Travaux du Muséum National d'Histoire Naturelle «Grigore Antipa»	Vol. LIII	pp. 125–138	© Décembre 2010

DOI: 10.2478/v10191-010-0009-4

CRITICAL EVALUATION OF THE SPECIMENS OF *LITHOBIUS VALIDUS* MEINERT – SPECIES GROUP (CHILOPODA: LITHOBIIDAE) FROM THE "Z. MATIC" AND "ŞT. NEGREA" COLLECTIONS (ROMANIA)

ŞTEFAN NEGREA

Abstract. Z. Matic's collection, preserved at the Zoological Museum of the "Babeş-Bolyai" University of Cluj-Napoca, and Şt. Negrea's collection, preserved at the "Emil Racovitza" Speleological Institute of Bucharest (the only chilopod collections existing in Romania) are containing three species of the *Lithobius validus* Meinert group: *L.* (*L.*) *validus* Meinert, 1872 (*sensu* Eason, 1974 a), *L.* (*L.*) *moldavicus* Prunesco, 1966 (*sensu* Negrea, in the present paper) and *L.* (*L.*) *matici* Prunesco, 1966. New synonymies are proposed: *Lithobius punctulatus moldavicus* Prunesco, 1966 = *Lithobius moldavicus* Negrea in this work = *Lithobius validus* Zapparoli, 1994 nov. syn.; *Lithobius matici* Prunesco, 1966 = *Lithobius matici biharicus* Prunesco, 1966 nov. syn. The subspecies *Lithobius punctulatus moldavicus* Prunesco, 1966 is elevated to the taxonomical rank of species, *Lithobius moldavicus* Prunesco, establishing its geographical area as it is currently known. The following species are redescribed: *Lithobius validus* Meinert, 1872, based on the Romanian Carpathians populations; *Lithobius moldavicus* Prunesco, 1966 based on the specimens of the Eastern Carpathians – including the type series, establishing a *lectotypus* and an *allolectotypus*; *Lithobius matici* Prunesco, 1966 based on populations from the Eastern Carpathians and the Western Carpathians.

Résumé. La collection de Z. Matic, gardée au Musée Zoologique de l'Université "Babeş-Bolyai" de Cluj-Napoca et la collection de Şt. Negrea, gardée à l'Institut de Spéléologie "Émile Racovitza" de Bucarest (les seules collections de chilopodes existant en Roumanie) contiennent trois espèces du groupe Meinert de *Lithobius validus*: *L.* (*L.*) *validus* Meinert, 1872 (*sensu* Eason, 1974 a), *L.* (*L.*) *moldavicus* Prunesco, 1966 (*sensu* Negrea, dans l'article ci-present) et *L.* (*L.*) *matici* Prunesco, 1966. Sont proposées de nouvelles synonymies: *Lithobius punctulatus moldavicus* Prunesco, 1966 = *Lithobius moldavicus* Negrea dans l'article présent = *Lithobius validus* Zapparoli, 1994 nov. syn.; *Lithobius matici* Prunesco, 1966 = *Lithobius matici biharicus* Prunesco, 1966 nov. syn. La sous-espèce *Lithobius punctulatus moldavicus* Prunesco, 1966 est élevée au rang d'espèce, *Lithobius moldavicus* Prunesco, en lui traçant l'aire géographique telle qu'elle est connue à présent. Les espèces suivantes sont décrites à nouveau: *Lithobius validus* Meinert, 1872 basée sur des populations des Carpates roumains; *Lithobius moldavicus* Prunesco, 1966 basée sur des populations des Carpates Orientaux – incluant la série type et établissant un lectotypus et un allolectotypus; *Lithobius matici* Prunesco, 1966 basée sur des populations des Carpates Orientaux et Occidentaux.

Key words: *Lithobius validus* s. str., *Lithobius moldavicus*, *Lithobius matici*, new synonymies, re-description, geographical distribution, "Z. Matic" and "Şt. Negrea" collections, Romania.

INTRODUCTION

The study of the biodiversity is a prioritary objective of the UE zoologists engaged, among others, in the achievement of the "Fauna Europaea" project. The Romanian Chilopod Catalogue (Negrea, 2006) fitted in this context by critically presenting all the species mentioned on the present Romanian territory, including the probable ones. This catalogue is to be continued by a series of works containing the reexamination of the two chilopod collections existing in Romania: the "Zachiu

English version by Oriana Irimia-Hurdugan.

Matic" collection (Zoological Museum of the "Babeş-Bolyai" University, Cluj-Napoca) and the "Ştefan Negrea" collection ("Emil Racovitza" Speleological Institute, Bucharest). The present work is the first of this series and refers to the "*Lithobius validus* Meinert - group species" that I have identified in the two collections. At the end of the study of these collections, while publishing the results, I will indite a monography, bringing our knowledge on the Romanian chilopods up to date, for the first time in forty years that passed since the publishing of the remarkable volumes of my regretted colleague and friend, Zachiu Matic (1966, 1972).

The collection constituted by Z. Matic has been donated to the Zoological Museum of the Cluj University during his lifetime, without publishing its catalogue. It contains the specimens he collected himself as well as the geophilomorphs collected by his collaborator, Cornelia Dărăbanţu for her PhD thesis, a series of tubes with biological material borrowed from the famous "Biospeologica" collection put together by R. Jeannel and E. Racovitza, as well as the "type series" containing specimens collected and used by Prunesco (1966) for the description of *Lithobius punctulatus moldavicus* and of *Lithobius matici* with its two subspeçies: *L. matici matici* and *L. matici biharicus*. Thus, the valuable collection of Z. Matic has offered me the necessary material for the revision I was about to enterprise in order to elucidate the taxonomical status of the above mentioned subspecies as well as that of *Lithobius matici* Prunesco (*nomen novum* for *L. validus punctulatus* Verhoeff, 1937) and of the populations of *Lithobius validus* Meinert, 1872 of the Romanian Carpathians.

The presence of some tubes suffering at some point of desiccation showed that the Museum's personnel have manipulated sometimes the collection. I suppose that, during one of these verifications, the content of several tubes containing different species was mixed together. Only this would explain the presence of some *Eupolybothrus tridentinus* (Fanzago, 1874) specimens alongside *Lithobius validus* in the tubes no. 513 (Cheile Bicazului) and 515 (Trascău) labeled as *L. punctulatus*; also it could explain why the only specimen (1 ♀ ps) from the tube no. 529 (Băile Herculane), labeled in ink as *L. punctulatus moldavicus*, is actually *E. tridentinus* (details are presented in the description of the mentioned species, paragraph: "Examined material").

The "Ştefan Negrea" collection is still not finished (chilopods are still received and identified by me). In the near future, this collection is to be closed and its catalogue is to be published for the use of taxonomists interested in information on its contents.

In this study I reached the conclusion that, from a classification point of view, one and the same taxon appears under several different names for different authors so new synonymies are proposed:

- *Lithobius validus* Meinert, 1872 and Eason, 1974 a = *Lithobius punctulatus punctulatus sensu* Prunesco, 1966;

- *Lithobius validus* Meinert, 1872 = *Lithobius punctulatus sensu* Matic, 1966;

- *Lithobius punctulatus moldavicus* Prunesco, 1966 = *Lithobius moldavicus sensu* Negrea in this paper = *Lithobius validus sensu* Zapparoli, 1994 nov. syn. (the synonymy is based on the author's gonopod draw on the collected material, see species description in the present paper);

- *Lithobius matici* Prunesco, 1966 = *Lithobius matici biharicus* Prunesco, 1966, nov. syn. (the synonymy is based on the study of the same specimens of the "Zachiu Matic" collection, also examined by C. Prunesco, see the species description in the present paper).

The "*Lithobius punctulatus* Prunesco, 1966 subspecies" (sic! Correct: *Lithobius punctulatus moldavicus* Prunesco, 1966) is elevated at the taxonomical rank of species – *L. moldavicus* Prunesco – establishing its geographical area based on the data presently known.

Lithobius validus Meinert, 1872, *L. moldavicus* Prunesco, 1966 and *L. matici* Prunesco, 1966 are redescribed after the specimens from the studied collections. *Lectotypus, allolectotypus* and *paralectotypi* are established for *Lithobius moldavicu*s, chosen from the typical series kept in the "Zachiu Matic" collection.

MATERIAL AND METHODS

The material from the "Z. Matic" and "Șt. Negrea" collections was reexamined with the aid of a Zeiss stereoscope (4x to 100x magnification), and the drawings were made on scale using a *camera lucida* "Carl Zeiss-Jena" prism type. The obtained data were noted on cards, one for all specimens of the same species existing in a tube.

All material is preserved in 75% alcohol. The tubes of the "Z. Matic" collection contain also a Museum label (written in China ink) and one or two labels written in crayon by Z. Matic (the most part) or by C. Prunesco (I am acquainted with their handwriting) – to which I added my own label, containing the result of the reexamination presented in this paper.

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 – leg 1 (P from the latin *pes-pedis*); Cx - coxa; Tr - trochanter; Pf - prefemur; Fe - femur; Ti - tibia; T – tergite.

I was surprised to notice that the anamorphous stages were absent (*foetus, larva* I, II, III, IV and *larva media*) from the "Z. Matic" collection. I personally consider that the identification of each specimen's stage of development is necessary since it provides the certitude of the species identification and eliminates the possibility to describe a juvenile stage as a new species (subspecies), etc.

RESULTS

In this part of the paper I will present the results of the reexamination of the specimens of the *Lithobius validus* Meinert – group species from the "Z. Matic" and "Șt. Negrea" collections which proved to belong to three species: *L.* (*L.*) *validus* Meinert, 1872, *L.* (*L.*) *moldavicus* Prunesco, 1966 and *L.* (*L.*) *matici* Prunesco, 1966. I have reached the conclusion that all the three species are valid and that, at least on the Romanian territory, they have no subspecies.

Lithobius* (*Lithobius*) *validus Meinert, 1872, sensu Eason, 1974 a

Lithobius validus Meinert, 1872: 291; Eason, 1974 a: 11; 1974 b: 71; Negrea, 2006: 107.
Lithobius punctulatus Latzel, 1876: 97 (*non vide*!); Matic, 1966: 110.
Lithobius calabrensis Fanzago, 1880 a: 269.
Lithobius brachycephalus Fanzago, 1880 b: 16.
Lithobius molleri Verhoeff, 1893: 317 (*non vide*!).
Lithobius punctulatus punctulatus Prunesco, 1966: 53.
?*Lithobius punctulatus* C. L. Koch, 1847: 147 (**Nomen dubium** cf. Eason, 1974 a: 146).
Non *Lithobius validus* var. *punctulatus* Latzel, 1888: 93 (*non vide*!); Verhoeff, 1900: 156 (*non vide*!).
(Fig. 1 a, b)

Type locality. Rasa (South Tirol).

Type specimens. *Lectotype*: a female selected by D. Schmidt, labeled "*Lithobius validus* Mein. Razzes M." *Paralectotype*: a male accompanying the lectotype and conspecific with it (preserved at the British Museum N.H., Reg. no 13.6.18.614-615 – vide Eason, 1974 a: 11-12).

Examined material. The "Z. Matic" collection contains 17 tubes of *Lithobius validus* Meinert, numbered: 512-526, 530 and 533. In these tubes I have identified the following specimens: no. 512: Ceahlău, 10.06.1959: 1 ♂ ms, 1 ♂ mj, 2 ♀ ms, 1 ♀ mj; no. 513: Cheile Bicazului, 03.10.1958: 4 ♀ ms (plus 1 ♂ mj of *Eupolybothrus tridentinus*); no. 514: Băile Herculane, 12.11.1960: 2 ♂ mj, 1 ♀ mj; no. 515: Trascău, 09.06.1957: 1 ♂ ms, 1 ♀ ms, 1 ♀ pr (plus 2 ♂ mj and 1 ♀ mj of *Eupolybothrus tridentinus*); no. 516: Cheile Bicazului, 12.07.1960: 1 ♂ ps, 1 ♀ ms; no. 517: Lacu Roşu, 20.05.1961: 1 ♂ ps, 1 ♀ ms; no. 518: Bicaz, 25.04.1962: 1 ♂ ms, 1 ♂ mj, 1 ♀ ms; no. 519: Băile Herculane, 07.05.1961: 1 ♂ ms, 1 ♂ ps, 1 ♀ ps; no. 520: Slănic Moldova, 05.10.1962: 1 ♀ mj; no. 521: Ceahlău, 20.04.1961: 1 ♂ ms, 1 ♀ ms, 2 ♀ ps; no. 522: Târgu Ocna, 21.04.1961: 1 ♂ ps; no. 523: Tarcău, 28.10.1960: 1 ♂ ps, 1 ♀ ms; no. 524: Cheile Bicazului, 15.05.1962: 1 ♀ ms; no. 525: Zagreb (Croatia), 11.05.1969: 27 specimens ♂ and ♀ ms, mj, ps, pr, im; no. 526: Zagreb (Vhorine Dolyi B. Potoh Kriva Draga), 21.08.1961: 11 specimens ♂, ♀, ms, mj, ps; no. 530: Băile Moneasa, 20.04.1961: 1 ♂ pr; no. 533: Stâna de Vale (Bihor), 13.05.1926, leg. R. Jeannel: 1 ♀ ps. It is the only label inscribed with the name of the person who collected the material in the 17 tubes, written in China ink in Jeannel's handwriting - so this material is part of the "Biospeologica" collection put together by Emil Racovitza.

Note. On the labels placed inside the tubes, *L. validus* Meinert, appears as: *L. punctulatus* (no. 512-526); *L. validus* and *L. punctulatus moldavicus* (on two of the labels placed inside tube no. 530); *L. validus punctulatus* and *L. matici biharicus* (on two of the labels placed inside tube no. 533). On the labels there is no mention of the name or the date of the person that wrote them.

Redescription based on the examined material.

Body length (measured from head to T15 included) of the ms: 25-30 mm; mj: 22-24 mm; ps: 18-21 mm; pr: 14.5-17 mm. Colour: chestnut-brown, darker on the cephalic shield. Long antennae, of 41 to 46 articles (there are teratological cases: ♀ ms with 43+24 articles or with 46+18 articles); the last article is 1.5-2 times longer than the previous. Pigmented ocelli, counting 1+23 up to 1+27 on 6-7 irregular, curved, bent rows, sometimes unarranged in rows. The Tőmősváry organ is the size of a middle size ocellus, with a round, slightly convex contour. The forcipular coxosternite presents 6+6 up to 8+8 robust, blunt, black-tipped teeth. The T 6, 7, 9, 11 and present large, broad and pointed-tip triangular projections at the angles. The coxal pores are well shaped: the first proximal one is small and round, the following are increasingly oval and bigger, becoming "buttonhole"-shaped, their number (at the ms and the mj) is between 7 and 9 pores on each of the P12-P15 coxa. The legs 1-15 have a bi-articulated tarsus, with a yellowish-chestnut brown coloration; especially on the P12-P15, the internal side of the prefemur, femur and tibia, there are maculae filled with violaceous pigment. There are no coxolateral spinous setae on P12-P15. The P15 claw is simple.

The adult female gonopods (Fig. 1 a, b) have an apical claw with three denticles: the middle one is the strongest and the longest: the internal one is more developed than the external one. The spurs, 2+2, are cylindrical-conical, relatively short and robust. The first (basal) article presents two irregular rows of bristles, more or less thin, on the internal antero-ventral rim (underneath the spurs), which interconnect at the level of the spur and get smaller towards the base – a total number of 16-22. The second (median) article has 17-25 dorsal bristles, of different

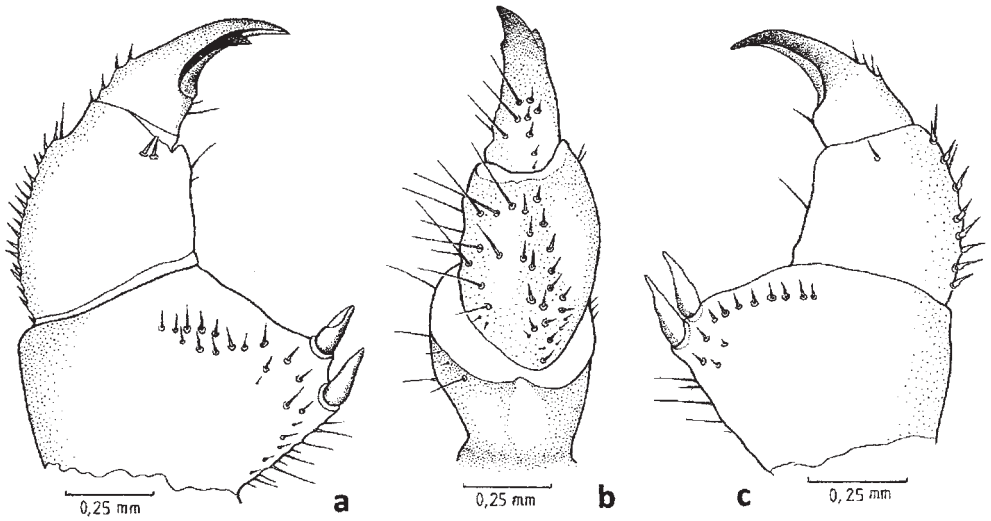

Fig. 1 - *Lithobius validus* Meinert – ♀ gonopod: a, internal side (Ceahlău Mountain, 10.06.1959); b, same gonopod in dorsal view; c: *Lithobius moldavicus* Prunesco – ♀ gonopod, internal side (Cheile Bicazului, 03.09.1962).

lengths, shorter and denser towards the base of the article, not arranged in rows; on the internal side there are 1-2 acute setae; on the external side there are numerous long setae. The third (apical, claw bearer) article has 5-7 bristles smaller and thinner at the base on its dorsal rim, most often forming an irregular row; on the external side there are long setae situated at the base of the claw.

The legs' spinulation is rich, as presented in table 1. The variability of the spinulation on P1-P15 is very low, within the regular limits for this species.

Lithobius* (*Lithobius*) *moldavicus Prunesco, 1966

Lithobius moldavicus Negrea, 2006: 103 **stat. nov**.

Lithobius punctulatus moldavicus Prunesco, 1966: 55; Matic, 1966: 112.

Lithobius validus Zapparoli, 1994 a: 249 **nov. syn.**

?*Lithobius validus rotteri* Dobroruka, 1958: 205. It has been described based on 3 specimens from Batumi; the differences are the lack of the triangular projections of the T6, the simpler P15 spinulation: (V: 01321, D: 10200), the lesser number of coxal pores (5-6 on a coxa); the length of the body (18-21 mm) indicates a ps stadia – which would also explain the quantitative differences.

(Figs 1 c, 2)

Type locality. The Ceahlău Mountain (indicated by Prunesco, 1966, as "*terra typica*").

Type specimens. Due to the fact that, in the present paper, I am elevating Prunesco's subspecies (1966) to the rank of species and because he did not established the type, I am selecting the following lectotypes from the specimens collected by Prunesco and kept in the "Z. Matic" collection: *Lectotype*: the only ♀ ms from the tube no. 527. *Allolectotype*: 1 ♂ pr from the tube no. 528. *Paralectotypes*: the remaining specimens (4 ♀ mj, 1 ♀ ps) from the tube no. 528.

Table 1

The spinulation of the legs 1-15 in *Lithobius validus* Meinert (the spines in parenthesis may lack from one or both legs of that pair).

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

Examined material. The "Z. Matic" collection contains the following specimens of *L. moldavicus*, all of them belonging to the series of "type specimens": no. 527: Cheile Bicazului, 03.09.1962: 1 ♀ ms; no. 528: Tarcău, 07.05.1963: 4 ♀ mj, 1 ps ♀, 1 pr ♂. The "Șt. Negrea" collection contains only one specimen: no. F336 (temporary number): Bertea (The Bend Subcarpathians, Prahova), on a gypsum diaclasis, 4.5 m deep, leg. E. Nitzu, 14.06.2001: 1 ♂ mj.

Note. On the labels inside the "Z. Matic" collection tubes, *L. moldavicus* Prunesco appears as: *L. validus punctulatus* and *L. punctulatus moldavicus* (on the two labels inside the tube no. 527) and as *L. validus* and *L. punctulatus moldavicus* (on the two labels inside the tube no. 528). The following specimens don't belong to the *L. moldavicus* species although one of the two labels inside the tubes specifies "*L. punctulatus moldavicus*": 512 (Ceahlău, 10.06.1959); 513 (Cheile Bicazului, 03.10.1958); 515 (Trascău, 09.06.1957); 521 (Ceahlău, 20.04.1961); 529 (Băile Herculane, 27.05.1963); 530 (Băile Moneasa, 20.04.1961); these tubes contain, mainly, *L. validus* Meinert specimens (see the precedent species).

Redescription based on the examined material.

Body length (measured from head to T15 included) of the ♀ ms = 26 mm; ♀ mj = 20-24 mm; ♀ ps = 18 mm; ♂ pr = 14 mm. Colour: yellowish-chestnut brown, relatively uniform, darker on the forehead. Head (Fig. 2 a) slightly wider rather than longer. Long antennae (up to half of the body length): ♀ ms: 49-50 articles, ♀ mj: 47-53, ♀ ps: 18; ♂ pr: 14. The last article is 1.5-1.7 times longer than the previous. The round or oval ocelli (Fig. 2 b), disposed on 4-5 rows, more or less regular: ♀ ms: 1+17 (left) and 1+19 (right); ♀ mj: 1+18-19; ♀ ps: 1+13-14; ♂ pr: 1+9-11 in irregular rows. The Tőmősváry organ is the size of a middle size ocellus. The forcipular coxosternite (Fig. 2 c): ♀ ms: 7+7 robust, blunt teeth with the median suture narrow and deep and disposing of 2+2 porodonts, thick-based and pointed-tipped; ♀ mj: 6+6 – 7+7; ♀ ps: 6+6; ♂ pr: 6+6. T6, 7, 9, 11, 13 (Fig. 2 d) presenting triangular projections on the posterior angles at all the epimorphous stages. The

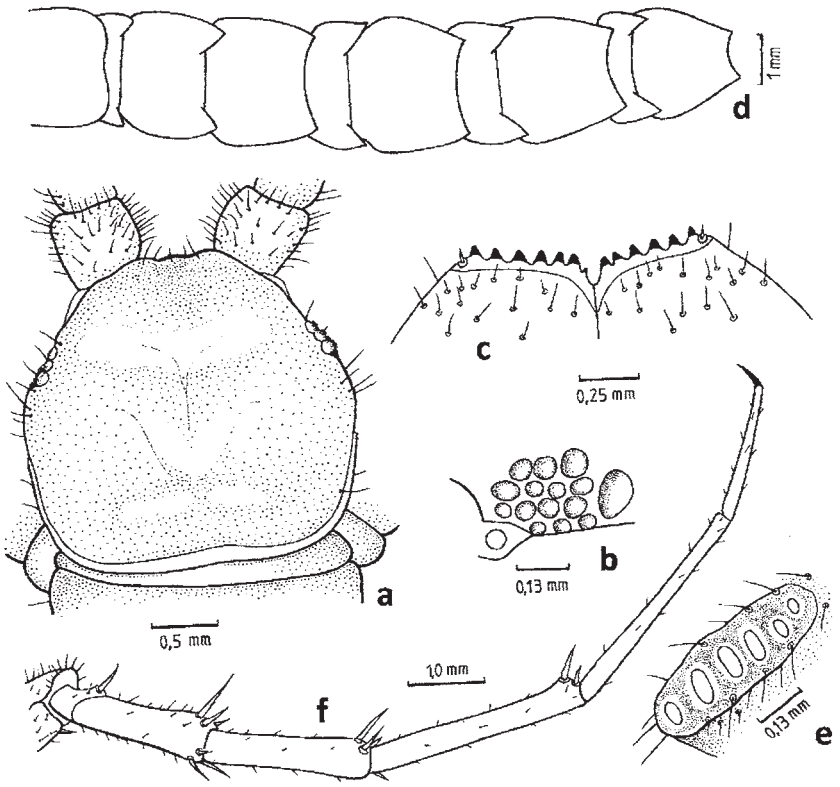

Fig. 2 - *Lithobius moldavicus* Prunesco: a, cephalic shield; b, the ocelli and the Tőmősváry organ; c, forcipular coxosternite; d, tergites 5-14; e, P15 coxal pores; f, the right P15, external side. Male from the Bend Subcarpathians, Bertea, 14.06.2001.

coxal pores (Fig. 2 e) from the P1-P15 are buttonhole shaped, excepting the first proximal pore that is round and small, followed by 1-2 oval pores, increasing in size; ♀ ms: 8-9 pores on a single row; ♀ mj: 6-8; ♀ ps: 5-7; ♂ pr: only 5 round or slightly oval pores. The legs 1-15 have a bi-articulated tarsus, light chestnut brown colored. The glandular pores are present on the P12-15, easily noticeable on the internal side, as violaceous maculae, with a clear contour on the P15. The legs 14 and 15 are long and slender; P15 (Fig. 2 f) with a simple apical claw and without coxolateral spinous setae. The female gonopod (Fig. 1 c) with a simple claw and 2+2 spurs 3-3.5 times bigger in length than in width. The ms female presents 10 bristles on the first article of the gonopod on the internal side, relatively thin and almost equal; the last 2 bristles at the spurs level are doubled by shorter setae; the mj females have a row on the internal side of the first article composed of 7+6, 8+10 or 10+10 bristles; the ps female presents a row of only 3-4 bristles. The second article of the ms gonopod presents on the dorsal rim an irregular row of 8 bristles, quasi-equal, the last 2 distal bristles being doubled, on the external side, by two longer bristles; the mj females have the dorsal row composed of 6+7, 8+6 or 7+7 bristles, doubled externally at the distal end by 2-3 longer bristles; the ps female has the dorsal row formed of 4-5

unequal bristles, in an irregular pattern, doubled by 1-2 setae on the external side. The third article of the gonopod presents, on the dorso-external rim, 3-4 bristles, thinner and shorter than those of the second article, that are not disposed in a row; the mj females present 3-4 thinner bristles, situated dorso-externally and not forming a row; the ps female has also 2-3 smaller bristles, situated dorso-externally. In all development stages, on the internal side of the second article a spinuous setae is present (Fig. 1 c). The spinulation of the ms female's legs is presented in table 2. It gets richer from one stadia to another, from the pr to ms. For comparison with the total ms spinulation from the table, I give the spinulation of the P1 and P2 for a ♂ pr: P1: –, –, m, m, m/ –, –, –, a, a; P2: –, –, mp, amp, m/ –, –, mp, ap, a.

Table 2

The spinulation of the legs 1-15 in *Lithobius moldavicus* Prunesco.

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

Lithobius* (*Lithobius*) *matici Prunesco, 1966

Lithobius validus punctulatus Verhoeff, 1937: 156.
Lithobius matici **nov. nom.** Prunesco, 1966: 57 for *L. validus punctulatus* Verhoeff, 1937.
Lithobius matici matici Prunesco, 1966: 58 **nov. syn.**
Lithobius matici biharicus Prunesco, 1966: 59 **nov. syn.**
Lithobius matici Negrea, 2006: 103.
Non *Lithobius punctulatus* C. L. Koch, 1847: 147; *Lithobius validus* Meinert, 1872.

Type locality. „*L. validus punctulatus* Verhoeff": Petnicka pecina, province of Valjevo, Bosnia; „*L. matici matici* Prunesco": Ineu Mountain (Rodna Mountains, Romania); „*L. matici biharicus* Prunesco": Bihor Mountains (Romania) – see Prunesco (1966).

Type specimens. „*L. validus punctulatus* Verhoeff" (*vide* Eason, 1974 b: 12): in the Verhoeff collection at the British Museum (NH). (Reg. No. 03.8.25.27-28); „*L. matici matici* Prunesco" and „*L. matici biharicus* Prunesco": the author had not selected holotypes and allotypes; the syntypes that he disposed of for the description of these „subspecies" are those of the collection „Z. Matic" (the same that I have examined myself – see below „Examined material"); since I established this is a

nomen novum, the type specimens will remain the ones in the Verhoeff collection from the British Museum.

Examined material. The „Z. Matic" collection contains 21 tubes with specimens of *L. matici* Prunesco, numbered: 531, 532, 534-552. In these tubes I have ideintifed the following specimens: no. 531: Pădurea Neagră, 15.06.1959: 1 ♂ ps and 1 ♀ im; no. 532: Ordâncușa, 14.08.1921 (leg. R. Jeannel): 1 ♂ mj; no. 534: Valea Nucșoarei, 02.06.1955: 2 ♂ ps, 1 ♂ pr, 1 ♀ ps, 2 ♀ pr; no. 535: Cheile Turzii, 06.07.1958: 1 ♂ ps, 1 ♂ im; no. 536: Piatra Ceții (Cetea-Teiuș), 05.05.1959: 3 ♂ mj, 1 ♀ mj; no. 537: Detunata, 26.05.1922 (leg. R. Jeannel): 1 ♂ ps; no. 538: Detunata, 07.05.1923 (idem): 1 ♀ ms; no. 539: Detunata, 26.05.1922 (idem): 1 ♀ mj, 1 ♀ ps, 1 ♀ pr, 1 ♂ im; no. 540: Cetățile Rădesei, Izvorul Someșului Cald, 11.07.1960 (leg. B. Stugren): 1 ♂ ps, 1 ♀ mj, 1 ♀ ps; no. 541: Piatra Muncelului, Băița, 10.06.1922 (leg. R. Jeannel): 1 ♂ ps, 1 ♂ pr; no. 542: „Sources du Someș", 20.06.1922 (idem): 1 ♂ pr; no. 543: Cheile Turzii, 30.06.1958: 1 ♀ ms; no. 544: Scărișoara, 21.05.1957: 1 ♂ pr; no. 545: Piatra Muscelului, Băița –Bihor, 1000 m alt. (leg. R. Jeannel): 1 ♂ pr; no. 546: Poșești, 04.10.1921 (idem): 1 ♂ mj; no. 547: Valea Vinului, 11.09.1959: 1 ♂ pr, 1 ♀ ps; no. 548 Colibița (Ilva Mică, Cluj), 07.07.1954: 1 ♂ pr; no. 549: Valea Vinului (Beni), 24.05.1960: 1 ♀ ps; no. 550: Valea Vinului (Ineu), 25.06.1960: 1 ♀ im; no. 551: Valea Vinului (Saca), 25.06.1960: 1 ♀ ps; no. 552: Valea Vinului, 28.05.1960: 1 ♀ im. The „Șt. Negrea" collection contains 1 tube: no. 9: Stâna de Vale, upstream of Izvorul Minunilor, in the woods, 04.06.1954 (leg. Șt. Negrea): 2 ♂ ms.

Note. On the labels inside the tubes from the „Z. Matic" collection (two in each tube), *L. matici* appears as „*L. validus*" and „*L. matici biharicus*" (no. 531, 532, 534-536, 538, 540, 542-544); as: „*L. validus punctulatus*" and „*L. matici biharicus*" (no. 537, 539, 541, 545, 546) and as: "*L. validus*" and „*L. matici matici*" (no. 547-552). On the labels the name of the person who wrote them is not indicated.

Redescription based on the examined material.

Body length (measured from head to T15 inclusively) of ♂,♀ ms: 23-24 mm; mj: 20-22.5 mm; ps: 18-20 mm; pr: 15-17.5 mm; im: 11-14.5 mm. Colour: yellow-ochre-chestnut brown, darker on the tergites and the cephalic shield. Short antennae, of 30-37 articles (ms may have 33+34 articles, just as an im!); the last article is 1.2-2 times longer than the previous. The pigmented ocelli, in number of 1+14-17 during the ms, mj and ps stages, and of 1+10-11 during the pr and im stages, have different sizes and are disposed in very irregular pattern, sometimes forming 4-5 imperfect rows of closely packed ocelli. The Tőmősváry organ has an elevated brown circular edge, slightly bigger than the middle sized ocellus. The cephalic shield is slightly wider rather than longer. The forcipular coxosternite can present 6+8 teeth at the ms; 7+7 at the mj; 6+6 – 7+7 at the ps; 5+5 – 6+6 at the pr and 5+5 – 5+6 at the im; the porodonts are spine-like, on a small lateral elevation; the median groove is narrow and deep; the teeth are small, with blunt, black tips, more packed near the median groove. The T6, 7, 9, 11, 13 present prominent triangular projections at the posterior angles; among them, the T6 is smaller but more distinct; during the im stadia, the T6 is almost at a right angle, bearly distinct. The coxal pores: the proximal one is small and round, than the pores are getting bigger and more oval, without becoming buttonhole like, as in *L. validus*; their contour is thin and brown; their number: 7-9 on each coxa in the case of ms and mj, 6-8 in the case of the ps, 5-7 in the case of the pr and 3-4 in the case of the im stage. The legs 1-15 have a bi-articulated tarsus, in the same colour as the body's, without violaceous

pigment filled maculae as in *L. validus*. The 14th and 15th are shorter and more robust than those of *L. validus* and do not present coxolateral spines. The males do not present secundary sexual characters. The adult female's gonopods present a tridentated claw, the lateral teeth being small or very small; there was an exception for a ♀ps from Valea Vinului (Saca) that presented a bidentated claw, with a well developped external tooth and an absent internal tooth; in an opposite case, a ♀ps from the same Valea Vinului (Beni), the claw was tridentated with two equally developped lateral teeth. The gonopod spurs (2+2) have a cylinder-conic shape, relatively short and pointed, similar to those of *L. validus*. The basal article, without dorsal spines, presents 5-6 bristles on the internal side, forming an irregular row, up to the spurs and continuing with 4-5 bristles beyond them. The second article presents 15-17 dorsal spines, of different sizes, on 2-3 irregular rows, and several very small spines laterally placed in the ms stage and counting 8-15 in the mj and ps stages. The apical article presents 4-6 dorsal setae of different sizes, sometimes organized in 1-2 rows. During all the stages of development, on the internal side of the third article, a spinous seta is present. The legs spinulation in ps ♂ and ♀ of 18-19 mm is presented in table 3. One can notice that the spinulation of *L. matici* is very similar to that of the other species of the *L. validus* group. The individual variability is within the regular limits for this species.

Table 3

The spinulation of the legs 1-15 in *Lithobius matici* Prunesco (the spines in parenthesis may lack from one or both legs of that pair).

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

DISCUSSION

The reexaminations of the specimens from the "Z. Matic" and "Şt. Negrea" collections allowed the clarification of the taxonomical status of the species from the *Lithobius validus* Meinert – group in Romania: *L. validus* Meinert, *L. moldavicus* Prunesco and *L. matici* Prunesco. I have established new synonymies and the taxonomical status of these species and I have redescribed them based on the specimens from the two collections. I have reached the conclusion that the three species are valid and, at least on the Romanian territory, they have no subspecies.

Regarding the geographical distribution, I consider that there are some remarks to be made - as a consequence of the reevaluation of the "Z. Matic" and "Ş t. Negrea" collections. *Lithobius moldavicus* Prunesco is different from *L. validus* Meinert (s.str.) mainly by the claw of the female gonopod (with one tip instead of three tips) and by the bristles number and distribution on the internal side of the first article and on the dorsal rim of the second article (see fig. 1 a-c). This type of gonopod is described and pictured identically by Zapparoli (1994 a) for "*L. validus*" who found it in numerous sites in Turkey, this fact comforting me in saying that it was actually *L. moldavicus*. In consequence I propose a synonymy based on obvious morphological characters: *Lithobius validus* sensu Zapparoli, 1994 = *Lithobius moldavicus* Prunesco nov. syn. I would also emphasize that the description and the *camera lucida* drawings are made by Prunesco and myself based on the same material from the "Z. Matic" collection while the drawing made by Zapparoli based on material from Turkey presents an identical chetotaxy of the female gonopod. Regarding the nomenclature, Eason (1972, 1974) and also Meinert (1872) gave strong arguments in favor of the return to *L. validus* as a valid name, considering *L. punctulatus* a *nomen dubium*.

Regarding my proposal to bring the subspecies "*L. punctulatus moldavicus* Prunesco" to the rank of species, it is based on the following zoogeopgraphical argument: the two species are occupying distinct areas in Europe (Fig. 3): while *L. validus* occupies the western mountain area of Europe (from the Western Pyrenees to the Carpathian Mountains), *L. moldavicus* occupies the eastern area (from the Carpathians to the Caucasus), an interference area existing in the Romanian Carpathians. Since it was not found in the Balkan peninsula (*vide* Stoev, 1997), I presume the geographical area of *L. moldavicus*, presently appearing discontinuous, to have once stretched from the Carpathians through the northern of the Black Sea to the Caucasus, from where Dobroruka (1958) described the species *Lithobius validus rotteri* (possibly *L. moldavicus* as well, so Probable Synonym) and from there to Turkey. It is worth emphasizing that at the interference of the two species' geographical areas – meaning in the Romanian Eastern Carpathians – I have found no hybrids, not even in Bicaz where the two species are cohabiting; this leads us to conclude that these are not subspecies but two valid species. In consequence: *Lithobius punctulatus moldavicus* Prunesco, 1966 = *Lithobius moldavicus* Prunesco, 1966.

It is interesting to notice that all certain sites for the species of the *Lithobius validus* Meinert group are comprised between 40° and 50° lat., where the species prefer mountain areas (Fig. 3). The map is based on information from the following: Eason (1974 a), Dobroruka (1958), Fanzago (1880 a, b), Iorio (2008), C. L. Koch (1847), Latzel (1876, 1880, 1888), Matic (1959, 1966, 1968), Meinert (1872), Negrea (2006), Prunesco (1966), Stoev (1997), Verhoeff (1893, 1900, 1937) and Zapparoli (1994 a); I regret not being able to get the last author's papers from 1994 b and 2006.

Regarding *Lithobius matici*, the author (Prunesco, 1966) has distinguished two subspecies: *L. matici matici* and *L. matici biharicus*. By examining the same specimens from the "Z. Matic" collection that have served him to describe these taxa, I have concluded that there are no important morphological characters to justify the existence of two subspecies. The identification key provided by the author in his paper is based on the gonopod claw: in the case of "*matici*" (endemic to the Rodna Mountains and the surroundings – in the Eastern Carpathians) the claw is

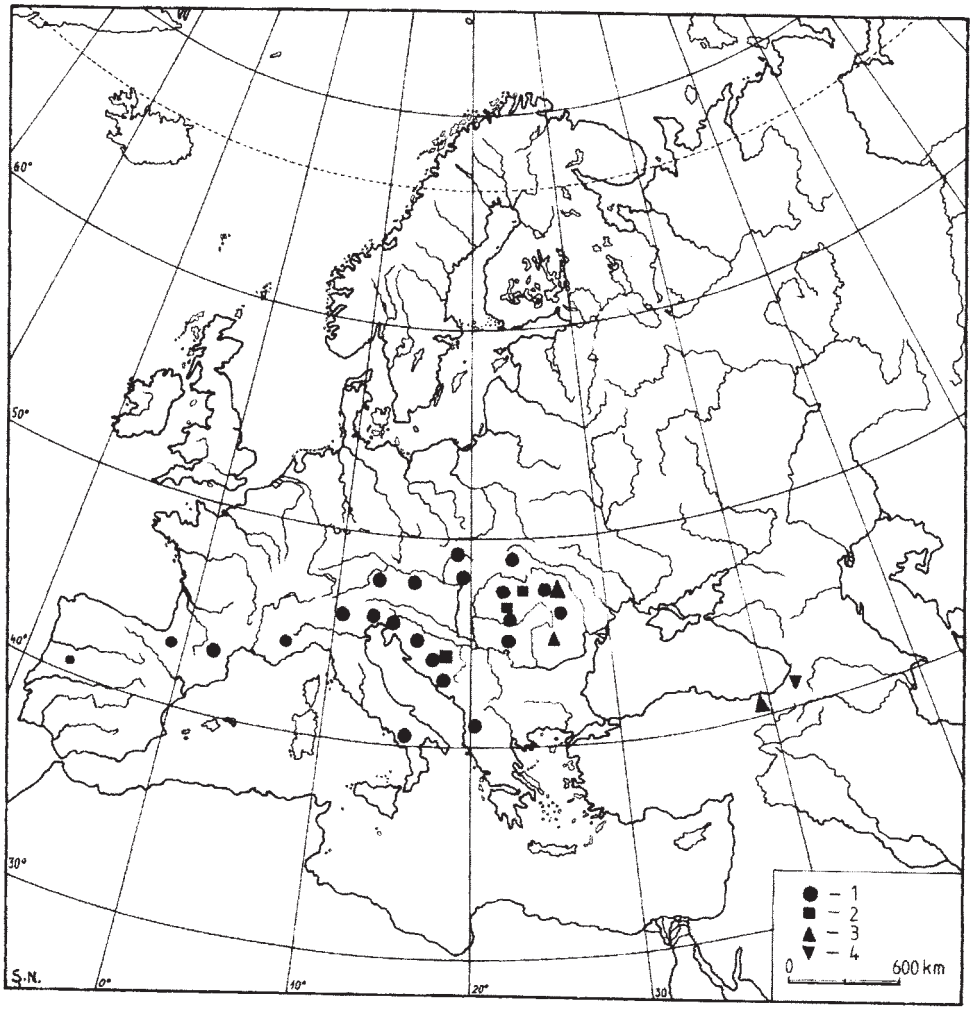

Fig. 3 - Geographical distribution of the *Lithobius validus* – Meinert species group in Europe: 1. Sites in which the presence of the *Lithobius validus* Meinert species is certain (for some authors the species is mentioned as *L. punctulatus*); 2. Sites in which the presence of the *Lithobius matici* Prunesco species is certain (Rodna Mountains and Bihor Mountains in Romania, Valjevo province in Bosnia); 3. Sites in which the presence of the *Lithobius moldavicus* Prunesco species is certain; 4. Batumi, the site for which the *Lithobius validus rotteri* Dobroruka subspecies (orig. Şt. Negrea) was described. Note: The map does not include the sites given by Zapparoli (1994 and 2006, *non vide*), who mentions *L. punctulatus* from the West Alps and Central Apennines.

bidentated and the external tooth is very small; in the case of "*biharicus*" (Bihor Mountains in the Western Carpathians and the Valjevo province in Bosnia) the claw is tridentated. In the redescription of *L. matici*, I have shown that I have identified only one specimen having a bidentated claw in the population from Valea Vinului (Rodna Mountains), all the other specimens possessing a tridentate claw. Nevertheless, I have also identified in this population (Valea Vinului) 1 ♀ ps with a

normally developed external claw of the tooth but a rudimentary internal tooth, noticeable only under a very high magnification. These exceptions show that the Rodna Mountains population registers an important degree of individual variability. In conclusion, I can assess that, from a zoogeographical point of view, there are three known populations of *L. matici* (Fig. 3): a first one in Bosnia (the Valjevo region), from where Verhoeff (1937) has described *L. validus punctulatus*, a second one in the Bihor Mountains (Western Carpathians) and a third one in Rodna Mountains and surroundings (Eastern Carpathians). Why should the populations of Valjevo and Bihor, so far apart one another, should belong to the same subspecies (*biharicus*) and the one in Rodna Mountains, much closer to Bihor, should belong to another subspecies (*matici)*, as long as there are no major morphological characters to separate them? In consequence, I propose that *L. matici biharicus* should be considered synonym of *Lithobius matici* Prunesco, 1966, nov. syn.

ACKNOWLEDGEMENTS

I would like to thank my colleague and friend Dr. Carol Prunescu (Bucharest) for his papers in French, Dr. Karin Voigtlander (Goerlitz) and Dr. Jörg Spelda (Petershausen); Mrs. Marinela Năzăreanu for the great quality of the handmade China ink copies of my *camera lucida* drawings; my colleague Dr. Oriana Irimia for the English translation and the computerized edition of this paper; Prof. Delia Ceuca, Director of the Zoological Museum of "Babeş-Bolyai" University from Cluj-Napoca for graciously lending me the *Lithobius validus* Meinert – group species material from the "Z. Matic" collection; most particularly to my colleague and friend Jean-Jacques Geoffroy, CIM Secretary, and Prof. Willi Xylander and his team that have invited me to the 14th International Congress of Myriapodology in Goerlitz (21-25th of July 2008) and thus allowing me to present this paper.

EVALUAREA CRITICĂ A SPECIMENELOR APARŢINÂND GRUPULUI DE SPECII *LITHOBIUS VALIDUS* MEINERT (CHILOPODA: LITHOBIIDAE) DIN COLECŢIILE "Z. MATIC" ŞI "ŞT. NEGREA" (ROMÂNIA)

REZUMAT

Colecţia "Z. Matic", păstrată la Muzeul Zoologic al Universităţii "Babeş-Bolyai" din Cluj-Napoca, şi colecţia "Şt. Negrea", păstrată la Institutul de Speologie "Emil Racoviţă" din Bucureşti (singurele colecţii de Chilopode existente în România) conţin trei specii de *Lithobius validus*-group Meinert: *L.* (*L.*) *validus* Meinert, 1872 (*sensu* Eason, 1974 a), *L.* (*L.*) *moldavicus* Prunesco, 1966 (*sensu* Negrea în prezentul articol) şi *L.* (*L.*) *matici* Prunesco, 1966. Sunt propuse noi sinonime: *Lithobius punctulatus moldavicus* Prunesco, 1966 = *Lithobius moldavicus* Negrea în acest articol = *Lithobius validus* Zapparoli, 1994 nov. syn.; *Lithobius matici* Prunesco, 1966 = *Lithobius matici biharicus* Prunesco, 1966 nov. syn. Subspecia *Lithobius punctulatus moldavicus* Prunesco, 1966 este ridicată la rang de specie, *Lithobius moldavicus* Prunesco, stabilindu-i-se aria geografică cunoscută până în prezent. Sunt redescrise speciile: *Lithobius validus* Meinert, 1872 pe baza populaţiilor din Carpaţii româneşti; *Lithobius moldavicus* Prunesco, 1966 pe baza specimenelor din Carpaţii Orientali - inclusiv din seria tipică, stabilindu-se un *lectoptypus* şi un *allolectotypus*; *Lithobius matici* Prunesco, 1966 pe baza populaţiilor din Carpaţii Orientali şi Munţii Apuseni.

LITERATURE CITED

DOBRORUKA, L. J., 1958 - Chilopoden aus Batumi und Tibilisi, gesammelt von J. Rotter. Zoologischer Anzeiger, 160: 204-206.

EASON, E. H., 1972 - The type specimens and identity of the species described in the genus *Lithobius* by C. L. Koch and L. Koch from 1841 to 1878 (Chilopoda: Lithobiomorpha). Bulletin of the British Museum (Natural History), Zoology, 22: 105-150.

EASON, E. H., 1974 a - The type specimens and identity of the species described in the genus *Lithobius* by F. Meinert and now preserved in the Zoological Museum, Copenhagen

University (Chilopoda: Lithobiomorpha). Zoological Journal of the Linnean Society, 55: 1-52.
EASON, E. H., 1974 b - On certain aspects of the generic classification of the Lithobiidae, with special reference to geographical distribution. Symposion of Zoological Society of London, 32: 65-73.
FANZAGO, F., 1880 a - Escursione in Calabria (1877-1878). Miriapodi. Pp. 265-277. *In*: G. Cavanna (ed.), ***, Bullettino della Società Entomologica Italiana. 1881, 12.
FANZAGO, F., 1880 b - *Lithobius brachycephalus* n. sp. Bullettino della Società Entomologica Italiana, Firenze, Resoconti delle adunanze: 16.
IORIO, E., 2008 - Contribution à l'étude des chilopodes (Chilopoda) des Alpes–Maritimes, incluant une clé d'identification des lithobiomorphes Lithobiidae de Provence–Alpes–Côte d'Azur. Bulletin de la Société linnéene de Provence, 59 (127): 127-190.
KOCH, C. L., 1847 - System der Myriapoden. *In*: G. Panzer, Atterich-Schäffer (eds.), Kritische Revision der Insecte fauna Deutchlands 3. Regensburg: 147.
LATZEL, R., 1876 - Beitrage zur Fauna Kärntens. Jahrbüker Naturhistorischen Landesmus Kärnten, 12: 91-124.
LATZEL, R., 1880 - Die Miriopoden des Östereichisch-Ungarischen Monarchie, I. Die Chilopoden. Wien, Holder.
LATZEL, R., 1888 - Die vom k.k. Oberarzte Herrn Dr. Justyn. Karlinski im Jahre 1887 in Bosnien, der Herzegowina und in Novibazar gesammelten Myriopoden. Verhandlugen Naturhistorische Museum im Hamburg, 12: 111-122.
MATIC, Z., 1959 - Noi contribuţii la cunoaşterea Lithobiidelor cavernicole din Peninsula Iberică. Studii şi Cercetări în Biologie, Cluj, R.P.R., 10: 323-333. (in Romanian)
MATIC, Z., 1966 - Chilopoda, Anamorpha. *In*: Fauna Republicii Socialiste România, 6 (1): 1-267. (in Romanian)
MATIC, Z., 1968 - Chilopodele din colecţia „Biospeologica" (seriile VII-VIII). Lucrările Institutului de Speologie "Emil Racoviţă", 7: 55-77. (in Romanian)
MATIC, Z., 1972 - Chilopoda Epimorpha. *In*: Fauna Republicii Socialiste România, 6 (2): 1-224. (in Romanian)
MEINERT, F., 1872 - Myriapoda Musei Havniensis, 2. Lithobiini. Natur Tidsskrift, Sciodte, Kjobenhavn, 8: 281-344.
NEGREA, ŞT., 2006 - A Catalogue to the Lithobiida, Scutigerida and Scolopendrida species (Myriapoda: Chilopoda) of Romania. Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa", 49: 93-118.
PRUNESCO, C., 1966 - Groupe des espèces *Lithobius punctulatus* C. Koch – *Lithobius matici* nom. nov. (Chilopoda) en Europe. Acta Zoologica Cracoviensia, 11: 51-62 + plates VI-X.
STOEV, P., 1997 - A check list of the centipedes of the Balkan Peninsula with some taxonomic notes and a complete bibliography (Chilopoda). Entomologica Scandinavica, Lund, Supplement 51: 87-105.
VERHOEFF, C., 1893 - Ueber einige palaearktische Chilopoden. Berliner Entomologische Zeitschrift, 38 (3): 313-326.
VERHOEFF, K. W., 1900 - Beiträge zur kenntniss paläarctischen Myriopoden. XV. Aufsatz: Lithobiden aus Bosnien, Herzegowina und Dalmatien. Berliner Entomologische Zeitschrift, 45: 153-179.
VERHOEFF, K. W., 1937 - Chilopoden – Studien. Zur Kenntnis der Lithobiiden. Archiv für Naturgeschicte. Zeischrift für Sistematische Zoologie, Neue Folge, 6: 171-257.
ZAPPAROLI, M., 1994 a - Chilopodi di Turchia. IV. Specie del genere *Lithobius* Leach, 1814 s.str. (Chilopoda, Lithobiomorpha). Fragmenta Entomologica Roma, 25: 175-256.
ZAPPAROLI, M., 1994 b - Chilopodi dell'Italia nord-occidentale. Rivista Piemontana di Storia Naturale, 14 (1993): 97-127. (*non vide*)
ZAPPAROLI, M., 2006 - A catalogue of the centipedes (Chilopoda) of Central Apennines (Italy). Bollettino del Museo Civico di Storia Naturale di Verona, Botanica, Zoologia, 30: 165-273. (under *L. punctulatus*, *non vide*)

Received: March 23, 2010
Accepted: September 6, 2010

Institutul de Speologie "Emil Racoviţă"
al Academiei Române, Casa Academiei Române,
Calea 13 Septembrie nr. 13, Mezanin, cam. 239
RO- 050711, Bucureşti, România
e-mail: stnegrea@yahoo.com