BEAUFORTIA

SERIES OF MISCELLANEOUS PUBLICATIONS
ZOOLOGICAL MUSEUM OF THE UNIVERSITY OF AMSTERDAM

No. 175 Volume 14 november 8, 1967

On two Italian *Lithobius* species described by Silvestri, with taxonomic notes on the genus *Eupolybothrus* Verhoeff (Chilopoda, Lithobiida) *)

C. A. W. JEEKEL

ABSTRACT

A re-examination of the types of *Lithobius occultus* Silvestri, 1894, and *Lithobius excellens* Silvestri, 1894, from Italy, has shown that the two are based on specimens of the same species which takes the name of *Eupolybothrus (Schizopolybothrus) excellens* (Silvestri, 1894), and is probably most closely related to *E. tabularum* (Verhoeff, 1937). A tentative survey of the subgenera of the genus *Eupolybothrus* Verhoeff, 1907, is given, and a new subgenus, *Leptopolybothrus* nov. subgen., type-species *Lithobius leptopus* Latzel, 1880, is erected.

In 1894 Silvestri published the descriptions of two species of the genus *Lithobius* Leach from Ligurian caves. The first, *L. occultus*, was referred to the subgenus *Lithobius* s. str., the second, *L. excellens*, to the subgenus *Archilithobius* Stuxberg. The two species were based on female specimens only.

Although it was already evident from the descriptions that both species, on account of the multi-seriate coxal pores, were referable to the genus *Eupolybothrus* Verhoeff, their identity and relationship remained virtually obscure. From the reference to different subgenera one might get the impression that two quite unrelated species were involved. Moreover, the absence in *excellens* of triangular projections of the tergites, implied by the reference to *Archilithobius*, was remarkable as no other species of *Eupolybothrus* thus characterized had been reported from Italy since.

When visiting the Genoa Museum in 1964 I could not restrain myself from satisfying my curiosity as regards the identity of the two species and took the

Received: August 25, 1967.

*) Based on data accumulated through the aid of a grant (I 954—36) from the Netherlands Organization for the Advancement of Pure Research (Z.W.O.), and the Italian National Council of Research (C.N.R.).

opportunity to examine the type material. To my surprise the types proved to belong to a single species, the type of *occultus* apparently being a not entirely full-grown specimen of *excellens*. It is very difficult now to understand why Silvestri regarded the specimens specifically distinct, and what may have induced him to refer them even to different subgenera. The only excuse here indeed seems that the famous Italian entomologist " was very young when he wrote that paper".

Eupolybothrus (Schizopolybothrus) excellens (Silvestri)

Lithobius (Archilithobius) excellens Silvestri, 1894 : 580.
Lithobius (Lithobius) occultus Silvestri, 1894 : 579.

Type material. — The type material of *excellens* consists of a single female specimen labelled "La Spezia, Caverna del Ginepro, 1869, Abdul Kerim". As there is no evidence in Silvestri's description that he had more than one specimen, I have labelled it as holotype. The material of *occultus* was labelled "Grotta del Gazzo, 19.IX.1888, Barberi" and consisted also of a single female specimen. Apparently, Silvestri also had but one specimen of this species, and, consequently, I have labelled it also as holotype.

Descriptive notes. — The specimen of *occultus* is apparently not fully mature: the medial spur of the gonopods is distinctly smaller than the lateral one. This condition accounts for most of the differences between the two type specimens. The following notes made after the type of both species may supplement Silvestri's descriptions.

Colour of both specimens much as in *Lithobius forficatus*: light castaneous.

Head as long as wide. Antennae about four fifths of the body length (*excellens*) or about two thirds of the body length (*occultus*), composed of 76 (*exc.*, right antenna mutilated) and 73 (*occ.*, right) and 61 (*occ.*, left) antennomeres. 2nd antennomere two and a half times as long as the 3rd. Ocelli small.

Forcipular coxosternite without particulars.

Tergites slightly uneven, in the second half of the body with dispersed short setae. Posterior angles of T. 6 obtuse, of T. 7 about rectangular. T. 9, T. 11 and T. 13 with acutely angular projections (fig. 1).

Sternites dispersedly impresso-punctate.

Legs of the 14th and 15th pairs from the femur onwards with dense pore sieves on the medial (posterior) side only. Relative length of the podomeres of the 15th leg (length of head = 100): P. 105 (*exc.*), 100 (*occ.*); F. 118 (*exc.*), 126 (*occ.*); Ti. 145 (*exc.*), 156 (*occ.*); Ta. 1 141 (*exc.*), 148 (*occ.*); Ta. 2 105 (*exc.*), 100 (*occ.*). Spinulation of legs, see table. Spines very long, the VPm spine of the first leg almost as long as the greatest length of the prefemur.

Female gonopods without particulars.

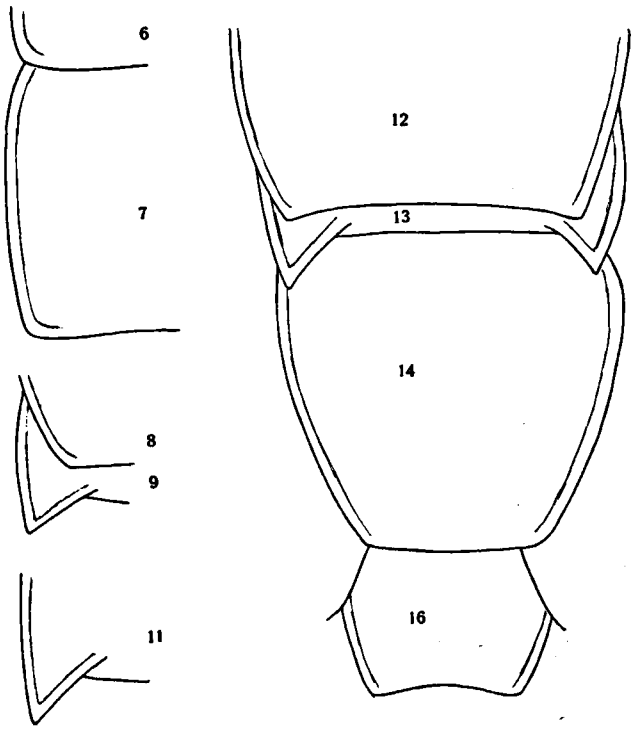

FIG. 1. *Eupolybothrus excellens* (Silvestri), holotype ♀. Outline of tergites 6, 7, 8, 9, 11, 12, 13, 14, and 16.

	excellens type		occultus type	
	ventral	dorsal	ventral	dorsal
Ca	14 - 15	11/12 - 15	14 - 15	12 - 15
m	14 - 15	- - -	14 - 15	- - -
Tr	12 - 15	- - -	12 - 15	- - -
Pa	1 - 15	1 - 15	1 - 15	1 - 15
m	1 - 15	1 - 15	1 - 15	1 - 15
p	1 - 15	1 - 15	1 - 15	1 - 15
Fa	1 - 15	1 - 14	1 - 15	1 - 13 (14?)
m	1 - 15	- - -	1 - 15	- - -
p	1 - 15	1 - 15	1 - 15	1 - 15
Tia	1 - 15	1 - 14	1 - 15	1 - 13 (14?)
m	1 - 15	- - -	1 - 15	- - -
p	1 - 13	3 - 14	1 - 13 (14?)	3 - 13 (14?)

TABLE I. The spinulation of the legs of the female holotypes of *Eupolybothrus excellens* (Silvestri) and *Lithobius occultus* Silvestri. In *excellens* there were two VCa spines on each 15th coxa. Both legs of the 14th pair in *occultus* were missing.

Taxonomic position. — Although not as large a genus as *Lithobius*, *Eupolybothrus* Verhoeff has gradually become quite rich in nominal species and subspecies. But apart from a small number of more widely distributed species, most of the described forms seem to be rather weakly defined. As in the other lithobiid genera, the species are characterized by a number of morphological features of subequal importance which occur in an almost infinite number of combinations. This, combined with an unusually high degree of individual variation, renders classification and identification of the species of *Eupolybothrus* extremely difficult. Moreover, the species of *Eupolybothrus* in particular almost always occur in thin populations and are seldomly collected in large numbers. Perhaps scantiness of material and the rather large size of the species have induced authors to overrate the taxonomic importance of particular differences which, in an absolute sense, are less conspicuous in the smaller species of *Lithobius*. Certainly too much importance has been attached, for instance, to the number of ocelli and antennomeres, and we may, therefore, safely assume that the future development of taxonomy in *Eupolybothrus* will greatly reduce the number of species and subspecies.

Attempts to divide the genus into subgenera have been made by Verhoeff only. The first, from 1907, was based on the absence or presence of triangular projections on the tergites and ran more or less parallel to a similar subdivision of *Lithobius* by Stuxberg. In this way the three following subgenera were recognized: *Propolybothrus* (tergites without projections), *Allopolybothrus* (projections on the 9th, 11th and 13th, or on the 11th and 13th tergites), and *Eupolybothrus* (projections on the 6th, 7th, 9th, 11th and 13th, or 7th, 9th, 11th and 13th tergites). Somewhow this classification remained purely theoretical and was never brought into practice.

Ignoring altogether his earlier work Verhoeff much later created several new subgenera now based on the gonopods and the genital sternite of the males. Thus *Schizopolybothrus* (gonopods short, genital sternite deeply incised), *Parapolybothrus* (gonopods short, genital sternite rounded or slightly emarginate), and *Mesobothrus* (gonopods long, genital sternite deeply emarginate) came into existence; the nominal subgenus was characterized by long gonopods and a rounded or weakly emarginate genital sternite.

Unfortunately, the practical value of these subgenera is doubtful. Verhoeff created his later classification in connection with the description of new species, and many of the previously described species were not considered, either because their male genital characters had not been sufficiently described, or because they had been based on female specimens. Moreover, Verhoeff failed to correlate the genital characters with the more conventional characters.

For the time being it seems, therefore, that a more useful classification can be attained by making tentatively use of the characters offered by the spinulation of the legs, the projections of the tergites, the number of claws on the last pair of legs, the sexual modifications of the legs in the males, etc. In this way it is possible to set up a framework in which most of the described

forms can be arranged, and which may be elaborated subsequently into a more satisfactory subgeneric classification.

In a previous paper (Jeekel, 1963) a review of the nomenclatorial status of *Eupolybothrus* and its subgenera was given. In the following key the subgenera are defined, and a new one is added.

KEY TO THE SUBGENERA OF *EUPOLYBOTHRUS* VERHOEFF

1. VCm spine present on 15th leg. (15th leg with a single claw, and always with one or more VCa spines. Triangular projections present on tergites 9, 11 and 13, or totally absent) 2
— VCm spine absent. (15th leg with a single or double claw; VCa spines present or absent. Triangular projections present at least on tergites 11 and 13) 3
2. Triangular projections of tergites absent ..... *Propolybothrus* Verh.
— Triangular projections present on tergites 9, 11 and 13 ..... *Schizopolybothrus* Verh.
3. 15th leg with a double claw. VCa spines usually absent. Triangular projections present on the tergites 9, 11 and 13, generally also on tergites 6 and 7 ..... *Eupolybothrus* s. str.
— 15th leg with a single claw. VCa spines usually present 4
4. VCa spines absent. Projections present on tergites 7, 9, 11 and 13, sometimes also on tergite 6. Male gonopods long ..... **Leptopolybothrus** nov. subg.
— VCa spine present on the 15th leg 5
5. Projections present on tergites 6, 7, 9, 11 and 13 or only on tergites 9, 11 and 13. Ventral spinulation of 15th leg: 0, 1, 3, 2, 2. Male gonopods long ..... *Mesobothrus* Verh.
— Projections present on tergites 6, 7, 9, 11 and 13. Ventral spinulation of 15th leg: 0, 1, 3, 3, 1—2. Male gonopods short, two-jointed ..... *Parapolybothrus* Jeekel
— Projections present on tergites 9, 11, and 13, sometimes rudimentary on tergite 9. Ventral spinulation of 15th leg: 0, 1, 3—4, 1—2, 0—1, (1). Male gonopods short, single-jointed ..... *Allopolybothrus* Verh.

As the subgenera created by Verhoeff are used here in a more or less strongly emended sense, it seems desirable to enumerate the species referable to them, without, however, striving after completeness, and without an evaluation of the status of the species and subspecies. Since *E. excellens* (Silv.) belongs to *Schizopolybothrus*, the species of this subgenus will be discussed a little more in detail.

Review of the subgenera of *Eupolybothrus* Verhoeff

Subgenus *Propolybothrus* Verhoeff, 1907

Besides the type-species, *E. nodulosus* (Verhoeff, 1905), this subgenus has only *E. werneri* (Attems, 1902). The two species are known by their type specimens only, which came from Thessalia (Greece) and Magnesia (= Manisa, Turkey ?), respectively. The differences between the two seem rather unimportant and, in fact, may relate to different post-larval stages of the same species.

The subgenus is characterized by the absence of triangular projections on the tergites, and the presence in the 15th leg of a VCm and a VCa spine. The 15th leg has a single claw, and in the male its prefemur is dorsally sulcate. The male gonopods are short.

Subgenus *Schizopolybothrus* Verhoeff, 1934

This subgenus was monotypically based on *E. caesar* (Verhoeff, 1899), to which later *E. tabularum* (Verhoeff, 1937) was added. In the present concept *Schizopolybothrus* comprises over a dozen of forms occurring in North Italy, Jugoslavia, Albania, and Greece. Apparently the species of this subgenus are rare, and most of the described forms are known only from the original material.

The characters of the subgenus are the presence of triangular projections on the 9th, 11th and 13th tergites, and a VCm spine on the 15th leg. The 15th leg has one to four VCa spines, and a single claw. 14th leg with one to three VCa spines.

According to the structure of the last two pairs of legs of the male and the male gonopods, the species can be divided into three categories.

I. The 15th leg with a large rounded knob proximad of the middle of the caudal side of the prefemur. The prefemur of the 14th leg often has a triangular process distally on the dorso-caudal side. Gonopods short.

To this group belong *E. caesar* (Verhoeff, 1899), *E. caesar* ssp. *valonensis* (Verhoeff, 1905), *E. caesar* ssp. *patens* (Attems, 1935), *E. spiniger* (Latzel, 1888), *E. acherontis* (Verhoeff, 1900) (probably, although only the female has been described), *E. acherontis* ssp. *wardaranus* (Verhoeff, 1937), *E. stygis* (Folkmanova, 1940), and *E. leostygis* (Verhoeff, 1899). Its known distribution includes Jugoslavia (Bosnia, Hercegovina, Dalmatia, Macedonia), Albania, and Greece (Corfu, Epirus). *E. stygis* and *E. leostygis* were originally described from caves.

II. The 14th and 15th legs without special modifications. Gonopods short.

Here belong *E. tabularum* (Verhoeff, 1937), and probably also *E. excellens* (Silvestri, 1894), although the male characters of the latter are unknown. The two species were described from northwestern Italy (Prov. Cuneo, Prov. Genova), *E. excellens* from caves.

III. Prefemur of the 15th leg with a deep dorsal furrow. Gonopods long.

The two known species, *E. zeus* (Verhoeff, 1901) and *E. sissii* (Kanellis, 1959), were described from Central Greece and Euboea, respectively.

The characters by which the species and subspecies within these three categories are separated concern mainly differences in the numbers of ocelli, antennomeres and coxosternal teeth, and the spinulation of the legs. Their significance in many cases seems dubious, and it is very likely that the groups II and III actually concern only one species each. One may even wonder if not the so-called species and subspecies of group I are just elements of one single polytypic species. Probably the cave-dwelling specimens, with their more elevated number of antennomeres and sometimes reduced number of ocelli, do not represent one or more different troglobiont species, but are merely the cave forms of one troglophilous species. Given the usual instability of the mentioned characters in *Eupolybothrus*, the influence of cave life on the ontogenetic development might well result here in a considerable amount of variability.

Considering the above, it is clear that the following key to the species of *Schizopolybothrus* can be regarded only as a guide to the published descriptions and not as an identification key in the usual sense.

KEY TO THE SPECIES AND SUBSPECIES OF *SCHIZOPOLYBOTHRUS* VERHOEFF

1. Antennae composed of 61 to 83 antennomeres 2
— Antennae composed of 38 to 58 antennomeres 6
2. Eyes consisting of 2 to 5 (10) ocelli. 73 to 80 antennomeres. 7 + 7 to 11 + 11 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3—4, 2—3, 1—2; 2 or 3 VCa spines ..... *E. leostygis* (Verh.)
— Eyes consisting of 13 to 23 ocelli 3
3. 74 to 83 antennomeres. 15th leg with 2 to 4 VCa spines, in the male with a large prefemoral knob. Jugoslavian species 4
— 61 to 76 antennomeres. 15th leg with 1 or 2 VCa spines, in the male without modifications. Italian species 5
4. 15 ocelli. 74 antennomeres. 9 + 9 coxosternal teeth. Ventral spinulation of 14th leg: 1, 1, 3, 2, 1; 2 VCa spines. 15th leg with 3 VCa spines ..... *E. acherontis* (Verh.)
— 18 to 20 ocelli, 81 to 83 antennomeres. 8 + 8 or 9 + 9 coxosternal teeth. Ventral spinulation of 14th leg: 1, 1, 3, 2, 2; 3 VCa spines. Ventral spinulation of 15th leg: 1, 1, 3, 2, 2; 3 tot 4VCa spines ..... *E. acherontis* ssp. *wardaranus* (Verh.)
— 19 ocelli. 83 antennomeres. 10 + 11 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3, 2, 1; 2 VCa spines ..... *E. stygis* (Folkm.)
5. 18 to 20 ocelli. 61 to 76 antennomeres. 7 + 7 to 8 + 8 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3, 3, 2; 1 or 2VCa spines ..... *E. excellens* (Silv.)
— 20 ocelli. 65 to 67 antennomeres. 9 + 9 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3, 2, 1—2; 1 or 2 VCa spines ..... *E. tabellarum* (Verh.)
6. 38 to 50 antennomeres. 15th leg with 1 VCa spine, in the male with a dorsal prefemoral furrow 7
— 50 to 58 antennomeres. 15th leg with 2 to 4 VCa spines, in the male with a large prefemoral knob 8
7. 19 to 20 ocelli. 41 to 50 antennomeres. 7 + 7 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3, 2, 1 ..... *E. zeus* (Verh.)
— 38 antennomeres. 8 + 8 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3, 2, 2 ..... *E. sissii* (Kanellis)
8. 16 to 19 ocelli. 50 to 56 antennomeres. 7 + 7 to 11 + 11 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 4, 2, 0—1; 3 VCa spines ..... *E. spiniger* (Latz.)
— 13 ocelli. 54—57 antennomeres. 6 + 6 to 8 + 9 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3, 2, 0; 2 or 3 VCa spines ..... *E. caesar* (Verh.)
— 19 ocelli. About 50 antennomeres. 8 + 8 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3, 2, 1; 3 VCa spines ..... *E. caesar* ssp. *valonensis* (Verh.)
— 23 ocelli. 58 antennomeres. 9 + 9 coxosternal teeth. Ventral spinulation of 15th leg: 1, 1, 3, 2, 2; 2 or 3 VCa spines ..... *E. caesar* ssp. *patens* (Att.)

In connection with the species of *Schizopolybothrus* the following remarks must be made.

Verhoeff (1943) referred *leostygis* to his subgenus *Mesobothrus*, thus implying that the species has long gonopods. As this is contradictory to his own and to Attems's (1935) descriptions, and as *leostygis* through other characters

shows strong affinities to *acherontis* and *caesar*, we may safely assume that this was an error.

Verhoeff (1943) distinguished a subspecies *stygisleo* of *E. leostygis* which was characterized by having 2 ocelli (instead of 4 to 5) and by having the ten distal antennomeres $1^1/_3$ to $1\frac{1}{2}$ times longer than broad and the last antennomere $1\frac{3}{4}$ times longer than broad. Considering the instability of this kind of characters in the Lithobiidae this subspecies is better withdrawn. The characters in the above key were derived from the descriptions and notes on *leostygis* and *stygisleo* by Verhoeff (1899, 1900, 1943) and Attems (1935). According to Attems the species has up to 10 ocelli.

The record of *leostygis* by Attems (1908) was based on a misidentification and refers to *E. obrovensis* (Verhoeff, 1930).

It is not clear why Attems (1935) referred his subspecies *patens* to *leostygis*. In view of the high number of ocelli and the considerably lower number of antennomeres, this form has comparatively little to do with *leostygis* and is better associated with *caesar*.

E. excellens seems very closely related to *tabularum*, but unfortunately the discovery of the male has to be awaited before a more definite statement can be made. Moreover, *tabularum* is characterized by a dense brush of setae covering partly the coxosternal teeth. This brush is lacking completely in *excellens*.

Subgenus *Eupolybothrus* Verhoeff, 1907, s. str.

The type-species, *Lithobius grossipes* C. L. Koch, 1847, is generally considered to be a junior synonym of *E. fasciatus* (Newport, 1845). Around this species the majority of described species, subspecies and varieties of the genus can be arranged, so that *Eupolybothrus* s. str. is numerically the largest of the recognized subgenera. Geographically it has also the largest range, extending from southeastern France, Switzerland and southeastern Germany, throughout Italy and the Balkans, to Turkey and Syria, and the species are likely to be the dominant forms of the genus in collections from this area. Relatively few species have been described from caves.

The subgenus is characterized by the absence of a VCm spine on the 15th leg, which has a double claw. VCa spines almost always absent. Triangular projections present on the 6th, 7th, 9th, 11th and 13th tergites, rarely reduced or absent on the 6th and 7th. Male gonopods long.

For a long time *E. fasciatus* has been considered to have a range largely agreeing with the area of the subgenus. But, as Verhoeff (1941) has pointed out, most of the earlier *fasciatus* records are probably referable to forms of the group of *E. apenninigenus* (Brölemann, 1894). It seems likely that *E. fasciatus* is restricted to northern Italy and northern Jugoslavia and adjacent Central Europe. According to Verhoeff the only other form belonging to the *fasciatus* group is *E. baldensis* (Verhoeff, 1937).

In one group with *E. apenninigenus* belong *E. apenninigenus* ssp. *presbanus* (Verhoeff, 1941), *E. a.* ssp. *planinarum* (Verhoeff, 1943), *E. a.* ssp. *cribellatus*

(Verhoeff, 1944), *E. a.* ssp. *coxodentatus* (Verhoeff, 1941), *E. a.* ssp. *bilselii* (Verhoeff, 1941), *E. a.* var. *fasciatograecus* (Verhoeff, 1901), *E. albanicus* (Verhoeff, 1934), *E. storkani* (Verhoeff, 1934), and, probably, *E. a.* ssp. *anoplus* Chamberlin, 1952, *E. a.* ssp. *mesobius* Chamberlin, 1952, *E. acigolensis* Chamberlin, 1952, *E. agamus* Chamberlin, 1952, *E. gamus* Chamberlin, 1952, *E. lamprus* Chamberlin, 1952, *E. mediolus* Chamberlin, 1952, *E. segregans* Chamberlin, 1952, *E. sternethus* Chamberlin, 1952, *E. syngenes* Chamberlin, 1952, and *E. telus* Chamberlin, 1952.

Two subspecies and a number of varieties have been associated with *fasciatus*, but probably they belong to the *apenninigenus* group. In fact, the name *bosniensis* Latzel may, after a re-examination of the type material, prove to be the correct name for *apenninigenus*. Pending a revision of the types the names of these subspecies and varieties are *E. fasciatus* ssp. *bosniensis* (Latzel, 1888), *E. f.* ssp. *bosniensis* var. *calabrensis* (Attems, 1929), *E. f.* ssp. *bosniensis* var. *flavescens* (Verhoeff, 1900), *E. f.* ssp. *bosniensis* var. *postsulcatus* (Verhoeff, 1901), *E. f.* ssp. *graecus* (Verhoeff, 1899), *E. f.* ssp. *graecus* var. *pictus* (Attems, 1902), *E. f.* ssp. *graecus* var. *unicolor* (Attems, 1902).

Of the remaining forms referable to *Eupolybothrus* s. str. may be mentioned *E. praecursor* (Attems, 1902), *E. p.* ssp. *alarichi* (Attems, 1934), *E. mesopotamius* (Verhoeff, 1944), *E. athenarum* (Kanellis, 1959), *E. dubius* (Manfredi, 1948), *E. longicornis* (Risso, 1826), *E. l.* ssp. *martini* (Brölemann, 1896), *E. gloriastygis* (Absolon, 1935), and *E. andreevi* Matic, 1964.

Although the number of described species in this subgenus is quite impressive, the number of well recognizable forms is small, and no doubt a revision of the types will result here in a considerable clean-up.

Subgenus **Leptopolybothrus** subgen. nov.

This subgenus is characterized by the absence of VCm and VCa spines on the 15th leg, which has a single claw. Projections present in the 7th, 9th, 11th and 13th tergites, sometimes also on the 6th. Male gonopods long. 15th leg in male without modifications.

The type-species is *Eupolybothrus leptopus* (Latzel, 1880) (= *Lithobius leptopus* Latzel, 1880, Die Myriopoden der österreichisch-ungarischen Monarchie **1** : 53), which has been recorded from southern Germany, Switzerland, and Czechoslovakia to Rumania and Jugoslavia. In this species Verhoeff (1937) has attempted to distinguish some subspecies and varieties which, however, seem rather weakly characterized and which need further definition. Besides the type-species the subgenus includes also *E. cerberus* (Verhoeff, 1929) and *E. cerberus* ssp. *brentanus* (Verhoeff, 1931) from northeastern Italy and northwestern Jugoslavia, both cavernicolous.

Subgenus *Mesobothrus* Verhoeff, 1937

Verhoeff based this subgenus monotypically on *E. transsylvanicus* (Latzel, 1882), to which he added *E. leostygis* and *E. macedonicus* (Verhoeff, 1943) in

1943. As has been pointed out already, *leostygis* is more properly located in the subgenus *Schizopolybothrus*, which leaves only two species in *Mesobothrus*. The range of these two includes Rumania, Jugoslavia and Bulgaria.

The subgenus is characterized by the absence of a VCm spine and the presence of one or two VCa spines on the 15th leg, which has a single claw. Projections are present in the 9th, 11th and 13th tergites, and, in *transsylvanicus*, also in the 6th and 7th tergites. Male gonopods long, the genital sternite of the male medially incised. 15th leg of the male with the femur deeply furrowed. Ventral spinulation of the 15th leg: 0, 1, 3, 2, 2.

Subgenus *Parapolybothrus* Jeekel, 1963

In 1934 Verhoeff used the name *Parapolybothrus* for a subgenus including *E. electrinus* (Verhoeff, 1934), *E. herzegowinensis* (Verhoeff, 1900), *E. obrovensis* (Verhoeff, 1930), and *E. elongatus* (Newport, 1849). As no type-species was designated the name *Parapolybothrus* Verhoeff is an unavailable name. By designating *E. electrinus* as type in 1963 I validated the name.

The subgenus is characterized by the absence of a VCm spine and the presence of a VCa spine on the 15th leg, which has a single claw. Projections are present in the 6th, 7th, 9th, 11th and 13th tergites. Ventral spinulation of the 15th leg: 0, 1, 3, 3, 1 — 2. Male gonopods short, two-jointed, the genital sternite scarcely or not emarginate.

The species referable to this subgenus can be arranged in three categories.

I. The prefemur of the 15th leg of the male inflated just proximad of the middle on the caudal (medial) side. Here belong *E. electrinus*, *E. electrinus* ssp. *paulianus* (Manfredi, 1956), *E. vulcanius* (Verhoeff, 1942), *E. frederici* (Manfredi, 1947), and probably, although the male is not known, *E. imperialis* (Meinert, 1872). All these species came from Italy; *paulianus* was described from a cave.

II. The prefemur of the 15th leg of the male with a conical protuberance just proximad of the middle on the caudal (medial) side.

Here belongs only one cavernicolous species from northwestern Jugoslavia, *E. obrovensis*.

III. Prefemur of the 15th leg of the male without inflation or protuberance.

Here only *E. herzegowinensis*, from Jugoslavia.

The distinction between the species of the first category is hardly possible, and it seems likely that only one species is actually involved.

Subgenus *Allopolybothrus* Verhoeff, 1907

The type-species, *Lithobius koenigi* Verhoeff, 1891, is probably the same as *Lithobius elongatus* Newport, 1849, and *Lithobius impressus* C. L. Koch, 1841, all of which were described from North Africa. For some reason most authors have used the name *elongatus* in recent literature, although probably *impressus* or even *nudicornis* Gervais, 1837, will eventually prove to be the valid name.

As subspecies and varieties of *elongatus* have been described *E. elongatus* var. *oraniensis* (Verhoeff, 1901), *E. e.* ssp. *corsicus* (Léger & Duboscq, 1903), *E. e.* ssp. *alpinus* (Brölemann, 1930), *E. e.* ssp. *calabrus* (Manfredi, 1933), *E. e.* ssp. *aprutianus* (Manfredi, 1950), *E. e.* ssp. *levis* (Verhoeff, 1943), *E. e.* ssp. *imperanus* (Verhoeff, 1937), and *E. e.* ssp. *sardus* (Manfredi, 1956).

Allopolybothrus is characterized by the absence of a VCm spine and the presence of a VCa spine on the 15th leg, which has a single claw. Projections present in the 9th, 11th and 13th tergites, often reduced in the 9th. Ventral spinulation of the 15th leg: 0, 1, 3—4, 1—2, 0—1, (1). Male gonopods short, single-segmented.

Besides North Africa, the range of the subgenus includes Spain, south-eastern France, Italy, and the larger western Mediterranean islands. Probably only one species is involved in which a number of subspecies may be recognized, but the majority of published descriptions are based on a far too scanty material.

References

Attems, C.

1908 Ein neuer Brachydesmus aus Höhlen Istriens. — Zool. Anz., **33** : 492—493.

Jeekel, C. A. W.

1963 The generic and subgeneric names of the European Lithobiidae generally referred to Polybothrus Latzel, 1880. — Ent. Ber., Amsterdam, **23** : 193—195.

Silvestri, F.

1894 Res Ligusticae XXII. Diagnosi di nuove specie di Miriapodi cavernicoli. — Annali Mus. civ. Stor. nat. Genova, **34** : 579—581.

Verhoeff, K. W.

1899 Neue und wenig bekannte Lithobiiden. — Verh. zool.-bot. Ges. Wien, **49** : 451—459.

1900 Lithobiiden aus Bosnien, Herzogowina und Dalmatien. — Berl. ent. Z., **45** : 153—179.

1934 Beiträge zur Systematik und Geographie der Chilopoden. — Zool. Jb. (Syst.), **66** : 1—112, pl. 1—6.

1937 Chilopoden-Studien. Zur Kenntnis der Lithobiiden. — Arch. Naturgesch., (N.F.) **6** : 171—257.

1941 Asiatische Beiträge. — Revue Fac. Sci. Univ. Istanbul, (B) **6** : 85—117.

1943 Über Chilopoden aus westbalkanischen Höhlen. — Z. Karst- u. Höhlenk., **1942/1943** : 133—152.

Drs. C. A. W. Jeekel
Zoölogisch Museum der Universiteit van Amsterdam
Afdeling Entomologie
Zeeburgerdijk 21
Amsterdam-O. — The Netherlands