A new genus and species of “goneplacid-like” brachyuran crab
(Crustacea: Decapoda) from the Gulf of California, Mexico,
and a proposal for the use of the family
Pseudorhomblilidae Alcock, 1900

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Abstract.—A new genus and species of crab, Bathyrhombila furca, are
described from localities in the Gulf of California, western coast of Mexico.
The new genus is close to Pseudorhomblila H. Milne Edwards and belongs to
a group of three genera tentatively assigned to the subfamily Pseudorhomblilidae
Alcock, 1900 by Guinot in 1969. The affinity of Bathyrhombila, new
genus, with other genera of “Goneplacidae” (Euphrosynoplax Guinot, Pseu-
dorhomblila H. Milne Edwards, Nanoplax Guinot, Oedioplax Rathbun, and Chac-
cellus Guinot) is discussed, noting that they all represent primitive transitional
forms between the cyclometopous and the catometopous abdomen-sternum
organization, and a similar “xanthoid-goneplacid” facies. On the basis of these
affinities, it is proposed that these six genera be included into the family Pseu-
dorhomblilidae Alcock, within the Heterotremata Guinot, 1977.

Resumen.—Se describe un nuevo género y una nueva especie de cangrejo,
Bathyrhombila furca, recolectado en localidades del golfo de California,
costa oeste de México. El nuevo género se parece a Pseudorhomblila H. Milne
Edwards y pertenece a un grupo de tres géneros tentativamente asignados a la
subfamilia Pseudorhomblilidae Alcock, 1900 por Guinot en 1969. Se discute la
afinidad de Bathyrhombila, nuevo género, con otros género de “Goneplacidae”
(Euphrosynoplax Guinot, Pseudorhomblila H. Milne-Edwards, Nanoplax Guin-
ot, Oedioplax Rathbun, y Chacellus Guinot), señalando que todos ellos repre-
sentan formas primitivas de transición entre la organización abdomen-esternón
cyclometopes y catometopes, y una apariencia similar de tipo “xanthoid-goneplacideo”. En base a estas afinidades, se propone que estos seis géneros
sean incluidos en la familia Pseudorhomblilidae Alcock, dentro del grupo de los

Two common and widely distributed families of brachyuran crabs, the Xanthidae
and Goneplacidae (sensu Balss 1957) have long been recognized as containing hetero-
genous groups of genera (see Guinot 1970, 1977, 1978; Serène 1984; Williams 1984;
Martin & Abele 1986). In the last twenty years, the organization of the Xanthidae
sensu Balss has been subject to many
changes. The concept of a superfamily
Xanthoidea proposed by Guinot (1978) em-
phasized the sternal position of female
openings (“sternitères”) coupled with the
coxal or coxo-sternal position of male gen-
ital openings, thus relating the Xanthoidea
with the heterotremateous arrangement (Heterotremata, as defined by Guinot 1977).
Guinot (1978) insisted on the fact that
among the Xanthoidea, two groups of fam-
ilies should be considered: one with male

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opening coxal, and another in which the male opening progressively migrates to a coxo- sternum position. In the later group, the evolutionary process is associated with a modification of the facies, which becomes goneplacid-like (Guinot 1978:266). Guinot (1978) also suggested that when all genera of Goneplacidae sensu Balss will have been reviewed, new families might be added to the second, goneplacid-like group of Xanthoidea (i.e., those genera with a coxo-sternum male openings).

A group of goneplacid-like brachyuran crabs presently included in the Goneplacidae has long been recognized as representing an intermediate step towards the transformation of the cyclometopous (heterotrematous) abdomen-sternum arrangement (male genital opening coxal; abdominal somites 1–2 covering entirely the space between the coxa of P5; sternite plate 8 entirely covered by these abdominal somites and not visible ventrally) into a catametopous arrangement (male opening sternum; sternite plates 7 and 8 widened, ventrally united and visible ventrally; abdominal segments 1–2 reduced, clearly separated from coxa of P5) (Guinot 1969a, 1978, 1979). For Guinot (1969b, 1970) this group of genera represents an evolutionary step towards the more advanced catametopous (thoracotrematous) organization in which the sternum occupies an increasingly wider area between the basal abdominal somites and the coxa of P5, and the male opening moves progressively towards a sternal position. Guinot (1970: 1076, 1080) suggested that several of these genera (i.e., Pseudorhombula H. Milne Edwards, 1837, Oedi- plax Rathbun, 1893, and possibly Nanoplax Guinot, 1967) could be integrated in the subfamily Pseudorhombulidae Alcock, 1900 pro parte.

Guinot (1969b: 721) also described the genus Chacellos Guinot, 1969b, monotypic at that time, which she considered "... [a genus with] une organisation très proche de l'organisation cyclométopienne et fait sans doute partie des Crabes formant le passage entre Cyclométopes et Catamétopes [an organization close to the cyclometopous organization and probably belonging to the crabs linking the cyclometopous to the catametopous]." A second species of Chacellos was added by Hendrickx (1989a) who, despite of a "rather xanthoid facies," included it in the Goneplacidae with a "primitive catametopous organization." Another genus, Euphrosynoplax Guinot, 1969b was also described by Guinot (1969b:720), to accommodate an undescribed species of crab from Florida: E. clausa Guinot, 1969b. Again, Guinot (1969b) emphasized the primitive catametopous stage of this genus, relatively close to the cyclometopous arrangement. A second species of Euphrosynoplax was recently described by Vázquez-Bader & Gracia (1991) from the Gulf of Mexico. Although these authors did not clearly illustrate sternite eight, they refer to a (what appears as a primitive) catametopous organization of their species. E. campechensis, with a "... male opening coxal [and] a small portion of sternite 8 not covered by the second abdominal somite."

The present paper deals with a new species of crab that present morphological similarities with those in the above cited genera. It is herein considered that this new species requires a new genus. Furthermore, the use of the family Pseudorhombulidae Alcock, 1900, is proposed for a group of six genera with a "xanthoid-goneplacid" facies representing primitive transitional forms between the cyclometopous and the catametopous abdomen-sternum organization.

Abbreviations used in this paper are: CW, carapace width; CL, carapace length; P2 to P5, pereiopods; P1 and P2, male first and second pleopods (gonopods), respectively; SEM, Scanning Electron Microscope; EMU, Estación Mazatlán UNAM, invertebrate reference collection; SIO, SCRIPPS Institution of Oceanography, invertebrates collection, La Jolla, California, U.S.A.; LACM, Los Angeles County Museum of
Natural History, Los Angeles, California, U.S.A.

Drawings were made with a camera lucida (Fig. 2). Holotype was photographed using a Kodak TMAX 100 ASA black and white film (Fig. 1), and SEM microphotographs of male gonopods were obtained using the classical technique of acetone dehydrated, gold-palladium coated gonopods extracted from type material (Fig. 3).

_Bathyrhombila_, new genus

**Diagnosis.**—Carapace 1.4 to 1.5 broader than long, anteriorly convex, slightly convex and narrower posteriorly; general shape "xanthoid". Antero-lateral margin arched, with 4 teeth, excluding the outer orbital tooth which is well-defined and slightly projecting; second and outer orbital teeth fused, forming an almost straight slightly projecting margin; length of this margin almost half the frontal width. Postero-lateral border converging posteriorly. Regions relatively well marked. Front narrow, less than ½ maximum width of carapace, slightly projecting forwards, with a shallow median depression, margin sinuous, with a well-marked notch between the external corner and the inner orbital tooth. Orbits reduced in size; eyes relatively small. Upper orbital margin slightly concave, with 2 distinct sutures; lower orbital margin with 2 strong teeth, inner one acute, outer one rounded. Antennal flagellum long, entering orbit; basal article of antenna relatively long, slightly oblique, in contact with front; a small apophyse intercalated between basal article and epistome (pterygostomian upper border); palp folding horizontally. Interantennular septum broadly triangular. Third maxillipede with menus about 0.5 times length of ischiu, antero-external angle slightly produced; palp articulating at inner distal angle of menus. Chelipeds large and robust, not markedly unequal in large males, subequal in females; carpus with a blunt, moderately large spine at inner angle; pincers very large, fingers flattened, pointed, tips recurved, gap between fingers reduced. A very conspicuous, strong pterygostomian ridge in front of cheliped articulation. Walking legs slender, long, flattened. Sternum moderately wide, narrowing in front of P1. Abdominal segments 3–5 incompletely fused; suture 3–4 distinguishable, a remaining notch on both extremities; suture 4–5 obsolete, a remaining notch on both extremities. A small portion of sternite 8 visible, close to articular condyle of P5, not in contact with sternite plate 7. A shallow depression in front of the abdominal telson. Male genital opening coxal and gonopod 1 free. P11 long, slender, with slightly curved apex; stiff subterminal spines, with stout and long lateral (apical) process and shorter, hook-like apical process. P12 short, sigmoid.

**Type species.** _Bathyrhombila furcata_, new species, by original designation and monotypy.

**Etymology.**—The name of the genus is a combination of _rhombula_ and _bathy_, to indicate affinities with the genus _Pseudorhombula_ H. Milne Edwards and the fact that most specimens were collected in the bathybiotic region.

_Bathyrhombila furcata_, new species

Figs 1–3

**Material examined.**—Holotype. male (CW 24.6 mm; CL 17.5 mm), 05 Jul 1965, station SIO 65-257, La Paz Bay (24°19'N, 110°26'W), Baja California, Mexico, otter trawl, 55–80 m (coll. W. Baldwin) (SIO C-2116).

Paratypes: male (CW 20.3 mm; CL 14.45 mm), 18 Jan 1968, station MV68-I-59, Gulf of California, north of Angel de La Guarda Island (29°41'N, 113°56'W), Baja California, Mexico, 566–644 m, otter trawl, R/V _T. Washington_ (coll. C. Hubbs) (SIO C-5669A). Male, slightly damaged (CW 22.8 mm; CL 16.35 mm), 18 Jan 1968, station MV68-I-59, Gulf of California, north of Angel de La Guarda Island (29°41'N,
113°56'W), Baja California, Mexico, 566-644 m, otter trawl, R/V T. Washington (coll. C. Hubbs) (LACM-68-464.1, ex-SIO C-5669).

Non-paratypes: 1 soft shell male (cw 25.95 mm; CL 17.95 mm), 1 damaged soft-shell ovigerous female (CW ca. 17.9 mm; CL ca. 13.0 mm), 18 Jan 1968, station MV68-I-59, Gulf of California, north of Angel de La Guarda Island (29°41'N, 113°56'W), Baja California, Mexico, 566-644 m, otter trawl, R/V T. Washington (coll. C. Hubbs) (SIO-5669C).

Description.—Carapace wide (CW/CL ratio 1.40–1.46). Front narrow (7.05 mm wide in holotype), sinuous; fronto-orbital width (13.4 mm in holotype) about half the carapace width. Carapace anteriorly convex and mostly covered with small flattened granules, without setae; granules more numerous and rounded close to edges and on antero-lateral teeth. Antero-lateral margin with five teeth (including the outer orbital tooth), the posterior three large to medium-sized, conical; second teeth reduced, fused with the outer orbital tooth and forming an almost straight, little projecting margin; outer orbital tooth little produced, distinct. Fifth tooth smaller than the preceding two; fourth teeth acute, pointing upward; third teeth wider than fourth and fifth, its sides at a right angle, flattened compared to fourth. Orbital lobe well-marked; upper orbital margin somewhat irregular, with small rounded granules and two conspicuous sutures (median and lateral); lower orbital margin with granulated inner tooth and outer lobe, both granulated. Outer orbital tooth well-defined, little projecting. Pterygostomian and subhepatic regions granulated. Pterygostomian ridge coarsely granulated.

Distal border of merus of third maxilliped sinus, with a marked median concavity; antero-external angle little produced; merus coarsely granulated; ischium with more flattened granules, its distal border produced internally in a lobe; palp coarse.

Cheliped very strong, long (length of major cheliped ca. 1.75 CW); claw heavy and long (length of major claw about equal to CW), right claw being slightly higher (right/left claw maximum height ratio 1.09 to 1.12). Merus with granules on anterior and posterior sides, a dorsal row of granules and a blunt superior subterminal angle, produced in a low tubercle. Carpus strong, obliquely subquadrate in dorsal view, surface slightly irregular dorsally; clusters of granules arranged in rugae (well defined in the holotype) on outer slope; a blunt, moderately large spine at inner angle; a well-defined sulcus parallel to distal border. Manus inflated, smooth (microscopically punctated). Fingers long, flattened, pointed, strongly incurving and with recurved tips, gap between fingers reduced; length of dactylus of major claw ca. 0.4 times length of claw; dorsal margin of dactylus of major claw almost straight, that of major claw only slightly curved. Cutting edge of dactylus of both claws sharp, that of major claw with a strong, projecting subrectangular proximal tooth, followed by a series of irregular, smaller teeth; cutting edge of plexus with a series of irregular teeth; cutting edges of smaller claw with reduced teeth.

Pereiopods 2–5 long, slender, flattened; merus covered with dense granules on lower and upper margin, sides almost smooth; carpus and propodus partly covered with granules on upper margin; a low, longitudinal granulated crest on upper margin of carpus; dactylus about same length as propodus, with longitudinal rows of setae, tip short, corneous. Pereiopods 2–4 subequal in length (P2 = 1.66 times CW; P3 = 1.69 times CW; P4 = 1.63 times CW), fifth pereiopod notably shorter (1.39 times CW).

A small portion of sternite eight of male abdomen visible between second and third abdominal somites; first and third somites slightly wider than second, second and third of about the same length and with subacute lateral margins; sixth somite wider than long, sides concave, narrower medially, distal and proximal margin equal; seventh somite (telson) as long as sixth, posteriorly
rounded. First somite and lateral portion of second coarsely granulated; other somites with fewer flattened granules or almost smooth.

Female gonopores longitudinally oval; opening vertical.

First pleopod of male long, slender, bending and slightly curved distally. Two rows of small spines on the shaft; two series of 3 and 5 much longer distal spines on each side of the fold, close to the apex; a strong, spine-like subterminal process, and a terminal, hook-shaped shorter process; a cluster of spines on the side opposite to the fold; an obscure third lobe, covered with tiny spines, in front of the hooked process.

Ethymology.—The name of the species refers to the peculiar arrangement of the subapical setae of the male first pleopod, simulating a fork (furca).

Remarks.—The smaller male features more marked heterochely, the right claw being about 1.34 times the maximum height of the smallest whereas it is 1.11 in the holotype. The soft-shell male is also the largest male available but due to the lack of calcification this specimen has not been used as holotype. The only available female also features a soft-shell, and although basic characteristics match the description of the species, it was not designated as type material either. The bathymetric range of B. furcata is rather wide; the holotype was taken in trawl between 55 and 80 m, while the rest of the material was obtained in a single trawl from a depth of 566–644 m.

Discussion

Like several other genera included in the Goneplacidae or "Goneplacid-like" group (i.e., Pseudorhombila, Nanoplax, Oediplax, and Chaelesium), Bathyrombila represents a primitive evolutionary step towards a caraplected stage, in which an uncovered expanded sternite 8 unites to sternite 7. In
the former four genera, the abdominal somite 2 is: notably reduced, its lateral margin straight and clearly separated from the coxa of P5 (e.g., *Oediplax granulata* Rathbun, 1893, type species of the genus; *Pseudorhombila xanthiformis* Garth, 1940; *P. octodentata* Rathbun, 1906); reduced but antero-laterally acute, in such a way that the acute corner is close to the coxa of P5 (e.g., *Chacellus pacificus* Hendrickx, 1989a); or antero-laterally acute and touching the coxa of P5 (e.g., *Nanoplax xanthiformis* A. Milne Edwards, 1880). In all cases, somite 2 leaves a reduced portion of sternite 8 visible at the basis of coxa of pereiopod 5. In *Bathyrhombila* the antero-laterally produced corner of somite 2 is almost in contact with the coxa of P5. In his study of *Bathyplax typhlus oculiferus* Miers, 1886, Tavares (1996: 420) note that the size of visible portion of sternite 8 varies among specimens of a same species; data related to other genera, however, are lacking. *Pseudorhombila*. *Nanoplax* and *Oediplax* are considered by Guinot (1969b, 1970) as potential members of a series of "Goneplaciidae" related to the Xanthidae, equivalent to the *Pseudorhombillinae* Alcock, 1900. Among the species of *Pseudorhombila*, the abdomen-sternum organization itself varies from a primitive step (sternites 7 and 8 appear not in contact in ventral view, male opening coxal: *P. xanthiformis*) to a more advanced phase [sternites 7–8 in contact on a short distance, in ventral view, displacement of the male opening towards a sternal position: *P. quadridentata* (Laureille, 1828); *P. octodentata* (Rathbun, 1906), and *P.
ometlanti Vázquez-Bader & Gracia, 1995; this would make Pseudohomobila the most advanced genus of all.

The "facies goneplacien" referred to by Guinot (1969a, b) is distinguishable in all the above mentioned genera (in particular considering the shape of the cheliped) and the pierygostomian ridge, also referred to
by Guinot (1969a, 242) as a "... caractère assez constant [in Goneplacidae], rarement signalé ..." [a rather constant feature, rarely reported], is also present in all four genera (strong and sharp in Oediplax; strong and granulated in Bathyrhombila; strong to moderate in Pseudohombila; weak in Chaclclus). In the case of B. furcata, the general aspect of the crab relates it to species of Pseudohombila; the carapace is similar, notably wider than long, with distinguishable regions and convex in lateral view. Both genera feature large to very large (Bathyrhombila), heavy chelipeds, although the heterochely is more marked in Pseudohombila. Orbits and eyes are small. Structure of the frontal and antennular regions and of the bucal frame is similar, as is the shape of the third maxilliped, although the antero-lateral angle of the merus is not so produced in Bathyrhombila (in this respect, closer to Oediplax). Both genera also feature long (Pseudohombila) to very long (Bathyrhombila), flattened, slender P2-P5. Bathyrhombila, however, differs from Pseudohombila in the following characters: the exoral and second teeth of carapace are fused, forming a wide, almost straight slightly projecting margin (exoral tooth almost wanting in Pseudohombila); the pterygotomian ridge, in front of the cheliped articulation, is much stronger in Bathyrhombila; the second abdominal segment is wider in Bathyrhombila; and the structure of the male P1 is strikingly different (Fig. 3). Considering the shape of the male gonopods, the slender P1 of Bathyrhombila is closer to P11 of Chaclclus (Pseudohombila and Oediplax possess a shorter, more massive P11). Ornamentation of the tip of P11 however, shows affinities with some species of Panopeidae Ortmann, 1893 such as Lophopanopeus frontalis Rathbun (see Martin & Abele 1986: fig. 1N). Although the "third lobe (typical of Panopeidae) in Bathyrhombila furcata, new species is hardly distinguishable, the other two processes are strongly developed. In contrast, long subterminal spines (present on the P11 of B. furcata) are also observed on P11 of species of Pseudohombila and on the type-species of Nanoplax [i.e., N. xanthiformis (A. Milne Edwards, 1880)] (Hendrickx 1995), with a single cluster of subterminal spines in the later.

Another genus close to the "Pseudohombiliid" organization is Euprosynopax Guinot. The visible portion of sternite 8, however, is smaller in E. clausa (the type-species of the genus) than in Pseudohombila, Bathyrhombila and Oediplax; and is similar in size to sternite 8 of Nanoplax xanthiformis and the two known species of Chaclclus.

When all these species are compared, they present striking similarities as far as their general shape and aspect is concerned. On the basis of these considerations, and following the suggestion of Guinot (1970; 1080), the use of the family-group name Pseudohombiliidae Alcock, 1900, is proposed for those genera of "goneplacid-xanthid" crabs.

Pseudohombilidae Alcock, 1900

Pseudohombilinae Alcock, 1900:286, 292, 297, pro parte.


Type genus.—Pseudohombila.

Included genera.—Bathyrhombila new genus, Chaclclus, Euprosynopax, Nanoplax, Oediplax, and Pseudohombila.

Definition.—Carapace xanthoid, wider than long, with 3–5 (including outer orbital) antero-lateral teeth. Bucal frame widening anteriorly. Orbits of moderate or reduced size, oval. Chelipeds goneplacids, long, heavy, with long, strongly to moderately incurving fingers. Pterygotomian ridge in front of chelipeds) strong to moderate. Abdominal somites 3–5 at least partially fused, sutures usually visible. Second abdominal somite reduced, its antero-lateral margin in contact with (anterior angle produced) or separated (margin straight) from basis of coxa of P5. Sternal plate wide and slightly
to moderately depressed between P1 (minimum width between P1 equal to 0.60–0.63 times maximum width between P2). A small to relatively large piece of sternite 8 visible ventrally; sternite 8 not touching sternite 7 in ventral view (P11 coxal) or in contact over a short distance (P11 displaced towards a sternal position). P11 long and slender or moderately long and strong; ornamentation variable. P12 short, strongly or moderately sigmoid.

Genera.—The family is divided into three groups of genera. Group A includes the most primitive catometopous forms (i.e., Nanoplax, Chacellus, Bathyformidae and Euphorinusplax); group B includes species with a larger visible piece of sternite 8 (Pseudohomolidae pro parte, and Oediplax); group C includes species with a larger visible piece of sternite 8 in contact over a short distance with sternite 7 (Pseudohomolidae pro parte).

Remarks.—Among the Pseudohomolidae, several species present a subtriangular hiatus between the ischiium and the merus of the third maxilliped (e.g., Chacellus pacificus; both species of Euphorinusplax, Oediplax granulata, Pseudohomolidae xanthifemor, P. quadridenata and P. guinotae Hernandez-Aguilera, 1982) while other species (e.g., Chacellus filiformis Guinot, 1969b; Pseudohomolidae omeletant) possess an anteriorly expanded lobe at the inner angle of the ischiium that makes contact with the proximal margin of the merus (Hendricks 1989a: table 1). The third maxilliped of other species have not been illustrated in the literature and specimens have not been available for examination. In Nanoplax, the partially-fused outer orbital and second teeth are much narrower than in any other genus included in the Pseudohomolidae, although still separated by a shallow notch. The carapace of species of Pseudohomolidae and Oediplax features a reduced to un conspicuous first antero-lateral tooth and the fifth tooth varies from well (e.g., P. octodentata) to poorly developed (or obsolete) (e.g., P. quadridenata).

Provisional key to genera of Pseudohomolidae

1. Distance between outer orbital and first antero-lateral teeth much shorter than orbit width; these tooth partially fused, separated by a shallow notch. Extremity of male P11 with a strong laterally projecting flange .............. Nanoplax
   - Distance between outer orbital and first antero-lateral teeth about equal to orbit width ........................................... 2

2. P11 of male long, very slender and tapering, with only a few minute spines along the shaft ................ Chacellus
   - P11 of male stout, strong, twisted, with median to large spines along the shaft and distal part ..................... 3

3. Outer orbital and first antero-lateral teeth coalesced, forming an almost straight slightly projecting margin. Extremity of male P11 with two longitudinal series of very long spines .................. Bathyformidae
   - Outer orbital and first antero-lateral teeth reduced, separated by a granulated space; granules coarse to minute ...... 4

4. Merus of MXP3 not produced anterolaterally .................. Oediplax
   - Merus of third maxilliped strongly produced anterolaterally ............... 5

5. Extremity of male P11 with a strong subterminal or lateral upturned flange; a patch of strong spines just below the flange and series of weaker spines along shaft .................. Pseudohomolidae
   - Extremity of male P11 with a lateral flange; no patch of strong subterminal spines below the flange, but a series of moderate size spines along the shaft ....... Euphorinusplax

Relationships between Pseudohomolidae Alcock and the Panopeidae Ortmann are difficult to establish. As emphasized by Guinot (1969a:249, 250, and in lit.) this is due basically to the complexity of the Panopeidae sensu lato, of which a first group presents a xanthid facies and coxal male opening (e.g., Euryxanopus, Panopeus), while a second group presents a gonopod facies and coxal or coxo-sterneal male opening (e.g., Cyrtixopha, Glyptixopha). Some
species of the Panopeinae second group (e.g., *Glyptopax pugnax* Smith, 1870, the type species of the genus, and *G. consaigei* Hendrickx, 1989b) present a sternum-abdomen organization more advanced towards a catometopous organization, with uncovered section of sternites seven and eight widely in contact and covering a groove through which the penis passes (see Hendrickx 1969b: 653). All members of the Panopeidae, including *Glyptopax*, however, feature the typical “Panopeid” PII ornamentation.

Specimens of the monospecific genera *Thalassopax* Guinot and *Robertsella* Guinot were not available during this study. Both genera were briefly described by Guinot (1969b) to accommodate specimens erroneously identified by Rathbun (1918) as *Piliainopax elata* (A. Milne Edwards, 1880). Both genera are very similar primitive catometopous and feature distinctive male PI1. Shape of carapace (see Guinot 1969: plate V) of both genera is apparently different from typical pseudohorabilis (carapace more squarish; wider front and orbits). Further studies will be needed to show if these two genera belong to the Pseudohorabilidae or not.

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