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# ON THE SPECIMENS OF *EUPOLYBOTHRUS* (*LEPTOPOLYBOTHRUS*) *TRIDENTINUS* (FANZAGO, 1874) (CHILOPODA: LITHOBIIDAE) FROM THE "Z. MATIC" AND "ȘT. NEGREA" COLLECTIONS (ROMANIA)

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**Abstract.** This work is the second of the series dedicated to the critical evaluation of the Chilopod specimens from the "Z. Matic" and "Șt. Negrea" collections – the only ones existing in Romania (*vide* "Literature cited"). The history of the study of *Eupolybothrus tridentinus* (Fanzago, 1874), the synonymies, the examined material, the redescription of the species based on specimens found in the two collections are presented. A nomenclatural updating of two old records is proposed: *Eupolybothrus tridentinus* (Fanzago) = *Polybothrus leptopus sensu* Matic, 1958; *Eupolybothrus tridentinus* (Fanzago) = *Eupolybothrus leptopus* f. *brolemanni sensu* Negrea, 1964. The paper concludes on some taxonomical and ecological remarks regarding the *Eupolybothrus tridentinus* (Fanzago) species.

**Résumé.** Cet article est le second d'une série dédiée à l'évaluation critique des spécimens de Chilopodes des collections "Z. Matic" et "Șt. Negrea" – les seules existant en Roumanie (*vide* "Literature cited"). Sont présentées l'historique de l'étude d'*Eupolybothrus tridentinus* (Fanzago, 1874), les synonymies, le matériel examiné, la redéscription de l'espèce en base des spécimens trouvées dans les deux collections. Une mise à jour de la nomenclature est aussi proposée : *Eupolybothrus tridentinus* (Fanzago) = *Polybothrus leptopus sensu* Matic, 1958; *Eupolybothrus tridentinus* (Fanzago) = *Eupolybothrus leptopus* f. *brolemanni sensu* Negrea, 1964. L'article se conclue avec quelques remarques taxonomiques et écologiques à propos de l'espèce *Eupolybothrus tridentinus* (Fanzago).

**Key words:** collections, re-description, geographical distribution, habitats, "Z. Matic" and "Șt. Negea" collections, Romania.

## *INTRODUCTION*

The genus *Eupolybothrus* Verhoeff, 1907 has a western-Palaearctic distribution, being particularly familiar in Central Europe and the circum-Mediterranean area (Zapparoli, 2006). Until the '60s, the only species of this genus considered certain in Romania was *E. transsylvanicus* (Latzel, 1882) described from Caransebeș (Banat); it has a SE European distribution, meaning Bosnia and Herzegovina, Croatia, Greece, Hungary, Serbia, Montenegro, Romania and Bulgaria (Matic, 1966; Stoev, 2002; Zapparoli, 2006). The second species, *E. fasciatus* (Newport, 1845), was not found in Romanian territory yet; this trans-Adriatic species, described from Florence (*vide* Stoev, 2002: 29), was erroneously cited by Daday (1889) from Mehadia, as also mentioned by Matic (1966: 69). According to Zapparoli (2006), *E. fasciatus* is an endemic species to Apennines (Italy) and the records from the other side of Adriatic sea are probably wrong. The third species, *E. tridentinus* (Fanzago, 1874), was mentioned for the first time in the present Romanian territory at Divici (Banat) by Daday (1889: 103 and 105) under "*Lithobius leptopus* Latzel". According to Stoev (2002), the chorotype of the *E.*

English version by Oriana Irimia-Hurdugan.

*tridentinus* species is "SE-European". It has been found in Greece, Bulgaria, the ex-Yugoslavia, Albania, Italy, Austria, Hungary and even in Germany (Bavaria). In Romania, it was collected in 1928 in several caves in the Mehedinți Mountains (the Southern Carpathians) and, only in 1999, from the SSE (Superficial Subterranean Environment) in the same mountains (the slope of the Motrul Mare Valley at Steiul Roșu, upstream of Cloșani). Matic (1958: 81) identified it under "*Polybothrus leptopus* Latzel 1880" in the material collected from two caves of the Southern Carpathians: Peștera de la Poiana Ruşchiului, 500 m alt., Sohodol-Gorj village (1 ♂, leg. Chappuis and Winkler, 15.06.1928); Peștera de la Vârful Înalt, 800 m alt., Nadanova-Mehedinți village (3 ♀♀, leg. Chappuis and Winkler, 03.06.1928). This material is now part of the "Biospeologica" collection, the 8th series, at the Speleological Institute of Cluj-Napoca – unlike the rest of the chilopods of this collection that have been integrated to the "Z. Matic" collection and received inventory numbers. Negrea (1964: 343) published this species under "*Eupolybothrus* (*P.*) *leptopus* f. *brolemanni* Verhoeff", based on the material from Mehedinți Mountains (Southern Carpathians), more precisely, the caves no. 6, 9, 12 and 13 of the Valea Lupşei, Motrul Mare basin (leg. A. & V. Decu in July and October 1960 and April and September 1961); the paper contains a differential diagnostic accompanied by the description of the coxal pores and of the 6-9 tergites. All these cave captures were cited by Matic (1966). Although "forma *brolemanni* Verhoeff" has no taxonomical and zoogeographical value (it has no important morphological characters and no specific area). I have also mentioned it in Negrea (1965) and Negrea (1966), after which, in the following papers (Matic & Negrea, 1967; Negrea et al., 1993; Negrea, 1994) referring it as *E. leptopus* Latzel, and more recently, in the Romanian Chilopod Catalogue (Negrea, 2006) as *E.* (*Leptopolybothrus*) *tridentinus* (Fanzago, 1874). In other words, I stepped in Eason's and Minelli's footsteps (1976) who examined the Fanzago and Fedrizzi collection, preserved at the Istituto di Biologia Animale, Università di Padova.

In the above cited paper, the two authors are referring, among other things, to "*Lithobius tridentinus*". By examining the previously mentioned collection, they have found in tube 176, labelled "*Lithobius tridentinus* Fanz. (Silv.) Salorno", two specimens of the species commonly known as *E. leptopus* (Latzel). Concluding that the female specimen is Fanzago's holotype, they described it as such in their paper (*vide* Eason & Minelli, 1976: 187). Thus, they established a new synonymy: *E. leptopus* (Latzel, 1880) is a junior synonym of *E. tridentinus* Fanzago, 1874. Following this synonymisation, *E. leptopus*, identified in Romania by Matic (1958) and by Negrea (1964) in several caves in NW Oltenia, must be considered as *E. tridentinus* (Fanzago, 1874) from now on.

The present paper is the second in the series dedicated to the critical evaluation of the Chilopod specimens from "Z. Matic" and "Șt. Negrea" collections – the only Chilopod collections existing in Romania. Since in this introduction I have emphasized the history of the studies, in the following part I will present the old and the new synonymies, the species' redescription based on the specimens from the two collections and, in the end, some taxonomical, zoogeographical and ecological observations regarding *E. tridentinus*.

## *MATERIAL AND METHODS*

The specimens in the "Z. Matic" (Zoological Museum of the "Babeș-Bolyai" University, Cluj-Napoca) and "Șt. Negrea" ("Emil Racovitză" Speleological Institute, Bucharest) collections were re-examined with the aid of a Zeiss

stereoscope (4x – 100x magnification). The drawings were made by the author at scale using a *camera lucida* "Carl Zeiss-Jena" prism type. The obtained data were noted on cards, one for all the specimens of the same species existing in a tube.

All the material is preserved in 75% alcohol.

The acronyms used for the epimorphous stages are: ms – *maturus senior;* mj – *maturus junior;* ps – *pseudomaturus;* pr – *praematurus;* im – *immaturus;* ag – *agenitalis.* Other acronyms: P1 - P15 – leg 1 - leg 15; T – tergite; Cx – coxa; Tr – trochanter; Pf – prefemur; Fe – femur; Ti - tibia.

"Peştera" (in Romanian) = Cave; "Valea" (in Romanian) = Valley.

*RESULTS AND DISCUSSIONS*

## *Eupolybothrus* (*Leptopolybothrus*) *tridentinus* (Fanzago, 1874)

*Lithobius tridentinus:* Fanzago, 1874: 36; ?Daday, 1889: 102.
*Lithobius* (*Neolithobius*) *tridentinus*: Fanzago, 1876: 79.
*Lithobius* (*Eulithobius*) *tridentinus*: Fedrizzi, 1877: 200, 1878: 54; Latzel, 1880: 49 *vide* Eason & Minelli, 1976: 186.
*Lithobius leptopus*: Latzel, 1880: 53.
*Polybothrus tridentinus*: Attems, 1902: 543; ?1929: 306 *vide* Eason & Minelli, 1976: 186.
*Bothropolys* sp.: Manfredi, 1939: 54 *vide* Eason & Minelli 1976: 186.
*Polybothrus leptopus*: Matic, 1958: 81.
*Eupolybothrus leptopus* (Latzel): Matic & Negrea, 1967: 156.
*Eupolybothrus leptopus* f. *brolemanni*: Verhoeff, 1895: 297; Negrea, 1964: 343; Matic, 1966: 75; Negrea, 1965: 290, Negrea et al., 1993: 139; Negrea, 1994: 275; Negrea, 2006: 96; Zapparoli, 2006.
(Fig. 2)

*Type locality*: Valle di Non, Trentino, Italy.

*Type specimen* (*apud* Eason & Minelli, 1976: 187 and 201): the tube no. 176, labelled "*Lithobius tridentinus* Fanz. (Silv.) Salorno" contains the single female on which Fanzago based the description of "*L. tridentinus*" and is believed to be the holotype. In the table at the page 201 it is specified that this holotype originated in Trentino, Italy and that the species named by Fanzago (1874) "*Lithobius tridentinus*" is valid: "*Eupolybothrus tridentinus* (Fanzago, 1874) comb. nov. = *Eupolybothrus leptopus* (Latzel, 1880) Syn. nov." (*vide* Eason & Minelli, 1976: 201).

*Examined material*: The "Z. Matic" collection contains 6 tubes with the *Eupolybothrus tridentinus* specimens, numbered: 513, 515, 529, 1097, 1098 and 1099. In these tubes I have identified the following specimens: no. 513, Cheile Bicazului, 03.10.1958, leg. C. Prunescu: 1 ♂ mj (plus 4 ♀ ms of *Lithobius validus*) (see Negrea, 2010); no. 515, Trascău, 09.06.1957, leg. Z. Matic: 2 ♂ mj, 1 ♀ mj (plus 1 ♂ ms, 1 ♀ ms, 1 ♀ pr of *Lithobius validus*); no. 529, Băile Herculane, 27.05.1963, leg. C. Prunescu: 1 ♀ ps; no. 1097, Peştera de la Vârful Înalt, 04.05.1956, leg. Z. Matic: 1 ♂ mj (plus 1 ♂ and 1 ♀ of *Eupolybothrus* sp. missing the P14-P15); no. 1098, Peştera Ruşchiului, 10.09.1957, leg. Z. Matic: 1 ♂ ms, 1 ♂ mj (plus 1 ♀ im of *Eupolybothrus* cf. *tridentinus*, with only one P15 undetected from the body and presenting projections on the posterior corners of T6); no. 1099, Valea Lupşei, 03.08.1955, leg. Z. Matic: 1 ♂ ms, 1 ♂ ps, 3 ♀ mj (all presenting projections on the posterior angles of the T6) (Fig. 1).

The "Şt. Negrea" collection contains 6 tubes with *Eupolybothrus tridentinus* specimens, numbered: 112, 116, 118, 124, 129, 132, plus 1 tube without number – a total of 7 tubes. In these tubes I have identified the following specimens: no. 112, Peştera no. 6 din Valea Lupşei, 13.09.1961, leg. A. & V. Decu: 1 ♀ mj; no. 116,

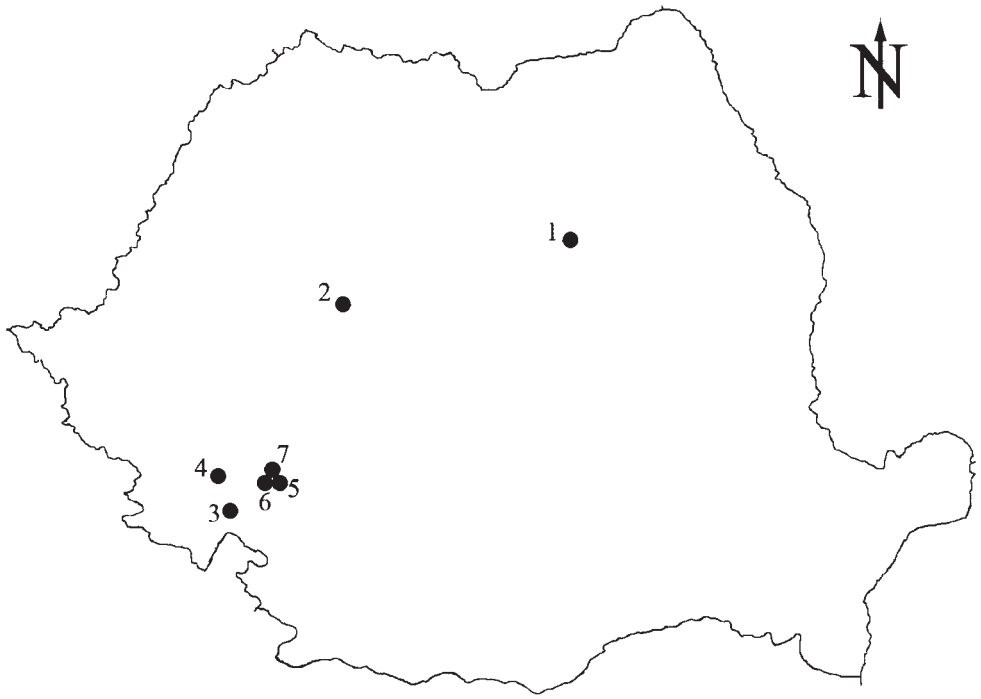


Fig. 1 - The distribution of the origin points of *Eupolybothrus tridentinus* specimens from "Z. Matic" and "Şt. Negrea" collections, in Romania. 1 – Cheile Bicazului; 2 – Trascău; 3 – Băile Herculane; 4 – Peştera de la Vârful Înalt; 5 – Peştera Ruşchiului; 6 – Valea Lupşei; 7 – Valea Motrului upstream of Cloşani (Gorj county) at Steiul Roşu.

Peştera no. 9 din Valea Lupşei, 14.10. 1960, leg. A. & V. D.: 1 ♀ mj, 1 ♂ pr; no. 118, Peştera no. 9 din Valea Lupşei, 27.04.1961, leg. A. & V. D.: 1 ♂ mj; no. 124, Peştera no. 12 din Valea Lupşei, 15.10.1960, leg. A. & V. D.: 1 ♂ ms; no. 129, Peştera no. 13 din Valea Lupşei, 19.07.1960, leg. A. & V. D.: 1 ♀ mj; no.132, Peştera no. 13 din Valea Lupşei, 15.10.1960, leg. A. & V. D.: 1 ♀ mj; unnumbered tube: Valea Motrului upstream of Cloşani (Gorj) at Steiul Roşu, in the 0-15 cm horizon, 16.10.1999, leg. Victoria Ilie: 1 ♀ ps (Fig. 1). It is the first specimen found in the Southern Carpathians outside the caves, in a SSE (Superficial Subterranean Environment) borehole.

*Note*. On the labels placed inside the tubes no. 513 (Cheile Bicazului = Bicaz Gorges) and no. 515 (Trascău) from the "Z. Matic" collection, in which specimens of *E. tridentinus* are found together with those of *Lithobius validus*, only the second species is mentioned as *L. punctulatus* (on one label) and as *L. punctulatus moldavicus* (on another label) – from which one can assume that the *E. tridentinus* specimens have been placed in the tube subsequent to a maintenance manipulation of the collection.

The tubes no. 1097-1099 are labelled *Eupolybothrus leptopus* Latzel – a junior synonym of *E. tridentinus*, used by myriapodologists at that time. On the labels of the " Şt. Negrea" collection only one name appears: *Eupolybothrus* (*P.*) *leptopus* f. *brolemanni* Verhoeff, used in the '60s by the most part of the European chilopodologists.

*Redescription*.

Body length (measured from head to end of the last tergite): ♂ ms: 18-20 mm; ♀ ps: 13-15 mm; ♂ pr: 11-12.5 mm. Width (T10): ♂ ms: 3 mm; ♂ and ♀ mj: 2.7 mm. Body colour: yellowish chestnut brown, darker on the extremities and with a black median strip on the tergites. Antennae: ♂ ms: 10.5 mm, ♂ and ♀ mj: 8-9 mm. The number of the articles of the antennae varies according to the development stage: ♂ ms: 46+49 (at the same specimen); ♂ and ♀ mj: 39+39; 40+41 or 40+43; ♀ ps: 31+33; ♂ pr: broken. The last article of the antenna is 1.5 times longer than the previous one. The ocelli are disposed on 3-4 irregular rows. The first ocellus after the posterior one is almost as big as the latter. At the ♂ ms: 1+17 ocelli on 4 rows (1+3,5,5,3); ♂ and ♀ mj: 1+11-16 on 3-4 rows (1+4,4,4,3; 1+4,3,3; 1+3,5,3,3); ♀ ps: 1+10-16 (1+4,5,4,3; 1+3,4,4,2); ♂ pr: 1+8 (1+2,4,2). The Tőmősváry organ is situated near the rim of the cephalic shield, being either equal, slightly smaller or bigger than the nearby ocelli, well contoured, but can also be indistinct. The cephalic shield is slightly wider than longer. The forcipular coxosternite (prosternum) is provided with numerous small, robust, teeth, black and blunt-tipped, disposed in a regular pattern as follows: ♂ ms: 8+8; ♂ and ♀ mj: 7+6, 7+7, 7+8 or 8+8; ♂ and ♀ pr: 7+7 or 8+8. The median groove is small. The porodonts are spine-like, short, with thick bases and sharp tips. The T7, T9, T11 and T13 present obvious triangular projections at the posterior corners (Fig. 2 a). T6 with rounded posterior angles; sometimes, in the adult forms, they are straight or even slightly prominent, but without forming real triangular projections. An exception is made in the case of the specimens identified as *Eupolybothrus* cf. *tridentinus,* collected in Peştera Ruşchiului and Valea Lupşei, presenting large projections. It might be a new species. The coxal pores of P12-P15 (Fig. 2 b) are round, disposed on three irregular rows in the ms, mj and ps stages placed at uneven distances between them, 8-16 pores for one coxa: the internal row is formed of 4-7 glandular pores remarkably larger than the others; the median row has 6-11 smaller pores, while the external row has 2-3 very small pores, situated at the very edge of the poriferous area. The ♂ pr has 8-9 pores disposed in two rows. The femur and the tibia of P1-P12 are diffusely coloured in a brown-violaceous pigment. If P1 is barely coloured on the femur, the colour intensifies towards the rear extremity of the body, so that P12 and P13 are very well coloured, with pigment concentrations without forming maculae; the other articles (coxa, trochanter, prefemur and tarsus) are yellow, without the pigment. P14-P15 have a violaceous pigmentation, from the trochanter to the tibia, but only on the internal side of the femur and tibia, there are small, packed maculae (glandular pores) on an intense violaceous background; the tarsus has a dirty yellow colour, presenting on the internal side some violet maculae, rare and blurred. The metatarsus is also dirty yellow coloured, lacking the maculae and having the distal part pale yellow coloured. P15 are long and thin, without any particular conformations; the apical claw is simple. Sometimes a small rudimentary claw is present, not longer than ½ of the width of the main claw. P1-P14 have a secondary claw. The P12-P15 coxae have no coxolateral spines. The female gonopods (Fig. 2 c) are hunched and present 2+2 conical spurs, relatively short, slightly curved and sharp-tipped. The apical claw is simple, strongly curved, sickle shaped. All three articles present long setae on the external side; on the internal side, several setae are present. The dorsal rim of the three articles is provided with bristles disposed in one more or less regular row and having different lengths for each article, as follows: 3-6 bristles on the first (basal) article; 7-13 bristles on the second (middle) article; 0-1

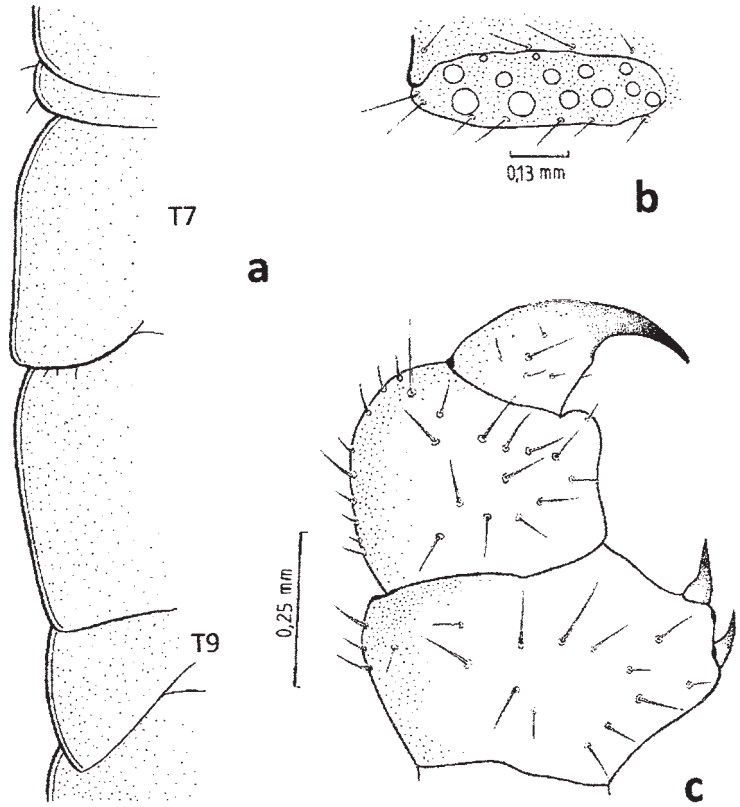


Fig. 2 - a, ♀ mj of *Eupolybothrus tridentinus* (Fanzago, 1874) collected on the 13th of Sept. 1961 from the Peştera no. 6 din Valea Lupşei, NW Oltenia – T6 to T9, left side - (reproduced from Negrea, 1964: 344); b, ♀ ps from Steiul Roşu, Valea Motrului, Gorj county, collected on the 16th of Oct. 1999 - P13 coxal pores (right); c, same, female gonopod, external side.

bristles on the third (apical) article. The male gonopods are long and curved distally, presenting setae only on the distal half. In the *praematurus* stage, the gonopods are bud-like. P1-P15 spinulation of mature stage is presented in the table 1. This spinulation is much poorer in the *praematurus* stage. For the same specimen, the same spines can be present on one leg and missing on the other leg of the same pair.

*Taxonomical remarks*

From the description made by Eason & Minelli (1976), it results that the holotype of the species *E. tridentinus* is quite deteriorated, missing taxonomically important appendages and body parts. This is the reason why the complete description presented in this paper – including data on the development stages – made on material from the Southern Carpathians is more than welcomed. It completes Matic's data (1958, 1966) on "*Polybothrus leptopus* Latz." respectively on *E. leptopus* Latz.

*Ecological remarks*

In the Mediterranean countries, *E. tridentinus* is common to the beech woods, in humid, shaded places, especially on the creek banks and seldom in drier, rockier

*Table 1*

The spinulation of the 1-15 legs in mature stage of *Eupolybothrus tridentinus* (Fanzago, 1874) (the spine in parenthesis may be missing).

| Leg no. | Ventral | | | | | Dorsal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Cx | Tr | Pf | Fe | Ti | Cx | Tr | Pf | Fe | Ti |
| 1 | - | - | m(p) | (a)m | (a)m | - | - | am(p) | a(p) | a(p) |
| 2 | - | - | mp | am | am | - | - | amp | a-p | a(p) |
| 3 | - | - | mp | am | am | - | - | amp | a-p | a-p |
| 4 | - | - | mp | am | am | - | - | amp | a-p | a-p |
| 5 | - | - | mp | am | am | - | - | amp | a-p | a-p |
| 6 | - | - | mp | am | am | - | - | amp | a-p | a-p |
| 7 | - | - | mp | am | am | - | - | amp | a-p | a-p |
| 8 | - | - | mp | am | am | - | - | amp | a-p | a-p |
| 9 | - | - | amp | am | am | - | - | amp | a-p | a-p |
| 10 | - | - | amp | am | am | - | - | amp | a-p | a-p |
| 11 | - | - | amp | am | am | - | - | amp | a-p | a-p |
| 12 | - | - | amp | amp | am | - | - | amp | a-p | a-p |
| 13 | - | - | amp | amp | am | - | - | amp | a-p | p |
| 14 | - | m | amp | amp | (a)m | (a) | - | amp | (a)p | p |
| 15 | - | m | amp | amp | (a)m | a | - | (a)mp | p | - |

places (Matic, 1958). According to Stoev (2002), in Bulgaria this species lives at the altitude of 120-1600 m where its habitat includes coniferous and deciduous forests in mountain area but it is also present in open areas (bush, lawn, meadow, rocky fields or slopes). To these habitats I added the caves and the superficial soil under the hemiedaphon. The different habitats are preferred in the following order: *Fagus sylvatica, Picea abies, Salix* sp., *Corylus avelana, Tilia* sp., *Quercus* sp., *Pinus* sp. and caves. Regarding the latter, Negrea (1965, 1966) emphasizes that, in the caves from Valea Lupşei, the specimens were collected in the photic zone, in the leaves at the base of the caves' walls, knowing that the caves are small and damp and situated in rare beech woods, and specifies that *E. tridentinus* must be considered a subtroglophile species. In another paper, Matic & Negrea (1967) have identified, for the first time in Romania, some specimens of *E. tridentinus* in the superficial environments: in Valea Iaunei (one of Cerna's tributaries) under beech dote; at Vârtoape (in Oltenia) under the bark, in beech dote and in the soil underneath the litter, from July to October. Finally, Negrea et al. (1993) added a first cave from Banat Mountains: Peştera Albă din Valea Comarnicului, in the floor fauna.

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# ASUPRA SPECIMENELOR DE *EUPOLYBOTHRUS* (*LEPTOPOLYBOTHRUS*) *TRIDENTINUS* (FANZAGO, 1874) (CHILOPODA: LITHOBIIDAE) DIN COLECȚIILE "Z. MATIC" ȘI "ȘT. NEGREA" (ROMÂNIA)


## REZUMAT

Acest articol este al doilea dintr-o serie dedicată evaluării critice a specimenelor de Chilopode din colecțiile "Z. Matic" și "Șt. Negrea" – singurele existente în România (*vide* "Literature cited"). Articolul conține istoricul studiului speciei *Eupolybothrus tridentinus* (Fanzago, 1874), sinonimiile, materialul examinat, redescrierea speciei pe baza specimenelor găsite în cele două colecții. Este propusă și o actualizare a nomenclaturii: *Eupolybothrus tridentinus* (Fanzago) = *Polybothrus leptopus sensu* Matic, 1958; *Eupolybothrus tridentinus* (Fanzago) = *Eupolybothrus leptopus* f. *brolemanni sensu* Negrea, 1964. Articolul se încheie cu câteva remarci taxonomice și ecologice despre specia *Eupolybothrus tridentinus* (Fanzago).


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