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The present knowledge of the centipede fauna of Anatolia (Chilopoda) [1]

MARZIO ZAPPAROLI
Dipartimento di Protezione delle Piante, Università della Tuscia,
Via San Camillo de Lellis - I-01100 Viterbo (Italy)

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SUMMARY

On the basis of published records and original data collected between 1973-1993, a synthesis is presented of the present knowledge of the centipede fauna of the Anatolian peninsula from faunistic and biogeographical points of view. The whole Anatolia within Turkey as it is politically constituted today is considered. One-hundred-twenty-three species have been recorded: 2 Scutigeromorpha (2 genera), 73 Lithobiomorpha (7 genera), 13 Scolopendromorpha (2 genera), and 35 Geophilomorpha (15 genera). These values, however, are provisional, owing to the lack of faunistic knowledge and some unresolved taxonomic problems, especially for Geophilomorpha. For the zoogeographical analysis, 100 species have been considered. The main chorological categories are represented as follows: species widely spread in the Holarctic Region (17 species): W-Palearctic (1), Sibero-European (1), Centralasiatic-European (2), Turano-Europeo-Mediterranean (2), Turano-Mediterranean (2), Europeo-Mediterranean (1), SW-Asiatic (8); species more or less widely spread in Europe (23): European (5), Centraleuropean (5); S-European (13); species more or less widely spread in the Mediterranean countries (20): Mediterranean (9), E-Mediterranean (11); species widely spread in the Palearctic Region but occurring in small periferal areas of Western Palearctic region (2): Saharo-Turano-Sindian (1), NE-African-Sindian (1). The endemics of the Near East occurring in Anatolia (38 species) are arranged in the following groups: N-Anatolian (= Pontic) (13), W-Anatolian (2), NW-Anatolian (3), Ponto-Caucasian (6), S-Anatolian (= Taurian) (8), Central Anatolian (1), Kurdish (4), Kolkhidan (1). The larger rate of endemics has been recorded in N-Anatolia, especially in E-Pontus, where it reaches about the 38% of the regional fauna. The rate of endemics recorded in SE-Anatolia (5%) is very low but this figure could be influenced by the general lack of faunistic knowledge in this area. An annotated checklist of the species of centipedes of Turkey is also given (Appendix I), as well as a synthesis of their local distribution according to the presence in the natural regions and in the administrative provinces (Appendix II). The following new species and subspecies of Lithobiidae are described (Appendix III): *Lithobius (Lithobius) antonellae* n. sp., *Lithobius (Lithobius) biondii* n. sp., *Lithobius (Sigibius) dogubayazitensis* n. sp. and *Lithobius (Monotarsobius) manicastrii* n. sp., all from E-Anatolia; *Lithobius (Lithobius) ispartensis* n. sp., *Lithobius (Lithobius) plesius antalyanus* n. subsp. and *Lithobius (Lithobius) plesius audisioi* n. subsp., all from S-Anatolia (Mediterranean region); and *Lithobius (Lithobius) rizensis* n. sp., from E-Pontus. The following new synonymies are proposed: *Lithobius liber* Lignau, 1903 = *Lithobius cilicius* Verhoeff, 1925 **syn. nov.**; *Lithobius liber* Lignau, 1903 = *Tamulinus phanetus* Chamberlin, 1952 **syn. nov.**; *Henia (Turkophilus) porosa* Verhoeff, 1941 = *Henia angelovi* Ribarov, 1987 **syn. nov.**

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INTRODUCTION

Only about twenty papers were published on the centipede fauna of Turkey between the second half of the nineteenth to the end of the twentieth century. After Newport (1845) and Koch (1863), who supplied the first records from the area, collected from "Lycia, in valle fluvii Xanthi" the first and from "Efes" the second, the earliest papers were chiefly published by the two European myriapodologists Carl Wilhelm Verhoeff (Verhoeff, 1896, 1898, 1905, 1925, 1934, 1937) and Carl Graaf Attems (Attems, 1905, 1932, 1939, 1947). Both authorities studied the sporadic specimens collected mainly during some of the classic zoological trips in Anatolia, such as those of the entomologists or naturalists Carl Escherich, who visited the Bosphorus and Bursa regions in 1895, Martin Holtz, who visited the Cilician Taurus range in 1898, Arnold Penther and Emerich Zederbauer, who explored the Erciyas Dağ (vil. Kayseri) in 1905, and Henry Gadeau de Kerville who collected in the Ankara region in 1912.

Richer collections were taken about three decades later, from 1940 to 1949, by the German zoologist Curt Kosswig, Director of the Institute of Zoology of the University of Istanbul, who visited many regions during his activity in Turkey. Some of those specimens were studied by Verhoeff (1941a, 1943) and later the same author attempted to list the Turkish centipedes for the first time (Verhoeff, 1944). A paper on Scutigeromorpha also collected by C. Kosswig was published by Demir (1948).

After the death of Karl W. Verhoeff, in 1945, Kosswig entrusted his collections to the United States specialist Ralph V. Chamberlin, who published in 1952 one of the most important papers on the centipedes of Turkey. In Chamberlin (1952) 85 new species and 11 new genera and subgenera are described; moreover faunistic data on established species is also given as well as an updated checklist of the Turkish fauna. This paper and the related collection - now in the National Museum of Natural History, Smithsonian Institute, Washington (USA) - are therefore among the most important points of reference in the study of the Near East centipede fauna. However, due to the fact that Chamberlin's descriptions are very concise and often without drawings, and many of the type specimens of the described taxa are lost, many problems arise concerning the taxonomic identity of some taxa.

From the seventies to the beginning of the eighties, a further increase in the knowledge has been presented by the Rumanian specialist Zachiu Matic, who studied (Matic, 1970, 1973, 1976, 1977, 1980, 1983) the specimens collected during the zoological expeditions of the Italian Museum of Natural History of Verona and the Institute of Zoology of Rome University "La Sapienza" (cf. Sbordoni and Vigna Taglianti, 1989), as well as by the Institute of Zoology of Sofia, Bulgaria, and the Museum of Natural History of Genève, Switzerland. In the same period, a revision of Scutigeridae was published by Würmli (1973).

In the framework of a general revision of the centipede fauna of Turkey, a series of papers dealing with Lithobiomorpha have been recently published by Zapparoli

(1988, 1989a, 1989b, 1992, 1993a, 1993b, 1994a, 1995) and Zapparoli and Minelli (1993). The first modern attempt to point out distribution patterns of Turkish centipedes was published by Zapparoli (1990). The purpose of this paper is to give a preliminary zoogeographical analysis of the centipede fauna of Turkey, an updated checklist of the species, and descriptions of new taxa.

STUDY AREA, MATERIAL AND METHODS

The whole Anatolia within Turkey as it is politically constituted today (about 756.850 sq. km) is considered; owing to faunistic affinities the Greek islands of the Southern Sporades are also included (cf. Zapparoli, 1990). According to Erol (1982, 1983), the study area has been divided in the following nine natural regions (see also Fig. 1 and Tab. 1): 1 = Marmara Region; 2 = Aegean Region; 3 = Mediterranean Region; 4_1 = W-Pontus Subregion; 4_2 = Central Pontus Subregion; 4_3 = E-Pontus Subregion; 5 = Inner Anatolian Region; 6 = E-Anatolian Region; 7 = SE-Anatolian Region.

Geographical and physiographical notes on Turkey are given by Hoffman and Lohmander (1964); other useful information is in Davis (1965). Regarding cartographic reference it is possible to refer to Darkot and Motta (1976), Tanoglu et al. (1961) and Euro Atlas (1991). The Turkish Republic is divided in a number of administrative provinces, in Turkish "vilayet", here abbreviated as "vil.".

This paper is based on a catalogue of the centipede fauna of Turkey (Zapparoli, in prep.), where all the literature records are critically revised, together with much of the material of the previous authors, including the type specimens of the more critical taxa. Moreover, unpublished data is considered that has been collected since the sixties by museums of natural history and research institutes, such as the Termézsettudományi Múzeum, Budapest (Hungary), the Naturhistorisches Museum Wien (Austria); the National Museum of Natural History,

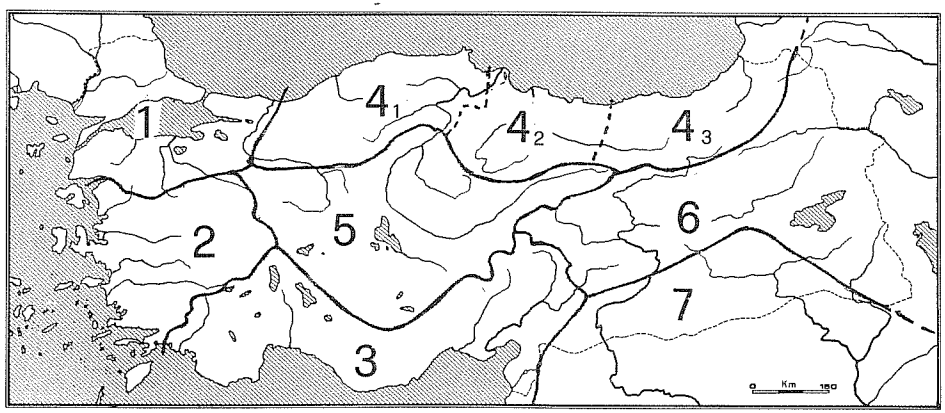


Fig. 1 - Approximative boundary of the natural regions of Turkey according to Erol (1982, 1983).

Tab. 1 - Centipedes of Anatolia. Chorotype and distribution in the natural region. **Chorotypes:** CAE = Centralasiatic-European; CEU = Centraleuropean; EME = E-Mediterranean; EUM = Europeo-Mediterranean; EUR = European; MED = Mediterranean; NAF = NE-African-Sindian; SEU = S-European; SIE = Sibero-European; STS = Saharo-Turano-Sindian; SWA = SW-Asiatic; TEM = Turano-Europeo-Mediterranean; TUM = Turano-Mediterranean; WPA = W-Palearctic. **Near East endemic species** (E): ANAC = Central Anatolian endemic; ANAN = N-Anatolian (= Pontian) endemic; ANAS = S-Anatolian (= Taurian) endemic; ANAW = W-Anatolian endemic; ANNW = NW-Anatolian endemic; KOLK = Kolkhidan endemic; KURD = Kurdish endemic; POCA = Ponto-Caucasian endemic. **Natural regions** (according to Erol, 1982; 1983): 1 = Marmara Region; 2 = Aegean Region; 3 = Mediterranean Region; 4_1 = W-Pontus Subregion; 4_2 = Central Pontus Subregion; 4_3 = E-Pontus Subregion; 5 = Inner Anatolian Region; 6 = E-Anatolian Region; 7 = SE-Anatolian Region. **Others:** i = introduced species.

Species	Chorotypes	Natural regions								
		1	2	3	4_1	4_2	4_3	5	6	7
1. *Scutigera coleoptrata*	MED	+	+	+	+			+		
2. *Thereuonema syriaca*	SWA			+					+	+
3. *Lamyctes emarginatus*	-				i					
4. *Ottobius hopanus*	E (KOLK)						+			
5. *Eupolybothrus (Eupolybothrus) litoralis*	EME	+	+	+	+	+		+		+
6. *Lithobius (subg.) liber*	SWA						+		+	
7. *Lithobius (Lithobius)* cf. *agilis*	CEU (*L. agilis*)			+						
8. *Lithobius (Lithobius) antonellae*	E (KURD)								+	
9. *Lithobius (Lithobius) beschkovi*	SEU				+		+			
10. *Lithobius (Lithobius) biondii*	E (KURD)								+	
11. *Lithobius (Lithobius) carinatus*	EME	+	+	+						
12. *Lithobius (Lithobius) coloratus*	E (POCA)						+			
13. *Lithobius (Lithobius) confusus*	E (ANAN)				+					
14. *Lithobius (Lithobius) delictus*	E (ANAN)				+		+			
15. *Lithobius (Lithobius) elongipes*	E (ANAS)			+						
16. *Lithobius (Lithobius) erdschiasius*	E (ANAC)							+		
17. *Lithobius (Lithobius) ergus*	SEU	+								
18. *Lithobius (Lithobius) erythrocephalus*	EUR		+	+	+	+	+	+	+	+
19. *Lithobius (Lithobius) forficatus*	EUR	+			+	+	+			
20. *Lithobius (Lithobius) integrior*	E (ANAN)				+					
21. *Lithobius (Lithobius) intermissus*	E (ANAW)	+	+	+				+		
22. *Lithobius (Lithobius) ispartensis*	E (ANAS)		+	+						
23. *Lithobius (Lithobius) kastamonuensis*	E (ANAN)				+	+	+			
24. *Lithobius (Lithobius) lobifer*	E (ANAS)			+						
25. *Lithobius (Lithobius) lucifugus*	CEU	+		+						
26. *Lithobius (Lithobius) mutabilis*	-								?	
27. *Lithobius (Lithobius) nigripalpis*	EME	+	+	+	+	+	+	+	+	+
28. *Lithobius (Lithobius) persicus*	SWA								+	
29. *Lithobius (Lithobius) plesius*	SWA			+	+	+	+			+
30. *Lithobius (Lithobius) punctulatus*	SEU						+			
31. *Lithobius (Lithobius) rizensis*	E (ANAN)						+			
32. *Lithobius (Lithobius) subtilis* sensu Muralevitch	E (POCA)						+			
33. *Lithobius (Lithobius) uludagensis*	E (ANNW)	+								
34. *Lithobius (Lithobius) viriatus*	SEU	+		+	+	+	+	+	+	

35. *Lithobius (Sigibius) boluensis*	-	+			+					
36. *Lithobius (Sigibius) dogubayazitensis*	E (KURD)								+	
37. *Lithobius (Sigibius) jurinici*	SEU					+				
38. *Lithobius (Sigibius) micropodus*	MED	+	+	+	+	+	+			
39. *Lithobius (Sigibius) microps*	EUR	+		+	+	+	+			
40. *Lithobius (Sigibius) "microps elongatus"*	E (POCA)	+			+	+	+	+		
41. *Lithobius (Sigibius) mollis*	E (ANAW)	+		+						
42. *Lithobius (Sigibius) rectus*	E (ANAN)					+	+			
43. *Lithobius (Sigibius ?)* cf. *reiseri*	-			+						
44. *Lithobius (Sigibius) simplicior* (Chamberlin)	-	+								
45. *Lithobius (Sigibius) tidissimus*	EME	+	+	+				+	+	
46. *Lithobius (Monotarsobius) aeruginosus*	CEU				+		+		+	+
47. *Lithobius (Monotarsobius)* cf. *catascaphius*	SEU (*L. catascaphius*)			+	+					
48. *Lithobius (Monotarsobius) crassipes*	SIE	+	+	+		+	+	+		
49. *Lithobius (Monotarsobius) curtipes*	CAE	+		+		+	+		+	
50. *Lithobius (Monotarsobius) evasus*	E (ANAN)	+			+					
51. *Lithobius (Monotarsobius) ferganensis*	CAE	+			+	+	+		+	
52. *Lithobius (Monotarsobius) manicastrii*	E (KURD)						+			
53. *Lithobius (Monotarsobius) paucispinus*	E (ANAN)	+			+		+			
54. *Lithobius (Monotarsobius) simplicior* (Verhoeff)	E (ANAN)						+		+	
55. *Lithobius (Monotarsobius) sivasiensis*	E (ANAN)				+	+			+	+
56. *Lithobius (Monotarsobius) tuberculipes*	SWA						+	+	+	
57. *Lithobius (Ezembius) tahirensis*	-								+	
58. *Lithobius (Ezembius) zeylanus*	SWA			+					+	+
59. *Lithobius (Porobius) pamukkalensis*	E (ANAS)		+	+						
60. *Lithobius (Porobius) parvicornis*	SWA			+			+	+		+
61. *Harpolithobius adontus*	-			+						
62. *Harpolithobius anodus*	SEU			+						
63. *Harpolithobius augens*	-	+								
64. *Harpolithobius erraticus*	-				+					
65. *Harpolithobius halophilus*	SEU	+			+	+	+	+		
66. *Harpolithobius osellai*	E (ANAN)					+	+			
67. *Harpolithobius perplexus*	E (POCA)					+	+			
68. *Harpolithobius polonezenus*	SEU	+			+	+				
69. *Harpolithobius secutus*	-			+						
70. *Harpolithobius vignatagliantii*	E (ANAS)			+						
71. *Anodonthobius osellai*	E (ANAN)	+					+			
72. *Pleurolithobius orientis*	EME	+	+							
73. *Pleurolithobius patriarchalis*	EME	+	+	+						
74. *Hessebius armatus*	-			+						
75. *Hessebius barbipes*	TUM			+						+
76. *Scolopendra canidens*	STS								+	+
77. *Scolopendra cingulata*	MED	+	+	+	+	+	+	+	+	+
78. *Scolopendra clavipes*	EME	+	+	+						
79. *Scolopendra cretica*	-		i?							
80. *Scolopendra mirabilis*	NAS									+

81. *Cryptops anomalans*	EUR	+			?				?	
82. *Cryptops brignolii*	E (ANAN)				+					
83. *Cryptops caucasius*	E (POCA)						+		+	
84. *Cryptops compositus*	-	+			+		+			
85. *Cryptops hortensis*	TEM					+	+		+	
86. *Cryptops kosswigi*	EME	+	+	+	+		+	+	+	
87. *Cryptops parisi*	CEU	+			+					
88. *Cryptops trisulcatus*	MED	+	+	+						
89. *Himantarium gabrielis*	MED	+	+	+		+		+		
90. *Tracophius cilicius*	-			?						
91. *Thracophilus pachypus*	EME		+	+						+
92. *Bothriogaster signata*	TUM	+	+	+				+	+	+
93. *Dignathodon microcephalus*	MED		+	+		+		+		
94. *Henia (Henia) athenarum*	SEU	+			+	+	+			
95. *Henia (Henia) illyrica*	SEU	+		+		+		+		
96. *Henia (Scotophilus) bicarinata*	MED		+	+					+	+
97. *Henia (Chaetechelynae) transversa*	E (ANAS)			+						
98. *Henia (Turkophilus) porosa*	SEU	+			+					
99. *Nyctunguis persimilis*	-							?		
100. *Pachymerium caucasicus*	SWA				+		+			
101. *Pachymerium ferrugineum*	WPA	+	+	+		+	+		+	
102. *Pachymerium serratum*	-			+						
103. *Pachymerium syriacum*	EME			+						+
104. *Clinopodes flavidus*	TEM	+	+	+	+	+	+	+	+	+
105. *Kurdistanius kosswigi*	-									+
106. *Geophilus carpophagus*	EUM			+	+	+	+			
107. *Geophilus caucasicus*	E (POCA)					+	+		+	
108. *Geophilus conjungens*	EME	+	+	+		+		+	+	
109. *Geophilus honozus*	E (ANAS)			+						
110. *Geophilus insculptus*	EUR	+							+	
111. *Geophilus linearis*	MED	+	+	+		+		+	+	+
112. *Geophilus mundus*	-				+					
113. *Geophilus poseidonis*	MED		+							
114. *Geophilus simoporus*	-	+		+						
115. *Geophilus truncorum*	-									
116. *Bithyniphilus bosporanus*	E (ANNW)	+								
117. *Bebekium mirabile*	E? (ANNW?)	+								
118. *Pleurogeophilus latisternum*	-			?						
119. *Pleurogeophilus mediterraneus*	SEU			?		+	+			
120. *Porethus ballidagus*	-				+					
121. *Porethus pauciporus*	E (ANAS)	?		+						
122. *Porethus segregans*	-			+						
123. *Strigamia acuminata*	CEU	+		+	+	+	+		+	
						66				
Number of species		49	28	55	39	34	44	22	32	20

Smithsonian Institute, Washington (USA); the Institute of Zoology of Academy of Sciences, Sofia (Bulgaria), the Zoological Museum, Copenhagen (Denmark), the Italian Museo civico di Storia naturale "G. Doria", Genoa, the Museum of Zoology of the University of Rome "La Sapienza", the Museo regionale di Scienze naturali, Turin, the Museo civico di Storia naturale, Verona, and the Museo civico di Storia naturale "E. Caffi", Bergamo.

The chorotype of the species has been defined according to Vigna Taglianti et al. (1993, 1999).

FAUNISTIC AND ZOOGEOGRAPHICAL REMARKS

The species of centipedes to date recorded in the study area are 123 (see Appendix I): Scutigeromorpha 2 species (2 genera, 2 families), Lithobiomorpha 73 species (8 genera, 2 families), Scolopendromorpha 13 species (2 genera, 2 families), Geophilomorpha 35 species (15 genera, 6 families).

It may be observed that this figure is rather high among other Mediterranean and South European areas, whose faunistic knowledge is comparable to Turkey's, even if not always current (Fig. 2). The approximate number of species recorded and the bibliographic sources critically revised are: Maghreb, 70 species (Brölemann, 1921; Zapparoli, unpublished records); Iberian peninsula, 50 (Attems, 1927, 1952; Machado, 1952); France, 104 (Demange, 1981; Geoffroy, 1999); peninsular Italy, 148, Sardinia, 55, Sicily, 40 (Foddai et al., 1995); former Yugoslavia, 138 (Stoev, 1997); Rumania, 90 (Matic, 1966, 1972); Bulgaria, 90 (Stoev, 1997); Crimea, 10, Caucasus, 45 (Attems, 1907; Zalesskaya, 1987; Zalesskaya and Schileyko, 1991); mainland Greece, 86, Crete, 27, Cyprus, 10 (Zapparoli, unpublished records). The

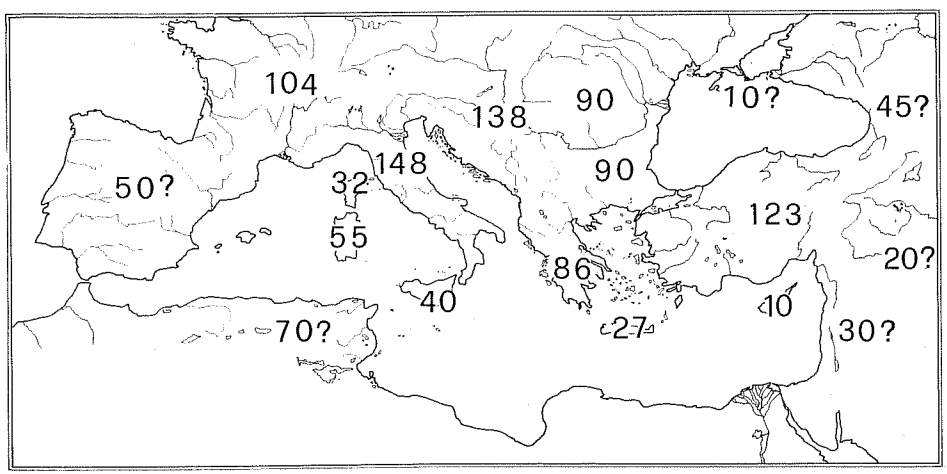


Fig. 2 - Number of species of centipedes in the Mediterranean and South European countries (cf. text for references); question marks indicate a rough estimate.

low number of species of centipedes in Middle East countries, especially for Iran, Iraq, and Syria (20-30 species in all: Zapparoli, unpublished records, see below for references), must be related to a lack of knowledge.

It is possible to assume, however, that the real number of centipedes present in the study area must be higher than the recorded value. To date, Scutigeromorpha and the Lithobiomorpha genera *Lithobius* s. str., *Pleurolithobius*, *Eupolybothrus* and *Ottobius* are the best known taxa. On the contrary, the number of species and the distribution of other genera of Lithobiomorpha and Scolopendromorpha Cryptopidae is surely underestimated. Moreover, little is known about the Geophilomorpha, both from faunistic and taxonomic points of view, especially for Geophilidae and Schendylidae, with almost no reliable records.

From a faunistic point of view, the knowledge of the area is probably still far from being complete. The westernmost regions of Turkey are better known (Tab. 1), mainly the Taurus range and Mediterranean coasts (55 species), as well as the Marmara Sea area (49 species). Sixty-five species have been recorded in the Pontus range. Turkish Armenia, Central Anatolia and Turkish Kurdistan are the lesser known regions, with 32, 22 and 20 species each. The easternmost part of Turkish Kurdistan is the region that is known the least (e.g.: only three species recorded from the vil. Hakkari). However, the observed general reduction of knowledge from west to east must be related to unequal faunistic exploration.

From a zoogeographical standpoint, the still incomplete and fragmentary nature of the faunistic and taxonomic knowledge, allows us to give only a preliminary rough analysis of the fauna. Moreover, it is not possible at present to correctly evaluate the distribution of the species to date considered as endemic, without a better knowledge of the fauna of adjacent areas such as the Caucasus and the Middle East. As regards the Middle East, only five papers are devoted to the fauna of Syria (Attems, 1910, 1926; Brölemann, 1922, 1923; Porat, 1893), two to Iraq (Chamberlin, 1958; Dobroruka, 1976), one to Cyprus (Turk, 1952), and eight to Iran (Attems, 1951; Brölemann, 1922, 1923; Eason, 1981; Matic, 1969, 1980; Pocock, 1900; Zapparoli, 1986). This is an area about 2.271.500 sq. km wide, nearly a fifth as large as Europe, and where, even if not greatly heterogeneous from an environmental standpoint, only a few dozen species have been to date recorded. Therefore, an objective evaluation of the affinities among the Anatolian fauna and other adjacent geographical areas is not presently possible.

In Tab. 2 the species of centipedes recorded in the study area are listed according to their chorotype. The zoogeographical analysis considers only 100 of the 123 species listed in the checklist in Appendix I. The following 23 species are not considered:

a) species whose identity is uncertain: *Lithobius boluensis*, *L.* cf. *reiseri*, *L. (S.) simplicior*, *L. tahirensis*, *Harpolithobius adontus*, *H. augens*, *H. erraticus*, *H. secutus*, *Hessebius armatus*, *Cryptops compositus*, *Thracophilus cilicius*, *Pachymerium*

serratum, *Kurdistanius kosswigi*, *Geophilus mundus*, *G. simoporus*, *Pleurogeophilus latisternus*, *Porethus ballidagus*, *P. segregans*.

b) species whose presence in the study area is uncertain: *Lithobius mutabilis*, *Nyctunguis persimilis*, *Geophilus truncorum*.

c) species introduced or probably introduced in the study area: *Lamyctes emarginatus*, *Scolopendra cretica*.

Although in the future more data will be added to present knowledge, the main chorological patterns represented in the centipedes fauna of Turkey can be outlined as follows.

Tab. 2 - Chorotypes of the centipedes of Turkey.

SPECIES WIDELY SPREAD IN THE HOLARCTIC REGION (17)

W-Palearctic (1)
Pachymerium ferrugineum

Sibero-European (1)
Lithobius (Monotarsobius) crassipes

Centralasiatic-European (2)
Lithobius (Monotarsobius) curtipes
Lithobius (Monotarsobius) ferganensis

Turano-Europeo-Mediterranean (2)
Cryptops hortensis
Clinopodes flavidus

Turano-Mediterranean (2)
Hessebius barbipes
Bothriogaster signata

Europeo-Mediterranean (1)
Geophilus carpophagus

SW-Asiatic (8)
Thereuonema syriaca
Lithobius (subg.) liber
Lithobius (Lithobius) persicus
Lithobius (Lithobius) plesius
Lithobius (Monotarsobius) tuberculipes
Lithobius (Ezembius) zeylanus
Lithobius (Porobius) parvicornis
Pachymerium caucasicus

SPECIES MORE OR LESS WIDELY SPREAD IN EUROPE (23)

European (5)
Lithobius (Lithobius) erythrocephalus
Lithobius (Lithobius) forficatus
Lithobius (Sigibius) microps
Cryptops anomalans
Geophilus insculptus

Centraleuropean (5)
Lithobius (Lithobius) cf. *agilis*
Lithobius (Lithobius) lucifugus
Lithobius (Monotarsobius) aeruginosus
Cryptops parisi
Strigamia acuminata

Tab. 2 - Chorotypes of the centipedes of Turkey (continued).

S-European (13)
Lithobius (Lithobius) beschkovi
Lithobius (Lithobius) ergus
Lithobius (Lithobius) punctulatus
Lithobius (Lithobius) viriatus
Lithobius (Sigibius) jurinici
Lithobius (Monotarsobius) cf. *catascaphius*
Harpolithobius anodus
Harpolithobius halophilus
Harpolithobius polonezenus
Henia (Henia) athenarum
Henia (Henia) illyrica
Henia (Turkophilus) porosa
Pleurogeophilus mediterraneus

SPECIES MORE OR LESS WIDELY SPREAD IN THE MEDITERRANEAN COUNTRIES (20)
Mediterranean (9)
Scutigera coleoptrata
Lithobius (Sigibius) micropodus
Scolopendra cingulata
Cryptops trisulcatus
Himantarium gabrielis
Dignathodon microcephalus
Henia (Scotophilus) bicarinata
Geophilus linearis
Geophilus poseidonis

E-Mediterranean (11)
Eupolybothrus (Eupolybothrus) litoralis
Lithobius (Lithobius) carinatus
Lithobius (Lithobius) nigripalpis
Lithobius (Sigibius) tidissimus
Pleurolithobius orientis
Pleurolithobius patriarchalis
Scolopendra clavipes
Cryptops kosswigi
Thracophilus pachypus
Pachymerium syriacum
Geophilus conjungens

SPECIES WIDELY SPREAD IN THE PALEARCTIC REGION BUT OCCURRING IN SMALL PERIFERAL AREAS OF THE WESTERN PALEARCTIC REGION (2)
Saharo-Turano-Sindian (1)
Scolopendra canidens

NE-African-Sindian (1)
Scolopendra mirabilis

ENDEMICS TO THE NEAR EAST (38)
N-Anatolian endemic (13)
Lithobius (Lithobius) confusus
Lithobius (Lithobius) delictus
Lithobius (Lithobius) integrior
Lithobius (Lithobius) kastamonuensis
Lithobius (Lithobius) rizensis
Lithobius (Sigibius) rectus

Tab. 2 - Chorotypes of the centipedes of Turkey (continued).

Lithobius (Monotarsobius) evasus
Lithobius (Monotarsobius) paucispinus
Lithobius (Monotarsobius) sivasiensis
Lithobius (Monotarsobius) simplicior (Verhoeff)
Harpolithobius osellai
Anodonthobius osellai
Cryptops brignolii

W-Anatolian endemic (2)
Lithobius (Lithobius) intermissus
Lithobius (Sigibius) mollis

NW-Anatolian endemic (3)
Lithobius (Lithobius) uludagensis
Bebekium mirabile (?)
Bithyniphilus bosporanus

Ponto-Caucasian endemic (6)
Lithobius (Lithobius) coloratus
Lithobius (Lithobius) subtilis sensu Muralevitch, 1929 non Latzel, 1880
Lithobius (Sigibius) "microps elongatus"
Harpolithobius perplexus
Cryptops caucasius
Geophilus caucasicus

S-Anatolian (= Taurian) endemic (8)
Lithobius (Lithobius) elongipes
Lithobius (Lithobius) ispartensis
Lithobius (Lithobius) lobifer
Lithobius (Porobius) pamukkalensis
Harpolithobius vignatagliantii
Henia (Chaetechelynae) transversa
Geophilus honozus
Porethus pauciporus

Central Anatolian endemic (1)
Lithobius (Lithobius) erdschiasius

Kurdish endemic (4)
Lithobius (Lithobius) antonellae
Lithobius (Lithobius) biondii
Lithobius (Sigibius) dogubayazitensis
Lithobius (Monotarsobius) manicastrii

Kolkhidan endemic (1)
Ottobius hopanus

Chorotypes of species widely spread in the Holarctic Region

This group covers 17% of the centipede fauna of Anatolia and shows the highest values in the E-Anatolia and SE-Anatolia natural regions, where it corresponds to nearly 40% of the fauna; lower rates are recorded in the Marmara Region and in the W-Pontus Subregion (Fig. 3; Tab. 3). The detailed composition of this group is very heterogeneous and the species included could be arranged in seven chorotypes (W-Palearctic, Sibero-European, Centralasiatic-European, Turano-Europeo-Mediterranean, Turano-Mediterranean, Europeo-Mediterranean, SW-Asiatic). Except for the SW-Asiatic, most of these are poorly represented, by only one or two species.

The SW-Asiatic chorotype is doubtlessly the most important of this section, including about 47% of the species ascribed. In this group are the Scutigeridae *Thereuonema syriaca* and the Lithobiidae *Lithobius liber, L. persicus, L. plesius* (Fig. 11), *L. tuberculipes, L. zeylanus* and *L. parvicornis.*

Thereuonema syriaca belongs to a genus including two other species, *T. tuberculata* Wood, 1862, from E-Asia, and *T. turkestana* Verhoeff, 1905, from Central Asia (Würmli, 1975). *T. syriaca* extends its range from the Middle and Near East, southward to the Arabian peninsula and, along the Rift Valley, towards NE-Africa (Egypt, Sudan, Kenya). *Lithobius liber* belongs to the SW-Asiatic *Lithobius* species of the *elegans* group (see Appendix I, note 4) and has been recorded in Caucasus, E-Pontus and E-Anatolia. *L. persicus* is known only in a few localities in E-Turkey and N-Iran, but it is probably widely distributed especially in steppe and open habitats of E-Anatolia and Iran. *L. plesius* is to date recorded only in Anatolia with three subspecies, *L. p. plesius* along the whole Pontus, *L. p. antalyanus*, in the W-Taurus Mts., and *L. p. audisioi*, to date recorded

Tab. 3 - Percentage rates of main chorotypes and endemic species in the Anatolian natural regions. 1 = Marmara Region; 2 = Aegean Region; 3 = Mediterranean Region; 4_1 = W-Pontus Subregion; 4_2 = Central Pontus Subregion; 4_3 = E-Pontus Subregion; 5 = Inner Anatolian Region; 6 = E-Anatolian Region; 7 = SE-Anatolian Region.

	Natural Regions								
	1	2	3	4_1	4_2	4_3	5	6	7
Main chorotypes									
Holoartic	13.6	17.9	22.9	15.2	23.5	26.2	22.7	35.5	36.8
European	31.8	3.6	18.8	39.4	32.3	26.2	18.2	16.1	10.5
Mediterranean	34.1	67.8	37.5	18.2	23.5	9.5	45.4	22.6	36.8
Palearctic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	10.5
Endemics	20.5	10.7	20.8	27.3	20.6	38.1	13.6	22.6	5.3

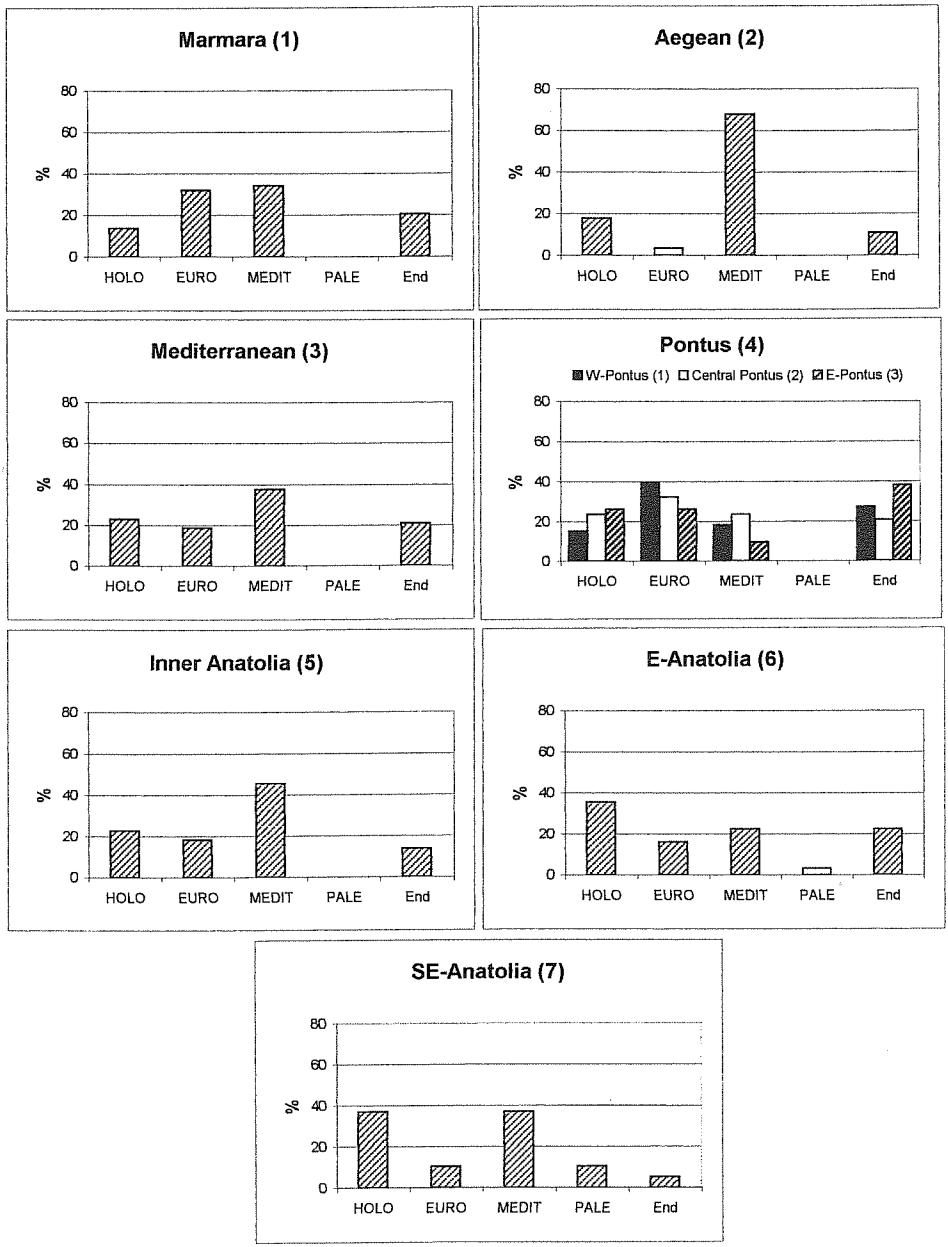


Fig. 3. - Main chorotypes and endemics percentage of the centipedes fauna of Anatolia according to their distribution in the natural region.

only from the Amanus Mts. and in NW-Kurdistan but probably also present in NW-Syria. *L. tuberculipes*, described from Krasnaja Poliana (NW-Caucasus) (cf. Zalesskaja, 1987), has been recorded in Turkey from the E-Pontus, Inner and E-Anatolian regions and it is present in Armenia and Azerbaijan as well (Zapparoli, unpublished records). *L. zeylanus* is a species included in *Ezembius*, a subgenus whose distribution covers all the Eastern Paleartic Region and W-Alaska. *L. zeylanus* has been recorded at present in SE-Anatolia and in Turkish Kurdistan, but it probably extends more eastwards into Iran, Iraq and Syria. *L. parvicornis* is distributed in NW-Iran, Middle East, SW- and E-Anatolia. The range of this species exclude the Pontus mountains, but a record from vil. Gumushane (E-Pontus) is known (Zapparoli, unpublished record) (Fig. 8).

Among the SW-Asiatic representatives here included is also the Geophilidae *Pachymerium caucasicus*. This species has been mainly recorded in E-Pontus, Iran, Iraq, Azerbaijan and Saudi Arabia, even if isolated records from Japan also exist (cf. Lewis, 1996).

The W-Palearctic chorotype is represented by one species only, the Geophilidae *Pachymerium ferrugineum*, one of the wider distributed centipedes in Anatolia.

The Sibero-European and Centralasiatic-European chorotypes are represented in the study area by species distributed only along the Pontus, such as the Lithobiidae *Lithobius crassipes* and *L. curtipes*, both belonging to the first group, and *L. ferganensis*, belonging to the second one. Also the Europeo-Mediterranean chorotype shows in the study area a similar pattern of distribution, but the only Anatolian centipede attached to this group, *Geophilus carpophagus*, is also present in a separate area of E-Taurus (Zapparoli, unpublished records).

The Turano-Europeo-Mediterranean chorotype is represented by the Cryptopidae *Cryptops hortensis*, ranging in Anatolia in the easternmost part of Pontus and in Antitaurus (Zapparoli, unpublished records) mostly in forested habitats, and by the Geophilidae *Clinopodes flavidus*, one of the most frequent species in the whole study area, especially in pastures and steppes.

Two species could be ascribed to the Turano-Mediterranean chorotype, such as the Lithobiidae *Hessebius barbipes* and the Himantariidae *Bothriogaster signata*. *H. barbipes* ranges from Iran to the E-Mediterranean region, reaching eastward Cyrenaica (N-Africa) and the SW-Anatolian historical region of Caria, across N-Syria and N-Iraq and the SE- and E-Mediterranean coast. *B. signata* also extends its distribution from Afghanistan and Iran towards the E-Mediterranean area up to Tunisia, in N-Africa, and to Bulgaria, in SE-Europe. The distribution of *B. signata* in Anatolia is much wider than that of *H. barbipes* and includes almost the whole peninsula excluding the Pontus area. Both species prefer arid open habitats, steppe or bushlands.

Chorotypes of species widely spread in Europe

23% of the Anatolian centipedes could be arranged in this group. The main part of these species is present in the northernmost regions such as the Pontus, especially in the western subregion were they represent about 40% of the fauna, and in the Marmara Region (Fig. 3, Tab. 3). A very lower rate must be recorded in the Aegean Region (3.5%), whereas in the more inland natural regions, such as Inner, E- and SE-Anatolia, and in the Mediterranean Region, intermediate values (10-18%) have been recorded.

Among the species occurring mainly in the Pontus range, some are scattered along the whole range, such as the S-European *Lithobius viriatus*, *Henia athenarum*, and *H. illyrica*, the European *Lithobius microps*, *L. forficatus* and *Geophilus insculptus*, or the Centraleuropean *L. aeruginosus* and *Strigamia acuminata*. *Henia illyrica* extends its distribution to the Central Plateau, reaching southward the northern slopes of the Taurus range. *Lithobius viriatus* ranges from SE-Italy to the Caucasus, Crimea and NW-Iran through the Balkans and N-Anatolia; separate populations are known in the W-Taurus and in Palestine (Zapparoli, 1988, 1991).

To this group also belongs the Centraleuropean *Cryptops parisi*, present in Anatolia only in the western part of the northern regions, and some S-European species showing a narrower distribution area mainly including Bulgaria and N-Turkey. These are *Lithobius ergus*, *L. jurinici*, *L. beschkovi*, *Harpolithobius polonezenus* and *Henia porosa*.

Harpolithobius halophilus, a species belonging to a genus ranging from NW-Italy to the Caucasus, across the Balkans and N-Anatolia, and also occurring in separate areas such as the W-Alps, S-Anatolia and Palestine, is also included among the S-European species. *H. halophilus* has been recorded in scattered localities of European Turkey, Pontus, and Inner Anatolia as well as in Lebanon and in Israel (Zapparoli, 1991).

One S-European species, *Lithobius punctulatus*, ranges in Anatolia only along the easternmost Pontus regions. This species is also discontinuously distributed along the Pyrenees, the Alps and N-Italy, the Central Apennines, the Carpathians and SW-Caucasus.

Among the species present in the Pontus range as well as in the Taurus mountains, are included the S-European *Harpolithobius anodus* and *Pleurogeophilus mediterraneus*, but some taxonomic problems must be solved before a definite zoogeographical treatment is possible. *H. anodus*, shows a continuous distribution from the E-Alps to Anatolia, through the Carpathians and Balkans, with a separate European area in the W-Alps. This species has been recorded in Anatolia from the Taurus (Verhoeff, 1925, 1934; Zapparoli, unpublished records) but four species apparently close to *H. anodus*, and whose identities need to be revised, were described by Chamberlin (1952) from E-Taurus (*H. adontus*, *H. secutus*) and from

N-Anatolia (*H. erraticus*, *H. augens*). *Pleurogeophilus mediterraneus* shows a discontinuous distribution which also includes N-Africa, Balearic Islands, Central Europe and Balkans. In Anatolia this species has been recorded in the E-Pontus but two other apparently close *Pleurogeophilus* (*P. latisternus* and *P. turkensis*), whose identities are uncertain, have been described from isolated areas of the Taurus range (Attems, 1947; Chamberlin, 1952).

Two other species are included in the group of European species, *Lithobius* cf. *agilis*, recorded from a cave in the W-Taurus (Zapparoli, 1994a), and *Lithobius* cf. *catascaphius*, known from two localities in W-Pontus (vil. Bolu) and W-Taurus (vil. Konya) respectively. Both *L. agilis* and *L. catascaphius* show a European discontinuous distribution including also part of Anatolia. *L. agilis* is known from Central and Eastern European countries, southward to N-Italy and the Balkans. Isolated populations are also present in the Pyrenees, Sardinia, Greece and Crete. *L. catascaphius* is known from very few localities in N-Italy and in Bulgaria. The final identity of the Anatolian records of both species, here provisionally assigned, may be well stated when more material is available.

In this section are also included *L. erythrocephalus* and *Cryptops anomalans*. *L. erythrocephalus* is the only European species distributed throughout Anatolia, and its general distribution range extends eastward from Northern, Central and Eastern Europe, across the Middle East to E-Iran. Old records from N-Africa and the southern Iberian Peninsula need to be confirmed. *L. erythrocephalus* is also known from Iceland, Macaronesia, and Arabia, where it was probably introduced. *Cryptops anomalans* is marginally present in Turkey, as the only reliable records come from the European side (cf. Tab. 1).

Chorotypes of species widely spread in the Mediterranean countries

These species represent 20% of the Anatolian centipedes and are almost half shared with the E-Mediterranean (55%), whose rate is comparatively higher, and the Mediterranean (45%) chorotypes. In Anatolia, the broad Mediterranean component is mainly represented in the Aegean Region, were it exceeds 65% of the fauna (Fig. 3, Tab. 3). A high value (about 45%) has also been recorded in Inner Anatolia, and lower percentages have been recorded in the Pontus (E-Pontus) and in E-Anatolia Regions. In the Mediterranean Region of Anatolia, the percentage of this chorotype is relatively low (37%). This can be explained by remembering the occurrence in S-Anatolia, especially in the W-Taurus mountains, of a number of European or S-European species that are more widely and continuously distributed in Europe and in N-Anatolia and represented in this region only by relic populations (*i.e.*, *Harpolithobius* spp., *L.* cfr. *agilis*, *L. viriatus*, *Strigamia acuminata*).

To the E-Mediterranean chorotype belong species like *Lithobius carinatus*, whose distribution extends from Greece (E-Peloponnesus, Attica, Evvoia, Egean

Islands) and Turkey (Western and Southern regions) to the Middle East (Palestine), and *Scolopendra clavipes*, distributed from W- and S-Anatolia to Palestine. *Cryptops kosswigi* and *Pachymerium syriacum* show almost the same distribution pattern, but they also extend more eastwards in Mesopotamia and in Kurdistan (Zapparoli, unpublished records); *C. kosswigi* is also present in Crete.

The two Lithobiidae of the genus *Pleurolithobius*, *P. orientis* and *P. patriarchalis*, are also included in the group of E-Mediterranean species. *P. orientis* is recorded only from both sides of the Marmara and Aegean coasts; *P. patriarchalis* shows a more extensive distribution including Bulgaria, S-Italy and Cyrenaica (introduced?) (Zapparoli, 1989a; Zapparoli and Minelli, 1993).

A more extensive distribution in the eastern countries of the Mediterranean basin is shown by *Eupolybothrus litoralis*, the only species represented in the Near East of a genus of Lithobiidae mainly occurring in S-Europe (Zapparoli, 1995b). *E. litoralis* has a wide distribution from the Balkans to Palestine, through the Aegean Islands, Crete and Cyprus. Almost the same pattern is shown by the Himantariidae genus *Thracophilus*, but in spite of the revision of Matic and Darabantu (1974), the taxonomic arrangement of this genus is still unsatisfactory. *T. pachypus* is probably the only *Thracophilus* species that is present in Turkey and it has been recorded in a few localities of southern Anatolia as well as in Palestine (Zapparoli, 1995a, unpublished records).

An E-Mediterranean chorotype is also shown by *Lithobius nigripalpis*, a very common Lithobiidae whose distribution includes SW-Anatolia (including the Central Plateau), Crete, the Aegean Islands, S-Greece (Peloponnesus, Attika, Evvoia), and Bulgaria, northwards to the Danube river and to Dobruja (Roumania). It does not occur in the S-Balkans (Macedonia, Northern and Central Greece).

Two other E-Mediterranean species are *Lithobius tidissimus* and *Geophilus conjungens*, both occurring throughout S-Anatolia and in the adjacent Aegean islands of Rhodos (*L. tidissimus*), Karpathos and Kos (*G. conjungens*). These species show a wide distribution in the study area and it is possible that they are also present in Syria and in Lebanon.

The Mediterranean chorotype is represented by species like *Scolopendra cingulata*, whose distribution excludes the Balearic Islands, Corsica, Sardinia and Crete, *Himantarium gabrielis*, which is absent from the Iberian peninsula, *Dignathodon microcephalus*, absent from Crete, and *Henia bicarinata* and *Scutigera coleoptrata*, both extending from the Canary Islands to Iran. Among the Mediterranean species, *Geophilus poseidonis* must also be mentioned (Zapparoli, unpublished records). It is a halophilous species known from scattered littoral localities along the Mediterranean and Red Seas (Egypt, Somalia). Another species is *Cryptops trisulcatus*, formerly known from the W-Mediterranean, but recently recorded also from Greece (Zapparoli, 1994b) and

Turkey (Zapparoli, unpublished records). *Lithobius micropodus* and *Geophilus linearis* must be also included in the group of Mediterranean species.

Chorotypes of species widely spread in the Palearctic Region but occurring in small peripheral areas of the W-Palearctic region

Two species (2%) are arranged in this group, both belonging to the Scolopendridae genus *Scolopendra*: the Saharo-Turano-Sindian *S. canidens* and the NE-African-Sindian *S. mirabilis*. These two species prefer steppe as well as open habitats, and they have been recorded in Turkey only in localities along the Syrian border and in Kurdistan, were they find their northern limit (Zapparoli, unpublished records). *S. canidens* belongs to a group of species including *S. dalmatica*, from the Balkans, *S. oranensis*, from Central Italy, Sardinia and Sicily, *S. clavipes*, from W-Anatolia (including Rhodos) and Palestine, and *S. cretica*, from Crete (Würmli, 1980; Lewis, 1985). *S. mirabilis* reaches eastward to the Rajastan (Kanna, 1977), but Schileyko (1995) reported it also from forest on an island (Cat Ba Isl.) off the coast of North Vietnam.

Endemics to the Near East

This group comprises about 38% of the centipede fauna of Anatolia, a value higher than those for other Mediterranean areas. In Italy, for instance, the endemic centipedes comprise about 30% of the fauna (cf. Foddai et al., 1995); in Mainland Greece (Zapparoli, unpublished records), it is about 25%, and in France (excluding Corsica), it is around 20% (cf. Demange, 1981; Geoffroy, 1999).

Of the listed endemics (Tabb. 1, 2), 29 species (79% of the total endemics) belong to the order Lithobiomorpha, 6 (16%) to Geophilomorpha, 2 (5%) to Scolopendromorpha Cryptopidae; no endemics are found among the Scutigeromorpha. A similar pattern also exist for the Italian fauna, where Lithobiomorpha represent 75%, Geophilomorpha 23%, and Scolopendromorpha 2% of all the Italian endemic centipedes.

The species endemic to the Near East present in Anatolia, must be arranged in the following eight groups: N-Anatolian endemic (13 species), W-Anatolian endemic (2), NW-Anatolian endemic (3), Ponto-Caucasian endemic (6), S-Anatolian (= Taurian) endemic (8), Central Anatolian endemic (1), Kurdish endemic (4), Kolkhidan endemic (1).

The bulk of endemics occur in the N-Anatolia mountain areas, especially in the E- and in the W-Pontus, where they are respectively 38% and 27% of the fauna (Fig. 3, Tab. 3). In the Mediterranean, Marmara and E-Anatolia Regions this percentage is about 20-22%, whereas in the Aegean and in the Inner Anatolia Regions it falls to 10-13%. To date, a lower percentage of endemics is recorded

in SE-Anatolia Region, but as already stated, the number of species in each of the above groups could change as the faunistic and taxonomic knowledge of the Anatolian and Near East centipedes increase.

In the N-Anatolia region the main group of endemics is represented by species ranging along the Pontus. Of the six species present throughout the range, *L. kastamonuensis* and *L. sivasiensis* are distributed more or less uniformly in the coast mountains, the former, and more inland, the latter (Fig. 4). The other three species, *L. simplicior* Verhoeff, *L. delictus* and *L. paucispinus*, are all known from only a few scattered localities (Fig. 4).

Anodonthobius osellai, a Lithobiidae belonging to a monotypic genus close to the S-European *Harpolithobius*, is also included in this group. *A. osellai* is continuously distributed in the E-Pontus range, and is also recorded in the westernmost Ulu Dağ (vil. Bursa) (Fig. 4). Ranging throughout the Pontus is also the Ponto-Caucasian endemic *Lithobius (Sigibius) "microps elongatus"*, also known from Caucasus (Zapparoli, unpublished data).

Seven species are distributed in NW-Anatolia only (from W-Pontus to Ulu Dağ). Among these are such N-Anatolian endemics as *Lithobius confusus*, *L. integrior*, *L. evasus* and *Cryptops brignolii* (Fig. 5). Also included is the NW-Anatolian endemic *Lithobius uludagensis*, which is closely related to the European *L. erythrocephalus* and known only from broadleaved forest habitats of Ulu Dağ (Fig. 7). Moreover there are the Geophilidae *Bebekium mirabile* and *Bithyniphilus bosporanus*, only recorded from localities on both sides of the Bosphorus (Fig. 7) and both belonging to monotypic genera apparently close to *Geophilus*.

Three N-Anatolian endemics have been recorded in the E-Pontus, *Lithobius rizensis*, *L. rectus* and *Harpolithobius osellai*, all with S-European affinities (Fig. 6).

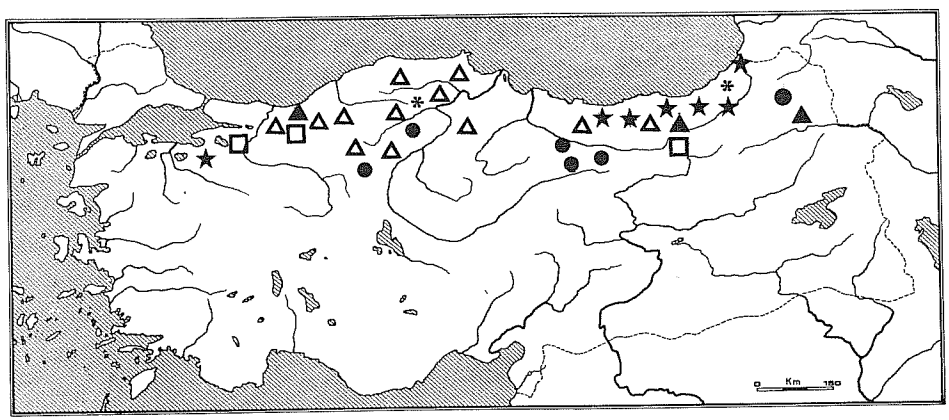


Fig. 4 - Distribution map of *Lithobius delictus* (Chamberlin, 1952) (asterisks), *L. kastamonuensis* Matic, 1983 (open triangles), *L. paucispinus* (Matic, 1976) (open squares), *L. sivasiensis* (Matic, 1976) (full circles), *L. simplicior* (Verhoeff, 1943) (full triangles), *Anodonthobius osellai* Matic, 1983 (full stars).

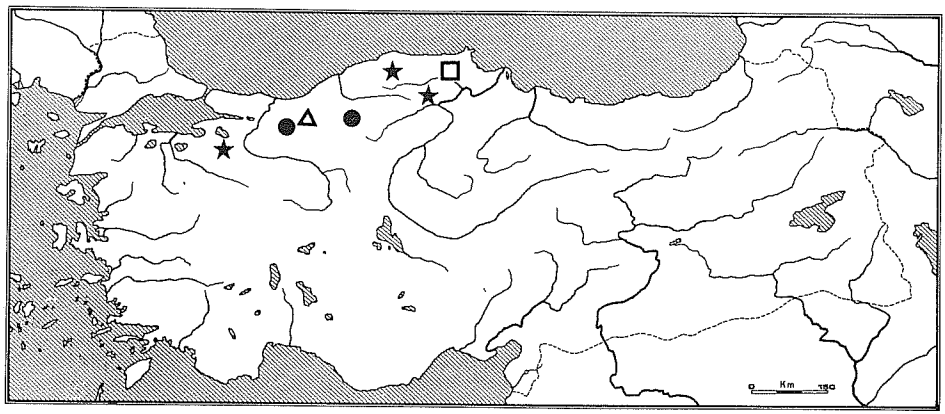


Fig. 5 - Distribution map of *Lithobius confusus* (Chamberlin, 1952) (circles), *L. integrior* (Chamberlin, 1952) (triangle), *L. evasus* (Chamberlin, 1952) (stars), *Cryptops brignolii* Matic, 1977 (square).

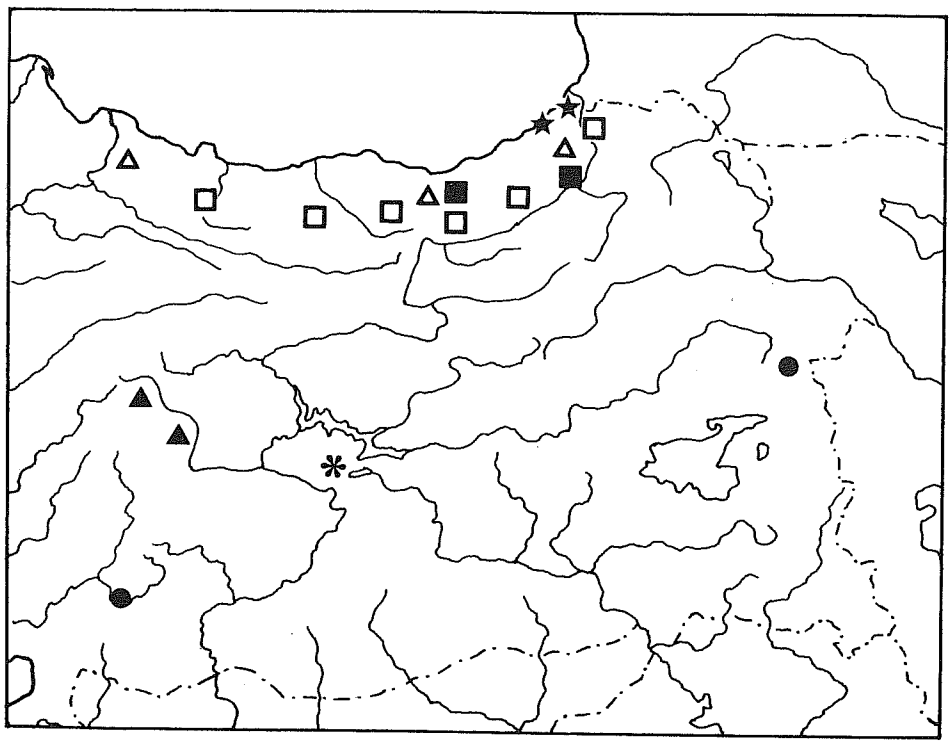


Fig. 6 - Distribution map of *Ottobius hopanus* (Chamberlin, 1952) (stars), *Lithobius antonellae* n. sp. (full triangles), *L. dogubayazitensis* n. sp. (full circles), *L. manicastrii* n. sp. (asterisk), *L. rectus* (Chamberlin, 1952) (open triangles), *L. rizensis* n. sp. (full squares), *Harpolithobius osellai* Matic, 1983 (open squares).

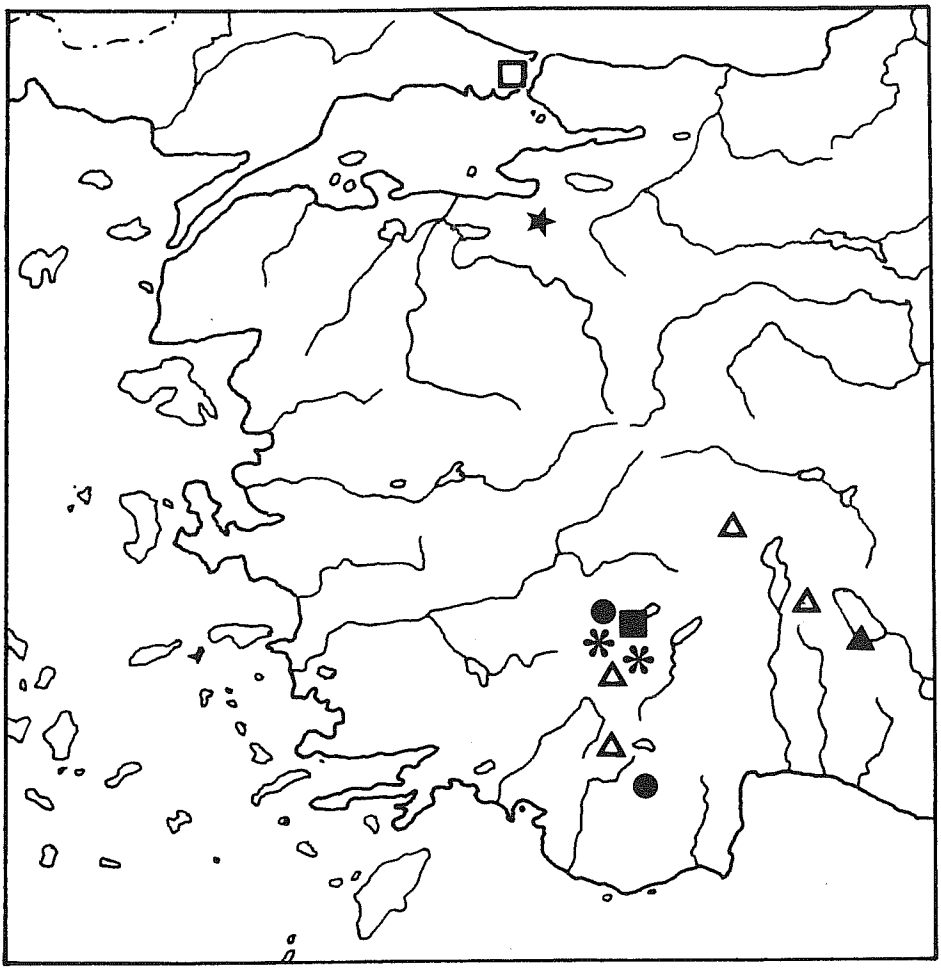


Fig. 7 - Distribution map of *Lithobius uludagensis* Matic, 1983 (star), *L. ispartensis* n. sp. (open triangles), *L. lobifer* (Chamberlin, 1952) (circles), *Harpolithobius vignatagliantii* Zapparoli, 1989 (full triangle), *Henia transversa* (Chamberlin, 1952) (asterisks), *Bebekium mirabile* Verhoeff, 1944 (open square) and *Geophilus honozus* (Chamberlin, 1952) (full square).

In the easternmost part of the Pontus range some Ponto-Caucasian endemics have also been recorded, like *L. subtilis* sensu Muralevitch, *L. coloratus*, *H. perplexus* and *Cryptops caucasius*, all with European (Centro-European or S-European) affinities, and *Geophilus caucasicus*, whose affinities are uncertain.

In the E-Pontus the Kolkhidan Lithobiidae *Ottobius hopanus*, one of the most remarkable endemics of the whole Anatolian fauna, has also been recorded. This species, whose affinities are still uncertain, is known only from mesophilous broadleaved forests of a very few localities between 90-320 m on s.l., close to the Georgian border, near Hopa (Fig. 6). *Ottobius* is a monotypic genus and a

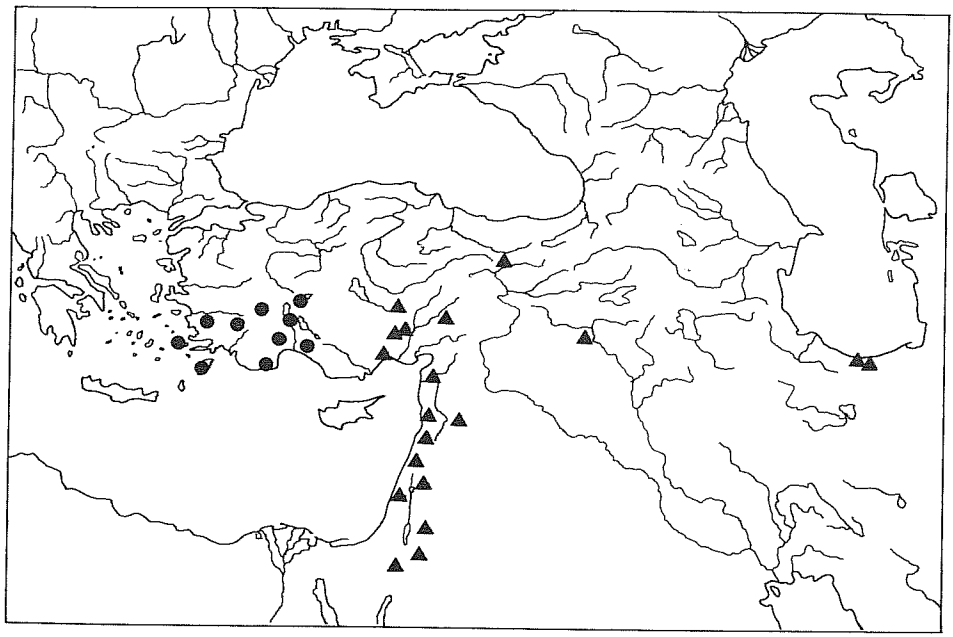


Fig. 8 - Distribution map of *Lithobius pamukkalensis* Matic, 1980 (circles) and *L. parvicornis* (Porat, 1893) (triangles).

senior synonym of *Osellaebius* Matic, 1973, as proposed by Zapparoli (1993a). At present, *Ottobius* is included in the subfamily Pseudolithobiinae, together with the Nearctic genus *Pseudolithobius* Stuxberg, 1875. Eason (1992) considers *Osellaebius* and *Pseudolithobius* as belonging to a natural group and he supports the idea of a faunistic link between the Middle East and N-America. According to Zapparoli (1993a) this hypothesis is insufficiently proved and, even if one accepts the taxonomic arrangement of the subfamily, the affinities between the genera are in doubt.

Concerning S-Anatolia, some endemic species are mainly in W-Taurus, such as the S-Anatolian endemic *Lithobius ispartensis* (Fig. 7), close to *L. integrior*, and *L. lobifer* an apparently isolated species among the *Lithobius* s. str. of the E-Mediterranean (Fig. 7).

In W-Taurus as well in S-Sporades four other centipedes have been reported: *Lithobius pamukkalensis*, which is close to the SW-Asiatic *L. parvicornis* (Fig. 8), *Harpolithobius vignatagliantii*, a troglobitic species with S-European affinities known only from a cave in the northern slopes of Pisidian Taurus (cave of Haci Hakif Is., Beysehir Lake, vil. Konya), *Henia (Chaetechelynae) transversa*, belonging to a subgenus including two S-European species (*H. vesuviana* (Newport, 1844) and *H. montana* (Meinert, 1870)), and *Geophilus honozus*, whose identity must be ascertained (Fig. 7).

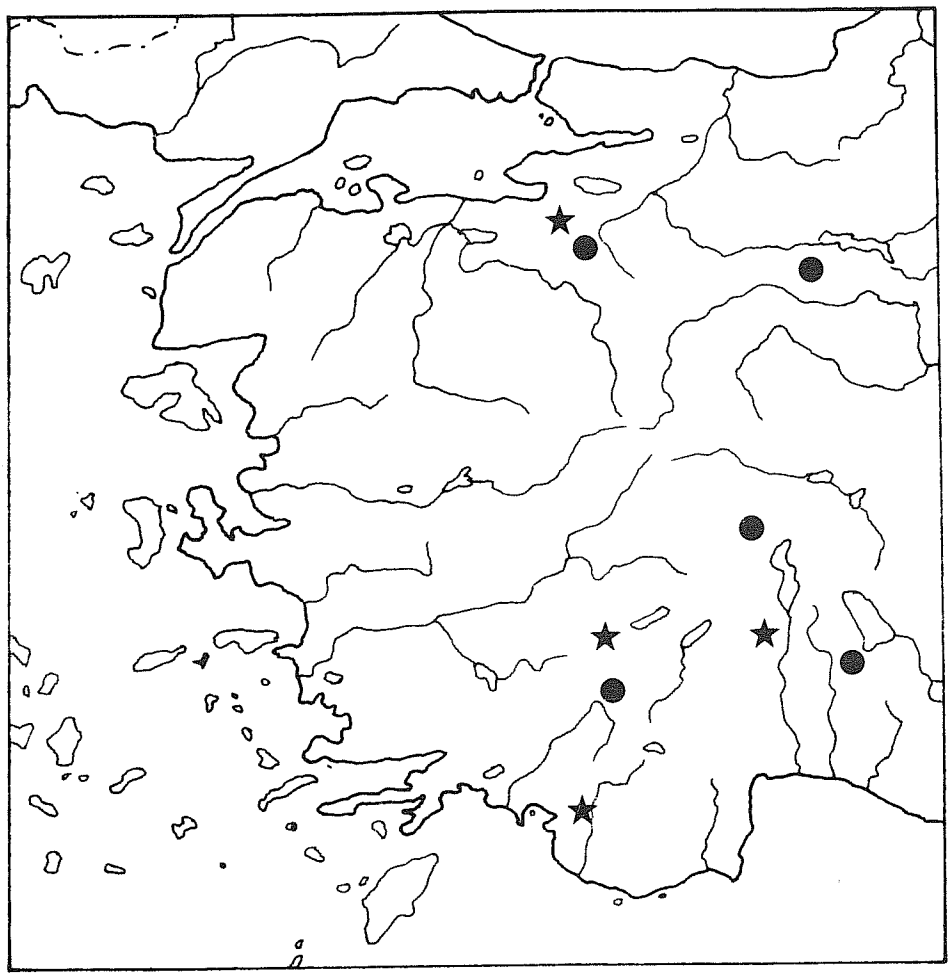


Fig. 9 - Distribution map of *Lithobius intermissus* (Chamberlin, 1952) (circles) and *L. mollis* (Chamberlin, 1952) (stars).

In E-Taurus (Hatay) two enigmatic species of centipedes have been reported: the Lithobiidae *Lithobius elongipes* and the Chilenophilidae *Porethus pauciporus*. Problems about their taxonomic identity must be still resolved and errors of labelling cannot be excluded (cf. Zapparoli, 1994a and notes 8 and 81 of the checklist in Appendix I). Both species could be present in NE-Syria as well and Afrotropical affinities may be considered for *Porethus pauciparus*.

Distributed from W-Taurus northwards to the southern slopes of Ulu Dağ, across the Aegean Region, are two W-Anatolian endemics, *Lithobius intermissus*, apparently close to *L. kastamonuensis*, and *L. mollis* (Fig. 9).

In the central and in easternmost districts of Anatolia the number of endemics recorded is fewer than in the other natural regions. As already stated, the faunistic

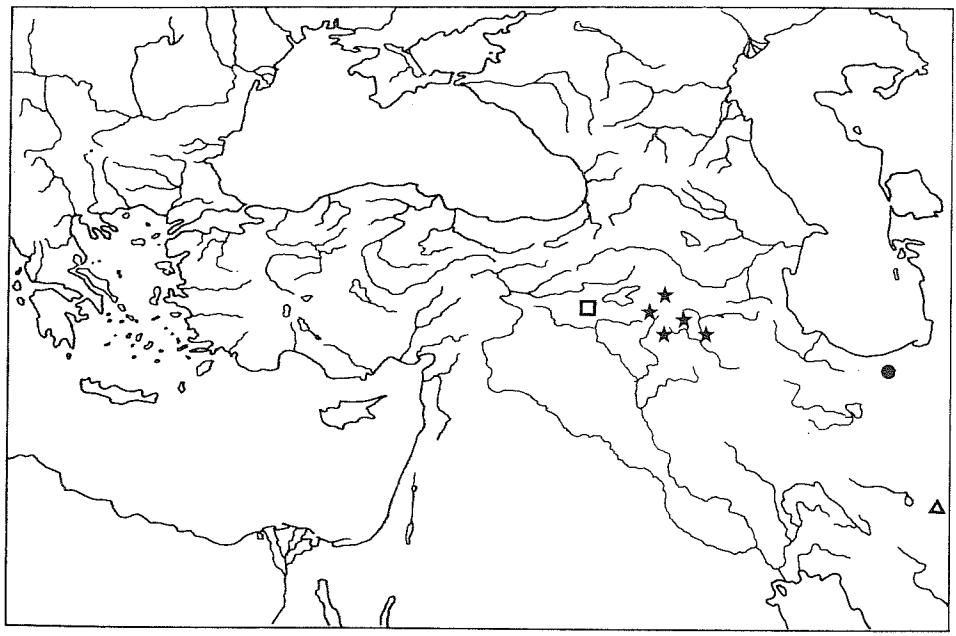


Fig. 10 - Distribution map of *Lithobius biondii* n. sp. (squares), *L. persicus* (stars) Pocock, 1899, *L. laccatus* Attems, 1951 (open triangle) and *L. easoni* Matic, 1969 (circle).

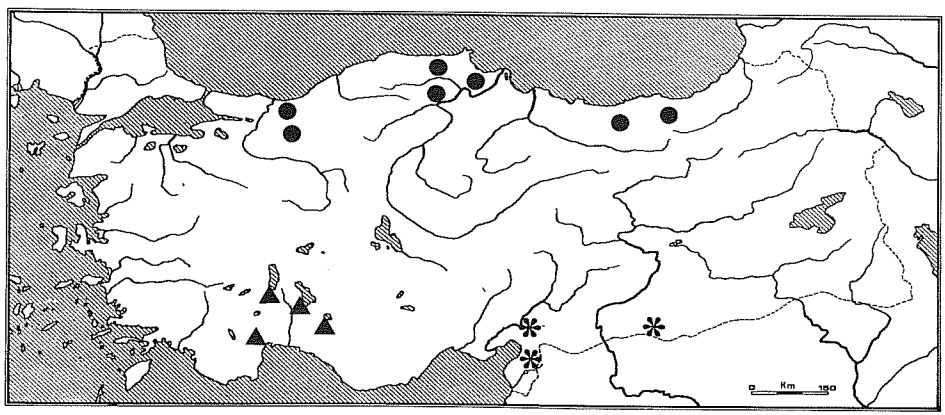


Fig. 11 - Distribution map of *Lithobius plesius plesius* (Chamberlin, 1952) (circles), *L. p. antalyanus* n. subsp. (triangles) and *L. p. audisioi* n. subsp. (asterisk).

knowledge of these areas, as well as those of adjacent Armenia, Iran, Iraq and Syria, is still poorly known and the total number of recorded species (not only the endemics) must be considered very provisional.

In Inner Anatolia the only exclusive species known to date is the Centro-Anatolian *Lithobius erdschiasius*, recorded from the Erciyas Dağ (vil. Kayseri), at 2500 m above s.l. and known only from the type (Zapparoli, 1994a). This species seems to be related to the European *L. lucifugus*.

Among the endemic centipedes of the eastern regions of Anatolia are three species here described as new and whose affinities are still poorly known (Fig. 6). These are *Lithobius antonellae*, recorded from localities of the vilayet of Malatya and Sivas, *L. manicastrii*, from the vilayet of Elâziğ, and *L. dogubayazitensis*, from a locality near the Iranian border (Dogubayazit, vil. Agri). All these species, here regarded as Kurdish endemics, have been collected from open and stony habitat, or steppe and shrub environments. Also known from E-Anatolia (vil. Bitlis) is *Lithobius biondii* collected in steppe environments and also considered a Kurdish endemic. This species belongs to the group of *L. persicus*, which includes *L. persicus*, from E-Anatolia and Iran, *L. laccatus* Attems, 1951, and *L. easoni* Matic, 1969, both known only from Iran (Fig. 10).

APPENDIX I:
CHECKLIST OF THE SPECIES OF CENTIPEDES OF TURKEY

In this appendix a checklist of the species to date known in Turkey, as politically constituted today, is given. This list is compiled after a critical review of the following papers: Attems (1902, 1903, 1905, 1910, 1926, 1929a, 1929b, 1930, 1932, 1939, 1947), Chamberlin (1952), Crabill (1964), Demir (1948), Kanellis (1959), Koch (1863), Kohlraush (1881), Kutorga (1834), Lewis (1985), Matic (1968, 1970, 1973, 1976, 1977, 1980), Matic and Darabantu (1974), Minelli (1982), Muralevitch (1926, 1929), Newport (1845), Sbordoni (1969), Sseliwanoff (1879), Tortonese (1948, 1951-52), Verhoeff (1896, 1898, 1901, 1902, 1905, 1925, 1934, 1937, 1941a, 1941b, 1943, 1944), Würmli (1973, 1975, 1977, 1980), Zapparoli (1988, 1989a, 1989b, 1990, 1993a, 1994a, 1995b), Zapparoli and Minelli (1993). This is a complete list of papers dealing with the taxonomy and the centipede fauna of Turkey. Further unpublished data collected during more recent zoological missions are also considered (see Methods). Numbers between brackets are related to the explanatory notes on the critical taxa given at the end of the list. The list is compiled mainly according to a scheme recently adopted for the Italian fauna (Foddai et al., 1995); inside the genera, the species are listed in alphabetical order.

Order Scutigeromorpha
Family **Scutigeridae**

001.0. ***Scutigera*** Lamarck, 1801
001.0 *coleoptrata* (Linnaeus, 1758)

002.0. ***Thereuonema*** Verhoeff, 1904
001.0 *syriaca* Verhoeff, 1905

Order Lithobiomorpha
Family **Henicopidae**

003.0. ***Lamyctes*** Meinert, 1868
001.0 *emarginatus* (Newport, 1844) (= *Lamyctes fulvicornis* Meinert, 1868)[1]

Family **Lithobiidae**

004.0. ***Ottobius*** Chamberlin, 1952 (= *Osellaebius* Matic, 1973)[2]
001.0 *hopanus* Chamberlin, 1952 (= *Osellaebius anatolicus* Matic, 1973)

005.0. ***Eupolybothrus (Eupolybothrus)*** Verhoeff, 1907[3]
001.0 *litoralis* (L. Koch, 1867)

006.0. ***Lithobius*** Leach, 1814 subg.?[4]
001.0 *liber* Lignau, 1903 (= *Lithobius cilicius* Verhoeff, 1925 **syn. nov.**, = *Tamulinus phanetus* Chamberlin, 1952 **syn. nov.**)

007.0. ***Lithobius*** Leach, 1814 subg. ***Lithobius*** Leach, 1814[5]
001.0 cf. *agilis* C.L. Koch, 1847
002.0 *antonellae* Zapparoli, n. sp.
003.0 *beschkovi* Matic and Golemansky, 1967[6]
004.0 *biondii* Zapparoli, n. sp.
005.0 *carinatus* L. Koch, 1862
006.0 *coloratus* Sseliwanoff, 1880[7]
007.0 *confusus* (Chamberlin, 1952)
008.0 *delictus* (Chamberlin, 1952)
009.0 *elongipes* (Chamberlin, 1952)[8]
010.0 *erdschiasius* Verhoeff, 1943
011.0 *ergus* (Chamberlin, 1952)[9]
012.0 *erythrocephalus* C.L. Koch, 1847
013.0 *forficatus* (Linnaeus, 1758)
014.0 *integrior* (Chamberlin, 1952)
015.0 *intermissus* (Chamberlin, 1952)
016.0 *ispartensis* Zapparoli, n. sp.
017.0 *kastamonuensis* Matic, 1983
018.0 *lobifer* (Chamberlin, 1952)

019.0 *lucifugus* L. Koch, 1862
020.0 *mutabilis* L. Koch, 1862[10]
021.0 *nigripalpis* L. Koch, 1867[11]
022.0 *persicus* Pocock, 1899
023.0 *plesius* (Chamberlin, 1952)
p. plesius (Chamberlin, 1952)
p. anatalyanus Zapparoli, n. subsp.
p. audisioi Zapparoli, n. subsp.
024.0 *punctulatus* C.L. Koch, 1847[12]
025.0 *rizensis* Zapparoli, n. sp.
026.0 *subtilis* sensu Muralevitch, 1929 non Latzel, 1880[13]
027.0 *uludagensis* Matic, 1983
028.0 *viriatus* Sseliwanoff, 1878[14]

008.0. ***Lithobius*** Leach, 1814 subg. ***Sigibius*** Chamberlin, 1913
001.0 *boluensis* (Matic, 1983)[15]
002.0 *dogubayazitensis* Zapparoli, n. sp.
003.0 *jurinici* Matic and Golemansky, 1965[16]
004.0 *micropodus* Matic, 1980 (= *L. microps* sensu Auct. non Meinert, 1868)
005.0 *microps* Meinert, 1868[17]
006.0 "*microps elongatus*" Verhoeff, 1944 (= ? *Sigibius oblivus* Chamberlin, 1952; = ? *Monotarsobius bursaensis* (Matic, 1983))[18]
007.0 *mollis* (Chamberlin, 1952)
008.0 *rectus* (Chamberlin, 1952)
009.0 cf. *reiseri* Verhoeff, 1900[19]
010.0 *simplicior* (Chamberlin, 1952) (not *Monotarsobius simplicior* Verhoeff, 1943) (= ? *Monotarsobius achaetus* Matic, 1976; = ? *Monotarsobius besucheti* Matic, 1976)[20]
011.0 *tidissimus* (Chamberlin, 1952)

009.0. ***Lithobius*** Leach, 1814 subg. ***Monotarsobius*** Verhoeff, 1905
001.0 *aeruginosus* L. Koch, 1862
002.0 cf. *catascaphius* Verhoeff, 1937[21]
003.0 *crassipes* L. Koch, 1862 (= ? *Lithobius (Paobius) ercijasius* Verhoeff, 1944; = ? *Archeobius ulterior* Chamberlin, 1952; = ? *Lithobius ephessoensis* Matic, 1980; = ? *Monotarsobius olympicus* Verhoeff, 1941)[22]
004.0 *curtipes* C.L. Koch, 1847 (= ? *Monotarsobius filiolus* Chamberlin, 1952; = ? *Monotarsobius conformatus* Chamberlin, 1952)[23]
005.0 *evasus* (Chamberlin, 1952)
006.0 *ferganensis* Trotzina, 1880 (= *Monotarsobius curtipes turkestanicus* Attems, 1904; = *Monotarsobius nodonotatus* Verhoeff, 1943; = ? *Monotarsobius ballidagus* Chamberlin, 1952; = ? *Monotarsobius schizus* Chamberlin, 1952)[24]

007.0 *manicastrii* Zapparoli, n. sp.
008.0 *paucispinus* (Matic, 1976)
009.0 *simplicior* (Verhoeff, 1943) (non *Sigibius simplicior* Chamberlin, 1952)
010.0 *sivasiensis* (Matic, 1983)
011.0 *tuberculipes* Folkmanova, 1958[25]

010.0. ***Lithobius*** Leach, 1814 subg. ***Ezembius*** Chamberlin, 1919
001.0 *tahirensis* Matic, 1983[26]
002.0 *zeylanus* (Chamberlin, 1952)

011.0. ***Lithobius*** Leach, 1814 subg. ***Porobius*** Porat, 1893
001.0 *pamukkalensis* Matic, 1980
002.0 *parvicornis* (Porat, 1893) (= ? *Lithobius (Pleurolithobius) argaeensis* Attems, 1905; ? *Lithobius (Monotarsobius) ocellatus* Verhoeff, 1925; ? *Turkobius (Alibius) andrethus* Chamberlin, 1952; ? *Turkobius (Alibius) sogukolukus* Chamberlin, 1952; ? *Hessebius tauricus* Verhoeff, 1941; ? *Turkobius annexus* Chamberlin, 1952)[27]

012.0. ***Harpolithobius*** Verhoeff, 1904[28]
001.0 *adontus* Chamberlin, 1952[29]
002.0 *anodus* (Latzel, 1880)
003.0 *augens* Chamberlin, 1952[30]
004.0 *erraticus* Chamberlin, 1952)[31]
005.0 *halophilus* Verhoeff, 1941
006.0 *osellai* Matic, 1983
007.0 *perplexus* Zalesskaya, 1972[32]
008.0 *polonezenus* (Chamberlin, 1952) (= ? *Lithobius besucheti* Matic, 1976 not *Monotarsobius besucheti* Matic, 1976)[33]
009.0 *secutus* Chamberlin, 1952[34]
010.0 *vignatagliantii* Zapparoli, 1989

013.0. ***Anodonthobius*** Matic, 1983
001.0 *osellai* Matic, 1983

014.0. ***Pleurolithobius*** Verhoeff, 1899[35]
001.0 *orientis* (Chamberlin, 1952) (= *atopior* Chamberlin, 1952)
002.0 *patriarchalis* (Berlese, 1894)

015.0. ***Hessebius*** Verhoeff, 1941
001.0 *armatus* Verhoeff, 1943[36]
002.0 *barbipes* (Porat, 1893) (= *Archeobius phanus* Chamberlin, 1952; = ? *Lithobius* (*Paobius*) *hatayensis* Verhoeff, 1943; = ? *Hessebius kosswigi* Verhoeff, 1941)[37]

Order Scolopendromorpha
Family **Scolopendridae**

016.0. ***Scolopendra*** Linné, 1758
001.0 *canidens* Newport, 1844[38]
002.0 *cingulata* Latreille, 1829
003.0 *clavipes* C.L. Koch, 1847
004.0 *cretica* Attems, 1902[39]
005.0 *mirabilis* (Porat, 1876)[40]

Family **Cryptopidae**

017.0. ***Cryptops*** Leach, 1814
001.0 *anomalans* Newport, 1844[41]
002.0 *brignolii* Matic, 1977
003.0 *caucasius* Verhoeff (= *Cryptops osellai* Matic, 1977)[42]
004.0 *compositus* Chamberlin, 1952[43]
005.0 *hortensis* (Donovan, 1810)[44]
006.0 *kosswigi* Chamberlin, 1952
007.0 *parisi* Brölemann, 1920 (= ? *Cryptops parisi cottarellii* Matic, 1977)[46]
008.0 *trisulcatus* Brölemann, 1902[46]

Order Geophilomorpha
Family **Himantariidae**

018.0. ***Himantarium*** C.L. Koch, 1847
001.0 *gabrielis* (Linnaeus, 1758)[47]

019.0. ***Thracophilus*** Verhoeff, 1926 (= ? *Monognathodon* Verhoeff, 1943; = ? *Kataplexus* Chamberlin, 1952)[48]
001.0 *cilicius* Attems, 1947 (= ? *Monognathodon crassipes* Verhoeff, 1943; = ? *Kataplexus korikenus* Chamberlin, 1952)[49]
002.0 *pachypus* Verhoeff, 1934[50]

020.0. ***Bothriogaster*** Sseliwanoff, 1879
001.0 *signata* (Kessler, 1874) (= ? *Bothriogaster meinerti* Sseliwanoff, 1879; = ? *Bothriogaster arasana* Verhoeff, 1943)[51]

Family **Dignathodontidae**

021.0. ***Dignathodon*** Meinert, 1870
001.0 *microcephalus* (Lucas, 1846)

022.0. ***Henia*** C.L. Koch, 1847 subg. ***Henia*** C.L. Koch, 1847 (= ? *Zigophilus* Chamberlin, 1952)[52]
001.0 *athenarum* Pocock, 1891 (= ? *Zigophilus turkicolensis* Chamberlin, 1952)[54]

002.0 *illyrica* (Meinert, 1870) (= ? *Henia termena* Chamberlin, 1952; = ? *Henia illyrica konyana* Chamberlin, 1952)[54]

023.0. ***Henia*** C.L. Koch, 1847 subg. ***Scotophilus*** Meinert, 1870
001.0 *bicarinata* (Meinert, 1870) (= ? *Henia dalamana* Chamberlin, 1952)[55]

024.0. ***Henia*** C.L. Koch, 1847 subg. ***Chaetechelynae*** Meinert, 1870 (= ? *Ethenia* Chamberlin, 1952)[56]
001.0 *transversa* (Chamberlin, 1952)

025.0. ***Henia*** C.L. Koch, 1847 subg. ***Turkophilus*** Verhoeff, 1941[57]
001.0 *porosa* Verhoeff, 1941[58] (= *Henia angelovi* Ribarov, 1987 **syn. nov.**)

Family **Schendylidae**

026.0. ***Nyctunguis*** Chamberlin, 1914[59]
001.0 *persimilis* Attems, 1932[60]

Family **Geophilidae**

027.0. ***Pachymerium*** C.L. Koch, 1847 (= ? *Turkomerium* Chamberlin, 1952)[61]
001.0 *caucasicus* (Attems, 1903)
002.0 *ferrugineum* (C.L. Koch, 1835) (= ? *Brachygeophilus erzurumensis* Chamberlin, 1952; = ? *Brachygeophilus orientis* Chamberlin, 1952; = ? *Brachygeophilus eudontus* Chamberlin, 1952; = ? *Geophilus elazigus* Chamberlin, 1952)[62]
003.0 *serratum* Verhoeff, 1943[63]
004.0 *syriacum* (Attems, 1903) (= ? *Turkomerium anatolianum* Chamberlin, 1952)[64]

028.0. ***Clinopodes*** C. Koch, 1847
001.0 *flavidus* C.L. Koch, 1847[65]

029.0. ***Kurdistanius*** Verhoeff, 1944[66]
001.0 *kosswigi* Verhoeff, 1944[67]

030.0. ***Geophilus*** Leach, 1814
001.0 *carpophagus* Leach, 1814[68]
002.0 *caucasicus* Sseliwanoff, 1884[69]
003.0 *conjungens* Verhoeff, 1898
004.0 *honozus* (Chamberlin, 1952)[70]
005.0 *insculptus* Attems, 1895
006.0 *linearis* C.L. Koch, 1855
l. linearis C.L. Koch, 1855
l. asiaeminoris (Verhoeff, 1898)[71]
007.0 *mundus* (Chamberlin, 1952)[72]
008.0 *poseidonis* Verhoeff, 1901[73]

009.0 *simoporus* (Chamberlin, 1952)[74]
010.0 *truncorum* Bergsoe and Meinert, 1866[75]

031.0. ***Bithyniphilus*** Verhoeff, 1944[76]
001.0 *bosporanus* Verhoeff, 1944

032.0. ***Bebekium*** Verhoeff, 1944[77]
001.0 *mirabile* Verhoeff, 1944

033.0. ***Pleurogeophilus*** Verhoeff, 1901
001.0 *latisternus* Attems, 1947[78]
002.0 *mediterraneus* (Meinert, 1870) (= ? *Pleurogeophilus turkensis* Chamberlin, 1952)[79]

Family **Chilenophilidae**

034.0. *Porethus* Chamberlin, 1952[80]
001.0 *ballidagus* Chamberlin, 1952
002.0 *pauciporus* Chamberlin, 1952
003.0 *segregans* Chamberlin, 1952

Family **Linotaeniidae**

035.0. ***Strigamia*** Gray, 1843
001.0 *acuminata* (Leach, 1815) (= ? *Linotaenia munda* Chamberlin, 1952)[81]

NOTES

1) Unpublished record. Introduced species; the synonym has been recently formally proposed by Eason (1996).
2) The genus has been revised by Zapparoli (1993a).
3) A revision of the Turkish *Eupolybothrus* has been published by Zapparoli (1995b).
4) The species below listed belong to a group of *Lithobius* including *L. elegans* Sseliwanoff, 1880, *L. stuxbergi* Sseliwanoff, 1880, *L. colchicus* Muralevich, 1907, *L. foviceps* Muralevitch, 1926; *L. striatus* Muralevitch, 1926, *L. rufus* Muralewitch, 1926; *L. armenicus* (Muralevitch, 1926), *L. fasciatus* Muralevitch, 1929 (not *Eupolybothrus fasciatus* (Newport, 1845)), *L. striatus monosulcatus* Folkmanova, 1958, and *L. reconditus* Zalesskaja, 1972. This group ranges in Crimea, Caucasus, Turkish and Iranian Armenia. The actual taxonomy of the above mentioned taxa is very unsatisfactory and needs a revision. These speceis could also be referred to a different subgenus of *Lithobius*.
5) A revision of the Turkish species has been published by Zapparoli (1988, 1994a).
6) Unpublished record, species previously known only from Bulgaria (Matic and Golemansky, 1967b); first record from Turkey.
7) Unpublished record, species previously known only in the Caucasus, new for the Turkish fauna.
8) Species described from Narlicaköy (vil. Hatay) and only known from the type locality. The type material is lost and the identity of the species is uncertain (Zapparoli, 1994a).
9) This species is also present in Bulgaria were it was recorded under *Lithobius christovici* Matic and Golemanski, 1964; the identity between *L. christovici* and *L. ergus* was proposed by Stoev (1995).
10) Uncertain quotation; the only Turkish records of this species is from "Basch-Kadyklàr" (= Başgedikler, vil. Kars, E-Pontus) (Muralewitch, 1926, 1929).
11) The synonymies of this species are discussed in Zapparoli (1988).

12) Recorded as *Lithobius validus* in Zapparoli (1990, 1994a).

13) Provisional identification for specimens corresponding to the description of *L. subtilis* given by Muralevitch (1929: 48). These specimens were found in localities of the E-Pontus ranges (Zapparoli, unpublished records) and probably belong, as well as those recorded by Muralevitch (1926, 1929) as *L. subtilis*, to a new species ranging in the Caucasus and the E-Pontus.

14) The synonymies of this species are discussed in Zapparoli (1988).

15) The identity of this species, only known from the type locality (vil. Bolu: Abant Lake; vil. Istanbul: Belgrado Forest), is uncertain.

16) Unpublished record, species previously known only from Bulgaria (Matic and Golemansky, 1965, 1967a), first record from Turkey.

17) Unpublished record, first record from Turkey.

18) Probably a good species whose name must be changed because *elongatus* is nomen preoccupatum by *Eupolybothrus elongatus* (Newport, 1849) junior synonym for *E. nudicornis* (Gervais, 1837). *S. oblivus* and *M. bursaensis* are both probably identical to *"microps elongatus"*.

19) A single unpublished record (1 mutilated ♀ without of the 13th-15th legs from vil. Konya, Seydisehir, near Ferzen Mağarasi, 23.IV.1973, V. Sbordoni leg) here only tentatively identified. *L. reiseri* is to date know only from few localities of Bosnia-Herzegovina. Owing to the small body size (10 mm long), the yellow colour of the body, the absence of ocelli, the antennae of about 30-38 articles, the prosternum with 2+2 teeth, the reduced spinulation, the 15th leg apical claw single, the female gonopod with 2+2 spurs and tridentate claw, *L. reiseri* seems to be close to some species, like *L. electrinus* Verhoeff, 1937, from N-Italy, *L. apfelbecki* Verhoeff, 1900, from Bosnia-Herzegovina, and *L. subterraneus* Matic, 1962, from Roumania, with which it seems to form a group of close related species.

20) Species apparently close to *Lithobius burzelandicus* Verhoeff, 1931 s.l., from Roumania and Bulgaria. Probably identical to *L. (S.) simplicior* are *Monotarsobius achaetus* Matic, 1976, described from Yalova (vil. Istanbul), and *Lithobius besucheti* (Matic, 1976), from Kilyios (vil. Istanbul). The name of this species must be changed because nomen preoccupatum by *Monotarsobius simplicior* Verhoeff, 1943.

21) *L. catascaphius* has been described on a ♀ from Vestone (Lombardia, Italy) (Verhoeff, 1937). A second record (♂) has been quoted by Matic and Golemansky (1967a) from an epigean locality of Bulgaria (v. Cepina, Èepinsko Défilé). The specimens from Turkey, here provisionally identified as *L.* cf. *catascaphius*, shows some difference in the spinulation.

22) The species is probably identical to *Lithobius ercijasius*, *L. ulterior*, *L. ephessoensis* and *Monotarsobius olympicus*, all recorded only from Turkey.

23) Unpublished record, first record from Turkey. However, an uncertain quotation of *L. curtipes* was given by Matic (1970) under *L. baloghi* Loksa, 1947, *Monotarsobius filiolus* and *M. conformatus*, both know only from Turkey, are probably identical to *L. curtipes*.

24) The species has never been recorded in Turkey under this name. *M. nodonotatus* is considered as the same of this species by Eason (1997); *Monotarsobius ballidagus* and *M. schizus*, only known from Pontus range, also probably belong to this species.

25) Unpublished record, first record from Turkey. This species has been informally considered as the same of *L. ferganensis* by Eason (1997), but this proposal needs to be verifed.

26) The identity of this species is uncertain, may be identical to *L. zeylanus.*

27) As suggested in Zapparoli (1991), *Lithobius argaeensis*, *L. ocellatus*, *T. andrethus*, *T. sogukolukus*, *T. annexus* and *Hessebius tauricus* could be identical to this species.

28) The taxonomy of the Turkish species referred to *Harpolithobius* is very unsatisfactory and the species described by Chamberlin (1952) needs to be revised.

29) The identity of this species, known only from the type locality (vil. Hatay: Narlicakoy), is uncertain.

30) The identity of this species, known only from the type locality (vil. Istanbul: Yalova), is uncertain.

31) The identity of this species, known only from the type locality (vil. Bolu: Abant), is uncertain.

32) Unpublished record, species previously known only from Caucasus, first record from Turkey.

33) Probably this is the true name for *Harpolithobius anodus dentatus* Matic, 1957, previously never recorded in Turkey but known in the Balkans (Stoev, 1997); *H. polonezenus* may be also identical to *Lithobius (Lithobius) besucheti* (non *Lithobius (Monotarsobius) besucheti* nomen preoccupatum).

34) The identity of this species, known only from the type locality ("Sogukoluk (between Antochia and Alexandrette)") is uncertain. May be conspecific with *H. adontus.*

35) The identity of the species belonging to this genus is discussed in Zapparoli (1989a) and Zapparoli and Minelli (1993).

36) The identity of this species, known only from the type locality (vil. Hatay: Alma Dağ) is uncertain.

37) The species has never been recorded in Turkey under this name; *Lithobius* (*Paobius*) *hatayensis* and *Hessebius kosswigi* may be identical to *H. barbipes*.

38) Unpublished record, first record from Turkey.

39) Species quoted for Turkey (SW) only by Würmli (1980) but this data must be referred to introduced specimens.

40) Unpublished record, species NE-African-Sindian, first record from Turkey.

41) Only known from the European side of Turkey as Attems's (1932) records from Ankara need to be confirmed.

42) This species has never been quoted in Turkey under this name; the synonym has been recently proposed by Zalesskaya and Schileyko (1991).

43) The identity of this species, known only from Turkey, is uncertain.

44) Unpublished record, first record from Turkey. The name of the author of this species, formerly known as Leach, 1915, is quoted according to Jeekel (1999).

45) The identity of the subspecies *C. p. cottarellii* needs to be confirmed.

46) Unpublished records from the Aegean coast, first record from Turkey; also recorded from Halki Is. and Rodos (Dodecanese) (Zapparoli, 1994b).

47) The identity of the subspecies *H. g. delattini* Verhoeff, 1943 and *H. g. asiaeminoris* Verhoeff, 1943 only recorded from Turkey, are probably without any taxonomic value.

48) To this genus probably also belong *Monognathodon* and *Kataplexus*.

49) Only recorded from the type locality, "Cilicischer Taurus" (Attems, 1947), this species may be identical to *Monognathodon crassipes*, which type locality is generally quoted as "Kleinasien" (Verhoeff, 1943), and *Kataplexus korikenus*, both quoted only for Turkey.

50) The identity of the species, known only from the type locality (vil. Mardin: Mardin) is uncertain.

51) *Bothriogaster meinerti* and *B. arasana* may be identical to this species.

52) *Zigophilus* may be the same as *Henia (Henia)*.

53) *H. athenarum* has never been quoted in Turkey under this name. *Zigophilus turkicolensis* may be identical to this species.

54) *Henia termena* and *Henia illyrica konyana* may be identical to this species.

55) Unpublished record, first record from Turkey. *Henia dalamana* may be identical to this species.

56) *Ethenia* could be identical to *Henia (Chaetechelynae)*.

57) *Turkophilus* was originally proposed as a genus by Verhoeff (1941a) and as a subgenus of *Henia* by Crabill (1964).

58) Described from Istanbul (Belgrado Forest), also quoted from Ulu Dağ (Verhoeff, 1941a; Matic, 1970). Unpublished records are from central Pontus. The species is also present in SE Bulgaria where it has been described as *Henia angelovi* by Ribarov (1987) (**syn. nov.**).

59) Neotropical genus, the identity of the record is uncertain (see the next note).

60) Uncertain quotation. The species has been recorded in Turkey only from the type locality, the surroundings of Ankara (Attems, 1932). I myself looked for specimens of *N. persimilis* in the type locality many times but, in spite of the numerous attempts, have never been able to find it. Owing to the recent record of this species from Wien (Christian, 1996), the town were C.G. Attems worked, I suspect an erroneous labelling of the type specimen.

61) *Turkomeryum* may be identical to this genus.

62) *Brachygeophilus erzurumensis*, *B. orientis*, *B. eudontus*, *Geophilus elazigus* all known only for Turkey may be identical to this species.

63) The identity of the species, known only from the type locality (vil. Isparta: Senirkent, 10 km from Uluborlu, m 1000), is uncertain.

64) Unpublished record, first record from Turkey. *Turkomerium anatolianum* may be identical to this species.

65) The identity of the subspecies *C. f. kurdistanus* Verhoeff, 1944 and *C. f. ankarensis* Verhoeff 1944, recorded only from Turkey, needs a revision.

66) The identity of this genus, probably related to *Clinopodes*, is uncertain.

67) The identity of this species, known only from the type locality (vil. Mardin: Mardin), is uncertain.

68) Unpublished record, first record from Turkey.

69) Unpublished record, first record from Turkey.

70) The identity of the species, originally described under *Brachygeophilus* Brölemann, 1909 and known only from the type locality (vil. Denizli: Honaz Dağı, m 2000), is uncertain.

71) The identity of this taxon must be confirmed.

72) The identity of the species, originally described under *Brachygeophilus* Brölemann, 1909 and known only from the type locality (vil. Çankiri: Yeniceköyü, Ilgaz Dağ, m 600), is uncertain.

73) Unpublished records from the Mediterranean coast, first record from Turkey.

74) The identity of the species, originally described under *Brachygeophilus* Brölemann, 1909 and known only from the type localities (vil. Hatay: Narlycaköy; vil. Istanbul: Polonezköy), is uncertain.

75) Uncertain quotation; the only Turkish record of this Central European species is from "Arpagel-Tschaldyr Pass" (= Arpaçay-Cildir, vil. Artvin, E-Pontus) (Muralewitch, 1926).

76) The identity of this genus, probably related to *Geophilus*, is uncertain.

77) This genus may be identical to *Geophilus*.

78) The identity of the species, known only from the type locality, generically quoted as "Cilicischer Taurus", is uncertain.

79) Unpublished records from the Pontus area, first record from Turkey. *Pleurogeophilus turkensis*, known only from the type locality (vil. Denizli: Honaz Dağ, m 2000), may be identical to this species.

80) The taxonomy of this genus and the identity of the three species ascribed are quite confusing and need to be revised. All three species are to date known only from the type locality. *Porethus segregans* (the type species of the genus), described from Iskenderun (vil. Hatay), and *Porethus ballidagus*, described from central Pontus, seem to be identical to *Pachymerium caucasicus*, distributed, as regards the study area, in the E-Pontus, or to *Pachymerium ferrugineum*, recorded in Anatolia in many scattered localities. *Porethus pauciporus* is described from Polonezköy (vil. Istanbul) and seems to be a valid species. Specimens corresponding to the original description of *P. pauciporus* have been collected at Iskenderun (vil. Hatay) (Zapparoli, unpublished records). In my opinion, the presence of *P. pauciparus* at Polonezköy needs to be confirmed and, as Iskenderun is reported as the type locality of *P. segregans* as well as the second known locality for *P. pauciparus*, I suspect a wrong indication of the type locality of these two species in the Chamberlin's (1952) original paper.

81) *Linotaenia munda*, only known from scattered localities in Turkey (vil. Çankiri: Yeniceköyu, Ilgaz; vil. Hatay: Soağukoluk; vil. Kastamonu: Derbend), may be identical to this species.

II. DISTRIBUTION OF CENTIPEDES OF THE TURKISH FAUNA ACCORDING TO THE NATURAL REGIONS AND ADMINISTRATIVE PROVINCES (VILAYETS) WHERE THEY ARE PRESENT

In this appendix the species of centipedes of the Turkish fauna are listed according to the above checklist; natural regions are listed according to Erol (1982, 1983), vileyets are listed in alphabetical order; unpublished records are marked with an asterisk.

Scutigeromorpha

1. *Scutigera coleoptrata*. **Marmara**: Balikesir, Çanakkale*, Istanbul. **Aegean**: Aydin, Muğla*. **Mediterranean**: Adana, Antalya*, Hatay, Içel, Isparta*, Muğla*. **W-Pontus**: Zonguldak*. **Inner Anatolia**: Ankara, Çorum*, Konya.

2. *Thereuonema syriaca*. **Mediterranean**: Adana, Hatay, Içel. **E-Anatolian**: Bingöl*, Bitlis, Elaziğ, Erzincan, Karamanmaraş, Malatya*, Muş*. **SE-Anatolian**: Gaziantep, Şaniurfa*, Siirt.

Lithobiomorpha

3. *Lamyctes emarginatus*. **W-Pontus**: Sinop*.

4. *Ottobius hopanus*: **E-Pontus**: Artvin.

5. *Eupolybothrus (Eupolybothrus) litoralis*. **Marmara**: Balikesir, Bursa, Çanakkale, Istanbul, Kocaeli, Tekirdağ. **Aegean**: Afyonkarahisar, Aydin, Denizli, Manisa. **Mediterranean**: Adana, Antalya, Burdur, Hatay, Içel, Isparta, Izmir, Konya, Muğ

la, Nidğe. **W-Pontus**: Bolu, Zonguldak. **Central Pontus**: Amasya, Çorum. **Inner Anatolia**: Nevşehir. **SE-Anatolia**: Gaziantep, Hakkâri, Mardin.

6. *Lithobius (subg.) liber*. **Mediterranean**: Içel?. **E-Pontus**: Artvin. **E-Anatolia**: Sivas*.

7. *Lithobius (Lithobius)* cf. *agilis*. **Mediterranean**: Antalya.

8. *Lithobius (Lithobius) antonellae*. **E-Anatolia**: Malatya, Sivas.

9. *Lithobius (Lithobius) beschkovi*. **W-Pontus**: Zonguldak*. **E-Pontus**: Giresun*, Rize*, Trabzon*.

10. *Lithobius (Lithobius) biondii*. **E-Anatolia**: Bitlis.

11. *Lithobius (Lithobius) carinatus*: **Marmara**: Çanakkale*. **Aegean**: Balikesir, Izmir. **Mediterranean**: Adana, Denizli, Hatay, Içel, Isparta, Konya.

12. *Lithobius (Lithobius) coloratus*. **E-Pontus**: Erzurum*.

13. *Lithobius (Lithobius) confusus*. **W-Pontus**: Ankara, Bolu.

14. *Lithobius (Lithobius) delictus*. **W-Pontus**: Çankiri. **E-Pontus**: Artvin*.

15. *Lithobius (Lithobius) elongipes*. **Mediterranean**: Hatay.

16. *Lithobius (Lithobius) erdschiasius*. **Inner Anatolia**: Kayseri.

17. *Lithobius (Lithobius) ergus*. **Marmara**: Istanbul.

18. *Lithobius (Lithobius) erythrocephalus*. **Aegean**: Afyonkarahisar*, Izmir. **Mediterranean**: Adana, Antalya, Hatay, Muğla, Içel, Isparta, Konya. **W-Pontus**: Bolu. **Central Pontus**: Çorum, Amasya, Samsun, Ordu*, Tokat. **E-Pontus**: Rize, Giresun, Gümüşhane. **Inner Anatolia**: Ankara, Kayseri, Nevşehir, Konya, Nidğe, Sivas, Yozgat. **E-Anatolia**: Ağri, Bitlis, Elâziğ, Erzincan, Erzurum, Kars, Muş, Tunceli, Van. **SE-Anatolia**: Gaziantep, Diyarbakir.

19. *Lithobius (Lithobius) forficatus*. **Marmara**: Istanbul. **W-Pontus**: Bolu, Kastamonu, Sinop. **Central Pontus**: Ordu, Samsun. **E-Pontus**: Artvin, Giresun, Rize.

20. *Lithobius (Lithobius) integrior*. **W-Pontus**: Bolu.

21. *Lithobius (Lithobius) intermissus*. **Marmara**: Bursa*. **Aegean**: Afyon*. **Mediterranean**: Burdur, Isparta*, Konya*. **Inner Anatolia**: Eskişehir*.

22. *Lithobius (Lithobius) ispartensis*. **Aegean**: Afyon. **Mediterranean**: Denizli, Isparta.

23. *Lithobius (Lithobius) kastamonuensis*: **W-Pontus**: Ankara, Bolu, Çankiri. **Central Pontus**: Çorum, Kastamonu, Ordu*, Sinop. **E-Pontus**: Giresun, Trabzon.

24. *Lithobius (Lithobius) lobifer*. **Mediterranean**: Denizli, Antalya.

25. *Lithobius (Lithobius) lucifugus*. **Marmara**: Istanbul. **Mediterranean**: Antalya.

26. *Lithobius (Lithobius) mutabilis*. **E-Anatolia**: Kars?.

27. *Lithobius (Lithobius) nigripalpis*. **Marmara**: Balikesir, Bilecik, Bursa, Çanakkale, Edirne, Istanbul, Kirklareli, Kocaeli. **Aegean**: Afyonkarahisar, Aydin, Izmir, Kütahya*, Manisa. **Mediterranean**: Antalya, Burdur, Içel, Isparta, Konya, Muğla, Nidğe, Denizli. **W-Pontus**: Ankara, Bolu, Çankiri, Kastamonu, Sinop.

Central Pontus: Amasya, Çorum, Tokat. **E-Pontus**: Gümüşhane. **Inner Anatolia**: Ankara, Çankiri, Eskişehir, Kayseri, Nevşehir, Nidğe, Yozgat. **E-Anatolia**: Ağri, Bingöl, Erzurum. **SE-Anatolia**: Mersin.

28. *Lithobius (Lithobius) persicus*. **E-Anatolia**: Ağri, Hakkâri, Van.

29. *Lithobius (Lithobius) plesius*. **Mediterranean**: Antalya, Konya, Isparta (subsp. *antalyanus*); Adana, Hatay (subsp. *audisioi*). **W-Pontus**: Bolu, Çankiri, Kastamonu, Sinop (supsp. *plesius*). **Central Pontus**: Ordu*, Samsun* (subsp. *plesius*). **E-Pontus**: Giresun*, Trabzon (subsp. *plesius*). **SE-Anatolia**: Mardin (subsp. *audisioi*).

30. *Lithobius (Lithobius) punctulatus*. **E-Pontus**: Artvin, Ordu, Rize.

31. *Lithobius (Lithobius) rizensis*. **E-Pontus**: Rize.

32. *Lithobius (Lithobius) subtilis* sensu Muralevitch non Latzel. **E-Pontus**. Artvin*, Rize*, Trabzon*.

33. *Lithobius (Lithobius) uludagensis*. **Marmara**: Bursa.

34. *Lithobius (Lithobius) viriatus*. **Marmara**: Bursa, Istanbul, Kokaeli. **Mediterranean**: Antalya, Burdur, Hatay, Isparta, Karamanmaraş, Muğla. **W-Pontus**: Bolu, Çankiri, Kastamonu, Sinop. **Central Pontus**: Amasya, Çorum, Ordu, Samsun, Tokat. **E-Pontus**: Artvin, Erzincan, Giresun, Gümüshane, Rize, Trabzon. **Inner Anatolia**: Kayseri, Sivas, Yozgat. **E-Anatolia**: Ağri, Erzurum, Kars, Tunceli.

35. *Lithobius (Sigibius) boluensis*. **Marmara**: Istanbul. **W-Pontus**: Bolu, Ankara*.

36. *Lithobius (Sigibius) dogubayazitensis*. **E-Anatolia**: Ağri, Karamanmaraş.

37. *Lithobius (Sigibius) jurinici*. **Central Pontus**: Amasya*, Ordu*, Samsun*, Tokat*.

38. *Lithobius (Sigibius) micropodus*. **Marmara**: Balikesir*, Bursa*, Kirklareli. **Aegean**: Izmir. **Mediterranean**: Konya*, Içel*. **W-Pontus**: Bolu*, Kastamonu. **Central Pontus**: Sivas*, Tokat*. **E- Pontus**: Artvin*.

39. *Lithobius (Sigibius) microps*. **Marmara**: Bursa. **Mediterranean**: Antalya. **W-Pontus**: Bolu. **Central Pontus**: Çorum. **E-Pontus**: Giresun.

40. *Lithobius (Sigibius) "microps elongatus"*. **Marmara**: Balikesir*, Bursa*, Edirne*, Istanbul, Kocaeli*. **W-Pontus**: Bolu, Çankiri*, Kastamonu*, Eskişehir*. **Central Pontus**: Samsun*, Ordu*. **E-Pontus**: Giresun*, Artvin*. **Inner Anatolia**: Kayseri*, Konya*.

41. *Lithobius (Sigibius) mollis*. **Marmara**: Bursa*. **Mediterranean**: Denizli, Isparta*.

42. *Lithobius (Sigibius) rectus*. **Central Pontus**: Samsun*. **E-Pontus**: Artvin, Rize*.

43. *Lithobius (Sigibius ?)* cf. *reiseri*. **Mediterranean**: Konya*.

44. *Lithobius (Sigibius) simplicior* (Chamberlin). **Marmara**: Bursa*, Istanbul.

45. *Lithobius (Sigibius) tidissimus*. **Marmara**: Balikesir*, Bursa. **Aegean**: Aydin*.

Mediterranean: Antalya, Denizli*, Içel*, Konya*, Muğla*. **Inner Anatolia**: Kayseri*, Nidge*, Sivas*. **E-Anatolia**: Malatya*, Muş*.

46. *Lithobius (Monotarsobius) aeruginosus.* **W-Pontus**: Çankiri*, Kastamonu. **E-Pontus**: Artvin*, Rize*. **E-Anatolia**: Erzurum*. **SE-Anatolia**: Gaziantep*.

47. *Lithobius (Monotarsobius)* cf. *catascaphius.* **Mediterranean**: Konya*. **W-Pontus**: Bolu*.

48. *Lithobius (Monotarsobius) crassipes.* **Marmara**: Balikesir*, Bursa, Tekirdağ*. **Aegean**: Afyon*, Aydin, Izmir. **Mediterranean**: Antalya*, Denizli, Isparta*. **Central Pontus**: Ordu*, Tokat*. **E-Pontus**: Artvin*, Giresun*, Rize*, Trabzon*. **Inner Anatolia**: Eskişehir*, Kayseri.

49. *Lithobius (Monotarsobius) curtipes.* **Marmara**: Bursa. **Mediterranean**: Konya*. **Central Pontus**: Çorum*, Tokat*. **E-Pontus**: Artvin*, Erzurum. **E-Anatolia**: Ağri*, Kars.

50. *Lithobius (Monotarsobius) evasus.* **Marmara**: Bursa*. **W-Pontus**: Çankiri*, Kastamonu.

51. *Lithobius (Monotarsobius) ferganensis.* **Marmara**: Bursa, Istanbul*. **W-Pontus**: Kastamonu, Sinop, Çankiri*, Kastamonu*. **Central Pontus**: Amasya, Ordu*, Tokat*. **E-Pontus**: Artvin, Erzurum, Giresun*, Gümüşhane*, Rize, Trabzon. **E-Anatolia**: Kars, Ağri*, Elaziğ*, Erzurum*.

52. *Lithobius (Monotarsobius) manicastrii.* E-Anatolia: Elâziğ.

53. *Lithobius (Monotarsobius) paucispinus.* **Marmara**: Bursa. **W-Pontus**: Bolu*. **E-Pontus**: Gümüşhane*.

54. *Lithobius (Monotarsobius) simplicior* (Verhoeff). **E-Pontus**: Artvin. **E-Anatolia**: Kars.

55. *Lithobius (Monotarsobius) sivasiensis.* **W-Pontus**: Ankara*, Çankiri*. **Central Pontus**: Çorum*, Tokat*, Sivas. **E-Anatolia**: Erzurum*. **SE-Anatolia**: Hakkâri*.

56. *Lithobius (Monotarsobius) tuberculipes.* **E-Pontus**: Giresun*, Gümüşhane*. **E-Anatolia**: Kars*. **Inner Anatolia**: Afyon*, Ankara*, Nevşehir*. Sivas*, Yozgat*.

57. *Lithobius (Ezembius) tahirensis.* **E-Anatolia**: Ağri.

58. *Lithobius (Ezembius) zeylanus.* **Mediterranean**: Adana*, Hatay, Içel*. **E-Anatolia**: Bitlis*, Malatya*, Van. **SE-Anatolia**: Gaziantep, Şaniurfa*.

59. *Lithobius (Porobius) pamukkalensis.* **Aegean**: Denizli, Aydin*. **Mediterranean**: Antalya*, Isparta*, Konya*.

60. *Lithobius (Porobius) parvicornis.* **Mediterranean**: Hatay, Içel, Karamanmaraş*. **E-Pontus**: Gümüşhane. **Inner Anatolia**: Kayseri, Nidğe, Nevşehir*. **SE-Anatolia**: Adimayan*, Mardin, Şaniurfa *.

61. *Harpolithobius adontus.* **Mediterranean**: Hatay.

62. *Harpolithobius anodus.* **Mediterranean**: Antalya*, Içel, Konya*, Muğla*.

63. *Harpolithobius augens.* **Marmara**: Istanbul, Çanakkale*.

64. *Harpolithobius erraticus.* **W-Pontus**: Bolu.

65. *Harpolithobius halophilus*. **Marmara**: Istanbul*. **W-Pontus**: Ankara. **Central Pontus**: Amasya*, Çorum*, Tokat. **E-Pontus**: Trabzon*. **Inner Anatolia**: Çorum*.

66. *Harpolithobius osellai*. **Central Pontus**: Ordu*. **E-Pontus**: Artvin*, Giresun*, Rize, Trabzon*.

67. *Harpolithobius perplexus*. **Central Pontus**: Ordu*. **E-Pontus**: Artvin*.

68. *Harpolithobius polonezenus*. **Marmara**: Istanbul, Kirklareli, Kocaeli*. **W-Pontus**: Bolu*. **Central Pontus**: Ordu*.

69. *Harpolithobius secutus*. **Mediterranean**: Hatay.

70. *Harpolithobius vignatagliantii*. **Mediterranean**: Konya.

71. *Anodonthobius osellai*. **Marmara**: Bursa*. **E-Pontus**: Artvin, Giresun*, Rize, Trabzon*.

72. *Pleurolithobius orientis*. **Marmara**: Bursa*, Edirne*, Istanbul. **Aegean**: Izmir*.

73. *Pleurolithobius patriarchalis*. **Marmara**: Balikesir, Bilecik, Bursa*, Çanakkale. **Aegean**: Aydin*, Izmir. **Mediterranean**: Antalya*.

74. *Hessebius armatus*. **Mediterranean**: Hatay, Adana*.

75. *Hessebius barbipes*. **Aegean**: Aydin*, Muğla*. **Mediterranean**: Adana*, Antalya, Denizli*, Hatay, Içel, Isparta*, Muğla*. **SE-Anatolia**: Gaziantep*, Mardin*, Siirt*, Şaniurfa.

Scolopendromorpha

76. *Scolopendra canidens*. **E-Anatolia**: Van*. **SE-Anatolia**: Mardin*, Siirt*.

77. *Scolopendra cingulata*. **Marmara**: Balikesir*, Bilecik, Bursa, Çanakkale*, Istanbul, Tekirdağ*. **Aegean**: Afyon*, Aydin*, Denizli*, Izmir, Kütahya*, Manisa*, Muğla*. **Mediterranean**: Adana, Antalya, Burdur*, Hatay, Içel, Isparta, Konya, Muğla*. **W-Pontus**: Çankiri. **Central Pontus**: Amasya, Çorum, Samsun, Tokat*. **E-Pontus**: Giresun*, Gümüşhane*. **Inner Anatolia**: Ankara*, Eskişehir, Kayseri, Nevşehir*, Nidğe*, Sivas*, Yozgat*. **E-Anatolia**: Adiyaman*, Elaziğ*, Erzincan*, Malatya*, Muş*, Van*. **SE-Anatolia**: Gaziantep, Hakkâri*.

78. *Scolopendra clavipes*. **Marmara**: Çanakkale*. **Aegean**: Afyon*, Aydin*, Izmir, Muğla*. **Mediterranean**: Adana*, Antalya, Burdur*, Denizli*, Isparta*, Konya*, Muğla*, Nidğe.

79. *Scolopendra cretica*. **Aegean**: Aydin, Izmir, Manisa.

80. *Scolopendra mirabilis*. **SE-Anatolia**: Gaziantep*, Şaniurfa*.

81. *Cryptops anomalans*. **Marmara**: Çanakkale*, Edirne*, Istanbul. **W-Pontus**: Ankara?. **E-Anatolia**: Tunceli?.

82. *Cryptops brignolii*. **W-Pontus**: Kastamonu.

83. *Cryptops caucasius*. **E-Pontus**: Artvin. **E-Anatolia**: Kars.

84. *Cryptops compositus*. **Marmara**: Istanbul, Tekirdağ*. **W-Pontus**: Çankiri*, Kastamonu. **E-Pontus**: Artvin*.

85. *Cryptops hortensis*. **Central Pontus**: Ordu*, **E-Pontus**: Artvin*, Samsun*. **E-Anatolia**: Sivas*.

86. *Cryptops kosswigi.* **Marmara:** Balikesir*, Bilecik*, Çanakkale*, Istanbul. **Aegean:** Izmir*, Muğla*. **Mediterranean:** Adana*, Antalya*, Denizli*, Hatay*, Içel*, Isparta*, Konya*, Muğla*. **W-Pontus:** Çankiri*. **E-Pontus:** Artvin*, Gümüşhane*, Rize*, Trabzon*. **Inner Anatolia:** Ankara*, Eskişehir*. **E-Anatolia:** Malatya*, Muş*.

87. *Cryptops parisi.* **Marmara:** Istanbul, Kirklareli. **W-Pontus:** Sinop.

88. *Cryptops trisulcatus.* **Marmara:** Çanakkale*. **Aegean:** Muğla*. **Mediterranean:** Antalya*.

Geophilomorpha

89. *Himantarium gabrielis.* **Marmara:** Balikesir*, Bursa, Çanakkale*, Istanbul. **Aegean:** Afyon*, Izmir*, Muğla. **Mediterranean:** Antalya*, Burdur, Içel*, Isparta*, Muğla, Konya. **Central Pontus:** Çorum*. **Inner Anatolia:** Ankara, Çankiri*, Çorum*, Kayseri*, Eskişehir*, Konya, Nevşehir*.

90. *Thracophius cilicius.* **Mediterranean:** Içel?.

91. *Thracophilus pachypus.* **Egean:** Izmir*. **Mediterranean:** Hatay, Içel, Konya*. **SE-Anatolia:** Mardin.

92. *Bothriogaster signata.* **Marmara:** Balikesir*, Bursa, Çanakkale*, Istanbul. **Aegean:** Afyon*, Aydin*, Denizli. **Mediterranean:** Adana*, Antalya, Burdur, Denizli, Hatay, Içel, Izmir, Muğla*. **Inner Anatolia:** Ankara, Eskişehir*, Kayseri, Konya*, Nevşehir*, Niğde*. **E-Anatolia:** Bingöl*, Bitlis*, Elaziğ, Kars, Malatya*, Muş*, Van*. **SE-Anatolia:** Gaziantep*, Şaniurfa*.

93. *Dignathodon microcephalus.* **Aegean:** Denizli. **Mediterranean:** Adana*, Antalya*, Muğla*. **Central Pontus:** Tokat*. **Inner Anatolia:** Eskişehir*.

94. *Henia (Henia) athenarum.* **Marmara:** Çanakkale*, Istanbul. **W-Pontus:** Çankiri. **Central Pontus:** Çorum*, Ordu*, Samsun*. **E-Pontus:** Artvin*. Giresun*, Rize*.

95. *Henia (Henia) illyrica.* **Marmara:** Çanakkale*, Istanbul. **Mediterranean:** Konya. **Central Pontus:** Samsun. **Inner Anatolia:** Konya. Kayseri.

96. *Henia (Scotophilus) bicarinata.* **Aegean:** Afyon*, Muğla*. **Mediterranean:** Adana*, Antalya, Hatay*, Muğla*. **E-Anatolia:** Elâziğ*. **SE-Anatolia:** Şaniurfa*.

97. *Henia (Chaetechelynae) transversa.* **Mediterranean:** Burdur, Denizli.

98. *Henia (Turkophilus) porosa.* **Marmara:** Bursa*, Istanbul. **W-Pontus:** Çankiri*.

99. *Nyctunguis persimilis.* **Inner Anatolia:** Ankara?.

100. *Pachymerium caucasicus.* **W-Pontus:** Kastamonu. **E-Pontus:** Artvin*, Giresun*, Trabzon*.

101. *Pachymerium ferrugineum.* **Marmara:** Istanbul. **Aegean:** Muğla*, Denizli*. **Mediterranean:** Adana*, Antalya*, Hatay, Içel, Isparta*, Konya*, Niğde*. **Central Pontus:** Çorum*, Tokat*. **E-Pontus:** Artvin*, Giresun*, Rize*. **E-Anatolia:** Ağri*, Bitlis*, Elaziğ, Erzurum.

102. *Pachymerium serratum.* **Mediterranean:** Isparta.

103. *Pachymerium syriacum*. **Mediterranean**: Antalya*, Içel. **SE-Anatolia**: Dyarbakir*.

104. *Clinopodes flavidus*. **Marmara**: Balikesir*, Bilecik*, Bursa, Çanakkale, Istanbul. **Aegean**: Afyon, Aydin*, Denizli, Izmir, Kütahya*. **Mediterranean**: Adana*, Antalya, Burdur, Hatay, Isparta*, Içel, Konya, Niğde*. **W-Pontus**: Bolu, Çankiri, Kastamonu, Sinop*. **Central Pontus**: Çorum*, Ordu*, Samsun, Tokat*. **E-Pontus**: Erzurum, Giresun*, Gümüşhane*, Trabzon*. **Inner Anatolia**: Ankara, Çankiri, Çorum*, Eskişehir*, Kayseri, Konya, Nevşehir*, Niğde*, Sivas*, Yozgat*. **E-Anatolia**: Ağri*, Bingöl*, Bitlis*, Elaziğ, Erzincan*, Erzurum, Kars, Muğla*, Muş*, Van*. **SE-Anatolia**: Gaziantep, Malatya*, Şaniurfa*.

105. *Kurdistanius kosswigi*. **SE-Anatolia**: Mardin.

106. *Geophilus carpophagus*. **Mediterranean**: Hatay*, Içel*. **W-Pontus**: Çankiri*, Kastamonu*. **Central Pontus**: Ordu*. **E-Pontus**: Giresun*.

107. *Geophilus caucasicus*. **Central Pontus**: Ordu*. **E-Pontus**: Artvin*. **E-Anatolia**: Kars*.

108. *Geophilus conjungens*. **Marmara**: Balikesir*, Bilecik*, Bursa*, Çanakkale*, Istanbul. **Aegean**: Afyon*, Aydin*, Manisa*. **Mediterranean**: Antalya*, Konya, Içel*, Izmir*, Muğla*. **Central Pontus**: Ordu*, Tokat*. **Inner Anatolia**: Çankiri*, Yozgat*. **E-Anatolia**: Ağri*, Muş*.

109. *Geophilus honozus*. **Mediterranean**: Denizli.

110. *Geophilus insculptus*. **Marmara**: Bursa. **E-Anatolia**: Kars*.

111. *Geophilus linearis*. **Marmara**: Istanbul. **Aegean**: Denizli. **Mediterranean**: Antalya*, Hatay*, Isparta*, Konya*, Niğde*. **Central Pontus**: Tokat*. **Inner Anatolia**: Eskişehir*, Kayseri*, Nevşehir*. **E-Anatolia**: Ağri*, Kars*, Malatya*. **SE-Anatolia**: Şaniurfa*.

112. *Geophilus mundus*. **W-Pontus**: Çankiri.

113. *Geophilus poseidonis*. **Aegean**: Muğla*.

114. *Geophilus simoporus*. **Marmara**: Istanbul. **Mediterranean**: Hatay.

115. *Geophius truncorum*. **E-Anatolia**: Kars?.

116. *Bithyniphilus bosporanus*. **Marmara**: Istanbul.

117. *Bebekium mirabile*. **Marmara**: Istanbul.

118. *Pleurogeophilus latisternum*. **Mediterranean**: Mersin?.

119. *Pleurogeophilus mediterraneus*. **Mediterranean**: Denizli?. **Central Pontus**: Ordu*. **E-Pontus**: Artvin*, Rize*.

120. *Porethus ballidagus*. **W-Pontus**: Kastamonu.

121. *Porethus pauciporus*. **Marmara**: Istanbul?. **Mediterranean**: Hatay*.

122. *Porethus segregans*. **Mediterranean**: Hatay.

123. *Strigamia acuminata*. **Marmara**: Bursa, Kirklareli. **Mediterranean**: Antalya*, Hatay?. **W-Pontus**: Kastamonu, Çankiri. **Central Pontus**: Ordu*. **E-Pontus**: Artvin*, Giresun*, Rize*. **E-Anatolia**: Erzurum*, Kars*.

III. DESCRIPTION OF NEW SPECIES AND SUBSPECIES

The following abbreviations are used to indicate the collections were the material examined is preserved: MZ = M. Zapparoli; MZUR = Museo di Zoologia dell'Università di Roma "La Sapienza", Italy; NHMW = Naturhistorisches Museum Wien, Austria; ZMUC = Zoologisk Museum, University of Copenhagen, Denmark. Other abbreviations: C = coxa, t = trochanter, P = prefemur, F = femur, T = tibia; a = anterior, m = median, p = posterior; V = ventral, D = dorsal.

Lithobius (Lithobius) antonellae n. sp.

Diagnosis. A *Lithobius* s. str. small sized (10.0-10.5 mm long), chestnut in colour; antennae with 32-43 articles; ocelli 1+2,2,1, 1+3,3 on each side; prosternum with 2+2 conical teeth, without shoulders, porodont setiform; posterior border of T.1 straight; TT. 1, 3, 5, 8, 10, 12 with posterior marginal ridge interrupted in the middle; posterior angles of TT. 9, 11 and 13 without posterior projections; coxal pores circular, 1-3; VaC absent; 15th leg with accessory apical claw; female gonopod with two or three spurs almost long, narrow and sharp, apical claw wide, tridentate.

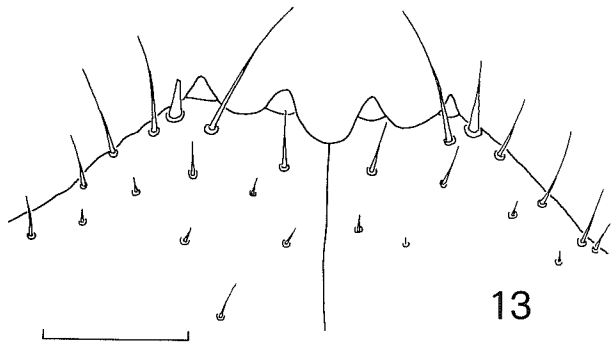
Loc. typ.: Turkey, vil. Sivas, Zyarett Geçidi, m 1800-2000, 41 km W Gurun.

Type series. Holotype: ♀, Turkey, vil. Sivas, Zyarett Geçidi, m 1800-2000, 41 km W Gurun, 25.V.1988, M. Zapparoli leg. (MZUR). Paratypes: 2 ♀♀, same data as for holotype, M. Zapparoli leg. (MZUR).

Additional material: 1 ♀, Turkey, vil. Malatya, 5 km N Darende, m 1300, 6.V.1993, M. Zapparoli leg. (MZ).

Holotype description. Colour: chestnut; head, T. 1 and TT. 10-14 darker. Size: 10.5 mm long, 1.1 mm broad at T. 10. Head: smooth; 0.9 mm long, 0.9 mm broad, broader than T.1, posterior border very slightly emarginate, posterior marginal ridge present, lateral terminations of marginal ridge distinct. Antennae: 2.7-3.0 mm long, 37-41 articles, terminal article two or three times longer than the penultimate. Ocelli (Fig. 12): 1+2,2,1 on each side, posterosuperior ocellus as large as the principal ocellus. Organ of Tömösváry (Fig. 12): slightly smaller than a secondary ocellus. Prosternum: with 2+2 conical teeth, porodont setiform, lateral to the porodont the free border slopes without forming shoulders.

Tergites: smooth, T.1 almost rectangular, narrower than T. 3, posterior border slightly emarginate; TT. 1 with a median subtriangular thickening formed by the posterior marginal sulcus and the posterior marginal ridge (Fig. 14), TT. 3, 5, 8, 10 and 12 with a pair of small curved paramedian sulci arising from the



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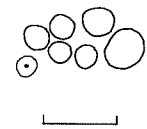

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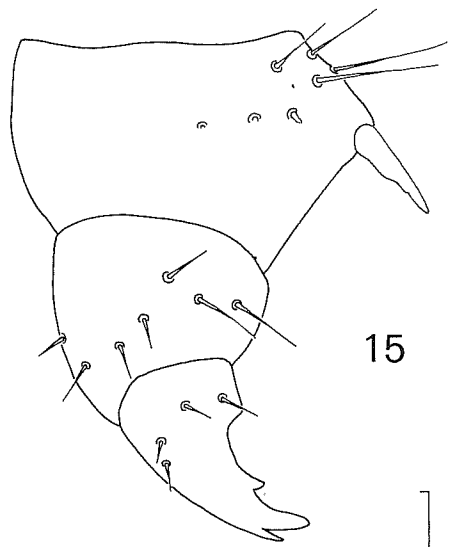

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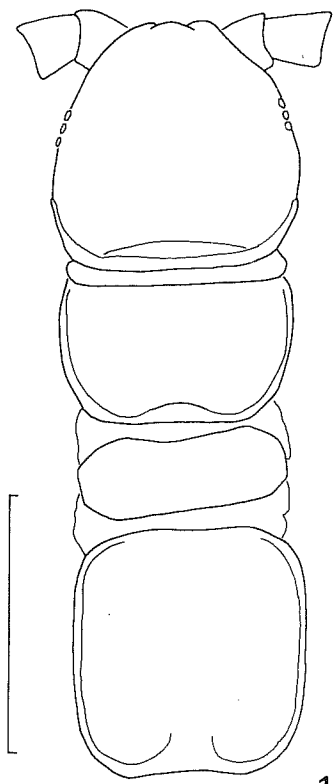

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Figs. 12-16 - *Lithobius (Lithobius) antonellae* n. sp. Left ocelli and organ of Tömösváry, holotype (12); dental margin of prosternum, ventral, paratype (13); Head and TT. 1-3, habitus, dorsal, holotype (14); right female gonopod, dorsolateral (15), and left gonopod spurs, ventral (16), paratype. Scales 0.1 mm (12, 13, 15, 16), 1.0 mm (14).

posterior marginal sulcus (Fig. 14), these paramedian sulci are more evident in the anterior tergites than in the posterior ones; posterior border of the TT. 3 and 5 slightly emarginate, straight in TT. 7 and 8, emarginate in TT. 10 and 12, concave in T. 14; posterior angles rounded in TT. 3, 5, 8, 10 and 12, angulated in T. 7; TT. 2, 4 and 6 with posterior border straight and posterior angles blunt or slightly rounded; posterior angles of TT. 9 and 11 blunt or slightly rounded, T. 13 with posterior angles angulated. Intermediate tergite: posterior border feebly emarginate.

Coxal pores: small, circular, 1,2,3,2, separated from each other by their own diameter or more. Anterior legs: tarsal articulations on first to 13th legs distinct. 14th leg: 2.5 mm long. 15th leg: 2.7 mm long, accessory apical claw present. Glandular pores: on 13th to 15th legs.

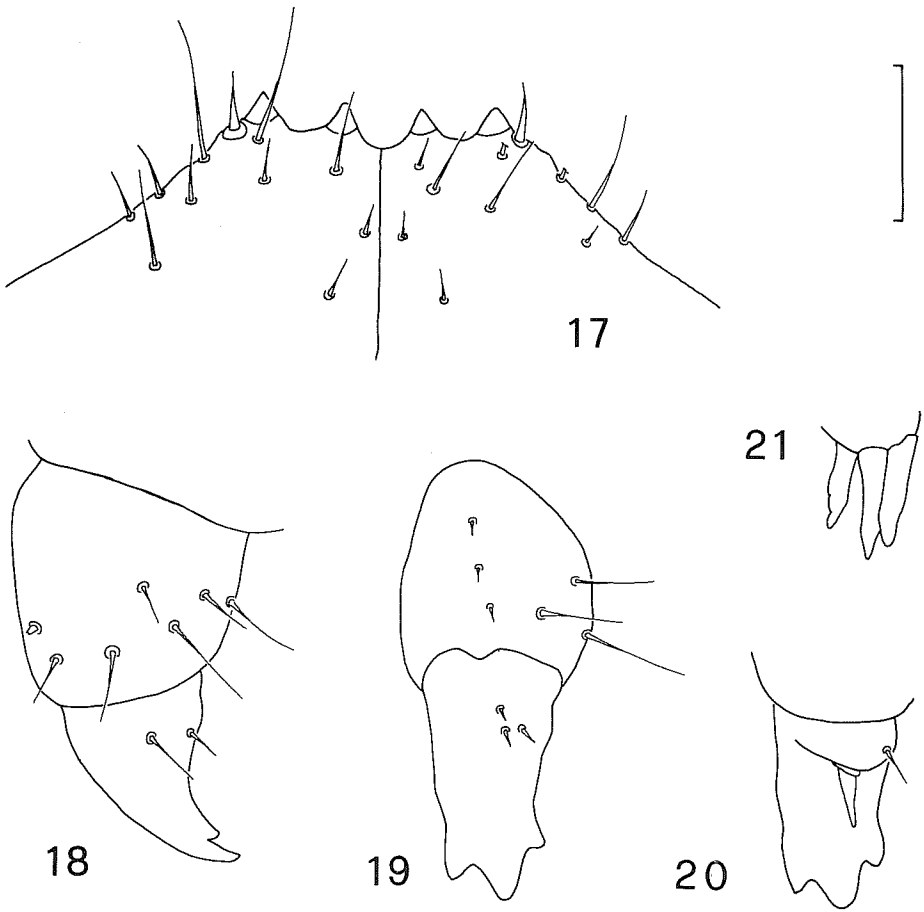
Female gonopod: with two spurs almost long, narrow and sharp, apical claw wide, tridentate; two dorsolateral setae on a line on second article and two on the third; no dorsomedial setae. Spinulation: see Tab. 4.

Tab. 4 - *Lithobius (Lithobius) antonellae* n. sp. (holotype): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	-	am	m	-	-	-	a	a
2	-	-	-	am	m	-	-	-	a p	a p
3-8	-	-	-	am	am	-	-	-	a p	a p
9	-	-	m	am	am	-	-	-	p	a p
10	-	-	m	amp	am	-	-	-	p	a p
11	-	-	mp	amp	am	-	-	-	p	a p
12	-	-	mp	amp	am	-	-	mp	p	a p
13	-	-	mp	amp	m	-	-	mp	p	p
14	-	m	amp	m	-	a	-	mp	p	p
15	-	m	amp	m	-	a	-	mp	p	-

Paratypes description and variability. The paratypes differ from the holotype in the following characters. Size: 10.0 mm long, 1.0 mm broad at T. 10. Head: as long as broad or slightly broader than long. Antennae: 2.2-2.5 mm long, with 32-37 articles. Coxal pores: 1,2,2,2. 14th leg: 2.3 mm long. 15th leg: 2.5 mm long. The dental margin of the prosternum of a paratype female, ventral side, is shown in Fig. 13. The female gonopod of the same specimens is shown in Figs. 15-16. Spinulation: as in the holotype.

The female from 5 km N of Darende differs from the holotype and the paratypes in the following characters. Antennae: 2.5-3.0 mm long, with 42-43 articles, terminal article twice longer than the penultimate; ocelli: 1+3,3 on each side, posterosuperior ocellus as large as the principal ocellus; in Fig. 17 is shown the dental margin of the prosternum; coxal pores: 1,2,2,2; 14th leg: 2.0 mm



Figs. 17-21 - *Lithobius (Lithobius) antonellae* n. sp., ♀, Turkey, vil. Malatya, 5 km N Darende, m 1300, 6.V.1993, M. Zapparoli leg.: dental margin of prosternum, ventral (17); right female gonopod 2nd and 3rd article, dorsolateral (18) and dorsal (19); right female gonopod 3rd article (20) and spurs, ventrolateral (21). Scales 0.1 mm.

long. 15th leg: 3.0 mm long; female gonopod (Figs. 18-21): with three long, narrow and sharp spurs and with a broad tridentate claw; an abnormal supplementary spur is present on the ventral side of the right claw; three short dorsolateral setae on a line on the second article and three on two lines on the third article; no dorsomedial setae. Spinulation: see Tab. 5.

Etymology. Named in honour of my wife Antonella Altieri.

Tab. 5 - *Lithobius (Lithobius) antonellae* n. sp. (♀, Turkey, vil. Malatya, 5 km N Darende): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	-	-	m	-	-	-	-	-
2	-	-	-	am	m	-	-	-	a p	p
3-5	-	-	-	am	am	-	-	-	a p	p
6	-	-	-	am	m	-	-	-	a p	p
7	-	-	-	am	m	-	-	-	a p	a p
8-10	-	-	-	amp	m	-	-	-	a p	a p
11	-	-	m	amp	m	-	-	-	a p	a p
12	-	-	mp	amp	m	-	-	p	p	a p
13	-	m	mp	amp	m	-	-	mp	p	p
14	-	m	amp	m	-	a	-	mp	p	-
15	-	m	amp	m	-	a	-	mp	-	-

Distribution and ecological remarks. Only known from two localities in Central Anatolia (Fig. 6). 1300-2000 m on s.l., both collecting sites are characterised by open dry habitat, stony calcareous ground dominated by *Astragalus* sp.

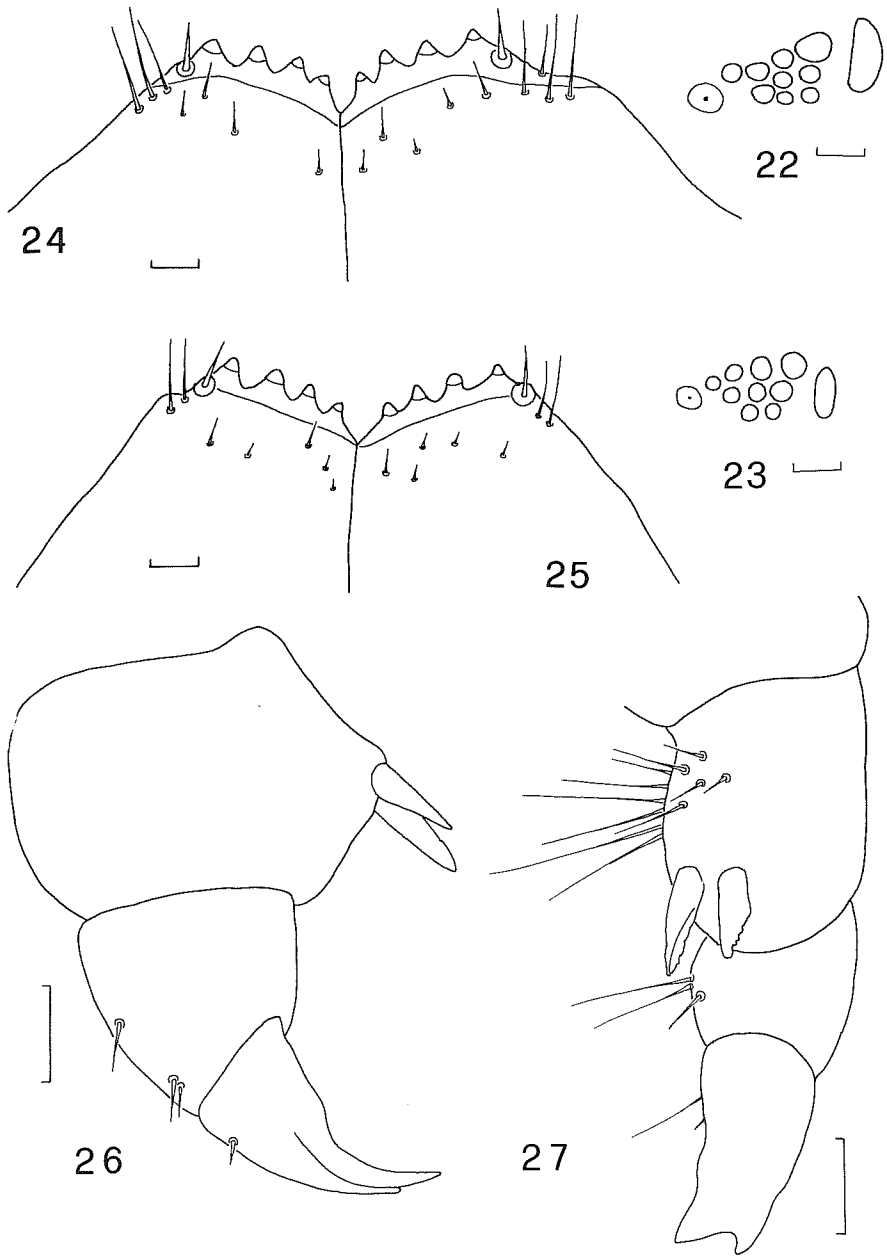
Comparative remarks. *L. antonellae* is similar to *L. delictus*, from W- and E-Pontus. The diagnostic characters of the two species are summarised in Tab. 6.

Tab. 6 - Diagnostic characters of *Lithobius (Lithobius) delictus* (Chamberlin, 1952) and *Lithobius (Lithobius) antonellae* n. sp.

	L. delictus	*L. antonellae*
body lenght (mm)	10.0	10.0-10.5
n. of antennal articles	35-38	32-43
n. of ocelli	1+3,2; 1+1,2	1+2,2,1; 1+3,3
n. of prosternal teeth	3+3, 2+2	2+2
paramedian sulci on large tergites	absent	present
triangular projections on TT. 9, 11 and 13	absent on TT. 9 and 11, small on T. 13	absent
n. of coxal pores	1-3	1-2
accessory 15th apical claw	present	present
VaC	absent	absent
DaC	absent	present on 14th and 15th legs
female gonopod	-	with two spurs and tridentate claw, no dorsomedian setae on the 1st article

Lithobius (Lithobius) biondii n. sp.

Diagnosis. A *Lithobius* s. str. belonging to the group of species of *L. persicus*, apparently close to *L. laccatus* Attems, 1951, medium sized (17.0-19.0 mm long), chestnut in colour; antennae with 43-46 articles; ocelli: 1+4,3,2 on each side; organ of Tömösváry as large as an ocellus; prosternum with 4+4 rounded teeth,



Figs. 22-27 - *Lithobius (Lithobius) biondii* n. sp. Left ocelli and organ of Tömösváry, holotype (22), paratype (23); dental margin of prosternum, ventral, holotype (24), paratype (25); left female gonopod, holotype, dorsal (26), ventrolateral (27). Scales 0.1 mm.

without shoulders, porodont spiniform; TT. 9 and 11 without triangular projection, very small triangular projections only on T. 13; coxal pores: 4-6, circular; 15th leg with accessory apical claw; female gonopod with two spurs, claw broad with a lateral denticle on the internal side. VaC on leg 15th and sometimes 14th.

Loc. typ.: Turkey, vil. Bitlis, Bitlis, m 1700.

Type series. Holotype: ♀, Turkey, vil. Bitlis, ruins N from Bitlis, m 1700, 20.V.1988, M. Zapparoli leg. (MZUR). Paratype: 1 ♀, same data as for holotype, M. Zapparoli leg. (MZ).

Holotype description. Colour: chestnut. Size: 19.0 mm long, 1.8 mm broad at T. 10. Head: smooth, broader than long, broader than T. 1, posterior border almost straight, posterior marginal ridge with a distinct median thickening, lateral terminations of marginal ridge distinct. Antennae: 5.0-5.5 mm long, with 45-46 articles, last article three time longer than the penultimate. Ocelli (Fig. 22): 1+4,3,2 on each side, posterosuperior ocellus as large as the secondary ocelli and the principal ocellus. Organ of Tömösváry (Fig. 22): as large as an ocellus and close to the ocelli. Prosternum (Fig. 24): 4+4 rounded teeth, porodont spiniform, lateral to the porodont the anterior border slopes obliquely without formation of shoulders.

Tergites: smooth, T. 1, broader than T. 3, almost trapezoidal, posterior border slightly emarginate; posterior border slightly emarginate in TT. 3, 5, 8, emarginate in TT. 10 and 12, straight in TT. 7 and 14; posterior angles rounded in TT. 3, 5, 8, angulated in T. 7, 10, 12 and 14; TT. 2, 4 and 6 with posterior angles blunt and posterior border straight; TT. 9 and 11 with blunt posterior angles, without triangular projection and posterior border straight, very small triangular projections only on T. 13. Intermediate tergite: posterior border feebly emarginate.

Coxal pores: 4,5,5,5, circular, separated one from another by less than their own diameter, the pores are progressively larger from the proximal to the distal. Anterior legs: with tarsal articulations on first to 13th legs distinct. 14th leg: 5.0 mm long, slender. 15th leg: 6.0 mm long, slender, accessory apical claw present. Glandular pores: concentrated on 11th-15th legs. Female gonopod (Figs. 26, 27): with two conical, sharp and long spurs with denticolate margin, close to one another; claw broad with a distinct lateral denticle on the internal side, broad at the base; three thin dorsolateral setae on two lines on second article, the proximal seta is spaced from the other two, more distally placed and close to one another; third article with a thin seta; no dorsomedial setae.

Spinulation: see Tab. 7.

Tab. 7 - *Lithobius (Lithobius) biondii* n. sp. (holotype): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	p	amp	m	-	-	mp	a	a
2-10	-	-	mp	amp	am	-	-	mp	a p	a p
11-12	-	-	amp	amp	am	-	-	mp	a p	a p
13-14	-	m	amp	amp	am	a	-	amp	p	p
15	a	m	amp	amp	a	a	-	amp	p	-

Paratype description and variability. The paratype differs from the holotype in the following characters. Size: 17.0 mm long. Antennae: 5.0 mm long, 43-45 articles. Coxal pores: 4,6,6,5. Ocelli, organ of Tömösváry and dental margin of the prosternum are shown in Figs. 23 and 25. Spinulation: see Tab. 8, letters in brackets indicates spines present on one side only.

Tab. 8 - *Lithobius (Lithobius) biondii* n. sp. (paratype): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	p	amp	am	-	-	mp	a	a
2-7	-	-	mp	amp	am	-	-	mp	a p	a p
8-9	-	-	mp	amp	am	-	-	amp	a p	a p
10-12	-	-	amp	amp	am	-	-	amp	a p	a p
13	-	m	amp	amp	am	(a)	-	amp	p	a p
14	(a)	m	amp	amp	am	a	-	amp	p	p
15	a	m	amp	amp	a	a	-	amp	p	-

Etymology. Named in honour of my friend and colleague Prof. Maurizio Biondi, Department of Environmental Sciences, University of L'Aquila (Italy), specialist of Coleoptera Chrysomelidae Alticinae.

Distribution and ecological remarks. Known only from the type locality in the E-Turkey (Fig. 10). 1700 m on s. l., steppic, grazed open habitat.

Comparative remarks. *Lithobius biondii* is close to *L. persicus* Pocock, 1899, from SE-Turkey and N-Iran, and *L. laccatus* Attems, 1951, from N-Iran. The diagnostic characters of the three species are summarized in Tab. 9.

Lithobius* (*Lithobius*) *ispartensis n. sp.

Diagnosis. A *Lithobius* s. str. small sized (11.0-13.0 mm long), light brown in colour, antennae with 27-28 articles, ocelli 1+3,3, 1+4,3 on each side; prosternum with 2+2 teeth, porodont setiform; TT. 9, 11 and 13 without triangular posterior projections; coxal pores 2-3, circular; VaC absent; 15th leg

Tab. 9 - Diagnostic characters of *Lithobius (Lithobius) persicus* Pocock, 1899, *Lithobius (Lithobius) laccatus* Attems, 1951 and *Lithobius (Lithobius) biondii* n. sp.

	L. persicus	*L. laccatus*	*L. biondii*
body size (mm)	19.0-25.0	22.0	17.0-19.0
n. of ocelli	1+11-21	not numerous	1+9
n. of antennal articles	47-57	46	43-46
n. prosternal teeth	2+2, sometimes 3+3	2+2, 3+3	4+4
VaC	on 12th-15th legs	on 13th-15th legs	on 14th-15th legs
female gonopod	with three spurs and a bidentate claw	with two spurs and a bidentate claw	with two spurs and a bidentate claw
n. of coxal pores	4-6	4-6	4-6
triangular projections on TT. 9, 11 and 13	T. 9 without projection, T. 11 sometimes with projections, T. 13 with projections	TT. 9 and 11 without projections, T. 13 with small projections	TT. 9 and 11 without projections, T. 13 with small projections

with accessory apical claw; female gonopod with two spurs and unidentate claw.

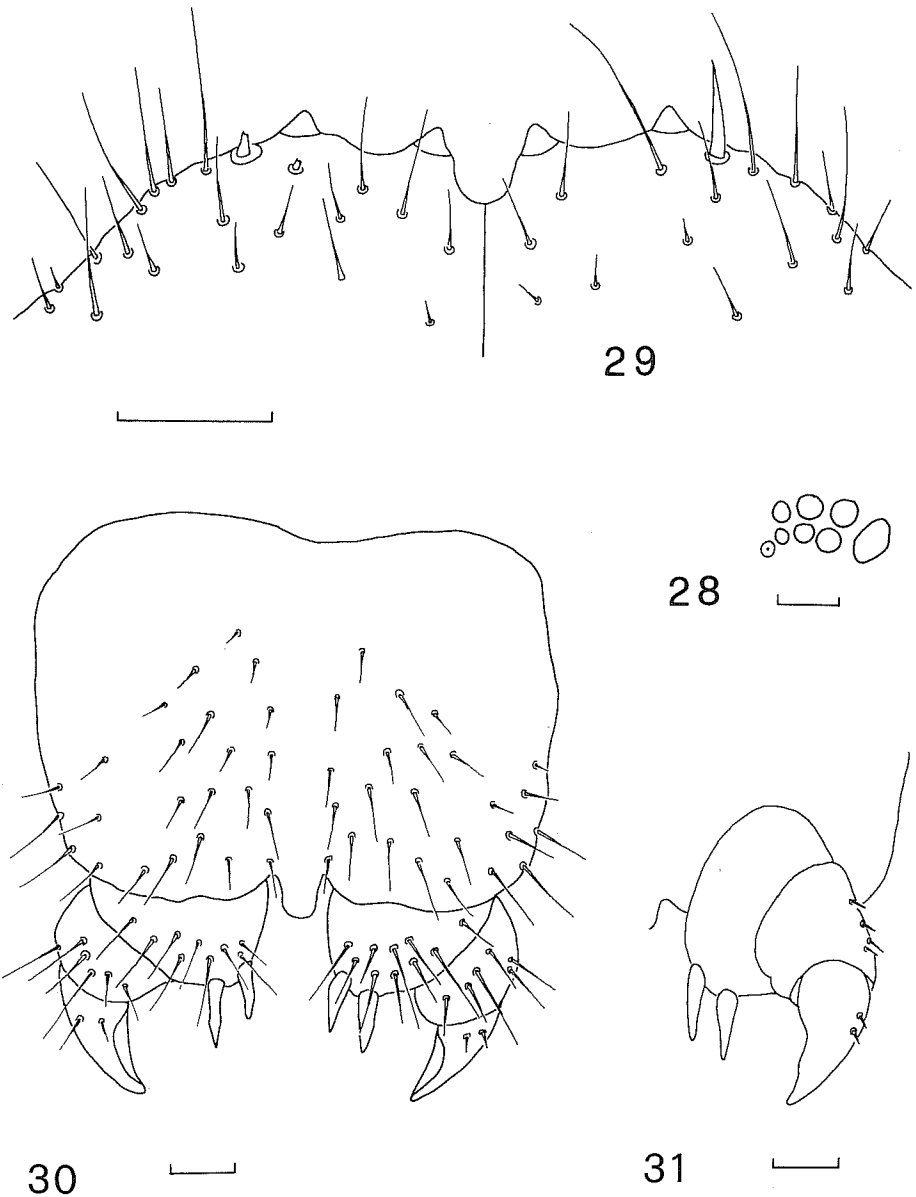
Loc. typ.: Turkey, vil. Isparta, Egridir.

Type series. Holotype: ♀, Turkey, vil. Isparta, Egridir, 18.IV.1973, A. Vigna Taglianti leg. (MZUR). Paratypes: 1 ♂, 1 ♀, same data as for holotype, P. Brignoli leg. (MZUR).

Additional material: 1 ♀, Turkey, vil. Afyon, Afyon-Şuhut, m 1300, grassland, 3.V.1995, H. Enghoff, M. Frater and H. Read leg. (ZMUC).

Holotype description. Colour: light chestnut. Size: 12.5 mm long, 1.3 mm broad at T. 10. Head: moderately wrinkled, 1.2 mm long, 1.1 mm broad, broader than T. 1, posterior border straight, posterior marginal ridge present, lateral termination feebly outlined. Antennae: 4.0 mm long, 28-25 (broken) articles, last article longer three times than the penultimate. Ocelli (Fig. 28): 1+3,3 on each side, depigmented, on two horizontal rows, posterosuperior ocellus smaller than the principal one but larger than the secondary ocelli. Organ of Tömösváry (Fig. 28): smaller than the secondary ocelli. Prosternum: anterior border broad, with 2+2 small teeth, spaced one from each other, porodont setiform, lateral to the porodont the anterior border slopes obliquely without formation of shoulders.

Tergites: moderately wrinkled, T. 1 little narrower than T. 3, almost rectangular with posterior border slightly emarginate, posterior angles rounded; posterior border of TT. 3, 5 and 8 slightly emarginate, emarginate in T. 10, straight in TT. 7 and 14; posterior angles rounded in TT. 3, 5 and 8, slightly blunt in T. 7, little rounded in TT. 10, 12 and 14; TT. 2, 4 and 6 with posterior border straight and posterior angles rounded; TT. 9, 11 and 13 without



Figs. 28-31 - *Lithobius* (*Lithobius*) *ispartensis* n. sp. Left ocelli and organ of Tömösváry, holotype (28), dental margin of prosternum, ventral, paratype (29); female gonopods, ventral (30), left, dorsal (31), paratype. Scales 0.1 mm.

triangular posterior projections, TT. 9 and 11 with posterior angles blunt, those of T. 13 are angulated. Intermediate tergite: posterior border straight.

Coxal pores: 2,2,2,2, circular, small, separated one from another by more than their own diameter. Anterior legs: tarsal articulation on first to 13th legs distinct. 14th leg: 1.3 mm long. 15th leg: 1.6 mm long. Accessory apical claw present.

Glandular pores: concentrated on 14th and 15th legs only. Female gonopod: with two relatively long spurs and unidentate claw; four dorsolateral setae on a line on the second article; two dorsolateral setae on a line on the third article; no dorsomedial setae. Spinulation: see Tab. 10, letters in brackets indicate spines present on one side only.

Tab. 10 - *Lithobius (Lithobius) ispartensis* n. sp. (holotype): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	p	amp	m	-	-	p	a p	a
2-4	-	-	p	amp	m	-	-	mp	a p	a p
5-11	-	-	p	amp	am	-	-	mp	a p	a p
12	-	-	mp	amp	m	a	-	(a)mp	p	p
13	-	-	mp	amp	m	a	-	amp	p	p
14	-	(m)	(a)mp	mp	-	a	-	amp	p	-
15	-	m	amp	m	-	a	-	amp	-	-

Paratypes description and variability. Size: 12.0-13.0 mm long. Ocelli: 1+4,3 on each side. Antennae: with 27-28 articles, almost reaching T.3, last article two or three times longer than the penultimate. Intermediate tergite: posterior border straight in both sexes, rahter broader in female than in male. Coxal pores: 2,3,3,2 (♀), 1,2,2,1 (♂). 14th and 15th legs moderately swollen in both sex. Male genitalia: first genital sternite with 8-10 setae on each side, second genital sternite without setae, gonopod with two apical setae. The dental margin of prosternum, ventral, is shown in Fig. 29. The female gonopods are shown in Figs. 30, 31. Spinulation: see Tab. 11, letters in brackets indicate the variable spines.

Tab. 11 - *Lithobius (Lithobius) ispartensis* n. sp. (paratypes): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	p	amp	m	-	-	(m)p	a p	a
2-3	-	-	p	amp	m	-	-	mp	a p	a p
4-6	-	-	p	amp	(a)m	-	-	mp	a p	a p
7-10	-	-	p	amp	am	-	-	mp	a p	a p
11	-	-	p	amp	am	-	-	(a)mp	a p	a p
12	-	-	mp	amp	am	(a)	-	(a)mp	p	p
13	-	m	mp	amp	am	a	-	(a)mp	p	p
14	-	m	amp	amp	(m)	a	-	amp	p	-
15	-	m	amp	m	-	a	-	amp	-	-

The female from Afyon-Şuhut differs from the types in the following main features: size 11.0 mm long, ocelli 1+3,2 on each side, antennae with 26-28 articles, coxal pores: 1,2,2,2; spinulation: see Tab. 12; the main differences concerns FpV that is absent in first to 10th leg, and the PaD wich is totally absent.

Tab. 12 - *Lithobius (Lithobius) ispartensis* n. sp. (♀, vil. Afyon, Afyon-Şuhut): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	p	am	m	-	-	mp	a	-
2	-	-	p	am	m	-	-	mp	a p	a
3-6	-	-	p	am	m	-	-	mp	a p	a p
7-10	-	-	p	am	am	-	-	mp	a p	a p
11	-	-	p	amp	am	-	-	mp	a p	p
12	-	-	mp	amp	am	-	-	mp	p	p
13	-	m	amp	amp	am	a	-	mp	p	p
14	-	m	amp	amp	m	a	-	mp	p	-
15	-	m	amp	m	-	a	-	mp	-	-

Etymology. Named after the province were the type locality is located.

Distribution and ecological remarks. Known only from some sites in SW-Turkey (Fig. 7). 1200-1300 m on s.l. Habitat preferences are unknown, one specimen recorded in grassland (vil. Afyon).

Comparative remarks. *Lithobius (L.) ispartensis* n. sp. is close to *L. (L.) integrior* (Chamberlin, 1952), from Abant and from Bolu Dağ geçidi (both localities in the vil. Bolu) (Zapparoli, 1994a). The diagnostic characters of the two species are summarized in Tab. 13.

Tab. 13 - Diagnostic characters of *Lithobius (Lithobius) integrior* (Chamberlin, 1952) and *Lithobius (Lithobius) ispartensis* n. sp.

	L. integrior	*L. ispartensis*
body size (mm)	12.0	12.0-13.0
n. of antennal articles	46-47	26-28
n. of ocelli	1+4,4,3	1+3,3, 1+4,3
prosternal teeth and porodont	2+2, setiform	2+2, setiform
n. of coxal pores	3-4	2-3
DaC	on 14th-15th legs	on 12th-15th legs
female gonopod	with two short cilindroconical spurs, claw short, unidentate, first article with 5 dorsomedian setae, second article with 6 dorsolateral setae	with two long spur, claw long, unidentate, first article without dorsomedian setae, second article with 5 dorsolateral setae

Lithobius (Lithobius) plesius (Chamberlin, 1952)

Lithobius (Lithobius) plesius antalyanus n. subsp.

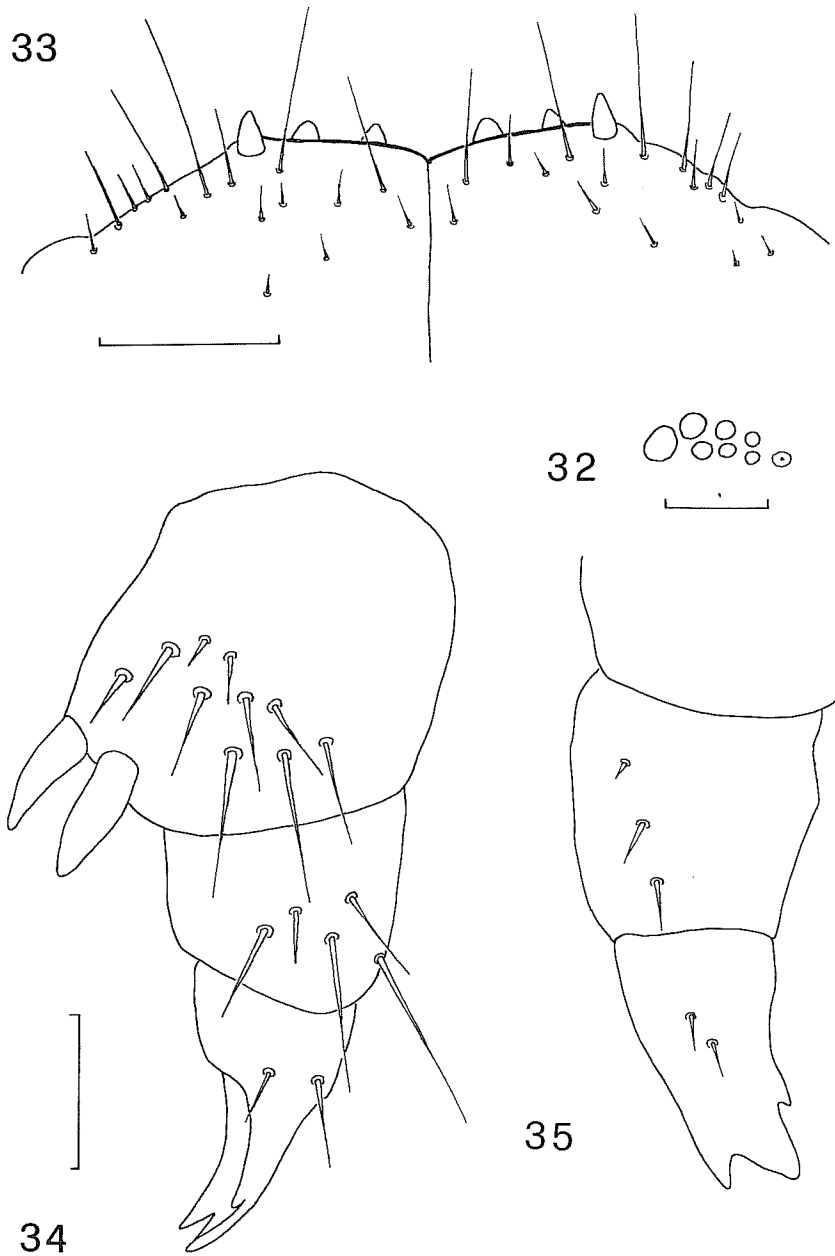
Diagnosis. A *Lithobius plesius* 13.0-15.0 mm long, light to dark chestnut in colour; antennae with 38-42 articles; ocelli 1+5-8 on each side, depigmented or little pigmented, posterosuperior ocellus little smaller than the principal ocellus; prosternum with 2+2 small teeth, porodont dentiform; TT. 9, 11 and 13 without triangular projections at the posterior angles; coxal pores 3-5, circular; tarsus of the 1st-3th legs inflated like in the genus *Harpolithobius* Verhoeff, 1904 but rarely with pigmented maculae; 15th leg with accessory apical claw; VaC absent; female gonopod with two cilindroconical spurs and a broad claw with a well developed denticle on the internal side and a very small denticle on the external side sometimes apparently absent.

Loc. typ.: Turkey, vil. Antalya, Korkuteli.

Type series. Holotype: ♂, Turkey, vil. Antalya, Korkuteli, 28.IV.1973, A. Vigna Taglianti leg. (MZUR). Paratypes: same data as for holotype, 1 ♀, A. Vigna Taglianti leg. (MZUR); 1 ♀, P. Brignoli leg. (MZUR).

Additional material: Turkey: 2 ♂♂, 1 ♀ immature, vil. Antalya, Korkuteli, 28.IV.1973, P. Brignoli leg. (MZ); 2 ♂♂ immature, 2 ♀♀ immature, ibidem, M. Di Rao leg. (MZ); 2 ♀♀, vil. Antalya, Topraktepe, m 200, 22.XI.1981, A. Vigna Taglianti leg. (MZ); 1 ♀, vil. Antalya, Irmasan Geçidi, 28.IV.1982, m 1430-1525, A. Vigna Taglianti leg. (MZ); 1 ♂, ibidem, 28.IV.1982, M. Zapparoli leg. (MZ); 1 ♂, vil. Antalya, beech near Antalya, V.1969, G. Pretzmann (NHMW); 1 ♂, vil. Antalya, Sagirin-Tasagil (NE Serik), m 25, *Pinus* forest with *Quercus coccifera*, 7.V.1995, H. Enghoff, M. Frater and H. Read leg. (ZMUC); 1 ♂, 2 ♀♀, vil. Antalya, Gullukdağı-Termessos National Park, ca 25 km NW Antalya, m 900, high scrub, 5.V.1995, H. Enghoff, M. Frater and H. Read leg. (ZMUC); 1 ♀, vil. Antalya, Köprülü Kanyon National Park, ca 35 km N Serik, m 200, *Pinus* forest, 5.V.1995, H. Enghoff, M. Frater and H. Read leg. (MZ); 1 ♂, 2 ♀♀, vil. Antalya, Köprülü Kanyon National Park, ca 35 km N Serik, m 200, *Pinus* forest, ravine with *Platanus*, etc., 5.V.1995, H. Enghoff, M. Frater and H. Read leg. (ZMUC); 2 ♂♂, vil. Konya, Lake of Beysheir, Island of Aci Akif, 22.IV.1973, V. Sbordoni leg. (MZ); 1 ♂, vil. Isparta, Bademli, 6.V.1991, M. Zapparoli leg. (MZ); 1 ♀, vil Isparta, Egridir, 18.IV.1973, M. Di Rao leg. (MZ); 1 ♂, 1 ♀ immature, vil. Isparta, Egridir, near a cave at 6 km to crossroads to Anamas, m 1300, 17.IV.1973, V. Sbordoni leg. (MZ).

Holotype description. Colour: light chestnut. Size: 13.0 mm long, 1.3 mm broad at T. 3. Head: smooth, 1.3 mm broad, 1.2 mm long, broader than T. 1, posterior border straight, posterior marginal ridge present, lateral terminations



Figs. 32-35 - *Lithobius (Lithobius) plesius antalyanus* n. subsp., right ocelli and organ of Tömösváry, holotype (32); dental margin of prosternum, ventral, ♀ from Korkuteli (33); female gonopod, ♀ from Korkuteli, ventral (34), dorsal 2nd and 3rd articles (35). Scales 0.2 mm (32, 33), 0.1 mm (34, 35).

of marginal ridge fair distinct. Antennae: 4.7-5.0 mm long, with 40-42 articles, last article twice as long as the penultimate. Ocelli (Fig. 32): 1+2,2,2 on each side, depigmented, posterosuperior ocellus a little smaller than the principal ocellus. Organ of Tömösváry (Fig. 32): as large as the principal ocellus, spaced from the ocelli. Prosternum: broad, with 2+2 small theeth, porodont dentiform, spaced from the teeth and larger; the free border slopes backward gradually without forming shoulders lateral to the porodont.

Tergites: smooth; T. 1 trapezoidal almost broader than T. 3, posterior margin slightly emarginate; posterior border slightly emarginate in TT. 3 and 5, straight in T. 7 and 14, emarginate in TT. 8, 10 and 13; posterior angles rounded in TT. 3 and 5, blunt in TT. 7, 8, 10 and 12; TT. 2, 4 and 6 with posterior angles blunt and posterior border straight; TT. 9, 11 and 13 without triangular projections at the posterior angles, posterior border straight. Intermediate tergite: feebly emarginate.

Coxal pores: circular, small, 3,4,4,3, separated from each other by more than their own diameter. Anterior legs: tarsal articulation on first to 13th legs distinct; tarsus of the 1st to 13th legs inflated as in the genus *Harpolithobius* but without pigmented maculae (cf. Fig. 41). 14th leg: 3.6 mm long, slender. 15th leg: 5.0 mm long, slender, accessory apical claw present. Glandular pores: on legs 14th and 15th. Genitalia: first genital sternite with about fourteen setae on each side, second genital sternite without setae, gonopod short, broad, blunt apically, with a long apical seta.

Spinulation: see Tab. 14.

Tab. 14 - *Lithobius (Lithobius) plesius antalyanus* n. subsp. (holotype): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	m	am	a	-	-	p	a	-
2	-	-	m	am	am	-	-	mp	a	a
3-9	-	-	m	am	am	-	-	mp	a p	a p
10	-	-	mp	am	am	-	-	mp	a p	a p
11	-	-	amp	amp	am	-	-	mp	a p	a p
12	-	-	amp	amp	am	-	-	mp	p	a p
13	-	m	amp	amp	am	-	-	mp	p	a p
14	-	m	amp	amp	m	a	-	mp	p	p
15	-	m	amp	m	-	a	-	mp	-	-

Paratypes description and variability. Paratypes differing from the holotype in the following characters: size 13.0-15.0 mm long; antennae of 31-32 articles; ocelli 1+3,2, 1+2,2,2 on each side; intermediate tergite straight or feebly emarginate; coxal pores 2,3,3,3, 2,3,3,2; the proximal pore is sometimes smaller than the other pores; female gonopod (Figs. 34, 35) with two cilindroconical and almost long spurs, claw broad with a well developed denticle on the internal side, a small, more proximal lateral

denticle is also present on the external side; three long dorsolateral setae on a line on second article, the proximal one shorter, two long dorsolateral setae on a line on the third article; no dorsomedial setae. Tarsus of the 1st to 3th legs inflated as in the holotype. The dental margin of the prosternum, ventral, is shown in Fig. 33.

The additional specimens show the following variability in the above mentioned characters. Colour light to dark chestnut; size generally as in the types but a female from vil. Antalya, Köprülü Kanyon National Park, ca 35 km N Serik, is 21.5 mm long; antennae generally with 38-41 articles; ocelli generally not pigmented or only partially pigmented, 1+2,2,2, 1+2,2,2,2, 1+2,2,3,1 on each side; prosternum with 2+2 generally rounded teeth; intermediate tergite rather broader in female than in male; coxal pores mainly 3,5,5,4; 3,4,4,3; 2,3,4,3; 4,5,4,4; 15th leg of the larger males with a longitudinal dorsal sulcus or depression; tarsus of the 1st to 3rd legs inflated as in the type specimens, pigmented maculae only in the larger specimens. The variability of spinulation of the paratypes and additional material is in Tab. 15, letters in brackets indicate the variable spines.

Tab. 15 - *Lithobius (Lithobius) plesius antalyanus* n. subsp.: spinulation variability.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	p	am	a	-	-	p	a	(a)
2	-	-	m(p)	am	am	-	-	mp	a (p)	a
3-6	-	-	m(p)	am	am	-	-	mp	a p	a p
7-9	-	-	m(p)	am(p)	am	-	-	mp	a p	a p
10	-	-	mp	am(p)	am	-	-	mp	a p	a p
11	-	-	(a)mp	amp	am	-	-	mp	a p	a p
12	-	-	(a)mp	amp	am	-	-	(a)mp	(a) p	a p
13	-	m	amp	amp	am	(a)	-	(a)mp	p	(a) p
14	-	m	amp	amp	m	a	-	(a)mp	p	p
15	-	m	amp	(a)m	-	a	-	(a)mp	(p)	-

Etymology. Named after the Turkish province from were the type material was found.

Distribution and ecological remarks. Known from many localities in the W-Taurus range (Fig. 11). 25-1525 m on s. l., mainly in *Pinus* forest, also under *Pinus* with *Quercus coccifera*, under *Platanus* and under high scrub.

Lithobius (Lithobius) plesius audisioi n. subsp.

Diagnosis. A *Lithobius plesius* 14.0-19.0 mm long, chestnut in colour, tarsus of the first pair of legs inflated as in the genus *Harpolithobius*; antennae with 40-46 articles; ocelli: 1+8, 1+9 on each side, not pigmented; organ of Tömösváry very small; prosternum with 2+2 more or less spaced teeth, porodont dentiform; TT. 9 and 11 without triangular projections on the posterior angles, T. 13 with very

small projections; coxal pores 3-5, circular; 15th leg with VaC, without secondary sexual characters; 15th leg with accessory apical claw; female gonopod with two cilindroconical spur and long claw with a small lateral denticle on each side.

Loc. typ.: Turkey, vil. Hatay (= Antakya), surroundings of Yarpuz, m 800-1000.

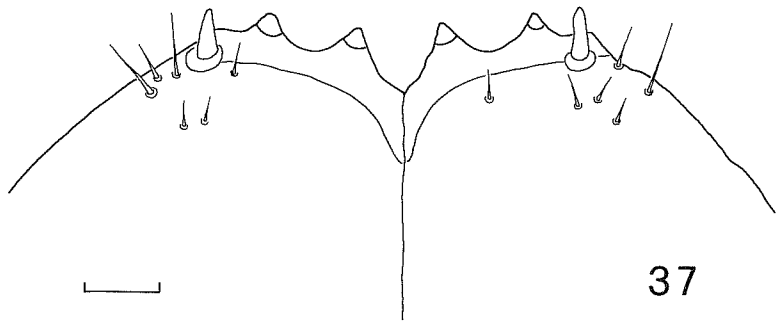
Type series. Holotype: ♀, Turkey, vil. Hatay (= Antakya), surroundings of Yarpuz, m 800-1000, 18.V.1988, M. Zapparoli leg. (MZUR). Paratypes: 1 ♂, 2 ♀♀, same data as for holotype, M. Zapparoli leg. (MZUR).

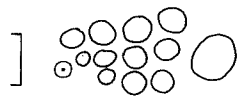
Additional material: 1 ♂, Turkey, vil. Adana, Monti Amanus, Yarpuz, m 900-1050, 12.VI.1986, P. Audisio leg. (MZ); 1 ♂, Turkey, vil. Mardin, between Mardin and Hop Geçidi, m 900-1000, 19.V.1988, M. Zapparoli leg. (MZ).

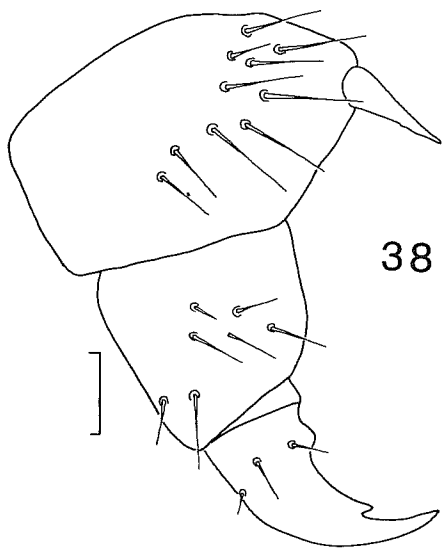
Holotype description. Colour: chestnut; head, antennae and last tergite darker. Size: 19.0 mm long, 1.9 mm broad at T. 10. Head: smooth, 1.8 mm broad, 1.6 mm long; posterior border slightly emarginate; posterior marginal ridge present, lateral terminations of marginal ridge distinct. Antennae: 6.0-6.5 mm long with 40-43 articles mainly broader than long or as broad as long, last article twice as long as the penultimate. Ocelli (Fig. 36): 1+2,2,2,2 on each side, not pigmented, posterosuperior ocellus a little smaller than the principal ocellus and broader than the other secondary ocelli. Organ of Tömösváry (Fig. 36): close to the ocelli and very small (about one half of the diameter of a secondary ocellus. Prosternum (Fig. 37): with 2+2 conical teeth, the teeth are spaced, the porodont is dentiform, the free border slopes backward gradually without forming shoulders lateral to the porodont.

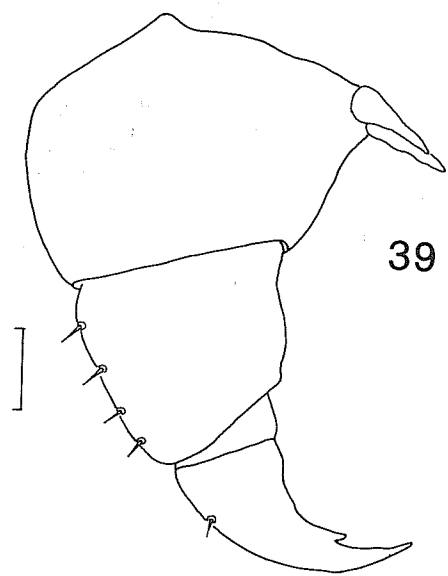
Tergites: smooth; T. 1 as broad as T. 3, subrectangular, posterior angles rounded, lateral borders parallel, posterior border slightly emarginate; posterior border straight in TT. 3, 7, slightly emarginate in T. 5, 8, 10 and 14, emarginate in T. 12; posterior angles rounded in TT. 3, 5, 8, 10, 12, blunt in TT. 7, angulated in T. 14; posterior angles blunt in TT. 2 and 4, angulated in T. 6; posterior margin straight in TT. 2, 4 and 6.TT. 9 and 11 without triangular projections on the posterior angles which are angulated, posterior border straight, T. 13 with very small projections. Intermediate tergite: posterior border straight.

Coxal pores: 4,4,5,4, circular, spaced one from another by more than their own diameter, the proximal pore is smaller than the others. Anterior legs: tarsal articulation on first to 13th legs distinct, tarsus of the first leg enlarged as in the species of the genus *Harpolithobius* but without the pigmented maculae (cf. Fig. 40). 14th leg: 4.5 mm long, not swollen. 15th leg: 5.0 mm long, not swollen, accessory apical claw present, about one half of the principal claw long. Glandular pores: on 11th to 15th legs. Female gonopod (Figs. 38, 39): with two cilindroconical spurs, claw long with a small denticle on each side; dorsolateral setae short, in a single row, four-five on the second article and one-two on the third; no dorsomedial setae. Spinulation: see Tab. 16.









Figs. 36-39 - *Lithobius (Lithobius) plesius audisioi* n. subsp. Right ocelli and organ of Tömösváry, holotype (36); dental margin of prosternum, ventral, holotype (37); female gonopod, holotype, ventral (38), dorsal (39). Scales 0.1 mm.

Tab. 16 - *Lithobius (Lithobius) plesius audisioi* n. subsp. (holotype): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	mp	am	m	-	-	mp	a	a
2	-	-	mp	am	am	-	-	mp	a p	a
3-10	-	-	mp	am	am	-	-	mp	a p	a p
11	-	-	mp	amp	am	-	-	mp	a p	a p
12	-	-	amp	amp	am	-	-	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	a	m	amp	amp	-	a	-	amp	p	-

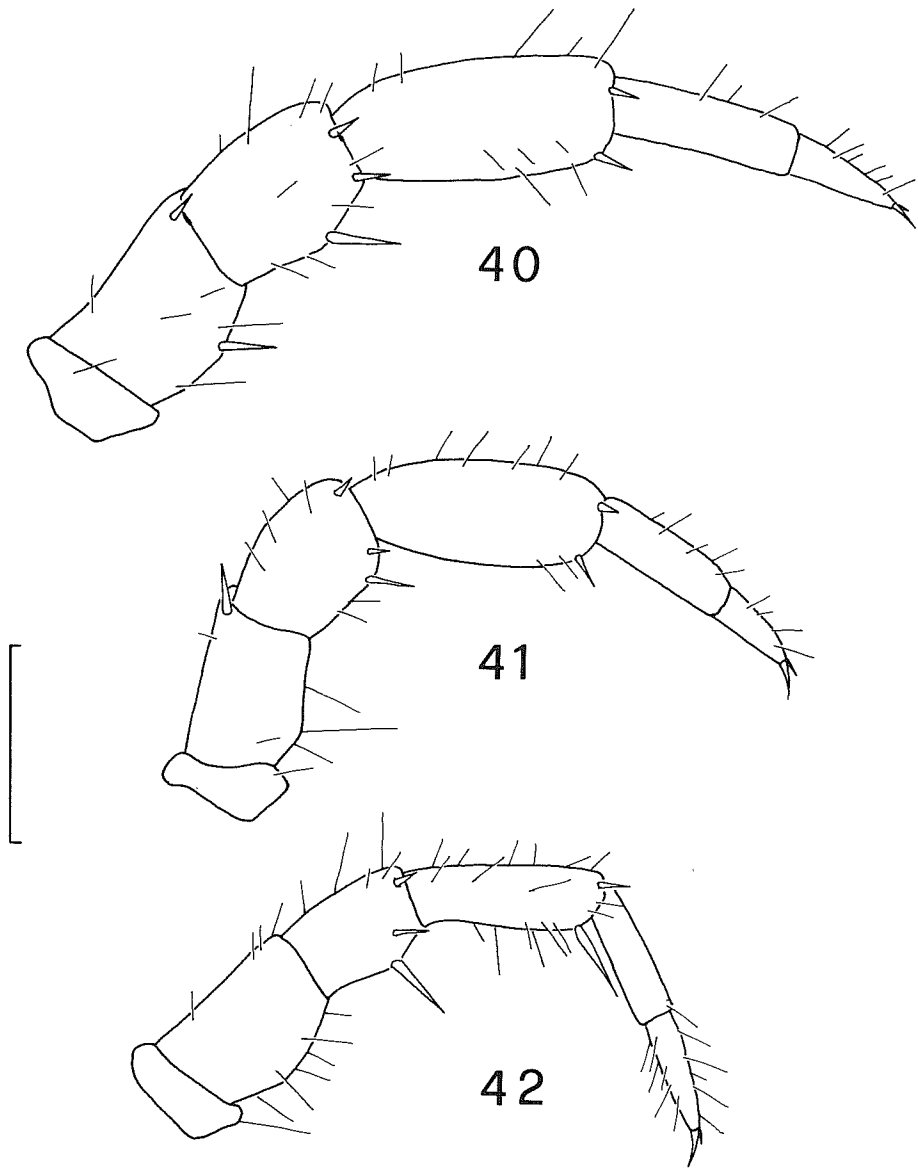
Paratypes description and variability. Size 14.0-19.0 mm long; antennae with 42-46 articles, ocelli 1+3,3,2, 1+3,3,2,1 on each side; posterior border of intermediate tergite straight or feebly emarginate, broader in female than in male; coxal pores 3,4,4,4; 3,4,4,3; male 15th leg without secondary sexual characters, femur slender and without dorsal sulcus; male genitalia: first genital sternite with about 20 setae on each side, second genital sternite without setae; gonopod broad, rounded and with one apical seta. Spinulation: see Tab. 17, letters in brackets indicate the variable spines.

Tab. 17 - *Lithobius (Lithobius) plesius audisioi* n. subsp. (paratypes): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	p	am	am	-	-	mp	a	a
2	-	-	mp	am	am	-	-	mp	a p	a
3-6	-	-	mp	am	am	-	-	mp	a p	a p
7-9	-	-	mp	am(p)	am	-	-	mp	a p	a p
10-11	-	-	mp	amp	am	-	-	mp	a p	a p
12	-	-	amp	amp	am	-	-	amp	a p	a p
13	-	m	amp	amp	am	(a)	-	amp	a p	a p
14	(a)	m	amp	amp	am	(a)	-	amp	p	p
15	a	m	amp	amp	-	a	-	amp	p	-

Etymology. Named in honour of Prof. Paolo A. Audisio, Dipartimento di Biologia Animale e dell'Uomo, Università di Roma "La Sapienza", specialist of Coleoptera Nitidulidae, best friend and colleague, fellow sufferer in many zoological trips to Anatolia.

Distribution and ecological remarks. Known from E-Turkey, from Amanus Mts. to southern slopes of the Anti Taurus range (Fig. 11). 800-1050 m on s. l.; in steppic and grazed open habitats (vil. Mardin, between Mardin and Hop Geçidi), in *Pinus* forest (vil. Hatay, surroundings of Yarpuz).



Figs. 40-42 - 1st leg, left, anterior side: *Lithobius (Lithobius) plesius audisioi* n. subsp., Turkey, vil. Antalya, between Harbie and Yayladagi, Sofularkoyu, m 450, 14/15.XI.1981, A. Vigna Taglianti leg. (40); *Lithobius (Lithobius) plesius antalyanus* n. subsp., Turkey, vil. Antalya, Topraktepe, m 200, 22.XI.1981, A. Vigna Taglianti leg. (41); *Lithobius (Lithobius) plesius plesius*, Turkey, vil. Sinop, Dranaz Geçidi (Burnuk), m 1000-1100, 16.VI.1992, P. Audisio and M. Zapparoli leg. (42). Scales 0.5 mm.

Comparative remarks. *Lithobius p. plesius* (Chamberlin, 1952) ranges along the whole Pontic range (Zapparoli, 1994a); *L. p. antalyanus* n. subsp. and *L. p. audisioi* n. subsp. show almost the same body size, number of antennal articles, number and arrangement of ocelli, shape of the prosternum with dentiform porodont, and pattern of spinulation of the nominal species. In Figs. 40-42 are showed comparative drawings of the first leg of each subspecie. The diagnostic characters of the three subspecies are sumarized in Tab. 18.

Tab. 18 - Diagnostic characters and distribution of *Lithobius (Lithobius) plesius plesius* (Chamberlin, 1952), *Lithobius (Lithobius) plesius antalyanus* n. subsp. and *Lithobius (Lithobius) plesius audisioi* n. subsp.

	L. p. plesius	*L. p. antalyanus*	*L. p. audisioi*
body size (mm)	13.0-15.0	13.0-15.0	14.0-19.0
n. of ocelli	1+5, 1+6	1+5, 1+6	1+8, 1+9
n. of antennal articles	37-39	38-42	42-46
VaC	present	absent	present
female gonopod	bidentate claw	tridentate claw	tridentate claw
tibia 1st-3th legs	normal	inflated	inflated
male 15th femur	with a dorsal sulcus	with a dorsal sulcus	without a dorsal sulcus

Lithobius* (*Lithobius*) *rizensis n. sp.

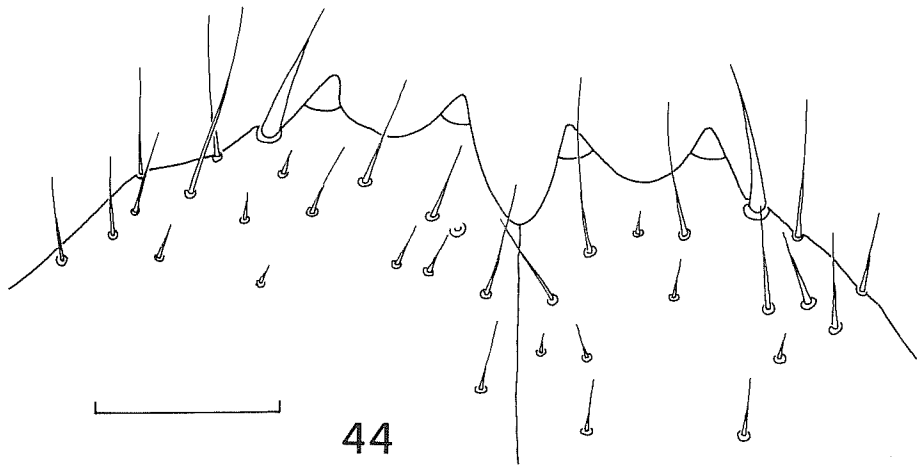
Diagnosis. A *Lithobius* s. str. light chestnut in colour, small sized (11.5 mm long), antennae with 38-40 articles, ocelli 1+12 on each side, prosternum with 2+2 teeth, porodont setiform, posterior angles of TT. 9, 11 and 13 with small triangular projection, posterior border of the intermediate tergite very incised in the middle, coxal pores 3,4,4,3, 15th leg with accessory apical claw, VaC absent; mature female unknown.

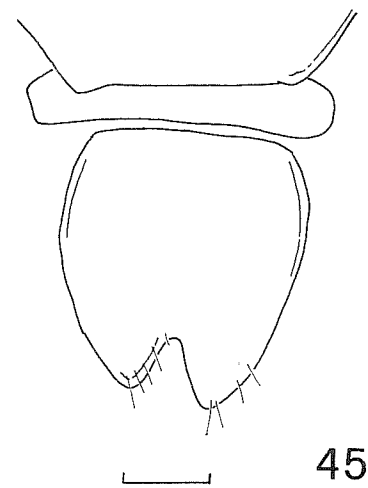
Loc. typ.: Turkey, vil. Rize, surroundings of Iliça (Ayder), m 1200-1600.

Type series. Holotype: ♂, Turkey, vil. Rize, surroundings of Iliça (Ayder), m 1200-1600, 20.VII.1976, A. Vigna Taglianti leg. (MZUR). Paratype: 1 ♂, same data as for holotype, A. Vigna Taglianti leg. (MZUR).

Additional material: 1 ♀ (immature), Turkey, vil. Rize, surroundings of Iliça (Ayder), m 1200-1600, 20.VII.1976, A. Vigna Taglianti leg. (MZ).

Holotype description. Colour: light chestnut. Size: 11.5 mm long, 1.5 broad at T. 10. Head: slightly wrinkled, 1.2 mm broad, 1.0 mm long, broader than T. 1, posterior border slightly emarginate, posterior marginal ridge with a distinct median thickening, lateral terminations of marginal ridge distinct. Antennae: 5.5 mm long, with 38-40 articles, last article two times longer than the penultimate. Ocelli (Fig. 43): 1+3,4,3,2 on each side, posterosuperior ocellus as large as a secondary ocellus. Organ of Tömösváry (Fig. 43): as large as secondary ocellus and close to the ocelli. Prosternum: with 2+2 teeth, the internal tooth is smaller





Figs. 43-45 - *Lithobius* (*Lithobius*) *rizensis* n. sp., holotype. Left ocelli and organ of Tömösváry, holotype (43); dental margin of prosternum, ventral, paratype (44); posterior border of intermediate tergite, holotype (45). Scales 0.2 mm (43, 45), 0.1 mm (44).

than the external one which is also more prominent, porodont setiform, lateral to the porodont the anterior border forms a broad shoulder running backwards obliquely.

Tergites: slightly wrinkled; T. 1 narrower than T. 3, almost rectangular, posterior border slightly emarginate; posterior border silghtly emarginate in TT. 3, 5, 8, 10, emarginate in TT. 12 and 14, straight in TT. 7; posterior angles very

rounded in TT. 3 and 5, angulated in TT. 7, 8, 10, 12 and 14; posterior border slightly emarginate in TT. 2 and 4, straight in T. 6; posterior angles very rounded in TT. 2 and 4, angulated in T. 6; posterior angles of T. 9 with broad and little prominent triangular projection, TT. 11 and 13 with broader and more prominent triangular posterior projection. Intermediate tergite: posterior border deeply incised in the middle (Fig. 45).

Coxal pores: circular, 3,4,4,3, separated one from another by their own diameter or little more; proximal pores little smaller than the distal ones. Anterior legs: tarsal articulation on first to 13th legs distinct. 14th leg: 3.8 mm long, slender. 15th leg: 4.0 mm long accessory apical claw present. Glandular pores: concentrated on 13th-15th legs. Genitalia: first genital sternite with 20 setae on each side, second genital sternite without setae, gonopod large and with three apical setae.

Spinulation: see Tab. 19.

Tab. 19 - *Lithobius (Lithobius) rizensis* n. sp. (holotypus): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	-	-	-	-	-	p	a	a
2	-	-	-	m	m	-	-	mp	a p	a
3	-	-	-	am	m	-	-	mp	a p	a
4-5	-	-	-	am	m	-	-	mp	a p	a p
6	-	-	-	amp	am	-	-	mp	a p	a p
7-8	-	-	m	amp	am	-	-	mp	a p	a p
9-11	-	-	mp	amp	am	-	-	mp	a p	a p
12	-	-	amp	amp	am	-	-	amp	a p	a p
13	-	m	amp	amp	am	-	-	amp	a p	a p
14	-	m	amp	amp	am	-	-	amp	p	p
15	-	m	amp	m	-	-	-	a	-	-

Paratype description and variability. Differing from the holotype in the following characters. Antenne: with 36-37 articles. Ocelli: 1 + 3,4,4 on each side. Prosternum: as in Fig. 44. Coxal pores: 4,5,5,4. Spinulation: see Tab. 20. The immature female from the same locality of the type specimens is 10.0 mm long, with 36-36 antennal articles, 1 + 3,3,2,1 ocelli on each side, 3,4,4,3 coxal pores, gonopod not fully developed with two small spurs and a tridentate claw with lateral denticles scarcely developed.

Etymology. Named after the province were the type locality is located.

Distribution and ecological remarks. Known only from the type locality in the E-Pontus range (Fig. 6), 1200-1600 m on s.l.; no habitat information. The material examined has been collected by pitfall-trapping.

Tab. 20 - *Lithobius (Lithobius) rizensis* n. sp. (paratypus): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	-	m	m	-	-	mp	a	a
2-4	-	-	-	am	m	-	-	mp	a p	a
5	-	-	-	am	m	-	-	mp	a p	a p
6	-	-	-	am	am	-	-	mp	a p	a p
7-8	-	-	mp	am	am	-	-	mp	a p	a p
9-10	-	-	mp	am	am	-	-	amp	a p	a p
11	-	(-)	?	?	(am)	-	-	amp	a p	a p
12	-	(-)	?	?	(am)	-	-	amp	a p	a p
13	-	m	amp	amp	am	-	-	amp	a p	a p
14	-	m	amp	amp	m	-	-	amp	p	a p
15	-	m	amp	m	-	-	a	amp	-	-

Comparative remarks. *Lithobius rizensis* n. sp. is similar to *Lithobius caucasicus* Sseliwanoff, 1880, from Caucasus. The diagnostic characters of the two species are summarised in Tab. 21.

Tab. 21 - Diagnostic characters of *Lithobius (Lithobius) caucasicus* (Sseliwanoff, 1880) and *Lithobius (Lithobius) rizensis* n. sp.

	L. caucasicus	*L. rizensis*
body size (mm)	8.0-15.0	11.5
n. of antennal articles	33-42	38-40
n. of ocelli	1+5-7, 1+5-8	1+12
prosternal teeth and porodont	2+2 teeth, porodont ?	2+2 teeth, porodont setiform
n. of coxal pores	2-4, 3-4	3-4
VaC	absent	absent
DaC	absent	absent
male 13th, 14th and 15 th legs	with a dorsal sulcus on prefemur, femur and tibia	without dorsal sulcus
female gonopod	with one spur (immature? abnormal?) and unidentate claw	unknown
intermediate tergite	unknown	posterior border deeply incised in the middle

Lithobius (Sigibius) dogubayazitensis n. sp.

Diagnosis. A *Lithobius* medium sized, yellow in colour, with a sulcus on the internal side of tibia and tarsus of the 14th leg and tibia, tarsus and pretarsus of the 15th leg. VaC absent.

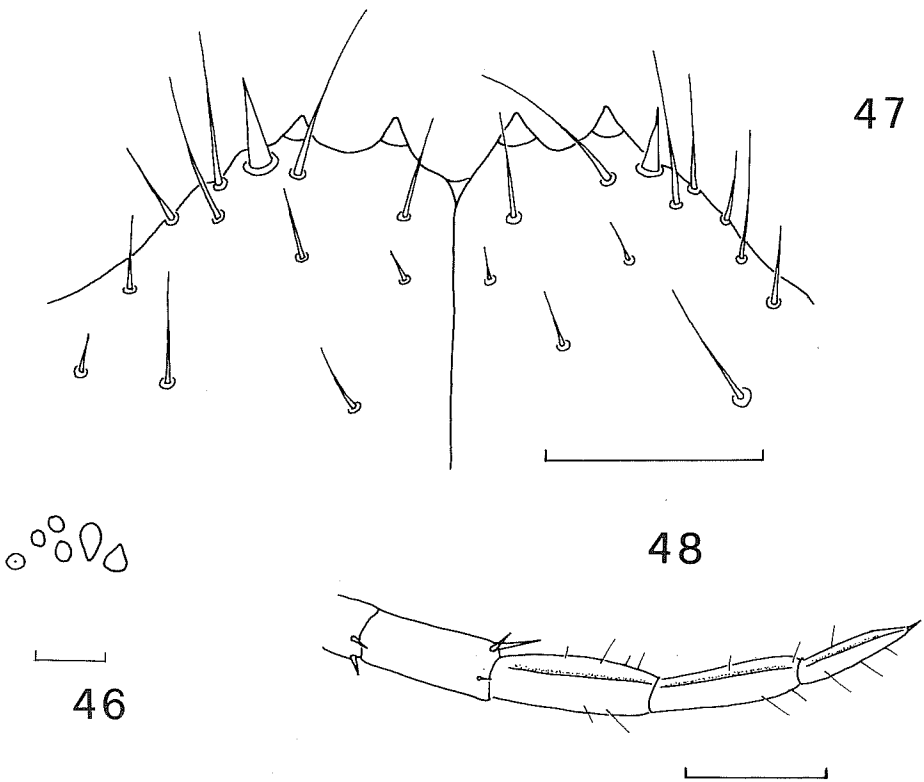
Loc. typ.: Turkey, vil. Agri, Dogubayazit, Isak Pasa Saray, m 1800-2000.

Type series. Holotype: ♂, Turkey, vil. Agri, Dogubayazit, Isak Pasa Saray, m 1800-2000, 22.V.1988, M. Zapparoli leg. (MZUR). Paratype: 1 ♂, same data as for holotype, M. Zapparoli leg. (MZUR).

Holotype description. Colour: yellow. Size: 8.5 mm long, 0.8 mm broad at T. 10. Head: almost wrinkled, 0.7 mm long, 0.8 mm broad, posterior border slightly

emarginate; posterior marginal ridge present, lateral terminations of marginal ridge little distinct. Antennae: 2.5 mm long, with 32 articles on each antenna, last article two times and a half as long as the penultimate. Ocelli (Fig. 46): 1+3,2 on each side, posterosuperior ocellus as large as the principal ocellus and larger than the secondary ocelli. Organ of Tömösváry (Fig. 46): as large as a secondary ocellus. Prosternum: with 2+2 small, triangular teeth, porodont setiform, the free border slopes backward feebly oblique forming narrow shoulders lateral to the porodont.

Tergites: almost wrinkled; T. 1 as broad as T.3, almost rectangular, posterior border slightly emarginate; TT. 3 and 5 with posterior angles rounded, blunt in T. 7, angulated in TT. 8, 10, 12 and 14, TT. 3 and 8 with posterior border slightly, emarginate in T. 10 and 12, straight in T. 7; TT. 2 and 4 with blunt posterior angles, angulated in T. 6; TT. 9, 11 and 13 with posterior border straight and without triangular projections on posterior angles, which are angulated. Intermediate tergite: posterior border emarginate.



Figs. 46-48 - *Lithobius (Sigibius) dogubayazitensis* n. sp. Left ocelli and organ of Tömösváry, holotype (46); dental margin of prosternum, ventral, paratype (47); left 15th leg, laterodorsal, holotype (48). Scales 0.1 mm (46, 47), 0.5 mm (48).

Coxal pores: 2,2,2,2, circular, small, spaced one from another by more than their own diameter, the proximal pore is smaller than the others. Anterior legs: tarsal articulation on first to 13th legs not distinct. 14th leg: 1.8 mm long, slender. 15th leg: 2.5 mm long, slender, accessory apical claw absent. Glandular pores: on 14th and 15th legs; tibia, tarsus and pretarsus of 15th leg and tibia and tarsus of 14th leg with a longitudinal sulcus along the internal lateral side of the article (Fig. 48).

Genitalia: first genital sternite with four setae on the posterior border of each side, second genital sternite and gonopod not visible.

Spinulation: see Tab. 22, letters in brackets indicate spines present on one side only.

Tab. 22 - *Lithobius (Sigibius) dogubayazitensis* n. sp. (holotype): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	mp	am	m	-	-	p	a	a p
2	-	-	mp	am	am	-	-	p	a	a p
3	-	-	mp	am	am	-	-	p	a p	a p
4-7	-	-	mp	am	am	-	-	mp	a p	a p
8-11	-	-	mp	amp	am	-	-	mp	a p	a p
12	-	-	mp	amp	am	-	-	mp	a p	p
13	-	-	mp	amp	am	a	-	mp	p	p
14	-	m	amp	amp	am	a	-	mp	p	-
15	-	m	amp	amp	a	(a)	-	amp	p	-

Paratype description and variability. The paratype differs from the holotype in the following features. Size: 8.0 mm long; antennae: with 27 articles each; ocelli: 1+2,2 on each side, principal ocellus larger than the posterosuperior, ovoidal, depigmented; posterosuperior ocellus larger than the secondary ocelli, secondary ocelli only partially pigmented; 14th leg: 1.8 mm long; 15th leg: 2.4 mm long. The dental margin of the prosternum, ventral, is shown in Fig. 47. Spinulation: see Tab. 23.

Tab. 23 - *Lithobius (Sigibius) dogubayazitensis* n. sp. (paratype): spinulation.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	-	am	m	-	-	-	a p	p
2	-	-	-	am	m	-	-	p	a p	a p
3-7	-	-	-	am	am	-	-	mp	a p	a p
8-10	-	-	-	amp	am	-	-	mp	a p	a p
11-12	-	-	mp	amp	am	-	-	mp	a p	a p
13	-	-	mp	amp	am	-	-	mp	p	a p
14	-	m	amp	amp	am	a	-	amp	p	p
15	-	m	amp	amp	a	a	-	amp	p	-

Etymology. Named after the name of the type locality of the species.

Distribution and ecological remarks. Known from Turkish Armenia (Fig. 6). 1200-2000 m on s. l.; open habitat and steppe (vil. Agri, Dogubayazit), also with sparse *Juniperus* spp. (vil. Karamanmaraş, 10 km S from Karaman).

Comparative remarks. There are no previously known species of *Lithobius (Sigibius)* with a latero-internal sulcus on the 14th and 15th legs. This feature is known in species of the *Lithobius (Lithobius) lakatnicensis* Verhoeff, 1926 group (see Zapparoli, 1994a) and in some *Lithobius* s. str. of the Iberian peninsula close to *L. inermis* L. Koch, 1856 (see Serra, 1987).

Lithobius (Monotarsobius) manicastrii n. sp.

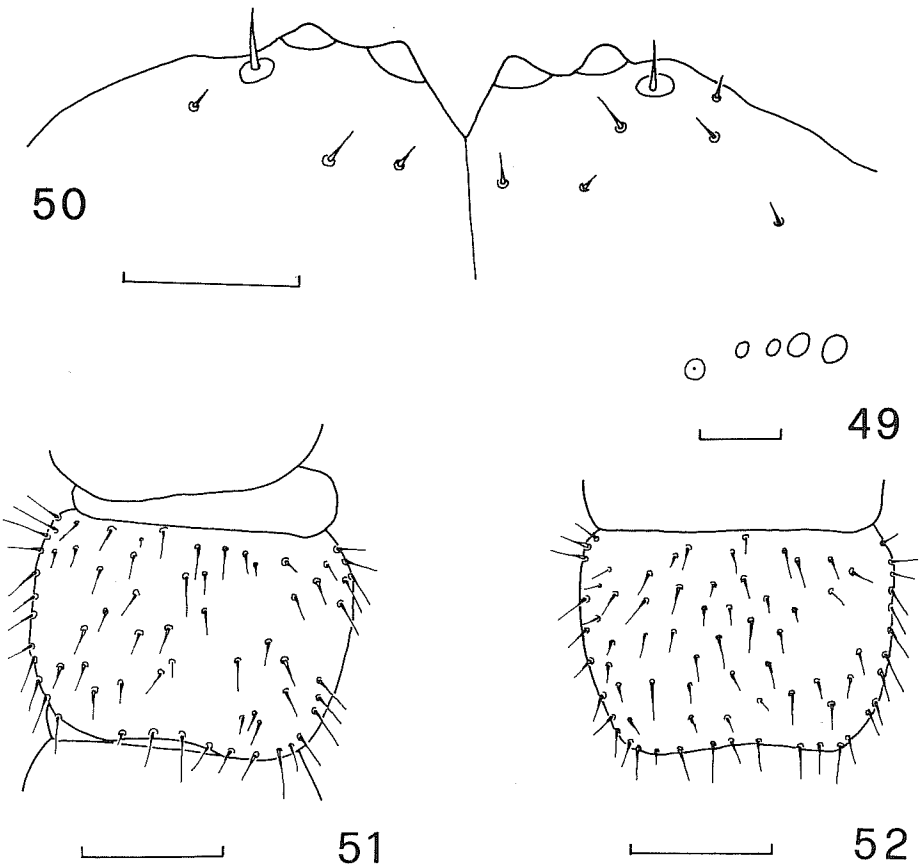
Diagnosis. A *Lithobius (Monotarsobius)*, small sized (9.0 mm long), reddish in colour, with head, tergites and dorsal side of legs with a dense covering of long setae; antennae with 20 elongate articles each; ocelli 1+3 on each side on one row, organ of Tömösváry not much larger than the principal ocellus; prosternum with 2+2 teeth, without shoulders, porodont setiform; coxal pores 2-3, circular; 15th leg without accessory apical claw; VaC absent.

Loc. typ.: Turkey, vil. Elazig, 35 km E from Elazig, m 1200.

Type series. Holotype: ♂, Turkey, vil. Elazig, 35 km E from Elazig, m 1200, 24.V.1988, M. Zapparoli leg. (MZUR).

Holotype description. Colour: reddish. Size: 9.0 mm long, 1.2 mm broad at T. 10. Head: wrinkled, 0.9 mm broad, 1.1 mm long, broader than T. 1, posterior border slightly emarginate, posterior marginal ridge present, lateral terminations of marginal ridge distinct. Antennae: 3.5 mm long, backward reaching T. 5-T. 7, with 20 elongate articles each, last article almost long as three times the penultimate. Ocelli (Fig. 49): 1+3 on each side arranged on one row, principal ocellus circular, posterosuperior ocellus almost oval, the two other ocelli are smaller than the posterosuperior and circular in shape. Organ of Tömösváry (Fig. 49): not much larger than the principal ocellus, spaced from the ocelli as the diameter of the principal ocellus. Prosternum (Fig. 50): with 2+2 teeth, porodont setiform, the free border slopes backward very gradually without forming shoulders lateral to the porodont.

Tergites: wrinkled; T. 1 almost trapezoidal, posterior border slightly emarginate; posterior angles of TT. 3, 5, 8, 10, 12, 14 rounded, those of T. 7 blunt, posterior border of TT. 3, 5, 8, 10, 12, 14 emarginate, those of T. 7 almost straight; TT. 2, 4 and 6 with posterior angles blunt and posterior border straight; TT. 9, 11 and 13 with posterior angles blunt, without triangular projetions, posterior border straight. Intermediate tergite: posterior border moderately



Figs. 49-52 - *Lithobius (Monotarsobius) manicastrii* n. sp., holotype. Left ocelli and organ of Tömösváry (49); dental margin of prosternum, ventral (50); TT. 5 (51) and 12 (52). Scales 0.1 mm (49, 50); 0.5 mm (51, 52).

emarginated. Head, tergites and dorsal side of legs with a covering of long setae backward oriented (Figs. 51, 52), the setae also borders the tergites margin; sternites show a normal arrangement of the setae

Coxal pores: 2,3,3,2, circular, small, spaced one from another by more than their own diameter, the proximal pore is smaller than the distal ones. Anterior legs: tarsal articulation on first to 13th legs not distinct. 14th leg: 2.2 mm long. 15th leg: 2.5 mm long, accessory apical claw absent. Glandular pores: concentrated on 14th and 15th legs.

Genitalia: first genital sternite with fifteen setae on each side, second genital sternite without setae, gonopod large, rounded, apparently without setae.

Spinulation: see Tab. 24, question marks indicate the absent legs.

Tab. 24 - *Lithobius (Monotarsobius) manicastrii* n. sp. (holotype): spinulation; legs 7th are absent.

	Ventral					Dorsal				
	C	t	P	F	T	C	t	P	F	T
1	-	-	p	am	m	-	-	p	a	a
2-3	-	-	p	am	m	-	-	mp	a p	a
4	-	-	p	amp	m	-	-	mp	a p	a p
5-6	-	-	p	amp	am	-	-	mp	a p	a p
7	-	-	(mp	amp	am)	-	-	(mp	a p	a p)
8-10	-	-	mp	amp	am	-	-	mp	a p	a p
11-13	-	-	mp	amp	am	-	-	amp	a p	a p
14	-	m	mp	amp	m	-	-	amp	p	p
15	-	m	amp	am	-	a	-	amp	p	-

Etymology. Named in honour of Dr. Claudio Manicastri, specialist of Crustacea Isopoda, Director of the Museo civico di Zoologia, Rome (Italy).

Distribution and ecological remarks. Known only from the type locality in E-Anatolia (Fig. 6). 1200 m on s.l.; open stony habitat with shrubs.

Comparative remarks. Among the *Monotarsobius* species to date recorded in the Near East *Lithobius manicastrii* is clearly distinguishable from the others by its dense covering of setae on the dorsal side of the body. The new species seems to be close to the Centraleuropean *L. aeruginosus* and the diagnostic characters are summarized in Tab. 25.

Tab. 25 - Diagnostic characters of *Lithobius (Monotarsobius) aeruginosus* L. Koch, 1862 and *L. (M.) manicastrii* n. sp.

	L. aeruginosus	*L. manicastrii*
body size (mm)	6.0-11.0	9.0
n. of ocelli and arrangement	1+2-5, on one row	1+3, on one row
anterior border of the prosternum	with 2+2 teeth, porodont setiform, without shoulders	with 2+2 teeth, porodont setiform, with shoulders
n. of coxal pores	2-4	2-3
VaC	absent	absent
DaC	present	absent
14th and 15th legs	swollen in both sexes	not swollen
female gonopod	with two spurs and tridentate claw	female unknown
covering of setae on dorsal side of the body	normal	dense

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