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KOROR MISTICIUS, NEW GENUS, NEW SPECIES (DECAPODA: HIPPOLYTIDAE), A CAVE SHRIMP FROM PALAU

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ABSTRACT

A new genus and species, *Koror misticius*, a shrimp belonging to a group of 6 monotypic genera within the Hippolytidae is described from a marine cave in Palau. It differs from *Barbouria* and *Janicea* in having arthrobranchs on the 4 anterior pairs of pereiopods and epipods on maxilliped 1, from *Ligur* in different placement of the "antennal spine" and in having the propodus of the 3 posterior pereiopods subdivided, and from *Parhippolyte* and *Somersiella* in having a slender rostrum and the appendix masculina distinctly longer than the appendix interna on the second male pleopod.

Only two species of caridean shrimps have been recorded from the inland saline ponds and wells and the anchialine and marine caves of Palau: *Halocaridinides trigonophthalma* (Fujino and Shokita, 1975) (Hart, 1980; Holthuis, 1982) and *Caridina typus* Kubo, 1941. The species here described is allied to *Barbouria* Rathbun, 1912, *Janicea* Manning and Hart, 1984, *Ligur* Sarato, 1885, *Parhippolyte* Borradaile, 1899, and *Somersiella* Hart and Manning, 1981. Unlike the previously described shrimps belonging to these five monotypic genera within the Hippolytidae, the new species has no unique character that may be relied upon to distinguish it from them. However, certain characteristics that occur in members of the other genera are uniquely combined in this new shrimp. Because it cannot be assigned to any one of these genera as they are currently defined, the new genus *Koror* is erected to receive it.

Hippolytidae

Koror, new genus

Diagnosis.—Carapace smooth, bearing "antennal" and branchiostegal spines; rostrum dentate, short. Eyes well developed and pigmented. First 4 abdominal pleura broadly rounded and unarmed; fifth and sixth produced in sharp tooth. Telson bearing 2 pairs of dorsal spines, 3 pairs of movable spines on posterior margin. Exopods present only on maxillipeds. Epipods borne on all maxillipeds and first 4 pereiopods. Pleurobranchs present above all pereiopods, arthrobranchs on third maxilliped and first 4 pereiopods, and setobranchs on coxae of all pereiopods. Mandible bearing 3-jointed palp. Pereiopods 1 and 2 chelate; pereiopod 2 merus and carpus subdivided; ischium subdivided in distal one-third, although less distinctly than carpus and merus; pereiopods 3, 4, and 5 with propodus subdivided and merus bearing strong lateral spines. Endopod of first pleopod of male without appendix interna, that of second with slender appendix masculina longer than appendix interna and bearing 2 clusters of setae.

Type Species.—*Koror misticius*, new species.

Etymology.—Named after the type locality, Koror Island, Palau.

Gender.—Masculine.

Relationships.—The features shared by the 6 genera are: presence of "antennal" and branchiostegal spines, pigmented eyes, shape and armament of pleura 6, two arthrobranchs on maxilliped 3, pleurobranchs above the pereiopods, epipods on maxilliped 3 and anterior 4 pereiopods, lack of incisor process on mandible, 3-jointed mandibular palp with last segment being long, chelate pereiopods 1 and 2, multiarticulate propodus, carpus, and merus on pereiopod 2, merus of pereiopods 3–5 undivided and armed with spines, 2 pairs of dorsal spines on telson, and lack of appendix interna on first pleopod of male.

The differences among the genera are noted in the key. The characters in the key are derived from data in: Chace, 1972; Crosnier and Forest, 1973; Hart and Manning, 1981; Gordon, 1936; Hobbs *et al.*, 1977; Hobbs III, 1978; Holthuis, 1963; Lemaitre, 1984;

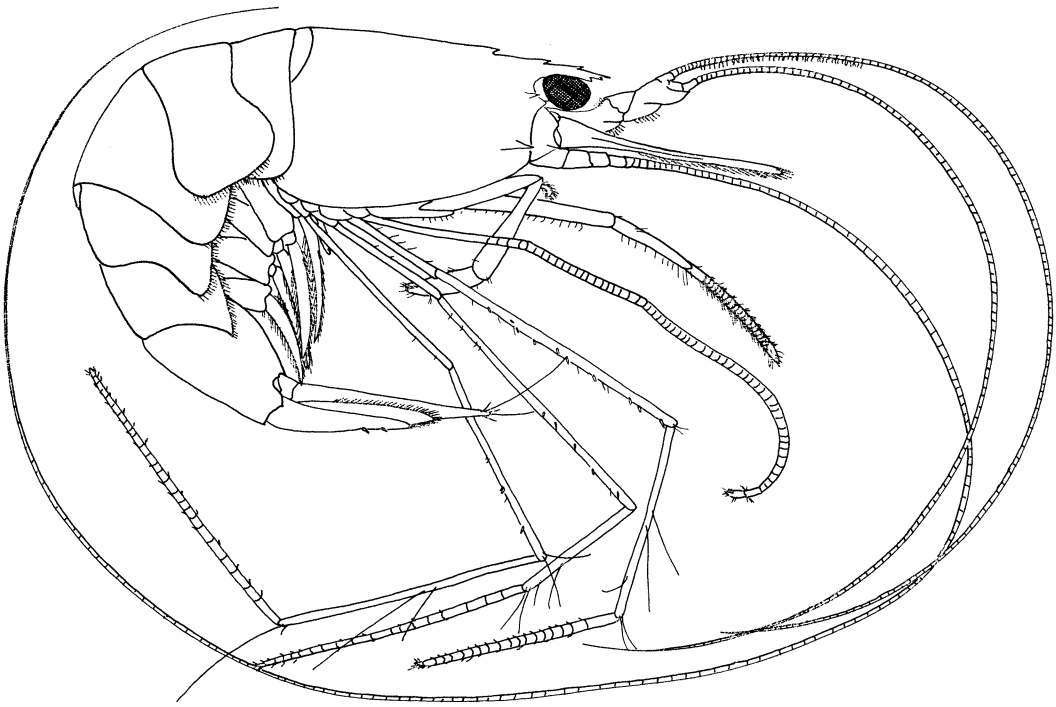

Fig. 1. *Koror misticius,* new genus, new species. Lateral view of male paratype.

Manning and Hart, 1984; Monod, 1968; Rathbun, 1912; Senna, 1903; Wear and Holthuis, 1977.

Koror misticius, new species
Figs. 1–4

Material.—Male holotype (USNM 235027), and 4 male paratypes (USNM 235028) collected from South Point Cave, Koror Island, Ngermeuangel, Palau, 7°18′32″N 134°30′05″E, on 18 April 1985 by Dennis Williams and Jeff Bozanic. One male (USNM 235029) collected in limestone cavern on Ngargol Island, Palau, at depth of 20 feet (6.1 m) in nearly complete darkness, 9 January 1972, by W. A. Starck and G. R. Allen.

Description of Holotype.—Rostrum laterally compressed, slender, about 5 times longer than high, extending almost to distal end of basal segment of antennular peduncle, bearing 2 or 3 teeth on dorsal margin and 1 or 2 on ventral margin; 1 tooth distinctly postorbital. Antennal angle produced anteriorly beyond tip of antennal spine; antennal spine placed behind anterior margin of carapace; branchiostegal spine placed behind margin, its tip surpassing margin; both antennal and branchiostegal spines continuing posteriorly in short horizontal carina; pterygostomian angle rounded, not produced.

Telson 3.7 times as long as broad, tapering in width posteriorly; dorsal spines of telson small, anterior pair situated in posterior half, posterior pair lying midway between anterior pair and posterior margin. Posterior margin tapering to sharp median point and armed with 3 pairs of movable posterior spines (mesial pair one-third length of middle ones, lateral pair one-half length of mesial ones).

Angle on outer margin of outer ramus of uropod acute, bearing single curved articulated spine mesial to angle.

Eyes prominent; cornea pigmented, slightly broader than stalk.

Antennular peduncle with acute stylocerite not reaching distal end of basal segment. Second segment equal in length to third.

Antennal scale 4.5 times as long as wide; outer margin straight throughout most of length, distal tooth overreaching narrowly rounded distal margin of blade, scale overreaching antennular peduncle by about half its length.

Mandible without incisor process, bearing slender 3-segmented palp, distal segment nearly as long as combined length of proximal 2 segments. First maxilla with dis-

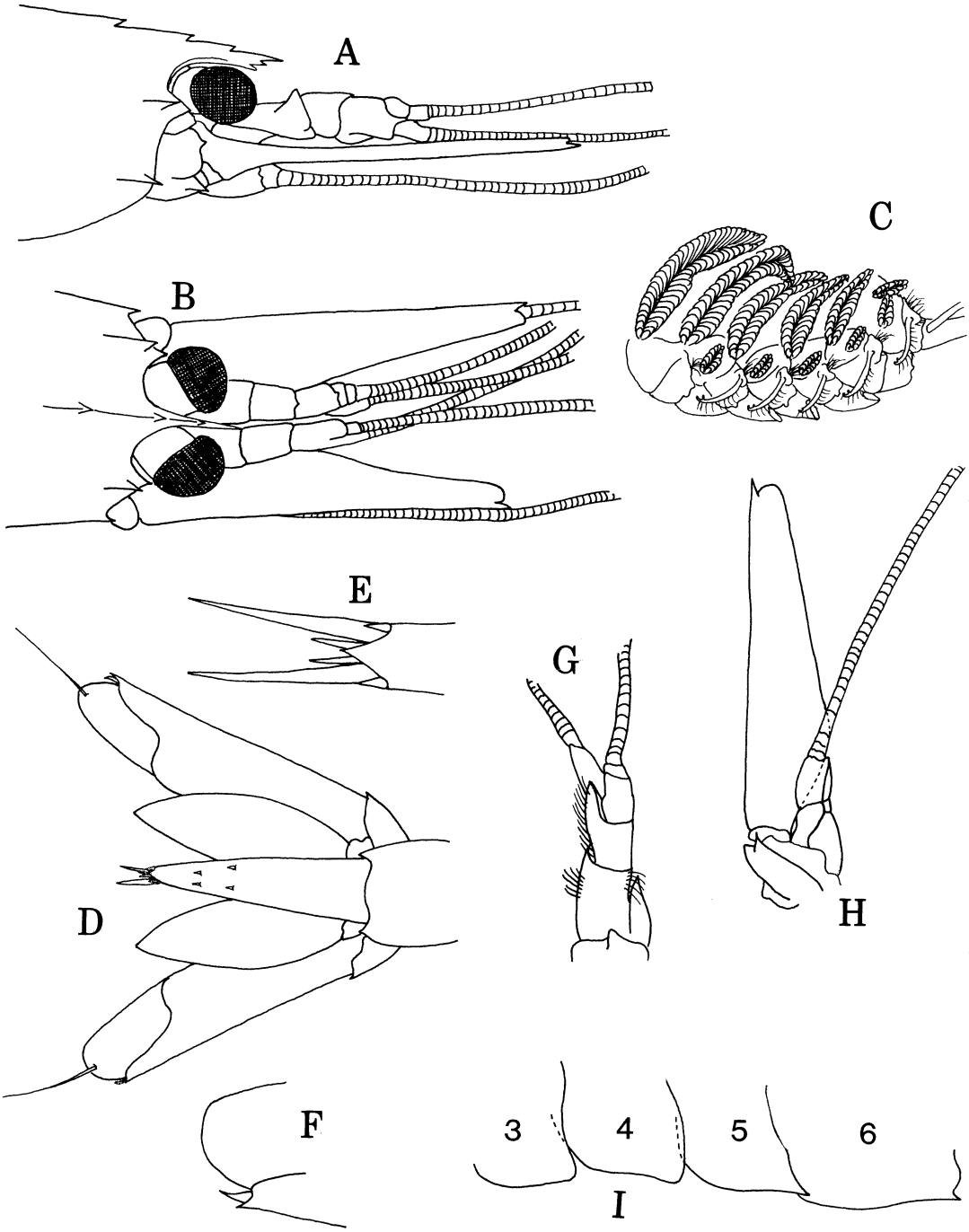

Fig. 2. *Koror misticius,* new genus, new species, holotypic male. A, cephalic region in lateral aspect; B, same, in dorsal aspect; C, lateral view of branchial region showing pleurobranchs, arthrobranchs, mastigobranchs, and epipods; D, telson and uropods; E, detail of terminal part of telson; F, detail of distal part of lateral ramus of uropod; G, antennule in dorsal aspect; H, antenna in ventral aspect; I, pleura 3–6.

tal lacinia spatulate, supporting several rows of short spines on mesial face; proximal lacinia digitiform, bearing many terminal and subterminal setae; palp slightly rolled in distal one-third, bearing terminal and subterminal setae. Second maxilla with scaphognathite broadly rounded proximally, not as broad distally; palp with single subterminal

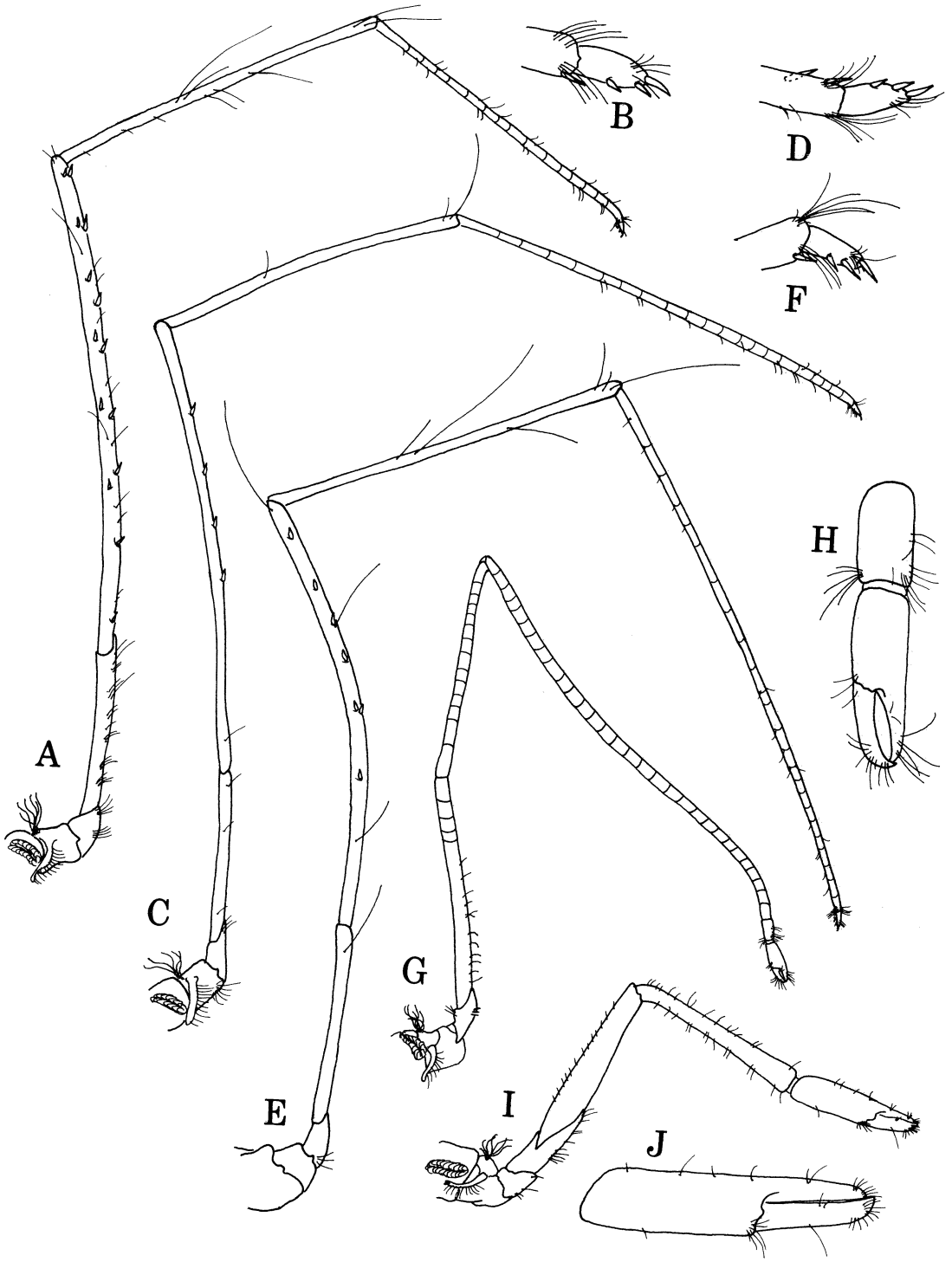

Fig. 3. *Koror misticius,* new genus, new species, holotypic male. A, third pereiopod; B, same, dactyl; C, fourth pereiopod; D, same, dactyl left member; E, fifth pereiopod; F, same, dactyl; G, second pereiopod; H, same, propodus and dactyl; I, first pereiopod; J, same, propodus and dactyl.

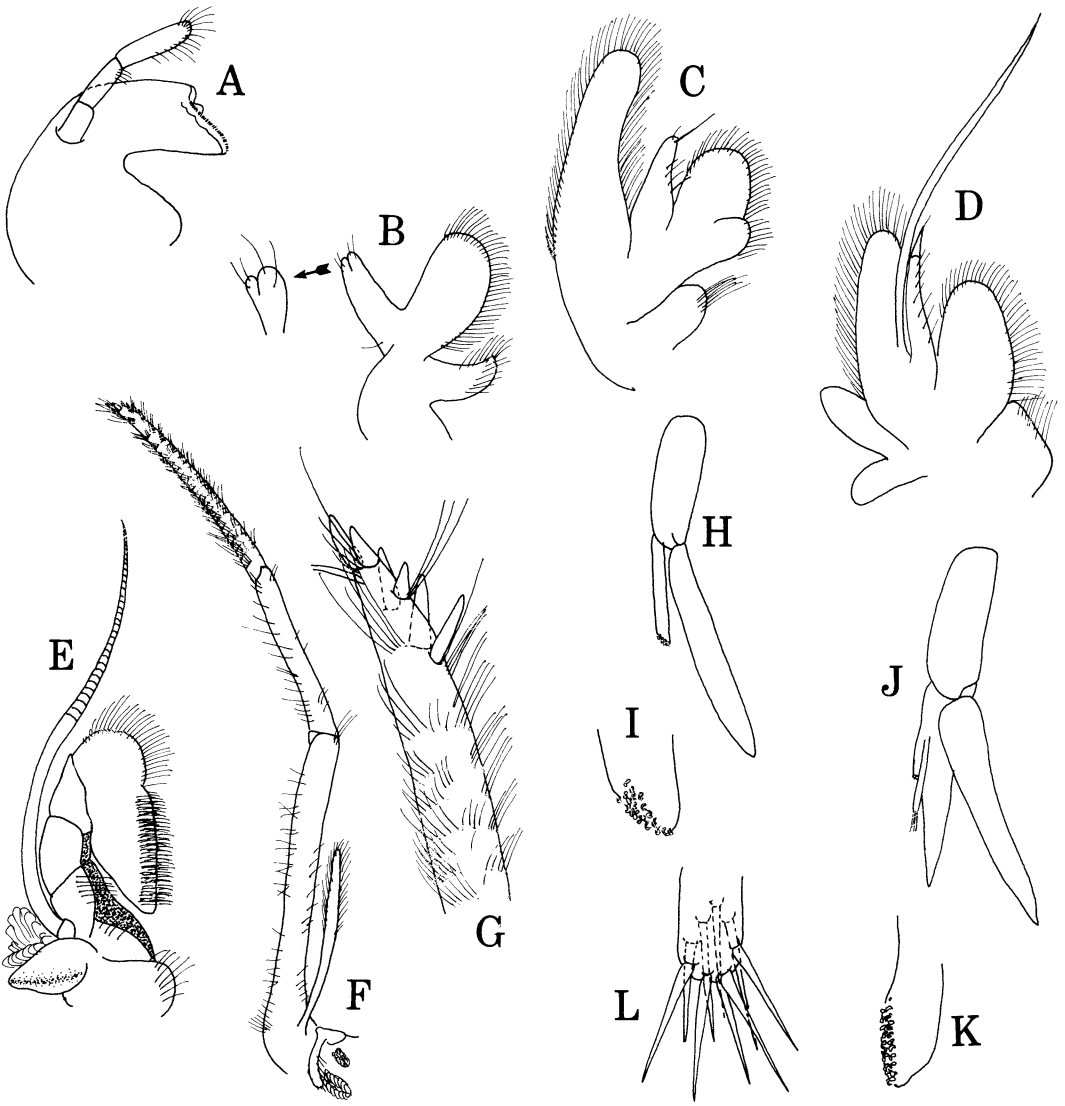

Fig. 4. *Koror misticius,* new genus, new species, holotypic male. A, mandible; B, first maxilla; C, second maxilla; D, first maxilliped; E, second maxilliped; F, third maxilliped; G, same, terminal spines; H, first pleopod; I, same, distal part of endopod; J, second pleopod; K, same, distal part of appendix interna; L, same, distal part of appendix masculina.

spine and several mesial setae; distal, middle, and proximal endites unremarkable.

First maxilliped with exopod bearing caridean lobe on lateral face; epipod bilobed; palp with 2 articles, bearing single subterminal spine and several setae on mesial face; proximal endites subtruncate, distal one broadly rounded. Second maxilliped bearing single epipod, podobranch, and well developed exopod reaching much beyond endopod. Third maxilliped overreaching antennal scale, exopod reaching slightly beyond midlength of ischium; with 1 epipod and 2 arthrobranchs, one small and obscured by larger, more ventrally situated one; terminal segment bearing transverse rows of weak spines and 1 terminal and 5 subterminal heavy corneous denticles.

Branchiae and endites as illustrated and as follows (P = present):

	Maxillipeds			Pereiopods				
	1	2	3	1	2	3	4	5
Pleurobranchs	—	—	—	1	1	1	1	1
Arthrobranchs	—	—	2	1	1	1	1	—
Podobranchs	—	1	—	—	—	—	—	—
Setobranchs	—	—	—	P	P	P	P	P
Epipods	1	1	1	1	1	1	1	—
Exopods	1	1	1	—	—	—	—	—

Pereiopods as illustrated. Pereiopods 1 and 2 chelate, fingers of both shorter than palms. Pereiopod 2 longer than 1; propodus, carpus, and merus subdivided, ischium with several rudimentary subdivisions in distal one-third. Pereiopods 3–5 with 3 spines on posterior surface of dactyl, propodus subdivided, carpus and merus undivided, merus armed with conspicuous spines.

Endopod of first pleopod of male half length of exopod; with cluster of coupling hooks at distal end; without appendix interna. Endopod of second pleopod of male with thin appendix masculina longer than appendix interna, armed with distal and mesial clusters of spines; longest spine about one-half length of appendix masculina.

Variability.—Rostrum with 1 or 2 ventral spines. One male with 2 dorsal rostral spines. Length of rostrum varying from barely reaching end of basal segment of antennal peduncle to slightly overreaching it. Subdivision of ischium of pereiopod 2 varying from distinct to vague.

Size.—Male holotype, postorbital carapace length 8.5 mm (10.1 mm including rostrum). Illustrated male paratype, postorbital carapace length 7.8 mm (10.0 mm including rostrum). Size range of other males postorbital carapace length 7.4–9 mm (10.1–12.1 mm including rostrum). Females unknown.

Distribution.—Palau.

Etymology.—From Latin, *misticius,* of mixed race, hybrid, referring to the combination of characters shared with the related genera and the lack of any single unique character.

Remarks.—The relationships of the genera *Barbouria* and *Ligur* were reevaluated by Manning and Hart in 1984 at which time they removed *Parhippolyte* from the synonymy of *Ligur,* assigned *Barbouria antigensis* to the new genus *Janicea,* and assigned a fifth species to the monotypic genus *Somersiella. Koror misticius* belongs to a sixth monotypic genus. Although it has no characters that are unique, it does not have characters that allow it to be placed into any of the existing genera.

Janicea, Barbouria, Ligur, and *Somersiella* have unique characters that separate them. *Janicea* and *Barbouria* are the only genera in this group that lack arthrobranchs on the four anterior pairs of pereiopods and epipods on the first maxilliped.

Ligur is the only genus with a long rostrum, distinctly overreaching the antennular peduncle. It is also the only genus with the "antennal spine" conventionally situated ventral to the indistinct orbital angle. In *Barbouria, Janicea, Koror, Parhippolyte,* and *Somersiella* this "antennal spine" is unusually situated posterodorsad to the distinct orbital edge. Chace (personal communication) believes that "the 'antennal spine' in *Ligur* is probably not homologous with the nearly postorbital spines that have been masquerading under that name in the other 5 genera." He "suspects this character may be more important to an understanding of the relationships of the 6 'genera' involved here than either arthrobranchs or subdivided propodi of the posterior pereiopods."

Somersiella is the only genus with arthrobranchs instead of podobranchs on maxilliped 2.

Parhippolyte and *Koror* can be distinguished by characters that are not unique to them, but are different in the two genera. In *Koror* the rostrum is slender, about five times longer than high, whereas in *Parhippolyte* it is much deeper, about two and one-half times longer than high. In *Koror* the appendix masculina is distinctly longer than the appendix interna on the second male

pleopod, whereas in *Parhippolyte* it is subequal in length to the appendix interna. The pleuron of the fourth abdominal somite is rounded posteroventrally in *Koror,* whereas in *Parhippolyte* it is acute posteroventrally. From the distributional viewpoint *Koror* is included in the same geographical region as *Parhippolyte,* which is the only other genus of the group known from the Pacific.

Key to Six Related Monotypic Genera within the Hippolytidae

1. Pereiopods without arthrobranchs 2
– Four anterior pairs of pereiopods with arthrobranchs 3
2. Cornea narrower than eyestalk; 3 posterior pairs of pereiopods with propodus entire, not subdivided; appendix masculina shorter than appendix interna on second male pleopod ..... *Barbouria*
– Cornea broader than eyestalk; 3 posterior pairs of pereiopods with propodus subdivided; appendix masculina longer than appendix interna on second male pleopod ..... *Janicea*
3. Rostrum distinctly overreaching antennular peduncle; antennal spine conventionally situated ventral to indistinct orbital angle; 3 posterior pairs of pereiopods with propodus entire, not subdivided ..... *Ligur*
– Rostrum reaching little if at all beyond level of distal margin of basal antennular segment; antennal spine situated posterodorsad to distinct orbital angle; 3 posterior pairs of pereiopods with propodus subdivided 4
4. Pleuron of fourth abdominal somite acute posteroventrally ..... *Parhippolyte*
– Pleuron of fourth abdominal somite rounded posteroventrally 5
5. Rostrum deep, 2.5 times as long as high, with 4 or 5 ventral teeth; appendix masculina subequal in length to appendix interna on second male pleopod ..... *Somersiella*
– Rostrum shallow, 5 times as long as high, with 1 or 2 ventral teeth; appendix masculina distinctly longer than appendix interna on second male pleopod ..... *Koror*

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ANNOUNCEMENT

Under the auspices of the Commission on Systematic and Evolutionary Biology of the International Union of Biological Sciences (IUBS), The International Congress of Systematic and Evolutionary Biology IV (ICSEB-IV) will be held at the University of Maryland, College Park, Maryland, 1–7 July 1990. The meeting is cosponsored by the Smithsonian Institution and the University of Maryland.

The overall theme for the meeting is "The Unity of Evolutionary Biology." The program will feature a number of major symposia aimed at illuminating some of the most exciting new areas of evolutionary biology as well as providing a synthesis of historical and mechanistic approaches to evolution in animals, plants, and microorganisms. Congressional symposia will focus on three major ideas:

Evolution in perspective: biodiversity, conservation, biotechnology, and global change;
Tempo and pattern of evolution: micro- and macroevolutionary processes; and
Systematics and phylogenetic reconstruction.

The goal of the Congress will be to foster a resynthesis of the theory of evolution, incorporating new and traditional approaches.

Keynote speakers will include Douglas Futuyma, Stephen J. Gould, Richard Leakey, Robert May, Peter Raven, John Maynard Smith, Geerat Vermeij, and Edward O. Wilson.

Individuals may present contributed papers in either oral or poster format, although posters are strongly encouraged. For further information on travel assistance contact Dr. Arthur Popper, Department of Zoology, University of Maryland, College Park, Maryland 20742.

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