pereopods very slender and long. Third pereopods the longest. Merus of P3 8 times as long as high and propodus 5 times longer than high. Last two pereopods 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.

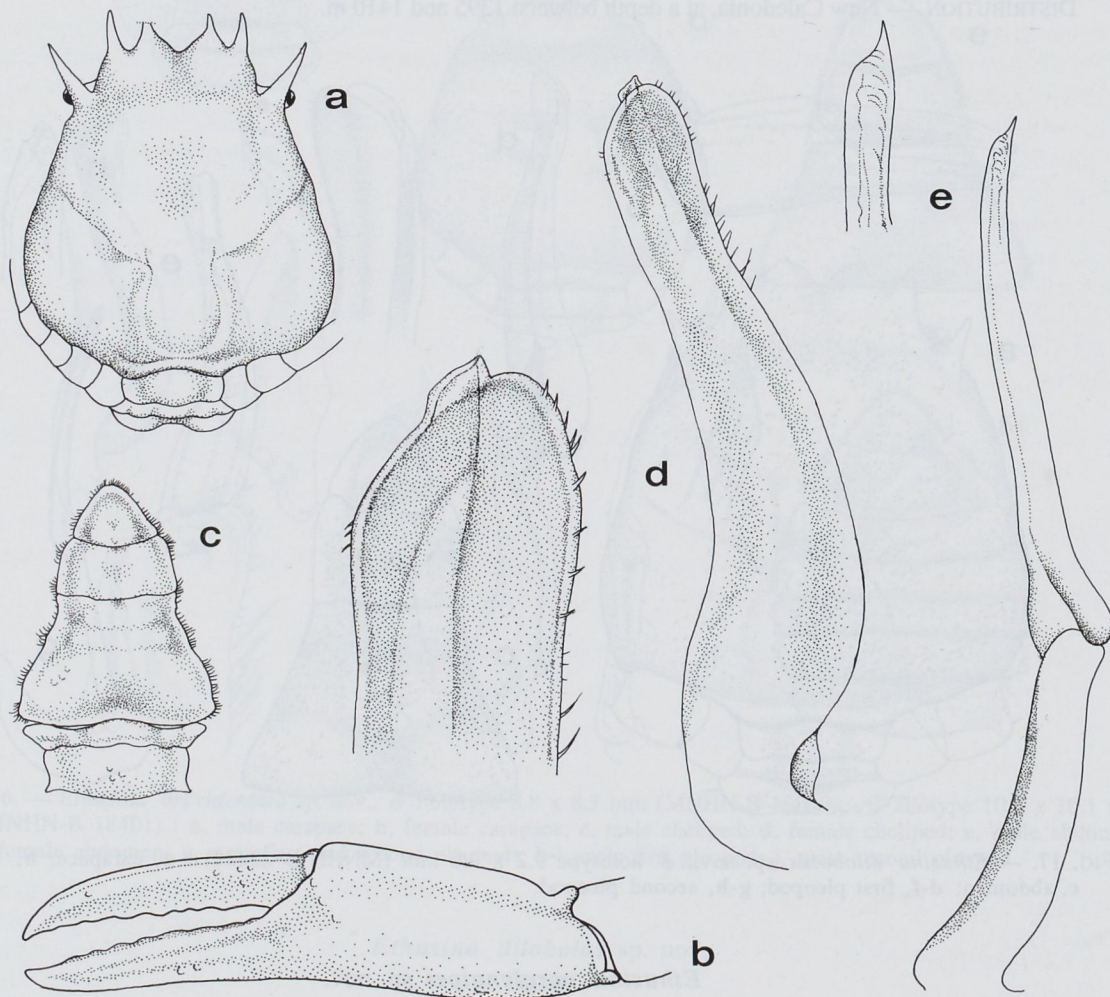


FIG. 18. — *Ethusina paralongipes* sp. nov., ♂ holotype 6.2 x 6.0 mm (MNH-B 22254): a, carapace; b, cheliped; c, abdomen; d, first pleopod; e, second pleopod.

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.

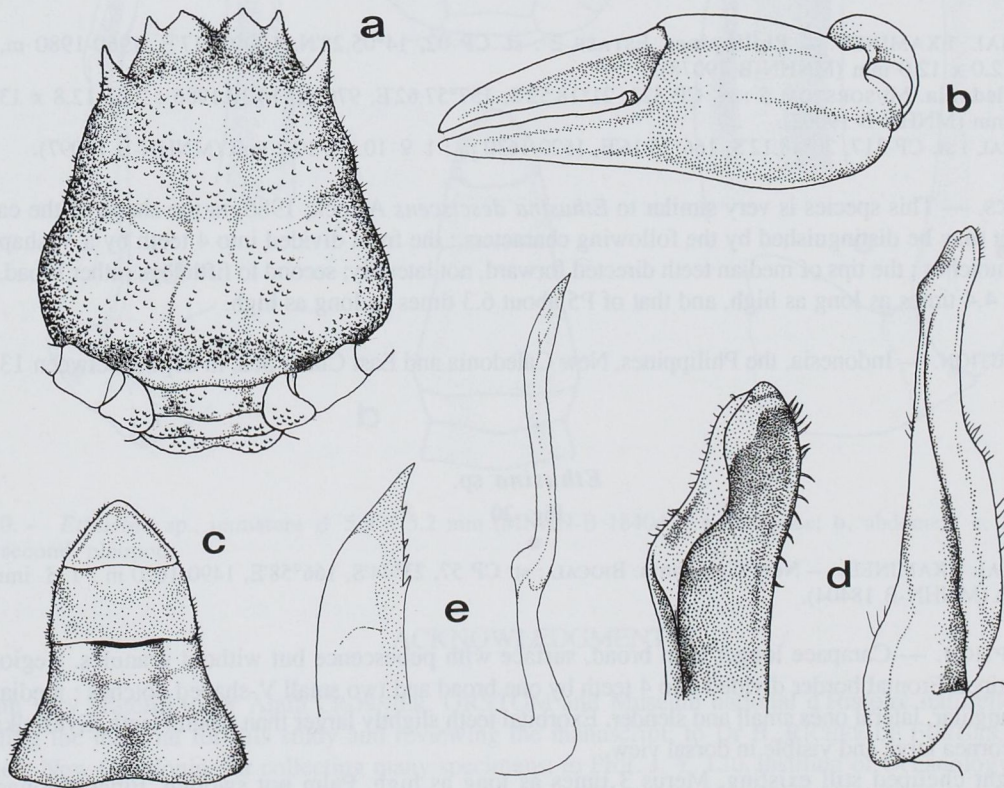


FIG. 19. — *Ethusina pubescens* sp. nov., ♂ holotype 10.1 x 10.0 mm (MNHN-B 19060) : a, carapace; b, cheliped; c, abdomen; d, first pleopod; e, second pleopod.

Second and third pereopods 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

*Ethusina* (*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. Eystalks 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.

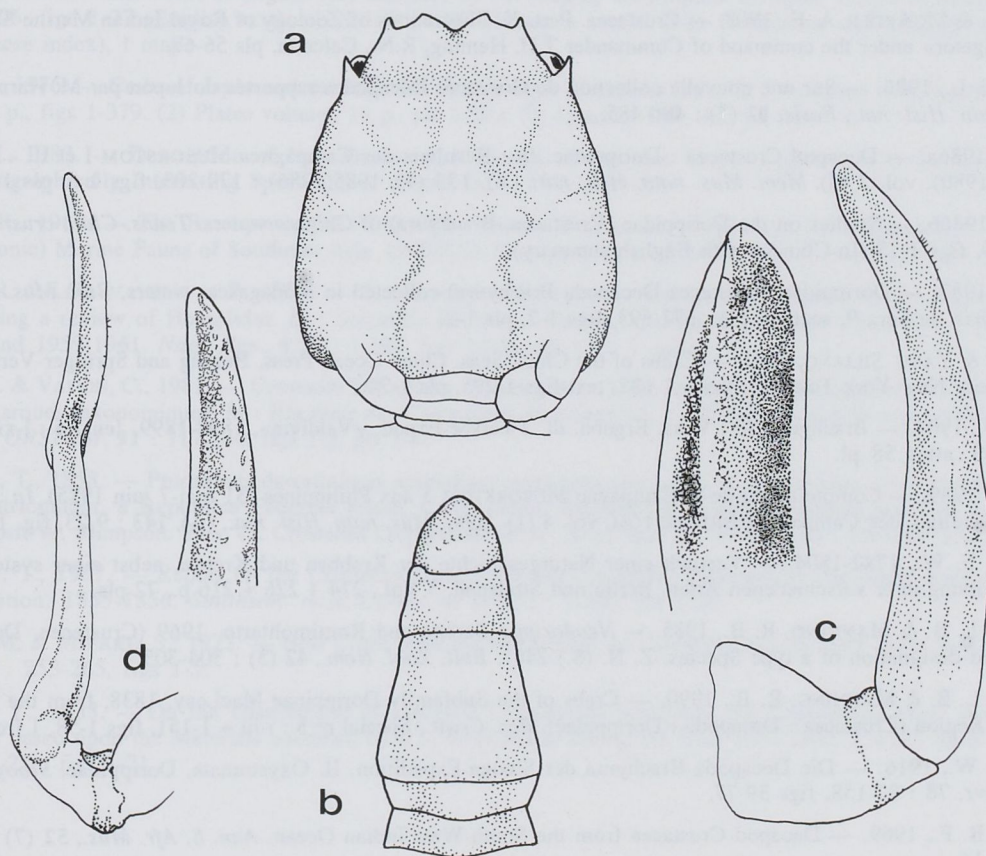


FIG. 20. — *Ethusina* sp., immature ♂ 5.8 x 5.2 mm (MNHN-B 18404) : a, carapace; b, abdomen; c, first pleopod; d, second pleopod.

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