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A NEW MILLIPED OF THE GENUS PELMATOJULUS FROM THE IVORY COAST (SPIROBOLIDA: PACHYBOLIDAE)

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ABSTRACT

Pelmatojulus tigrinus is described as new from the Comoé National Park, Côte d'Ivoire. The species differs from known regional species by the prolonged, distally notched sternum of the anterior gonopods and the remarkably long and distally torsate telopodite of the posterior gonopods. In this and some related pachybolids an increase in both size and number of setae on the lingual lamellae of the gnathochilarium is noted as a taxonomic character possibly definitive of a family group level category.

A revision of the large African spirobolidans currently referred to the genera *Pachybolus*, *Pelmatojulus*, and *Hadrobolus*, has been in preparation for several years but the constraints of other obligations imposes ongoing delays in the eventual completion of the project. A strikingly banded brown and orange pachybolid from West Africa is described here in order to make the name available for use in future publications on the natural history of this species, being conducted by the second author.

Family Pachybolidae Cook

Pachybolidae Cook, 1897, *Brandtia*, no. 18, p. 74. - Brolemann, 1913, *Bull. Soc. ent. France*, 1913(19), p. 477. - Hoffman, 1962, *Rev. suisse Zool.*, v. 69, p. 762; 1980, *Classification of the Diplopoda*, p. 80.

The content and homogeneity of this family as defined in my 1962 review do not seem to have been addressed in print since that time, aside the minimal outline presented in my "Classification" (1980: 80). The option of restoring Trigoniulinae + Centrobolinae to family status is by no means excluded.

Pelmatojulus

Pelmatojulus De Saussure, 1860, *Mem. Soc. Phys. Hist. Nat. Genève*, v. 15, p. "531" [=331]. Proposed as subgenus of *Julus* with three species, one of them new. Type species: *Julus (Pelmatojulus) insignis* DeSaussure, by subsequent designation of Hoffman, 1962).

Pachybolus (in part) Cook, 1897, *Brandtia*, no. 18, p. 74.

Pelmatojulus: Hoffman, 1962, *Rev. Suisse Zool.*, v. 69, p. 762. (installed at generic rank). - Jeekel, 1970, *Monogr. Nederlandse Ent. Ver.*, no. 5, p. 202 - Hoffman, 1980, *Classification of the Diplopoda*, p. 80.

Since revival of *Pelmatojulus* over 30 years ago there seems to have been nothing published bearing on the status or context of the name. Ongoing investigation on the cognate pachybolid fauna of East Africa, however, has so far produced no reason to doubt the original assumption that the species of that region (in which the anterior segments of males are not distinctly enlarged) are generically distinct from those in Equatorial and West Africa. Whether the several taxa presently referred to *Pelmatojulus* are congeneric among themselves is not likely either: variation in structure of their posterior gonopods is far greater than generally encompassed in a single milliped genus. The West African species which appears closest to that from Côte d'Ivoire in general gonopod structure is *P. ligulatus* (Voges), and these two would probably be considered congeneric in any eventual partition of *Pelmatojulus*. The type species *insignis* is notably disjunct from them.

Pelmatojulus tigrinus, new species

Figures 1-7

Material: Male holotype and male paratype (VMNH) from the southern part of the Comoé National Park (9.06-8.50N, 3.10-4.40W), 30 km north of Kakpin, Côte d'Ivoire; 19 April 1990; D. Mahsberg leg. Additional topoparatypes will be distributed to other collections.

Diagnosis: This species differs from others known from West Africa by the elongated and distally notched sternum of the anterior gonopods (Figure 1), and by the extremely long and subapically torsate telopodite of the posterior (Figures 4-6).

Holotype: Adult male with 57 segments, length ca 153 mm (specimen fragmented), maximum diameter 15.3 mm at segment 6, but 14 mm over most of body length. Color in life strikingly glossy: prozona of body segments orange-brown; collum, metazona, head and antennae, penultimate segment, and paraprocts dark brown; legs light brown, tarsi yellowish.

Head smooth and polished, without surface modification, labral setae (and sockets) missing, apparently abraded off. Interantennal space 5.0 mm, interocellarial space 4.8 mm, ocellaria subcircular, 2.2 mm in maximum diameter thus relatively small; each with about six rows of flat, hexagonal ocelli dispersed as 8, 7, 6, 5, 4, 3 = 33. Antennae short and robust, strongly compressed, 2nd article longest, more distal articles increasingly shorter and broader, 6th twice as wide as long, 7th with four sensory cones. Gnathochilarium of the form shown in Fig. 7, size and location of lingual macrosetae notable among known spirobolidans (but ascertained - unpublished observations - to recur in similar condition in other African pachybolids, see following discussion). Collum symmetrically narrowed ventrad, without anterior marginal stria; ventral region of 2nd segment produced and concave below end of collum. Segments smooth and appearing polished; sutures distinct, ozopores large, located in mesozona; prozona and metazona smooth, except the latter with sparsely scattered micropunctulae; mesozona with fine microsculpture of oblique lines up to level of pores, between which dorsally the lines merge into a network of transversely oblique, anastomosing meshes, sharply delimited against edge of metazona which is slightly elevated.

Coxal cavities of each posterior legpair open and very shallow, the legs thus easily detached; coxae of each anterior pair compressed, about 50% as thick as those of posterior pair; tarsal podomere by far the longest, its complete length subtended with membranous cushion on all legs from 3rd to last.

Gonopods large and robust. Anterior pair (coleopods) with relative small and short

tracheal apodemes. Sternum (Fig. 1) large, extending ventral about 2/3rds length of the coxae, and deeply notched apically; anterior surface concave, with an indistinct median ridge. Sternum continued on posterior side as slender process subtending base of telopodite with which connected; no connection with posterior base of coxa (Fig. 2). Gonocoxa simple,

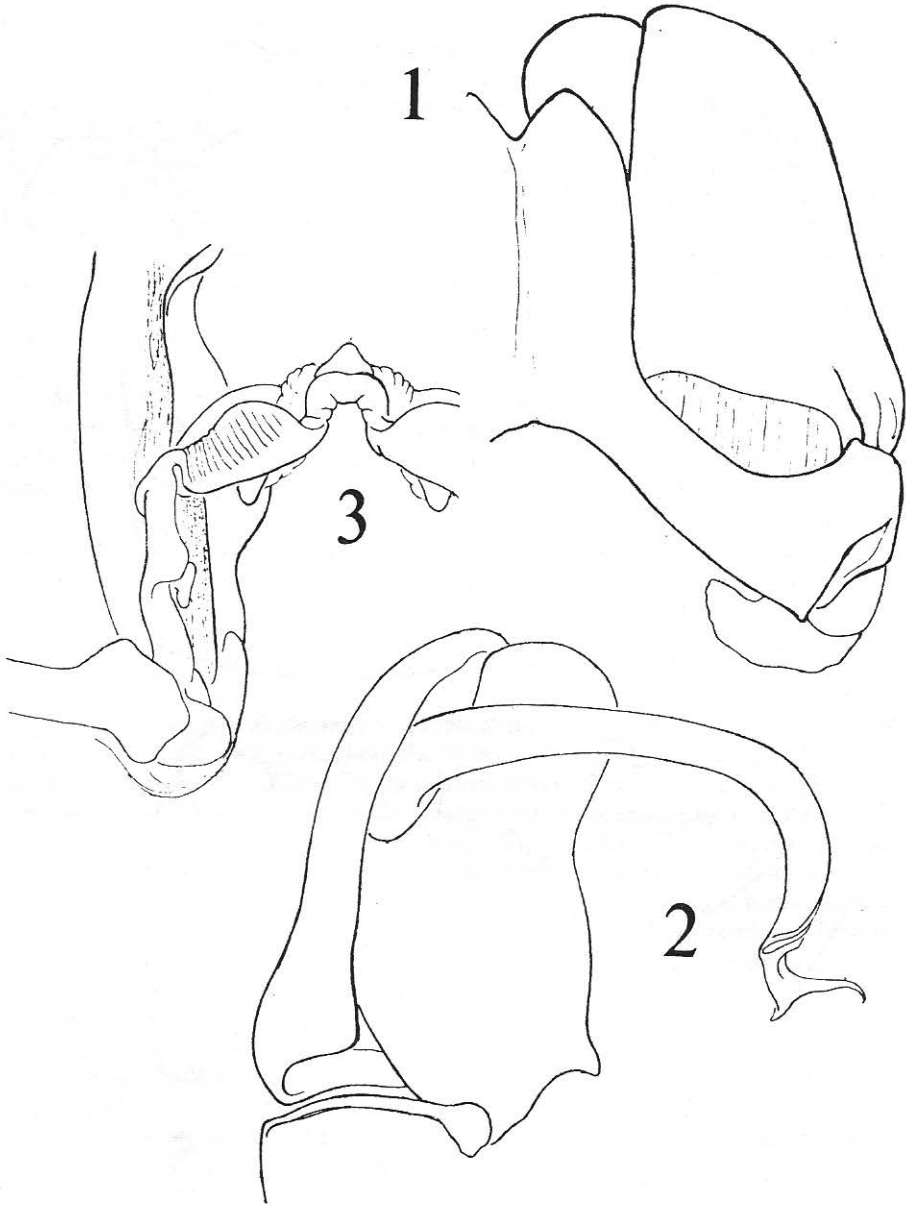


Fig. 1. *Pelmatojulus tigrinus*, right half of anterior gonopod, anterior aspect. Fig. 2, the same gonopod in caudal aspect with corresponding posterior gonopod shown *in situ*. Fig. 3, sternum and basal half of right posterior gonopod of the same specimen, caudal aspect, after removal of all tissue and membrane. Drawings of holotype.

flattened, apically rounded, without lobes or processes; telopodite simple, flattened, apically rounded, forming gonocoel with coxa, in situ contiguous with opposite telopodite. Posterior gonopods with complex, heavily sclerotized sternal structure (Fig. 3); coxal region with extensive gland on inner side but without distinct internal spherical chamber; prostatic groove

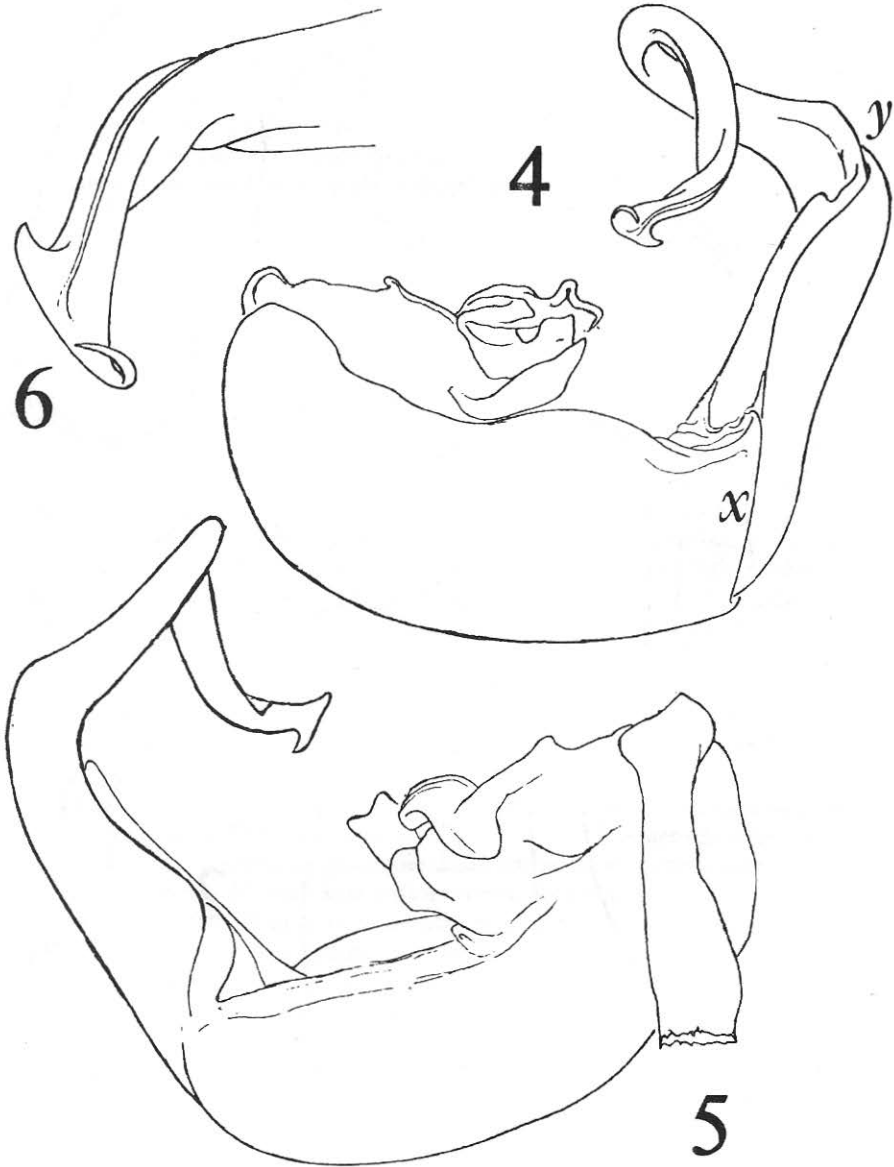


Fig. 4. *Pelmatojulus tigrinus*, right posterior gonopod, mesal aspect. Fig. 5. The same gonopod, ectal aspect, only half of sternal apodeme shown. Fig. 6. Apical region of telopodite of same gonopod, enlarged and drawn from a different aspect than Fig. 4.

concealed at base amidst extensive membranous folding along posterior face of of both coxa and telopodite, these two regions separated by a distinct but not flexible articulation (Fig. 4, X). Prostatic groove located on lateral side of telopodite for about half its length, thereafter (beyond secondary articulation, Fig. 4, Y) following the sinuous curves of the structure, the apical end of which is distinctly torsate (Fig. 6) and expanded, the groove debouching on the surface between the two apical processes.

Remarks: Immature males and females in all stages are less intensely colored than adult males, prozona beige, metazona light brown; the surface texture is matte in contrast to the glossy surface of adult males. Males average about 11 mm longer than females, and about 0.5 mm smaller in diameter at midbody.

Biology: *Pelmatojulus tigrinus* is active at the beginning of the rainy season and becomes inactive under dry season conditions. In contrast to most sympatric milliped species it is diurnal. *tigrinus* is found in gallery forests along the Comoé and Iringou rivers, where it prefers areas with shady humid conditions and a dense litter layer. The species is normally lives in the soil and litter, but after rains individuals ascend into shrubs and bushes. It is the only local millipede that consumes large quantities of hard-leaved tree litter (e.g., *Cynometra megalophylla*, *Cordifolia gigantea*) and dead wood. The high feeding rate of these large millipedes produces substantial faecal accumulation on the forest floor, enhancing the microhabitat for other soil arthropods and for seedlings; *tigrinus* is be considered a key species among the detritores of this gallery forest ecosystem. Ecology, life history, mating behavior, and host-parasite relations of the species have been studies in detail by the second author, and will be reported elsewhere.

P. tigrinus may be locally very abundant: up to 15 adults per square meter. Such population size contrasts strikingly with the situation in central Liberia, where O. F. Cook (an experienced millipede collector) obtained only one specimen during several years of field work (Cook, 1899: 660).

An Interesting Gnathochilarial Character

Aside from various expression of proportions, the gnathochilarium of spirobolidans maintains basic uniformity throughout the order, to the extent of having provided heretofore virtually no resources for distinguishing subordinal taxa. The sole exception seems to be the observation that in the genus *Chicobolus* (Spirobolidae) the distal edge of the stipes has 4-11 setae instead of the three normal for the family (Keeton, 1960: 25). It was with some interest therefore that a striking departure from a "normal" feature was noted (entirely by accident) on the type material of *P. tigrinus*, one that superficially appears to warrant further investigation as a useful taxonomic indication in at least the Pachybolidae. It is mentioned here prior to further personal investigation, to engage the attention of others who may have occasion to work with members of this order.

Typically the lingual lamellae in Spirobolida are relatively quite small and displaced far anteriad by the broad mentum, and in the vast majority of species examined so far each has two macrosetae. Of these, one is generally placed at or near the midlength (level of the mental apex), the other somewhat more distal, as shown in Figure 8. This is the arrangement shown in all published drawings of gnathchilaria, and has been confirmed by the personal examination of several species in each the Rhinocricidae, Spirobolidae, Atopetholidae, and Trigoniulinae.

By contrast, in *Pelmatojulus* and related genera, both setae occupy a position on the truncated distal edge, where the number may increase to four or five, with a corresponding increase in size (Fig. 7). The distal position of two setae has been observed in *P. insignis* and several undescribed West African species. The increased number of setae occurs in *tigrinus*, in *Epibolus pulchripes*, and several other undescribed species from Tanzania. In view of the

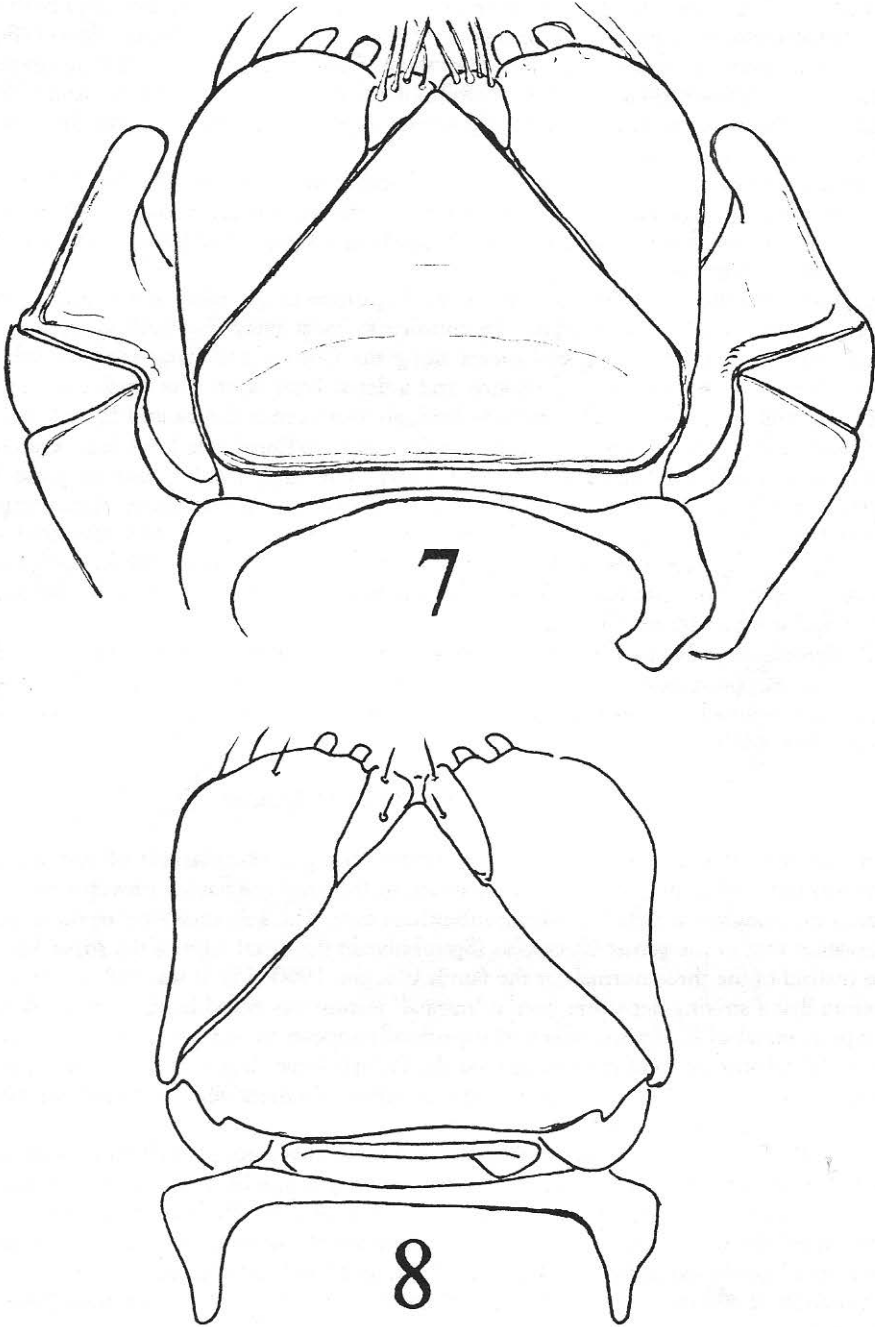


Fig. 7. *Pelmatojulus tigrinus*, gnathochilarium and mandibular bases, caudal aspect, showing proportions and location of macrosetae on the lingual lamellae. Fig. 8. *Atopetholus soleatus* Cook, gnathochilarium showing typical spiroboloid disposition of setae on the lingual lamellae.

general structural similarities of the large pachybolids of tropical Africa, the variant lingual lamellar pattern seems far more likely to be a synapomorphy than an independently derived homoplasy. When genera have been defined primarily on gonopodal characters, it may be possible to detect further correlations (e.g., whether two distal setae *vs* four correspond to groupings defined by genitalic characters).

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