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A NEW GENUS AND TWO NEW SPECIES OF CHYDORIDAE (BRANCHIOPODA : ANOMOPODA), FROM KORUP NATIONAL PARK, CAMEROON

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Abstract. Among the small crustaceans occurring in temporary waterbodies in the primary rain forest of Korup National Park in Cameroon, two new chydorid «cladoceran» species were found: *Hydropsilus degreefi* gen. et spec. nov. and *Bryospilus culverwelli* spec. nov.. Both species lack a compound eye. Apart from these new species, *Bryospilus repens*, which was thought to be restricted to epiphytic moss, was also found. *Hydropsilus degreefi* gen. et spec. nov. bears three setae on the inner distal lobe of P1, suggesting a relationship with *Alona*.

Key words : Cladocera, *Bryospilus*, Cameroon, Korup National Park

INTRODUCTION

In 1980 a new anomopod genus, *Bryospilus*, was described as a member of the moss fauna in wet forests (FREY, 1980). Along with the definition of the new genus, FREY (1980) described two new species, one from Venezuela and Puerto Rico (*B. repens*), another from New Zealand (*B. bifidus*). Both were obtained from epiphytic moss from elfin forests. We found three *Bryospilus* species in pristine primary rainforest of equatorial Africa (Korup National Park, Cameroon). Korup National Park is a lowland evergreen forest, typical of tropical wet coastal areas (ODNRI, 1989).

All sampling sites are located in remnants of what was once the great tropical belt of rain forest in Africa. Korup National Park lies mainly in the Ndian division of SouthWest Province. The protected area covers about 122,000 ha, located between 4°56'N-5°01'N and 8°48'E -8° 56'E. Most samples were taken from localities about 50m above sea level, belonging to the drainage basins of the Korup river, the Akpasang river, the Ndian river, and the Cross river.

During two sampling trips to the area, special attention was focused on ephemeral water bodies, such as small puddles and even empty nut shells of a *Strichnos* vine (SEGERS & MERTENS, 1997). Of 110 samples examined, six contained three different *Bryospilus* species, among them *B. repens* Frey, 1980 and an undescribed species. Material of the third species of *Bryospilus* was too scarce to enable full morphological study, but most probably represents a third undescribed *Bryospilus* species. Since the original description,

no new records were made of representatives of this genus, until we found them, together with *Alonella exigua* (Lilljeborg, 1853), *Alona eximia* (Kiser, 1948), and an unknown genus which is also described, in samples from the Korup National Park.

MATERIAL AND METHODS

A first series of samples was taken at the beginning of the rainy season (May, mean temperature 28°C), the second in the middle of the wet season (August, mean temperature 25°C). Samples collected by dragging through aquatic vegetation (plankton nets 50 µm and 100µm mesh) were preserved in 4% formalin. Specimens were examined under a Wild M5 stereomicroscope, and drawn using an Olympus CH2 compound microscope equipped with a camera lucida. For Scanning Electron Micrographs, specimens were dissected, dehydrated in an alcohol series, critical point dried, mounted on stubs, coated with gold and observed using a JEOL JSM-840 SEM.

DESCRIPTION OF NEW TAXA

Hydrospilus gen. nov.

Diagnosis: Body slightly elongated. Three broadly connected headpores. No lateral headpores. Postero-dorsal corner of valve without denticles. An ocellus present, but a compound eye lacking. Trunk limb 1 with three setae on inner distal lobe, two setae in the lateral group. Postabdomen distinctly broad. Basal spine about half length of claw, bearing eight spinules, the distalmost being the largest. Between the main striae, finer striation present ventrally; polygons present mainly posteriorly and dorsally. Antennal formula: 0-1-3(1)/0-0-3(1).

Differential diagnosis: *Hydrospilus* has three connected median headpores, and lacks lateral pores. In contrast *Bryospilus* has the median headpores not connected by any channel or line, and possess very small lateral pores. The trunk limb 1 in *Hydrospilus* bears three setae on the inner distal lobe, whereas the *Bryospilus* species have only two. The antennal formula differs between genera: 0-1-3(1)/0-0-3(1) (*Hydrospilus*) and 0-1-2(1)/0(1)-0-3(1) (*Bryospilus*).

Hydrospilus resembles *Bryospilus* in lacking a compound eye, and in having a somewhat similar gross appearance of the postabdomen. The absence of a compound eye and the presence of only two lateral setae in the lateral group of P1 in *Hydrospilus* suggest affinities with *Bryospilus*, while the three connected headpores and three setae on the inner distal lobe of P1 are reminiscent of *Alona*. Moreover, the headpores and postabdominal shape of *H. degreefi* is in particular in concordance with *A. eximia*. The presence of six rather than seven spines on the exopodite of P3 is an obvious difference between *Hydrospilus* and *Alona* (incl. *A. eximia*). So *Hydrospilus* can be related to its sister taxon *Bryospilus*, and to *Alona*.

Etymology: From (Gr.) *hydro*, water and (Gr.) *spilus*, spot. Analogous to *Bryospilus* and *Monospilus*, which also lack a compound eye and hence have only one eye spot.

Type species: *Hydrospilus degreefi* spec. nov., by monotypy.

***Hydropsilus degreefi* nov. gen., nov. spec.** (Figs 1-3)

Material examined: Ten parthenogenetic females, two juveniles.

Holotype: A parthenogenetic adult female on a slide, mounted in glycerine, and deposited at the Royal Institute of Natural Sciences, Brussels (KBIN : IG 28510a).

Paratypes: Dissected trunk limbs of a parthenogenetic female on a slide mounted in glycerine. The remaining individuals are preserved in formalin at the Dept. Biology, University Gent.

Type locality: Pamol Estate pond, Mundemba, Cameroon (5°01'N-8°56'E, leg. J. Mertens, 26/05/1995 in RUG.)

Diagnosis: Slightly elongated body shape with very broad ending rostrum. Headshield with three connected and median headpores. Postabdomen very broad (width/length = 0.5).

Etymology: the species name is after Willy De Greef, Science co-ordinator of Korup Project at the time, who invited us to Korup National Park and took part in the sampling trips.

Description

Size: Mean length 0.38mm (n=9), range 0.33-0.43mm. Mean length-width ratio of adult females is 1.43, range 1.23-1.67.

Shape: Slightly elongated (Fig. 1a; Fig. 3a), length about 1.4 times maximal height. Dorsal margin of valves anteriorly more curved than posteriorly, ventral margin anteriorly curved, posteriorly straight, posteroventral corner of valve broadly rounded and without denticles, posterodorsal corner not distinct. Ventral margin of valve adorned with feathered setae throughout, differentiated in three zones of different setae-length (Fig. 1b; Fig. 3f). At implant of each of the 19 posteriormost setae, are four to five short spinules.

Head shield terminating anteriorly in very broadly rounded rostrum (Fig. 1c; Fig. 3c). Three median headpores connected by a broad field surrounding them (Fig. 1f; Fig. 3b). Lateral headpores not found. Ocellus but no compound eye. Antennule with nine aesthetascs, one exceeds length of antennule. Antenna with two setae as long as the three segments together, one seta longer and apparently split. Antennal segments longer than wide. Antennal formula: 0-1-3(1)/0-0-3(1). Labrum with rather obtuse tip reaching far beyond rostral tip. Labral plate long, ending bluntly, and lacking setation.

***Trunk limbs*:**

P1 (Fig. 2a, b): Three setae on inner distal lobe, one nearly half the length of the others, being subequal in length. Endite with three groups of spines and setae distally. Inner group consisting of four elements, with outermost two spines more heavily chitinized, forming a two-pronged fork-like configuration. All four elements bilateral feathered. Both innermost setae are equally weakly developed. The middle group consists of three elements, two are almost equally strongly developed, the third is much weaker. The spine in the middle of the group shows a complex setulation pattern. At the base of these elements are several strongly chitinized denticles. Only two setae in lateral group.

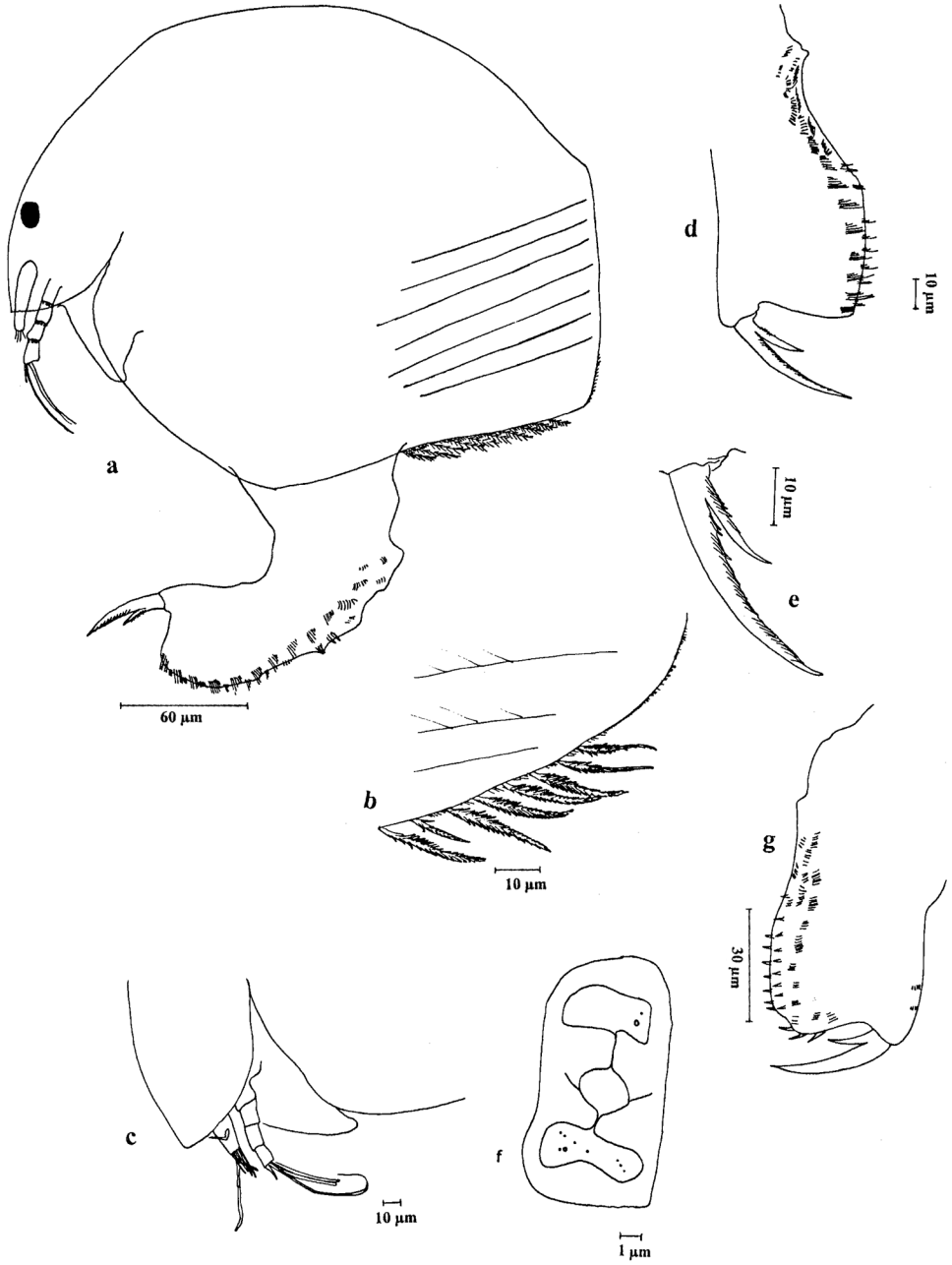


Fig. 1. – *Hydrospilus degreefi* sp. n., female. – (a) habitus, (b) posteroventral margin of valve, (c) rostrum, (d) postabdomen, (e) postabdominal claw, (f) headpores, (g) postabdomen of juvenile.

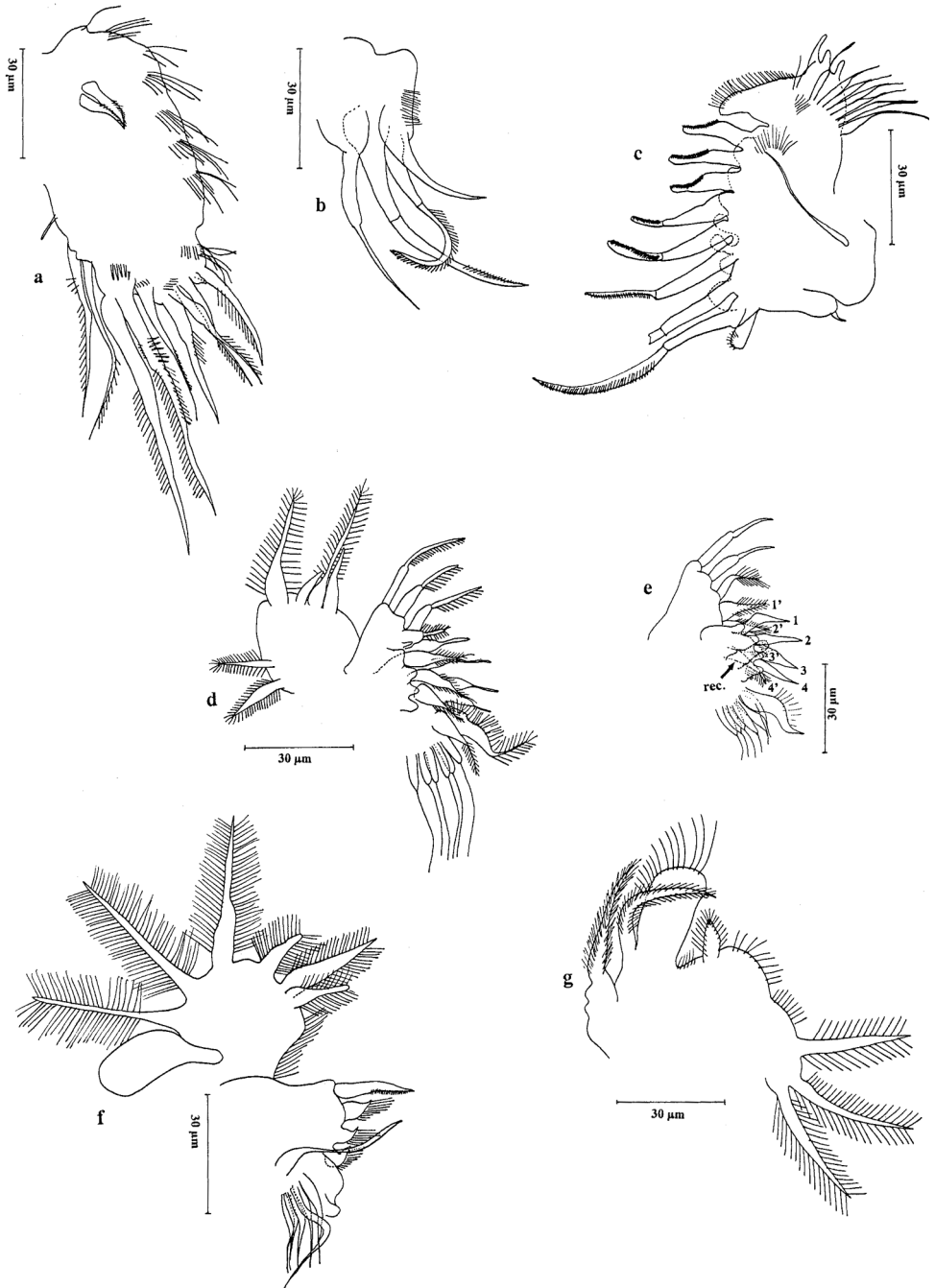


Fig. 2. – *Hydrosphilus degreefi* sp. n. nov., female – trunk limbs (a) P I without outer ramus, (b) P I outer ramus, (c) P 2, (d) P 3 with exopodite, (e) P 3 showing receptor, (f) P 4, (g) P 5.

P2 (Fig. 2c): Somewhat pointed expanded lobe between gnathobase and scraping spines. Seven gnathobasic filtering setae, eight scraping spines regressing in length. Endite surface bears a seta, the tip of which nearly reaches the base of scraping setae.

P3 (Fig. 2d, e): Six filtering setae, three two-segmented, bilateral feathered setae (indicated with arrow on figure). Exopodite with six setae.

P4 (Fig. 2f): Five gnathobasic filtering setae. Exopodite with six setae.

P5 (Fig. 2g): The setae between endite and gnathobase are subequally developed.

Postabdomen (Fig. 1d; Fig. 3d): Dorsal margin slightly curved with two rows of grouped spinules, the anteriormost consisting of five, the distalmost consisting of four spinules, dorsal margin almost straight distally, anal margin curved. Anal groove concave, postanal zone almost straight. Margin of preanal zone distinctly S-shaped bearing teeth, as well as lateral setae. Dorsal margin of postanal zone with nine groups of anal spinules, the distal one the largest. Pre-anal margin with five groups of denticles; the distalmost consisting of two stout denticles, the following four consisting of five each. Distal vertical side bearing two groups of setules. Flanks of postabdomen with 13 groups of lateral setae, linearly regressing in length proximally. Each group is composed of five to ten setae.

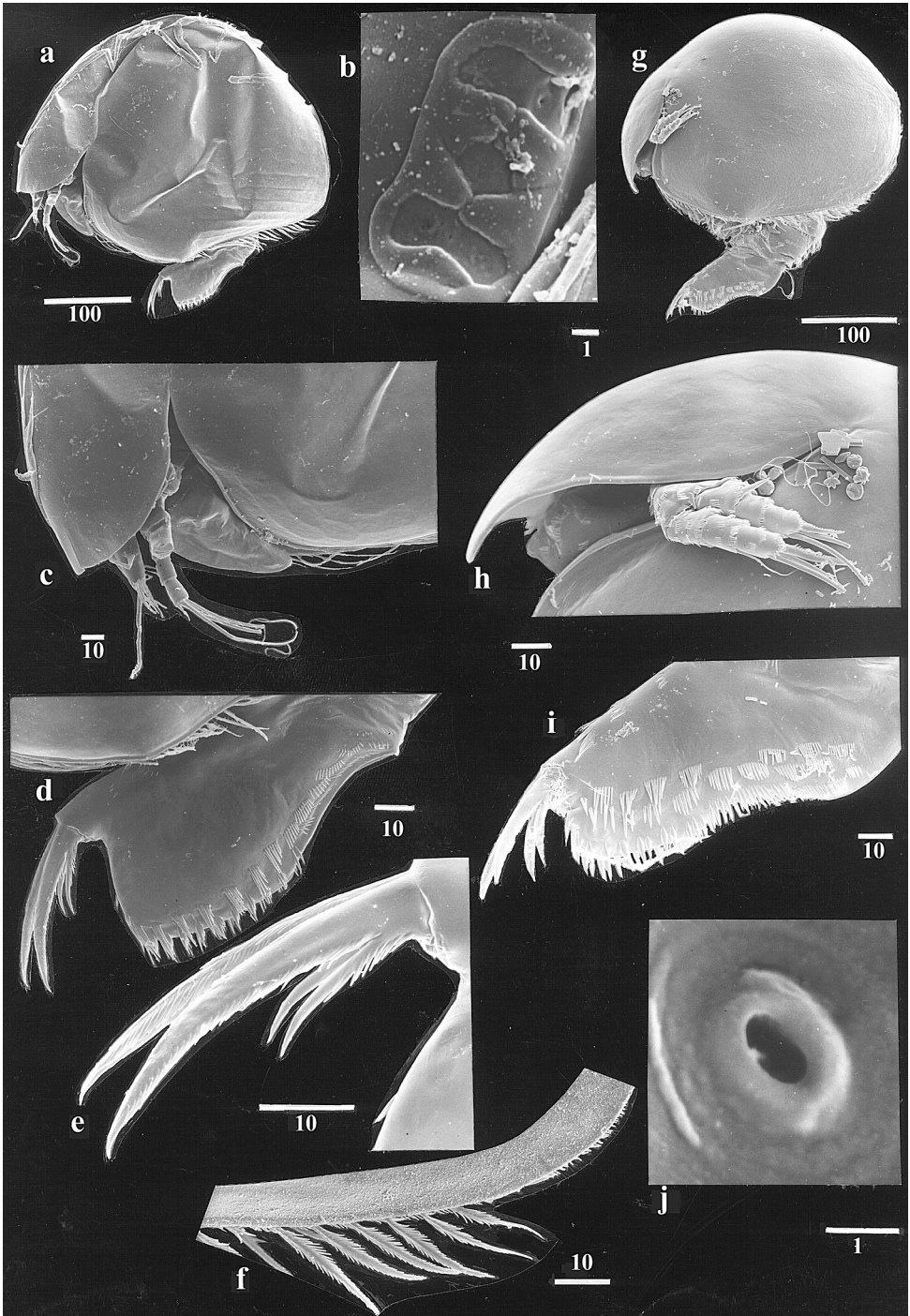
Postabdominal claw (Fig. 1e; Fig. 3e) rather slender and evenly curved, concave surface carrying two longitudinal rows of spinules. Basal spine half length of claw, spinules bearing eight setules, the distalmost the largest.

Ecology and distribution

Hydrospilus degreefi n. sp. is only known from the type locality. The species was found together with *Alonella exigua* and *Alona eximia*, in a small shady temporary stream, with weak current, and little vegetation.

Legend to Figure 3 (see opposite page)

Fig. 3. – Scanning electron micrographs. – (a-f) *Hydrospilus degreefi* sp. n., female: (a) habitus, (b) headpores, (c) rostrum, (d) postabdomen, (e) postabdominal claw, (f) posteroventral margin, (g-j). – *Bryospilus repens*, female: (g) habitus, (h) rostrum, (i) postabdomen, (j) headpore.



***Bryospilus culverwelli* nov. spec.** (Fig. 4)

Material examined: One parthenogenetic female, one adult male

Holotype: Parthenogenetic female on a slide, mounted in glycerine, and deposited at the Royal Institute of Natural Sciences, Brussels (KBIN: IG 28511a).

Paratype: Male individual, mounted in glycerine. (KBIN: IG 28511b).

Type locality: Temporary pond, Mundemba, Cameroon (5°04'N-8°49'E, leg. J. Mertens, 16/08/1995, in RUG).

Diagnosis: Postabdomen narrowing distally. Aesthetascs of antennule not reaching apex of rostrum. Antenna with three terminal setae.

Differential diagnosis: *Bryospilus culverwelli* n. sp. is probably a close relative of *B. repens*, but the distal end of the postabdomen is much narrower. The claws have two basal spines instead of one long, slightly-curved basal spine as in the latter species. The three terminal setae of the antenna in *B. culverwelli* are longer than those of *B. repens*. The aesthetascs of the antennule does not reach to the apex of the rostrum in *B. culverwelli*.

Etymology: Named after James Culverwell (Park Adviser of Korup Project at that time), who assisted us during our stay in Cameroon.

Description

Female: Body oval (Fig. 4a). Length 0.33mm, maximal height 0.23mm; ratio 1.4. Maximal height in the middle of the body. Posteroventral and posterodorsal corners of valves not distinct. Ventral margin of valves with continuous row of feathered setae. Labrum rather short and bluntly ending. Ocellus present, but no compound eye. Two median headpores not connected. Antennule merely reaching beyond half length of rostrum. Aesthetascs not reaching apex of rostrum. Antenna with three terminal setae, and one spine. Postabdomen narrowing distally (Fig. 4b). Lateral setules abundant, two rows of stout spines along the ventral margin, followed by three rows of grouped setules. Anal groove carries small spines. Claws with two basal spines, one longer than half length of claw, the other very tiny. Concave surface of claw with spinules.

Male: More elongate than female (Fig. 4c), length 0.30mm, maximal height 0.19mm; ratio 1.6. Antennule relatively longer in female, but still not reaching apex of rostrum. Ventral margin of valves with a row of feathered setae, roughly distinguishable into three groups; anteriormost shortest, middle group longest. Postabdomen narrowing distally (Fig. 4d). Dorsal margin crenulate, carrying anal denticles (much less stout than in female), organised in only one row (*versus* two rows in female), followed by two rows of grouped lateral spinules. At distalmost extremity of postabdomen one large spine. Claws broader than in female; only one basal spine, about half length of claw.

Ecology and distribution

Bryospilus culverwelli n. sp. has not been found outside its type locality. The species was found together with *Acroperus harpae* (Baird, 1834), in clear running water.

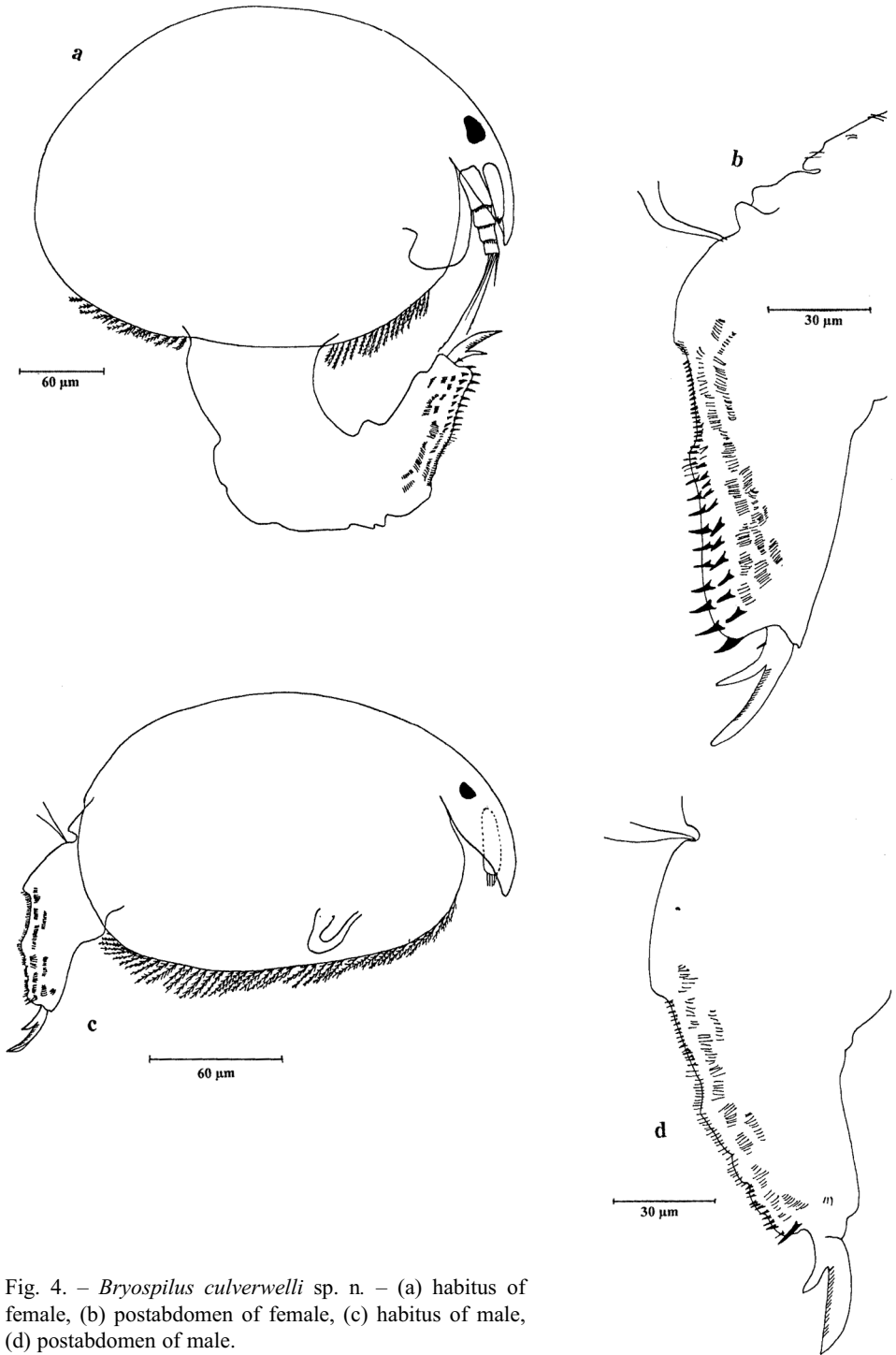


Fig. 4. – *Bryospilus culverwelli* sp. n. – (a) habitus of female, (b) postabdomen of female, (c) habitus of male, (d) postabdomen of male.

Bryospilus repens (Frey, 1980) (Figs 3, 5)

Material examined: Five parthenogenetic females

Observed characters are consistent with FREY's (1980) description. Two separated headpores surrounded by an annular thickening, antenna short and stubby, labrum with nodular thickening and small groups of setae, P1 with only two setae on the inner distal lobe, postabdomen of consistent structure and setation.

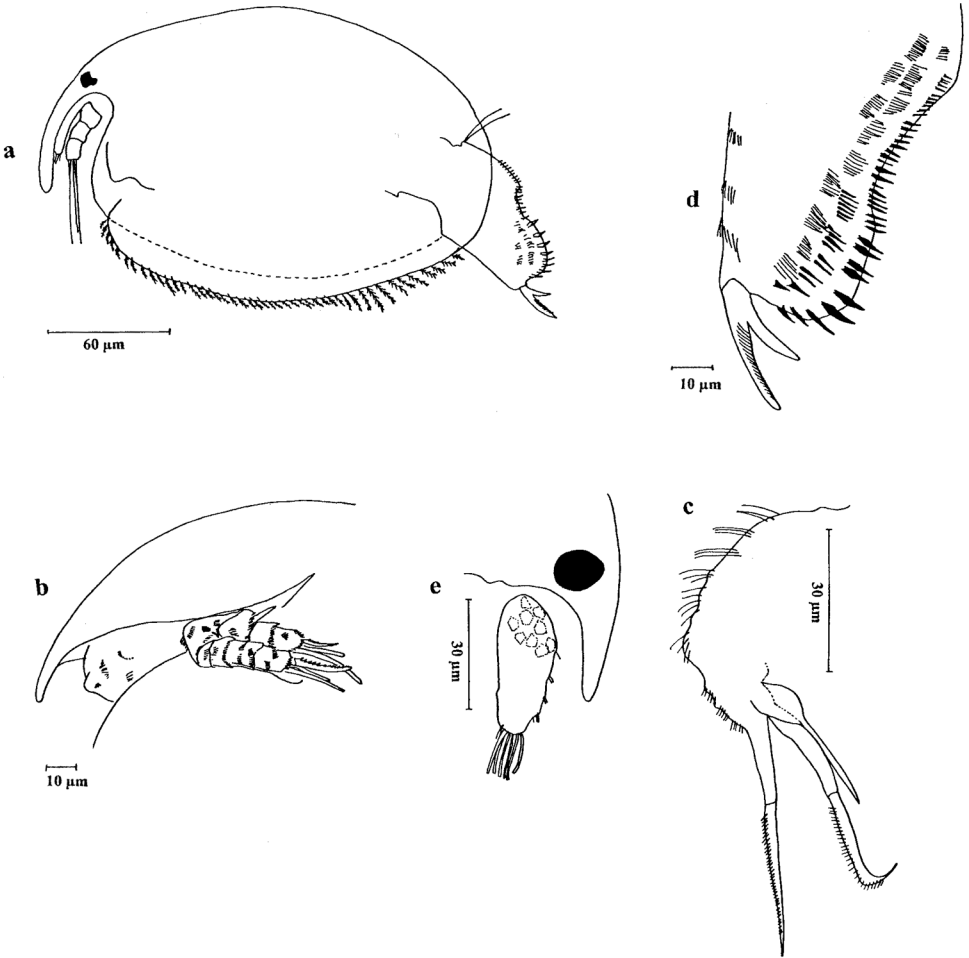


Fig. 5. – *Bryospilus repens* female. – (a) habitus, (b) rostrum, (c) outer ramus of P1, (d) postabdomen, (e) antennule.

DISCUSSION

The known distribution of *Bryospilus* is now expanded from New Zealand and Neotropical rain forests (Venezuela, Puerto Rico) (FREY, 1980) to the Paleotropics. The habitat of the genus is no longer restricted to the epiphytic damp moss vegetation, as thought by FREY (1980). Together with the representatives of the related new genus *Hydrospilus*, at least two *Bryospilus* species inhabit the waters of the tropical forest floor in Western Africa.

ACKNOWLEDGEMENTS

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