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A new thalassocypridine genus (Crustacea, Ostracoda) from brackish waters in the Indian and Pacific Oceans, with the description of a new species

by Karel WOUTERS

Abstract

Mangalocypria, a new genus of the tribe Thalassocypridini, is described, with a new species, and two previously described species, from Papua New Guinea, the Comoros and Indonesia. The new genus has a remarkable set of characters separating it from other members in the tribe: thin-shelled, translucent and smooth valves, V-process of lower lip developed as a rake, and postero- distal claw of furca fixed to shaft without a joint. The affinities of *Mangalocypria* gen. nov. with other genera is discussed, and some taxonomical problems in the tribe Thalassocypridini are commented upon. The diagnostic value of incompletely differentiated Zenker organs of premature males is discussed.

Key-words: Ostracoda, meiofauna, taxonomy, new genus, Indian Ocean, Pacific Ocean.

Résumé

Mangalocypria, un nouveau genre du tribu Thalassocypridini est décrit, avec une nouvelle espèce et deux espèces connues, de la Papouasie Nouvelle-Guinée, des Comores et de l'Indonésie. Le nouveau genre se distingue par un ensemble remarquable de caractères qui sont absents chez d'autres membres du tribu: valves minces, translucides et lisses, le rameau V de la lèvre inférieure est développée en forme de râteau, et la griffe postéro-distale de la furca et fixée au branche sans articulation.
Les relations de *Mangalocypris* avec d'autres genres et quelques problèmes taxonomiques dans le tribu des Thalassocypridini sont discutés. La valeur diagnostique des organes de Zenker incomplètement differenciés chez des mâles prématures est discutée.

Mots-clés: Ostracoda, méiofaune, taxonomie, nouveau genre, Océan Indien, Océan Pacifique.

Introduction

The tribe Thalassocypridini is a poorly known group of brackish and marine cypridacean ostracods. Several genera in the tribe are ill-defined, and need to be redescribed. This situation has led in the past to conflicting interpretations and to unsolved synonymies. Since several years I have been working on this group in an attempt to understand the complicated systematical context of paracypridine and thalassocypridine genera. The existing descriptions and figures are sometimes too vague or incomplete for taxonomical interpretation, and therefore restudy of the type material, if available and sufficiently well preserved, is certainly necessary. To solve some of the long standing taxonomical problems in this group, the study of the type material may well be insufficient, and the presence of new material is essential.
Recently collected material from Papua New Guinea, the Comoros and Indonesia, containing thalassocypridines, appeared to be very useful in this respect, and was used in the present study. Detailed analysis of the morphology of the valves, but especially of the soft parts led to the description of new features which can be used in unravelling the taxonomical confusion in the thalassocypridines. The logical consequence of this all was that a new genus had to be described.
The material used in this study is deposited in the ostracod collection of the Royal Belgian Institute of Natural Sciences, Brussels.

Leopold III Biological Station Laing Island, Contribution N° 351

Taxonomic account

Order Podocopida G.W. MÜLLER, 1894
Suborder Podocopina SARS, 1866
Superfamily Cypridoidea BAIRD, 1845
Family Candonidae KAUFMANN, 1900
Subfamily Paracypridinae SARS, 1923
Tribe Thalassocypridini HARTMANN & PURI, 1974

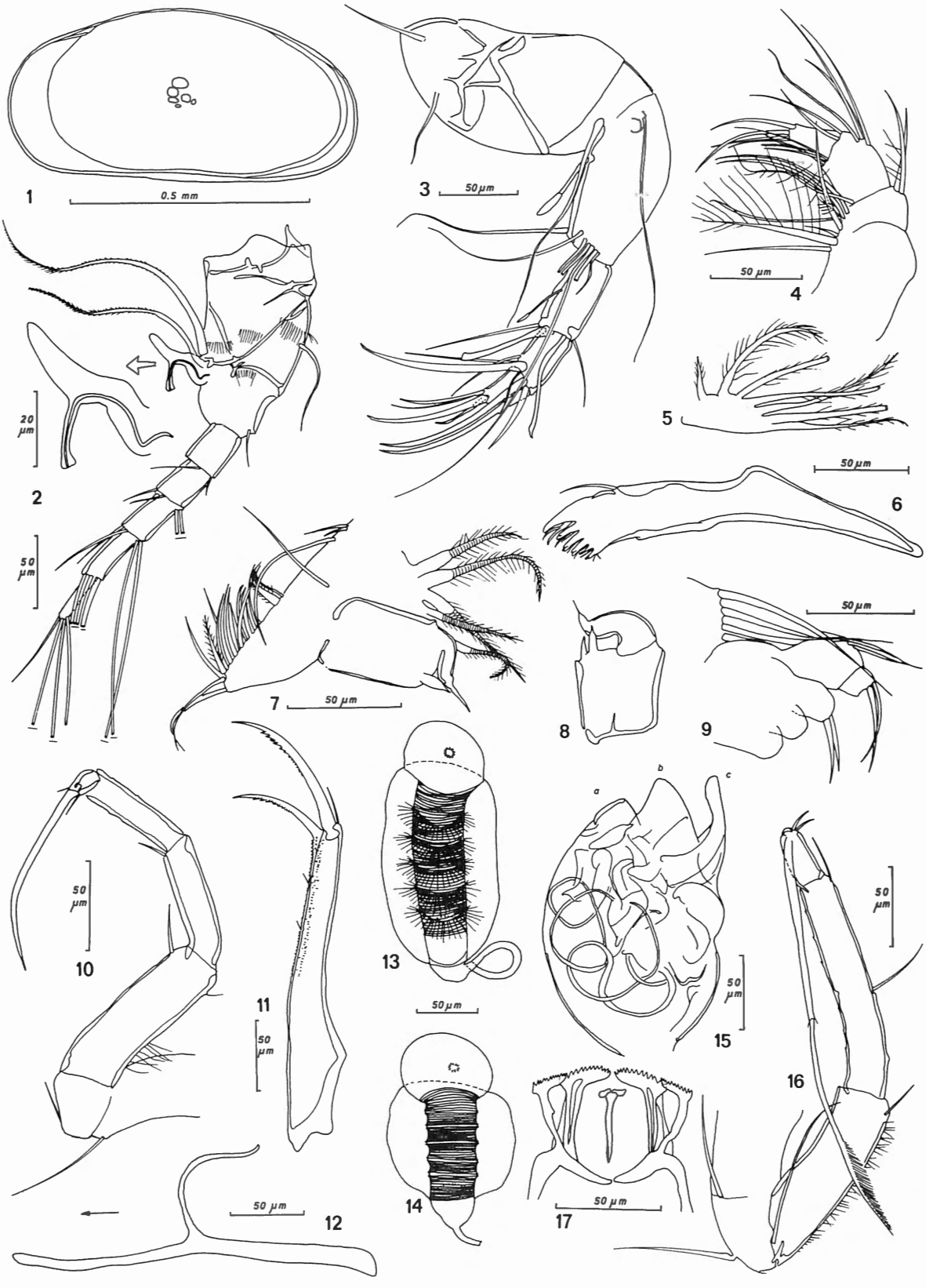
Genus *Mangalocypria* gen. nov.

DERIVATION OF NAME

From 'Mangal' = mangrove formation, and the suffix *-cypria* (gender feminine).

TYPE SPECIES

Mangalocypria appendix sp. nov. (here designated).



Figs 1-17. – *Mangalocypria appendix* gen. et sp. nov., Papua New Guinea, Madang Province.
1. Right valve, male, internal view, holotype (O.C. 2176). 2. Antennule, male, holotype. 3. Antenna, male, holotype. 4. Mandibular palp, male, paratype (O.C. 2177). 5. Mandibular epipodite, male, holotype. 6. Mandible, male, paratype (O.C. 2177). 7-8. Clasping organs, male, holotype. 9. Maxillule, male, holotype. 10. Second leg, male, holotype. 11. Furca, male, holotype. 12. Furcal attachment, male, holotype. 13. Zenker organ, male, holotype. 14. Zenker organ, premature male, paratype (O.C. 2177). 15. Male copulatory organ, holotype. 16. Third leg, cleaning limb, male, holotype. 17. Lower lip, female (O.C. 2185).

OTHER SPECIES

Mangalocypria eleotridis (HARDING, 1962) nov. comb.
Mangalocypria africana (HARTMANN, 1974) nov. comb.

DIAGNOSIS

Thin-shelled, fragile, translucent and smooth valves, with broadly and regularly rounded anterior and posterior margins; copulatory appendage with three distal lobes; V-process of lower lip developed as a rake; postero-distal claw of furca fixed to the shaft without a joint.
Discussion: see below.

Mangalocypria appendix sp. nov.
Figs 1-17, 45-50, 57

DERIVATION OF NAME: Latin *appendix*, because of the large expansion on the Rome-organ (used as a noun in apposition).

TYPE LOCALITY: Papua New Guinea, Madang Province, Hansa Bay, Sisimangun village, pond on the beach, NW of the village. Salinity: 4 g l^{-1}; leg.: K. Wouters, 27 May 1982 (station 3237).

HOLOTYPE

A dissected male with valves stored dry (O.C. 2176a) and soft parts preserved in a sealed glycerine preparation (O.C. 2176b).

PARATYPES

Three females and three males, dissected and stored as the holotype (O.C. 2177-2182).

OTHER MATERIAL

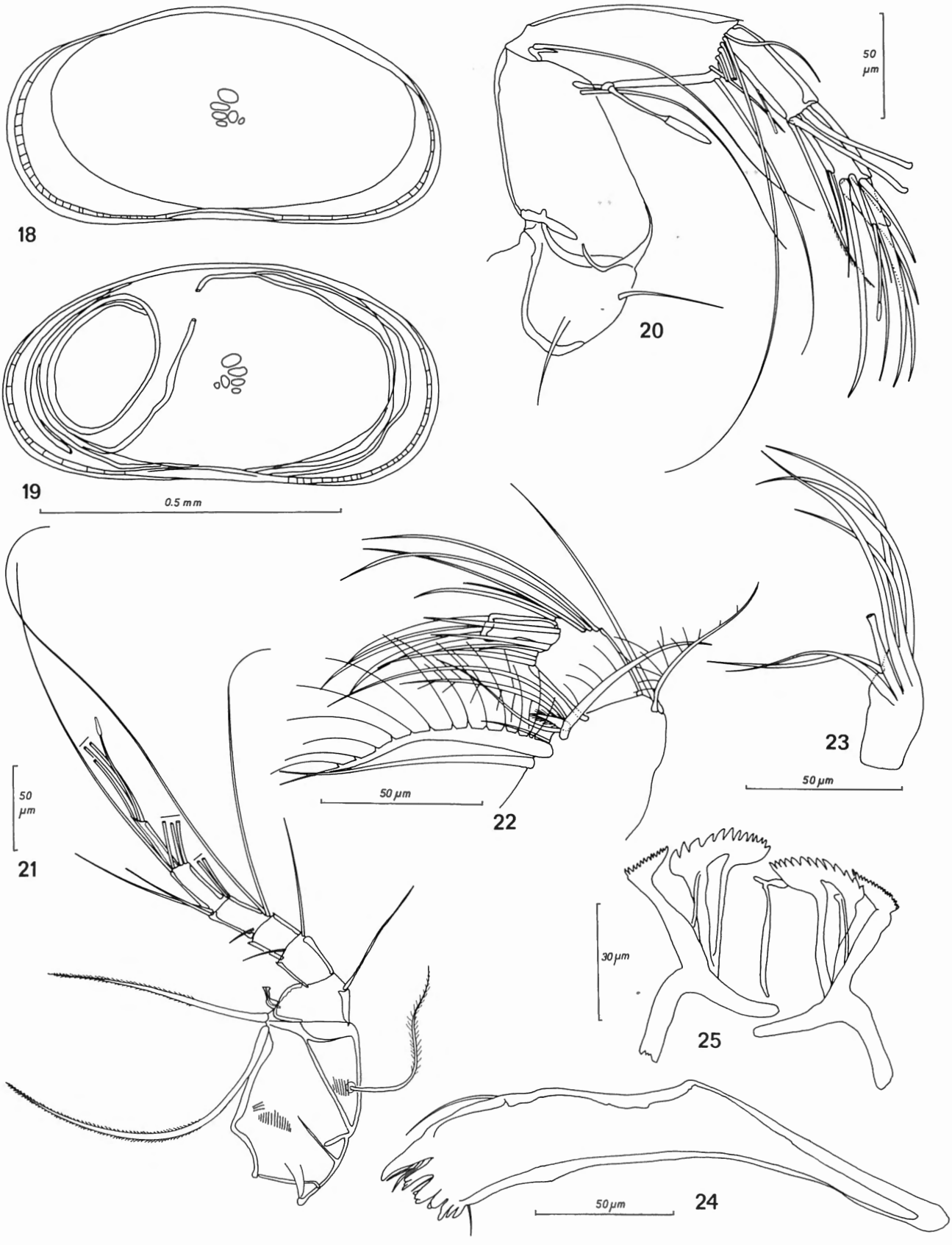
All material originates from northern Papua New Guinea, Madang Province.
Five microscopical preparations, River Boroi and Nubia Mission, salinities ranging from 1 to 14 g l^{-1}(Leg.: K. WOUTERS, 21 May, 26 May and 17 June 1982, stations 3180, 3223 and 3371) (O.C. 2183-2187).
Seventeen specimens preserved in ethanol, from three samples in the River Boroi, between Boroi Village and Bak Village, salinities ranging from 6 to 16 (Leg.: K. WOUTERS, 26 May 1982, stations 3219, 3222 and 3223), O.C. 2188, 2193 and 2194.
Thirteen specimens preserved in ethanol, from five samples in the River Awar, salinities 1, 4, 6, 8 and 11 g l^{-1} respectively (Leg.: K. WOUTERS, 28 May 1982, stations 3246, 3252, 3253, 3257 and 3259), O.C. 2198, 2190, 2191, 2192, 2195.
Note: salinities measured with a salinity refractometer.

DIAGNOSIS

Medium-sized valves, with evenly convex dorsal margin; Carapace spindle-shaped in dorsal view, with greatest width in the middle; Rome organ with distal expansion; natatory setae of antenna reaching just beyond tip of distal claws; distal setae of third and fourth segment of second leg short; dorsal lobe of copulatory appendage triangular, ventral lobe a narrowly curved hook.

DESCRIPTION

Valves (Figs 1, 45-50, 57) thin-shelled, fragile, translucent and very smooth, bean-shaped; anterior margin broadly rounded; dorsal margin regularly convex: ventral margin straight; transition between anterior, dorsal, posterior and ventral margins smooth, without angles; greatest height located near mid-length; carapace in dorsal view spindle-shaped, with pointed extremities; greatest width in the middle. Sexual dimorphism: female valves about 10% larger than males. Anterior inner lamella moderately wide, posterior one narrow; zone of concrescence narrow; few, short, fine and hardly visible marginal pore canals; anterior vestibulum deep and open, posterior one narrow; muscle scar pattern consisting of a curved anterior row of four scars and two small scars behind this row; hinge adont.
Antennule (Fig. 2) fairly slender, seven podomeres separate; segments 1 and 2 fused; setae long and slender; Rome-organ large, with remarkable distal expansion.
Antenna (Fig. 3): podomeres 4 and 5 distinctly divided in males, but fused in females; long swimming setae reaching slightly beyond the tip of the terminal claw; Y-aesthetasc long and slender, with a median suture.
Mandibula (Figs 4-6): vibratory plate of palp with one short and seven long feathered setae: molar teeth bifid or trifid.
Maxillule (Fig. 9): with a two-segmented short palp; terminal segment subrectangular; vibratory plate with six mouthward-directed "Strahlen".
First leg (Figs 7-8): male clasping apparatus with subrectangular body (first segment), and sigmoid terminal hook (second segment); pegs short and stout.
Second leg (Fig. 10): five-segmented, with a long and slender curved terminal claw; terminal segment very small.
Third leg (cleaning limb)(Fig. 16): five-segmented; penultimate segment not divided; two short terminal setae, and one long two-segmented reflexed seta, with terminal setules arranged in a comb-like pattern; joint between the two segments of the reflexed seta in the middle.
Furca (Fig. 11): large and slightly curved; one short distal seta and two large serrate terminal claws; posterior claw connected to shaft without a joint; two short and thin posterior setae; posterior part of distal half of shaft set



Figs 18-25. – *Mangalocypria africana* (HARTMANN, 1974), The Comoros, Grande Comore, Lac Salé, S. of Mitsiamouli.
18. Right valve, male, internal view (O.C. 2198). 19. Left valve, male, internal view (O.C. 2189). 20. Antenna, male (O.C. 2202). 21. Antennule, male (O.C. 2196). 22. Mandibular palp, male (O.C. 2198). 23. Mandibular epipodite, male (O.C. 2197). 24. Mandibula, female (O.C. 2200). 25. Lower lip, male (O.C. 2196).

with numerous very small spinules arranged in indistinct rows.
Furcal attachment (Fig. 12) simple, with slightly curved central axis and dorsal branch semi-circularly curved in posterior direction.
Copulatory appendage (Fig. 15) with three lobes: a small triangular dorsal lobe (a), a larger triangular median lobe (b) and a narrowly curved hook-like ventral lobe (c).
Lower lip (Fig. 17) with V-process (*sensu* SCHULZ, 1976) developed as a rake, resembling the T-process; the latter is set with teeth as in many other ostracods; teeth on the V-process slightly smaller than those on the T-process; about thirteen teeth on each of the four processes.
Zenker organ (Figs 13, 14): with five rosettes and a large and spherically enlarged entrance; spines on rosettes absent in some specimens (Fig. 14). The absence of spines was already described in other ostracods, including Thalassocypridini. Since in our material both spine-bearing and spine-lacking specimens occur together, the latter phenomenon is interpreted as being the premature state (see general discussion).

Dimensions
Holotype: length 0.73 mm; height 0.37 mm.
Paratypes: length 0.72 - 0.82 mm; height 0.35 - 0.42 mm.

OCCURRENCE

The new species was found in Northern Papua New Guinea, Madang Province. The type locality is a brackish beach pond near the village of Sisimangun, with stagnant water and fluctuating salinities. When the material was collected, a salinity of 4 g l^{-1} was measured. All other localities are situated in the same region as the type locality and represent different types of habitats: a large tidal river (Boroi), a small tidal river (Awar) and a ditch (Nubia). In the studied localities, measured salinities ranged from 1 to 16 g l^{-1}. *Mangalocypria appendix* sp. nov. can therefore be described as an oligo- to mesohaline species. It was found living together with, among others, *Dolerocypria taalensis* TRESSLER, 1937, *Renaudcypris wolffi* (HARDING, 1962), *Mungava munda* HARDING, 1962 and *Paracypria* sp.

DIFFERENTIAL DIAGNOSIS

Mangalocypria appendix can be easily distinguished from the two other species, *M. africana* and *M. eleotridis*, by the presence of a large expansion on the Rome organ. From *M. africana* it differs by the length of the natatory setae (longer in *M. africana*) and by the morphology of the lobes of the copulatory appendage. In *M. africana* the dorsal lobe is rounded whereas in *M. appendix* it is triangular. The distal setae on the third and fourth segment of the second leg are much longer in *M. africana*. Furthermore the dorsal margin, especially in the right valve, is tapering in *M. africana*, and evenly curved in *M. appendix*. In dorsal view, the greatest width is situated in the middle in *M. appendix* and clearly in front of the middle in *M. africana*. *M. eleotridis* is very closely related with *M. appendix*. The expansion on the Rome organ, and the narrowly curved hook of the ventral lobe of the copulatory appendage in *M. appendix*, however, allow an easy distinction between the two species. According to the measures given by Harding (1962) *M. eleotridis* is a markedly larger species.

Mangalocypria africana (HARTMANN, 1974) nov. comb.
Figs 18-34, 51-56, 58

Thalassocypria africana n. sp., HARTMANN, 1974, p. 364-365, Plate 145, Figs 1006-1014.

TYPE LOCALITY

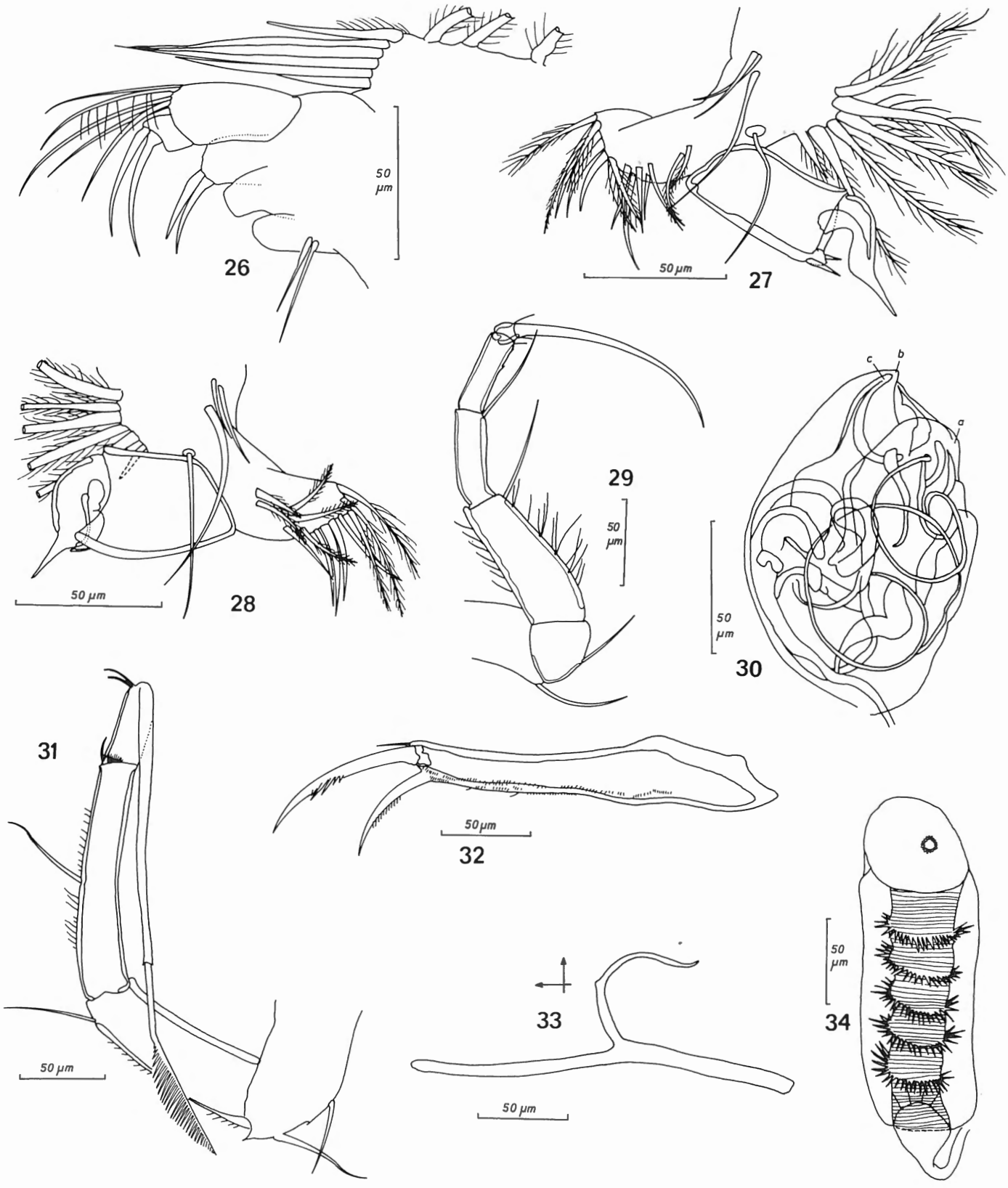
Costa do Sol mud flat, north of Lourenço Marques (= Maputo), Mozambique.

MATERIAL USED FOR REDECRIPTION

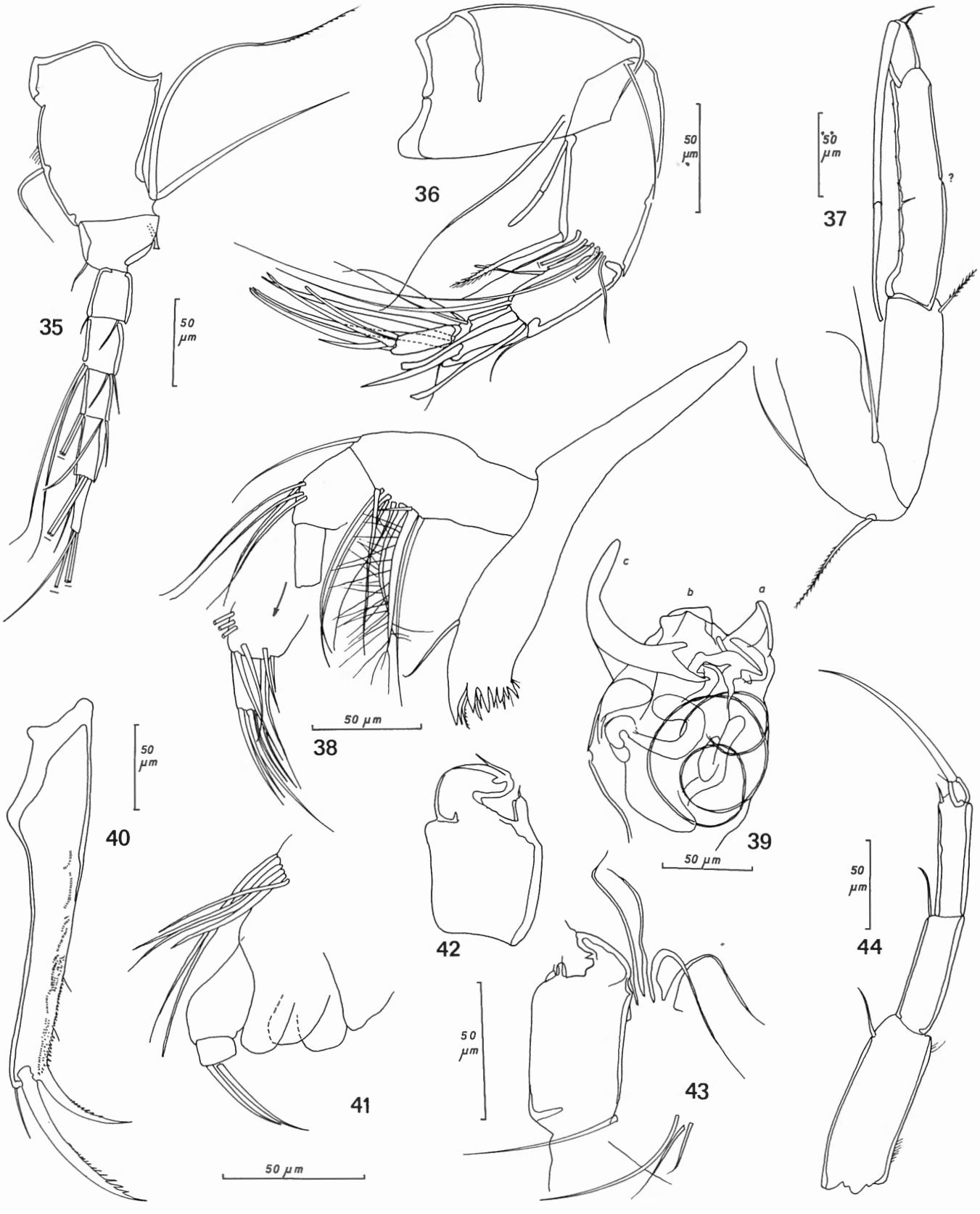
1. The Comoros, Grande Comore, Lac Salé, South of Mitsiamouli. Leg. J.-L. KENNES (Expédition Karthala 81), 28 July 1981 (stations 1 and 4): 3 dissected males and 3 dissected females (O.C. 2196-2202), and 70 specimens preserved in ethanol (O.C. 2209).
2. Papua New Guinea, southern coast, Motupore Island, near Port Moresby, mangrove along NE beach of the island, narrow strip of mangroves, in open connection with the sea; salinity not measured, but nearly marine; material collected at the high water level (pers. comm. FR. FIERS). Leg. FR. FIERS, 21 November 1986 (station 86): 2 dissected males and 1 dissected female (O.C. 2203-2205).
3. Indonesia, Northern Bali, large sand flat between Merta Sari and Serangan Island, mangrove formation; salinity 25 g l^{-1}. Leg. FR. FIERS, 30 November 1986 (station 101): 1 dissected male (O.C. 2206).
4. Indonesia, Sulawesi, Panikiang Island, about 100 Km N of Ujung Pandang, mangrove. Leg.: CL. MASSIN, 29 August 1994 (Station 44): 1 dissected male, and 1 whole carapace (O.C. 2207-2208).

DIAGNOSIS

Medium-sized valves, with postero-dorsal margin tapering towards posterior end; carapace spindle-shaped in dorsal view, with greatest width in front of the middle; Rome organ without distal expansion; natatory setae of antenna long; distal setae of third and fourth segment of the second leg long; dorsal lobe of copulatory appendage rounded, ventral lobe weakly developed and narrow.



Figs 26-34. – *Mangalocypria africana* (HARTMANN, 1974), The Comoros, Grande Comore, Lac Salé, S. of Mitsiamouli.
26. Maxillule, male (O.C. 2196). 27-28. Male clasping organs (O.C. 2197). 29. Second leg, male (O.C. 2187). 30 Male copulatory organ (O.C. 2198). 31. Third leg, cleaning limb, male (O.C. 2196). 32. Furca, male (O.C. 2198). 33. Furcal attachment , male (O.C. 2198). 34. Zenker organ, male (O.C. 2202).



Figs 35-44. – *Mangalocypria eleotridis* (HARDING, 1962). Holotype (male), Solomon Islands, Rennell Island, Lake Tegano, Niupani (Zoologisk Museum Copenhagen).
35. Antennule. 36. Antenna. 37. Third leg, cleaning limb. 38. Mandibula. 39. Copulatory appendage. 40. Furca. 41. Maxilulle. 42-43. Clasping organs. 44. Second leg.

ADDITIONAL REDESCRIPTION

Valves (Figs 18, 19) thin, translucent and smooth; dorsal margin convex; posterior margin of left valve narrowly rounded; maximal height situated in front of the middle; sexual dimorphism indistinct: male and female valves with the same lengths, but female valves higher. Carapace spindle-shaped, with greatest width situated somewhat in front of the middle. Anterior and posterior inner lamellae moderately wide; zone of concrescence narrow, with few short marginal pore canals. Muscle scar pattern consisting of a curved anterior row of four scars and two small scars behind this row.
Antennule (Fig. 21): with Rome organ well developed, but without distal expansion.
Antenna (Fig. 20): slender, with long podomeres; natatory setae reaching about 35 % beyond the tip of the terminal claws.
Mandible and maxillule (Figs 22-24, 26) without special features.
First leg (Figs 27, 28): male clasping organ with subrectangular first segment and large terminal hook (second segment).
Second leg (Fig. 29): five-segmented; distal setae of third and fourth segments long.
Third leg (cleaning limb)(Fig. 31): reflexed seta two-segmented; joint between the two segments beyond the middle.
Furca (Fig. 32) almost straight, with relatively short serrate terminal claws.
Furcal attachment (Fig. 33) with slightly curved central axis and strongly curved dorsal branch.
Copulatory appendage (Fig. 30) with three lobes: a distally rounded dorsal lobe (a), a large obliquely pointed triangular median lobe (b), and a narrow and curved ventral lobe (c).
Lower lip (Fig. 25) with V-process (*sensu* SCHULZ, 1976) developed as a rake; teeth on the V-process markedly smaller than those on the T-process; thirteen teeth on the T-process, and 13-16 on the V-process.
Zenker organ (Fig. 34) with five rosettes and a large spherical entrance.
Dimensions
Holotype (HARTMANN, 1975, p. 365): length 0.75 mm, height 0.36 mm.
Material from the Comoros and Indonesia: length 0.71 - 0.81 mm, length 0.35 - 0.41 mm.

OCCURRENCE

Mangalocypria africana was originally described from a mud flat, with *Zostera*, near Lourenço Marques (Matupo, Mozambique), with a salinity of 32 g l^{-1}. HARTMANN (1974) indicates that the salinity of the mud flat is probably strongly fluctuating during the rainy season. The species is now reported to have a much wider distribution and was found in a saline lake in the Comoros, a mangrove formation in Sulawesi, a sand flat in Bali, and a mangrove formation on Motupore Island (S. Papua New Guinea). The two measured salinity values, and the nearly marine condition of the mangrove formation on Motupore Island suggest that *M. africana* is a polyhaline, perhaps even a mixoeuhaline species, in contrast with *M. appendix* and *M. eleotridis*, which can be described as an oligo- to mesohaline species.

Mangalocypria eleotridis (HARDING, 1962) nov. comb. (Figs 35-44)

Paracypria eleotridis n.sp., HARDING, 1962, p. 56-58, Figs 25-35.

TYPE LOCALITY

Solomon Islands, Rennell Island, Lake Tegano (= Te-Nggano), from the stomach content of the fish *Eleotris fusca* (BLOCH & SCHNEIDER). Collected during the Danish Rennell Expedition in 1965 (see WOLFF, 1968).

MATERIAL USED FOR DESCRIPTION

The original description of the species was based on a single specimen, the holotype. It consists of a broken shell preserved in alcohol and the appendages mounted on a slide. I had the microscopical slide with the appendages on loan from the Zoological Museum Copenhagen.
No other specimens of this species are known.

DIAGNOSIS

Large valves; Rome organ without distal expansion; natatory setae of antenna reaching slightly beyond tip of claws; distal setae of third and fourth segment of second leg short; hook of male clasping apparatus short; dorsal lobe of copulatory appendage triangular, ventral lobe strongly developed and widely curved.

ADDITIONAL DESCRIPTION OF HOLOTYPE

Valves: there is no further information on valve morphology (not seen).
Antenna (Fig. 35): with very small Rome-organ, the latter without distal expansion.
Antenna (Fig. 36): natatory setae reaching just beyond the tip of the terminal claws.
Mandible and maxillule (Figs 38, 41) without special features.
First leg (Figs 42, 43): subrectangular first segment, with short and broad terminal hook (second segment).
Second leg (Fig. 44): distal setae of third and fourth segment short.
Third leg (Fig. 37): reflexed seta two-segmented; this seta is broken, but the joint between the two segments is

probably situated near or even somewhat in front of the middle.
Furca (Fig. 40): long, almost straight, and with long serrate terminal claws.
Furcal attachment: not found.
Copulatory appendage (Fig. 39): with three lobes: a triangular, distally pointed dorsal lobe (a), a large truncate median lobe (b), and a widely curved hook-like ventral lobe (c). It is not excluded that the median lobe (b) is actually triangular, because in the preparation this lobe gives the impression to be folded.
Lower lip: no further information.
Zenker organ: see fig. 35 of HARDING (1962).

Dimensions
Holotype (HARDING, 1962, p. 56): length 0.98 mm, height 0.44.
This is markedly larger that the two other species described here, but these measurements could not be checked.

OCCURRENCE

The species is known from the type locality, Lake Tegano, the largest brackish lake in the Pacific only. The lake has a salinity of 4.5 g l^{-1} (HARDING, 1962).

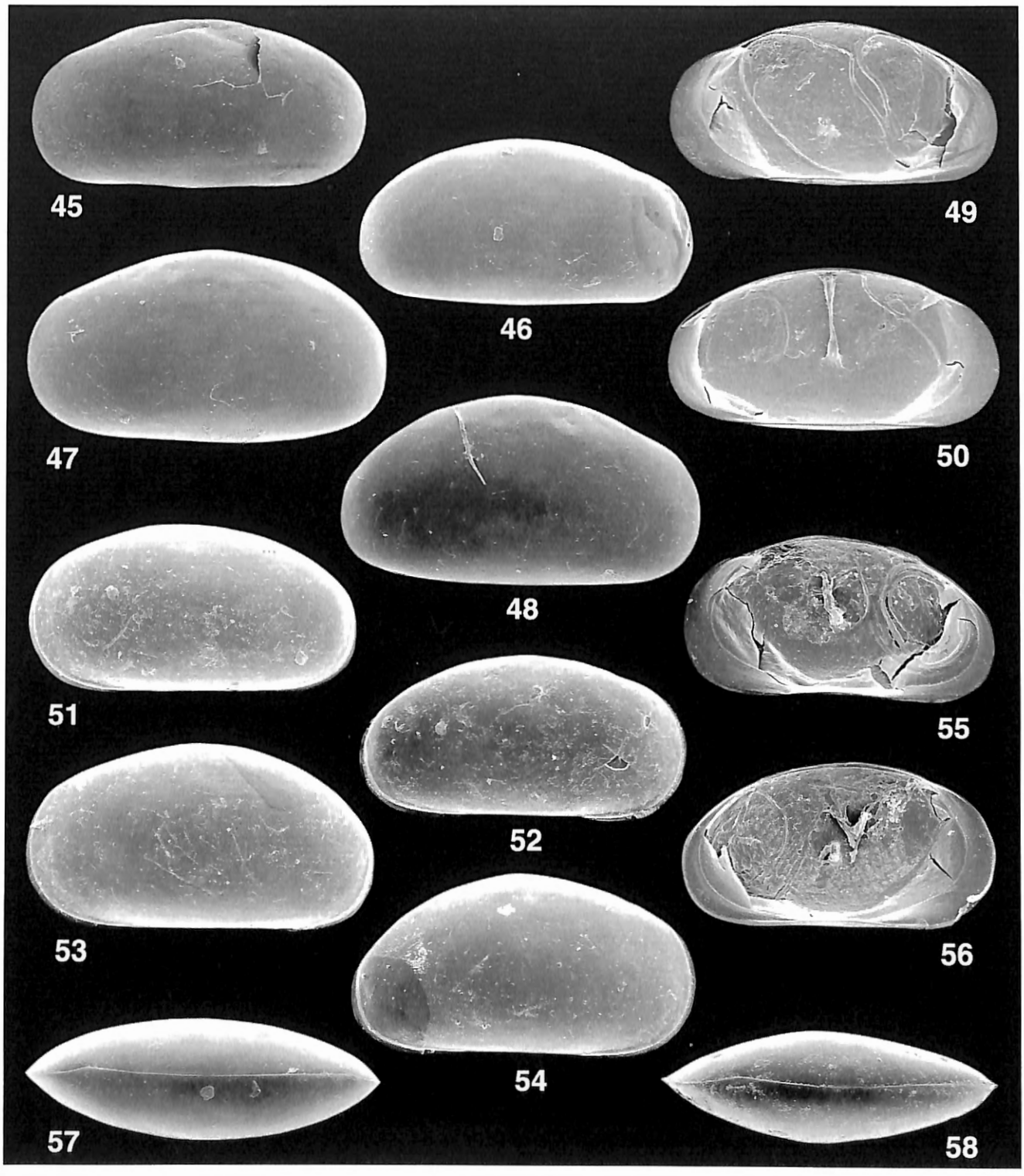
General discussion

TAXONOMY

The tribe Thalassocypridini is a poorly understood group of marine and brackish water cypridaceans. It presently consists of six genera: *Dolerocypria* TRESSLER, 1937, *Mungava*, HARDING, 1962, *Paracypria* SARS, 1905, *Pontoparta* VAVRA, 1901, *Parapontoparta* HARTMANN, 1955 and *Thalassocypria* HARTMANN, 1957.
The genera *Dolerocypria* and *Mungava* are relatively well known. *Paracypria* is a widely distributed genus with numerous species, which can be divided in at least three species groups around *P. tenuis* SARS 1905, *P. maryborooughensis* HARTMANN, 1981 and *P. minuta* MCKENZIE 1968 resp. The genus *Pontoparta* remains ill-defined. This genus has as type species *P. rara* VAVRA, 1901, described on the basis of a single female type specimen, which is moreover lost. Some other species assigned to *Pontoparta* probably do not belong there. The genera *Parapontoparta* and *Thalassocypria* need to be redescribed to establish their affinities with other genera and particularly with *Paracypria*.
One could raise the question why a new genus is necessary in a subfamily where there is so much taxonomical confusion. MADDOCKS (1992, p. 2) already argued that a conservative strategy for the present, should be "to forego new taxa until substantially more evidence is available", and MCKENZIE (1982, p; 417), when discussing problems in the Paracypridini, a tribe where the taxonomical *imbroglio* is even greater than in the Thalassocypridini, underlined that between closely related genera "homeomorphic confusion can only be avoided by looking for the apomorphic details in valves and soft parts which distinguish them from each other". The new genus described here is based on new material, and on comparison with type specimens of some thalassocypidine species. From this detailed comparison it appeared that it shows a unique set of characters, warranting the creation of a new genus.

DIFFERENTIAL DIAGNOSIS

The new genus *Mangalocypria* is characterised by thin-shelled, fragile, translucent and smooth valves, with broadly and regularly rounded anterior and posterior margins; copulatory appendage with three distal lobes; V-process of lower lip developed as a rake; postero-distal claw of furca fixed to the shaft without a joint.
The combination of these characters has not been seen elsewhere in the Thalassocypridini. The rounded shape of the valves is reminiscent of some *Mungava*-species. The genus *Mungava*, however, differs in many aspects, both of the valves and the appendages (see WOUTERS, 1987, MADDOCKS, 1992).
The most important characteristic of the new genus is in the structure of the lower lip. In *Mangalocypria* gen. nov., the V-process is developed as a rake, giving the lower lip the appearance of a double rake. This feature is unique, has not yet been observed in other genera of the tribe Thalassocypridini, and not even in other ostracod (sub-)families. In *Parapontoparta* and *Paracypria*, the two thalassocypridine genera that are closest to *Mangalocypria*, the V-process is a blunt, relatively short extremity, without the development of a rake. For this purpose, I compared the type specimen of *Parapontoparta arcuata* HARTMANN, 1955 (Z.I.M., n° 27455), and different species of the genus *Paracypria*, including paratypes of *Paracypria inujimensis* (OKUBO, 1980) nov. comb. (described as *Thalassocypria*) in the collections of the Royal Belgian Institute of Natural Sciences, Brussels.
Another remarkable feature is the presence of a fixed postero-dorsal furcal claw. This has, until now, not yet been observed in any other cypridacean ostracod. Comparison with species in *Paracypria* and *Parapontoparta* revealed that in these genera the postero-distal claw is not fixed, but attached to the furca by means of a joint. Although this may seem to be an unimportant character, it is interesting to note that all three species here referred to the new genus, clearly shear this feature as a synapomorphy.
This illustrates that detailed analysis of the soft parts can reveal new features, which are useful in unravelling complex taxonomical relationships. The complete description and/or figuration of valve and soft part characters therefore should be standard procedure when dealing with new taxa, even when at the time of description certain features do not seem particularly



Figs 45-50 and 57. *Mangalocypria appendix* gen. et sp. nov. 45-48 from the type locality, Sisimangun (Papua N.G.); 49, 50 and 57 from River Boroi (Papua N.G.).

45. Left valve, male, lateral view, holotype (O.C. 2176). 46. Right valve, male, lateral view, paratype (O.C. 2180). 47. Left valve, female, lateral view, paratype (O.C. 2182). 48. Right valve, female, lateral view, paratype (O.C. 2182). 49. Right valve, male, internal view (O.C. 2183). 50. Left valve, male, internal view (O.C. 2183). 57. Carapace, male, dorsal view (left = anterior)(O.C. 2187).

Figs 51-56 and 58. *Mangalocypria africana* (HARTMANN, 1974). 51-56 from the Comoros, Grande Comore, Lac Salé, S. of Mitsiamouli. 58 from Indonesia, Sulawesi, Panikiang Island.

51. Left valve, male, lateral view (O.C. 2198). 52. Right valve, male, lateral view (O.C. 2198). 53. Left valve, female, lateral view (O.C. 2199). 54. Right valve, female, lateral view (O.C. 2199). 55. Right valve, male, internal view (O.C. 2202). 56. Left valve, male, internal view (O.C. 2202). 58. Carapace, male, dorsal view (left = anterior) (O.C. 2208).

relevant. They may become important later, when new evidence is available.

THE PREMATURE ZENKER ORGAN

In the material of *Mangalocypria appendix*, two types of Zenker organ are present, namely with and without spines on the rosettes. The absence of spines is interpreted as an indication of the premature state of the specimen in question. This is not the first time that Zenker organs without spines were observed. SARS (1898) already described and figured them in *Megalocypris princeps*, and used this as diagnostic character for the genus. He was herein followed by MCKENZIE (1982), who also described the incompletely differentiated Zenker organ of a subadult male as typical for *Megalocypris*. ROME (1962) described and illustrated a Zenker organ "sans rosettes de chitine" for *Hypselecypris wittei*, and used it as a diagnostic feature for the genus *Hypselecypris*. MARTENS (1986) clearly established that the absence of spines on the Zenker organ is characteristic for subadult males, and should not be used as diagnostic feature. In an almost simultaneous paper, MARTENS *et al.* (1986), following SPASKII & KOVALENKO (1978), distinguished three second-order stages in the ontogeny of the ostracod adult stage, namely the premature, the mature and the postmature stage. Male specimens without spines on the Zenker organ can therefore more adequately be called premature. Zenker organs without spines were also described by HARTMANN (1955) in *Parapontoparta arcuata* and by MADDOCKS & STEINECK (1987) in *Parapontoparta spicacarens*. In both instances, the absence of spines was used as a diagnostic feature for the genus *Parapontoparta*. The same phenomenon was somewhat later also observed by MARTENS (1992) in the holotype of the candonid species *Namibcypris costata*. The shape and morphology of the Zenker organ might indicate here that this specimen is in the subadult (= premature) stage, although the degree of calcification of the valves and the condition of all other appendages made him believe that the specimen is a full grown adult. In new material of *Paracypria inujimensis* (OKUBO, 1980) I observed some specimens with Zenker organs without spines occurring together with numerous specimens with fully developed Zenker organs. It can be concluded that incompletely differentiated Zenker organs occur in different genera, belonging to different families. In many instances Zenker organs with and without spines are found together in the same sample. The presence or absence of spines on the rosettes therefore has no diagnostic value, but is only an indication of the ontogenetic state of an individual ostracod specimen. Confusion can be avoided by dissecting long series of specimens.

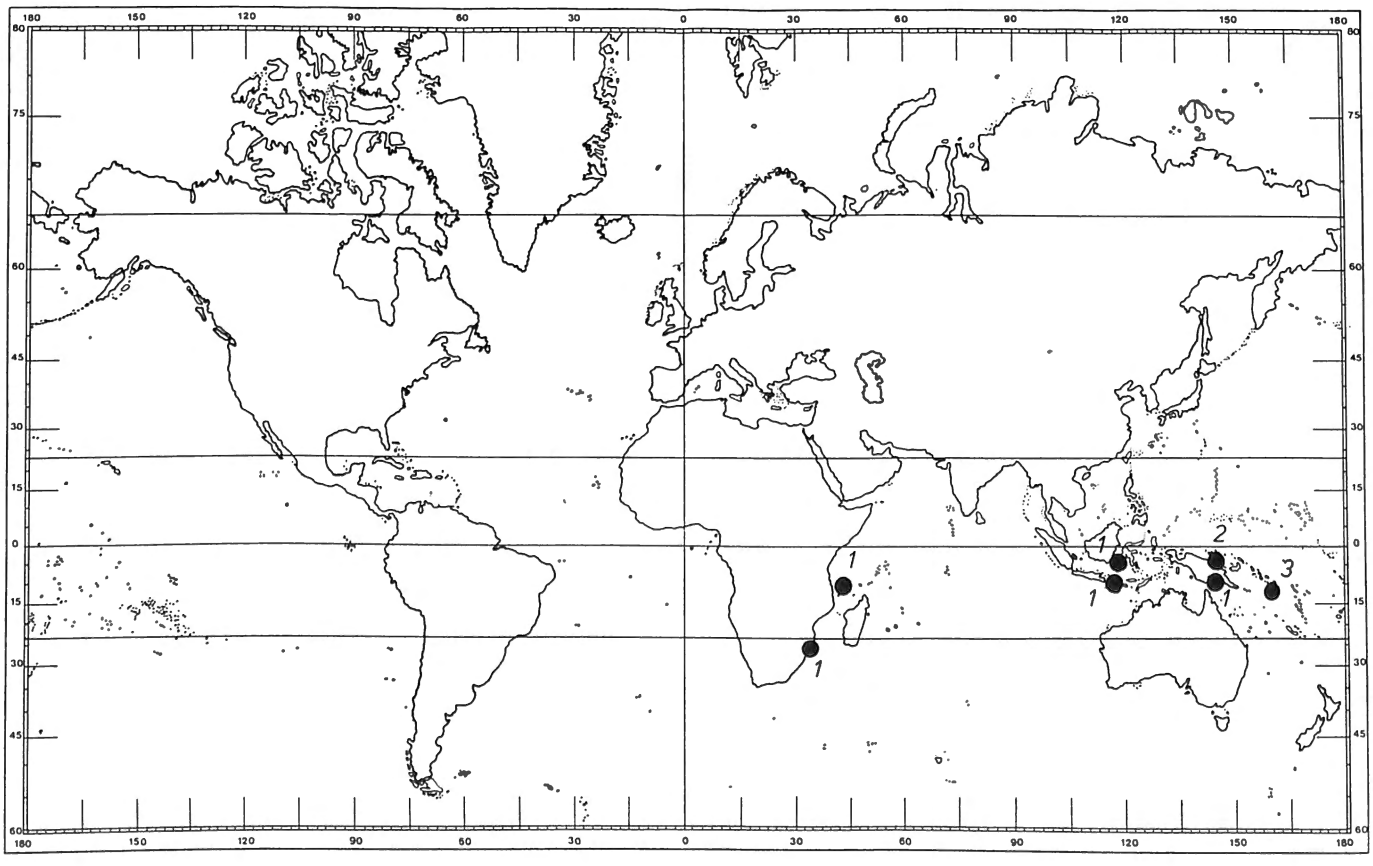


Fig. 59. Distribution of *Mangalocypria*-species. 1. *M. africana*, 2. *M. appendix* and 3. *M. eleotridis*.

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