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## The identity of *Paracordyloporus porati* (CARL), and the description of a related new species from Kamerun (Polidesmida: Prepodesmidae)<sup>1)</sup>

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(with 8 figures)

During the accumulation of data for my revision of the diplopod family Prepodesmidae, I have been able to study the original material upon which the name *Cordyloporus porati* CARL (1905) was based, and can now associate this name for the first time with a species which has been renamed twice in recent years. Since considerable time may elapse before the complete revision can be published, I wish to clarify the status of *porati* and some related species in a preliminary paper.

It is with pleasure that I acknowledge the generous cooperation of Dr. ERIC KJELLANDER (Naturhistoriska Riksmuseum, Stockholm) in loaning me the Kamerun prepodesmids described by PORAT, and of Dr. GISELA RACK (Zoologisches Museum, Hamburg) for the opportunity to describe a new paracordyloporid from the collections under her care.

### FAMILY PREPODESMIDAE

#### Genus *Paracordyloporus* BRÖLEMANN

*Paracordyloporus* BRÖLEMANN, 1916, Ann. soc. ent. France, 84, 606. — ATTEMS, 1929, Rev. Zool. Bot. Afr., 17, 330; 1938, Das Tierreich, 69, 381. *Grallodesmus* CHAMBERLIN, 1927, Bull. American Mus. Nat. Hist., 57, 242. *Cordyloporella* VERHOEFF, 1938, Zool. Anz., 124, 169.

Type species: Of *Paracordyloporus*, *Cordyloporus dilatatus* CARL, 1905; of *Grallodesmus*, *G. diplogon* CHAMBERLIN, 1927; of *Cordyloporella*, *C. hirsutipes* VERHOEFF, 1938 (all are types by original designation).

<sup>1)</sup> A contribution from research supported by a grant (G—9805) from the National Science Foundation, Washington, D. C.

**Diagnosis:** A prepodesmid genus of normal body form; antennae set low on head and close together; paranota of segments 2—4 projecting forward; paranota of following body segments nearly horizontal, the edges not set off by submarginal grooves, peritremata not or only weakly developed; the pore formula normal; sterna setose, usually without subcoxal spines; legs long and slender, usually without modification in the males.

Gonopod aperture small to moderate in size, not extending far into the prozonite; gonopods attached by small sternal remnant; coxae unmodified; prefemora and femora forming a straight, unmodified stalk set at a right angle to coxa; prefemora setose, without processes; femur set off by a oblique suture, with a large and prominent terminal femoral process which extends from the ventral surface and is abruptly reflexed dorsomedially; this process simple, or variously branched; tibiotarsus elongate, slender, unbranched, usually arcuate, always with a subterminal process; seminal groove commences on the median side of the prefemur, but gradually moves onto the dorsal or dorsolateral side of the telopodite in going distally, and extends to the extremity of the tibiotarsal blade.

Coloration variable, from uniform yellowish brown to bright patterns of red and yellow paranotal spots on a dark brown or black dorsal surface; legs and antennae usually concolorous with paranotal markings.

**Species:** So far 17 names have been based upon millipeds belonging to this genus. I recognize 12 valid species, with the addition of a new one described in this paper. A full discussion of classification and relationships will be presented in my forthcoming monograph.

### **Paracordyloporus porati** (CARL) (Figures 7, 8)

*Paradesmus Aubryi* (nec LUCAS, 1859) PORAT, 1893, Bihang Svenska Akad., 18(7), 20; 1894, *ibid*, 20(5), 34, fig. 6.

*Cordyloporus porati* CARL, 1905, Mem. Soc. Espan. hist. nat. 1, 267.

*Paracordyloporus porati* BRÖLEMANN, 1916, Ann. soc. ent. France, 84, 563. — ATTEMS, 1938, Das Tierreich, 69, 387.

*Cordyloporus camerunensis* ATTEMS, 1927, Ann. Naturh. Mus. Wien, 41, 70, fig. 27. **New Synonymy!**

*Paracordyloporus camerunensis* ATTEMS, 1938, Das Tierreich, 69, 385, fig. 421.

*Paracordyloporus* (*Cordyloporella*) *hirsutipes* VERHOEFF, 1938, Zool. Anz., 124, 171, figs. 7, 8. **New Synonymy!**

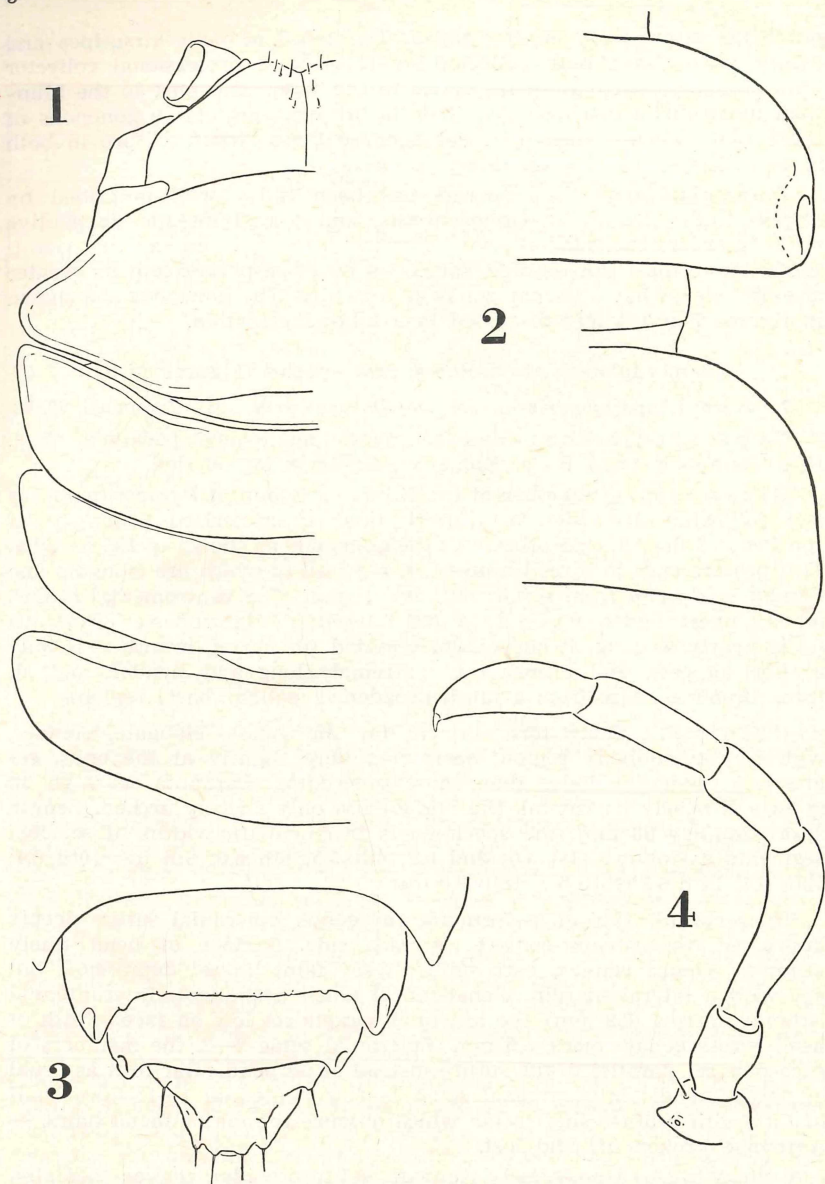
**Type specimens:** Lectoholotype and lectoparatypes of *Cordyloporus porati*, Naturh. Riksmus. Stockholm, from Kitta, Kamerun (SJÖSTEDT, leg.). Holotype of *Cordyloporus camerunensis*, Naturh. Mus. Wien, from N'Yong, Kamerun (HABERER, leg.). Holotype of *Paracordyloporus hirsutipes*, Zool. Staatssamml. München, from „Kamerun“ (HABERER, leg.). I have studied all of these specimens.

**Synonymy:** Even though PORAT published a fairly good sketch of the gonopod of this species in 1894, Count ATTEMS never attempted to identify the name *porati* with any material that he later studied. It is wellknown that ATTEMS preferred the certainty of naming a species as new, instead of the uncertainty of trying to match it up with an old description.

The name *hirsutipes* can be explained only as the result of VERHOEFF's careless and superficial work. Clearly he did not consult any of the

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*Paracordyloporus trissolabis*, n. sp. Fig. 1. Dorsal aspect of left side of head and first three tergites (antennae not shown). Fig. 2. Right side of segments 13 and 14, dorsal aspect, to show shape of paranota. Fig. 3. Segments 18—20, dorsal aspect. Fig. 4. Left leg of the 2nd pair, posterior aspect, showing the enlarged tarsal segment.



published information on the genus. The types of both *hirsutipes* and *camerunensis* were both collected by HABERER, a professional collector who probably sold part of his series to the Wien, and part to the München museums! I can also add that the illustrations of the gonopods of these two „species“ look different because these structures are in both cases deformed by the microscope preparation!

**Description:** This species has been fairly well described by ATTEMS under the name *camerunensis*, and I will include descriptive notes in the forthcoming revision. For the present, I can say that *porati* is similar to the following new species in every respect except its greater size and somewhat different gonopod structure. The gonopods are shown in figures 7 and 8, and discussed in a following section.

*Paracordyloporus trissolabis*, new species (Figures 1—6)

? *Paracordyloporus camerunensis papillatus* ATTEMS, 1931, Zoologica, 79, 93.

**Type specimens:** Male holotype and female paratype, Zool. Mus. Hamburg, from Buea, Kamerun, C. BIGGE leg. et ded.

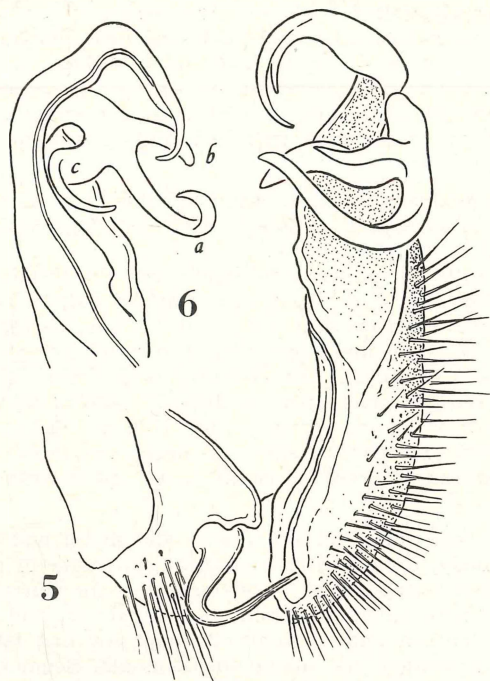
**Diagnosis:** A member of the Dilatatus Group of *Paracordyloporus* (see following discussion of classification), characterized primarily by the form of the femoral process of the gonopods as shown in fig. 5 and 6. This process ends in three branches (a, b, c), all of which are elongate and slender, and arise from a narrow basal region. The ventromedial branch (a) is longest, and curves dorsad and laterad; the lateroposterior branch (c) is nearly as long, it curves dorsomesiad (in *porati*, branch a is only a short process, and branch c is extremely long and slender, and all three branches arise from a much broadened, palmar basal region).

**Holotype:** Body form typical for the genus, elongate, slender, widest near midbody region, narrowing only slightly at the ends, segment 5 distinctly wider than those preceeding. Paranota set high on sides and nearly horizontal, the middorsum only slightly arched. Length approximately 38 mm (the specimen is fragmented); widths of selected segments as follows: 1st 5,0; 2nd 5,2; 4th 5,5; 6th 6,0; 8th 6,2; 10th 6,4; 12th 6,4; 14th 6,2; 16th 5,7; 18th 3,0 mm.

Head capsule typical in form for the genus, epicranial suture deeply impressed, the vertex convex on each side. Surface of head finely granular. Genae convex, each with a very faint lateral depression, but not with a lateral margin. Genal-labral notch prominent. Interantennal isthmus narrow (0,9 mm), the antennal sockets set low on face; width of head across genal apices, 3,6 mm. Epicranial setae 2—2, the members of each pair set parallel to the suture instead of perpendicular to it as usual in polydesmoids; interantennal setae 1—1; subantennal 1—1; lower half of face with profuse short setae which obscure the major facial hairs. — Antennae broken off and lost.

Collum (fig. 1) transversely elongate, subtrapezoidal, convex medially, the surface finely granular; anterior edge slightly emarginate behind the mandibles; only very slight indication of marginal rims laterally; caudal edge only slightly indented across middorsum.

Second, third, and fourth tergites subsimilar in appearance, but fourth distinctly wider than the preceding (fig. 1); paranota broad, overlapping,



*Paracordyloporus trissolabis*, n. sp. Fig. 5. Left gonopod of holotype, mesial aspect. Fig. 6. The same gonopod, dorsal aspect, the three branches of the femoral process lettered.

distinctly turned cephalad as usual for the genus, the anterior corners acutely angular, the posterior broadly obliquely rounded; anterior edge forming a distinct angle on the dorsal side; posterior edge rounded. Paranota of these segments set high on sides, horizontal or even slightly elevated laterally; dorsal surface of the metatergites finely granular.

Midbody segments with wider paranota, the width increasing back to segments 10—12, thence gradually narrowing caudally; stricture distinct but not sharply defined dorsally; surface of metatergites distinctly elevated above surface of prozonites, the texture becoming strongly granular with numerous small conic tubercules developed particularly behind the transverse sulcus; middorsum and bases of paranota about equally convex. Paranota of segments 5—12 essentially transversely rectangular, the corners rounded; of segments 13—19 becoming directed caudally, the anterior corners obliquely rounded and the posterior corners acutely angular; no trace of scapuloae or other marginal distinction.

Ozopores in normal sequence, located in ovoid depressions on the lateral side of indistinct marginal swellings, these not set off from dorsal surface or lateral edge of paranota except posterior to segment 13 where the pore depression is followed by an indentation in front of the posterior corner.



Posterior tergites with less distinct texture except on segments 17—19 where a posterior submarginal row of tubercules appears. Anterior corner of paranota becomes obliterated, the lateral edge continues backward directly from the stricture. Paranota of segment 19 slightly wider than base of segment 20. Latter of normal appearance for the family, the lateral subterminal tubercules enlarged and imparting a broadened appearance to the epiproct.

Legs set upon distinctly elevated, cruciately impressed, setose podosterna; no subcoxal spines or lobes developed. Legs long and slender, much longer than greatest width of body; podomeres slender, slightly clavate, abundantly setose; pretarsi small, nearly straight. Length relationship of podomeres:  $3 > 6 > 5 > 4 > 2 > 1$ ; actual lengths of podomeres of midbody segment: coxa 0,6 mm, prefemur 1,0 mm, femur 2,7 mm, post-femur 1,3 mm, tibia 1,5 mm, tarsus 2,3 mm, total 9,4 mm. First pair of legs reduced in size; second pair abruptly larger; coxa slightly elevated ventrodistally, seminal duct opening directly onto coxal surface; tarsus enlarged, greater in diameter than tibia (fig. 4). Sterna of segment 4 with two distinct paramedian, subcoxal processes, these directed somewhat cephalolaterad in front of coxal bases; other anterior sterna not modified.

Stigmata of segments 3—5 prominent, the distal end turned laterad from sides of body, prominently auriculate; stigmata of other segments smaller and closely applied to coxal condyles, the dorsal end not free from the sides; both stigmata similar in size, shape, and location. Sides of metazonites smooth and unmodified except for one large, or several small tubercules located just above the stigmata. Segments 17—19 with a vertical, submarginal row of small spines between posterior legs and underside of paranota. Stricture fairly-well defined down sides and across ventral surface of segments.

Gonopod aperture moderate in size, subellipsoidal in shape, not extending into the prozonite of segment 7, the edge is elevated all around but highest posteriorly and toward the lateral ends. Sternum depressed and flat between 8th pair of legs. Gonopods moderate in size, extending between legs of segment 6, of the form shown in fig. 5 and 6. The femoral process is reflexed strongly across the medial face of the telopodite, and terminates in three branches of approximately equal width but of different lengths (fig. 6, a, b and c); the basal area where the three branches come together is not enlarged.

Color in life unknown; the specimen at present is bleached by long preservation and is overall generally light yellowish-brown except for the dorsal and lateral surface of the stricture which are nearly dark brown.

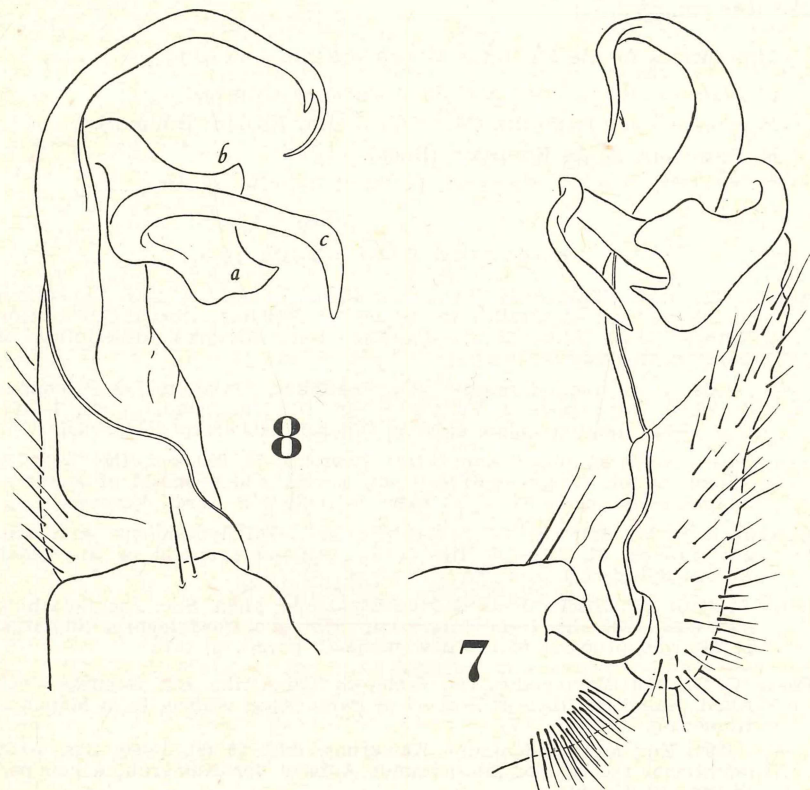
**Remarks:** There is a possibility that this form may be the same as that named as *P. camerunensis papillatus* by ATTEMS in 1931. ATTEMS defined his new variety on the basis of sternal processes on segment 4 (said to be lacking in *camerunensis*); his type material was from Victoria, Kamerun, and was the property of the Hamburg Zoological Museum. Unfortunately, the specimens are now lost or misplaced; I did not see them either at Hamburg or Wien, so the identity of *papillatus* cannot

be established at the present. My inclination is to regard the name as a Synonym of *porati*, as the development of sternal knobs is somewhat variable.

### The Dilatatus Group of *Paracordyloporus*

Most of the known species of *Paracordyloporus* fall readily into four groups on the basis of gonopod structure. These can be called the Dilatatus (4 species), Durus (1 species), Moeranus (1 species), and Speciosus (3 species) Groups. At the present time I wish to mention only the first of these ensembles.

The Dilatatus Group includes species in which the tibiotarsus of the gonopod is long and slender, forming a high arch over the strongly reflexed femoral process. The latter is bent strongly proximomedially, and terminates in three branches, or three terminal lobes of varying length, as shown in figures 5—8.



*Paracordyloporus porati* (CARL). Fig. 7. Left gonopod of lectoholotype, mesial aspect. Fig. 8. The same gonopod, dorsal aspect, with the branches of the femoral process lettered (compare with figure 6).

There is an additional character which seems to be peculiar to the species of this group. The tarsus of the 2nd pair of legs of the male is distinctly enlarged, or swollen ventrally, in strong contrast to the normal acuminate tarsal form of the following legs. The curious effect of these anterior legs, which are prominently much longer than those of the first pair, is of a second pair of antennae, which they much resemble in the preserved specimens! The original description of *dilatatus* (CARL, 1905, p. 266) states that „Le dernier article des pattes de la troisième paire du ♂ est fortement courbé et renflé en dessous dans sa partie distale“. Almost certainly, however, CARL mistook the 2nd pair of legs for the third. The same configuration occurs in *porati* and in *trissolabis* (fig. 4). The other species of this group, *P. occupatus* ATTEMS, 1940, is unknown as regards the 2nd leg, as VERHOEFF did not mention it in his very brief „description“ of his preoccupied name *Paracordyloporus porati* (1938, nec CARL, 1905), and since only the gonopod preparation of the type of this species remains at the Zoologische Staatssammlung, München. I suspect that *occupatus* will be found to have the tarsus of the 2nd legs enlarged, also.

The species of the *Dilatatus* Group are the following:

*P. dilatatus* (CARL). Cabo San Juan, Spanish Guinea.

*P. porati* (CARL). Kamerun (Mapanja; Kitta; N'Dian; Bibundi).

*P. trissolabis*, n. sp. Kamerun (Buea).

*P. occupatus* ATTEMS. Kamerun (without definite locality).

### Annotated Bibliography

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- , 1938: Fam. Leptodesmidae, Platyrrhachidae, Oxydesmidae, Gomphodesmidae (Myriapoda 3, Polydesmoidea II). Das Tierreich, **69**, 1—467, figs. 1—509 [only complete existing synopsis of *Paracordyloporus*].
- , 1940: Nachtrag zum 2. Band. Das Tierreich, **70**, 550—562, figs. 699—712 [discussion of VERHOEFF's 1938 paper, p. 558, and proposal of *Paracordyloporus occupatus* as a new name to replace *P. porati* VERHOEFF].
- BRÖLEMANN, H. W., 1916: Essai de classification des Polydesmiens. Ann. soc. ent. France, **84**, 523—608, figs. 1—18 [original proposal of the genus *Paracordyloporus*].
- CARL, J., 1905: Diplopodes de la Guinée Espagnole. Mem. Soc. Espanola hist. nat., **1**, 261—284, figs. 1—11 [original description of *Cordyloporus dilatatus*, p. 264, and proposal of the new name *C. porati*, p. 267].
- PORAT, C. O., 1893: Myriapoder fran Vest- och Syd-Afrika. Bih. Svenska Vet.-Akad. Handl. **18** (7), 1—52 [report of *Paradesmus Aubryi* from Mapanja, Kamerun].
- , 1894: Zur Myriopodenfauna Kameruns. *ibid.* **20** (5), 1—90, figs. 1—56 [additional records for „*Paradesmus Aubryi*“ for Kamerun; a gonopod illustrated, fig. 6].
- VERHOEFF, K. W., 1938: Zur Kenntnis der Oxydesmiden (Nach Objekten des Münchener Zoologischen Museums). Zool. Anz., **124**, 161—174, figs. 1—12 [original descriptions of *Paracordyloporus hirsutipes* and *P. porati*].



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