

METACRANGONYX ORTALI, N. SP., A NEW SUBTERRANEAN
MEMBER OF THE FAMILY CRANGONYCTIDAE
FROM DEAD SEA REGION

(CONTRIBUTION TO THE KNOWLEDGE
OF THE AMPHIPODA 178)

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A b s t r a c t

The new subterranean species, *Metacrangonyx ortali*, n. sp. (*Amphipoda Gammaridea*, fam. *Crangonyctidae*) is described and figured from the subterranean salt waters of Enot Qane, along the western coasts of Dead Sea. The taxonomic status of this species and that of genera *Metacrangonyx* Chevr. 1909, *Afrocrangonyx* G. Kar. 1981 and *Pygocrangonyx* G. Kar. & J. Barnard 1979 and discussed.

I z v o d

METACRANGONYX ORTALI, N. SP., NOVI PODZEMNI ČLAN IZ
FAMILIJE CRANGONYCTIDAE IZ REGIONA MRTVOG MORA
(178. PRILOG POZNAVANJU AMPHIPODA)

Nova podzemna vrsta, *Metacrangonyx ortali*, n. sp. (*Amphipoda Gammaridea*, fam. *Crangonyctidae*) je opisana i nacrtana iz podzemnih slanah voda kod Enot Qane, na zapadnoj obali Mrtvog mora. Analiziran je taksonomski status ove vrste, kao i rodova *Metacrangonyx* Chevr. 1909, *Afrocrangonyx* G. Kar. 1981. i *Pygocrangonyx* G. Kar. et J. Barnard 1979.

INTRODUCTION

The *Metacrangonyx* Complex of genera (*Amphipoda Gammaridea*, fam. *Crangonyctidae*) including genera *Metacrangonyx* Chevr. 1909, *Pygocrangonyx* G. Kar. & J. Barnard 1979, *Afro-*

crangonyx G. Kar. 1981 and *Longipodacrangonyx* Boutin & Mes-souli 1988 was known from the subterranean fresh and salt waters of North Africa and some adjacent islands of Atlantic and Mediterranean Sea, and towards east till desert of Sinai.

The recent expedition of the scientists from Israel along the coasts of Dead Sea, collected *Amphipoda*, including the specimens of this group in the Enot Qane (western coast of Dead Sea), what extended the areal of distribution of this complex more far to the north-east. The scientists from the Hebrew University in Jerusalem (Dr. D. Por, Dr. H. Bromley, Dr. C. Dimentman, Dr. G. Müller, Dr. R. Ortal) gave me very kindly the collected samples of *Amphipoda* from that expedition at disposition for study, among them the specimens of one new species, described and presented in this work under the name of *Metacrangonyx ortali*, n. sp.

Acknowledgments: I am thankful to Dr. Reuven Ortal, Dr. Heather Bromley and Dr. G. Müller from the Hebrew University of Jerusalem for the loan of material used in this study.

TAXONOMIC PROBLEMS OF METACRANGONYX — COMPLEX

Chevreaux (1909) established a new genus *Metacrangonyx* with a type species *M. longipes* Chevreaux 1909 from Baleares (Mallorca Island). Later, several other species of this genus were discovered and described: *Metacrangonyx remyi* Balazuc & Ruffo 1953 from Ijoukak (Morocco); *Metacrangonyx panousei* Ruffo 1953 from Igma (Morocco); *M. longicaudus* Ruffo 1954 from Oued Gheris (Morocco); *M. spinicaudatus* G. Karaman & Pesce 1980 from Sydi El Aydi (Morocco) and *M. sinaicus* Ruffo 1982 from Beer Gideih in Sinai Desert.

G. Karaman and J. L. Barnard (1979) removed *M. remyi* Bal. & Ruffo 1953 to the monotypic new genus *Pygocrangonyx* G. Kar. & J. L. Barnard 1979, based on absence of inner ramus of uropod 3, unlobed segment 2 of pereopods 5-7, etc.

G. Karaman (1981) removed the species *M. spinicaudatus* G. Kar. & Pesce 1980, *M. longicaudus* Ruffo 1954 and *M. panousei* Ruffo 1953 from genus *Metacrangonyx* to the new genus *Afrocragonyx* G. Kar. 1981 (type species: *M. spinicaudatus* G. Kar. & Pesce 1980) based on short telson (twice broader than long), by different shape of coxa 3 (small) and by short, 2-segmented mandibular palp.

Ruffo (1982) described a new species *Metacrangonyx sinaicus*, n. sp. from Beer Gideih and Beer Zureir in Sinai Desert. Because of presence of mandibular palp consisting of 2-3 articles (transitive character between genera *Metacrangonyx* and *Afrocra-*

gonyx), Ruffo fused genera *Metacrangonyx* and *Afrocrangonyx* together, although all other taxonomic characters of *M. sinaicus* agree with these of genus *Afrocrangonyx* (short coxa 3, short telson and short mandibula palp).

Boutin and Messouli (1988) followed Ruffo in synonymizing *Afrocrangonyx* with *Metacrangonyx*, and they described other new genus *Longipodacrangonyx* n. gen. (t. sp. *P. maroccanus*, n. sp.) from Morocco.

Stock and Rondé-Broekhuizen (1986) described a new species *Pygocrangonyx repens* n. sp. from the Fuerteventura Island (eastern Canary Islands), one species differing remarkably from *P. remyi* by large coxa 3, strongly lobate segment 2 of pereopod 5-7, poorly spiniferous uropod 3, narrow labrum, etc.

Based on their cladogram of genera *Afrocrangonyx* and *Metacrangonyx*, they mentioned that cladogram »seems to confirm Ruffo's and Boutin-Messouli's opinion that genus *Afrocrangonyx* is a poorly characterized unit«. Unfortunately, in that cladogram there were not included some of very important taxonomic characters, such as shape of coxa 3, shape of pereopods 5-7, shape of epimeral plates 1-3, presence or absence of ventrofacial spine on peduncle of uropod 1, etc., what should put some more different light on the relations between various species of *Metacrangonyx* Complex of taxa.

Based on current generic taxonomic criteria, presence or absence of inner ramus of uropod 3 is a good generic taxonomic character; based on it, within the *Metacrangonyx*-Complex (*Longipodacrangonyx* excluded), it is possible to divide all taxa in two groups: one group with developed inner ramus of uropod 3 (*Metacrangonyx* — Group) and other group without inner ramus of uropod 3 (*Pygocrangonyx* — Group).

Within the *Metacrangonyx* — Group (genera *Metacrangonyx* and *Afrocrangonyx*), one very large heterogeneity of important taxonomic characters exists (short to long coxa 3, various shape of labrum, various length of mandibular palp and number of its articles, symmetrical or asymmetrical palps of maxilla 1, shape and armature of uropod 3, etc.).

The type species of genus *Metacrangonyx* (*M. longipes* Chevreux 1909) differs clearly from the type species of genus *Afrocrangonyx*, *M. spinicaudatus* (G. Kar. and Pesce 1980) by long coxa 3, by long setose telson and long, 3-articulate mandibular palp reaching tip of mandible (short in *A. spinicaudatus*).

Other known taxa of genus *Afrocrangonyx*: *panousei* (Ruffo 1953), *longicaudus* (Ruffo 1954), *sinaicus* (Ruffo 1982), and *ortali*, n. sp., show also different various shape of coxa 3, mandibular

palp (shape and various number of palpar articles), various number of articles in accessory flagellum, symmetrical or asymmetrical palps of maxilla 1, shape of labrum, etc.

To avoid further misunderstandings, we mentioned a new species *ortali* under the formerly described genus *Metacrangonyx*; but, one detailed reexamination of *M. longipes* and all known taxa of genus *Afrocrangonyx* will show the real taxonomic relations between the genera *Metacrangonyx* and *Afrocrangonyx*, and it will confirm or deny the necessity of fusion of these two genera together. Especially, because it is to expect the discovery of many other new taxa of this group over North Africa and adjacent areals in the future.

Within the genus *Pygocrangonyx* — Complex: *remyi* (Balazuc & Ruffo 1953), *repens* Stock & Ronde-Broek. 1986, it is possible to observe also the large diversity of taxonomic characters: lobed or unlobed article 2 of pereopods 5-7, narrow labrum, short to large coxa 3, various shape and armature of uropod 3, various shape and number of palpar article in mandible, telson, etc.

But, as only two species of this complex are known (and probably other taxa should be discovered in the future), we didn't try to divide them into two different genera.

But, so large diversity of taxonomic characters within the *Metacrangonyx* and *Pygocrangonyx* groups, show that this complex is, consisting of numerous units of the same origin, but going in different evolutionary directions. In this light, it is possible to fuse all units into one large taxonomic category (genus) with very large limits of the variability, often exceeding the normal generic levels; another possibility is to divide these units into small different genera or subgenera, like these within the *Echinogammarus* — *Neogammarus* — *Sarothrogammarus* Complex of genera in the family *Gammaridae* (G. Karaman 1977a, 1977b; Stock 1971).

We consider still premature to create new subgenera and / or genera for these small units till discovery of other new taxa of this complex and detailed analyses of their taxonomic characters. On the other hand, we can not exclude the possibility that just the discovery of new taxa of this group of genera will show full transition between genera and, consequently, the fusion of some of them together.

METACRANGONYX ORTALI, N. SP.

figs.: 1-6

Material examined: WESTERN COAST OF DEAD SEA: Enot Qane, underground brackish salt stream, 19 km. N. of En Gedi, April 15, 1987, cca 23 spec. accompanied by *Bogidiellidae* gen. sp. (leg. R. Ortal and G. Müller).

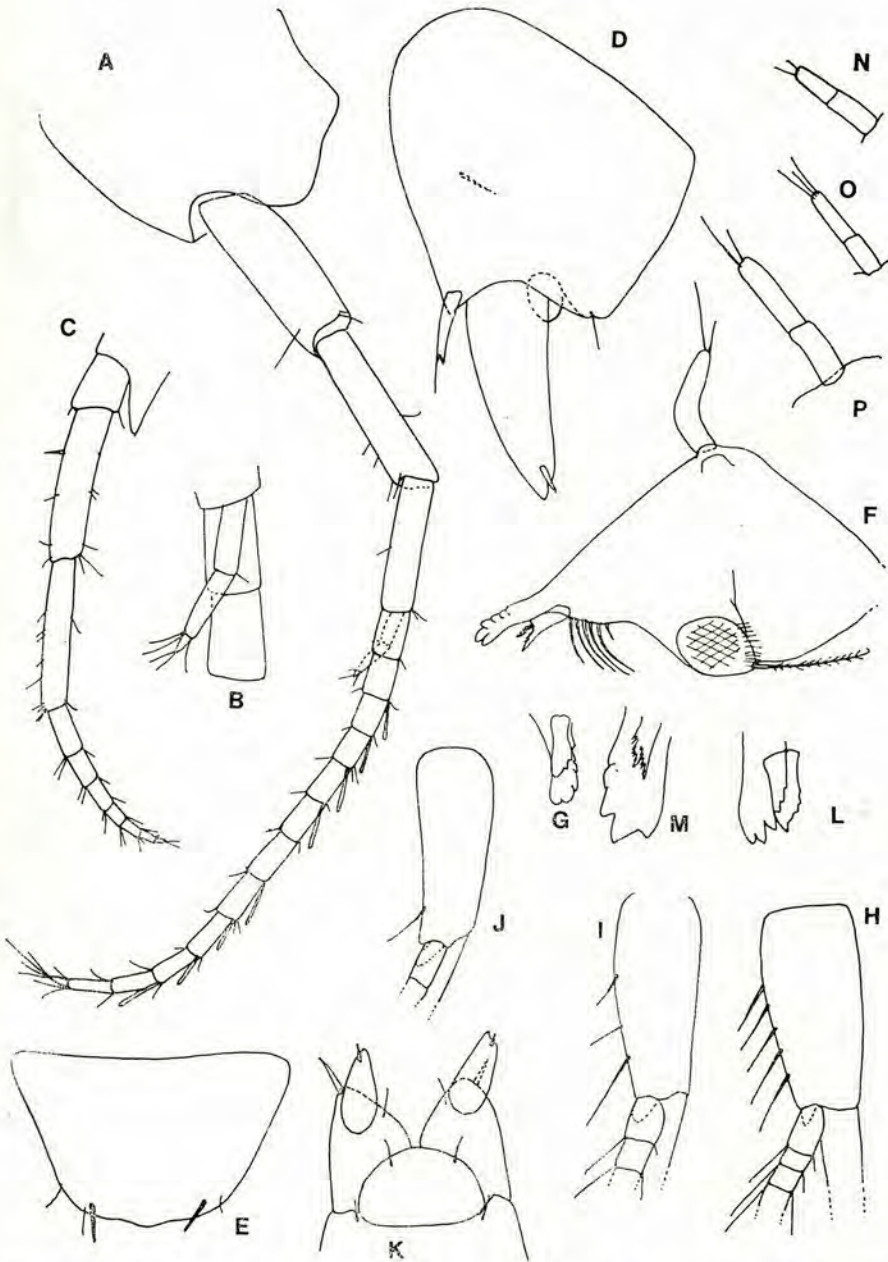


Fig. 1. *Metacrangonyx ortali*, n. sp., Enot Qane, female 3 mm: A = head with antenna 1; B = accessory flagellum; C = antenna 2; D = uropod 3; E = right mandible; G = tip of left mandible; H-J = pleopods 1-3; K = telson and uropods 3, male 2.9 mm; L-M = tip of left and right mandible, male 2.9 mm; N-O = left and right mandibular palp, male 2.9 mm; P = mandibular palp, male 2.7 mm.

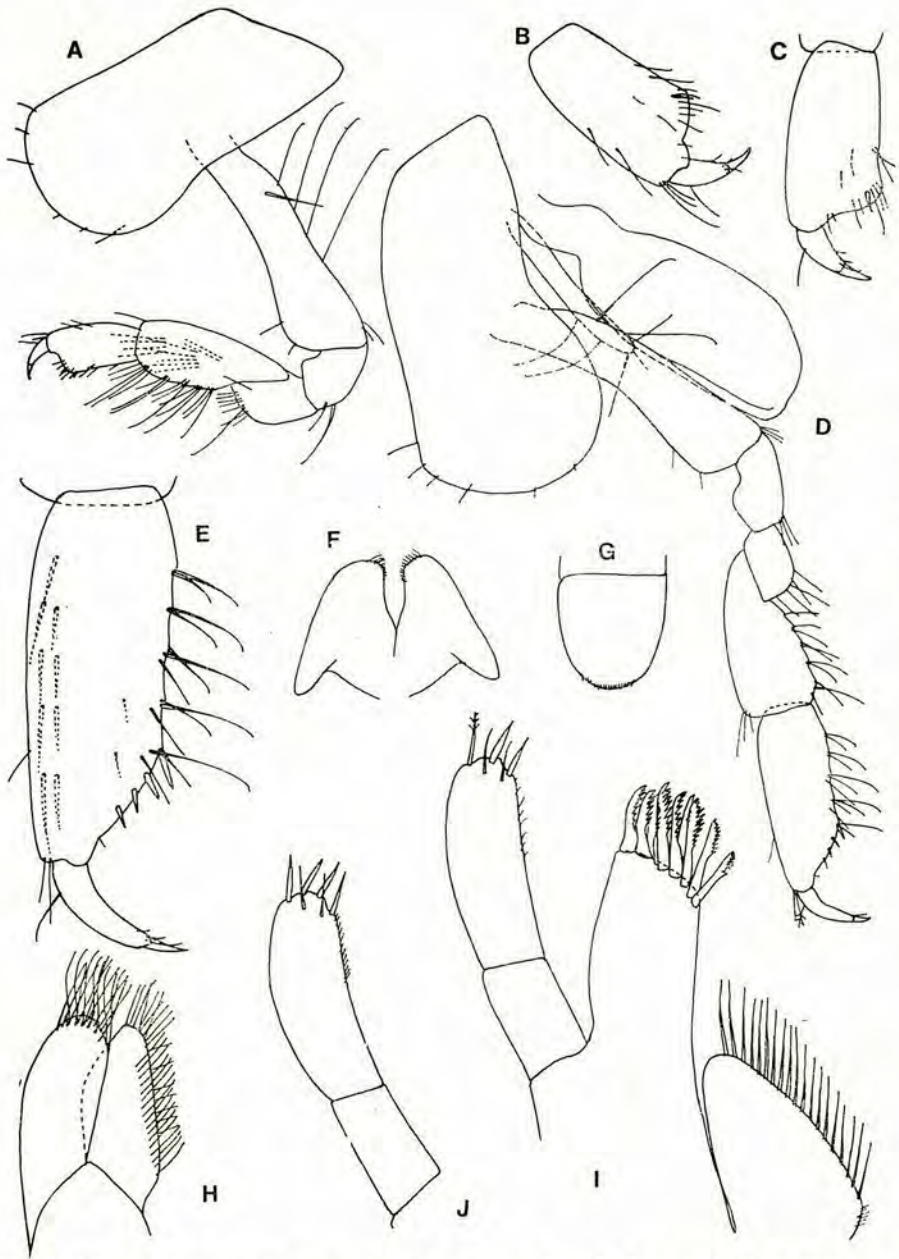


Fig. 2. *Metacrangonyx ortali*, n. sp., Enot Qane, female 3 mm: A-C = gnathopod 1; D-E = gnathopod 2; F = labium; G = labrum; H = maxilla 2; I-J = left and right maxilla 1.

Description: Female of up to 3 mm with setose oostegites: Body stout, smooth, metasomites on each side with 0-1 dorsolateral marginal seta (fig. 5 A); urosomites 1-3 on each side with 1 short seta, often these setae can be broken and invisible (fig. 3 E).

Head with short rostrum, lateral cephalic lobes well developed, subrounded (fig. 1 A), ventroanterior sinus poorly developed, but present (fig. 1 A), eyes absent.

Antenna 1 reaching nearly up to $2/5$ of body-length; peduncular segments 1-2 nearly subequal long, peduncular segment 3 slightly shorter (fig. 1 A), all poorly setose; main flagellum consisting of up to 13 articles, most of them with one aesthetasc nearly as long as the articles themselves (fig. 1 A); accessory flagellum 3-segmented, exceeding half of third peduncular segment (fig. 1 B).

Antenna 2 short, peduncular segment 3 short (fig. 1 C), peduncular segments 4-5 subequal, poorly setose (peduncular segment 4 often with one dorsal spine); flagellum shorter than peduncle, consisting of 7 articles. Antennal gland cone long, slightly exceeding tip of third peduncular segment, straight (fig. 1 C).

Labrum nearly as long as broad, or slightly longer (fig. 2 G), entire. Labium without inner lobes, outer lobes entire (fig. 2 F).

Mandible strong, with triturative molar: left mandible with short distal seta near molar, incisor with 4-6 teeth, lacinia mobilis with 4-5 teeth (fig. 1 G, L); right mandible with molar bearing long seta, incisor with 5-6 teeth, lacinia mobilis bifurcate, pluri-toothed (fig. 1 F, M); palp feeble, short, consisting of 2, rarely only 1 segment, bearing 2-3 distal setae (fig. 1 F, N, O, P); number of rakers is 5-8.

Maxilla 1: inner plate triangular, with row of distolateral plumose setae (fig. 2 I), outer plate with 11 spines bearing up to 13 lateral teeth each (fig. 2 I); palp of left and right maxilla 1 subequal, 2-segmented, narrow, often right palp with one spine more than left palp (fig. 2 I, J).

Maxilla 2 narrow, inner plate with oblique row of facial setae as well as with lateral and distal marginal setae (fig. 2 H).

Maxilliped: inner plate long, much exceeding outer tip of first palp segment, bearing 3 distal spines and setae (fig. 5 B), outer plate reaching $2/3$ to $3/4$ of second palp segment, with row of distolateral smooth spines (fig. 5 B), palp segment 3 unlobed, segment 4 along inner margin of pedestal with 3-4 setae, nail much shorter than pedestal (fig. 5 B).

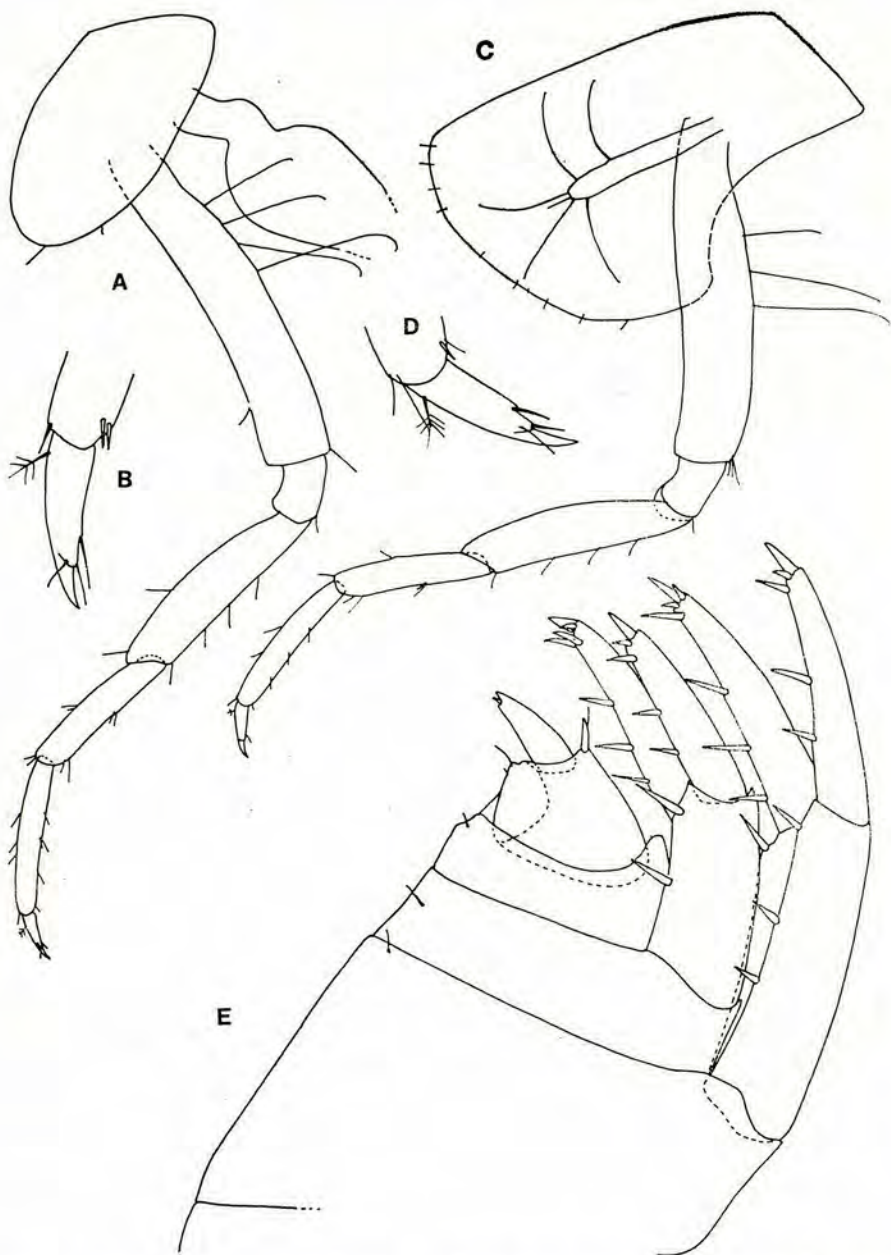


Fig. 3. *Metacrangonyx ortali*, n. sp., Enot Qane, female 3 mm: A-B = pereopod 3; C-D = pereopod 4; E = urosome with uropods 1-3.

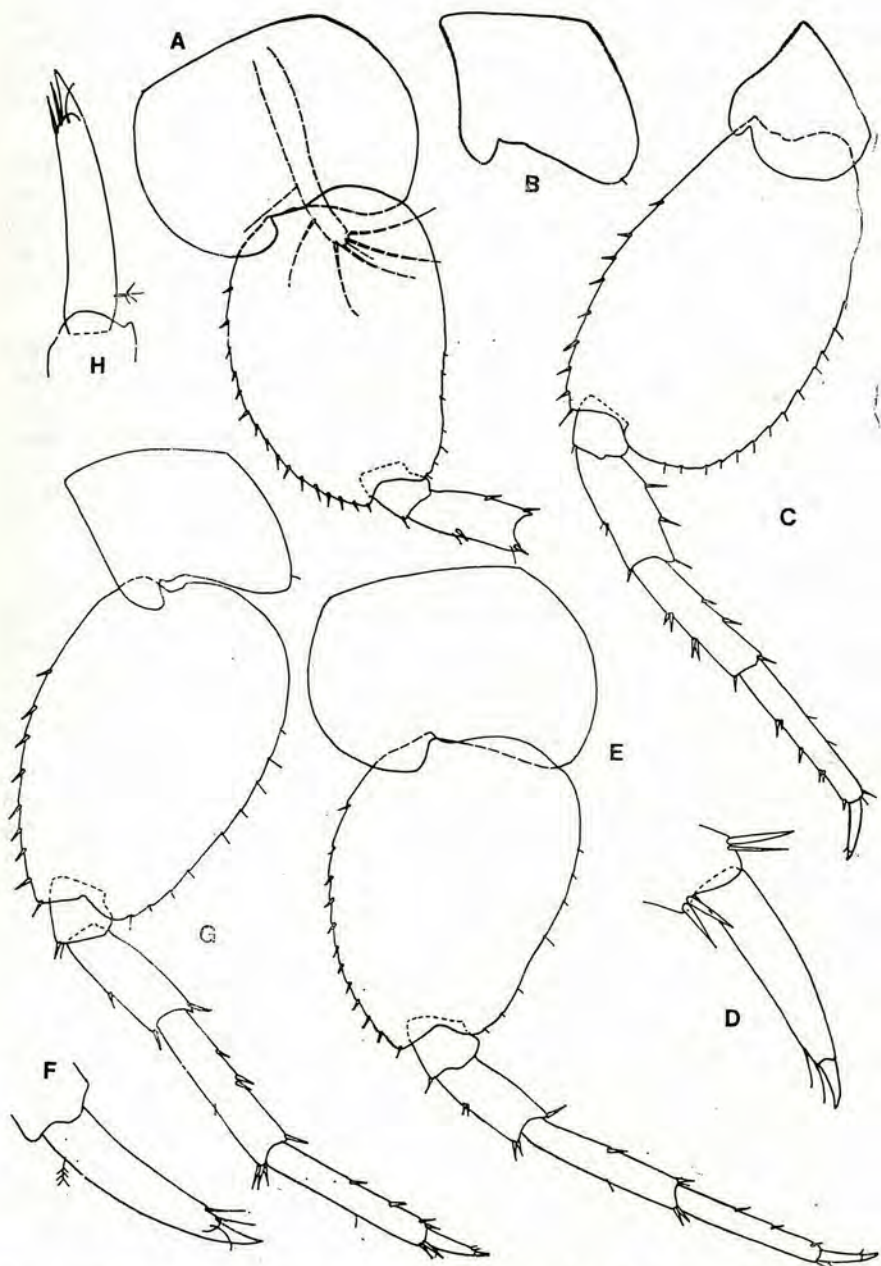


Fig. 4. *Metacrangonyx ortali*, n. sp., Enot Qane, female 3 mm: A = pereopod 5; B = coxa 6; C-D = pereopod 7; E-F = pereopod 5, female 2.9 mm; G-H = pereopod 6, female 2.9 mm.

Coxae 1-2 remarkably longer than broad, weakly dilated distally, bearing marginal setae (fig. 2 A, D); coxa 3 much shorter than 2 or 4, ovoid, tapering distally, with 1-2 marginal setae only (fig. 3 A); coxa 4 is the largest coxa, with well developed ventroposterior lobe (fig. 3 C).

Coxa 5 is remarkably shorter (lower) than 4, but broader than long (high), anterior lobe is much smaller than posterior one, posterior lobe is subrounded (fig. 4 A, E). Coxa 6 is remarkably smaller than 5, with posterior lobe much larger than anterior one, and with marked ventroposterior small tooth or seta (fig. 4 B, G). Coxa 7 is also bilobe, anterior lobe is small (fig. 4 C).

Gnathopods 1-2 subchelate, gnathopod 2 remarkably larger than 1. Gnathopod 1: segment 2 elongated, with row of 4 long posterior marginal setae; segments 3-4 short; segment 5 is longer than 6, with several groups of setae along posterior margin; segment 6 small, almost twice longer than broad, with parallel lateral margins (fig. 2 A, B, C); palm almost transverse or poorly oblique, bearing single setae and spines, dactyl reaching posterior margin of segment 6, with 1 seta at outer margin (fig. 2 B, C).

Gnathopod 2: segment 2 dilated distally, segments 3-4 short; segment 5 almost as long as 6, with row of groups of setae along posterior margin (fig. 2 D); segment 6 more narrow than 5, much longer than broad, with parallel lateral margins and with 5 groups of setae along posterior margin; palm oblique, short, with 4 palmar spines and setae (fig. 2 E), dactyl reaching posterior margin of segment 6, with 1 seta at outer margin.

Pereopods 3-4 subequal to each other, with segments 5-6 subequal long (fig. 3 A, C); dactyl short and stout, reaching nearly 1/3 of segment 6, with 2 setae along inner margin and 1 plumose seta at outer margin (fig. 3 B, D), nail short and stout.

Pereopods 5-7 relatively short, segments 3-6 not dilated, dactyl short and stout, with 2 setae at inner margin and 1 plumose seta at outer margin (fig. 4 C, D, E, F, G, H). Segment 2 of pereopods 5-6 slightly longer than broad, ovoid, with strongly convex anterior margin bearing 9-12 marginal spines (fig. 4 A, E, G), posterior margin of segment 2 of pereopod 5 weakly concave in the middle, that of pereopod 6 convex (fig. 4 A, E, G).

Segment 2 of pereopod 7 ovoid, slightly broader distally than proximally (fig. 4 C), anterior margin convex and provided with row of spines, posterior margin strongly convex, with row of short setae and with well developed ventroposterior short and broad lobe not exceeding distal tip of article 3 (fig. 4 C).

Pleopods 1-3 well developed, peduncle with 2 retinacula each, without any additional seta near them. Peduncle of pleopod 1

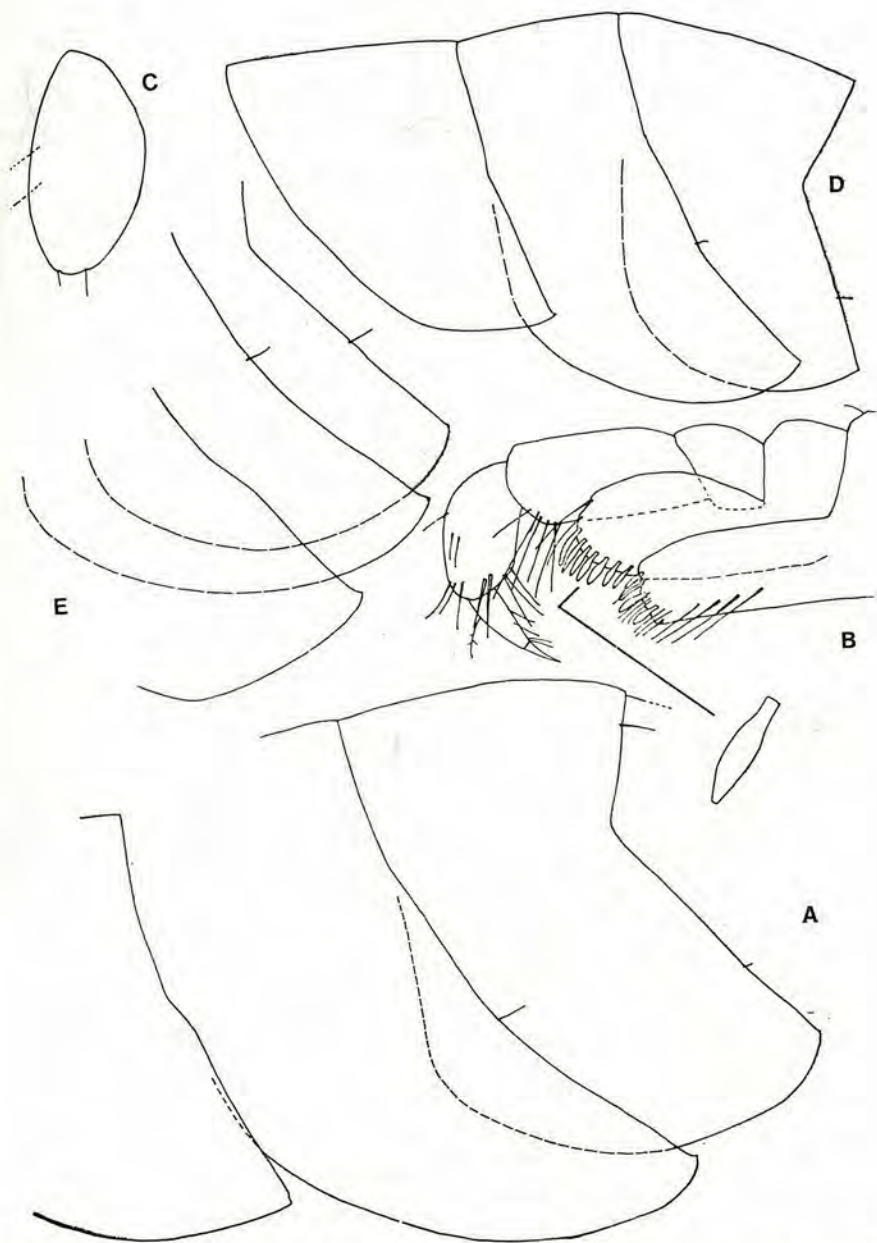


Fig. 5. *Metacrangonyx ortali*, n. sp., Enot Qane, female 3 mm: A = epimeral plates 1-3; B = maxilliped; C = coxa 3, male 2.9 mm; D = epimeral plates 1-3, male 2.9 mm; E = epimeral plates 1-3, male 2.7 mm.

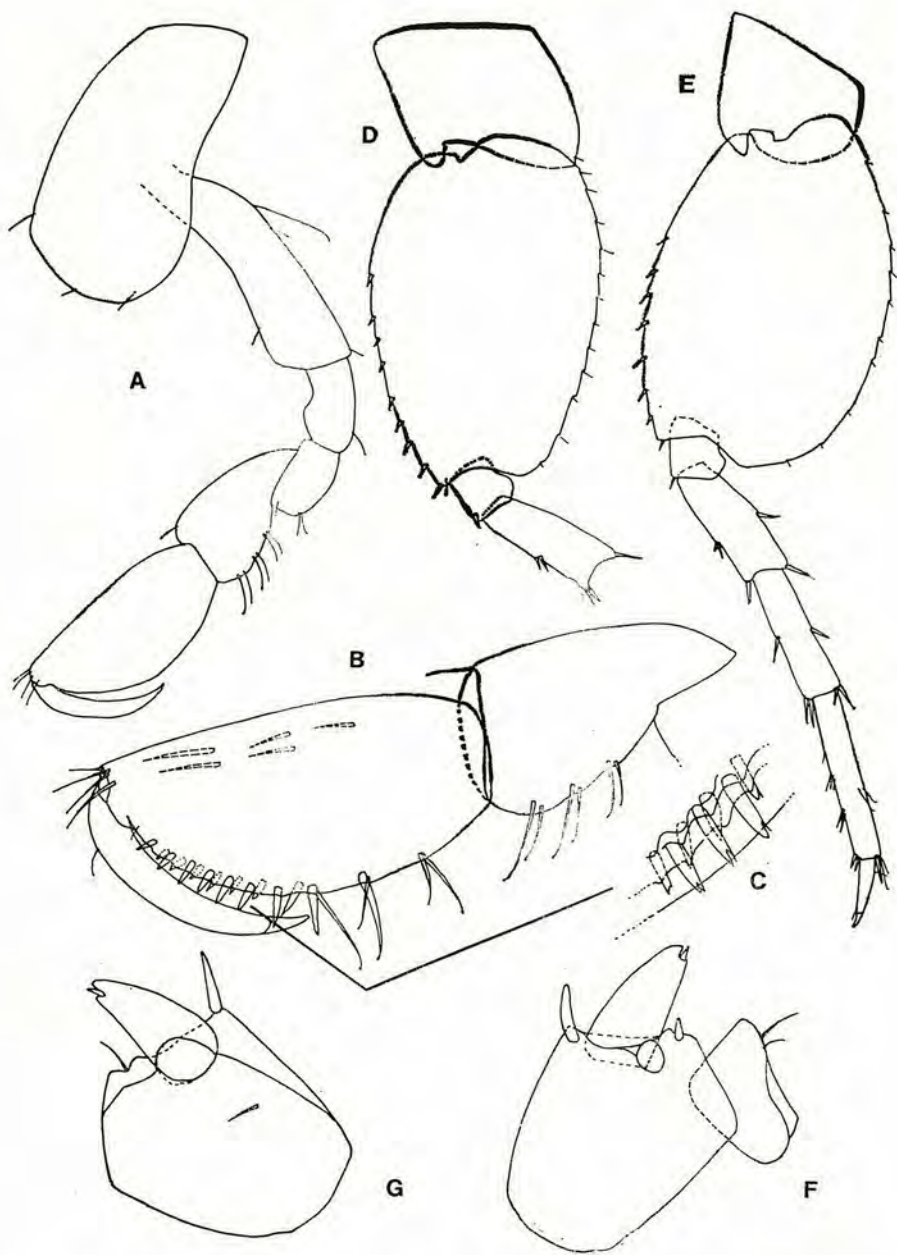


Fig. 6. *Metacrangonyx ortali*, n. sp., Enot Qane, male 2.9 mm: A-C = gnathopod 2; D = pereopod 6; E = pereopod 7; F = uropod 3 and telson; G = telson, female 2.9 mm.

along lateral margin with up to 5 setae (fig. 1 H), than of pleopod 2 with up to 3 setae (fig. 1 I), that of pleopod 3 with 1 seta (fig. 1 J); rami plurisegmented, normal.

Epimeral plates 1-3 subacute, with straight or concave posterior margin (fig. 5 A), epimeral plates 2-3 strongly produced posteroventrally, especially epimeral plate 2 (fig. 5 A).

Urosomite 1 near basis of peduncle of uropod 1 without any spine (fig. 3 E). Uropod 1: peduncle without ventrofacial spine, dorsoexternal row of 3 spines is present, dorsointernal row of spines absent (except distal spine) (fig. 3 E); rami stout, subequal or inner ramus is hardly longer than outer one, both rami shorter than peduncle, each with 2 strong lateral and 3-4 distal short spines.

Uropod 2: rami nearly subequal long or inner ramus hardly longer than outer one, with distal and lateral spines (fig. 3 E).

Uropod 3 short, peduncle broad, laterally compressed, with one distal spine and distal seta; spine is much shorter than peduncle (fig. 1 D). Inner ramus very small, circular; outer ramus 1-segmented, nearly as long as peduncle, with 1 subdistal short spine (fig. 1 D).

Telson fleshy, broader than long, entire, with 2 distal stronger setae often accompanied by 1-2 slender short setae (fig. 1 E).

Coxal gills simple, ovoid, with narrow peduncle. Oostegites narrow, with marginal setae (fig. 3 A, C).

Male 2.9 mm: Very similar to the females except gnathopod 2 (fig. 6 D, E). Gnathopod 2: segment 5 slightly shorter than 6 (fig. 6 B); segment 6 large, ovoid, palm strongly oblique nearly to the half of posterior margin of segment 6, provided with row of marginal external and internal strong spines (fig. 6 B, C); dactyl recurved, slender, with 1 seta at outer margin, nail short (fig. 6 B).

Telson like that in females, on peduncle sometimes the seta can be replaced with second spine (fig. 6 F, G). All other taxonomic characters are within the variability of the females also.

Variability. The setae on dorsolateral margin of metasomites and urosomites 1-2 can be often absent (broken or undeveloped?). The number of setae on telson is variable also (3-5). Mandibular palp is 2-segmented, rarely only 1-segmented (fig. 1 F, N, O, P). The number of the teeth on mandibular incisor and lacinia mobilis seems to be also rather variable. Ventroposterior corner of epimeral plates 1-3 can be more or less pointed (fig. 5 A, D, E); segment 2 of pereopods 6-7 can be more or less broad (fig. 4 C, G; 6 D, E).

Holotype: Female 3 mm.

Distribution: Known only from type-locality.

Derivatio nominis: This species is dedicated to Dr. Reuven Ortal from the Hebrew University of Jerusalem who collected that species.

Remarks and Affinities: *Metacrangonyx ortali*, new species, is very allied to the species *Metacrangonyx sinaicus* Ruffo 1982, described and known from the desert of Sinai (Beer Gideih in Wadi Watir; Beer Zureir SW. of Eilat) by several characteristics: 3-segmented accessory flagellum, shape of gnathopods 1-2, general shape of coxae, pereopods and uropods 1-3, short telson.

But, *Metacrangonyx sinaicus* Ruffo, differs clearly from *M. ortali*, n. sp. by: presence of ventrofacial spine on peduncle of uropod 1, by slightly stouter uropods 1-2, by uropod 3 peduncle bearing 2 distal spines and outer ramus is much shorter, reaching only 1/3-1/4 of peduncle-length and provided with 1 strong distal spine as long as ramus itself; by slightly lower coxae, by different shape of segment 2 of pereopods 5-7 bearing lower number of anterior marginal spines; by slightly more narrow tip of coxa 3; by longer and more slender dactyl of pereopods 3-7, by 2-3 segmented mandibular palp; by convex posterior margin of epimeral plates 3 and by more setose telson.

The species: *spinicaudatus* (G. Kar. & Pesce 1980) and *panousei* Ruffo 1953, both known from Morocco, differ distinctly from *M. ortali* by presence of ventrofacial spine on peduncle of uropod 1 and by several other characters.

M. longicaudus Ruffo 1954, known from Morocco also, seems to be without ventrofacial spine on peduncle of uropod 1 (based on figure of Ruffo, 1954), but this species differs clearly from *M. ortali* by extremely elongated antennal gland cone on antenna 2, by 4-segmented accessory flagellum, etc.

KEY TO THE METACRANGONYX- AFROCRANGONYX SPECIES

1. Mandibular palp long, nearly reaching tip of mandible; telson long
LONGIPES
- Mandibular palp short, never reaching tip of mandible; telson shorter 2
2. Antennal gland cone elongated, twice longer than third peduncular segment of antenna 2
LONGICAUDUS
- Antennal gland cone short, as long as or only slightly (1/2) longer than third peduncular segment of antenna 2 3

3. Peduncle of uropod 1 without ventrofacial spine
 ORTALI
- Peduncle of uropod 1 with ventrofacial spine 4
4. Telson with distal setae only PANOUSEI
- Telson with 2 long distal spines SPINICAUDATUS

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