

REVISION OF THE GENERA *CERNOSVITOVIA* OMODEO, 1956, *ITALOBALKANIONA* MRŠIĆ & ŠAPKAREV, 1988 AND *ALLOLOBOPHORA* EISEN, 1874 FROM THE BALKANS

N. MRŠIĆ

Mršić, N., 1992. Revision of the genera *Cernosvitovia* Omodeo, 1956, *Italobalkaniona* Mršić & Šapkarev, 1988 and *Allolobophora* Eisen, 1874 from the Balkans. *Misc. Zool.*, 16: 21-28.

Revision of the genera Cernosvitovia Omodeo, 1956, Italobalkaniona Mršić & Šapkarev, 1988 and Allolobophora Eisen, 1874 from the Balkans. – *Allolobophora dugesi* var. *getica* (= *A. getica*) and *Allolobophora bulgarica* have been two of the most problematic species with regard to their position in the Balkan earthworm taxonomic system (Mršić 1991). Temporarily they were ascribed to the genus *Cernosvitovia*. An additional analysis of the gathered material and some new data on certain taxonomic characteristics have shown that the *getica* species belongs in fact to the genus *Italobalkaniona*, while *bulgarica* should be attributed to the genus *Allolobophora*. *Cernosvitovia getica*, however, which has been in the past referred to in connection with the region of Serbia, is a new species and is herewith depicted by the name *Cernosvitovia paradoxa*. A complete description of the species and a determination key for the *Cernosvitovia* and *Italobalkaniona* genera are given.

Key words: Balkans earthworms, *Cernosvitovia (Zicsiona) paradoxa* n. sp., Identification key.

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INTRODUCTION

Allolobophora bulgarica was in 1934 described by Černosvitov. His description, however, was incomplete, as the position of male sexual apertures (one of the key taxonomic elements) was missing. EASTON (1983) placed it in the genus *Cernosvitovia*. In "Monograph" (MRŠIĆ, 1991) it was temporarily attributed to the genus *Cernosvitovia*, with a remark, that this species probably belonged to *Allolobophora*. ZICSI & POP (1991) ascertained that male aperture are situated on the 15th segment; however, some details concerning the shape of nephridial

bladder and the orientation of its glandular part are missing. In all other morphologic and anatomic respects it belongs to the genus *Allolobophora*, and it is thus regarded as such.

The taxon *Allolobophora dugesi* var. *getica* was in 1947 described by POP. Considering that his description (1947, 1948) were not sufficient to establish the position of male aperture, it was attributed to the genus *Cernosvitovia* with the following remark: "There was no Romanian material in respect of the *C. getica* species available to us, but in view of all morphologic and anatomic respects it is presumed that the material gathered in Romania and upon which the

species was described in identical with the one gathered by us" (1991, page 149). In view of the fact that male apertures on all Romanian specimens are situated on the 15th segment (ZICSI & POP, 1991) and, respectively, on the 27th segment in the specimens collected in Serbia, the Serbian specimens represent a new species and are denominated *Cernosvitovia (Zicsiona) paradoxa*. All other taxonomic characteristics of the *getica* species, however, are typical of the *Italobalkaniona* genus, and this is why it is regarded as such.

The *Cernosvitovia crnicae* species (KARAMAN, 1987) was originally regarded as a synonym for the *C. getica* species (MRŠIĆ & ŠAPKAREV, 1987), but was later (MRŠIĆ, 1991) dealt with an independent species.

The determination key includes *Cernosvitovia munteniana* (ZICSI & POP, 1991). It is not referred to in the "Monograph" (MRŠIĆ, 1991), for the description of this species was published at a later date. The "Monograph" and the determination key do not include the species *Cernosvitovia bertae* (COSIN et al., 1985), since this species belongs, in all probability, to an independent genus.

As far as the fauna of the Balkans and the enclosing regions is concerned, 204 species and 30 subspecies have been registered so far (201 species and 30 subspecies in MRŠIĆ, 1991).

In this article the description of new species, diagnoses on three genera and determination keys for the species belonging to them are given, as well as data on synonymies and other details which complete the Monograph of MRŠIĆ (1991).

RESULTS

Genus *Cernosvitovia* Omodeo, 1956, emend. MRŠIĆ & ŠAPKAREV, 1988

Diagnosis (table 1):

The body is unpigmented. The setae are closely-paired. The male apertures are invariably behind the 15th segment and extends from the 26th to the 30th segment. Two of four pairs of seminal vesicles and two or more pairs of spermathecae, often multiple. The pores of the spermathecae lie near setal line *cd* (rarely between *b* and *c*). The testes are in segments 10 and 11, and the ovaries in the 13th segment. The calciferous glands are to be found from the 10th to the 13th segment, having lateral tubercles (pouches) in the 10th segment. The longitudinal muscles is of a fasciculate type. The nephridial bladders are U-shaped or hooked; in certain species they are of a furcular shape behind the 15th segment. The curved (glandular) part is oriented towards the anterior part of the body. The typhlosole is trifid.

Type species:

Allolobophora rebeli Rosa, 1897

Distribution:

Eastern Balkans, Anatolia (fig. 1).

Subgenus *Cernosvitovia* Omodeo 1956, sensu MRŠIĆ & ŠAPKAREV, 1987

Diagnosis:

The nephridial bladder is hooked or U-shaped. Four pairs of seminal vesicles and two or more pairs of spermathecae. The first pair of spermathecae and seminal vesicles appears in the 9th or 10th segment.

Type species:

Allolobophora rebeli Rosa, 1893

Other species:

Allolobophora biserialis Cernosvitov, 1937

Allolobophora schweigeri Zicsi, 1973

Octolasmus dobrogeanum Pop, 1938

Cernosvitovia munteniana Zicsi & Pop, 1991

Distribution:

Albania, Rumania, Yugoslavia, Greece, Turkey and Bulgaria.

Subgenus *Zicsiona* Mršić & Šapkarev, 1987

Diagnosis:

The nephridial bladder is hooked, in certain species furcular after the 15th segment. Two pairs of seminal vesicles in the 11th and 12th segment and two or more pairs of spermathecae. The first pair of spermathecae always appears in the 13th or the 15th segment on the septa 12/13 (rarely) or 13/14 or 15/16.

Type species:

Cernosvitovia (Zicsiona) silicata Mršić & Šapkarev, 1987

Other species:

Cernosvitovia dudichi Zicsi & Šapkarev, 1982

Cernosvitovia crnicae Karaman, 1987

Cernosvitovia (Zicsiona) paradoxa n. sp.

Species potentially belonging to this genus:
? *Cernosvitovia bertae* Cosin, Mato & Mascato, 1985

Note:

Disregarding some very similar morphological and anatomical characteristics shared by the *C. bertae* species with other species of the genus *Cernosvitovia*, this species probably belongs to an independent genus *C. bertae* is greatly dislocated from the centre of the development of its genus. Similar taxonomic marks can be probably attributed to the convergence in its development. The structure of typhlosole is typical, the same as in most archaic Spanish and French species (bifid), in contrast to the Balkan species and the Turkish one, the shape of which is trifid. The position of the male aperture (on the ?43th segment), as well as the position of clitellum and tubercula pubertatis deviate a great deal from other species of this genus. Prior to a final decision it will be necessary, at any rate, to look at the direction of the

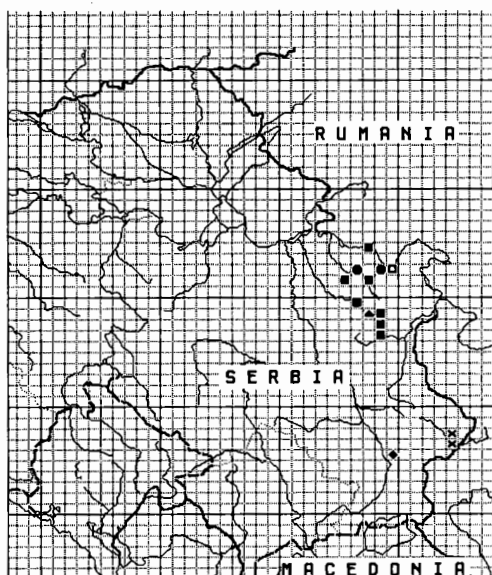


Fig. 1. Range of the genus *Cernosvitovia* in Serbia: ■ *C. (Z.) paradoxa* (author's data); □ *C. (Z.) paradoxa* (data from literature); ● *C. (Z.) silicata* (author's data); ◆ *C. (Z.) dudichi* (data from literature); ▲ *C. (Z.) crnicae* (data from literature); * *C. (C.) biserialis* (data from literature).

nephridial bladder (is curved or glandular part oriented towards the anterior or posterior part). For now the species has been placed in the *Cernosvitovia* genus and *Zicsiona* subgenus only conditionally.

Distribution:

Rumania, Serbia and ?Spain.

Cernosvitovia (Zicsiona) paradoxa n. sp.

1987 *Cernosvitovia (Zicsiona) getica* (part.)

Mršić & Šapkarev, *Biol. vestn.*, 35(2): 71.

1988 *Cernosvitovia (Zicsiona) getica* (part.)

Mršić & Šapkarev, *Acta Mus. Mac. Sci. Nat.*

19 (1/154): 13.

1989 *Cernosvitovia (Zicsiona) getica* (part.) Mršić,

Biol. vestn., 37(2): 43.

1991 *Cernosvitovia (Zicsiona) getica* (part.) Mršić,

Dela Sazu, 31(11): 152, figs. 41A, B.

Loc.typ:

Rajkova pečina, Majdanpek, Serbia.

Description:

External: The body is from 98 to 122mm long, consisting of 203 to 275 segments, their diameters ranging from 5 to 7mm. The

first dorsal pore is in intersegmental groove 10/11 /acc. to Šapkarev, 1980 13/14). The prostomium is prolobous. The distance between the setae is $aa=3bc$, $ab=2cd$, $dd<1/2U$. The intersetal ratio is $aa:ab:bc:cd:dd=30:4:10:2:92$ (on the 40th segment). Glandular papillae surround setae *ab* on segments 11, 12, 13 or 17, 18 or 16, 17. The pores of spermathecae lie near setal line *cd*. The pores of nephridial bladders lie between setae *b* and *c* (near setal line *b*). The male apertures are on the 27th segment, no glandular atrium. The clitellum extends from segments 24, 25, to 33, 1/2 34, 34, and the tubercula pubertatis are present from segments 24, 25, 1/2 25, 26 to 1/2 32, 33, 1/2 34. Showing of anterior part of the body in figures 41 A and B (MRŠIĆ, 1991).

Internal: Five to seven pairs of spermathecae in the 13th to the 17th, 18th or the 19th segment on the septa 12/13, 13/14 to 16/17, 17/18 or 18/19. The calciferous glands are to be found from the 10th to the 11th segment, having lateral tubercles (pouches) in the 10th segment. Six pairs of lateral hearts in the 6th to the 11th segments. The

Table 1. Taxonomic characters of species of the genus *Cernosvitovia* in the Balkans and neighbouring territories.

Species	Clitellum	Tubercula pubertatis	Seminal vesicles	Spermathecae	Male pore
Subgenus <i>Cernosvitovia</i>					
<i>C. biserialis</i>	1/n 23,24--34,1/n 35	24,25--34(35)	9-12	9-13/10-14)	27,28
<i>C. dobrogeana</i>	1/2 23-1/2 25--1/2 32,33	24--33	9-12	9-12	28
<i>C. schweigeri</i>	1/2 23,24--33,1/2 34	26,27--32,33	9-12	9,10	27-30
<i>C. rebeli</i>	1/3 24,25--31-1/2 33	25-27--31,32	9-12	9,10	27,28
<i>C. munteniana</i>	25--37	25--36	9-12	10-18	29
Subgenus <i>Zicsiona</i>					
<i>C. dudichi</i>	23--32	24--31	11,12	15-17	26
<i>C. silicata</i>	24,25--32,33	25,26--31,32	11,12	13-15	28-30
<i>C. paradoxa</i>	24,25--33,34	24-26--1/2 32-34	11,12	13-19(18)	27
<i>C. crniccae</i>	24--1/2 36	24--35	11,12	13-18	26
<i>C. bertae</i>	25-27--49-51	33-35--46-48	11,12	14-19	43?

septa are thickened from 6/7 to 9/10. The crop occupies segments 15 and 16, and the gizzard segments 17 to 1/2 19. The typhlosole is trifid. The nephridial bladder is U-shaped. The curved (glandular) part is oriented towards the anterior part of the body.

Distribution:

Serbia; endemic.

Material:

Rajkova pečina, Majdanpek, 16 VI 1986 (1 ex.), 3 VI 1987 (1 ex.), No. 3672 (1 ex.), No. 3674 (1 ex.), 16 VI 1986, 3 VI 1987, No. 3682 (1 ex.), No. 3683 (1 ex.), No. 3686 (1 ex.), EQ71; Majdanpek, 17 VI 1986, No. 3688 (1 ex.), No. 3689 (1 ex.), No. 3691 (1 ex.), No. 3692 (1 ex.), No. 3693 (1 ex.), EQ71; Kapetanska, 16 VI 1986, No. 3728 (1 ex.), EQ82; Lazareva-Zlotska pečina, 30 V 1987, No. 3836 (1 ex.), 3837 (1 ex.), 3838 (1 ex.), EP87; Stol, 2 VI 1987, No. 3840 (1 ex.), No. 3841 (1 ex.), No. 3842 (1 ex.), No. 3843 (1 ex.), No. 3844 (1 ex.), No. 3845 (1 ex.), No. 3846 (1 ex.), No. 3847 (1 ex.), EP88; Kožca near Lepenski vir, 27 V 1987, No. 3855 (1 ex.), 3856 (1 ex.), 3857 (1 ex.), 3858 (1 ex.), 3859 (1 ex.), 3860 (1 ex.), 3861 (1 ex.), EQ74; Ceremošnja, 6 VI 1987, No. 3865 (1 ex.), EQ51; Gornjanska klisura, Hladne vode, 6 VI 1987, No. 3871 (1 ex.), EQ40; Rajkova pečina, 16 VI 1986, 3 VI 1987, No. 3872 (1 ex.), EQ71; Kučaj planina, Crni vrh, 1 V 1987, No. 3873 (1 ex.), EP78; Despotovac, 5 VI 1987, No. 3881 (1 ex.), EP48; Žagubica-Lipa, 1 VI 1987, No. 3892 (1 ex.), EP69; Krivelj, 2 VI 1987, No. 3894 (1 ex.), No. 3899 (1 ex.), EP86; Majdanpek, 17 VI 1986, No. 3960 (1 ex.), EQ71.

Determination key of *Cernosvitovia*

1. Four pairs of seminal vesicles (9th to 12th segments). The first pair of spermathecae always appears in the 9th or rarely the 10th segment. The first pair of spermatheca opening in intersegmental

- groove 9/10 or 10/11 (rarely) subgenus *Cernosvitovia* (2)
- Two pairs of seminal vesicles in the 11th and the 12th segment. The first pair of spermathecae always appears in the 13th or the 15th segment. The first pair of spermathecae opening in intersegmental groove 12/13 (rarely), 13/14 or 15/16 subgenus *Zicsiona* (6)
- 2. Two pairs of spermathecae in the 9th and 10th segment 5
- Four or more pairs of spermathecae 3
- 3. Nine pairs of spermathecae *C. (C.) munteniana*
- Four or five pairs of spermathecae 4
- 4. Four pairs of spermathecae. The clitellum ends on segment 33 *C. (C.) dobrogeana*
- Five pairs of spermathecae. The clitellum ends on segment 34 or 35 *C. (C.) biserialis*
- 5. Clitellum on segments 1/2 23, 24 to 33, 1/2 34 and tubercula pubertatis on segments 26, 27 to 32, 1/2 33, 33 *C. (C.) schweigeri*
- Clitellum on segments 1/3 24, 25 to 31, 32, 1/2 33, and tubercula pubertatis on segments 25, 26, 27 to 31, 32 *C. (C.) rebeli*
- 6. Male aperture on segment 26 7
- Male aperture on segments 27, 28, 29 or 30 ... 8
- 7. Clitellum on segments 24 to 1/2 36 and tubercula pubertatis on segments 24 to 35 *C. (Z.) crnicae*
- Clitellum on segments 23 to 32 and tubercula pubertatis on segments 24 to 31 *C. (Z.) dudichi*
- 8. Clitellum on segments 24, 25 to 33, 1/2 33, 34 and tubercula pubertatis on segments 24, 25, 26 to 1/2 32, 33, 1/2 34 *C. (Z.) paradoxa* n. sp.
- Clitellum on segments 24, 25 to 32, 33 and tubercula pubertatis on segments 24, 25, 26 to 31, 1/2 32, 32 *C. (Z.) silicata*

Genus *Italobalkaniona* Mršić & Šapkarev, 1988

Diagnosis (table 2):

The body is unpigmented. The setae are closely-paired. The male aperture is on the 15th segment. Two pairs or rarely four pairs (the species *I. demirkapiae* and *I. zicsii*) of seminal vesicles and a larger number of spermathecae. The first pair of spermathecae appears in the 12th or the 13th segment on

Table 2. Taxonomic characters of species of the genus *Italobalkaniona*.

Species	Clitellum	Tubercula pubertatis	Seminal vesicles	Spermathecae
<i>I. demirkapiae</i>	19,20--32,33,35	19,20--28-30	9-12	14-18
<i>I. zicsii</i>	22--35,36	23,24--28,29	9-12	13-16
<i>I. pyrenaicoides</i>	18--28	19--27	11,12	13-15
<i>I. treskavicensis</i>	20,21--32	21--1/2 29-31	11,12	14-16
<i>I. stankovici</i>	22--34,35	25--31,32	11,12	14-16
<i>I. macedonica</i>	23--35	23,24--33,34	11,12	13-16
<i>I. getica</i>	24,25--33,34	24-26--1/2 32-34	11,12	13-19 (13-18)
<i>I. opisthocystis</i>	24,25--34-37	24,25--34-37	11,12	14-20
<i>I. o. krainensis</i>	25--39,40	25,26--38,39	11,12	14-20
<i>I. knazevensis</i>	25--41,42	25,26--38,39	11,12	12-16
<i>I. osellai</i>	1/2 23--38	23--25	11,12	13-16
<i>I. apuliae</i>	22--40	24--36	11,12	13-16
<i>I. januaeargenti</i>	24,25--34,35	26--33	11,12	14-17
<i>I. sarda</i>	25--37	27--35	11,12	13/14-18/19

the septa 13/14 or 12/13 (rarely) or 14/15 (rarely). The spermathecal pores lie near setal line *cd*. The testes are in segments 10th and 11th and the ovaries in the 13th segment. The nephridial bladders are U-shaped or hooked; the curved (glandular) part is oriented towards the anterior part of the body (genus *Scherotheca*: glandular part is oriented towards the posterior part of the body). The longitudinal muscles are of a fasciculate type. The typhlosole is trifid or multiple (only in the species *I. demirkapiae*) (genus *Scherotheca*: the typhlosole is bifid).

In certain species one notices a shift of the male aperture from the median position to the posterior part of the 15th segment. This feature is registered in the species *I. treskavicensis*, *I. zicsii*, *I. macedonica* and *I. pyrenaicoides*. In the species *I. demirkapiae* there appear either one or the other type of male aperture position.

Type species:

Eophila pyrenaicoides Šapkarev, 1977.

Other species:

Allolobophora opisthocystis Rosa, 1895

Allolobophora dugesi var. *getica* Pop, 1947/= *C. getical*

Allolobophora demirkapiae Karaman, 1969

Allolobophora januae-argenti stankovici Šapkarev, 1971/= *I. stankovici* stat. n./

Allolobophora zicsii Šapkarev, 1975

Eophila macedonica Šapkarev, 1977

Allolobophora osellai Zicsi, 1981

Allolobophora opisthocystis krainensis Šapkarev, 1987;

Italobalkaniona knazevensis Šapkarev, 1989;

Italobalkaniona treskavicensis Mršić, 1991.

Species potentially belonging to this genus:

Helodrilus (Eophila) januae-argenti Cognetii, 1903

Helodrilus (Eophila) sardus Michaelsen, 1910

Helodrilus (Allolobophora) apuliae Baldasseroni, 1913.

Distribution:

Rumania, Bulgaria, Serbia, Macedonia and southern Italy and ?Sardinia.

Table 3. Taxonomic characters of species and subspecies of the genus *Allolobophora* in the Balkans and the neighbouring territories.

Species	Clitellum	Tubercula pubertatis	Number of seminal vesicles	Spermathecae
<i>A. chlorotica</i>	29,30--37	31 33 35	4	9-11
<i>A. chlorotica kosovensis</i>	29--37	31 32 33 34 35	4	9-11
<i>A. chlorotica waldensis</i>	29,30--36	31 33 35	4	9-11
<i>A. chlorotica postepheba</i>	30--1/2 37,38	32 34 36	4	9-11
<i>A. burgondiae</i>	1/2 27,28--38	30,31--37	4	9-11
<i>A. carpathica</i>	23-25--32-36	28,29--32-34	4	9,10
<i>A. bulgarica</i>	23,24--37	25--32,33,35	4	9,10
<i>A. brunnecephala</i>	23,24--33	30--32	4	9,10
<i>A. vardarensis</i>	29--36	31 32 33 34	3	10,11

Determination key of *Italobalkaniona* for the Balkans

1. Four pairs of seminal vesicles (9th to the 12th) ... 2
 - Two pairs of seminal vesicles in the 11th and the 12th segments 3
2. Clitellum on segments 19, 20 to 32, 33 or 35 and tubercula pubertatis on segments 19, 20 to 28, 29, 30. Three pairs of spermathecae
 - *I. demirkapiae*
 - Clitellum on segments 22 to 35, 36 and tubercula pubertatis on segments 23 to 28, 29. Four pairs of spermathecae *I. zicsii*
3. Three pairs of spermathecae 4
 - More than three pairs of spermathecae 6
4. Clitellum ends before segments 30. Clitellum on segments 18, to 28, 1/2 28 and tubercula pubertatis on segments 19 to 27 *I. pyrenaicoides*
 - Clitellum ends after segment 30 5
5. Clitellum on segments 22 to 34, 35 and tubercula pubertatis on segments 25 to 31, 32
 - *I. stankovici*
 - Clitellum on segments 20, 21 to 32 and tubercula pubertatis on segments 21, 1/2 21 to 1/2 29, 30, 1/2 30, 31 *I. treskavicensis*
6. Four pairs of spermathecae. Clitellum on segments 23 to 35 and tubercula pubertatis on segments 23, 24, to 33, 34 *I. macedonica*
 - Five, six or seven pairs of spermathecae 7
7. Five pairs of spermathecae. Clitellum on segments 25 to 41, 42 and tubercula pubertatis on segments 25, 26 to 38, 39 *I. knazevensis*
 - Six or seven pairs of spermathecae 8
8. The first pair of spermathecae always appears in the 13th segment *I. getica*
 - The first pair of spermathecae always appears in the 14th segment 9
9. Clitellum on segments 24, 25 to 34, 35, 36, 37 and tubercula pubertatis on segments 24, 25 to 34, 35, 36, 37 *I. opisthocystis*
 - Clitellum on segments 25 to 39, 40 and tubercula pubertatis on segments 26 to 38, 39
 - *I. opisthocystis krainensis*

Genus *Allolobophora* Eisen, 1874; sensu Mršić & Šapkarev, 1988

Diagnosis (table 3):

The setae are closel-paired. The body is unpigmented or with brown or green pigmentation. The clitellum ends before the 40th segment. Four pairs of seminal vesicles and three or two pairs of spermathecae (the first pair appears in the 9th segment) or rarely three pairs of seminal vesicles and two pairs of spermathecae (the first pairs of spermathecae appears in the 10th segment). The pores of spermathecae lie near the *cd* setal line. The testes are in the 10th and 11th segments and the ovaries in the 13th segment. The longitudinal muscles are of a fasciculate type. The nephridial bladders are U-shaped or hooked, the curved (glandular) part is oriented towards the anterior part of the body. The typhlosole is trilobe.

Type species:

Enterion chloroticum Savigny, 1826

Other species and subspecies:

- Allolobophora chlorotica waldensis* Ribaucourt, 1896 /syn.: *Allolobophora nusbaumi* Ribaucourt, 1896/
- Allolobophora chlorotica postepheba* Bouché, 1972
- Allolobophora burgondiae* Bouché, 1972
- Allolobophora chlorotica kosovensis* Šapkarev, 1975.

Species potentially belonging to this genus:

- Allolobophora carpathica* Cognetti, 1927
- Allolobophora bulgarica* Černosvitov, 1934
- Allolobophora vardarensis* Šapkarev, 1971
- Allolobophora brunnecephala* Kvavadze, 1985

Distribution:

Holarctic.

Determination key of *Allolobophora* for Balkans and neighbouring countries

- 1. Three pairs of seminal vesicles. Clitellum on segments 29 to 36 and tubercula pubertatis on 32, 33 and 34 (in the shape of suckers) *A. vardarensis*
- Four pairs of seminal vesicles 2
- 2. Two pairs of spermathecae 3
- Three pairs of spermathecae 4
- 3. Clitellum on segments 23, 24, 25 to 32, 33, 34, 35, 36 and tubercula pubertatis on segments 28, 29 to 32, 33, 34 *A. carpathica*
- Clitellum on segments 23, 24 to 37, and tubercula pubertatis on segments 25 to 32, 33, 35 *A. bulgarica*
- 4. Clitellum on segments 29, 30 to 37, 1/2 37 and tubercula pubertatis on segments 31, 33, 35

- (small sucker-like discs) *A. chlorotica chlorotica*
- Clitellum on segments 1/3 29 to 37 and tubercula pubertatis on segments 31, 32, 33, 34 and 35 (small sucker-like discs) *A. chlorotica kosovensis*

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