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Atlas of European millipedes 2: Order Julida (Class Diplopoda)

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Abstract. For each of the 593 species of the millipede order Julida known from Europe, available information on taxonomy, distribution and habitat is summarized, and the distribution in 50 × 50 km UTM squares is shown on a map.

Keywords. Distribution, map, UTM, faunistics, taxonomy.

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Contents

Introduction	2
Material and methods	4
Results (Species accounts)	24
Family Blaniulidae	24
Family Galliobatidae	36
Family Nemasomatidae	36
Family Rhopaloiulidae	38
Family Trichoblaniulidae	38
Family Trichonemasomatidae	39
Family Julidae	39
Acknowledgements	172
References	173
Appendix 1: Post 2014 papers	188
Appendix 2: Maps	189

Introduction

The primary purpose of this atlas is to provide maps showing the known distribution of all European millipedes. The present volume (the second of three) deals with the 593 species belonging to the order Julida (sometimes called “snake millipedes”) which are currently known from Europe. The order Julida is the largest order of millipedes in Europe, where it also is the order with the largest geographic range. It has many species adapted to withstand harsher conditions than most species belonging to other orders, occurring throughout the Holarctic except in parts with permafrost and the warmer deserts (Shelley & Golovatch 2011: fig. 26). A list of the included species is given in Table 4 (p. 12), and images of a selection of species are shown on Fig. 1. The coverage map, Fig. 2, summarizes the known distribution of Julida in Europe.

The first part of the *Atlas of European Millipedes* was published several years ago (Kime & Enghoff 2011) and covered the orders Polyxenida, Glomerida, Platydesmida, Siphonocryptida, Polyzoniida, Callipodida and Polydesmida. The present part, covering the order Julida, is the second. The third and last part, covering the order Chordeumatida, is in preparation.

Millipedes are terrestrial arthropods belonging to the class Diplopoda. They comprise the largest class of the Myriapoda, the other classes being the Chilopoda (centipedes), Symphyla and Pauropoda. Globally, about 12,000 species of millipedes have now been described (Brewer *et al.* 2012). Very many species, especially tropical ones, remain to be described, and the best estimate of the actual number of existing millipede species may be that of Hoffman (1980) who, based on his unique knowledge of millipedes, estimated 80,000 existing millipede species. A recent attempt to make an estimate with advanced statistical methods resulted in much lower estimates (14–21,000 species), but the authors of this analysis (Brewer *et al.* 2012) realized that the numbers are too low.

Well over 1500 species of millipedes are currently known from Europe, according to the ‘*Fauna Europaea*’ database (Enghoff & Kime 2009). We have largely applied the same species concepts as ‘*Fauna Europaea*’, although in some cases there are differing opinions about species limits. It is likely that some of the “species” recognized here will in the future prove to be synonymous with other species, just as some subspecies may be regarded as species in the future. Very many subspecies of European millipedes have been named. In general, we have not considered subspecies, although they are mentioned in some cases. Some new species have been described since the *Fauna Europaea* database was composed and some others have been synonymised. We have taken account of all changes up to and including the end of 2014.

Problems with subspecies and synonyms aside, more new species will certainly be added to the European list; the fauna is not yet fully known. Since we stopped collecting data for the present atlas (end of 2014) several papers describing and recording European julidan millipedes have been published. These are listed and commented in Appendix 1. We are furthermore aware of scores of new species in various museum collections, waiting to be described, and we can say with confidence that further scores have still not been collected.

Several species of Julidae and Blaniulidae which occur in the open in the south are confined to hothouses in the north. Whereas we have tried to exclude hothouse records from the maps, we cannot be sure that we have been entirely successful with this. In several European hothouses the species *Paraspirobolus lucifugus* (Gervais, 1836) occurs (Jeekel 2001; Read 2008; Decker *et al.* 2014). It belongs to the juliformian order Spirobolida, which has no free-living European species. Three other species of Spirobolida have been found in a few hothouses, viz. *Pseudospirobolellus avernus* (Butler, 1876) in the British Eden project (see Stoev *et al.* 2010), as well as *Anadenobolus monilicornis* (Porat, 1876) and *Leptogoniulus sorornus* (Butler, 1876) in a few German hothouses (Decker *et al.* 2014), the latter also in



Fig. 1. A selection of European species of Julida. **A.** *Boreoiulus tenuis* (Bigler, 1913) (Blaniulidae) (J. Spelda phot.). **B.** *Trichoblaniulus hirsutus* (Brölemann, 1899) (Trichoblaniulidae) (D. Cheung phot.). **C–J.** Julidae. **C.** *Cylindroiulus boleti* (C.L. Koch, 1847) (J. Spelda phot.). **D.** *Leptoiulus belgicus* (Latzel, 1884) (J. Spelda phot.). **E.** *Ommatoiulus hoffmani* Akkari & Enghoff, 2012 (K. Mohr phot.). **F.** *Ommatoiulus sabulosus* (Linnaeus, 1758), colour variety from the Italian Riviera (D. Cheung phot.). **G.** *Pteridoiulus aspidiorum* Verhoeff, 1913 (J. Spelda phot.). **H.** *Pachyiulus cattarensis* (Latzel, 1884) (D. Antić phot.). **I.** *Serboiulus deelemanni* Strasser, 1971 (D. Antić phot.). **J.** *Unciger foetidus* (C.L. Koch, 1838) (J. Spelda phot.). Not to scale.

a Danish one (unpublished, H.E. det.). A few species of a further juliformian order, Spirostreptida, which likewise has no free-living species in Europe, have also established themselves indoors in Europe. Thus, *Aulonopygus aculeatus* Attems, 1914, has a population in a heated building in a zoological garden in the Netherlands (Soesbergen & Jeekel 2007) and two species of the genus *Epinannolene* have been found in German hothouses (Decker *et al.* 2014).

Material and methods

Taxonomy above the species level follows Hoffman (1980), with updates by Shelley (2002) except where otherwise stated. Newer papers of importance for classification at the generic level include Read (1990) on *Allajulus*, *Cylindroiulus*, *Enantiulus* and related genera, as well as Tabacaru (1978), Mauriès (1982) and Enghoff (1992) on the tribe Pachyiulini. Other important review papers are mentioned under the respective genera. Table 1 shows the ordinal-level classification of millipedes according to Shelley (2002), and Table 2 shows the families covered by the present volume.

The sequence of species is as follows: Families are treated in alphabetical sequence except for the very large family Julidae, which is placed last (cf. Table 2 where the families are shown in systematic order). Within each family, genera are treated in alphabetical order, as are the species within each genus.

For each species, the text is organised as follows:

The **valid name** of the species, in accordance with *Fauna Europaea* (Enghoff & Kime 2009), except where noted.

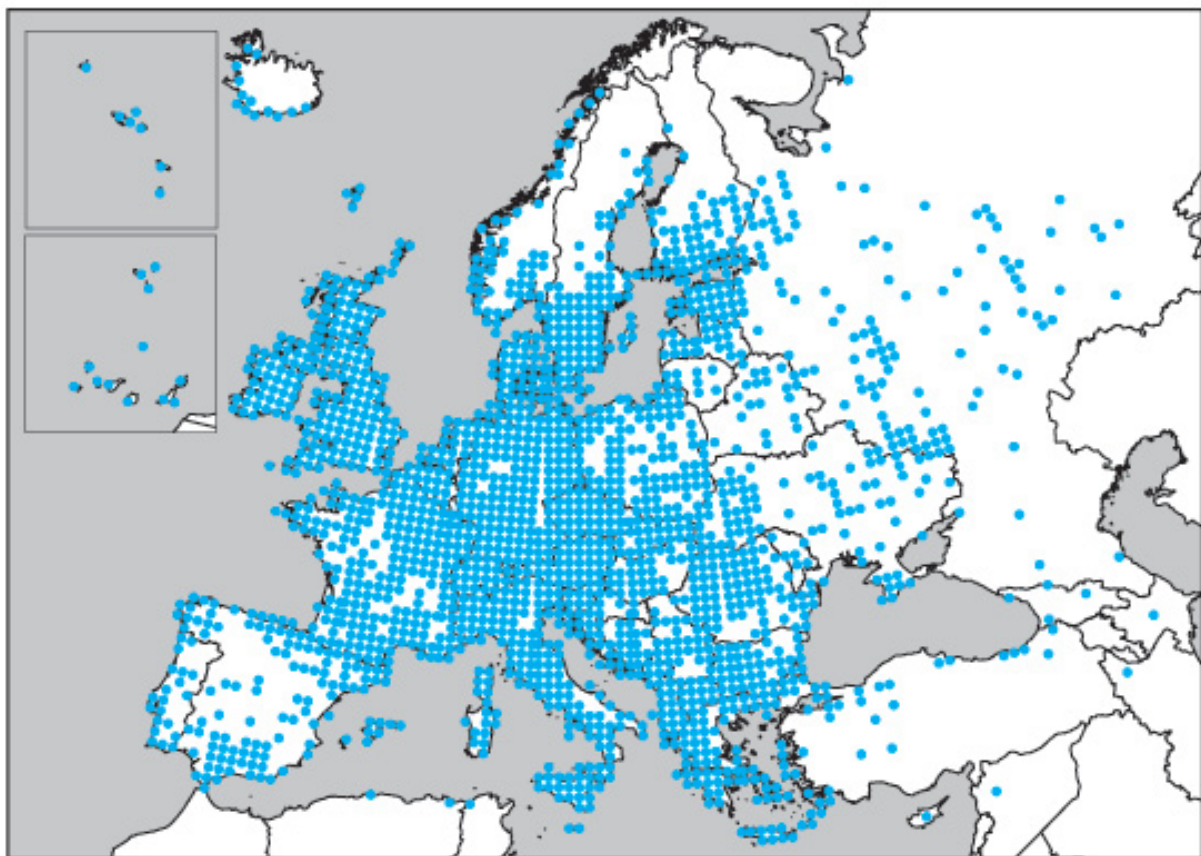


Fig. 2. Map showing all the 50 km squares which provided records included in this volume.

Table 1. Classification of millipedes according to Shelley (2002). Orders in brackets have no European species. The orders Spirobolida and Spirostreptida, marked with asterisks (*), are represented in Europe only by hothouse species. The order Julida, covered by the present volume, is shown in **bold**.

Class Diplopoda	
Subclass Penicillata	order Polyxenida
Subclass Chilognatha	
Infraclass Pentazonia	Superorder Limacomorpha (order Glomeridesmida)
	Superorder Oniscomorpha order Glomerida (order Sphaerotheriida)
Infraclass Helminthomorpha	
Subterclass Colobognatha	order Siphonocryptida order Platydesmida order Polyzoniida (order Siphonophorida)
Subterclass Eugnatha	Superorder Juliformia order Julida order Spirobolida* order Spirostreptida*
	Superorder Nematophora order Callipodida order Chordeumatida (order Stemmiulida)
	Superorder Merocheta order Polydesmida
	Helminthomorpha <i>incertae sedis</i> (order Siphoniulida)

Synonyms, again largely in accordance with *Fauna Europaea*. Whereas the synonymy does not pretend to be complete, we have tried to include all synonyms which may cause confusion, and we have always included the original combination, e.g., in the case of *Blaniulus guttulatus* (Fabricius, 1798), the first synonym given is *Julus guttulatus* Fabricius, 1798. The synonyms include in many cases subspecific names, cf. Introduction.

Where a synonym is given as, e.g., *Brachyiulus littoralis* Verhoeff, 1898, in the list of synonyms of *Brachyiulus pusillus* (Leach, 1814) it means that Verhoeff in 1898 described *B. littoralis* as a new species, but that *littoralis* is now regarded as a synonym of *pusillus*. Where a name is followed by “auct.” rather than an author name, it means that some authors used this name, which is not regarded as valid.

Distribution. The European distribution is given as a list of the geopolitical units from where the species has been reliably documented. The units and the abbreviations are, with one exception, the same as those used in *Fauna Europaea*, see Table 3 and Fig. 3. The exception concerns Serbia (SB) and Montenegro (MN) which in *Fauna Europaea* are treated as one unit (“Yugoslavia”, YU). Despite recent political changes, records from Kosovo are ascribed to Serbia (SB) and records from the Crimea are ascribed

Table 2. Families of Julida. Classification and sequence according to Shelley (2002). Families covered by the present volume are shown in **bold**. Notice that in the main text, the Julidae are placed last, and the other families are placed in alphabetical order.

ORDER JULIDA

Superfamily Blaniuloidea

Blaniulidae C.L. Koch, 1847

Galliobatidae Brolemann, 1921

Okeanobatidae Verhoeff, 1942

Zosteractinidae Loomis, 1943

Superfamily Juloidea

Julidae Leach, 1814

Rhopaloiulidae Attems, 1926

Trichoblaniulidae Verhoeff, 1911

Trichonemasomatidae Enghoff, 1991

Superfamily Nemasomatoidea

Chelojulidae Enghoff, 1991

Nemasomatidae Bollman, 1893

Pseudonemasomatidae Enghoff, 1991

Telsonemasomatidae Enghoff, 1992

Superfamily Paeromopodoidea

Aprosphylosomatidae Hoffman, 1961

Paeromopodidae Cook, 1895

Superfamily Parajuloidea

Mongoliulidae Pocock, 1903

Parajulidae Bollman, 1893

to Ukraine (UA). We have found several publications in which distributional data are erroneous with regard to present-day geopolitical units, including some which have been reiterated even as recently as 2012 in national inventories of species made after boundary changes. The Balkan countries have been particularly affected in this respect, especially Albania, in view of the numerous descriptions of endemics attributed there before the First World War which have for a long time related to other neighbouring countries. Specification of the distribution within one geopolitical unit is given in brackets, e.g., ES-SPA (Jaén Province). Distribution outside Europe is given in more general terms in the form (example) “ – Also North Africa”. In many cases a general characterisation of the distribution type is given as well, e.g., “Central, N & E Europe”. A map (Fig. 4) shows the major biogeographical zones within Europe which are referred to. Terms such as “extended Atlantic” – meaning in this case western species which occur further east than the limit on the map – are also used. For species with restricted distributions, of which there are very many, the types of distribution denoted are largely based on secondary glacial refugia found in De Lattin (1967), which are centres of endemism in millipedes, with more precise examples from, e.g., Verhoeff (1938), Tabacaru (1970) and Spelda (1996).

Habitat. Ecological information is given if known. It has, however, not been possible to examine every paper that has been published throughout Europe to find whether such details are given. When an author has made an important contribution to the knowledge of the ecology of a species, we have quoted the paper; otherwise the information is an amalgam of that found in several publications, together with our own experience in the field.

Clearly the ecological requirements of the majority of millipedes are to some extent similar, the bulk of them being detritivores and inhabitants of the forest floor. However, many millipedes are strictly limited

Table 3 (continued on next page). Geopolitical units in Europe as used in the present atlas and in *Fauna Europaea*. (A few of the geopolitical units in the table still have no millipede records.)

AD	Andorra
AL	Albania
AT	Austria
BA	Bosnia-Herzegovina
BE	Belgium
BG	Bulgaria
BY	Belarus
CH	Switzerland
CZ	Czech Republic
DE	Germany
DK-DEN	Danish mainland
DK-FOR	Faroe Is
EE	Estonia
ES-BAL	Balearic Islands
ES-CNY	Canary Islands
ES-SPA	Spanish mainland
FI	Finland
FR-COR	Corsica
FR-FRA	French mainland
GB-CI	Channel Islands
GB-GI	Gibraltar
GB-GRB	Great Britain, including Shetlands, Orkneys, Hebrides & Isle of Man
GB-NI	Northern Ireland
GR-CYC	Cyclades Islands
GR-DOD	Dodecanese Islands
GR-GRC	Greek mainland, including Ionian Is, Evia, Sporades & North Aegean Is.
GR-KRI	Crete, including small adjacent islands
HR	Croatia
HU	Hungary
IE	Republic of Ireland
IS	Iceland
IT-ITA	Italian mainland
IT-SAR	Sardinia
IT-SI	Sicily, including all neighbouring Italian islands
LI	Liechtenstein
LT	Lithuania
LU	Luxembourg
LV	Latvia
MC	Monaco
MD	Republic of Moldova
MN	Montenegro
MT	Malta
NL	The Netherlands
NO-NOR	Norwegian mainland and inshore islands
NO-SVA	Svalbard, Jan Mayen & Bear Island.
PL	Poland

PT-AZO	Azores Islands
PT-MDR	Madeira Islands
PT-POR	Portuguese mainland
PT-SEL	Selvagens Islands
RO	Romania
RU-FJL	Franz Josef Land
RU-KGD	Kaliningrad Region
RU-NOZ	Novaya Zemlya
RU-RUC	Central European Russia
RU-RUE	East Central Russia
RU-RUN	North European Russia
RU-RUS	South European Russia
RU-RUW	Northwest Russia
SB	Serbia
SE	Sweden
SI	Slovenia
SK	Slovakia
SM	San Marino
TR-TUE	European Turkey, including Imroz I.-Gökceada, but not islands in the Sea of Marmara
UA	Ukraine
VA	Vatican City



Fig. 3. Area codes as used in the atlas, from *Fauna Europaea* guidelines (Jong *et al.* 2014, supplementary material 1). Reproduced with permission. Note that MN (Montenegro) and SB (Serbia) in the above list and throughout this paper are shown as YU (Yugoslavia) on this map.

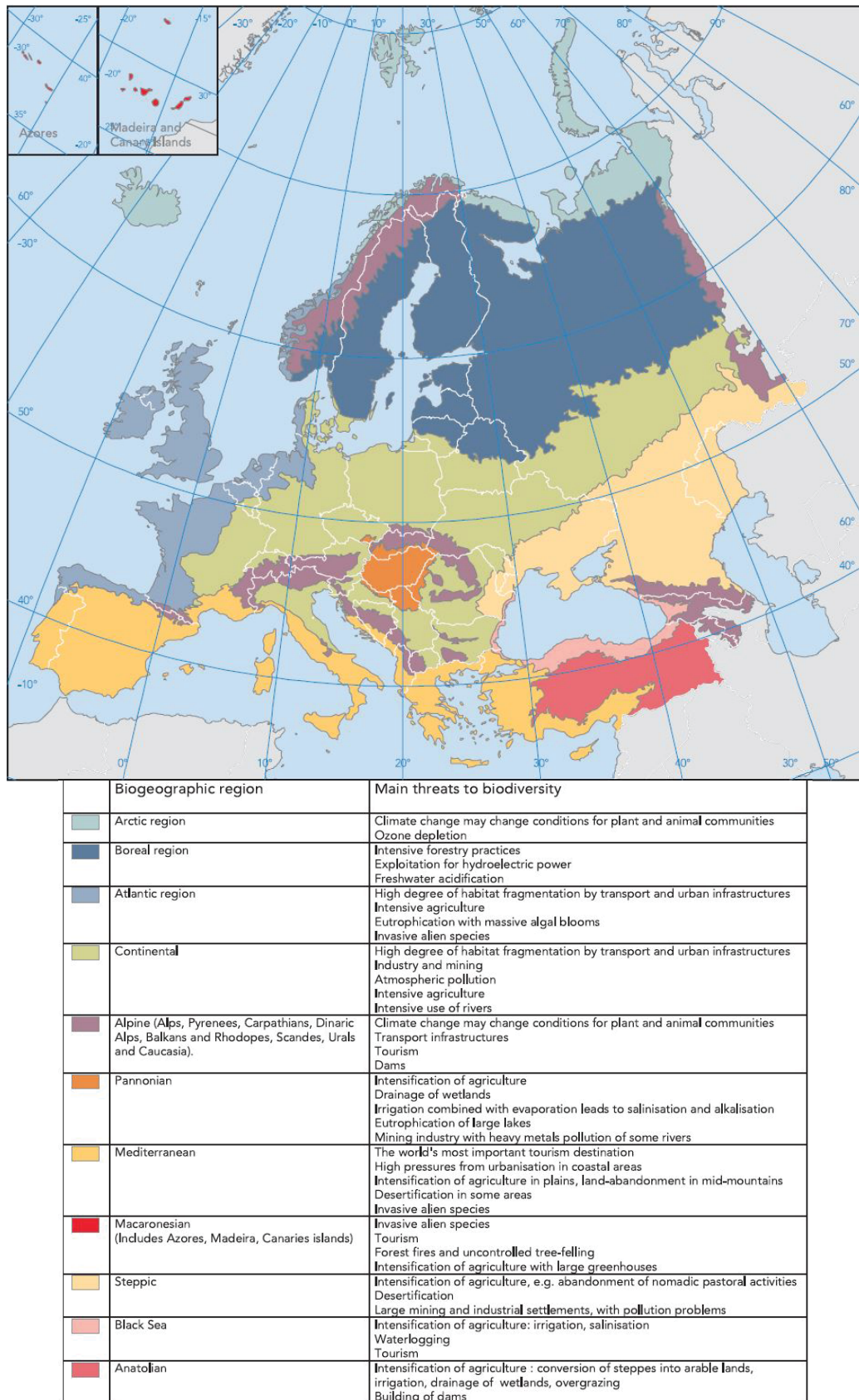


Fig. 4. Biogeographic regions in Europe, from European Environment Agency (2003); reproduced with permission.

by ecological factors such as temperature, soil texture, mineral composition (e.g., calcium content), humidity and humus type, which of course link with the type of vegetation. Therefore, where possible, we have tried to draw attention to specific biotopes and altitudinal ranges that have been noted by collectors. There is still a long way to go in this direction. For many species we have no information.

For the forest types (or other vegetation types) we have in general used the Latin names of the trees, etc. involved (e.g., *Quercus-Carpinus* forest) rather than, e.g., “oak-hornbeam forest” or “querceto-carpinetum”. The latter types of descriptive terms have, however, been included in some cases where this information is in the form of a citation of particular papers.

The term cavernicole is used “sensu lato”; true troglobionts are indicated as such.

Remarks. May include notes on taxonomy and distribution, and/or may refer to particular studies on, e.g., reproduction, economic importance, etc. Again, we do not claim completeness of coverage. It is beyond the scope of this atlas to analyse the reasons for the distribution of the genera and species. These lie in the history of Europe and such phenomena as plate tectonics, the Late Tertiary aridity crisis, the Quaternary glaciations, changes in sea level and climate change with associated shifts in vegetation belts. In addition, several species have become widespread due to the activities of Man.

In connection with the maps the reader’s attention is sometimes drawn to uneven coverage, the paucity of records and/or predicted distributional limits of species. To give an example, Stojalowska & Staręga (1974) noted the presence of *Unciger foetidus* C.L. Koch, 1838, in all 21 clearly demarcated regions of Poland. Yet this left over fifty 50 km squares devoid of precise records of this widespread species in the first Polish UTM maps later received from our colleague Wojciech Jędryczkowski, few of which we have subsequently been able to fill. This represents over a third of Poland. In view of its size, Russia is inevitably much less covered altogether. The same applies to some other larger countries. Accordingly, we have felt able to add imprecise records for the two Polish regions lacking precise records but have not done so for Russia, where the species’ limits are uncertain. Another difficulty is that in view of the very many boundary changes resulting from conflict in Europe and consequent changes of official language, we have been unable to locate some published sites when it is no longer clear to which place the author was referring. Moreover, there are often several places with the same name even in one region, those of saints for example; also, in some countries the names of towns have simply been altered without a change of language. Unfortunately, such records may be missing, owing to our uncertainty, again affecting mainly eastern areas of the continent.

The maps. The presence of each species is recorded in 50 km squares of the UTM grid. Six different base maps are used:

All of Europe, for species occurring north of ca 48° N.

Southern Europe, for relatively widespread species not occurring north of ca 48° N.

Southwestern Europe, for species confined to the Iberian Peninsula and southern-central France.

South-central Europe, for species confined to Italy and neighbouring areas.

Southeastern Europe, for species confined to the Balkans and neighbouring areas.

Madeira and Canary Islands, for species confined to these archipelagos.

A map is presented for each species except in the case of the Macaronesian species swarms in the genera *Acipes*, *Cylindroiulus* and *Dolichoïulus*, which each may have several species on the same small

island. Squares in which precisely located records occur are shown by blue dots in the centre of the 50 km square concerned. Because a record may refer to a corner of a 50 km square the centre of which is in another country/region some species seem to occur in countries/regions from where they have not been recorded. A few records referable only to, e.g., a province, occasionally a country, are shown using a blue circle located at the centre of the province in question. No distinction is made between old and new records; this is mainly because the number of specialist recorders has been relatively small and because they have operated over different time periods in many of the countries concerned. There are few recent records from some countries and few old records from others. Under these circumstances, using different symbols for different time periods would give a false impression of movement of species. Moreover, there is little evidence that millipede distributions have changed much over the past century, with the possible exception of a few introduced or pioneer species. A coverage map (Fig. 2) showing all the 50 km squares from which records included in this volume have been reported is given. Thus, while interpreting the distribution of the species indicated on the maps it should be borne in mind that the coverage has been far from uniform at the European scale and, indeed, within individual countries. While there are exceptions, there has been a marked tendency for collectors to concentrate on the more interesting mountainous areas, especially in areas of known endemism, and to pay scant attention to the less biodiverse lowland plains. Even on the basis of units of 50 km × 50 km squares, many squares have no records at all, especially in the larger countries.

In most calcareous regions, speleologists have been very active; in some of these there are far more records of cavernicolous species than of species living in the vegetation, litter and soil. There are many true troglobionts, but, at the same time, many of the species that were first found in caves are strongly pigmented and are either known to occur, or most probably occur, on the surface.

In this atlas “Europe” extends from the Azores to the Ural Mountains in Russia: the European part of Russia is delimited as in *Fauna Europaea*, which does not include the Caucasus area. In the Aegean area, this atlas covers all the islands belonging to Greece, while Cyprus and Asia Minor are not included. Only the European part of Turkey is covered. In the Atlantic, species from Iceland, the Azores, Madeira and the Canary Islands are listed. Some North African and Asiatic Turkish records of species occurring in Europe are shown on the maps, but exclusively African or Asiatic species are not considered. Dots in Asia Minor and North Africa refer only to species found in the *Fauna Europaea* database that occur there as well as in Europe. These data are not always complete. The vast majority of European millipedes do not occur elsewhere, except for those which have been introduced to other regions by way of human activities.

We have clearly not been able to find every published record and we have not been able to place some localities. Ambiguous or doubtful records have either been omitted or commented upon.

Our knowledge of the distribution of many species is very good, though for others it is extremely sketchy or inadequate. The maps represent a total of 13,217 50 km square records; with 593 species this means that on average each species has been recorded from 22 squares. There are many regional and probably even more point endemics, i.e., species recorded from only one 50 km square. The species with the most records is *Ommatoiulus sabulosus* (Linnaeus, 1758) which has been recorded from 796 squares. The maps are published in the knowledge that some of them do not show the full distribution of the species concerned, as mentioned above. In some cases it is possible to imagine the full picture and comments are sometimes made to this effect in the text. It is left to present and future myriapodologists to fill in those gaps that remain and to complete the ecological information and other data that are missing. The rich southern faunas are most in need of investigation, especially in Iberia.

Table 4 (continued on next pages). Species covered by the present atlas.

Family BLANIULIDAE

1. *Acipes andalusius* Enghoff & Mauriès, 1999
2. *Acipes atlanticus* Attems, 1937
3. *Acipes bifilum* Enghoff & Reboleira, 2013
4. *Acipes continentalis* Enghoff, 1986.
5. *Acipes decolor* Enghoff, 1983
6. *Acipes franzi* (Loksa, 1967)
7. *Acipes lateralis* Enghoff, 1983
8. *Acipes machadoi* Enghoff & Reboleira, 2013
9. *Acipes portosantoensis* Enghoff, 1983
10. *Acipes serratus* Enghoff, 1983
11. *Acipes waldeni* Enghoff, 1983
12. *Alpiobates peyerimhoffi* (Brölemann, 1900)
13. *Archiboreoiulus pallidus* (Brade-Birks, 1920)
14. *Archiboreoiulus sollaudi* Brolemann, 1921
15. *Blaniulus dollfusi* Brölemann, 1894
16. *Blaniulus eulophus* Silvestri, 1903
17. *Blaniulus guttulatus* (Fabricius, 1798)
18. *Blaniulus lichtensteini* Brolemann, 1921
19. *Blaniulus lorifer* (Brolemann, 1921)
20. *Blaniulus mayeti* (Brölemann, 1902)
21. *Blaniulus orientalis* Brolemann, 1921
22. *Blaniulus troglobius* Latzel, 1886
23. *Blaniulus troglodites* Brölemann, 1898
24. *Blaniulus velatus* Ribaut, 1954
25. *Blaniulus virei* Brölemann, 1900
26. *Boreoiulus simplex* Brolemann, 1921
27. *Boreoiulus tenuis* (Bigler, 1913)
28. *Choneiulus faunaeuropaeae* Enghoff, 2002
29. *Choneiulus lacinifer* Strasser, 1980
30. *Choneiulus palmatus* (Němec, 1895)
31. *Choneiulus subterraneus* (Silvestri, 1903)
32. *Cibiniulus phlepsii* (Verhoeff, 1897)
33. *Euzdakiulus sarensis* Mauriès, 1970.
34. *Iberoiulus breuili* Ceuca, 1967
35. *Iberoiulus cavernicola* Ceuca, 1967
36. *Mesoblaniulus serrula* (Brölemann, 1905)
37. *Monacobates monoecensis* (Brölemann, 1905)
38. *Nopoiulus kochii* (Gervais, 1847)
39. *Occitaniulus rouchi* Mauriès, 1965
40. *Orphanoiulus dinapolii* Strasser, 1960
41. *Orphanoiulus religiosus* Silvestri, 1903
42. *Proteroiulus broelemanni* Lohmander, 1925
43. *Proteroiulus fuscus* (Am Stein, 1857)
44. *Proteroiulus hispanus* Schubart, 1959
45. *Sardoblaniulus annae* Manfredi, 1956
46. *Tarracoblaniulus lagari* Mauriès & Vicente, 1977
47. *Tarracoblaniulus phantasmanus* Enghoff, Serra & Martínez, 2009

48. *Thassoblaniulus simplarius* Mauriès, 1985

49. *Vascoblaniulus cabidochei* Mauriès, 1967

Family GALLIOBATIDAE

50. *Galliobates gracilis* (Ribaut, 1909)

Family NEMASOMATIDAE

51. *Nemasoma varicorne* C.L. Koch, 1847

52. *Thalassisobates almeriensis* Enghoff, 2013

53. *Thalassisobates emesesensis* Enghoff, 2013

54. *Thalassisobates littoralis* (Silvestri, 1903)

Family RHOPALOIULIDAE

55. *Rhopaloiulus cameratanus* Attems, 1927

Family TRICHOBLANIULIDAE

56. *Trichoblaniulus cavernicola* Brölemann, 1905

57. *Trichoblaniulus hirsutus* (Brölemann, 1889)

58. *Trichoblaniulus lanuginosus* Ribaut, 1947

59. *Trichoblaniulus tarraconensis* Mauriès & Vicente, 1977

Family TRICHONEMASOMATIDAE

60. *Trichonemasoma peloponesius* (Mauriès, 1966)

Family JULIDAE

61. *Acanthoiulus cassinensis* (Verhoeff, 1910)

62. *Acanthoiulus fuscipes* (C.L. Koch, 1847)

63. *Afropachyiulus maritimus* Strasser, 1970

64. *Allajulus dicentrus* (Latzel, 1884)

65. *Allajulus groedensis* (Attems, 1899)

66. *Allajulus infossus* (Verhoeff, 1930)

67. *Allajulus marguareisi* (Strasser, 1970)

68. *Allajulus molybdinus* C.L. Koch, 1847

69. *Allajulus nitidus* (Verhoeff, 1891)

70. *Allajulus spinosus* (Ribaut, 1904)

71. *Allopodoiulus schiodtei* (Verhoeff, 1898)

72. *Allopodoiulus verhoeffi* (Jawłowski, 1931)

73. *Alpityphlus seewaldi* Strasser, 1967

74. *Amblyiulus aphroditae* (Attems, 1902)

75. *Amblyiulus creticus* (Verhoeff, 1901)

76. *Amblyiulus kovali* Golovatch, 2008

77. *Amblyiulus sporadensis* (Verhoeff, 1901)

78. *Apfelbeckiella bulgarica* Verhoeff, 1926

79. *Apfelbeckiella byzantina* Verhoeff, 1901

80. *Apfelbeckiella dobrogica* Tabacaru, 1966

81. *Apfelbeckiella golemanskyi* Ceuca, 1973

82. *Apfelbeckiella trnowensis* (Verhoeff, 1928)

83. *Balkanophoenix borisi* Verhoeff, 1937

84. *Banatoiulus troglobius* Tabacaru, 1985

85. *Brachyiulus apfelbecki* Verhoeff, 1898

86. *Brachyiulus bagnalli* (Brölemann, 1924)

87. *Brachyiulus jawlowskii* Lohmander, 1928

88. *Brachyiulus klisurensis* Verhoeff, 1903

89. *Brachyiulus lusitanus* Verhoeff, 1898

90. *Brachyiulus pusillus* (Leach, 1814)
91. *Brachyiulus stuxbergi* (Fanzago, 1875)
92. *Brachyiulus varibolinus* Attems, 1904
93. *Buchneria cornuta* Verhoeff, 1941
94. *Buchneria sicula* Strasser, 1959
95. *Chaetoleptophyllum montanum* (Verhoeff, 1898)
96. *Chaitoiulus spinifer* (Verhoeff, 1895)
97. *Chersoiulus ciliatus* Strasser, 1938
98. *Chersoiulus sphinx* Strasser, 1940
99. *Chromatoiulus hamuligerus* (Verhoeff, 1932)
100. *Chromatoiulus podabrus* (Latzel, 1884)
101. *Cylindroiulus abaligetanus* Verhoeff, 1901
102. *Cylindroiulus aetnensis* Verhoeff, 1910
103. *Cylindroiulus anglilectus* Read, 2007
104. *Cylindroiulus aostanus* Verhoeff, 1932
105. *Cylindroiulus apenninorum* (Brölemann, 1897)
106. *Cylindroiulus arborum* Verhoeff, 1928
107. *Cylindroiulus aternanus* Verhoeff, 1930
108. *Cylindroiulus attenuatus* Enghoff, 1982
109. *Cylindroiulus bellus* (Lignau, 1903)
110. *Cylindroiulus boleti* (C.L. Koch, 1847)
111. *Cylindroiulus boreoibericus* Read, 2007
112. *Cylindroiulus brachyiuloides* Enghoff, 1982
113. *Cylindroiulus britannicus* (Verhoeff, 1891)
114. *Cylindroiulus broti* (Humbert, 1893)
115. *Cylindroiulus burzenlandicus* Verhoeff, 1907
116. *Cylindroiulus caeruleocinctus* (Wood, 1864)
117. *Cylindroiulus cambio* Korsós & Read, 1994
118. *Cylindroiulus cantonii* (Brölemann, 1892)
119. *Cylindroiulus caramujensis* Lohmander, 1955
120. *Cylindroiulus chalandei* (Ribaut, 1904)
121. *Cylindroiulus cristagalli* Enghoff, 1982
122. *Cylindroiulus dahli* Demange, 1970
123. *Cylindroiulus decipiens* (Berlese, 1885)
124. *Cylindroiulus digitus* Enghoff, 1982
125. *Cylindroiulus disjunctus* Read, 1989
126. *Cylindroiulus dubius* Verhoeff, 1930
127. *Cylindroiulus exiguus* Enghoff, 1982
128. *Cylindroiulus fenestratus* Read, 1989
129. *Cylindroiulus festai* Manfredi, 1939
130. *Cylindroiulus fimbriatus* Enghoff, 1982
131. *Cylindroiulus finitimus* (Ribaut, 1905)
132. *Cylindroiulus franzi* Attems, 1952
133. *Cylindroiulus fulviceps* (Latzel, 1884)
134. *Cylindroiulus gemellus* Enghoff, 1982
135. *Cylindroiulus generosensis* Verhoeff, 1900
136. *Cylindroiulus gestri* (Silvestri, 1898)
137. *Cylindroiulus gigas* Verhoeff, 1932
138. *Cylindroiulus gregoryi* Read, 2007
139. *Cylindroiulus hirticauda* Enghoff, 1982

140. *Cylindroiulus horvathi* (Verhoeff, 1897)
141. *Cylindroiulus ibericus* Brölemann, 1913
142. *Cylindroiulus iluronensis* Brölemann, 1912
143. *Cylindroiulus infernalis* Lohmander, 1955
144. *Cylindroiulus insolidus* Lohmander, 1955
145. *Cylindroiulus italicus* (Latzel, 1884)
146. *Cylindroiulus julesvernei* Reboleira & Enghoff, 2014
147. *Cylindroiulus julipes* Enghoff, 1982
148. *Cylindroiulus kappa* Enghoff, 1982
149. *Cylindroiulus lagrecai* Manfredi, 1957
150. *Cylindroiulus latestriatus* (Curtis, 1845)
151. *Cylindroiulus latro* Attems, 1927
152. *Cylindroiulus latzeli* (Berlese, 1884)
153. *Cylindroiulus laurisilvae* Enghoff, 1982
154. *Cylindroiulus limitaneus* (Brölemann, 1905)
155. *Cylindroiulus londinensis* (Leach, 1814)
156. *Cylindroiulus lundbladi* Lohmander, 1955
157. *Cylindroiulus luridus* (C.L. Koch, 1847)
158. *Cylindroiulus madeirae* Attems, 1937
159. *Cylindroiulus meinerti* (Verhoeff, 1891)
160. *Cylindroiulus molisius* Verhoeff, 1932
161. *Cylindroiulus numerosus* Enghoff, 1982
162. *Cylindroiulus obscurior* Enghoff, 1982
163. *Cylindroiulus oromii* Reboleira & Enghoff, 2014
164. *Cylindroiulus pallidior* Enghoff, 1982
165. *Cylindroiulus parisiorum* (Brölemann & Verhoeff, 1896)
166. *Cylindroiulus pelatensis* Verhoeff, 1930
167. *Cylindroiulus perforatus* Verhoeff, 1905
168. *Cylindroiulus propinquus* (Porat, 1870)
169. *Cylindroiulus punctatus* (Leach, 1815)
170. *Cylindroiulus pyrenaicus* (Brölemann, 1897)
171. *Cylindroiulus quadratistipes* Enghoff, 1982
172. *Cylindroiulus rabacalensis* Lohmander, 1955
173. *Cylindroiulus rubidicollis* Verhoeff, 1930
174. *Cylindroiulus rufifrons* (C.L. Koch, 1847)
175. *Cylindroiulus sagittarius* (Brölemann, 1897)
176. *Cylindroiulus salicivorus* Verhoeff, 1908
177. *Cylindroiulus sanctimichaelis* Attems, 1927
178. *Cylindroiulus sangranus* (Verhoeff, 1932)
179. *Cylindroiulus sardous* (Silvestri, 1898)
180. *Cylindroiulus schubarti* Verhoeff, 1943
181. *Cylindroiulus segregatus* Brölemann, 1903
182. *Cylindroiulus sculus* (Silvestri, 1897)
183. *Cylindroiulus solarius* Verhoeff, 1942
184. *Cylindroiulus solis* Verhoeff, 1908
185. *Cylindroiulus sorrentinus* Verhoeff, 1912
186. *Cylindroiulus speluncaris* Lohmander, 1955
187. *Cylindroiulus strasseri* Verhoeff, 1930
188. *Cylindroiulus tirolensis* Verhoeff, 1901
189. *Cylindroiulus transmarinus* Enghoff, 1982
190. *Cylindroiulus tricuspis* Verhoeff, 1932

191. *Cylindroiulus truncorum* (Silvestri, 1896)
192. *Cylindroiulus turinensis* (Brölemann, 1897)
193. *Cylindroiulus unciger* Attems, 1952
194. *Cylindroiulus uncinatus* Strasser, 1969
195. *Cylindroiulus uroxiphos* Enghoff, 1982
196. *Cylindroiulus velatus* Enghoff, 1982
197. *Cylindroiulus ventanaea* Read, 2007
198. *Cylindroiulus verhoeffi* (Brölemann, 1896)
199. *Cylindroiulus vulnerarius* (Berlese, 1888)
200. *Cylindroiulus waldeni* Read, 1989
201. *Cylindroiulus xynon* Read, 1989
202. *Cylindroiulus ynnox* Read, 1989
203. *Cylindroiulus zarcoi* Read, 1989
204. *Cylindroiulus zinalensis* (Faës, 1902)
205. *Dolichoiulus alluaudi* (Brölemann, 1901)
206. *Dolichoiulus altitenerife* Enghoff, 1992
207. *Dolichoiulus aquasilvae* Enghoff, 1992
208. *Dolichoiulus architheca* Enghoff, 1992
209. *Dolichoiulus axeli* Enghoff, 1992
210. *Dolichoiulus baezi* Enghoff, 1992
211. *Dolichoiulus blancatypa* (Enghoff, 1992)
212. *Dolichoiulus canariensis* (Pocock, 1893)
213. *Dolichoiulus carolineae* Enghoff, 1992
214. *Dolichoiulus chioensis* Enghoff, 1992
215. *Dolichoiulus dendromystax* Enghoff, 1992
216. *Dolichoiulus dubiosus* Enghoff, 1992
217. *Dolichoiulus eumadeirae* Enghoff, 1992
218. *Dolichoiulus fjellbergi* Enghoff, 1992
219. *Dolichoiulus fuerteventurae* Enghoff, 1992
220. *Dolichoiulus gara* Enghoff, 1992
221. *Dolichoiulus heliophilus* Enghoff, 1992
222. *Dolichoiulus hercules* (Schubart, 1960)
223. *Dolichoiulus hyaena* Enghoff, 1992
224. *Dolichoiulus ibericus* Ceuca, 1973
225. *Dolichoiulus ingeae* Enghoff, 1992
226. *Dolichoiulus insularis* (Brölemann, 1901)
227. *Dolichoiulus jandiensis* Enghoff, 1992
228. *Dolichoiulus jonay* Enghoff, 1992
229. *Dolichoiulus kraepelinorum* (Latzel, 1895)
230. *Dolichoiulus labradae* Enghoff, 1992
231. *Dolichoiulus lasiurus* Enghoff, 1992
232. *Dolichoiulus longunguis* Enghoff, 2012
233. *Dolichoiulus madeiranus* (Mauriès, 1970)
234. *Dolichoiulus martini* Enghoff, 1992
235. *Dolichoiulus mystax* (Brölemann, 1901)
236. *Dolichoiulus nemasoma* Enghoff, 1992
237. *Dolichoiulus oromii* Enghoff, 2012
238. *Dolichoiulus oskari* Enghoff, 1992
239. *Dolichoiulus parcestriatus* (Brölemann, 1901)
240. *Dolichoiulus praesenilis* Enghoff, 1992
241. *Dolichoiulus quasimystax* Enghoff, 1992

242. *Dolichoiulus rectangulus* Enghoff, 1992
243. *Dolichoiulus salvagicus* (Latzel, 1895)
244. *Dolichoiulus sansebastianus* (Attems, 1911)
245. *Dolichoiulus senilis* (Attems, 1911)
246. *Dolichoiulus silvahierro* Enghoff, 1992
247. *Dolichoiulus silvapalma* Enghoff, 1992
248. *Dolichoiulus tiendarius* (Attems, 1911)
249. *Dolichoiulus tongiorgii* (Strasser, 1973)
250. *Dolichoiulus troglhierro* Enghoff, 1992
251. *Dolichoiulus typhlocanaria* Enghoff, 2012
252. *Dolichoiulus typhlops* Ceuca, 1973
253. *Dolichoiulus ultimus* Enghoff, 1992
254. *Dolichoiulus variabilis* Enghoff, 1992
255. *Dolichoiulus vosseleri* (Verhoeff, 1900)
256. *Dolichoiulus wunderlichii* Enghoff, 1992
257. *Dolichoiulus xerohierro* Enghoff, 1992
258. *Dolichoiulus xeropalma* Enghoff, 1992
259. *Dolichoiulus xylomystax* Enghoff, 1992
260. *Dolichoiulus ypsilon* Enghoff, 1992
261. *Dolichoiulus zygodon* Enghoff, 1992
262. *Elbaiulus carpinorum* Verhoeff, 1930
263. *Elbaiulus chrysopygus* (Berlese, 1888)
264. *Enantiulus armatus* (Ribaut, 1909)
265. *Enantiulus austriacus* (Verhoeff, 1896)
266. *Enantiulus dentigerus* (Verhoeff, 1900)
267. *Enantiulus karawankianus* (Verhoeff, 1908)
268. *Enantiulus nanus* (Latzel, 1884)
269. *Enantiulus simplex* (Verhoeff, 1926)
270. *Enantiulus tatanus* (Verhoeff, 1907)
271. *Enantiulus transsilvanicus* (Verhoeff, 1899)
272. *Enghophyllum naxium* (Verhoeff, 1901)
273. *Enghophyllum sifnium* Lazányi & Vagalinski, 2013
274. *Geopachyiulus negreai* Tabacaru, 1978
275. *Geopachyiulus nematodes* (Latzel, 1884)
276. *Haplophyllum mehelyi* (Verhoeff, 1897)
277. *Haplopodoiulus spathifer* (Brölemann, 1897)
278. *Heteroiulus intermedius* (Brölemann, 1892)
279. *Hylopachyiulus pygmaeus* (Attems, 1904)
280. *Hypsoiulus alpivagus* (Verhoeff, 1897)
281. *Interleptoiulus cernagoranus* Mršić, 1988
282. *Julus curvicornis* Verhoeff, 1899
283. *Julus scandinavus* Latzel, 1884
284. *Julus scanicus* Lohmander, 1925
285. *Julus terrestris* Linnaeus, 1758
286. *Kryphioiulus occultus* (C.L. Koch, 1847)
287. *Lamellotyphlus belevodae* Makarov, 2008
288. *Lamellotyphlus mehedintzensis* (Tabacaru, 1976)
289. *Lamellotyphlus sotirovi* Makarov, Mitić & Ćurčić, 2002
290. *Leptoiulus abietum* Verhoeff, 1914
291. *Leptoiulus alemannicus* (Verhoeff, 1894)
292. *Leptoiulus arelatus* Bigler, 1919

293. *Leptoiulus atticus* Strasser, 1970
294. *Leptoiulus baconyensis* (Verhoeff, 1899)
295. *Leptoiulus belgicus* (Latzel, 1884)
296. *Leptoiulus bertkaui* (Verhoeff, 1896)
297. *Leptoiulus borisi* Verhoeff, 1926
298. *Leptoiulus brentanus* Verhoeff, 1926
299. *Leptoiulus brevivelatus* Bigler, 1919
300. *Leptoiulus broelemanni* (Verhoeff, 1895)
301. *Leptoiulus bruyanti* Ribaut, 1951
302. *Leptoiulus carpinatorum* Verhoeff, 1929
303. *Leptoiulus cernagoranus* (Attems, 1927)
304. *Leptoiulus chiesensis* Verhoeff, 1934
305. *Leptoiulus cibdellus* (Chamberlin, 1921)
306. *Leptoiulus czarnohoricus* Jawłowski, 1928
307. *Leptoiulus demangei* Schubart, 1962
308. *Leptoiulus deubeli* (Verhoeff, 1897)
309. *Leptoiulus discophorus* (Attems, 1927)
310. *Leptoiulus dolinensis* Verhoeff, 1928
311. *Leptoiulus durmitorius* (Attems, 1927)
312. *Leptoiulus faesi* Bigler, 1919
313. *Leptoiulus frigidarius* Verhoeff, 1913
314. *Leptoiulus garumnicus* (Ribaut, 1904)
315. *Leptoiulus gilvicollis* Verhoeff, 1932
316. *Leptoiulus hauseri* Strasser, 1976
317. *Leptoiulus helveticus* (Verhoeff, 1894)
318. *Leptoiulus hospitelli* Brölemann, 1901
319. *Leptoiulus ivanjicae* Ćurčić & Makarov, 1997
320. *Leptoiulus juvenilis* (Ribaut, 1908)
321. *Leptoiulus kervillei* (Brölemann, 1896)
322. *Leptoiulus korongsius* (Attems, 1904)
323. *Leptoiulus krueperi* (Verhoeff, 1900)
324. *Leptoiulus laetedorsalis* (Verhoeff, 1898)
325. *Leptoiulus legeri* (Brölemann, 1897)
326. *Leptoiulus liptauensis* (Verhoeff, 1899)
327. *Leptoiulus macedonicus* (Attems, 1927)
328. *Leptoiulus magnus* Bigler, 1919
329. *Leptoiulus mariae* Gulička, 1952
330. *Leptoiulus matulicii* (Verhoeff, 1901)
331. *Leptoiulus meridionalis* (Brölemann, 1897)
332. *Leptoiulus montivagus* (Latzel, 1884)
333. *Leptoiulus noricus* Verhoeff, 1913
334. *Leptoiulus oribates* (Latzel, 1884)
335. *Leptoiulus pentheri* (Attems, 1927)
336. *Leptoiulus piceus* (Risso, 1826)
337. *Leptoiulus polonicus* Jawłowski, 1930
338. *Leptoiulus pretneri* Strasser, 1940
339. *Leptoiulus proximus* (Němec, 1896)
340. *Leptoiulus remyi* Schubart, 1962
341. *Leptoiulus riparius* (Verhoeff, 1894)
342. *Leptoiulus roszkowskii* Jawłowski, 1930
343. *Leptoiulus saltuvagus* (Verhoeff, 1898)

344. *Leptoiulus sarajevensis* (Verhoeff, 1898)
345. *Leptoiulus sarasini* Bigler, 1929
346. *Leptoiulus semenkevitchi* Lohmander, 1928
347. *Leptoiulus simplex* (Verhoeff, 1894)
348. *Leptoiulus storkani* Verhoeff, 1932
349. *Leptoiulus tatricus* Gulička, 1956
350. *Leptoiulus tendanus* Verhoeff, 1930
351. *Leptoiulus transsylvanicus* (Daday, 1889)
352. *Leptoiulus trilineatus* (C.L. Koch, 1847)
353. *Leptoiulus trilobatus* (Verhoeff, 1894)
354. *Leptoiulus tussilaginis* (Verhoeff, 1907)
355. *Leptoiulus umbratilis* (Ribaut, 1905)
356. *Leptoiulus uncinatus* Ribaut, 1951
357. *Leptoiulus vagabundus* (Latzel, 1884)
358. *Leptoiulus vieirae* (Verhoeff, 1900)
359. *Leptoiulus zagrebensis* Verhoeff, 1929
360. *Leptotyphloiulus coeruleoalbus* (Verhoeff, 1899)
361. *Leptotyphloiulus dolinensis* (Verhoeff, 1901)
362. *Macheiroiulus compressicauda* Verhoeff, 1901
363. *Mammamia profuga* Akkari, Stoev & Enghoff, 2011
364. *Megaphyllum anatolicum* (Attems, 1926)
365. *Megaphyllum argolicum* (Verhoeff, 1900)
366. *Megaphyllum austriacum* (Latzel, 1884)
367. *Megaphyllum beroni* (Strasser, 1973)
368. *Megaphyllum bicolor* (Loksa, 1970)
369. *Megaphyllum bosniense* (Verhoeff, 1897)
370. *Megaphyllum brachyurum* (Attems, 1899)
371. *Megaphyllum byzantinum* (Verhoeff, 1901)
372. *Megaphyllum carniolense* (Verhoeff, 1897)
373. *Megaphyllum cephalonicum* (Strasser, 1974)
374. *Megaphyllum chiosense* Lazányi & Korsós, 2012
375. *Megaphyllum crassum* (Attems, 1929)
376. *Megaphyllum creticum* (Strasser, 1976)
377. *Megaphyllum cygniforme* Lazányi & Korsós, 2012
378. *Megaphyllum danyi* Lazányi & Korsós, 2012
379. *Megaphyllum dentatum* (Verhoeff, 1898)
380. *Megaphyllum digitatum* Lazányi & Korsós, 2012
381. *Megaphyllum erythronotum* (Latzel, 1884)
382. *Megaphyllum euphorbiarum* (Verhoeff, 1900)
383. *Megaphyllum glossuliferum* (Schubart, 1934)
384. *Megaphyllum hercules* (Verhoeff, 1900)
385. *Megaphyllum imbecillum* (Attems, 1935)
386. *Megaphyllum karschi* (Verhoeff, 1901)
387. *Megaphyllum kievense* (Lohmander, 1928)
388. *Megaphyllum lamelliferum* (Strasser, 1974)
389. *Megaphyllum leucadium* (Attems, 1929)
390. *Megaphyllum lictor* (Attems, 1904)
391. *Megaphyllum loebli* (Strasser, 1974)
392. *Megaphyllum margaritatum* (Fanzago, 1875)
393. *Megaphyllum metsovoni* (Strasser, 1976)
394. *Megaphyllum montivagum* (Verhoeff, 1901)

395. *Megaphyllum mueggenburgi* (Verhoeff, 1901)
396. *Megaphyllum platyurum* (Latzel, 1884)
397. *Megaphyllum projectum* Verhoeff, 1894
398. *Megaphyllum recticauda* (Attems, 1903)
399. *Megaphyllum rhodopinum* (Verhoeff, 1928)
400. *Megaphyllum rosenauense* (Verhoeff, 1897)
401. *Megaphyllum rossicum* (Timotheew, 1897)
402. *Megaphyllum rubidicolle* (Verhoeff, 1901)
403. *Megaphyllum sapphicum* (Strasser, 1976)
404. *Megaphyllum silvaticum* (Verhoeff, 1898)
405. *Megaphyllum sjaelandicum* (Meinert, 1868)
406. *Megaphyllum syrense* (Verhoeff, 1903)
407. *Megaphyllum tauricum* (Attems, 1907)
408. *Megaphyllum taygetanum* (Attems, 1903)
409. *Megaphyllum taygeti* (Strasser, 1976)
410. *Megaphyllum transsylvanicum* (Verhoeff, 1897)
411. *Megaphyllum unilineatum* (C.L. Koch, 1838)
412. *Megaphyllum vicinum* (Verhoeff, 1903)
413. *Mesoiulus berleseii* Silvestri, 1898
414. *Mesoiulus cavernarum* (Verhoeff, 1938)
415. *Mesoiulus derouteae* Mauriès, 1971
416. *Mesoiulus drescoi* Mauriès, 1971
417. *Mesoiulus gridellii* Strasser, 1934
418. *Mesoiulus henroti* Mauriès, 1971
419. *Mesoiulus kosswigi* Verhoeff, 1936
420. *Mesoiulus mauriesi* Strasser, 1974
421. *Mesoiulus paradoxus* Berlese, 1886
422. *Mesoiulus rusticanus* Mauriès & Vicente, 1977
423. *Mesoiulus siculus* Silvestri, 1902
424. *Mesoiulus stammeri* (Verhoeff, 1936)
425. *Metaiulus pratensis* Blower & Rolfe, 1956
426. *Micropachyiulus paucioculatus* (Verhoeff, 1899)
427. *Ommatoiulus albolineatus* (Lucas, 1845)
428. *Ommatoiulus andalusius* (Attems, 1927)
429. *Ommatoiulus armatus* (Verhoeff, 1910)
430. *Ommatoiulus aurozonatus* (Berlese, 1886)
431. *Ommatoiulus baenai* Akkari & Enghoff, 2012
432. *Ommatoiulus baileyi* Akkari & Enghoff, 2012
433. *Ommatoiulus bavayi* (Brölemann, 1897)
434. *Ommatoiulus bipartitus* (Verhoeff, 1910)
435. *Ommatoiulus buchneri* (Verhoeff, 1940)
436. *Ommatoiulus cervinus* (Verhoeff, 1910)
437. *Ommatoiulus cingulatus* (Attems, 1927)
438. *Ommatoiulus clavigerus* (Verhoeff, 1921)
439. *Ommatoiulus corsicus* (Brölemann, 1903)
440. *Ommatoiulus corunnensis* (Verhoeff, 1910)
441. *Ommatoiulus demangei* Vicente & Rodriguez, 1992
442. *Ommatoiulus diplurus* (Attems, 1903)
443. *Ommatoiulus dorsovittatus* (Verhoeff, 1893)
444. *Ommatoiulus fuentei* (Brölemann, 1920)
445. *Ommatoiulus haackeri* Mauriès, 1969

446. *Ommatoiulus hoffmani* Akkari & Enghoff, 2012
447. *Ommatoiulus ibericus* Ceuca, 1974
448. *Ommatoiulus ilicis* (Brölemann, 1897)
449. *Ommatoiulus imminutus* (Brolemann, 1926)
450. *Ommatoiulus inconspicuus* (L.Koch, 1881)
451. *Ommatoiulus jaenensis* Akkari & Enghoff, 2012
452. *Ommatoiulus kimei* Akkari & Enghoff, 2012
453. *Ommatoiulus lienharti* (Brolemann, 1921)
454. *Ommatoiulus lusitanus* (Verhoeff, 1895)
455. *Ommatoiulus martensi* Mauriès, 1969
456. *Ommatoiulus moreleti* (Lucas, 1860)
457. *Ommatoiulus navasi* (Brölemann, 1918)
458. *Ommatoiulus niger* (Attems, 1952)
459. *Ommatoiulus oliveirae* (Verhoeff, 1893)
460. *Ommatoiulus oxypygus* (Brandt, 1841)
461. *Ommatoiulus parallelus* (C.L. Koch, 1847)
462. *Ommatoiulus porathi* (Verhoeff, 1893)
463. *Ommatoiulus pseudoflagellatus* Akkari & Enghoff, 2012
464. *Ommatoiulus recueroi* Akkari & Enghoff, 2012
465. *Ommatoiulus reipi* Akkari & Enghoff, 2012
466. *Ommatoiulus robustus* Ceuca, 1972
467. *Ommatoiulus rutilans* (C.L. Koch, 1847)
468. *Ommatoiulus sabinarensis* Akkari, Mauriès & Enghoff, 2012
469. *Ommatoiulus sabulosus* (Linnaeus, 1758)
470. *Ommatoiulus schubarti* Akkari & Enghoff, 2012
471. *Ommatoiulus teruelensis* Ceuca, 1974
472. *Ommatoiulus tridentifer* Ceuca, 1974
473. *Ommatoiulus variolosus* (Silvestri, 1898)
474. *Ophiulus aspidiorum* (Verhoeff, 1913)
475. *Ophiulus bastiensis* Verhoeff, 1943
476. *Ophiulus castanearum* Verhoeff, 1930
477. *Ophiulus cerii* Verhoeff, 1942
478. *Ophiulus chilopogon* (Latzel, 1884)
479. *Ophiulus collaris* Verhoeff, 1930
480. *Ophiulus corsicus* Verhoeff, 1943
481. *Ophiulus curvipes* (Verhoeff, 1898)
482. *Ophiulus germanicus* (Verhoeff, 1896)
483. *Ophiulus italianus* Attems, 1927
484. *Ophiulus jeekeli* Strasser, 1974
485. *Ophiulus lostiae* Silvestri, 1898
486. *Ophiulus macchiae* Verhoeff, 1930
487. *Ophiulus minimus* Strasser, 1958
488. *Ophiulus muelleri* Strasser, 1937
489. *Ophiulus napolitanus* (Attems, 1903)
490. *Ophiulus nigrofuscus* (Verhoeff, 1894)
491. *Ophiulus osellai* Strasser, 1970
492. *Ophiulus pilosus* (Newport, 1842)
493. *Ophiulus renosensis* Mauriès, 1969
494. *Ophiulus rubrodorsalis* (Verhoeff, 1900)
495. *Ophiulus sardus* Attems, 1927
496. *Ophiulus solitarius* Bigler, 1929

497. *Ophiulus spezianus* Verhoeff, 1936
498. *Ophiulus targionii* Silvestri, 1898
499. *Ophiulus velebiticus* Attems, 1927
500. *Pachyiulus apfelbecki* Verhoeff, 1901
501. *Pachyiulus asiaeminoris* Verhoeff, 1898
502. *Pachyiulus cattarensis* (Latzel, 1884)
503. *Pachyiulus dentiger* Verhoeff, 1901
504. *Pachyiulus flavipes* (C.L. Koch, 1847)
505. *Pachyiulus humicola* Verhoeff, 1910
506. *Pachyiulus hungaricus* (Karsch, 1881)
507. *Pachyiulus marmoratus* Verhoeff, 1901
508. *Pachyiulus oenologus* (Berlese, 1885)
509. *Pachyiulus silvestrii* Verhoeff, 1923
510. *Pachyiulus speciosus* Verhoeff, 1900
511. *Pachyiulus valonensis* Verhoeff, 1901
512. *Pachyiulus varius* (Fabricius, 1781)
513. *Pachypodoiulus eurypus* (Attems, 1895)
514. *Parastenophyllum frondicola* (Verhoeff, 1899)
515. *Pteridoiulus aspidiorum* Verhoeff, 1913
516. *Rhamphidoiulus bujukderensis* Attems, 1905
517. *Rhodopiella beroni* (Strasser, 1966)
518. *Rossiulus kessleri* (Lohmander, 1927)
519. *Rossiulus vilnensis* (Jawłowski, 1925)
520. *Rumaniulus mammosus* Attems, 1927
521. *Serboiulus deelemanni* Strasser, 1971
522. *Serboiulus kresnik* Makarov, 2013
523. *Serboiulus lucifugus* Strasser, 1962
524. *Serboiulus spelaeophilus* Gulička, 1967
525. *Stenophyllum hermannimuelleri* Verhoeff, 1897
526. *Stenophyllum primitivum* Verhoeff, 1897
527. *Stenophyllum semenicense* Ceuca, 1989
528. *Stenophyllum tabacarui* Vanoaica, 2003
529. *Styrioiulus pelidnus* (Latzel, 1884)
530. *Styrioiulus styricus* (Verhoeff, 1896)
531. *Symphyoius imparitius* (Karsch, 1888)
532. *Syniulus bolivari* (Ceuca, 1971)
533. *Syniulus lagari* (Ceuca, 1971)
534. *Syniulus puddui* Strasser, 1974
535. *Syrioiulus andreevi* Mauriès, 1984
536. *Tachypodoiulus niger* (Leach, 1814)
537. *Telsonius nycteridonis* Strasser, 1976
538. *Titanophyllum spiliarum* Akkari, Stoev & Enghoff, 2011
539. *Trogloiulus binii* Enghoff, 1985
540. *Trogloiulus boldorii* Manfredi, 1940
541. *Trogloiulus comensis* Strasser, 1977
542. *Trogloiulus concii* Manfredi, 1948
543. *Trogloiulus minimus* Manfredi, 1935
544. *Trogloiulus mirus* Manfredi, 1931
545. *Trogloiulus osellai* Strasser, 1977
546. *Trogloiulus vailatii* Strasser, 1978
547. *Typhloiulus acutunguis* Ceuca, 1979

548. *Typhloiulus albanicus* Attems, 1929
 549. *Typhloiulus ausugi* Manfredi, 1953
 550. *Typhloiulus beroni* Mauriès, Golovatch & Stoev, 1997
 551. *Typhloiulus bosniensis* Strasser, 1966
 552. *Typhloiulus bureschi* Verhoeff, 1926
 553. *Typhloiulus carniolensis* Strasser, 1940
 554. *Typhloiulus edentulus* Attems, 1951
 555. *Typhloiulus ganglbaueri* (Verhoeff, 1898)
 556. *Typhloiulus gellianae* Makarov & Rada, 2006
 557. *Typhloiulus georgievi* Strasser, 1962
 558. *Typhloiulus giganteus* Ćurčić & Makarov, 2002
 559. *Typhloiulus hauseri* Strasser, 1974
 560. *Typhloiulus illyricus* Verhoeff, 1929
 561. *Typhloiulus incurvatus* Verhoeff, 1899
 562. *Typhloiulus insularis* Strasser, 1938
 563. *Typhloiulus kotelensis* Jawłowski, 1938
 564. *Typhloiulus lobifer* Attems, 1951
 565. *Typhloiulus longinquus* Strasser, 1966
 566. *Typhloiulus longipes* Strasser, 1973
 567. *Typhloiulus maximus* Verhoeff, 1929
 568. *Typhloiulus montellensis* Verhoeff, 1930
 569. *Typhloiulus motasi* Tabacaru & Gava, 1992
 570. *Typhloiulus nevoi* Makarov, Mitić & Ćurčić, 2002
 571. *Typhloiulus polypodus* (Loksa, 1960)
 572. *Typhloiulus psilonotus* (Latzel, 1884)
 573. *Typhloiulus sculterorum* Brölemann, 1905
 574. *Typhloiulus serbani* (Ceuca, 1956)
 575. *Typhloiulus serborum* Ćurčić & Makarov, 2005
 576. *Typhloiulus staregai* Strasser, 1973
 577. *Typhloiulus strictus* (Latzel, 1882)
 578. *Typhloiulus tobias* (Berlese, 1886)
 579. *Typhloiulus uncinifer* Strasser, 1974
 580. *Unciger foetidus* (C.L. Koch, 1838)
 581. *Unciger transsilvanicus* (Verhoeff, 1899)
 582. *Xestoiulus bjelasnicensis* (Verhoeff, 1898)
 583. *Xestoiulus carpathicus* (Verhoeff, 1907)
 584. *Xestoiulus dalmaticus* Mršić, 1987
 585. *Xestoiulus fimbriatus* (Attems, 1904)
 586. *Xestoiulus fontisherculus* (Verhoeff, 1899)
 587. *Xestoiulus graciliventrus* (Verhoeff, 1898)
 588. *Xestoiulus imbecillus* (Latzel, 1884)
 589. *Xestoiulus laeticollis* (Porat, 1889)
 590. *Xestoiulus luteus* (Attems, 1951)
 591. *Xestoiulus pirinicus* (Gulička, 1967)
 592. *Xestoiulus rebeli* (Attems, 1904)
 593. *Xestoiulus rucneri* (Ceuca, 1990)
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Results

Species accounts

Class Diplopoda Blainville-Gervais, 1844
Order Julida Brandt, 1833
Family Blaniulidae C.L. Koch, 1847
Genus *Acipes* Attems, 1937

1. *Acipes andalusius* Enghoff & Mauriès, 1999

Distribution

ES-SPA (Jaen and Alicante Provinces).

Habitat

Caves and the Mesovoid Shallow Stratum (MSS).

Remarks

Described from a cave in Jaen Province. Recently collected in the Mesovoid Shallow Stratum (MSS) in Alicante Province (Confrides, Sierra de Aitana) (Enghoff & Reboleira 2013).

2. *Acipes atlanticus* Attems, 1937

Distribution

PT-MDR.

Habitat

Forest, mainly laurel forest; under bark and in wood of logs, under moss cushions on boulders, often together with *A. serratus*.

3. *Acipes biflum* Enghoff & Reboleira, 2013

Distribution

PT-POR (Algarve).

Habitat

Cavernicolous.

4. *Acipes continentalis* Enghoff, 1986

Distribution

ES-SPA (Avila & Madrid Provinces, Sierra de Gredos & Sierra de Gaudarrama).

5. *Acipes decolor* Enghoff, 1983

Distribution

PT-MDR (Porto Santo).

Habitat

Only found once, on a stony, strongly grazed gentle slope facing W, with short grass.

6. *Acipes franzi* (Loksa, 1967)

Choneiulus franzi Loksa, 1967.

Distribution

ES-CNY (El Hierro, Gran Canaria, La Gomera, La Palma, Tenerife).

Habitat

Most common in laurel forest and fayal-brezal, also occurring in lower, dry areas (e.g., with *Kleinia* and *Rumex* vegetation).

7. *Acipes lateralis* Enghoff, 1983

Distribution

PT-MDR (Porto Santo).

Habitat

Cupressus-Pinus forest, *Erica* scrub, also in more open, treeless places.

8. *Acipes machadoi* Enghoff & Reboleira, 2013

Distribution

PT-POR (Algarve).

Habitat

Cavernicolous.

9. *Acipes portosantoensis* Enghoff, 1983

Distribution

PT-MDR (Porto Santo).

Habitat

Cupressus-Pinus forest, *Erica* scrub, also in more open, treeless places.

10. *Acipes serratus* Enghoff, 1983

Distribution

PT-MDR.

Habitat

Forest, mainly laurel forest; almost exclusively in logs, often together with *A. atlanticus*.

11. *Acipes waldeni* Enghoff, 1983

Distribution

PT-MDR.

Habitat

Laurel forest; in the soil/litter interface.

Genus *Alpiobates* Verhoeff, 1911

12. *Alpiobates peyerimhoffi* (Brölemann, 1900)

Blaniulus peyerimhoffi Brölemann, 1900.

Distribution

FR-FRA, IT-ITA. Alps along Franco-Italian border. Hautes Alpes; Piedmont.

Habitat

Verhoeff (1932a) found it in an old, hollow chestnut (*Castanea*) tree.

Genus *Archiboreoiulus* Brolemann, 1921

13. *Archiboreoiulus pallidus* (Brade-Birks, 1920)

Proteroiulus pallidus Brade-Birks, 1920.

Boreoiulus pallidus auct.

Distribution

BE, CH, DE, DK-DEN, ES-SPA, FI, FR-FRA, GB-CI, GB-GRB, GB-NI, HU, IE, LU, NL, NO-NOR, PL, RO, RU-KDG, RU-RUC, RU-RUW, SE, SK, UA. Central, N & E Europe. – Also found in Stavropol, northern Caucasus, Russia (Zuev 2014) and introduced into Canada and USA.

Habitat

Endogean and troglophile, it has been found mainly in the soil, especially in loamy calcareous and other base-rich types. It is also synanthropic, especially in northern and eastern regions, found in forests, cultivated fields, grassland, gardens, garden waste, spoil heaps, etc.

Remarks

It is often associated with *Blaniulus guttulatus* and is similarly regarded as an agricultural pest in several root crops (Pierrard & Biernaux 1974). Its vertical migrations in the soil were described by Biernaux & Baurant (1964). Some parthenogenetic populations exist in the northern part of its European range, as well as in Canada. Prisnyi (2001) stated that all Russian populations appear to be male-free and largely anthropochoric. Regarded as highly endangered in Germany (Voigtländer *et al.* 2011).

14. *Archiboreoiulus sollaudi* Brolemann, 1921

Distribution

FR-FRA (Doubs Department, Jura Mountains).

Habitat

Cavernicolous.

Genus *Blaniulus* Gervais, 1836

Typhloblaniulus Verhoeff, 1897.

Plusioiulus Silvestri, 1903.

The genus *Blaniulus* is essentially Atlanto-Mediterranean. Most species are troglophiles or troglobionts.

15. *Blaniulus dollfusi* Brölemann, 1894

Distribution

BE, ES-SPA, FR-FRA, PT-POR. Southern part of Atlantic zone.

Habitat

Frequently found in forest litter (especially *Quercus*) and soil, also in stony pastures and dune systems with bushes, sometimes in fungi, e.g., twenty adult specimens were found in October, vertically arranged in the stipe of an edible *Boletus* in the Dordogne Department of France (R.D. Kime). Many records from N Portugal to Aquitaine. Introduced into Belgium (Enghoff 2010). Troglophile in Spain at least (Mauriès 1971).

16. *Blaniulus eulophus* Silvestri, 1903

Typhloblaniulus eulophus auct.

Distribution

IT-SAR (Oristano & Cagliari Provinces).

Habitat

Found under a log at Oristano and in two caves, the Grotta Pirusu at Su Benatzu and the Grotta delle Cava d'Onice at Is Cattas, both near San Antonio di Santadi in the province of Cagliari.

Remarks

Listed as a synonym of *B. troglodites* by Enghoff & Kime (2009) but the two species are clearly different by, e.g., *eulophus* having eyes and *trogodites* being blind.

17. *Blaniulus guttulatus* (Fabricius, 1798)

Julus guttulatus Fabricius, 1798.

Blaniulus guttulatus (Bosc, 1792) auct.

Iulus pulchellus Leach, 1814.

Distribution

AT, BE, BG, CH, CZ, DE, DK-DEN, EE, ES-CNY, ES-SPA, FI, FR-FRA, GB-CI, GB-GRB, GB-NI, HU, IE, IS, IT-ITA, IT-SI, LT, LU, LV, NL, NO-NOR, PL, PT-POR, PT-AZO, PT-MDR, RO, RU-KGD, RU-RUC, RU-RUW, SE, SK, UA. Most of Europe north of the Mediterranean zone, synanthropic and widely introduced. – Also introduced into Canada, USA, St. Helena, Tristan da Cunha and Norfolk Island.

Habitat

Sometimes found “wild” in forest litter and topsoil, e.g., deciduous forest on limestone. Research in Belgium (Kime *et al.* 1992) showed that all the specimens at such sites were found in soils with mull humus, about half of them being calcic mulls.

Generally on heavy loam soils, as in Britain, where Blower (1985) associated it with good arable loams and found it infrequently in base-deficient soils. The only Bulgarian record was from *Pinus sylvestris* and *Quercus petraea* forest (Vagalinski & Stoev 2007). *Blaniulus guttulatus* is strongly associated with cultivation, especially on ground with compost and surface refuse (Breny & Biernaux 1966). It occurs

in farmland, gardens, parks, orchards, colliery spoil heaps and waste ground, associated with organic matter and it often occurs in very large populations, also in caves.

Remarks

The genus *Blaniulus* being Atlanto-Mediterranean, it is possible that *B. guttulatus* is native to woodland on base-rich soils in western Europe. It has received much attention as an agricultural pest. A detailed study with respect to its behaviour and invasion of crops was made by Biernaux (1968); see also Pierrard & Biernaux (1974). Brookes & Willoughby (1978) studied the general ecology and life history of the species.

18. *Blaniulus lichtensteini* Brolemann, 1921

Distribution

FR-FRA (Southern, west of the Rhône: Gard, Hérault & Aveyron).

Habitat

Cavernicolous, confined to limestone areas.

19. *Blaniulus lorifer* (Brolemann, 1921)

Typhloblaniulus lorifer Brolemann, 1921.

Distribution

ES-SPA, FR-FRA. Pyrenean endemic.

Habitat

Cavernicolous.

Remarks

Brolemann (1921, 1923) distinguished four subspecies. At the moment there is no record within 100 km of either the Atlantic or the Mediterranean coasts. Mauriès (1969a) described the mating and periodomorphosis of *B. lorifer*.

20. *Blaniulus mayeti* (Brölemann, 1902)

Typhloblaniulus mayeti Brölemann, 1902.

Distribution

FR-FRA (Eastern Pyrenees near the Mediterranean Sea).

Habitat

Surface living.

21. *Blaniulus orientalis* Brolemann, 1921

Distribution

ES-SPA, FR-FRA. Mediterranean Pyrenees and south to Barcelona.

Habitat

Surface living.

22. *Blaniulus troglobius* Latzel, 1886

Typhloblaniulus troglobius auct.

Distribution

FR-FRA (Western and Central Pyrenees).

Habitat

Cavernicolous.

23. *Blaniulus troglodites* Brölemann, 1898

Blaniulus guttulatus troglodites Brölemann, 1898.

Typhloblaniulus troglodites auct.

Typhloblaniulus troglodytes auct.

Distribution

ES-SPA, FR-FRA. Pyrenean Region.

Habitat

Cavernicolous.

24. *Blaniulus velatus* Ribaut, 1954

Distribution

FR-FRA (Aude & Hérault Depts.).

Habitat

Cavernicolous.

Remarks

Known from two caves at Rieussec and Citou.

25. *Blaniulus virei* Brölemann, 1900

Typhloblaniulus virei auct.

Distribution

FR-FRA (Hérault Dept.).

Habitat

Cavernicolous.

Remark

Known only from the Grotte des D emoiselles near Ganges.

Genus *Boreoiulus* Brolemann, 1921

26. *Boreoiulus simplex* Brolemann, 1921

Distribution

CH, FR-FRA. Jura Mountains.

Habitat

Cavernicolous.

27. *Boreoiulus tenuis* (Bigler, 1913)

Monacobates tenuis Bigler, 1913.

Monacobates marcomannius Verhoeff, 1915.

Distribution

BE, DE, DK-DEN, FI, FR-FRA, GB-GRB, GB-NI, IE, LT, NL, NO-NOR, PL, RU-RUW, SE. Northern Europe (N Atlantic, N Central and Baltic).

Habitat

In base-rich soils; woodland and arable land. Highly synanthropic and occurs in crops. May be a pest of sugar beet (Breny 1964; Breny & Biernaux 1966). Has also been found on banks of clay deep in caves. Reported from Reykjavik, Iceland (Ólafsson 2010), but the images shown are clearly *Blaniulus guttulatus*.

Genus *Choneiulus* Brolemann, 1921

28. *Choneiulus faunaeuropaeae* Enghoff, 2002

Distribution

IT-SI (Grotta di Santa Ninfa in the Province of Trapani).

Habitat

Cavernicolous.

29. *Choneiulus lacinifer* Strasser, 1980

Distribution

IT-SAR (Grotta del Cane near Gortoe in the Province of Nuoro).

Habitat

Cavernicolous.

30. *Choneiulus palmatus* (Němec, 1895)

Blaniulus palmatus Němec, 1895.

Distribution

BE, CH, CZ, DE, DK-DEN, GB-CI, GB-GRB, FI, FR-FRA, HU, IT-ITA, IE, LT, LU, NL, NO-NOR, PL, PT-AZO, PT-MDR, RO, RU-RUC, SE. – Also introduced into Canada, USA and Australia.

Habitat

Soil and litter of woodland on mainly sedimentary basic and calcareous rocks. Tajovský (1998) recorded it from *Tilio cordatae-Fagetum* in the Czech Republic. May be found under bark. Widespread in gardens, parks, orchards, vineyards, cemeteries, quarries, mine galleries, disused railway areas, spoil heaps and frequently in greenhouses (predominantly in the latter in the N & E of its range). Recorded from catacombs in France and from caves. Found in the nests of ants and moles. Regarded as a stenotopic xerobiont woodland species with preference for xeric/mesoxeric meadows, fields and fallows in Saxony-Anhalt, Germany (Voigtländer 2011). It reaches an altitude of 1230 m in the Swiss Alps (Pedroli-Christen 1993).

Remarks

Its natural habitat may be woodland on base-rich soils. Sometimes an agricultural pest (Pierrard & Biernaux 1974).

31. *Choneiulus subterraneus* (Silvestri, 1903)

Nopoiulus subterraneus Silvestri, 1903.

Choneiulus gallicus Brolemann, 1921.

Nopoiulus minimus Verhoeff, 1941.

Choneiulus minimus auct.

Distribution

ES-CNY, FR-COR, FR-FRA, IT-ITA, MC. Western Mediterranean.

Habitat

Woodland, e.g., litter in small copse of *Castanea sativa*, surrounded by coniferous forest and maquis; in gardens, under stones; in rotting wood; in ants' nests; in caves (Enghoff 1984).

Genus *Cibiniulus* Verhoeff, 1927

Biselibates Verhoeff, 1940.

32. *Cibiniulus phlepsii* (Verhoeff, 1897)

Blaniulus phlepsii Verhoeff, 1897.

Biselibates bosporanus Verhoeff, 1940.

Biselibates phlepsii auct.

Distribution

BG, HU, PL, RO, RU-RUS, SB, TR-TUE, UA. E Central & E Balkan. – Also Anatolia, Georgia.

Habitat

Often in dead wood and under bark; ants' nests.

Genus *Euzdakiulus* Mauriès, 1970

33. *Euzdakiulus sarensis* Mauriès, 1970

Distribution

FR-FRA (Basque Region at Sare, Pyrénées Atlantiques).

Habitat

Cavernicolous.

Genus *Iberoiulus* Mauriès, 1985

Iberoiulus Ceuca, 1967, proposed without a type species and therefore not available.

34. *Iberoiulus breuili* Ceuca, 1967

Euzdakiulus breuili auct.

Distribution

GB-GI.

Habitat

Cavernicolous.

35. *Iberoiulus cavernicola* Ceuca, 1967

Euzdakiulus cavernicola auct.

Distribution

ES-SPA (Cadiz Province at Grazalema).

Habitat

Cavernicolous. Known only from two caves 3 km from each other (Enghoff & Reboleira 2014).

Genus *Mesoblaniulus* Brölemann, 1921

36. *Mesoblaniulus serrula* (Brölemann, 1905)

Blaniulus serrula Brölemann, 1905.

Distribution

FR-FRA (Maritime Alps).

Genus *Monacobates* Verhoeff, 1911

37. *Monacobates monoecensis* (Brölemann, 1905)

Typhloblaniulus monoecensis Brölemann, 1905.

Monacobates ormeanus Verhoeff, 1930.

Distribution

IT-ITA, MC. Riviera of Provence and Liguria.

Habitat

First recorded from underground in the basement of the Oceanographical Museum of Monaco; later, by Verhoeff, in the litter and humus of *Castanea* woodland at 950 m near Ormea.

Genus *Nopoiulus* Menge, 1851

38. *Nopoiulus kochii* (Gervais, 1847)

Iulus Kochii Gervais, 1847.

Nopoiulus pulchellus auct., not C.L. Koch (1838).

Nopoiulus minutus auct., not Brandt (1841).

Blaniulus venustus Meinert, 1868.

Nopoiulus breuili Brolemann, 1921.

Blaniulus atticus Verhoeff, 1925.

Distribution

AL, AT, BA, BE, BG, BY, CH, CZ, DE, DK-DEN, EE, ES-BAL, ES-CNY, FI, FR-FRA, GB-GRB, GB-NI, GR-GRC, HR, HU, IE, IT-ITA, IT-SI, LT, LV, LU, MK, NL, NO-NOR, PL, PT-AZO, PT-MDR, RO, RU-KGD, RU-RUC, RU-RUE, RU-RUS, RU-RUW, SB, SE, SI, SK, TR-TUE, UA. Euro-Caucasian, though few records from the W Mediterranean region. – A cosmopolitan species, introduced into North Africa (Egypt), Asia, North and South America and New Zealand.

Habitat

In Eastern Europe it is characteristically found in swamp woodland but in other forests as well. Found in light soils rich in humus, often in alluvial valleys or sandy areas. Also open grassland, horticultural ground, suburban areas, parks and gardens. Rotting tree stumps, under bark, in manure heaps, under plant pots, in litter and in the soil, once in a mole's nest. Reported from catacombs, caves and gypsum quarries/chalk pits. Largely synanthropic away from Eastern Europe. There is a report on this species infesting the human intestine (Ertek *et al.* 2004).

Remarks

As in the case of *Blaniulus guttulatus*, records of *Iulus* / *Blaniulus* / *Nopoiulus pulchellus* had to be treated with caution in making the maps. Errors are possible.

Genus *Occitaniulus* Mauriès, 1965

39. *Occitaniulus rouchi* Mauriès, 1965

Distribution

FR-FRA (Languedoc and Toulouse).

Habitat

Deep (50 cm) in soil; under a rock.

Genus *Orphanoiulus* Silvestri, 1903

40. *Orphanoiulus dinapolii* Strasser, 1960

Distribution

IT-SI (Palermo Province).

Habitat

Found in the Molara Cave at Cozzo Santa Croce.

Remarks

Although it was recorded from three caves near Palermo by Strasser (1970), Strasser (1960) pointed out in his description that this pigmented animal is in no way adapted to a cavernicolous existence.

41. *Orphanoiulus religiosus* (Silvestri, 1903)

Nopoiulus religiosus Silvestri, 1903.

Distribution

ES-BAL, IT-ITA. West Mediterranean.

Habitat

One record from a cemetery, two from caves.

Remarks

Originally associated with Christian catacombs. Specimens from Mallorca were described as ssp. *majoricensis* Mauriès & Vicente, 1977.

Genus *Proteroiulus* Silvestri, 1897

42. *Proteroiulus broelemanni* Lohmander, 1925

Distribution

ES-SPA, FR-FRA. Pyrenean / N Iberian.

Habitat

Sub-corticolous, may be found in leaf litter.

43. *Proteroiulus fuscus* (Am Stein, 1857)

Blaniulus fuscus Am Stein, 1857.

Nopoiulus pulchellus auct., not C.L. Koch, 1838.

Nopoiulus palmatus coelebs Verhoeff, 1907.

Distribution

AT, BE, BG, BY, CH, CZ, DE, DK-DEN, DK-FOR, EE, ES-CAN, FI, FR-FRA, GB-CI, GB-GRB, GB-NI, HU, IE, IS, IT-ITA, IT-SI, LT, LU, LV, NL, NO-NOR, PL, PT-AZO, PT-MDR, RU-KGD, RU-RUC, RU-RUE, RU-RUN, RU-RUW, RU-RUS, SE, SK, UA. Northern, Eastern and Central Europe. – Also introduced into Canada, USA, South Africa and St. Helena.

Habitat

Subcorticolous on many kinds of trees, both deciduous and coniferous, for most of its life cycle and found in a wide variety of wooded biotopes (forest tundra, taiga, mixed and deciduous forests and forest-steppe). It is to be found in leaf litter and in the soil, seasonally. Trapping on trees and on the ground indicates that it tends to disperse in autumn and winter, at least in the more temperate areas. It is associated with non-calcareous soils and peaty soils in particular (Tajovský 1998; Lee 2006).

It is sometimes the only millipede found in very dry pinewoods on sand.

South of about 48° N it is generally only found in mountainous terrain, for instance, in Switzerland at altitudes of between 400 m and 1525 m (Pedroli-Christen 1993).

Remarks

A hardy species, very common in northern Europe, declining southwards, absent from much of France, Iberia, Italy and the Balkans. Found further north than any other species of millipede, in the forest-tundra of the Yamal Peninsula. Males are very rare, and *P. fuscus* is regarded as a purely parthenogenetic species (Enghoff 1978). The record from the Faeroe Islands is based on a juvenile and hence doubtful (Meidell & Solhøy 1990).

44. *Proteroiulus hispanus* Schubart, 1959

Distribution

ES-SPA (Sierra Nevada). – Also Morocco.

Habitat

At 2400–3450 m in Sierra Nevada. Found in rotten wood at 1400–2000 m in Morocco.

Genus *Sardoblaniulus* Manfredi, 1956

45. *Sardoblaniulus annae* Manfredi, 1956

Distribution

IT-SAR (Grotta Conca ‘e Crapas in the Province of Nuoro).

Habitat

Cavernicolous.

Genus *Tarracoblaniulus* Mauriès & Vicente, 1977

46. *Tarracoblaniulus lagari* Mauriès & Vicente, 1977

Distribution

ES-SPA (Tarragona, Llaveria, Cova Janet).

Habitat

Cavernicolous.

47. *Tarracoblaniulus phantasmanus* Enghoff, Serra & Martínez, 2009

Distribution

ES-SPA (Tarragona Province).

Habitat

Mountain oak wood (*Quercetum mediterraneomontanum*), sclerophyllous forest consisting mainly of *Quercus ilex*. A soil species.

Remarks

Postembryonic development and life cycle were studied by Enghoff *et al.* (2009).

Genus *Thassoblaniulus* Mauriès, 1985

48. *Thassoblaniulus simplarius* Mauriès, 1985

Distribution

GR-GRC (Thessaly, Thassos Island).

Habitat

Cavernicolous.

Genus *Vascoblaniulus* Mauriès, 1967

49. *Vascoblaniulus cabidochei* Mauriès, 1967

Distribution

FR-FRA (Gouffre de la Pierre-Saint-Martin in the Pyrenees, Basque Region).

Habitat

Cavernicolous. Cabidoche (1968: 670) described the unusual habitat of the species in detail: “Among the species living in this cavity, *Vascoblaniulus cabidochei* should be especially emphasized; it is localised very differently from the remaining fauna ... and is never found together with ... species which come to baits. (This is in contrast to what one can usually see in numerous caves at low altitude in the same region, where diplopods of the genus *Typhloblaniulus* = [*Blaniulus*] literally swarm on baits. The new genus described by Mauriès is thus quite distinct: in addition to morphological criteria its ecology is quite different because it is the only species which frequents the banks of subterranean watercourses” (translated from French). In the latter respect, *V. cabidochei* is reminiscent of certain *Trogloiulus* and *Typhloiulus* species (Enghoff 1985b).

Remarks

Its mouthparts are very different from those of other blaniulids, probably an adaptation to living in very wet places (Enghoff 1985b).

Family Galliobatidae Brolemann, 1921

Genus *Galliobates* Verhoeff, 1911

50. *Galliobates gracilis* (Ribaut, 1909)

Trichoblaniulus gracilis Ribaut, 1909.

Distribution

FR-FRA (West and South, from Brittany to just west of the Rhône).

Habitat

In the soil; found embedded under large stones and logs in woodland. Has been found in a cave in the Hérault Department (J.-F. David, pers.comm.)

Family Nemasomatidae Bollman, 1893

Genus *Nemasoma* C.L. Koch, 1847

Isobates Menge, 1851.

51. *Nemasoma varicorne* C.L. Koch, 1847

Distribution

AT, BA, BE, BG, BY, CH, CZ, DE, DK-DEN, FI, FR-FRA, GB-GRB, GB-NI, HR, HU, IE, IT-ITA, IT-SI, LT, LU, LV, MK, NL, NO-NOR, PL, RO, RU-KGD, RU-RUC, SB, SE, SI, SK, UA. North, Central and Eastern Europe. Missing from most of the Mediterranean region and the whole of SW Europe.

Habitat

Obligate subcorticole found on a wide variety of trees, although some species seem to be favoured, especially *Fagus sylvatica*. In Sweden, however, the most frequent ‘host’ is *Populus tremula*; in

the Rhein-Main region of Germany, it is *Alnus glutinosa*. Common on *Populus tremula* in Belarus (Tarasevich 1992). It may occasionally be found on the ground and has been taken in pitfall traps, even in grassland, perhaps during dispersal. It occurs in the southern taiga, broad-leaved and mixed forests as well as the northern forest-steppe.

Remarks

Parthenogenetic in the western, northern, eastern and southern parts of its large range, bisexual in the centre; areas of overlap where both forms occur are so far located in Denmark, the Netherlands, western Germany and Lithuania (Enghoff 1976, 1994; Hoy Jensen *et al.* 2002).

Genus *Thalasssobates* Verhoeff, 1908

52. *Thalasssobates almeriensis* Enghoff, 2013

Distribution

ES-SPA (Almeria).

Habitat

Cavernicolous.

53. *Thalasssobates emesesensis* Enghoff, 2013

Distribution

ES-CNY (La Gomera).

Habitat

Inhabits the Mesovoid Shallow Stratum (MSS).

54. *Thalasssobates littoralis* (Silvestri, 1903)

Isobates littoralis Silvestri, 1903.

Isobates adriaticus Verhoeff, 1908.

Isobates coiffaiti Demange, 1961.

Distribution

ES-BAL, ES-SPA, FR-COR, FR-FRA, GB-GRB, GR-GRC, GR-DOD, HR, IE, IT-ITA, IT-SAR, IT-SI, MC, NO-NOR, SE. Mediterranean + Atlantic. – Also North Africa and eastern USA.

Habitat

Marine, occurring in the intertidal zone of rocky coasts and banks of shingle. Not in sand or mud.

Remarks

The very large distribution, with large gaps, between Mediterranean records and those in Galicia, Britain, Ireland, Norway and Sweden, and the USA, is remarkable. The gaps must be largely due to long stretches of unsuitable coastline and lead to speculation about the method of dispersal through the ocean.

Family Rhopaloiulidae Attems, 1926
Genus *Rhopaloiulus* Attems, 1926

55. *Rhopaloiulus cameratanus* Attems, 1927

Cyphopoditius ciminensis Verhoeff, 1930.
Rhopaloiulus delattini Verhoeff, 1951.

Distribution

IT-ITA (Central Italy).

Habitat

In dark loam in a gorge with large rocks in *Castanea* forest on trachyte, under bushes, 450 m.

Remarks

Enghoff (1981) stated: “Of the four species/subspecies described in *Rhopaloiulus*, *R. cameratanus* Attems, 1927, *C. ciminensis* Verhoeff, 1930 and *R. cameratanus anenianus* Verhoeff, 1932 are without doubt synonyms, and *R. delattini* Verhoeff, 1951 should probably be relegated to synonymy as well”. We do this with some reservation.

Family Trichoblaniulidae Verhoeff, 1911
Genus *Trichoblaniulus* Verhoeff, 1898

56. *Trichoblaniulus cavernicola* Brölemann, 1905

Trichoblaniulus hirsutus cavernicola Brölemann, 1905.

Distribution

FR-FRA (Alpes de Haute Provence, Alpes Maritimes and Var Departments).

Habitat

Cavernicolous.

57. *Trichoblaniulus hirsutus* (Brölemann, 1889)

Blaniulus hirsutus Brölemann, 1889.

Distribution

FR-FRA, IT-ITA, IT-SAR, MC. West Mediterranean.

Habitat

Found in many superficial habitats, e.g., under stones in olive groves, in gardens, along the French and Italian Rivas, Monaco and Sardinia.

58. *Trichoblaniulus lanuginosus* Ribaut, 1947

Distribution

FR-FRA (known only from the Cova Bastera at Villefranche de Conflent, E Pyrenees).

Habitat

Cavernicolous.

59. *Trichoblaniulus tarraconensis* Mauriès & Vicente, 1977

Distribution

ES-SPA (known only from the Cova Janet at Llaveria, Tarragona).

Habitat

Cavernicolous.

Family Trichonemasomatidae Enghoff, 1991
Genus *Trichonemasoma* Mauriès & Vicente, 1975

60. *Trichonemasoma peloponesius* (Mauriès, 1966)

Trichoblaniulus peloponesius Mauriès, 1966.

Distribution

GR-GRC (Taygetos Mts & Mani Peninsula).

Habitat

Described from Glyphada Cave at Anogia, but also found epigeically at Pírgos-Dirou and in *Abies-Pinus* forest at Anoiga.

Family Julidae Leach, 1814
Genus *Acanthoiulus* Verhoeff, 1894

61. *Acanthoiulus cassinensis* (Verhoeff, 1910)

Pachyiulus cassinensis Verhoeff, 1910.

Distribution

IT-ITA (Central and southern Italy).

Habitat

A broad spectrum of habitats up to 1650 m in the Apennines. Limestone slope with *Olea*, dry *Quercus* scrub etc. (Verhoeff 1931, 1932b), deciduous forest at Amalfi on the coast near Naples. Caves.

62. *Acanthoiulus fuscipes* (C.L. Koch, 1847)

Julus fuscipes C.L. Koch, 1847.

Julus idriensis C.L. Koch, 1847.

Julus dalmaticus C.L. Koch, 1847.

Pachyiulus bosniensis Verhoeff, 1895.

Pachyiulus fuscipes auct.

Distribution

AL, BA, GR-GRC, HR, IT-ITA, MK, MN, SB, SI. Balkan-Adriatic.

Habitat

Coastal *Pinus* forest, scrub, among ruins, under stones. Troglophile: found in a cave and in artificial galleries in Albania (Mauriès *et al.* 1997).

Remark

Several subspecies and varieties of this species have been named. The isolated record from Southern Greece was attributed to a new variety *arcadicus* by Verhoeff (1900), whose the taxonomic status remains uncertain.

Genus *Afropachyiulus* Schubart, 1960

63. *Afropachyiulus maritimus* Strasser, 1970

Distribution

IT-SI (Island of Marettimo in the Egadi archipelago).

Genus *Allajulus* C.L. Koch, 1847

Ypsiloniulus Verhoeff, 1899.

Hoffman (1980) synonymised the large genus *Cylindroiulus* under *Allajulus*, but Read (1990) re-validated *Cylindroiulus* as a separate genus, leaving *Allajulus* with just seven species.

64. *Allajulus dicentrus* (Latzel, 1884)

Iulus dicentrus Latzel, 1884.

Cylindroiulus dicentrus auct.

Diploiulus dicentrus auct.

Distribution

AT, BA, HR, HU, IT-ITA, SI. Eastern & Dinaric Alpine area.

Habitat

Woodland, in Slovenia frequently *Fagus* forest from 650 to 1350 m. In Austria woodland trees included *Fagus sylvaticus*, *Carpinus betulus*, *Quercus petraea*, *Castanea sativa*, *Tilia cordata*, *Acer pseudoplatanus*, *Crataegus monogyna* and *Picea abies*, while the ground flora included *Salvia glutinosa*, *Gentiana asclepiadea*, *Vaccinium myrtillus*, *Campanula persicifolia*, *Sanicula europaea* and *Pteridium aquilinum* (Voigtländer *et al.* 1997). Also found in a cave.

65. *Allajulus groedensis* (Attems, 1899)

Iulus groedensis Attems, 1899.

Cylindroiulus groedensis auct.

Ypsiloniulus grödensis auct.

Distribution

AT, DE, HR, HU, IT-ITA, SI. Mainly Austrian & Italian Alps.

Habitat

Beechwoods up to 1200 m in Slovenia. Mixed woods. In litter, humus and screes.

66. *Allajulus infossus* (Verhoeff, 1930)

Cylindroiulus (Ormeoiulus) infossus Verhoeff, 1930.

Distribution

IT-ITA (Piedmont).

Habitat

Woodland in the mountains – *Castanea*, 1100–1200 m; *Corylus*, 1450 m; *Fagus*, 1250–1300 m. In litter and humus.

67. *Allajulus marguareisi* (Strasser, 1970)

Cylindroiulus marguareisi Strasser, 1970.

Distribution

IT-ITA (Piedmont).

Habitat

Described from a cave, Arma delle Fascetti, at Viozene in the Province of Ormea (1250 m); also found epigeically at Frabosa Soprana ca 15 km N of the type locality (G. Delmastro leg., HE det., specimens in ZMUC).

Remarks

Read (1990) suggested that this could be *A. groedensis* with a broken preanal spine. The two species are indeed very similar, and Strasser (1970) mentioned the straight preanal spine as one of the distinguishing characters. The specimens from Frabosa Soprana, however, have a pointed, upturned preanal spine, just like *A. groedensis*.

68. *Allajulus molybdinus* C.L. Koch, 1847

Cylindroiulus molybdinus auct.

Ypsiloniulus molybdinus auct.

Distribution

AT, BA, HR, SI. East Alpine and NW Balkan.

69. *Allajulus nitidus* (Verhoeff, 1891)

Iulus nitidus Verhoeff, 1891.

Cylindroiulus nitidus auct.

Ypsiloniulus nitidus auct.

Cylindroiulus nitidus rhenanus Verhoeff, 1910.

Distribution

AT, BE, CH, CZ, DE, DK-DEN, FR-FRA, GB-GRB, IS, LU, NL, NO-NOR, PL, SE. Central European, extending north to Scandinavia and Britain.

Habitat

A species particularly found in closed woodland on brown earth soils, strongly associated with clay, mull humus and active calcium, although it does occur on lighter neutral to moderately acidic soils and is scarce or absent from heavy waterlogged soils. Rare in sandy areas and in acidic woodlands on higher ground, yet it has been found on both Muschelkalk and Vosges Sandstone in Alsace, in montane *Fagus*

woods up to 1600 m in the French Alps (Geoffroy 1981b) and up to 2175 m in Switzerland (Pedroli-Christen 1993).

Associated with deciduous forest, especially *Quercus/Carpinus*, and while frequent in beech hangers, less so with *Fagus*. Other trees and shrubs frequently present are *Fraxinus excelsior*, *Acer campestre*, *A. pseudoplatanus*, *Prunus avium*, *Cornus alba* and *Corylus avellana*. In many of these woods ivy (*Hedera helix*) is omnipresent and in many of those on heavy calcareous soils it is by far the dominant species of millipede. Occasionally it is found in mixed forest with *Pinus* and other conifers.

Allajulus nitidus is most abundant in the lowlands and in the montane zone, increasingly synanthropic in the north of its range.

Remarks

It burrows readily and may be found throughout the year in the soil. It migrates vertically (Geoffroy 1981a) and is generally nearer the surface during the spring and again in the autumn, being hygrophile. It is very common in suitable soils throughout west-central Europe. A very variable species; males may go through several successive morphologically mature stadia; hence, there is a wide range of sizes and body ring numbers (Sahli 1969, 1986; Voigtländer 1987; Enghoff *et al.* 1993; Akkari & Enghoff 2011).

70. *Allajulus spinosus* (Ribaut, 1904)

Julus spinosus Ribaut, 1904
Leucoiulus spinosus auct.
Cylindroiulus spinosus auct.

Distribution

ES-SPA, FR-FRA. Atlanto-Mediterranean.

Habitat

Deciduous, mixed and coniferous woodland. Recorded dominant trees include *Fagus sylvatica*, *Fraxinus excelsior*, *Quercus petraea*, *Q. ilex*, *Abies alba* and *Pinus sylvestris*, with a mention of *Tilia* in oakwood. Most records are montane, up to 1600 m, from leaf litter, under bark on the ground and in the soil. Under large stones beside tracks. The soil is often very light and sandy. Troglophile.

Remarks

A rather unusual known distribution centred on the Pyrenees with northward extensions to the Dordogne, Montagne Noire and the Massif Central, but, while most records are montane, it has been found in pinewoods near sea level in Aquitaine, in lowland caves and around Toulouse. The limits of its range are uncertain, both in France and in Spain.

Genus *Allopodoiulus* Verhoeff, 1898.

71. *Allopodoiulus schiodtei* (Verhoeff, 1898)

Julus Schiödtei Verhoeff, 1898.

Distribution

BA.

Habitat

Deciduous forest.

72. *Allopodoiulus verhoeffi* (Jawłowski, 1931)

Leptoiulus verhoeffi Jawłowski, 1931.

Distribution

RO, UA. NW Romanian and NE Carpathian Mountains.

Genus *Alpityphlus* Strasser, 1967

73. *Alpityphlus seewaldi* Strasser, 1967

Typhloiulus seewaldi auct.

Distribution

AT, DE.

Habitat

Troglobiont, found at 1620 m. a.s.l.

Remarks

Originally described as Austrian, but the type locality was later shown to lie just on the German side of the border. However, *A. seewaldi* has subsequently been found on Austrian territory as well (Christian & Spötl 2010). Regarded as threatened with extinction in Germany (Voigtländer *et al.* 2011).

Genus *Amblyiulus* Silvestri, 1896

74. *Amblyiulus aphroditae* (Attems, 1902)

Pachyiulus aphroditae Attems, 1902.

Distribution

GR-DOD (Rhodos). – Also Cyprus and Asiatic Turkey.

75. *Amblyiulus creticus* (Verhoeff, 1901)

Pachyiulus creticus Verhoeff, 1901.

Pachyiulus obscurus Attems, 1902.

Distribution

GR-KRI.

Habitat

Forests. One record from a cave. Found from sea level to 640 m (Felesaki *et al.* 2010).

76. *Amblyiulus kovali* Golovatch, 2008

Distribution

UA (SW Crimea).

Habitat

Cavernicolous.

Remarks

Regarded as a neoendemic troglobiont in the Crimea by Golovatch (2008).

77. *Amblyiulus sporadensis* (Verhoeff, 1901)

Pachyiulus sporadensis Verhoeff, 1901.

Distribution

GR-GRC (Nikaria).

Habitat

The side of the road between Oxea and Monokampion (Strasser 1976).

Genus *Apfelbeckiella* Verhoeff, 1901

78. *Apfelbeckiella bulgarica* Verhoeff, 1926

Distribution

BG, TR-TUE. Strandzha Mountains.

Habitat

Broad-leaved forest, particularly *Quercus*. Caves. Under stones in cornfield on karst (Vagalinski & Stoev 2007).

79. *Apfelbeckiella byzantina* Verhoeff, 1901

Distribution

TR-TUE. – Also Asiatic Turkey.

Habitat

Forest.

80. *Apfelbeckiella dobrogica* Tabacaru, 1966

Distribution

RO (Dobrogea, Movile and Casian Caves).

Habitat

Cavernicolous.

81. *Apfelbeckiella golemanskyi* Ceuca, 1973

Distribution

BG (Western Rhodope Mountains).

Remarks

Recorded from only three sites by Ceuca (1973).

82. *Apfelbeckiella trnowensis* (Verhoeff, 1928)

Typhloiulus trnowensis Verhoeff, 1928.

Distribution

BG.

Habitat

Cavernicolous.

Remarks

Three subspecies have been described from different parts of Bulgaria.

Vagalinski & Stoev (2007) stated that, since the taxonomic status of some of the subspecies and species of the *trnowensis* group is uncertain, the records from the Pirin and Rhodope Mountains in the South may belong to closely related but different taxa.

Genus *Balkanophoenix* Verhoeff, 1937

83. *Balkanophoenix borisi* Verhoeff, 1937

Distribution

BG (Stara Planina & Rhodope Mountains).

Habitat

Cavernicolous.

Genus *Banatoiulus* Tabacaru, 1985

84. *Banatoiulus troglobius* Tabacaru, 1985

Distribution

RO (Zamonita Cave in the Banat Mountains).

Habitat

Cavernicolous.

Genus *Brachyiulus* Berlese, 1884

Brachyiulus Berlese, 1886.

Anoploiulus Verhoeff, 1894.

Microbrachyiulus Verhoeff, 1897.

85. *Brachyiulus apfelbecki* Verhoeff, 1898

Distribution

AL, BA, BG, GR-GRC, HR, IT-ITA, MN. West Balkan, Transadriatic.

Habitat

Open habitats: meadows. Found in large numbers in a meadow at Marango (Venezia) and also in Padova. *Olea europaea* forest, under stones. Botanical garden in Tirana.

86. *Brachyiulus bagnalli* (Brolemann, 1924)

Microbrachyiulus bagnalli Brolemann, 1924.

Brachyiulus latzeli Attems, 1949.

Distribution

AT, BG, CZ, HU, MK, PL, RO, SB, SI, SK.

Habitat

Mainly lowland pastures and on marshy ground in floodplains near watercourses; also natural forest, including *Quercus* in protected areas. Yet it has been found on a chalk hill at 550 m. It is often associated with human habitation, e.g., city parks and planted forests in Budapest, a service station, a hotel, an agricultural institute, a restaurant, a house yard. It may be located under wood.

87. *Brachyiulus jawlowskii* Lohmander, 1928

Distribution

MD, RO, PL, RU-RUC, RU-RUE, RU-RUS, UA. The forest-steppe belt of Kazakhstan, Russia, including SW Siberia, the Ukraine, reaching Moldova, Eastern Romania and just into Poland to the west.

Habitat

It occurs in broad-leaved and mixed forest in the Eastern European Plain, including the more southerly meadow-steppes of the Volga and Don Basins, usually in the litter. Several sites are on limestone. Among habitats cited by Prisnyi (2001) in the Middle-Russian upland are primary *Quercus* forest, limestone denudations and calciphilous steppe with *Hyssopus* and *Artemisia*. Jastrzebski (2012) found it on *Poa pratensis*-*Festuca rubra* meadows in Poland. Records from SW Siberia and Kazakhstan are from anthropogenous and semi-anthropogenous habitats (Nefediev *et al.* 2014).

Remarks

The species is a subendemic of the forest-steppe (Chorny & Golovatch 1993) and according to the map in Prisnyi (2001) has a discontinuous distribution. There seems to be a substantial gap between the records from the eastern area including parts of the Districts of Kirov, Tatarstan, Bashkortostan, Chuvashia and Ulyanovsk and the main western body of records going west from the interfluvial area between the Don and the lower Volga through the basins of the Dnieper and the Dniester to those of the Siret in Romania and the Bug in Poland (Jastrzebski 2012). Jastrzebski added that it ranges from the Taiga (boreal coniferous forest) in the north to the semi-desert belt in the south. The optimal area appears to be within the steppe belt east of the Dnieper (Wytwer *et al.* 2009); the Middle-Russian Upland is an area which harbours relict species.

88. *Brachyiulus klisurensis* Verhoeff, 1903

Distribution

GR-GRC (Klisura Sikia N of Aitoliko).

Habitat

The type locality is a wooded gorge.

Remarks

There is only the original record.

89. *Brachyiulus lusitanus* Verhoeff, 1898

Brachyiulus pusillus lusitanus Verhoeff, 1898.

Brachyiulus coreyraeus Verhoeff, 1900.

Brachyiulus corcyraeus arcadius Verhoeff, 1900.

Microbrachyiulus calcivagus Verhoeff, 1910.

Distribution

AT, BG, CH, CZ, DE, ES-BAL, ES-CNY, ES-SPA, FR-COR, GB-GRB, GR-GRC, HR, HU?, IT-ITA, IT-SAR, MC, MK, PT-AZO, PT-MDR, PT-POR. – Also Algeria, Egypt, Iran; introduced into Australia and North America.

Habitat

Found in forests, also open land (sandy area on Adriatic coast, on the roof of a police station situated in a field, grassy slopes on Gran Canaria as well as in laurel forest, under bark and moss. Dominant in meadows, corn fields and vineyards in NE Italy (Paoletti *et al.* 1988). In Bulgaria in mixed forests, in meadows, under stone debris in quarry, in city park, 224–900 m (Vagalinski & Stoev 2007). The British record is from the Eden Park Project in Cornwall, which has created some warmer foreign environments in very large heated greenhouses. We leave it in as an introduction as it has been found outside.

Remarks

There is a record, from Iran, of this species infesting a child's alimentary canal (Mowlavi *et al.* 2009).

90. *Brachyiulus pusillus* (Leach, 1814)

Iulus pusillus Leach, 1814.

Brachyiulus littoralis Verhoeff, 1898.

Distribution

AL, AT, BA, BE, CH, DE, DK-DEN, EE, ES-CNY, ES-SPA, FR-FRA, GB-CI, GB-GRB, GB-NI, GR-GRC, HR, IE, IT-ITA, LT, LU, MC, MN, NL, PL, PT-AZO, PT-MDR, RU-KGD, SE. – Introduced into Tunisia, South Africa, Australia and North America,

Habitat

Often in damp areas near watercourses, meadows, marshes, marshy woodland and farmland. On afforested colliery spoil heaps with garden refuse (Decker & Hannig 2010). In Western Europe it is not usually common in woodland, much more associated with arable land and pastures. It is reputed to favour heavy soils and is probably able to withstand inundation (Jeekel & Brugge 2001). Numbers may be found in damp buildings. In the north of its range it is synanthropic.

Remarks

Brachyiulus pusillus adults are visible throughout the year, by far most frequently in the spring when they breed. The species has been widely dispersed by human activity, occurring in Australasia, South Africa, North and South America and on many of the Atlantic Islands (Blower 1985; Lee 2006).

The Greek specimens from the Ionian area were named as the variety *ionica* by Strasser (1974).

91. *Brachyiulus stuxbergi* (Fanzago, 1875)

Iulus stuxbergi Fanzago, 1875.

Microbrachyiulus olearum Verhoeff, 1910.

Microbrachyiulus gilvicollis Verhoeff, 1941.

?*Iulus (Microiulus) merontis* Attems, 1902?

Distribution

GR-GRC, GR-KRI, IT-ITA, IT-SI, MT. Mediterranean. – Also Algeria and Tunisia.

Habitat

Seems to tolerate relatively arid conditions, found on clayey slopes and in garrigue, as well as woodland, maquis and gardens in Malta (Enghoff & Schembri 1989). On Crete it has been found up to an altitude of 860 m, in Epirus up to 990 m and in Sicily up to 1950 m on Mt.Etna.

Remark

Attems (1902) described *Julus (Microiulus) merontis* from several localities in Crete. This species remains uncertain (Felesaki *et al.* 2010); it is definitely not a species of *Xestoiulus* (= *Microiulus*) but rather seems to belong in *Brachyiulus*. Since *B. stuxbergi* is the only *Brachyiulus* known from Crete, we tentatively suggest that *J. merontis* may be a synonym of *B. stuxbergi*.

92. *Brachyiulus varibolinus* Attems, 1904

Brachyiulus beratinus Manfredi, 1945.

Distribution

AL, GR-GRC.

Habitat

In the Epirus Mountains at 530 m and 1620 m without habitat details (Strasser 1976).

Genus *Buchneria* Verhoeff, 1941

93. *Buchneria cornuta* Verhoeff, 1941

Distribution

IT-ITA (Ischia).

Habitat

In rotten vineyard poles.

94. *Buchneria sicula* Strasser, 1959

Distribution

IT-SI.

Habitat

Found on three occasions, once on the underside of a large lava rock in an abandoned vineyard.

Genus *Chaetoleptophyllum* Verhoeff, 1898

95. *Chaetoleptophyllum montanum* (Verhoeff, 1898)

Leptophyllum montanum Verhoeff, 1898.

Distribution

BA (Trebević).

Habitat

Under litter in woodland.

Genus *Chaitoiulus* Verhoeff, 1895

96. *Chaitoiulus spinifer* (Verhoeff, 1895)

Iulus spinifer Verhoeff, 1895.

Distribution

AT, HR, SI.

Habitat

Forest, under litter.

Genus *Chersoiulus* Strasser, 1938

97. *Chersoiulus ciliatus* Strasser, 1938

Distribution

HR (Cres Island).

Habitat

Cave entrance in dim light under straw by trickling water and on rotten wood on clay.

Remark

Čampari Cave near Petričevi is on Cres, not on Krk Island as stated by Mrsic (1994).

98. *Chersoiulus sphinx* Strasser, 1940

Distribution

HR, IT-ITA, SI.

Habitat

Cavernicolous. Found under rotting wood.

Genus *Chromatoiulus* Verhoeff, 1894

Pachybrachyiulus Verhoeff, 1897.

99. *Chromatoiulus hamuligerus* (Verhoeff, 1932)

Pachybrachyiulus hamuligerus Verhoeff, 1932.

Leptomastigoiulus hamuligerus Mršić (1993).

Distribution

MK.

Habitat

Mountains.

Remarks

Listed as occurring in AL by Attems (1959), Ceuca (1992) and Mauriès *et al.* (1997), but all verified sites are on the Macedonian side of the border. There are similar mistakes for other species described in the first decade of the 20th Century when Albania was larger, some sites are now in Serbia / Kosovo.

100. *Chromatoiulus podabrus* (Latzel, 1884)

Iulus podabrus Latzel, 1884.

Pachybrachyiulus podabrus auct.

Distribution

AL, BA, GR-GRC, HR, IT-ITA, MK, MN, SB. Transadriatic.

Habitat

Forests, e.g., *Pinus*, *Abies*, *Quercus*, *Fagus*, under litter, stones and moss, in soil. Also *Olea* groves and bushy places.

Genus *Cylindroiulus* Verhoeff, 1894

Micromastigoiulus Verhoeff, 1899.

Dendroiulus Verhoeff, 1930.

Allajulus auct.

Diploiulus auct.

This is a very large genus consisting of over 100 species in Europe ranging from Central Asia to Macaronesia, the majority being in Southern Europe, especially Italy, and on the island of Madeira, which hosts an endemic species swarm (Enghoff 1982, 1983; Reboleira & Enghoff 2014). Several species have spread northwards into much of the rest of Europe while some pioneering and anthropochorous members are becoming widespread globally.

101. *Cylindroiulus abaligetanus* Verhoeff, 1901

Cylindroiulus hyperophorus Attems, 1903.

Distribution

AT, BG, HR, HU. – Also Asiatic Turkey.

Habitat

Broad-leaved forest (Gruber 2007), e.g., *Quercus cerris*, *Q. frainetto*, *Fagus orientalis* with *Rhododendron ponticum*. Trogloxene.

Remarks

This species seems to be genuinely rare (Korsós & Read 1994).

102. *Cylindroiulus aetnensis* Verhoeff, 1910

Distribution

IT-ITA (Liguria), IT-SI.

Habitat

Sicilian mountains, recorded from 500–1900 m, at Randazzo in earth, humus and *Castanea* stumps.

Remarks

There is some doubt about the validity of records from the Italian mainland. On the one hand the record from Liguria (Strasser & Minelli 1984) seems improbable, but, on the other hand the suggestion by Strasser (1970) that the records of *Cylindroiulus rufifrons* from Calabria (see below) must refer to another species, probably *C. aetnensis*, is reasonable. On our map we have not placed a dot on the Italian mainland.

103. *Cylindroiulus angliclectus* Read, 2007

Distribution

ES-SPA, PT-POR. NW Iberia.

Habitat

Woodland in the Atlantic zone: deciduous, e.g., *Alnus*, *Quercus*, mixed or coniferous, e.g., *Pinus*. Found under large stones and pieces of wood.

104. *Cylindroiulus aostanus* Verhoeff, 1932

Distribution

IT-ITA (Piedmont).

Habitat

South of Aosta in *Pinus-Castanea* woodland in a ravine at 750 m. In deep litter decomposing into humus-rich soil.

105. *Cylindroiulus apenninorum* (Brölemann, 1897)

Iulus apenninorum Brölemann, 1897.

Cylindroiulus apenninorum albanensis Verhoeff, 1905.

Cylindroiulus albanensis auct.

Distribution

IT-ITA (Liguria to Calabria), NL, SM.

Habitat

Many biotopes from sea level to the alpine grasslands (at least to 2350 m). *Castanea* forest, maquis with *Carpinus*, under *Quercus laurifolia*, in *Laurus-Quercus suber* forest. In the leaf litter of mixed deciduous woodland in the Netherlands, presumably introduced from Italy to The Hague, where it is well established. Known from caves.

Remarks

There are some possible errors in the determination of the *C. apenninorum* group. See, e.g., Strasser (1970).

106. *Cylindroiulus arborum* Verhoeff, 1928

Distribution

AT, BE, BG, CZ, DE, GR-GRC, HU, LT, MK, PL, RO, SK, UA. Central and Eastern European. Also found in Stavropol, northern Caucasus, Russia (Zuev 2014).

Habitat

Forests, e.g., *Fagus sylvatica*, *Pinus nigra*, mostly in dead wood, but also found in litter. Oak-Hornbeam forest (*Quercus/Carpinus*). A mainly lowland species, recorded up to 550 m. The Belgian records are from a greenhouse and its immediate vicinity and it must have been an introduction (Biernaux 1972). Jawłowski (1933a) found the species exclusively in hothouses and similar artificial habitats in Poland. The Belgian and Polish records are, therefore, not shown on the map.

Remarks

Reports from France probably relate to *C. parisiorum* or perhaps *C. truncorum*; *C. arborum* is not included in the French checklist (Geoffroy 1996). The record from Lithuania (Schubart 1934) does not include a specific locality and is not shown on the map. The species has a patchy distribution in central continental Europe, extending south into the Balkans and rarely west of the River Elbe.

107. *Cylindroiulus aternanus* Verhoeff, 1930

Distribution

IT-ITA (Abruzzo Region, l'Aquila Province).

Habitat

Near the Aterno River in a gorge with scattered old oaks, upstream from l'Aquila above 600 m a.s.l. on calcareous rocks with litter, rich humus and screes.

108. *Cylindroiulus attenuatus* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Laurisilva, both dense/undisturbed and open or secondary, 400–1000 m.

109. *Cylindroiulus bellus* (Lignau, 1903)

Iulus bellus Lignau, 1903.

Cylindroiulus costatus Verhoeff, 1941.

Distribution

BG, TR-TUE. Pontian. – Also W Caucasus.

Habitat

Forest.

110. *Cylindroiulus boleti* (C.L. Koch, 1847)

Iulus boleti C.L. Koch, 1847.

Diploiulus boleti auct.

Distribution

AL, AT, BA, BG, CZ, DE, HR, HU, IT-ITA, MD, MK, MN, RO, SB, SI, SK, UA. Southeast Central Europe.

Habitat

A common lowland forest species, regularly in many types of oakwoods (*Quercus petraea*, *Q. pubescens*, *Q. frainetto*, *Q. dalechampii*) and often with hornbeam (*Carpinus betulus*, *C. orientalis*) and *Fagus sylvatica*, *Robinia pseudo-acacia*, *Picea abies*, *Pinus* sp. (Stašiov 2005; Vagalinski & Stoev 2007). Also *Fraxinus excelsior*, *Tilia cordata*, *Castanea sativa*, *Acer pseudoplatanus*, *Crataegus monogyna*, *Cornus mas*, *Ligustrum vulgare* (Voigtländer *et al.* 1997). Sometimes found in caves. Also anthills.

111. *Cylindroiulus boreoibericus* Read, 2007

Distribution

ES-SPA, PT-POR. NW Iberia.

Habitat

In a coastal dune area with *Pinus* and in temperate woodlands at low altitude, mainly deciduous, e.g., *Quercus*, *Fraxinus*. So far found near the sea or in lowland river valleys. Mostly under stones but also below wood and in leaf litter.

112. *Cylindroiulus brachyiuloides* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Slopes on or near the north coast with mosses, ferns, grass, herbs, *Rubus*; occasionally partly forested (Lauraceae, *Pinus*). 100–350 m.

113. *Cylindroiulus britannicus* (Verhoeff, 1891)

Iulus britannicus Verhoeff, 1891.

Cylindroiulus pollicaris Attems, 1904.

Cylindroiulus pollinaris Attems, 1933 (misspelling of *pollicaris*).

Distribution

AT, CZ, DE, DK-DEN, ES-CNY, ES-SPA, FI, FR-FRA, GB-GRB, GB-NI, IE, LT, NL, NO-NOR, PL, PT-AZO, PT-MDR, PT-POR, RO, RU-RUC, RU-RUW, SE, UA. – Also widely introduced into Siberia and the Afrotropical, Australian, Nearctic, Neotropical and Oriental regions.

Habitat

In Britain and Ireland it is found beneath the bark of dead deciduous tree trunks and stumps and in their decomposing wood. Sometimes in the soil but, if so, usually close to wood or leaf litter (Blower 1985). These remarks apply to rural and semi-natural woodland habitats. There are several records from alder (*Alnus*) woods near rivers in NW Spain and England; a very large population occurred in an *Alnus/Salix* swamp with *Carex* at Stodmarsh Nature Reserve in Kent. Yet, it also has a strong relationship with urban sites in Britain and Ireland (Lee 2006). In the majority of other countries it appears to be mostly or exclusively synanthropic, occurring particularly in cities and cultivated areas. The close link with parks, gardens and market gardens with greenhouses suggests that specimens found out of doors may be reliant on artificially warm habitats for much of the year in the North. In Sweden the records from the northern provinces of Västerbotten and Norrbotten are associated with greenhouses, as are records from Finland and elsewhere. Such records are not shown on the map. *Cylindroiulus britannicus* was found on an afforested colliery spoil heap with garden refuse in Germany

(Decker & Hannig 2010). It was discovered in a cave on a beach at Funchal, Madeira, and in logs of the laurisilva.

Remarks

The recorded distribution of *C. britannicus* in Europe is quite strange. Until recently, with the exception of Portugal, there were no records from the western part of the mainland. Recently, it has been found in semi-natural habitats in NW Spain and again in Portugal (Read 2007). As it is necessary to dissect adult males to identify the species it may have been overlooked in France, Belgium, Luxemburg and Switzerland; however, much field work has been undertaken in these countries by expert myriapodologists who have not found it. It may be that *C. britannicus* is essentially a Lusitanian or strictly Atlantic species – the west of France is very poorly known – which has become anthropochorous and a successful pioneer elsewhere, as witnessed by its fairly cosmopolitan distribution.

114. *Cylindroiulus broti* (Humbert, 1893)

Iulus broti Humbert, 1893.

Iulus allobrogicus Brölemann, 1896.

Cylindroiulus castanearum Verhoeff, 1930.

Distribution

CH (Valais, Ticino), FR-FRA (Alps), IT-ITA (Alps and Apennines).

Habitat

Montane, subalpine and alpine from 400 to 2200 m in Switzerland (Pedroli-Christen 1993), up to 2400 m in the Oisans area of the French Alps (Schubart 1954) and up to 2500 m in the Ecrins National Park (Geoffroy 1981b) where it was observed principally in forests including *Larix decidua*, *Fagus sylvatica*, *Populus tremula*, *Alnus viridis*, *Betula*, *Pinus sylvestris*, *Pinus uncinata*, *Abies* and *Picea*, but also in meadows with these trees, high level grasslands, rocky places and heaths or moors.

In the Vanoise National Park it was similarly distributed and particularly abundant in subalpine grassy *Larix* forests (Geoffroy 1983). In the Alpes Maritimes *C. broti* is associated with *Rhododendron*, *Vaccinium* moors and the more open *Larix* stands containing many alpine flowers. In the Ticino and in Italy, from 500 m up to 1450 m. Also in Italy in *Castanea* woodland, in *Corylus* litter from 1100 to 1200 m and in *Fagus* litter at 1250 m.

Remarks

A common species within its range. There is some possible confusion between records of this species and those of *C. decipiens* from the Apennines in Central Italy (see Strasser 1970).

115. *Cylindroiulus burzenlandicus* Verhoeff, 1907

Distribution

PL, RO, SK, UA. East Carpathian

Habitat

Broad-leaved forest; Carpathian beech (*Fagus*) forest (Jędryczkowski 1992); in Maramures (Romania), where the species is common, it was collected along streams in deciduous forest, mainly *Fagus*, but in *Quercus*, mixed and in *Pinus* woods as well (Korsós & Lazányi 2008). By the streams it was found in alder (*Alnus*) carr, peat bogs and pastures. Found in forest steppe in the Ukraine (Golovatch 1992). Quoted altitudes range from 400 m to 1000 m.

Remarks

Very similar to *C. luridus* of which it has been regarded as a subspecies (Korsós & Lazányi 2008). Gromysz-Kałkowska *et al.* (2000) studied the influence of environmental stress on the physiology of *C. burzenlandicus*.

116. *Cylindroiulus caeruleocinctus* (Wood, 1864)

Iulus caeruleocinctus Wood, 1864.

Iulus teutonicus Pocock, 1900.

Cylindroiulus londinensis caeruleocinctus Brade-Birks, 1922.

Cylindroulus teutonicus auct.

Cylindroiulus londinensis auct.

Distribution

AT, BE, CH, CZ, DE, DK-DEN, EE, ES-SPA, FI, FR-FRA, GB-GRB, GB-NI, HU, IE, IT-ITA, LT, LU, LV, NL, NO-NOR, PL, PT-POR, RU-KGD, RU-RUW, SE, UA. Widely distributed from Iberia to Russia but not south of the Alps and the Carpathians. Mainly Central Continental. – Also widely introduced into Canada and the USA.

Habitat

An abundant species in much of Central Europe, often dominant in open habitats, especially grassland, and characteristic of dry grassland on chalk and limestone in many regions. But it also occurs in hedges and small woods, though very rarely in forests. Common in parks, gardens, cemeteries, waste places and arable land, and over much of its range it is strongly synanthropic. Many large populations have been found in urban areas; Davis (1979, 1982) found it the commonest species to fall into pitfall traps in London, while Fairhurst (1984) found the optimum habitat in the United Kingdom to be loamy agricultural soils. It may be found under wet leaves in parks and beside rivers in towns. While considered calcicole by many authors (e.g., Haacker 1968 found a strong preference for alkaline soils), there are records from other types of soil. The same author indicated that its preferred foods were broadleaves, followed by grass and moss.

It both hibernates and aestivates at some depth in the soil and shows a marked activity peak in the spring and a lesser one in the autumn. Principally a lowland species, found up to 1240 m in Switzerland (Pedroli-Christen 1993) and on a xerorendzina with evergreen oaks (*Quercus*) at 940 m and a pasture on brown earth at 1130 m in the Spanish Pyrenees (Serra *et al.* 1996). There are many records of this species attacking crops.

Remarks

As can be seen from the synonyms there has been much confusion in the past as to the identity of this species (see, e.g., Mauriès 1964; David 1995). As a general rule all records of *C. teutonicus* and records of *C. londinensis* from countries other than Spain, France, Ireland and Great Britain relate to *C. caeruleocinctus*.

117. *Cylindroiulus cambio* Korsós & Read, 1994

Distribution

RU-RUS.

Habitat

Steppe.

Remarks

Described from the Botanical Garden in Rostov-on-Don, subsequently found in natural steppe habitats near Rostov-on-Don (Evsyukov & Golovatch 2013).

118. *Cylindroiulus cantonii* (Brölemann, 1892)

Iulus cantonii Brölemann, 1892.

Distribution

IT-ITA.

Habitat

Known only from the Botanical Garden of Pavia, where a male was collected by Professor Cantoni in the spring of 1873. Maybe an introduction?

119. *Cylindroiulus caramujensis* Lohmander, 1955

Distribution

PT-MDR.

Habitat

Laurisilva with *Erica arborea*; dry grassland with bracken (*Pteridium*).

Located under fallen leaves, under moss covering large boulders and under dry bark flakes of *Erica arborea* 1–2 m above the ground. Habitats from 900 to 1350 m.

120. *Cylindroiulus chalandei* (Ribaut, 1904)

Iulus chalandei Ribaut, 1904.

Cylindroiulus simplex Ceuca, 1974.

Distribution

AD, ES-SPA, FR-FRA. Central and Eastern Pyrenees.

Habitat

Montane/subalpine/alpine. Over its restricted range common in the leaf litter of woodland and under stones in meadows. In Spain associated with *Fagus sylvestris*, *Quercus ilex*, *Q. faginea*, *Pinus mugo*, *Buxus sempervirens* and *Populus* sp. (Vicente 1985) and found at altitudes from 250 to 2070 m. It occurs in alpine meadows. In France, there are precise records from pasture with dead wood at the edge of old coniferous forest, 1730 m, and from under pine cones in *Rhododendron/Cytisus* scrub with scattered *Pinus*, 2150 m, on Mont Canigou.

121. *Cylindroiulus cristagalli* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Under stones in an area with almost no vegetation on Pico Areeiro, 1800 m.

122. *Cylindroiulus dahli* Demange, 1970

Distribution

ES-SPA (La Coruña, Orense, Pontevedra Provinces), PT-AZO (São Miguel). Lusitanian.

Habitat

Woodland (*Quercus*, *Fraxinus*, *Pinus*), rocky shoreline with grassland, garden, city park. Often under stones or wood.

Remarks

This species was described from São Miguel and originally supposed to be endemic in the Azores but has been found more recently in nine locations in Galicia, most of which are given in Read (2007). It will most probably occur in Portugal.

123. *Cylindroiulus decipiens* (Berlese, 1885)

Iulus decipiens Berlese, 1885.

Distribution

IT-ITA. Calabria and perhaps mountains further north.

Habitat

Found above the tree line.

Remarks

Maybe some records of *C. decipiens* are due to confusion with *C. broti* (*q.v.*). It may be endemic in Calabria. Records are all from higher than 1200 m, on Montalto as high as 1950 m.

124. *Cylindroiulus digitus* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Laurisilva, mainly under moss on stones, 900 m.

125. *Cylindroiulus disjunctus* Read, 1989

Distribution

ES-CNY (El Hierro, La Palma).

Habitat

Laurisilva, under bark, stones and litter, in stump of *Erica* tree.

126. *Cylindroiulus dubius* Verhoeff, 1930

Distribution

IT-ITA (Piedmont).

Habitat

At the foot of an old *Castanea* tree on the side of Monte Mottarone near Stresa at an altitude of 500 m.

Remarks

Verhoeff (1930) stated that this blind species is very similar to *Cylindroiulus vulnerarius*. He found just one female.

127. *Cylindroiulus exiguus* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Laurisilva, both relatively undisturbed and pronouncedly secondary, 700–900 m.

128. *Cylindroiulus fenestratus* Read, 1989

Distribution

ES-SPA, PT-POR.

Habitat

The type material was found in *Quercus* litter in Portugal. Also found in *Eucalyptus* woods, woodland margins, road verges, ditches, a fishing harbour.

129. *Cylindroiulus festai* Manfredi, 1939

Distribution

IT-ITA (Piedmont).

Habitat

At 1100 m on the Gran Piano de Noasca in the Gran Paradiso National Park.

130. *Cylindroiulus fimbriatus* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Under stones and leaf litter in relatively undisturbed laurisilva, 600–1000 m.

131. *Cylindroiulus finitimus* (Ribaut, 1905)

Iulus finitimus Ribaut, 1905.

Distribution

ES-SPA, FR-FRA. Pyrenees and neighbouring mountains.

Habitat

Forest and some open habitats generally between 500 m and 2000 m in altitude. Alpine meadows from 1600 to 2200 m.

Remarks

It is possible that the two southernmost records on the map (Sierra de Aguila, Sierra del Moncayo) relate to *Cylindroiulus caeruleocinctus* (see remarks below under *Cylindroiulus londinensis*).

132. *Cylindroiulus franzi* Attems, 1952

Distribution

ES-SPA (W Andalusia).

Habitat

Mountains around Ronda. Collected from pine litter. Found up to 1500 m.

133. *Cylindroiulus fulviceps* (Latzel, 1884)

Iulus luridus var. *fulviceps* Latzel, 1884.

Cylindroiulus partenkirchianus Verhoeff, 1901.

Distribution

AT, DE, IT-ITA. E Alpine.

Habitat

Usually on calcareous terrain. *Fagus* forest; bushy woods; chalk scree; caves. One record from the Altiplano del Consiglio at 1200 m.

134. *Cylindroiulus gemellus* Enghoff, 1982

Distribution

PT-MDR.

Habitat

In and under logs and branches, under leaf litter, under moss covers on boulders from laurisilva. 700–1000 m.

135. *Cylindroiulus generosensis* Verhoeff, 1900

Diploiuulus generosensis auct.

Distribution

CH, IT-ITA. Largely cisalpine.

Habitat

Montane and subalpine, mainly in coniferous or marshy forests but also alpine heaths and meadows from 1000 to 2100 m, found from April until November with a peak in May (Pedroli-Christen 1993).

Remarks

Most records come from Switzerland (the Ticino with a few from the Valais) with a few from the Centovalli in Italy. It is common around Monte Generoso, after which it is named.

136. *Cylindroiulus gestri* (Silvestri, 1898)

Allaiulus gestri Silvestri, 1898.

Cylindroiulus gestroi auct.

Distribution

IT-SAR.

137. *Cylindroiulus gigas* Verhoeff, 1932

Distribution

IT-ITA (Piedmont).

Habitat

In a deep gorge with *Betula*, *Corylus* and *Castanea*, under forest litter. Mountain slopes south of Susa and of Torre Pellice, 700–800 m.

138. *Cylindroiulus gregoryi* Read, 2007

Distribution

ES-SPA (Galicia, Pontevedra Province).

Habitat

On the grounds of a finca with a garden and tourist accommodation.

139. *Cylindroiulus hirticauda* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Laurisilva, both relatively undisturbed and secondary with *Castanea*, 725–1000 m.

140. *Cylindroiulus horvathi* (Verhoeff, 1897)

Iulus horvathi Verhoeff, 1898.

Julus dietli Verhoeff, 1898.

Cylindroiulus vitosae Strasser, 1962.

Cylindroiulus ponticus Golovatch, 1978.

Distribution

BG, HU, PL, RO, UA. East Central European.

Habitat

Apparently a xerophilous species inhabiting dry grasslands and steppe vegetation (Korsós & Read 1994). Also *Quercus petraea* and *Carpinus orientalis* woodland, and caves (Golovatch 1990; Vagalinsky & Stoev 2007). Occurs in ant nests in Bulgaria (Stoev & Lapeva-Gjonova 2005). Lowland and up to 1500 m in Bulgaria.

Remarks

Records suggest a very patchy distribution ranging from the Pannonian biogeographic region in Hungary as far east as the Crimea.

141. *Cylindroiulus ibericus* Brölemann, 1913

Distribution

ES-SPA. Central Pyrenees.

Habitat

Forest in the Provinces of Huesca and Lerida. One precise record of altitude at 1500 m.

142. *Cylindroiulus iluronensis* Brölemann, 1912

Distribution

ES-SPA, FR-FRA. West-central Pyrenees.

Habitat

Open grassy *Fagus/Picea* woodland, in logs, 1360 m; *Fagus* forest with *Buxus*, in leaf litter on limestone, 1400–1500 m; *Fagus* forest, 1700–1800 m. At upper tree limit in *Pinus*, *Abies*, *Rhododendron* vegetation.

143. *Cylindroiulus infernalis* Lohmander, 1955

Distribution

PT-MDR.

Habitat

Laurisilva. Associated with dead wood - under bark, under and in decaying logs, 800–1150 m.

144. *Cylindroiulus insolidus* Lohmander, 1955

Distribution

PT-MDR.

Habitat

Near springs in laurisilva, 1080–1150 m.

145. *Cylindroiulus italicus* (Latzel, 1884)

Iulus italicus Latzel, 1884.

Iulus dalmaticus C.L. Koch, 1847, *sensu* Berlese (1883).

non *Iulus italicus* Verhoeff, 1894.

Distribution

AT, IT-ITA. Cisalpine.

Habitat

Subalpine; forest and open habitats. Several records give altitudes which range from 520 m to 1700 m.

Remarks

This species has been confused with *C. tirolensis*, and some records are probably wrongly referred to *italicus*.

146. *Cylindroiulus julesvernei* Reboleira & Enghoff, 2014

Distribution

PT-MDR.

Habitat

Cavernicolous, found in a lava tube.

147. *Cylindroiulus julipes* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Slopes and precipices on the north coast with a vegetation of mosses, grasses, herbs, *Rubus* and *Aeonium*, 100–150 m.

148. *Cylindroiulus kappa* Enghoff, 1982

Distribution

PT-MDR.

Habitat

In logs in laurisilva, 900 m.

Remark

Recorded only from Faja de Nogueira.

149. *Cylindroiulus lagrecai* Manfredi, 1957

Distribution

IT-ITA (Calabria).

Habitat

Mountains (Monte Pollino and La Sila), one site was at 1700 m. Not found below 1200 m (Strasser 1970).

150. *Cylindroiulus latestriatus* (Curtis, 1845)

Julus latestriatus Curtis, 1845.

Julus luscus Meinert, 1868.

Cylindroiulus frisius Verhoeff, 1891.

Cylindroiulus owenii Bollman, 1887.

Iulus parisiorum miraculus Brölemann & Verhoeff, 1896.

Distribution

BE, BY, CH, CZ, DE, DK-DEN, DK-FOR, EE, ES-CNY, ES-SPA, FI, FR-FRA, GB-CI, GB-GRB, GB-NI, HU, IE, LT, LV, NL, NO-NOR, PL, PT-AZO, PT-POR, RO, RU-KGD, RU-RUC, RU-RUW, SE, SK, UA. Extended Atlantic. – Also widely introduced in the Afrotropical, Australian, Palaeartic, Nearctic and Oriental regions. Found on several remote islands including Tristan da Cunha, Saint Paul and Easter Island.

Habitat

Among the roots of halophytes on fixed coastal dunes and in grassland on a sandy substrate; inland strongly associated with sandy areas, common on some heaths, has been found in the deciduous litter of woodland on light soils, but more usually synanthropic. Abundant in some horticultural areas and found often in urban gardens.

Remarks

This remarkable species is distributed along the Atlantic and North Sea coasts from Macaronesia and Portugal to Norway and in the Baltic reaches Finland and Russia. It becomes increasingly synanthropic into the Gulf of Bothnia and the Gulf of Finland, similarly inland on the Continent where there are numerous scattered records eastwards to Russia and the Ukraine. From Europe *C. latestriatus* has spread as far as South Africa, North, Central and South America, even to remote places such as St. Paul Island in the Antarctic and Easter Island in the Pacific Ocean, showing unusual pioneering abilities. It is perhaps the most widely distributed millipede on Earth. This may be correlated with its unusually short life cycle: reproduction may take place already in the second year of life (Voigtländer 1996).

151. *Cylindroiulus latro* Attems, 1927

Distribution

IT-ITA (Abruzzo).

152. *Cylindroiulus latzeli* (Berlese, 1884)

Iulus latzeli Berlese, 1884.

Dendroiulus latzeli auct.

Diploiulus latzeli auct.

Distribution

CH, IT-ITA (N Italy and in mountains further south, only above 1200 m in Calabria).

Habitat

It has a large altitudinal range. Woodland up to about 1100 m; strongly associated with dead wood and regularly found in large numbers under loose bark. It does occur in leaf litter, including on screes, and has been recorded with *Robinia* and *Corylus*. Also, it has been found in tree stumps in meadows and under stones in a park. Found in a number of caves. Attems (1927) cited agricultural land in Lombardy.

153. *Cylindroiulus laurisilvae* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Laurisilva, semi-natural or secondary with *Castanea*. Mostly found under and in fallen leaves but also under stones and logs, once in a log. 600–1000 m.

154. *Cylindroiulus limitaneus* (Brölemann, 1905)

Iulus limitaneus Brölemann, 1905.

Distribution

FR-FRA, MC. Maritime Alps.

Habitat

Only known from a few sites, mostly in *Pinus* woodland.

155. *Cylindroiulus londinensis* (Leach, 1814)

Iulus londinensis Leach, 1814.

Distribution

ES-SPA, FR-FRA, GB-GRB, IE. Atlantic.

Habitat

Woodland and open habitats, until above the tree line up to 2000 m, common on calcareous soils, but also present on brown earths and on well-drained acidic sandy soils. In Britain and Ireland not yet found on heaths, moorland, wetland or in synanthropic habitats (Lee 2006). In deciduous, mixed or coniferous (*Pinus*) forest; frequently in *Fagus* forests and also in *Quercus* woodland, sometimes with *Carpinus* and/or *Buxus*, often with *Castanea*, *Fraxinus*, *Tilia*, *Betula*, *Corylus*, in scrubby land with *Prunus*, *Cornus*, *Ligustrum*, *Juniperus*, *Ruscus*. At least in the south of its range in Spain it is found in evergreen *Quercus* stands. It is associated with a wide range of ground floras, occurring principally in litter and logs, descending into the topsoil during unfavourable weather. Common in Atlantic woods in France, on many types of parent rock, e.g., limestone, sandstone, schist, granite, volcanic, at the same time notably unrecorded from the eastern departments.

Remarks

There are correct records only from the countries listed above. All the references to this species in the literature from other countries relate to *C. caeruleocinctus*, with which it was formerly confused. In Spain, north of 42° N we are absolutely sure that our records do relate to *C. londinensis*, but, because of its strongly Atlantic distribution we are not certain if the three records in the literature shown south of 42° N relate to it or not, especially because when Ceuca (1972) made them, at two of the same sites he also identified *Cylindroiulus finitimus*, which he equated with *C. londinensis* var. *finitimus* and *C. teutonicus*, although the latter is now known to be a different species (*C. caeruleocinctus*). The previous nomenclatural confusion was rectified by Mauriès (1964), who demonstrated the specific differences between *C. caeruleocinctus*, *C. finitimus* and *C. londinensis*, making it clear that they were not all varieties of *C. londinensis* as many authors then believed. Blower (1985) gave an explanation of the confusion.

156. *Cylindroiulus lundbladi* Lohmander, 1955

Distribution

PT-MDR.

Habitat

Laurisilva, mostly with *Erica arborea* as an important element. Under the bark of standing trees, 1–2 m above ground, under moss cover on boulders, under leaves. 800–1150 m. Observed crawling on tree trunks during the night.

157. *Cylindroiulus luridus* (C.L. Koch, 1847)

Julus luridus C.L. Koch, 1847.

Distribution

AT, BA, BG, CZ, DE, HR, HU, IT-ITA, MK, RO, SB, SI, SK. Southeast Central Europe.

Habitat

Deciduous, mixed and coniferous forest. *Fagus*, *Quercus*, *Carpinus*, *Castanea*, *Tilia*, *Alnus*, *Fraxinus*, *Ulmus*, *Populus*, *Acer*, *Pinus*, *Picea*, etc. In leaf litter, under wood, etc. Occasionally in caves. May be found at altitudes as high as 1500 m. Particularly frequent in *Fagus* forests in the mountains, as high as 1630 m in Bulgaria (Golovatch & Kondeva 1992).

158. *Cylindroiulus madeirae* Attems, 1937

Distribution

PT-AZO (São Miguel), PT-MDR.

Habitat

Laurisilva, more open herb/bush vegetation and treeless terrain with more or less xerophilous herbs and grasses at the eastern end of Madeira. Found under stones and leaf litter up to an altitude of 900 m.

Remark

In all probability the record from São Miguel is the result of introduction by human agency.

159. *Cylindroiulus meinerti* (Verhoeff, 1891)

Iulus luridus var. *meinerti* Verhoeff, 1891.

Iulus meinerti auct.

Distribution

AT, CH, DE, HR, HU, IT-ITA, SI. Central and Eastern Alps from the Rhine to Croatia.

Habitat

Occurs up to 2000 m, above the tree line but mainly in montane deciduous, e.g., *Fagus*, mixed or coniferous, e.g., *Larix* forest between about 650 m and 1750 m. Often in dead wood and under loose bark. Also found under cowpats in meadows. Associated particularly with calcareous mountains. See notes under *C. tirolensis*.

160. *Cylindroiulus molisius* Verhoeff, 1932

Distribution

IT-ITA (Molise & Puglia).

Habitat

Broad-leaved forest, 800 m.

161. *Cylindroiulus numerosus* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Open vegetation with grasses, herbs, *Rubus*, sometimes *Euphorbia*, *Opuntia* or *Erica scoparia*, or under stone on almost barren areas of lava. Found not only on the main island, but also on the tiny Desertas islands to the SE (Read 1989). Only one specimen was taken from secondary laurisilva; 50–700 m, mostly below 500 m.

162. *Cylindroiulus obscurior* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Laurisilva, in one case open with bushes and only scattered laurels (*Laurus*), in another with *Pinus* and open, moist, moss-covered slopes. Under stones, leaf litter, and under dry moss on boulders, 250–900 m.

163. *Cylindroiulus oromii* Reboleira & Enghoff, 2014

Distribution

PT-MDR.

Habitat

Cavernicolous, found in a lava tube.

164. *Cylindroiulus pallidior* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Laurisilva, both relatively undisturbed and secondary. Under a fallen branch and under leaf litter in rather moist situations, 800–1000 m.

165. *Cylindroiulus parisiorum* (Brölemann & Verhoeff, 1896)

Iulus parisiorum Brölemann & Verhoeff, 1896.

Iulus luscus auct.

Cylindroiulus ignoratus Attems, 1927.

Distribution

AT, BE, CH, CZ, DE, DK-DEN, FR-FRA, GB-GRB, GB-NI, HR, HU, IT-ITA, MC, NL, PL, SI, UA.

Habitat

In at least Britain, Belgium, Denmark and Switzerland it occurs as a subcorticole in rural sites and is found in hollow decaying trees, soft wood and sawdust. Elsewhere the records are usually synanthropic, usually in gardens, parks, spoil heaps, greenhouses or graveyards. Recorded from the catacombs in Paris, quarries, a wood yard and rural localities in France, including a wheatfield.

Remarks

While the map shows records scattered from France to the Ukraine, the vast majority of these come from south and east England, with fewer than 10 from France and three from Belgium; the others are isolated captures. It occurs in association with human activity in all the countries shown, except Belgium (forest) and Switzerland (Caricaie wetlands). It is a fairly rare species, and some records are likely to be erroneous owing to possible confusion with other tail-less *Cylindroiulus* species. This includes the extra-European record from St. Helena Island by Hoffman (1977). We have left out some of the more doubtful records on the map. Regarded as threatened with extinction in Germany (Voigtländer *et al.* 2011).

166. *Cylindroiulus pelatensis* Verhoeff, 1930

Distribution

IT-ITA (Mt. Pelato near Castillioncello in Tuscany).

Habitat

Under a stone on cool SW slope, 150–250 m.

167. *Cylindroiulus perforatus* Verhoeff, 1905

Julus occultus Verhoeff, 1893, preoccupied.

Distribution

ES-SPA, PT-POR. Southwest Spain and Portugal.

Habitat

Woodland, most frequently captured in *Pinus* and *Quercus suber* litter.

168. *Cylindroiulus propinquus* (Porat, 1870)

Iulus propinquus Porat, 1870.

Micromastigoiulus propinquus auct.

Distribution

PT-AZO, PT-MDR, PT-POR.

Habitat

Quercus and *Pinus* woodland on granite in Portugal. On the islands in laurisilva, under stones and leaf litter.

169. *Cylindroiulus punctatus* (Leach, 1815)

Julus punctatus Leach, 1815.

Iulus silvarum Meinert, 1868.

Cylindroiulus silvarum auct.

Distribution

AT, BE, CH, CZ, DE, DK-DEN, ES-BAL, ES-SPA, FI, FR-FRA, GB-CI, GB-GRB, GB-NI, IE, LU, NL, NO-NOR, PL, SE. Extended Atlantic. – Also introduced into the Nearctic region (Newfoundland).

Habitat

Woodland of all sorts, most frequently in dead and decaying wood and under the bark of dead trees and branches. However, it migrates vertically and is found in leaf litter especially from autumn to spring and in the soil when it is cold. It is hygrophile and accumulates in rather deep decomposing litter and the underlying humus on silty soils in particular (Kime & Wauthy 1984) and extends into sandy heathlands (Blower 1985). It is found in hedges, arable land, parks, gardens and other places, generally associated with wood, yet is more rural than synanthropic.

It is a thermophile lowland species, although it occurs up to over 1000 m at its southern limit in the Mediterranean woodlands of Catalonia. Schubart (1934) associated it with various ants' nests.

Remarks

Many studies of this species have been made, e.g., Barlow (1957), Breny & Biernaux (1966), Banerjee (1967a, 1967b), Haacker (1968) and Geoffroy (1981a). It migrates vertically from the leaf litter or the soil in cold winters up into trees in the spring; in summer it may be found metres above the ground, descending again during the autumn. Its lowland Atlantic distribution is probably governed by the avoidance of cold winter temperatures. Wood and leaf litter are both important foods. It is a very common species, the most frequently recorded in Britain (Lee 2006) and Belgium (Kime 2004).

170. *Cylindroiulus pyrenaicus* (Brölemann, 1897)

Iulus pyrenaicus Brölemann, 1897.

Distribution

ES-SPA, FR-FRA. Pyrenees and Montagne Noire.

Habitat

Regularly in Fagetum. Apart from *Fagus* forest recorded in mixed woodland with *Fagus*/*Quercus*/*Tilia*/*Corylus*/conifers; recorded in a *Pinus* plantation in the Basque Country. In often deep litter, moss, under bark and in dead wood. Also in stony pastures with marginal bushes or some trees.

171. *Cylindroiulus quadratistipes* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Relatively undisturbed and secondary laurisilva, under leaf litter, 800–850 m.

172. *Cylindroiulus rabacalensis* Lohmander, 1955

Distribution

PT-MDR.

Habitat

Laurisilva, semi-natural or secondary; most specimens found under leaf litter, a few under dry moss on a boulder. From 600 to 1000 m.

173. *Cylindroiulus rubidicollis* Verhoeff, 1930

Julus (Cylindroiulus) Verhoeffii Brölemann – Verhoeff (1896).

Distribution

IT-ITA (Northern Piemonte: Aosta, Susa, Lake Maggiore).

Habitat

Castanea thicket, 650 m a.s.l.; under cushions of *Sedum* on a sunny hill; under large stones and aspen (*Populus tremula*) litter on sand on a river bank.

174. *Cylindroiulus rufifrons* (C.L. Koch, 1847)

Julus rufifrons C.L. Koch, 1847.

Distribution

IT-ITA (Lombardia, Venezia, Calabria).

Habitat

No information apart from a cave at Scilla in Calabria (see below).

Remarks

There are only old records from the 19th century concerning this species. Berlese (1882–1903) listed sites from Calabria, and Brölemann (1895) listed sites from Lombardy. Minelli (1985) stated that the above-mentioned cave record might be attributed to another species, and Strasser (1970) thought that the Calabrian records possibly referred to *C. aetnensis* and that the Venetian record probably referred to *C. boleti*. Strasser & Minelli (1984) regarded *C. rufifrons* as a doubtful species in need of revision.

175. *Cylindroiulus sagittarius* (Brölemann, 1897)

Iulus sagittarius Brölemann, 1897.

Cylindroiulus hispanicus Ceuca, 1974.

Distribution

ES-SPA, FR-FRA. Western Pyrenees and Northern Spanish Cordillera.

Habitat

Montane forest, especially *Fagus*, *Quercus*, often with *Fraxinus*, *Crataegus*, *Ilex*, *Corylus*; *Alnus* woods along streams; *Castanea* grove with *Daphne*, *Helleborus*, *Salvia*, *Lathraea* and *Rubus*. Found in litter, moss, under bark and in rotting trunks and logs. 550–2000 m. Frequently on limestone.

Remarks

It occupies a similar niche to *Cylindroiulus punctatus*, which it replaces higher up in the mountains.

176. *Cylindroiulus salicivorus* Verhoeff, 1908

Distribution

DE, GB-GRB, IT-ITA. Cisalpine.

Habitat

Wet grassland with *Salix*; in the humus of an old chestnut (*Castanea*) wood, 530 m.

Remarks

It has been found in Scotland at the Royal Botanic Gardens, Edinburgh, and the St Andrews Botanic Garden (Lee 2006) and also in Germany at Karlsruhe Palace (Spelda 2005). This clearly suggests introduction by human agency.

177. *Cylindroiulus sanctimichaelis* Attems, 1927

Distribution

ES-SPA (Basque Country, Navarre, Catalonia, Castilla la Mancha, Andalusia).

Habitat

Woodland, bushy areas, meadows, pastures, alpine habitats, rocky scrub (garrigue) and stony ground as on karst. Woodlands include *Pinus*, *Ulmus*, *Populus*, *Fraxinus*, *Castanea*, *Fagus* and many kinds of *Quercus*, both deciduous and evergreen species, especially *Q. ilex* and *Q. cozza* in Catalonia (Vicente 1985). Associated shrubs include *Buxus*, *Crataegus*, *Corylus*, *Sambucus* and *Viburnum*; some woodlands were heavily grazed. Commonly found in leaf litter. Records are from low down up to 2500 m altitude (Mauriès 1974).

Remarks

Most of our data are from the provinces of Alava, Navarra and Barcelona, where it is common. Records from further south indicate that it may have a wide range in Spain and may occupy a wide range of habitats.

178. *Cylindroiulus sangranus* (Verhoeff, 1932)

Dendroiulus sangranus Verhoeff, 1932.

Dendroiulus foveolatus Schubart, 1932.

Distribution

IT-ITA (Marche, Abruzzi e Molise, Lazio, Campania).

Habitat

Broad-leaved forest, 800–850 m, in hollow *Castanea* trunk at Nemi, 620 m, *Quercus ilex* and *Castanea* near Ariccia. 1200 m on Monte Vettore.

179. *Cylindroiulus sardous* (Silvestri, 1898)

Diploiulus sardous Silvestri, 1898.

Distribution

IT-SAR.

Habitat

Little information; one record is from a cave.

180. *Cylindroiulus schubarti* Verhoeff, 1943

Distribution

FR-COR.

Habitat

Corsican mountains.

181. *Cylindroiulus segregatus* Brölemann, 1903

Distribution

FR-COR.

Habitat

Deciduous forests, evergreen *Quercus* woods, *Pinus* and *Ilex* wood; grassy areas; maquis; screes; below stones and wood. From sea level up to at least 1000 m.

182. *Cylindroiulus siculus* (Silvestri, 1897)

Diploiulus siculus Silvestri, 1897.

Distribution

IT-SI (Trapani, Palermo & Messina Provinces).

Remarks

Perhaps an uncommon species, so far as we know only reported once (from between Cesaro and the Femmina Morta Pass by Minelli in litt.) since it was recorded from Ficuzza and S. Ninfa by Silvestri.

183. *Cylindroiulus solarius* Verhoeff, 1942

Distribution

IT-ITA (Campania, Isle of Capri).

Habitat

In needle litter of *Pinus halepensis*, in *Quercus-Castanea* grove, dense maquis under stones and in litter.

Remarks

According to Verhoeff (1942) the most frequent julid of the Isle of Capri.

184. *Cylindroiulus solis* Verhoeff, 1908

Distribution

IT-ITA (Liguria).

Habitat

In the woodland litter and humus-rich earth of *Castanea*, *Quercus* and *Fagus* stands, up to about 1000 m in *Castanea* and at 1250–1300 m on limestone in the case of *Fagus*.

185. *Cylindroiulus sorrentinus* Verhoeff, 1912

Distribution

IT-ITA (Campania, Calabria).

186. *Cylindroiulus speluncaris* Lohmander, 1955

Distribution

PT-MDR.

Habitat

Laurisilva at 1150 m.

187. *Cylindroiulus strasseri* Verhoeff, 1930

Distribution

IT-ITA (Elba).

Habitat

Castanea forest, under litter and humus.

188. *Cylindroiulus tirolensis* Verhoeff, 1901

Cylindroiulus broelemanni Attems, 1904.

Julus italicus – Verhoeff (1894).

non *Iulus italicus* Latzel, 1884.

Distribution

CH, IT-ITA. Cisalpine.

Habitat

Mainly subalpine, in both open grassland and closed forest communities, from 1100 to 2200 m.

Remarks

Species close to *C. meinerti* and *C. italicus*, see Pedroli-Christen (1993). It is possible that some of the data on the map relate to another species.

189. *Cylindroiulus transmarinus* Enghoff, 1982

Distribution

PT-MDR (Porto Santo).

Habitat

Woodland with *Quercus coccifera*, *Erica*, *Cupressus*, *Pinus*, *Taxus*, *Laurus*, *Mimosa*; treeless areas often with sparse rock vegetation, screes, gravel and lichens; grassland, mossy places and in ferns; associated with *Mesembryanthemum*, *Carduus*, *Euphorbia*, *Trifolium*, *Oxalis* etc. Altitudinal range 150–400 m (the highest point on the island is 517 m).

190. *Cylindroiulus tricuspis* Verhoeff, 1932

Distribution

IT-ITA (Piedmont).

Habitat

In *Corylus* litter and humus, 1400 m, also on humus below *Corylus*, *Acer* and *Berberis*, litter on crystalline scree at 1280 m.

191. *Cylindroiulus truncorum* (Silvestri, 1896)

Diploiulus truncorum Silvestri, 1896.

Cylindroiulus luscus salicis Verhoeff, 1926.

Distribution

AT, BE, CH, DE, DK-DEN, ES-CNY, FI, FR-FRA, GB-GRB, GB-CI, GB-NI, HU, LU, NL, NO-NOR, PL, PT-MDR, PT-POR, SE, UA. Extended Atlantic. – Also North Africa (Algeria, Tunisia), introduced into Siberia and the Australian, Neotropical and Nearctic regions.

Habitat

Strongly synanthropic over most of its known range, found in botanical and other gardens, parks, cemeteries, horticultural nurseries, greenhouses, farms, in hay, on spoil heaps, quarries, scrub, in refuse on waste ground. There was an infestation of house walls in Belgium (Kime, 2004). Haacker (1968) found that it spread into surrounding woodland in West Germany, that it preferred high humidity and ate mainly leaves. Found in woodland litter in Portugal as well as Germany. In laurisilva with tree heather at 800–900 m on Tenerife (Monte de las Mercedes).

Remarks

Schubart (1934) thought that the species was probably introduced into northern Europe from the Mediterranean, and its occurrences on the Canary Islands and Madeira are certainly also due to introduction. However, while it occurs in North Africa, there are no records from Italy or continental Spain and only two or three from France, in western and central parts – Finistère (Blower 1987), Nièvre (Jawłowski 1933b), and possibly Vienne departments (a female). It may have been overlooked in the past because of known confusion with similar species, especially *C. parisiorum* and *C. arborum*. We have not shown on our map records from Göteborg and Piteå in Sweden, Buskerud in Norway, southern Finland, and Kiev in the Ukraine because these are from greenhouses.

192. *Cylindroiulus turinensis* (Brölemann, 1897)

Iulus turinensis Brölemann, 1897.

Distribution

IT-ITA (Piedmont).

Habitat

In the litter of woodlands and shaded rocky slopes with bushes; *Castanea*, *Corylus*, *Fagus*, *Acer*, *Berberis*; 1000–1500 m.

193. *Cylindroiulus unciger* Attems, 1952

Distribution

ES-SPA (Madrid and Zaragoza Provinces).

Habitat

A specimen from Peñaflores (Zaragoza) was collected on dry gypsum ground with planted *Pinus halepensis* trees.

194. *Cylindroiulus uncinatus* Strasser, 1969

Distribution

IT-SI.

Habitat

Islands off the west coast of Sicily.

195. *Cylindroiulus uroxiphos* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Laurisilva with *Castanea*, 725 m.

196. *Cylindroiulus velatus* Enghoff, 1982

Distribution

PT-MDR.

Habitat

Open woodland, 525–1000 m.

197. *Cylindroiulus ventanaea* Read, 2007

Distribution

ES-SPA (Galicia: La Coruña and Lugo Provinces).

Habitat

Quercus wood.

198. *Cylindroiulus verhoeffi* (Brölemann, 1896)

Iulus verhoeffi Brölemann, 1896.

Cylindroiulus henningsi Verhoeff, 1912.

Distribution

AT, CH (Ticino), FR-FRA (Savoy Alps), IT-ITA (Alpine Piedmont & Lombardy). Cisalpine & western Alps.

Habitat

Eurytope up to subalpine level, 1500 m (Pedroli-Christen 1993).

199. *Cylindroiulus vulnerarius* (Berlese, 1888)

Mesoiulus vulnerarius Berlese, 1888.

Typhloiulus vulnerarius auct.

Cylindroiulus ellingseni Verhoeff, 1912.

Distribution

BE, CZ, DE, FR-FRA, GB-GRB, GB-NI, IE, IT-ITA (from Liguria and Veneto south to Campania), NL, SE. – Also introduced into the Nearctic region.

Habitat

In association with wood and rich, decaying organic matter in contact with the soil. In Tuscany, Verhoeff (1908) found it beside a river in *Alnus* litter and under dead wood. Most records in other regions are urban or suburban, from gardens, parks, glasshouses, under manure heaps, compost or debris. Found in buried dead wood and in a mole's nest. It occurs in caves and catacombs.

Remarks

Schubart (1934) presumed an Italian origin and introduction into all the other countries. Its occurrence in a rural Belgian cave and its numerous captures in the Low Countries and in the United Kingdom and Ireland lead one to wonder if it survived recent glaciations in caves in the Mosan district of Belgium and perhaps elsewhere (Kime 2004; Kime & Dethier 2010). We have not shown on our map a record from Göteborg in Sweden because this is from a greenhouse.

200. *Cylindroiulus waldeni* Read, 1989

Distribution

PT-MDR.

Habitat

Laurisilva with giant *Ocotea* trees, under leaves and in soil between stones. 700–1000 m.

201. *Cylindroiulus xynon* Read, 1989

Distribution

PT-MDR.

Habitat

Laurisilva dominated by *Erica*, in soil under leaf litter.

202. *Cylindroiulus ynox* Read, 1989

Distribution

PT-MDR.

Habitat

Laurisilva dominated by *Erica*, in soil under leaf litter.

203. *Cylindroiulus zarcoi* Read, 1989

Distribution

PT-MDR.

Habitat

Laurisilva with giant *Ocotea* trees, under moss and lichens on *Ocotea*.

204. *Cylindroiulus zinalensis* (Faës, 1902)

Iulus zinalensis Faës, 1902.

Distribution

AT, CH, DE, IT-ITA. Swiss Alps and eastwards to the Rivers Inn and Adige.

Habitat

Montane and subalpine forests of several types (e.g., *Quercus*, *Fagus*, *Castanea*, mixed forest and often in conifers), bushy areas, heaths, moors and open marshy ground. Some forest sites are clearly calcareous. It has a wide altitudinal range up to over 2500 m.

Remarks

Pedroli-Christen (1993) noted that it is parapatric with, and morphologically similar to *Allajulus nitidus*.

Genus *Dolichoiulus* Verhoeff, 1900

Nesopachyiulus Attems, 1902.

Trichopachyiulus Verhoeff, 1910.

Anagaiulus Enghoff, 1992.

A large genus of over 50 species, the vast majority of which are found on the Canary Islands, with a few on the Madeiran Islands, the Cape Verde Islands and on the mainland of SW Europe + Morocco. Detailed descriptions of the species and information on their habitats and distribution may be found in Enghoff (1992, 2012) and Enghoff & Báez (1993).

205. *Dolichoiulus alluaudi* (Brölemann, 1901)

Pachyiulus alluaudi Brölemann, 1901.

Pachyiulus canariensis Brölemann, 1901.

Geopachyiulus alluaudi auct.

Geopachyiulus canariensis auct.

Nesopachyiulus alluaudi auct.

Nesopachyiulus canariensis auct.

Distribution

ES-CNY (Gran Canaria).

Habitat

Pinus forest under the needle litter and stones; also in bushes and grassland. Associated with species of *Euphorbia*, *Lavandula*, *Cistus*, *Castanea*, *Opuntia*, *Agave*, *Rubus*, *Prunus*, *Teline*. Occurs in the more humid central and northern parts of Gran Canaria, 150–1900 m.

206. *Dolichoiulus altitenerife* Enghoff, 1992

Distribution

ES-CNY (Tenerife).

Habitat

High altitude sites from forest, especially *Pinus canariensis* forest at an elevation of 1300 m to about 2000 m and *Spartocytisus* bushland above the forest, up to 2200 m. Under stones and in litter.

Remarks

Records so far confined to the Cordillera Dorsal to the north-east of Teide.

207. *Dolichoiulus aquasilvae* Enghoff, 1992

Distribution

ES-CNY (Monte del Agua, NW Tenerife).

Habitat

In a log in laurisilva.

208. *Dolichoiulus architheca* Enghoff, 1992

Distribution

ES-CNY (Gran Canaria).

Habitat

Open vegetation, known locally as “Tabaibas and Cardones”, typically dominated by large xerophytic species of *Euphorbia*. Also associated with *Launaea*, *Cistus*, *Echium*, *Eucalyptus*, *Lavandula*, *Micromeria*, *Kickxia*, *Beta*, *Opuntia*, *Plocama* and occasionally scattered *Pinus canariensis*. Often under stones and mainly in barrancos, gullies which only occasionally contain water, 50–950 m.

209. *Dolichoiulus axeli* Enghoff, 1992

Distribution

ES-CNY (Tenerife).

Habitat

Barren rocky sites, dry slopes with *Euphorbia* species (Taibabas & Cardones) and in lush bushy situations in the west coastal areas of Tenerife, 0–970 m.

210. *Dolichoiulus baezi* Enghoff, 1992

Distribution

ES-CNY (Tenerife).

Habitat

Collected from under stones in the Tabaibas and Cardones with *Euphorbia* and other xerophytes (*Lavandula*, *Kleinia*, *Zygophyllum*, *Neochamaelia*, *Plocama*) along the north coast of Tenerife, up to 150 m.

211. *Dolichoius blaucatypa* (Enghoff, 1992)

Anagaiulus blaucatypa Enghoff, 1992.

Distribution

ES-CNY (Tenerife).

Habitat

Laurisilva, found in the soil in the eastern part of the Anaga Mountains. It may also be in litter or under logs and stones.

212. *Dolichoius canariensis* (Pocock, 1893)

Iulus canariensis Pocock, 1893.

Distribution

ES-CNY (Tenerife).

Habitat

A wide variety of habitats from near the sea to an altitude of 3050 m on Mount Teide, where it occurs in the “retamar” (specialised mountain broom vegetation with endemic species which is usually above the cloud layer created by the north-east trade winds). Plentiful in the *Pinus canariensis* forest below the retamar, it is less frequently found on the dry slopes of the *Euphorbia* zone (Taibabas and Cardones) below the forest (and usually below the cloud layer), reaching the desert along the south coast. It has not been found in the laurisilva of the humid north-east.

Remarks

Widespread, though recorded mainly from the central part of the island in and around the National Park and on the south coast, often associated with *D. kraepelinorum* (Latzel, 1895). Replaced by *D. axeli* in the west and not yet recorded from the east coast (partly replaced by *D. insularis* (Brölemann, 1901)). Occurs higher than any other species of *Dolichoius*, at 3050 m (Enghoff 1992).

213. *Dolichoius carolineae* Enghoff, 1992

Distribution

ES-CNY (southern Gran Canaria).

Habitat

Very dry open areas with *Euphorbia*, under stones, 50–120 m.

214. *Dolichoius chioensis* Enghoff, 1992

Distribution

ES-CNY (Cueva Grande de Chio, W Tenerife).

Habitat

Cavernicolous.

215. *Dolichoiusulus dendromystax* Enghoff, 1992

Distribution

ES-CNY (Anaga Mts, Tenerife).

Habitat

Laurisilva, 600–900 m. Mostly found in epiphytic mosses and lichens on trees, under the flakes of bark of *Erica scoparia* and sometimes in logs on the ground.

216. *Dolichoiusulus dubiosus* Enghoff, 1992

Distribution

ES-CNY (La Gomera).

Habitat

A forest species, known only from El Cedro and Los Aceviños.

Remarks

The species was described from a female specimen which may correspond to a male described by Loksa (1967) from laurisilva and assigned by him to *D. tiendarius* (Attems, 1911). Subsequent, unpublished finds (material in ZMUC) including a male have confirmed this. *D. tiendarius* is similar to but smaller than *D. dubiosus* and is not a forest species.

217. *Dolichoiusulus eumadeirae* Enghoff, 1992

Distribution

PT-MDR (S coast).

Habitat

Open scrub with *Euphorbia*, *Aeonium*, *Opuntia*, *Rubus*, thistles, grasses, herbs. Stony slopes and screes on basalt.

218. *Dolichoiusulus fjellbergi* Enghoff, 1992

Distribution

ES-CNY (Santa Lucia, Gran Canaria).

Habitat

Upper dry zone, under plants on a cliff, 990 m.

219. *Dolichoiusulus fuerteventurae* Enghoff, 1992

Distribution

ES-CNY (Fuerteventura).

Habitat

More or less open vegetation in central and southern Fuerteventura with *Euphorbia*, *Argyranthemum*, *Sideritis*, *Asteriscus*, *Kleinia*, *Launaea* and grasses. On rocks in litter under bushes; under stones, moss and other vegetation, 370–760 m.

220. *Dolichoiusulus gara* Enghoff, 1992

Distribution

ES-CNY (La Gomera).

Habitat

Laurisilva, associated with logs and trees, under bark and moss pads, often several metres above the ground. Found well inside rotting wood. Has been observed in the soil, 900–1200 m.

Remarks

Seems to prefer slightly more moist/less superficial microsites than its syntopic congener, *D. senilis* (Attems, 1911).

221. *Dolichoiusulus heliophilus* Enghoff, 1992

Distribution

ES-CNY (S Gran Canaria).

Habitat

Under stones on dry rocky slopes with *Euphorbia*. A dry barranco. At low altitude near the sea.

222. *Dolichoiusulus hercules* (Schubart, 1960)

Nesopachyiulus hercules Schubart, 1960.

Distribution

ES-SPA (Málaga, Antequera, Mollina, Cueva de los Organos). – Also Morocco.

Habitat

Cavernicolous.

Remarks

Possibly a senior synonym of *D. ibericus* Ceuca, 1973 (Mauriès & Vicente 1977).

223. *Dolichoiusulus hyaena* Enghoff, 1992

Distribution

ES-CNY (Monte de las Mercedes, Anaga Mts, Tenerife).

Habitat

Laurisilva. In the soil and litter, rarely in logs, 860–900 m.

224. *Dolichoiusulus ibericus* Ceuca, 1973

Distribution

GB-GI (Glenrocky Cave).

Habitat

Cavernicolous.

Remarks

Possibly a junior synonym of *D. hercules*.

225. *Dolichoius ingae* Enghoff, 1992

Distribution

ES-CNY (Tenerife).

Habitat

Coastal sites of the eastern Anaga Peninsula, where it occurs under stones on slopes from sea level to 320 m. In the dry zone with *Euphorbia*, *Opuntia*, *Argyranthemum*, *Astydamia* and grasses.

226. *Dolichoius insularis* (Brölemann, 1901)

Pachyiulus insularis Brölemann, 1901.

Pachyiulus insularis penicillata Attems, 1903.

Pachyulus penicillatus auct.

Geopachyiulus insularis auct.

Geopachyiulus penicillatus auct.

Nesopachyiulus insularis auct.

Nesopachyiulus penicillatus auct.

Distribution

ES-CNY (S coast of Anaga Peninsula, Tenerife).

Habitat

Euphorbia scrubland and bushes. Under stones. Once in a cave.

227. *Dolichoius jandiensis* Enghoff, 1992

Distribution

ES-CNY (Jandia, S Fuerteventura).

Habitat

Grassy area with *Asteriscus*, under stones and under moss and higher plants on rocks. 720–750 m.

228. *Dolichoius jonay* Enghoff, 1992

Distribution

ES-CNY (Bosque del Cedro, La Gomera).

Habitat

In a relatively dry log in laurisilva-brezal. 1100 m.

229. *Dolichoius kraepelinorum* (Latzel, 1895)

Julus Kraepelinorum Latzel, 1895.

Pachyiulus kraepelinorum auct.

Trichopachyiulus kraepelinorum auct.

Nesopachyiulus kraepelinorum auct.

Distribution

ES-CNY (Tenerife).

Habitat

Found in many different habitats from sea level to about 2200 m. Abundant in *Pinus canariensis* forest where it is found in the litter, under stones and in the topsoil, sometimes in close association with the root mycorrhiza of the pines. It occurs above the forest in the sparse mountain vegetation of the Teide National Park, associated with *Spartocytisus nubigenus* and *Pterocephalus*. Below the forests it occurs in bushy areas, the extensive *Euphorbia* zone, in dry fields, coastal sites and a barranco with *Artemisia*, under stones.

Remarks

Widespread and common on Tenerife but apparently replaced by *D. insularis* on the south coast of the Anaga Peninsula and by *D. axeli* in the west.

230. *Dolichoiulus labradae* Enghoff, 1992

Dolichoiulus tiendarius – Izquierdo *et al.* 1986.

Distribution

ES-CNY (NE Tenerife).

Habitat

Cavernicolous.

231. *Dolichoiulus lasiurus* Enghoff, 1992

Distribution

ES-CNY (Tenerife).

Habitat

Laurisilva of the eastern part of the Anaga Mountains and from degraded laurisilva (fayal) above Güimar on the eastern slope of the Teide massif. Under stones, in the litter and in the soil, rarely in logs, 600–900 m.

232. *Dolichoiulus longunguis* Enghoff, 2012

Distribution

ES-CNY (Gran Canaria).

Habitat

Found in an artificial gallery.

233. *Dolichoiulus madeiranus* (Mauriès, 1970)

Nesopachyiulus madeiranus Mauriès, 1970.

Distribution

PT-MDR (Porto Santo).

Habitat

Sparsely vegetated habitat types on dry stony slopes, from sea level to about 200 m. Cushion plants, grass, lichens, herbs, thistles, *Euphorbia*, scattered *Tamarix*.

234. *Dolichoiusulus martini* Enghoff, 1992

Distribution

ES-CNY (Roque Bentayga near Artenara, Gran Canaria).

Habitat

Sparse soil and litter on small ledges of rocks with bushes, 1125 m.

235. *Dolichoiusulus mystax* (Brölemann, 1901)

Pachyiulus mystax Brölemann, 1901.

Geopachyiulus mystax auct.

Nesopachyiulus mystax auct.

Distribution

ES-CNY (Anaga Mts, NE Tenerife).

Habitat

Laurisilva, records being above 600 m and most about 800–900 m. Typically in *Laurus*, *Erica arborea* and *Erica scoparia* forest with mosses and ferns, often in ravines. Under stones, in the soil and under or in litter, moss and decaying logs.

236. *Dolichoiusulus nemasoma* Enghoff, 1992

Distribution

ES-CNY (Tenerife).

Habitat

Under stones in very dry lava-fields and open types of vegetation (*Launaea*, *Plocama* and frequently *Euphorbia*) including abandoned fields. A coastal species from sea level up to only 100 m for all sites where the altitude is known.

237. *Dolichoiusulus oromii* Enghoff, 2012

Distribution

ES-CNY (Gran Canaria)

Habitat

The mesovoid shallow stratum (MSS, “milieu souterrain superficiel”), a system of narrow crevices in the ground.

238. *Dolichoiusulus oskari* Enghoff, 1992

Distribution

ES-CNY (Gran Canaria).

Habitat

Open vegetation often dominated by species of *Euphorbia*, with *Kleinia*, *Aeonium*, *Opuntia*, and *Plocama* cited. On barranco slopes, terraces, cultivated fields. Found under stones from 50 to 900 m.

239. *Dolichoïulus parcestriatus* (Brölemann, 1901)

Pachyiulus parcestriatus Brölemann, 1901.

Geopachyiulus parcestriatus auct.

Nesopachyiulus parcestriatus auct.

Distribution

ES-CNY (N Gran Canaria).

Habitat

Open vegetation dominated by a few different species of *Euphorbia*, under the litter and under stones, 150–375 m.

240. *Dolichoïulus praesenilis* Enghoff, 1992

Distribution

ES-CNY (Parque Nacional de Garajonay, La Gomera).

Habitat

Laurisilva/fayal-brezal or plantations of *Pinus canariensis* with indigenous undergrowth (*Erica* and *Adenocarpus*). Under stones and in logs, 1150–1400 m, the summit region.

241. *Dolichoïulus quasimystax* Enghoff, 1992

Distribution

ES-CNY (Anaga Mountains, Tenerife).

Habitat

Litter in laurisilva.

Remark

The only specimen known was found in a deep ravine with a brook, together with *D. mystax*.

242. *Dolichoïulus rectangulus* Enghoff, 1992

Distribution

ES-CNY (La Gomera).

Habitat

Laurisilva/fayal-brezal. Under and in logs and in litter. 1150–1200 m.

Remarks

Records confined to the southwestern edge of the laurisilva zone, apparently vicariant with *D. gara*.

243. *Dolichoius salvagicus* (Latzel, 1895)

Julus salvagicus Latzel, 1895.
Pachyiulus salvagicus auct.
Geopachyiulus salvagicus auct.
Nesopachyiulus salvagicus auct.

Distribution

PT-SEL (Selvagem Grande and Grand Piton Island).

Habitat

Once collected under a succulent cushion plant.

244. *Dolichoius sansebastianus* (Attems, 1911)

Pachyiulus sansebastianus Attems, 1911.
Nesopachyiulus sansebastianus auct.

Distribution

ES-CNY (La Gomera).

Habitat

Unforested parts of La Gomera, especially in the drier southern part of the island. In xerophilous vegetation, lower to upper *Euphorbia* zone, associated also with *Cistus*, *Aeonium*, *Sonchus*, *Carlina*, *Plocama* and *Argyranthemum*, and littoral communities with *Salsola longifolia*. Under stones, in litter and the soil, 20–1200 m.

245. *Dolichoius senilis* (Attems, 1911)

Pachyiulus senilis Attems, 1911.
Nesopachyiulus senilis auct.

Distribution

ES-CNY (La Gomera).

Habitat

Laurisilva, found in logs and under their bark or under bark flakes or moss pads on living trees. May be several metres above the ground but sometimes in leaf litter and found at altitudes of 950–1200 m.

246. *Dolichoius silvahierro* Enghoff, 1992

Distribution

ES-CNY (El Hierro).

Habitat

Laurisilva, under bark, 1010–1030 m.

247. *Dolichoius silvapalma* Enghoff, 1992

Distribution

ES-CNY (La Palma).

Habitat

Laurisilva and brezal. Found in logs and under bark; under stones on the ground, 590–750 m.

248. *Dolichoius tiendarius* (Attems, 1911)

Pachyiulus tiendarius Attems, 1911.

Nesopachyiulus tiendarius auct.

Distribution

ES-CNY (La Gomera).

Habitat

Unforested parts of La Gomera. Open vegetation types in grassy zones, abandoned fields and barrancos, associated with *Euphorbia*, *Launaea*, *Plocama*, *Argyranthemum*, *Rumex*, *Schizogyne*, *Adenocarpus*. Found under stones, in plant litter and in dead *Euphorbia* stems, 10–1200 m. One record from *Pinus* forest at 1200 m.

249. *Dolichoius tongiorgii* (Strasser, 1973)

Amblyiulus tongiorgii Strasser, 1973.

Distribution

FR-FRA (Alpes-Maritimes and Gard departments), IT-ITA (San Rossore near Pisa, Porto Caleri S of Chioggia).

Habitat

Sandy beaches of the Mediterranean. Found with halophile isopods and amphipods. Also collected under the bark of a tree stump (Mauriès 1982).

250. *Dolichoius troglhierro* Enghoff, 1992

Distribution

ES-CNY (El Hierro, Cuaclo las Moleras cave).

Habitat

Cavernicolous.

251. *Dolichoius typhlocanaria* Enghoff, 2012

Distribution

ES-CNY (Gran Canaria).

Habitat

The mesovoid shallow stratum (MSS, “milieu souterrain superficiel”), a system of narrow crevices in the ground.

252. *Dolichoius typhlops* Ceuca, 1973

Distribution

ES-CNY (El Hierro, La Palma), ES-SPA (Cadiz, Málaga, Sevilla).

Habitat

In litter, soil and caves.

Remarks

Regarded as introduced on the Canary Islands (Enghoff 2002).

253. *Dolichoiusulus ultimus* Enghoff, 1992

Distribution

ES-CNY (Gran Canaria).

Habitat

Stony field with xerophytic bushes (*Euphorbia*, *Kleinia*, *Launaea*), 475 m.

254. *Dolichoiusulus variabilis* Enghoff, 1992

Distribution

ES-CNY (La Gomera, Tenerife).

Habitat

Found under stones and litter in open vegetation near the coast, associated with *Euphorbia*, *Plocama*, *launaea* and grass on La Gomera at La Crucita, 250 m. On Tenerife it is associated with *Solanum vesperilio* and *Aeonium lindleyi* litter at Punta del Hidalgo, 350 m.

Remarks

This is the only endemic Canarian *Dolichoiusulus* species occurring on more than one island. There is but one record from each of the two islands.

255. *Dolichoiusulus vosseleri* (Verhoeff, 1900)

Pachyiulus vosseleri Verhoeff, 1900.

Trichopachyiulus vosseleri auct.

Nesopachyiulus vosseleri auct.

Distribution

ES-CNY (Tenerife).

Habitat

Occurs in the more humid parts of Tenerife; from the relatively open areas near sea level the species occurs up into the frequently cloudy *Pinus canariensis* forests at 850 m. In the lower zones it may be found in association with stands of *Euphorbia canariensis*, *Euphorbia regis-jubae*, *Opuntia*, *Agave*, *Solanum vesperilio* – zones known locally as Tabaibes and Cardones. Found on sea slopes. Often under stones, sometimes in dead succulent plants.

256. *Dolichoiusulus wunderlichi* Enghoff, 1992

Distribution

ES-CNY (Lanzarote).

Habitat

Xerophilous vegetation. Litter under *Sideritis* on rocks; under *Euphorbia*, grass, etc. Lower dry zone, 350 m.

257. *Dolichoiulus xerohierro* Enghoff, 1992

Distribution

ES-CNY (El Hierro).

Habitat

Open coastal habitats from sea level to about 400 m. In dry, sandy, stony and beach fields, under stones and in rotten roots. Associated with *Schizogyne*, *Lotus*, *Plantago*, *Kleinia*, *Rumex*.

258. *Dolichoiulus xeropalma* Enghoff, 1992

Distribution

ES-CNY (La Palma).

Habitat

Fairly lush open vegetation, under rotten bark of *Echium* and in plant litter, 410–740 m.

259. *Dolichoiulus xylomystax* Enghoff, 1992

Distribution

ES-CNY (Tenerife).

Habitat

Laurisilva in the Anaga Mountains in north-eastern Tenerife. Mostly in logs.

260. *Dolichoiulus ypsilon* Enghoff, 1992

Distribution

ES-CNY (Tenerife).

Habitat

Cavernicolous, among plant roots on mud.

261. *Dolichoiulus zygodon* Enghoff, 1992

Distribution

ES-CNY (near Cuevas de Corcho, N Gran Canaria).

Habitat

Small moss pads in wet rock crevices on west-facing rockface outside the forest, 1300 m.

Genus *Elbaiulus* Verhoeff, 1930

262. *Elbaiulus carpinorum* Verhoeff, 1930

Distribution

IT-ITA (Elba Island).

Habitat

Dense woodland with *Castanea*, *Carpinus*, *Quercus laurifolia*, *Rubus*, *Clematis* mixed with maquis bushes, under a deeply embedded stone.

263. *Elbaiulus chrysopygus* (Berlese, 1888)

Iulus chrysopygus Berlese, 1888.

Mesoiulus scossirolli Manfredi, 1948.

Distribution

IT-ITA (Tuscany).

Habitat

Cavernicolous.

Genus *Enantiulus* Attems, 1894

Leptophyllum Verhoeff, 1895.

Metaleptophyllum Schubart, 1957.

264. *Enantiulus armatus* (Ribaut, 1909)

Leptophyllum armatum Ribaut, 1909.

Distribution

FR-FRA, GB-GRB. Atlantic.

Habitat

Forest and woodland - *Fagus*, *Fraxinus*, *Quercus*, *Carpinus*, *Tilia*, *Acer*, *Populus*, *Castanea*, *Corylus*. Under bark, in logs and in leaf litter. On several types of soil from clayey inundation forest to rendzinas on limestone, sandy areas and brown earths on metamorphic rocks. Mainly at low altitude but on high limestone plateaus ("causses") and in volcanic areas up to at least 900 m in the Massif Central of France. In England found in mainly coastal and synanthropic sites including a golf course.

Remarks

As things stand at present, all the records of *Enantiulus armatus* from France are from a zone south and west of the River Loire. All the British records are from Devon and Cornwall in SW England. Unless it has been introduced into England it ought to be found in NW France. In so far as it is eurytopic it resembles its congener to the east, *Enantiulus nanus* (Latzel, 1884) (see below).

265. *Enantiulus austriacus* (Verhoeff, 1896)

Leptophyllum austriacum Verhoeff, 1896.

Distribution

IT-ITA. Cisalpine.

Habitat

Between litter and stones in a shadowy place.

Remarks

Pedroli-Christen (1993) referred the records of *E. austriacus* given by Attems (1949) to *E. dentigerus*, but it is not clear that she regarded the two species as synonymous. For the time being, we regard both as valid.

266. *Enantiulus dentigerus* (Verhoeff, 1900)

Leptophyllum dentigerum Verhoeff, 1900.

Distribution

CH, IT-ITA. Cisalpine.

Habitat

Deciduous forests from 285 to 1000 m in Switzerland (Pedroli-Christen 1993). In Italy from 270 to 1100 m in litter and under stones in mainly *Castanea*, *Quercus* and *Robinia* woodland and bushy thickets, often on steep slopes (Reip, pers. comm.).

267. *Enantiulus karawankianus* (Verhoeff, 1908)

Leptophyllum karawankianum Verhoeff, 1908.

Distribution

AT, IT-ITA, SI.

Habitat

On calcareous ground under *Corylus* litter and in humus; under *Salix* litter.

268. *Enantiulus nanus* (Latzel, 1884)

Iulus nanus Latzel, 1884.

Leptophyllum nanum auct.

Distribution

AT, BA, BE, BG, CH, CZ, DE, DK-DEN, FR-FRA, HR, HU, IT-ITA, LT, LU, MK, MN, NL, PL, RO, SB, SE, SI, SK, UA. Central European.

Habitat

Eurytopic to a large degree though showing a preference for relatively warm and especially damp forests, including inundation forests with *Alnus* and/or *Populus*, marshes and bogs. Yet it occurs in *Fagus* forests on limestone and in deciduous, mixed or coniferous forests on many other types of rock, e.g., basalt, granite, gneiss and sandstone. It also occurs in bushy areas, heaths, pastures, moorland and even dry calcareous grassland over a large altitudinal range. In Switzerland, for instance, it has been found from 270 m to 2060 m (Pedroli-Christen 1993) and in Bulgaria up to 2400 m (Vagalinski & Stoev

2007). There are records from caves. It shuns urban sites and cultivated land and is most abundant in montane forests.

Remarks

Population densities of *E. nanus* are very high in many localities. It has been the subject of some detailed studies, e.g., Voigtländer (1987) and Kofler & Meyer (1992).

269. *Enantiulus simplex* (Verhoeff, 1926)

Leptophyllum simplex Verhoeff, 1926.

Distribution

AT.

Habitat

Under *Fagus* litter.

270. *Enantiulus tataranus* (Verhoeff, 1907)

Leptophyllum tataranum Verhoeff, 1907.

Distribution

HU, PL, SK.

Habitat

Cave entrance.

271. *Enantiulus transsilvanicus* (Verhoeff, 1899)

Leptophyllum transsilvanicum Verhoeff, 1899.

Distribution

AT, PL, RO, SI, UA.

Habitat

Found in pine-beech forest in Maramures (Romania) (Korsós & Lazányi 2008). Attems (1951) described ssp. *verrucosus* from a cave.

Genus *Enghophyllum* Lazányi & Vagalinski, 2013

272. *Enghophyllum naxium* (Verhoeff, 1901)

Brachyiulus naxius Verhoeff, 1901.

Chromatoiulus naxius auct.

Megaphyllum naxium auct.

Distribution

GR-CYC (Naxos, Antiparos), GR-DOD (Mavri Islet).

Habitat

Litter.

273. *Enghophyllum sifnium* Lazányi & Vagalinski, 2013

Distribution

GR-CYC (Sifnos).

Genus *Geopachyiulus* Verhoeff, 1899

274. *Geopachyiulus negreai* Tabacaru, 1978

Distribution

RO (Caras-Severin Province, River Caras valley).

Habitat

Leaf litter of deciduous forests.

275. *Geopachyiulus nematodes* (Latzel, 1884)

Iulus nematodes Latzel, 1884.

Distribution

RO (Braşov, Timiş, Hunedoara and Salaj Provinces).

Habitat

Humus-rich earth in woodland and gardens, several centimetres below the surface.

Genus *Haplophyllum* Verhoeff, 1897

276. *Haplophyllum mehelyi* (Verhoeff, 1897)

Micropodoiulus mehelyi Verhoeff, 1897.

Distribution

RO, UA (East Carpathian).

Habitat

Mountains up to alpine levels.

Genus *Haplopodoiulus* Verhoeff, 1898

277. *Haplopodoiulus spathifer* (Brölemann, 1897)

Micropodoiulus spathifer Brölemann, 1897.

Distribution

ES-SPA, FR-FRA, GB-GRB. Western half of the Pyrenees and at least the eastern half of the Northern Spanish Cordillera, extending north into the Landes in France. Probably introduced into Britain.

Habitat

Deciduous, mixed and coniferous woods: common in forests of *Fagus* and *Quercus* (mainly deciduous but some evergreen) and sometimes found with *Acer*, *Alnus*, *Pinus*, *Platanus*, *Robinia* and *Salix*. Associated shrubs or small trees are *Buxus*, *Ilex*, *Corylus*, *Ligustrum*, *Crataegus*, *Juniperus*, *Sambucus*, *Viburnum*, *Genista*, *Ruscus*, *Cornus* and *Daphne*. *Lonicera*, *Clematis* and *Rubus* are frequently present

in the woods. It has occasionally been collected in stony pastures but usually in the presence of some thorny bushes, e.g., *Prunus* and/or a few trees. Most of the reported sites were on limestone, up to 1400 m in the mountains. It shows a preference for deep deciduous leaf litter which retains moisture (Corbet & Jones 1996).

Remarks

In all probability introduced into the south of England because all four known sites are connected with botanical gardens in which it survives.

Haploporoiulus spathifer may largely dominate the diplopod population in suitable sites, occurring in very large numbers. The eastern limit of this species in the Pyrenees is fairly clear but the other limits of its distributional range are not yet known. It may well be confined to the Atlantic biogeographic zone.

Genus *Heteroiulus* Verhoeff, 1897

Heteroporoiulus Silvestri, 1897.

278. *Heteroiulus intermedius* (Brölemann, 1892)

Julus intermedius Brölemann, 1892.

Allajulus salvadorii Silvestri, 1896.

Distribution

IT-ITA (Piedmont, Liguria, Lombardy, Venetia).

Habitat

Castanea, *Carpinus*, *Quercus* woodland, in deep litter layers, especially in the lower, more decomposed part.

Genus *Hylopachyiulus* Attems, 1904

279. *Hylopachyiulus pygmaeus* (Attems, 1904)

Pachyiulus pygmaeus Attems, 1904.

Micropachyiulus corylorum Verhoeff, 1908.

Hylopachyiulus likanus Attems, 1927.

Distribution

AT, BA, HR, IT-ITA, SI.

Habitat

Under deeply embedded stones in *Fagus* woodland, 1100 m (Strasser 1966). Under *Corylus* (Verhoeff 1908). One record from a cave.

Genus *Hypsoiulus* Verhoeff, 1913

280. *Hypsoiulus alpivagus* (Verhoeff, 1897)

Iulus (Leptoiulus) alpivagus Verhoeff, 1897.

Distribution

AT, CH, DE, FR-FRA, IT-ITA. Alpine.

Habitat

Mainly alpine; when lower down it is generally in deep, cool gorges or in caves. Petrophile on sedimentary rocks – rocky outcrops, screes, bases of cliffs, old river beds, limestone pavements and alpine meadows in mosaics with stony and rocky places. Found between 600 m and 2800 m in Switzerland (Pedroli-Christen 1993), as low as 500 m in Vorarlberg, Austria (Mathis 1951).

Remarks

Two varieties have been described, the small typical form and the taxon *alpivagus suevicus* Verhoeff, 1908, the latter being larger and rare, confined to a few sites in Germany and Switzerland.

Genus *Interleptoiulus* Mršić, 1988

281. *Interleptoiulus cernagoranus* Mršić, 1988

Distribution

MN.

Habitat

The only information is “near the source of the Ribnica, in the vicinity of Titograd [= Podgorica]”.

Genus *Julus* Linnaeus, 1758

Iulus auct.

Micropodoiulus Verhoeff, 1893.

The type genus of the family Julidae, consisting of four species in Europe. The vast majority of the numerous European species originally described in *Julus/Iulus* have been transferred to other genera.

282. *Julus curvicornis* Verhoeff, 1899

Distribution

SK.

Habitat

Principally *Quercus-Carpinus* and *Fagus* forests in central and western parts of Slovakia. According to Stašiov (2002, 2005), suitable sites were *Quercus-Carpinus* forest litter with low humus and carbon content, high nitrogen content and maximum degree of saturation capacity of the soil and litter layers; some of the forests were relatively young, with smaller trees (40–60 yrs), but at least one well-populated stand was 80–100 years old. In *Fagus* stands there was more activity in litter of relatively low pH. Trees listed from the sampling sites were *Quercus petraea*, *Q. cerris*, *Q. dalechampii*, *Q. virgiliana*, *Carpinus betulus*, *Fagus sylvatica*, *Fraxinus excelsior*, *Tilia cordata*, *Acer campestre*, *Picea abies*, *Abies* sp. Site records indicate a vertical distribution between 200 and 930 m in the area studied, with *Quercus* forest lower down, increasingly mixed with *Fagus* going higher up and then replaced by mainly montane *Fagus* forests, some (*Fagetum dealpinum*) on dry, steep calcareous slopes. True Central European xerothermic mixed *Quercus* woodland on sunny, base-rich soils too dry for *Fagus* includes *Lithospermo-Quercetum*, another quoted habitat. *Julus curvicornis* was also recorded from mixed *Fagus*, *Abies* and *Picea* (*Fagetum Abietino-piceosum*) which is situated above 850 m.

Remarks

A record from Déj, NW Romania (Verhoeff 1899) is based on a female and is not shown on the map.

283. *Julus scandinavicus* Latzel, 1884

Julus scandinavicus Latzel, 1884.

Julus ligulifer Latzel & Verhoeff, 1892.

Micropodoiulus ligulifer auct.

Julus terrestris auct.

Distribution

AT, BE, CH, CZ, DE, DK-DEN, FR-FRA, GB-GRB, GB-NI, HU, IE, LU, NL, NO-NOR, PL, SE, SK. Central European, extending north to Britain, Ireland and S Scandinavia. – Also introduced into the Nearctic Region.

Habitat

A very common animal, eurytopic to some degree, it is chiefly a species of woodland, although it occurs frequently on heaths, wetlands, humid open grassland and sand dunes. While it has been found in moderately dry calcareous grassland it appears to be generally absent from forests on limestone. It prefers woods characteristic of lighter acidic soils on a sandy or loamy substrate, for instance on the Lüneburger Heide in Germany where it is found in *Pinus/Betula* with *Calluna*, *Molinia* and ferns and in *Alnus* and *Populus* stands in wetter areas (Lindner *et al.* 2010). Similarly, in Belgium it is strongly associated with *Erica/Calluna* heaths, ranging into *Pinus/Betula/Quercus* woodland and *Alnus* by streams. Another strongpoint is the coastal dune area. Higher up in the Ardennes it is abundant in *Fagus* and coniferous forest. Many authors associate it with a thick litter/humus layer; Barlow (1957) related this to its preference for high humidity and its avoidance of extreme conditions. Kime & Wauthy (1984) listed it as intermediate in specialisation on habitat, neither a generalist nor a specialist. According to Lee (2006) it shows a strong negative association with cultivated land and waste ground.

Common microsites are below stones or rock, in leaf litter and in grass tussocks.

Remarks

One of the most frequently recorded European species within its quite large range. The map therefore gives a good indication of the recording effort across Central Europe. Rather isolated to the east are the records of Ložek & Gulička (1962) who give Humenné and Michalovce in E Slovakia.

Golovatch (pers. comm.) states that the published records by Lang (1954) from the Carpathian area in the Ukraine (and East Slovakia?) are erroneous and we have omitted them. Ložek & Gulička (1962) give Humenné and Michalovce in E Slovakia which we include.

Haacker (1969) described the mating behaviour of *J. scandinavicus*.

284. *Julus scanicus* Lohmander, 1925

Julus terrestris scanicus Lohmander, 1925.

Distribution

AT, CZ, DE, DK-DEN, HU, LV, SE, SK. Discontinuous in Central Europe.

Habitat

Deciduous woodland, mostly damp, even very damp biotopes like *Alnus* swamps, also (wet?) heathland. Regarded as a eurytopic hygrobiont woodland species with preference for floodplains and swamp forests in Saxony-Anhalt, Germany (Voigtländer 2011).

Remarks

The known distribution is very patchy. There is a group of populations in the Danube basin in Austria, Hungary, SW Slovakia and SE Czech Republic, another in E Germany (Brandenburg), a patch near Oldesloe in Schleswig-Holstein, more on the Danish islands of Sjaelland and Bornholm, in SW Sweden, and finally an isolated record from Skangalia in Latvia.

285. *Julus terrestris* Linnaeus, 1758

Micropodoiulus terrestris auct.

Julus rugifrons Meinert, 1868.

Distribution

BY, CZ, DE, DK-DEN, EE, FI, HR, HU, LT, LV, PL, RO, RU-KGD, SB, SE, SK, UA.

Habitat

Forests, *Fagus* woodland, mixed forest, bushes, “Erlenbruch” (Erle = *Alnus*), humid *Alnus* swamps, wet heaths with *Myrica gale*, sandbanks with *Hippophaë*, lowland meadows with or without shrubs, grass tussocks.

Remarks

Tajovský (2001) stated that there are no recent records from the Czech Republic and that the validity of historical data is questionable. In view of this we omit Czech records from our map.

Genus *Kryphioiulus* Read, 1990

286. *Kryphioiulus occultus* (C.L. Koch, 1847)

Allajulus occultus C.L. Koch, 1847.

Cylindroiulus occultus auct.

Ypsiloniulus occultus auct.

Distribution

AT, CZ, DE, HU, LT, NO-NOR, PL, RO, RU-KGD, RU-RUC, SE, SK, UA. East Central European.

Habitat

In SE Germany it is common in damp deciduous woodland on basic rocks and in former vineyards. Spelda (1999) quoted the edge of a wood on Muschelkalk in Baden-Württemberg at the western limit of its range. Numerous recorders have cited woodland including *Quercus*, *Fagus* and *Pinus*, as well as *Alnus* swamps. Under stones and bark.

In an important paper involving this species Voigtländer (1987) stated that it is hygrophilic and prefers warm calcareous sites, becoming increasingly synanthropic towards the northern part of its range, where it may occur on other soils and is found in gardens, parks, cemeteries, greenhouses and town ramparts. This applies to other peripheral records. Regarded as a stenotopic xerobiont woodland species with preference for xeric/mesoxeric meadows, fields and fallows in Saxony-Anhalt, Germany (Voigtländer 2011).

Genus *Lamellotyphlus* Tabacaru, 1976

287. *Lamellotyphlus belevodae* Makarov, 2008

Distribution

SB (Bele Vode Cave, Mt Miroč in eastern Serbia).

Habitat

Cavernicolous.

288. *Lamellotyphlus mehedintzensis* (Tabacaru, 1976)

Typhloiulus mehedintzensis Tabacaru, 1976.

Distribution

RO (several caves at the western end of the southern Carpathians).

Habitat

Cavernicolous.

289. *Lamellotyphlus sotirovi* Makarov, Mitić & Ćurčić 2002

Distribution

SB (Buronov Ponor Cave, Mt Miroč in eastern Serbia).

Habitat

Cavernicolous.

Genus *Leptoiulus* Verhoeff, 1894

A large genus of over seventy described species which is almost exclusively European. Several subgenera have been denoted, and very many subspecific and infrasubspecific names have been suggested which are not listed here. Our interpretation of the species and names should, despite the valuable help of J.-P. Mauriès, be regarded as a preliminary one, to be tested by future revisionary work.

290. *Leptoiulus abietum* Verhoeff, 1914

Distribution

AT (Northeast Alps).

Habitat

Coniferous and mixed woodland, 600–1400 m (Schubart 1934).

291. *Leptoiulus alemannicus* (Verhoeff, 1894)

Iulus allemannicus Verhoeff, 1894.

Distribution

AT, CH, CZ, DE, HR, IT-ITA, SI. Subalpine-Alpine.

Habitat

Occurs from about 800 m up to 2800 m without any very evident habitat preference between river banks, screes, rocky areas, moraines, subalpine meadows (1960–1980 m) and alpine meadows including *Rhododendro-vaccinietum-cembretosum* (2070 m); *Rhododendro-Vaccinion* (2100–2190 m); communities of *Empetro-Vaccienetum uliginosi* with extended lichen-heaths (2250–2340 m); a stony *Loiseleurieto-Cetrarietum* (2500–2550); *Hygrocurvuletum* (2650 m) (Meyer 1985; Pedroli-Christen 1993;). It also occurs in some forests, especially shady slopes with *Alnus viridis*, *Fagus* (Schubart 1934; Strasser, 1940) and conifers (Verhoeff 1913). Microsites under decaying wood, heaps of rubble and stones. Active from June to November, with a pronounced peak in July (Pedroli-Christen 1993).

Remarks

Records from the Czech Republic are discounted, following Tajovský (2001). Verhoeff created a few subspecies of *L. alemannicus*. The most southerly records which are from a relatively low altitude on the Island of Cres and the South of Slovenia belong to the subspecies *L. alemannicus austriacus* Verhoeff, 1910 (Mršić 1994).

292. *Leptoiulus arelatus* Bigler, 1919

Distribution

FR-FRA, IT-ITA. Piedmontese Alps.

Habitat

Alpine. Up to over 2600 m.

Remarks

Apparently more or less restricted to NW Piedmont. In France it has been found only close to the frontier.

293. *Leptoiulus atticus* Strasser, 1970

Distribution

GR-GRC.

294. *Leptoiulus baconyensis* (Verhoeff, 1899)

Julus alemannicus baconyensis Verhoeff, 1899.

Leptoiulus bakonyensis auct.

Leptoiulus alemannicus auct.

Leptoiulus vagabundus auct.

Leptoiulus vagabundus baconyensis auct.

Distribution

HR, HU, PL, RO, SI, SK, UA.

Habitat

Forest. By stream in *Fagus* forest (Korsós & Lazányi 2008). *Fagus-Acer* forest with *Alnus* (Jawłowski 1931).

295. *Leptoiulus belgicus* (Latzel, 1884)

Iulus belgicus Latzel, 1884.

Julus gracilis Rothenbühler, 1899.
Leptoiulus albolineatus auct.

Distribution

AT, BE, CH, DE, ES-SPA, FR-FRA, GB-CI, GB-GRB, GB-NI, IE, IT-ITA, LU, NL. Extended Atlantic from northern Spain to Germany.

Habitat

Eurytopic but showing a tendency to occur along river courses and in coastal areas, whether in forests, bushy areas, hedges, grasslands, or on sandbanks and dunes. Found in large numbers under stones in the intertidal zone on a sandy beach on the south coast of Wales (Kime 2004). It climbs readily, occurring in vegetation and moss on old roofs in Southwest France. Apparently thermophile, while it shows no clear preference for one type of soil, it favours warm sites in well-drained positions on limestone, light loams or sand. It was found in xeric scrub societies in Saxony-Anhalt, Germany (Voigtländer 2011), and has been regarded as a eurytopic xerobiont woodland species with preference for thermophilous oak woods. Known, too, from a well-drained *Fagus silvatica* forest with *Pinus* and *Cytisus* at an altitude of just below 1000 m in the Haute Loire Department of France, it has been recorded at 1100 m in Spain (Kime 1990) and 1800 m on a south-facing slope in Switzerland (Pedroli-Christen 1993). Sometimes on spoil heaps of old coal mines. *L. belgicus* is most active in late summer and autumn (Morgan 1989; Pedroli-Christen 1993; Kime 1997).

Remarks

According to the literature it has a highly patchy distribution, more than might be deduced from its supposed preferences. Of the many regions investigated, some have yielded many records and others scarcely any. In Italy, reported only near Aosta (Manfredi 1937) and doubted by Strasser (1978a). It is found nearby in the Upper Rhône Basin.

The white dorsal stripe mentioned in its description is not always present; moreover, marbled specimens possessing absolutely typical gonopods have been found in France. Its regional variability and abundance not only, but particularly in SW France, Benelux and SW England, together with S Wales, suggest that it is a relict species indicative of survival during glacial times.

296. *Leptoiulus bertkaui* (Verhoeff, 1896)

Iulus bertkaui Verhoeff, 1896.

Distribution

CH, DE, FR-FRA, LU. Meuse, Rhine and Weser river basins.

Habitat

Humid areas, usually in close proximity to rivers; these may be open (meadows and marshes) or more frequently closed (wooded river margins, inundation forest). It prefers natural or semi-natural biotopes. In the Meuse Basin associated with woodland (*Salix*, *Alnus*, *Betula*, *Quercus*, *Fagus*) on greensand or in valleys in Jurassic limestone. Most active in springtime. Found as high as 1000 m above sea level in the south of its range.

Remarks

For almost a century it was known only from the Rhine Basin. Then it was reported from the Rhône Basin, but only near Geneva in Switzerland, not very far from the headwaters of the Rhine (Pedroli-

Christen 1993). More recent finds in *Alnus* and *Quercus* woods in the Meuse Basin in France and the upper Weser Basin near Kassel in Germany (Voigtländer & Hauser 1998) add extensively to its range.

297. *Leptoiulus borisi* Verhoeff, 1926

Leptoiulus rylaicus Verhoeff, 1928.

Leptoiulus macrovelatus Schubart, 1934.

Distribution

BG.

Habitat

Mainly montane and alpine, on both limestone and granite, and as high as 2750 m in the Pirin Mountains (Beron 2008). Lower down it occurs in *Quercus petraea*, *Fagus sylvatica* and coniferous forests (Vagalinski & Stoev 2007).

Remarks

While this species occurs mainly in the mountains of SW Bulgaria, there are isolated records from the centre and the Black Sea coast.

298. *Leptoiulus brentanus* Verhoeff, 1926

Distribution

IT-ITA (Southern Alps).

Habitat

Found in the Brenta Valley and in the Trentino (Monte te Pari, 1600–1800 m).

299. *Leptoiulus brevivelatus* Bigler, 1919

Distribution

FR-FRA, IT-ITA. Western Alps.

Habitat

Alpine, on the frontier in Piedmont and Rhône-Alps.

300. *Leptoiulus broelemanni* (Verhoeff, 1895)

Iulus broelemanni Verhoeff, 1895.

Distribution

AT, CH, IT-ITA. Southern Alpine.

Habitat

Thermophile and eurytopic; found in warm situations from 193 m to 1700 m, mostly in the lower part of the range (Pedroli-Christen 1993). *Castanea* forest. Once in a cave.

301. *Leptoiulus bruyanti* Ribaut, 1951

Distribution

FR-FRA (Morvan, Massif Central).

Habitat

Apparently montane. Recorded from sites between 500 m and 900 m in altitude in the beech forests of the Morvan Massif in Burgundy, in pure *Fagus* forest with no ground vegetation, or with *Pinus*, with *Ilex* or with *Quercus*, *Ilex*, *Sorbus aucuparia* and *Rubus*. Alternatively high up in mixed *Fagus*, *Abies* and *Picea* forest. In the south of the Massif Central it was found on the open Causse de Sauveterre (a limestone plateau at 900 m in the Department of Lozère) under a small group of trees. Occurs on sedimentary, metamorphic and volcanic rocks.

Remarks

All the recorded sites for this endemic French species are cited in Kime & Iorio (2010).

302. *Leptoiulus carpinorum* Verhoeff, 1929

Distribution

HR (North-west).

Habitat

Under *Carpinus*, *Fagus* and *Acer* litter at Plitvice.

303. *Leptoiulus cernagoranus* (Attems, 1927)

Microiulus cernagoranus Attems, 1927.

Distribution

MN.

Remarks

Described from a single male from an unknown site in the country.

304. *Leptoiulus chiesensis* Verhoeff, 1934

Distribution

IT-ITA (Lombardy).

Habitat

River gorges around the northern end of Lake Garda and in the Giudicarie Valley to the west.

305. *Leptoiulus cibdellus* (Chamberlin, 1921)

Iulus minutus Porat, 1889, preoccupied.

Iulus cibdellus Chamberlin, 1921.

Leptoiulus minutus auct.

Distribution

AT, BY, CZ, DE, DK-DEN, EE, FI, HU, LT, PL, RO, RU-KGD, RU-RUW, SE, SK. Central Europe.

Habitat

Moist localities with decaying leaves. Wet areas with *Alnus* and *Salix*, swampy meadows (Schubart 1934), it has been associated with *Iris* and puddles of water. Grassy woodland, e.g., *Quercus*, *Fraxinus*.

Remarks

Precise localities for this species are lacking from LV, and largely lacking from BY and LT, where the species is probably more widespread than shown on the map.

306. *Leptoiulus czarnohoricus* Jawłowski, 1928

Distribution

UA (East Carpathian).

Habitat

Forested mountains.

307. *Leptoiulus demangei* Schubart, 1962

Distribution

ES-SPA, FR-FRA. Catalan Pyrenees.

Habitat

Woodland, with mention of *Fagus silvatica*, *Quercus petraea* and *Castanea sativa*. Meadow with trees. In leaf litter. Records from 550 m to 1150 m. Believed to be hygrophile (Vicente 1985).

308. *Leptoiulus deubeli* (Verhoeff, 1897)

Iulus deubeli Verhoeff, 1897.

Distribution

RO, UA (East Carpathian).

Habitat

Alpine. Above forests under stones.

309. *Leptoiulus discophorus* (Attems, 1927)

Microiulus discophorus Attems, 1927.

Distribution

AL (northern mountains).

Habitat

Unknown.

310. *Leptoiulus dolinensis* Verhoeff, 1928

Distribution

HR, SI. Dinaric Alps.

Habitat

Fagus forest, valleys; under boards.

311. *Leptoiulus durmitorius* (Attems, 1927)

Microiulus durmitoricus Attems, 1927.

Distribution

MN (Durmitor Mt).

312. *Leptoiulus faesi* Bigler, 1919

Distribution

CH (Alps).

Habitat

Calcicole, collected under stones in alpine meadows, 2170–2500 m.

Remarks

A doubtful species similar to *L. helveticus* according to Pedrolí-Christen (1993), who found only *L. helveticus* at one of Bigler's sites that she reinvestigated.

313. *Leptoiulus frigidarius* Verhoeff, 1913

Distribution

IT-ITA (Alps).

Habitat

Found at 2500 m altitude.

314. *Leptoiulus garumnicus* (Ribaut, 1904)

Iulus garumnicus Ribaut, 1904.

Distribution

FR-FRA (north side of Central Pyrenees: Haute Garonne, Ariège).

Habitat

Rural sites between 500 m and 800 m in altitude are quoted, but the vegetation is generally not specified. In garden refuse and under stones. Known to be active in autumn with *L. belgicus*.

315. *Leptoiulus gilvicollis* Verhoeff, 1932

Distribution

FR-FRA, IT-ITA.

Habitat

Broad-leaved forest.

Remarks

There is an unpublished note by Ribaut in his papers located in the Muséum national d'Histoire naturelle (Paris) that this species was found at Fontan in the Alpes Maritimes in France.

316. *Leptoiulus hauseri* Strasser, 1976

Distribution

GR-GRC (Epirus).

Habitat

Found in two places, Kato Kalentini at 230 m and Anemoraki at 410 m.

317. *Leptoiulus helveticus* (Verhoeff, 1894)

Iulus helveticus Verhoeff, 1894.

Iulus odieri Brölemann, 1896.

Leptoiulus odieri auct.

Leptoiulus vagabundus auct.

Distribution

AT, CH, IT-ITA. Alps and Jura Mountains.

Habitat

Predominantly in alpine meadows, rocky outcrops and screes on sedimentary strata. *Castanea* and coniferous forest. Found at an altitude as low as 500 m in the Jura but up to 2800 m in the Alps.

Remarks

Several subspecies have been described. Pedroli-Christen (1993) suggested that it may be a polytypic species including *L. faesi* and *L. sarasini*.

318. *Leptoiulus hospitelli* Brölemann, 1901

Iulus laurorum Verhoeff, 1908.

Distribution

FR-FRA (Alpes Maritimes), IT-ITA (Piedmont and Liguria), MC.

Habitat

Under *Corylus* leaves close to snowfields (in April) near the Tende/Tenda Pass from Italy into the Maritime Alps in France, at an altitude of 1400–1500 m. In a damp meadow, under stones, 200 m. One record from a cave.

Remarks

Very similar to *L. piceus* and regarded as a synonym of the latter by Brolemann (1924).

319. *Leptoiulus ivanjicae* Ćurčić & Makarov, 1997

Distribution

SB (West).

Habitat

Quercus and *Fagus* litter.

320. *Leptoiulus juvenilis* (Ribaut, 1908)

Julus juvenilis Ribaut, 1908.

Distribution

FR-FRA (north side of Central Pyrenees: Haute Garonne, Hautes Pyrénées).

Habitat

Montane, usually at about 1000 m. Several sites are mentioned without ecological details; some are known to be forests.

321. *Leptoiulus kervillei* (Brölemann, 1896)

Iulus kervillei Brölemann, 1896.

Leptoiulus vanoyei De Queker, 1957.

Distribution

BE, DE, FR-FRA, GB-CI, GB-GRB, LU, NL. Mild Atlantic.

Habitat

Very strictly linked with woodland, almost always deciduous (*Fagus*, *Quercus*, *Carpinus*, *Robinia*) with rich organic layers on the woodland floor (mull or mull-moder humus) and on loamy soils; scarce on very sandy or heavy clay substrates. There are records from old spoil heaps re-colonized by forest. In Britain, at the northern end of its range, it has a largely coastal distribution with a preference for non-calcareous loams (Lee 2006). Its distribution in the west and north of France, Belgium, Luxemburg, NW Germany, the southern tip of the Netherlands and the south of England and Wales links it with a mild, oceanic climate. It is principally a lowland species, occurring up to about 600 m in the Massif Central. Adults are mainly found in the spring when they breed.

Remarks

The apparent preference for non-calcareous soils in Britain may be connected with the scarcity of calcareous soils in the southwest where it is most abundant. It does occur on chalk formations in the southeast as it does in France, especially in *Fagus* forest. Analyses made in Belgium, where it is closely associated with silty soil (“limon”) on which it is very common, suggested that *L. kervillei* is very specialized with regard to habitat. Climatic requirements aside, soil texture is the predominating factor, more important than pH (Kime & Wauthy 1984; Kime *et al.* 1992).

322. *Leptoiulus korongsius* (Attems, 1904)

Julus korongsius Attems, 1904.

Distribution

PL, RO, UA. East Carpathians.

Habitat

Mainly alpine, up to 1700 m on Mt Howerla, under stones or in grass tussocks, sometimes in high-level conifers.

323. *Leptoiulus krueperi* (Verhoeff, 1900)

Julus krueperi Verhoeff, 1900.

Distribution

GR-GRC (central mountains).

Habitat

Discovered in the alpine zone of Mt Koras.

324. *Leptoiulus laetedorsalis* (Verhoeff, 1898)

Iulus laetedorsalis Verhoeff, 1898.

Microiulus laetedorsalis auct.

Distribution

BA (south), MN.

Habitat

Forest, e.g., *Fagus*. Under moss; in a large, rotting log.

325. *Leptoiulus legeri* (Brölemann, 1897)

Julus legeri Brölemann, 1897.

Distribution

FR-FRA (Mediterranean, extending north and west).

Habitat

Little information. Under moss and debris.

326. *Leptoiulus liptauensis* (Verhoeff, 1899)

Julus ciliatus liptauensis Verhoeff, 1899.

Distribution

PL, SK. Carpathian.

Habitat

Higher mountain forests: spruce and pine (*Oxalido-Picetum*, *Vaccinio-myrtilli-Pinetum*) 1240–1755 m on Nizké Tatry Mts; mainly calcicole and in small numbers in the Zapadné Tatry on subalpine *Vaccinium myrtillus* heath and alpine grassland (1660–1750 mm) – details in Tajovský (1997). Lower down in eastern Slovakia found in deciduous forests (*Alnus*, *Fagus*, *Carpinus*) at 440–500 m (Mock 1999).

327. *Leptoiulus macedonicus* (Attems, 1927)

Microiulus macedonicus Attems, 1927.

Xestoiulus macedonicus auct.

Distribution

AL, GR-GRC, MK, SB (Kosovo).

Habitat

Upper *Fagus* forests and alpine; in litter, under stones. Up to 2550 m on Alpet, Albania (Beron 2008).

328. *Leptoiulus magnus* Bigler, 1919

Distribution

IT-ITA (Piedmont).

Habitat

High alpine, very close to the French frontier. Up to at least 2650 m.

329. *Leptoiulus mariae* Gulička, 1952

Distribution

SK (Muranska Plateau).

Habitat

Trogloxene. Cave entrance.

330. *Leptoiulus matulicii* (Verhoeff, 1901)

Julus matulicii Verhoeff, 1901.

Microiulus matulicii auct.

Distribution

BA (far south) MN (near Adriatic).

Habitat

Fagus forest.

331. *Leptoiulus meridionalis* (Brölemann, 1897)

Iulus meridionalis Brölemann, 1897.

Distribution

ES-SPA, FR-FRA. Basque Country and Western Pyrenees.

Habitat

Forest, especially *Fagus* woods; in litter up to around 1000 m. On one occasion in evergreen *Quercus* with *Rubus* and moss. Also in stony meadows, on dry slopes but often near streams, sometimes with *Prunus* scrub and scattered *Fagus* trees, recorded on lower slopes from 300 m. In a town park with *Platanus* and *Castanea*.

332. *Leptoiulus montivagus* (Latzel, 1884)

Iulus montivagus Latzel, 1884.

Iulus braueri Verhoeff, 1895.

Iulus tosanus Verhoeff, 1916.

Leptoiulus braueri auct.

Leptoiulus weberi Verhoeff, 1927.

Leptoiulus tosanus zurstrasseni Verhoeff, 1929.

Leptoiulus catascaphicus Verhoeff, 1931.

Leptoiulus triglavensis Strasser, 1940.

Distribution

AT, CH, CZ, DE, FR-FRA, IT-ITA, SI. Alpine.

Habitat

Alpine meadows, under stones. In Switzerland it is found in pastures and dry grassland from as low as 280 m in the north. In the south it occurs from 920 to 2860 m (Pedroli-Christen 1993). It reaches 2400 m in Slovenia, where it was found under stones and in cushions of turf (Strasser 1940). In Bavarian woods it may be found under decaying bark and below moss on blocks of granite (Schubart 1934). Kobel-Lamparski (1987) found it to be the most abundant millipede in vineyards in Kaiserstuhl, southern Germany, and gave detailed information on its population structure.

Remarks

Among all the species of *Leptoiulus* with complicated taxonomic histories, *L. montivagus* probably takes the prize. It seems to be a relict species surviving at high altitudes, formerly widespread during the ice age, and since then the now isolated populations on the summits of mountain chains have diversified to some degree. Regarded as highly endangered in Germany (Voigtländer *et al.* 2011).

333. *Leptoiulus noricus* Verhoeff, 1913

Leptoiulus alemannicus auct.

Leptoiulus simplex auct.

Leptoiulus marcomannius Verhoeff, 1913.

Leptoiulus simplex obenbergeri Gulička, 1965.

Distribution

AT, CZ, DE, SK. Sudetico-Carpathian.

Habitat

In forest litter, both deciduous and coniferous, from 500 to 1900 m.

Remarks

The *noricus* records are predominantly Austrian and come from a compact area mainly in the Salzburg sector of the Alps (including part of SE Bavaria) while the *marcomannius* records come from E Bavaria, the Czech Republic and Slovakia. Also dubiously recorded from PL, see under *L. simplex*.

334. *Leptoiulus oribates* (Latzel, 1884)

Julus oribates Latzel, 1884.

Leptoiulus simplex oribates auct.

Distribution

AT, IT-ITA. Corinthian and Gailtaler Alps.

Habitat

High Alpine. Trogkofel, Rosskofel and Gartnerkofel (Strasser 1959).

335. *Leptoiulus pentheri* (Attems, 1927)

Microiulus pentheri Attems, 1927.

Distribution

MN.

Remarks

The type and so far only locality, Koštica, is a location on Prokletije Mt, on the border between Montenegro and Albania but in the territory of MN.

336. *Leptoiulus piceus* (Risso, 1826)

Iulus piceus Risso, 1826.

Distribution

FR-FRA, IT-ITA, MC, PT-MDR.

Habitat

Mediterranean coastal vegetation, gardens.

Remarks

Regarded as introduced on Madeira (Enghoff 2008).

337. *Leptoiulus polonicus* Jawłowski, 1930

Leptoiulus trilobatus polonicus Jawłowski, 1930.

Distribution

PL, UA. North-east Carpathian (Bieszczady, Pieniny and Gorgany Mountains).

338. *Leptoiulus pretneri* Strasser, 1940

Distribution

SI (Sanntal Alps).

339. *Leptoiulus proximus* (Němec, 1896)

Julus proximus Němec, 1896.

Julus ciliatus bükkensis Verhoeff, 1899.

Leptoiulus trilobatus buekkensis auct.

Leptoiulus vagabundus auct.

Leptoiulus ciliatus auct.

Leptoiulus trilobatus auct.

Distribution

AT, BY, CZ, DE, DK-DEN, FI, HR, HU, LT, LV, MD, NL, NO-NOR, PL, RO, RU-KGD, RU-RUC, RU-RUE, RU-RUN, RU-RUW, SE, SI, SK, UA.

Habitat

Deciduous woodland, *Quercus*, *Carpinus*, *Alnus*, *Betula*, and also some coniferous woods, e.g., *Picea*, and especially *Pinus*; generally shady and humid to wet low-lying woods with thick moder litter; bushy areas by streams, *Alnus* swamps; cemeteries.

Remarks

The effects of flooding on a *L. proximus* population were studied by Tufová (2003).

340. *Leptoiulus remyi* Schubart, 1962

Distribution

ES-SPA, FR-FRA. Catalan Pyrenees.

Habitat

Wooded areas, e.g., *Pinus halepensis*, *Quercus suber*, *Olea* groves, maquis with *Rosmarinus* and *Lavandula*. In litter and under stones. At low altitude and up to at least 800 m. Xerophile in Mediterranean habitats (Vicente 1985).

Remarks

All the records were from the Mediterranean end of the Pyrenees until recently, when it was reported from an evergreen oakwood in Navarre (H. Reip in litt.).

341. *Leptoiulus riparius* (Verhoeff, 1894)

Iulus riparius Verhoeff, 1893.

Iulus baldensis Verhoeff, 1896.

Iulus nivicomis Verhoeff, 1901.

Leptoiulus nivicomis auct.

Distribution

AT, CH, IT-ITA. South Central Alpine.

Habitat

Mostly stony alpine meadows, 1050–2630 m, in sunny localities but in subalpine and montane zones as well (Pedroli-Christen 1993).

Remarks

The distribution of *L. riparius* was discussed in detail by Thaler & Meyer (1974).

342. *Leptoiulus roszkowskii* Jawłowski, 1930

Distribution

RO, UA. NE Carpathian.

Habitat

Found at 809 m in Prut valley.

Remarks

A possibly rare species of the NE Carpathians described from the Prut valley above Vorokhta in the south of Ivano-Frankovsk Province in the Ukraine and reported by Ceuca (1967) from Durau in Ceahlau National Park in the province of Neamt in NE Romania.

343. *Leptoiulus saltuvagus* (Verhoeff, 1898)

Iulus marmoratus Attems, 1895.

Julus saltuvagus Verhoeff, 1898.

Leptoiulus vagabundus auct.

Distribution

AT, CH, DE, HR, HU, IT-ITA, SI. Central and Eastern Alps.

Habitat

Woodland in the montane zone, e.g., *Quercus*, *Carpinus*, *Tilia*, *Castanea*, *Fraxinus*, *Acer*, *Fagus*, *Pinus* and occasionally *Picea*, and with *Cornus*, *Ligustrum* and *Crataegus* in the shrub layer. These habitats range up to about 1500 m. It is also found at some open sites. Higher up it occurs in sub-alpine meadows, the *Rhododendron/Vaccinium* shrub layer and at *Alnus viridis* sites at about 2000 m in Tyrol. It occurs above 2000 m in *Empetrum-Vaccinietum-uliginosi* heaths with lichens (Pedroli-Christen 1993, Meyer 1985, Voigtländer *et al.* 1997). Beron (2008) gives an altitudinal range from 700 m to 2500 m.

Remarks

The synonymy *saltuvagus* = *marmoratus* follows Attems (1927). Pending revisionary work on this species complex, we use the better known, albeit younger name, *saltuvagus*. The species seems to be quite tolerant with regard to water loss (Meyer & Eisenbeis 1985).

344. *Leptoiulus sarajevensis* Verhoeff, 1898

Julus sarajevensis Verhoeff, 1898.

Macedoiulus storkani Verhoeff, 1932.

Distribution

BA, BG, HR, MK, MN, SB (Serbia, Kosovo).

Habitat

Mountains.

Remarks

See under *L. storkani* Verhoeff, 1932.

345. *Leptoiulus sarasini* Bigler, 1929

Distribution

CH (Engadine).

Habitat

Under blocks of limestone on an alpine meadow (2320–2550 m).

Remarks

Bigler (1929) described the species from two males found with *L. helveticus* in the Swiss National Park. It is very similar to *L. helveticus* (see Pedroli-Christen 1993) and has not been found again.

346. *Leptoiulus semenkevitchi* Lohmander, 1928

Distribution

UA.

Habitat

Forest-steppe endemic.

Remarks

A relict species in the Red Data Book of the Ukraine, known from Goloseyevo near Kiev and Zolotonosha in the Cherkassy Region (S. Golovatch, pers. comm.).

347. *Leptoiulus simplex* (Verhoeff, 1894)

Julus alemannicus simplex Verhoeff, 1894.

Julus alemannicus glacialis Verhoeff, 1908.

Leptoiulus simplex glacialis auct.

Leptoiulus marcomannius traunianus Verhoeff, 1913.

Distribution

AT, BE, CH, DE, FR-FRA, HR, HU, IT-ITA, LU, SB, SI. Alpine and parts of Central Europe.

Habitat

Mainly alpine. In the Central High Alps it occurs mainly in grassland and lichen-heath with *Empetrum* at about 2200–2300 m (Meyer 1985), reaching as high as 3300 m. In Switzerland it is the most frequently encountered species in open alpine and open or closed subalpine habitats. It is often found in boggy areas at about 1500 m. At lower altitudes it is confined to cool and humid forests, often coniferous areas in the Black Forest, or *Fagus* woods, as in the Jura and Italy and again in some boggy areas (Meyer 1985; Pedroli-Christen 1993; Spelda 1999). Found in *Erica cinerea* cushions scattered with *Fagus* leaves in the montane zone (500–750 m) near Laveno in Italy (Verhoeff 1930). Discovered in several coniferous and *Fagus* forests and in a raised bog in the Belgian Ardennes, all at about 550 m, but even lower down in the Viroinval and in the Moselle Valley in the Grand Duchy of Luxemburg (Kime 2004). It has an unusually large altitudinal range of over 3000 m. Found under stones in pastures, in tree stumps, under rotten wood, moss and ferns in woodland.

Remarks

A glacial relict (Schubart, 1934). The distribution is unusual; beyond the Alps it reaches Belgium to the northwest and Serbia to the southeast. Also recorded from Poland in the east by Enghoff & Kime (2009), but as *Leptoiulus simplex marcomannius*, which is presumably *Leptoiulus noricus* Verhoeff, 1913. Its distribution in Poland is logical for *L. noricus* and not for *L. simplex*. These records are not shown on either map. Taxonomically close to *L. alemannicus*, its complicated taxonomic history was explained by Spelda (1999).

348. *Leptoiulus storkani* Verhoeff, 1932

Microiulus (Oroiulus) storkani auct.

Xestoiulus (Oroiulus) storkani auct.

Leptoiulus (Oroiulus) jaroslavi Mauriès, Golovatch & Stoev, 1997.

Distribution

AL?, GR-GRC?, HR?, MK.

Habitat

The type locality is “Korab, Duboka Recka” which refers to a stream (Duboka Recka) on Mt Korab on the border between Albania and Macedonia. No ecological details.

Remarks

This species has the same *locus typicus* as *L. sarajevensis* to which it is similar. Makarov *et al.* (2004) claim that it is a Macedonian endemic. Mauriès *et al.* (1997) proposed the replacement name *Leptoiulus jaroslavi* to avoid secondary homonymy with *Macedoiulus storkani* Verhoeff, 1932. Inasmuch as the latter species is regarded as a junior synonym of *Leptoiulus sarajevensis* Verhoeff, 1898, the replacement is unnecessary.

Attems' data cite presence in Epirus in Greece and Albania; however, many of these were collected in the first decade of the 20th century and do not apply to present day national boundaries – several species quoted by Attems for Albania are often in other bordering countries, or even Bulgaria.

349. *Leptoiulus tatricus* Gulička, 1956

Distribution

SK.

Habitat

Alpine region of Tatra Mts.

350. *Leptoiulus tendanus* Verhoeff, 1930

Distribution

FR-FRA, IT-ITA.

Habitat

Leaf litter of *Fagus* and *Corylus* in two woods near the mountain pass of Tenda (Tende) close to the French-Italian border, at an altitude of 1200–1500 m.

351. *Leptoiulus transsylvanicus* (Daday, 1889)

Julus transsylvanicus Daday, 1889.

Distribution

RO (Southern Carpathian).

Habitat

Alpine; under stones and grass tussocks.

Remarks

Known only from the Retezat and Bucegi Mountains (Transylvanian Alps).

352. *Leptoiulus trilineatus* (C.L. Koch, 1847)

Julus trilineatus C.L. Koch, 1847.

Julus silvivagus Verhoeff, 1898.

Distribution

AL, AT, BA, BG, CH?, GR-GRC, HR, IT-ITA, MK, MN, RO, SB, SI, TR-TUE. Southern Alps, largely Balkan, and Transadriatic.

Habitat

A widely distributed Balkan species found from sea level up to well above 2000 m in the Balkan Mountains – 2150 m on Durmitor (Beron 2008), 2200–2300 m in the Rila Mountains (Vagalinski & Stoev 2007). Reported from woodland dominated by *Fagus sylvatica*, several species of *Quercus*, *Carpinus betulus*, *C. orientalis*, *Abies* and *Pinus* spp. Also in open habitats (meadows and alpine grasslands). Collected from leaf litter, under stones and bark, on a limestone slope, between *Corylus*, *Rubus* and *Ruscus*.

Troglophile, for instance caves in the Italian province of Puglia – Strasser (1965) argues that it was one of the Balkan species which was able to cross the Adriatic when the sea level was much lower than today, before the breaching of the Straits of Gibraltar.

Remarks

Widespread and common from the southern Alps to Greece and Turkey. There are also records from Piedmont and Liguria (NW Italy), e.g., by Verhoeff (1932a), but we are in doubt about these (the quite similar *L. hospitelli* occurs in the same area) and have omitted them from the map. We have also omitted some records from Apulia and Calabria (S Italy) referred by Strasser (1970), as these probably concern other species. There have been no records of this species from Switzerland since Verhoeff (1913) collected it near Lugano, although the site was revisited (Pedroli-Christen 1993).

353. *Leptoiulus trilobatus* (Verhoeff, 1894)

Iulus trilobatus Verhoeff, 1894.

Iulus ciliatus Verhoeff, 1897.

Iulus Adensameri Verhoeff, 1897.

Distribution

AT, CZ, DE, HU, PL, RO, SK, UA.

Habitat

Submontane and montane closed forests, including *Picea* forest. Has been found in peat bogs.

354. *Leptoiulus tussilaginis* (Verhoeff, 1907)

Iulus tussilaginis Verhoeff, 1907.

Distribution

HU (North-west), PL (Tatra Mts), SK (Nizke Tatra Mts; Muranska Plateau). (Western) Carpathians.

Habitat

Mountains. Subalpine coniferous woodland. Cave entrance. The isolated record from Hungary was from hills adjoining the Austrian Burgenland. Most records are over 850 m.

355. *Leptoiulus umbratilis* (Ribaut, 1905)

Iulus umbratilis Ribaut, 1905.

Distribution

ES-SPA, FR-FRA (Pyrenees, Landes).

Habitat

Montane woodland, e.g., *Quercus*, *Castanea*, in litter, on tree trunks, below moss. *Pinus* forest associated with *Sorbus aucuparia*, *Vaccinium*, *Rhododendron*, *Lonicera*, *Rubus fruticosus*, *R. idaeus*, *Aconitum*, *Gentiana*, *Campanula*, *Epilobium*. Pasture being invaded by woody plants, 1130 m. *Echinopartum* shrubland, 1272 m (Serra *et al.* 1996). Under logs in pasture near old *Pinus* forest, 1600 m. Thus, so far found from a height of 95 m in the Landes up to at least 1600 m in the Pyrenees.

Remarks

The recent discovery of this species in the lowland pine forests in the Department of the Landes, on the west coast of France, about 175 km north-west of the nearest previously known locality, is noteworthy.

356. *Leptoiulus uncinatus* Ribaut, 1951

Distribution

FR-FRA (Pyrenees near the Mediterranean Sea).

357. *Leptoiulus vagabundus* (Latzel, 1884)

Iulus vagabundus Latzel, 1884.

Leptoiulus hermagorensis Verhoeff, 1928.

Leptoiulus lignivagus Verhoeff, 1928.

Distribution

AT, SI.

Habitat

Forest. Under wood, litter and moss; under *Blechnum* ferns.

358. *Leptoiulus vieirae* (Verhoeff, 1900)

Iulus vieirae Verhoeff, 1900.

Distribution

PT-POR.

Habitat

Captured in *Robinia/Quercus/Pinus* litter at Sintra, west of Lisbon by P.T. Bailey in November, 1986, in a pitfall trap (pers comm.).

Remarks

The only other record is from the vicinity of Coimbra – Verhoeff's locus typicus.

359. *Leptoiulus zagrebensis* Verhoeff, 1929

Distribution

HR, SI.

Habitat

Forest, under litter. Cave in Slovenia (Strasser 1940).

Genus *Leptotyphloiulus* Verhoeff, 1899

360. *Leptotyphloiulus coeruleoalbus* (Verhoeff, 1899)

Typhloiulus coeruleoalbus Verhoeff, 1899.

Distribution

AL, BA.

Habitat

Fagus forest, in litter.

Remarks

Recorded from Albania by Ceuca (1992) who did, however, not give an exact locality.

361. *Leptotyphloiulus dolinensis* (Verhoeff, 1901)

Typhloiulus dolinensis Verhoeff, 1901.

Distribution

BA (South Hercegovina).

Habitat

In deep humus of a valley.

Remarks

Supposed endemic found at Suma near Trebinje.

Genus *Macheiroiulus* Verhoeff, 1901

362. *Macheiroiulus compressicauda* Verhoeff, 1901

Distribution

GR-GRC (Epirus and Thessalia).

Habitat

Subalpine wood.

Genus *Mammamia* Akkari, Stoev & Enghoff, 2011

363. *Mammamia profuga* Akkari, Stoev & Enghoff, 2011

Distribution

IT-ITA (Prov. Taranto).

Habitat

Cavernicolous.

Remarks

Only known from Grotta della Cava; the cave is now destroyed.

Genus *Megaphyllum* Verhoeff, 1894

Brachyiulus auct., non Berlese, 1884.

Chromatoiulus auct., non Verhoeff, 1894.

Cerabrachyiulus Verhoeff, 1901.

This large genus is distributed from Central Europe to the Middle East and the Caucasus and is currently under study by Eszter Lazányi and Boyan Vagalinsky. The vast majority of the European species occur in the Balkan Peninsula (Lazányi *et al.* 2012).

364. *Megaphyllum anatolicum* (Attems, 1926)

Chromatoiulus anatolicus Attems, 1926.

Chromatoiulus anatolicus denticulatus Strasser, 1969.

Megaphyllum anatolicum denticulatum – Lazányi *et al.* 2012.

Distribution

BG, GR-GRC.

Habitat

Open areas; grassland with *Pinus* trees; under stones in disused quarry. Up to 1350 m in Turkey; 50–244 m in Bulgaria (Vagalinski & Stoev 2007).

Remarks

Bulgarian specimens were described as ssp. *denticulatus* Strasser, 1969. The nominate subspecies inhabits Asia Minor. Specimens from Greece seem to be intermediate (Strasser 1974).

365. *Megaphyllum argolicum* (Verhoeff, 1900)

Brachyiulus argolicus Verhoeff, 1900.

Chromatoiulus argolicus auct.

Distribution

GR-GRC (Peloponnese).

Habitat

Under *Malva*-like bushes between soil and plant litter; under *Laurus* litter.

Remarks

The species has not been found again since 1900.

366. *Megaphyllum austriacum* (Latzel, 1884)

Iulus austriacus Latzel, 1884.

Brachyiulus austriacus auct.

Chromatoiulus austriacus auct.

Brachyiulus dahli Verhoeff, 1901.

Chromatoiulus austriacus dahli auct.

Chromatoiulus dahli auct.

Distribution

BA, HR, IT-ITA, MK, MN, SI, SB. Balkan from Venezia to Macedonia.

Habitat

Woodland and bushy areas. Reported from woods with *Ruscus* in Croatia (Verhoeff, 1929).

Remarks

Lazányi *et al.* (2012) discussed the status of the taxon *dahli* and concluded that it is at most a subspecies of *austriacum*.

367. *Megaphyllum beroni* (Strasser, 1973)

Chromatoiulus beroni Strasser, 1973.

Distribution

BG (Rhodope Mountains).

Habitat

A cave near Triglad at 1150 m.

Remarks

Known only from the type locality. It does not look like a troglobiont and is probably a rare surface living form (Lazányi *et al.* 2012).

368. *Megaphyllum bicolor* (Loksa, 1970)

Chromatoiulus bicolor Loksa, 1970.

Megaphyllum bicolor crassiflagellum Mauriès & Karamaouna, 1984.

Distribution

GR-CYC, GR-DOD.

Habitat

The subspecies *crassiflagellum* is the dominant millipede in the *Juniperus* maquis ecosystem on the island of Naxos (Karamaouna & Geoffroy 1985).

369. *Megaphyllum bosniense* (Verhoeff, 1897)

Brachyiulus bosniensis Verhoeff, 1897.

Chromatoiulus bosniensis auct.

Chromatoiulus cotinophilus Loksa, 1962.

Distribution

AL, AT, BA, BG, GR-GRC, HR, HU, IT-ITA, MK, MN, RO, SB, SI.

Habitat

Woodland, e.g., *Fagus*, *Acer*, *Quercus*, *Carpinus*, *Fraxinus*, *Tilia*, *Castanea*, *Picea*, *Pinus*. Also pastures and a city park. Up to at least 1400 m. Collected in litter, under stones and bark.

370. *Megaphyllum brachyurum* (Attems, 1899)

Brachyiulus brachyurus Attems, 1899.

Megaphyllum brachyurus thassensis Mauriès, 1985.

Distribution

GR-GRC. – Also Asiatic Turkey, Iran, Russia, from the Caucasus north to Stavropol District, Georgia, Azerbaijan.

Habitat

Forests in the mountains of Eastern Turkey where it has been found on a few occasions between 1700 m and 2500 m above sea level; also in forests in southern parts of Russia east of the Black Sea where the nominal subspecies occurs at lower altitudes. In Greece ssp. *thassensis* was found in a cave.

Remarks

The nominal subspecies lives in the Caucasus (Russia, Georgia, Azerbaijan). On present evidence there is a very large gap between the populations in Eastern Turkey, Iran, Azerbaijan, Georgia and from the Caucasus as far north as Stavropol District, just south of the *Fauna Europaea* mapping area, on the one hand and the subspecies *thassensis* Mauriès, 1985, in Greece on the other.

371. *Megaphyllum byzantinum* (Verhoeff, 1901)

Brachyiulus byzantinus Verhoeff, 1901.

Chromatoiulus byzantinus auct.

Distribution

TR-TUE. – Also Asiatic Turkey.

Habitat

Forest.

372. *Megaphyllum carniolense* (Verhoeff, 1897)

Brachyiulus carniolensis Verhoeff, 1897.

Brachyiulus austriacus carniolensis auct.

Chromatoiulus carniolensis auct.

Brachyiulus monticola Verhoeff, 1898.

Chromatoiulus monticola auct.

Megaphyllum monticola auct.

Distribution

AL, BA, HR, MN, SB, SI.

Habitat

Forests, under litter but especially under moss cushions on old or dead trees (Verhoeff 1929). *Fagus* forest, under wood. Under *Saxifraga* cushions. Up to 2000 m on Bjelasnica Mountain.

373. *Megaphyllum cephalonicum* (Strasser, 1974)

Chromatoiulus cephalonicus Strasser, 1974.

Distribution

GR-GRC.

Habitat

Quercus coccifera woodland.

374. *Megaphyllum chiosense* Lazányi & Korsós, 2012

Distribution

GR-GRC (Chios Island).

375. *Megaphyllum crassum* (Attems, 1929)

Chromatoiulus crassus Attems, 1929.

Distribution

MK, SB. Šar Planina mountain range.

Habitat

Fagus forest.

376. *Megaphyllum creticum* (Strasser, 1976)

Chromatoiulus margaritatus var. *cretica* Strasser, 1976.

Megaphyllum cretica auct.

Distribution

GR-KRI.

Habitat

Found at heights of 1500–2200 m.

Remarks

Described as a variety, elevated to full species status by Ćurčić *et al.* (2001).

377. *Megaphyllum cygniforme* Lazányi & Korsós, 2012

Distribution

GR-GRC (Greek Macedonia).

Habitat

At brook in secondary forest and on rocky pasture, 370–442 m.

378. *Megaphyllum danyi* Lazányi & Korsós, 2012

Distribution

GR-GRC (Arcadia County, Peloponnese).

Habitat

Platanus galley along Lousios River.

379. *Megaphyllum dentatum* (Verhoeff, 1898)

Brachyiulus dentatus Verhoeff, 1898.

Chromatoiulus dentatus auct.

Distribution

AL, BA, BG, MK, MN, SB.

Habitat

Forest, under litter.

Remarks

The imprecise record from Bulgaria stems from the mention by Attems (1929) of “East Rumelia”, an old province of the Ottoman Empire comprising much of Southern Bulgaria, the capital of which was Philippopolis (now Plovdiv). The species was listed from Albania by Ceuca (1992) who gave no precise locality.

380. *Megaphyllum digitatum* Lazányi & Korsós, 2012

Distribution

GR-GRC (Arcadia County, Peloponnese).

Habitat

Picea forest and grassland, 1310 m.

381. *Megaphyllum erythronotum* (Latzel, 1884)

Julus austriacus var. *erythronotus* Latzel, 1884: 299.

Brachyiulus banaticus Verhoeff, 1899.

Chromatoiulus banaticus auct.

Megaphyllum banaticum auct.

Distribution

RO.

Habitat

Forests, under litter.

Remarks

This species has mostly been referred to under Verhoeff's species epithet *banaticum*.

382. *Megaphyllum euphorbium* (Verhoeff, 1900)

Brachyiulus euphorbium Verhoeff, 1900.

Chromatoiulus euphorbium auct.

Distribution

GR-GRC (Peloponnese).

Habitat

Alpine grassland and rocky areas. Under dead *Euphorbia* stems in stony desert. Also found in *Abies-Pinus* forest in Aroania Mts near Kalavrita. Known sites well over 1000 m in altitude.

383. *Megaphyllum glossuliferum* (Schubart, 1934)

Chromatoiulus glossulifer Schubart, 1934.

Megaphyllum glossulifer auct.

Distribution

BG (Stara Planina and Rila Mountains).

Habitat

Subalpine and alpine, 2200–2400 m. In coniferous forest, beneath bark and stones, and in alpine grassland. Found in grass litter in granite scree near snowfield.

384. *Megaphyllum hercules* (Verhoeff, 1900)

Brachyiulus unilineatus hercules Verhoeff, 1900.

Chromatoiulus hercules auct.

Distribution

AL, BG, GR-GRC, MK, UA. South Balkan.

Habitat

In diverse habitats from anthropogenic habitats to montane forests, 180–2100 m (Lazányi *et al.* 2012). Scrub, gravel, under stones and bark. Leaf litter.

Remarks

There are records from Ljuboten, a peak on Šar Planina Mt on the frontier of Macedonia with Kosovo (SB).

385. *Megaphyllum imbecillum* (Attems, 1935)

Chromatoiulus imbecillus Attems, 1935.

Distribution

AL, GR-GRC, MK. Epirus region.

Habitat

Fallen leaves in a virgin *Platanus* forest. Near springs. 410–704 m.

Remarks

Strasser (1976) described two varieties of *M. imbecillum* which were listed as subspecies by Ceuca (1992). He suggested that this might be the most common *Megaphyllum* species in the Epirus.

386. *Megaphyllum karschi* (Verhoeff, 1901)

Brachyiulus karschi Verhoeff, 1901.

Chromatoiulus karschi auct.

Distribution

AL.

Habitat

Leaf litter.

387. *Megaphyllum kievense* (Lohmander, 1928)

Chromatoiulus kievensis Lohmander, 1928.

Distribution

MD, RO, RU-RUC, UA.

Habitat

Steppe and forest-steppe zones: calciphilous steppe with *Hyssopus* and *Artemisia*, meadows and limestone denudations (Prisnyi 2001).

388. *Megaphyllum lamelliferum* (Strasser, 1974)

Chromatoiulus lamellifer Strasser, 1974.

Megaphyllum lamellifer auct.

Distribution

GR-GRC (Epirus).

Habitat

Young coniferous plantation, 550 m. Oakwood (*Quercus*), 360 m.

389. *Megaphyllum leucadium* (Attems, 1929)

Chromatoiulus leucadius Attems, 1929.

Distribution

GR-GRC (island of Lefkada).

Remarks

Supposed endemic, similar to species on other Ionian islands.

390. *Megaphyllum lictor* (Attems, 1904)

Brachyiulus lictor Attems, 1904.

Chromatoiulus lictor auct.

Distribution

BG, RO, TR-TUE. East Balkan.

Habitat

Broad-leaved forests, especially *Quercus*. Also *Fagus*. Up to 1500 m.

391. *Megaphyllum loebli* (Strasser, 1974)

Chromatoiulus loebli Strasser, 1974.

Distribution

GR-GRC (Peloponnese).

Habitat

Gorges with forest; conifers and *Platanus*, in leaf litter. One site at 885 m.

Remarks

Only two known sites, a ravine at Kalavrita and a gorge at Korfes in Arkadia County.

392. *Megaphyllum margaritatum* (Fanzago, 1875)

Julus margaritatus Fanzago, 1875.

Chromatoiulus margariatus auct.

Brachyiulus aetnensis Verhoeff, 1910.

Brachyiulus garganensis Verhoeff, 1932.

Distribution

GR-GRC, IT-ITA, IT-SI.

Habitat

Pastures. *Fagus* forest. One record at 990 m in the Epirus and only above 1200 m in Calabria.

Remarks

Strasser (1974, 1976) described three varieties of *M. margaritatum*, one of which is now regarded as a separate species, *M. creticum*.

393. *Megaphyllum metsovoni* (Strasser, 1976)

Chromatoiulus metsovoni Strasser, 1976.

Distribution

GR-GRC (Epirus and Parnassos Mountains)

Habitat

Found at 1630 m in the Metsovon Pass and in *Picea* forest at 1115 m on Parnassos Mts.

394. *Megaphyllum montivagum* (Verhoeff, 1901)

Brachyiulus montivagus Verhoeff, 1901.
Brachyiulus latesquamosus Attems, 1903.
Chromatoiulus montivagus auct.
Chromatoiulus latesquamosus auct.
Chromatoiulus macedonicus Strasser, 1976.
Megaphyllum latesquamosum auct.
Megaphyllum macedonicum auct.

Distribution

GR-GRC, MK, SB.

Habitat

Found in woodland in Athens, in the suburbs of Skopje, Macedonia, on the shore of Lake Prespa, in dry grassland and gallery forest; near water. 700–1650 m.

Remarks

Lazányi *et al.* (2012) discussed the synonymy and variability of this apparently quite versatile species.

395. *Megaphyllum mueggenburgi* (Verhoeff, 1901)

Brachyiulus mueggenburgi Verhoeff, 1901.
Chromatoiulus mueggenburgi auct.
Cerabrachyiulus mueggenburgi auct.

Distribution

GR-DOD (Kasos, Karpathos).

Habitat

Found between 800 and 1400 m (Lazányi *et al.* 2012).

396. *Megaphyllum platyurum* (Latzel, 1884)

Iulus platyurus Latzel, 1884.
Chromatoiulus platyurus auct.

Distribution

RO, SB.

Habitat

Under moist, rotting fallen giant fir trees (Verhoeff 1897); troglaxene.

Remarks

Recorded in northern Serbia without a precise locality.

397. *Megaphyllum projectum* Verhoeff, 1894

Brachyiulus projectus deubeli Verhoeff, 1899.
Brachyiulus dioramus Verhoeff, 1907.
Brachyiulus projectus kochi Verhoeff, 1907.

Brachyiulus projectus dioritanus Verhoeff, 1907.

Brachyiulus austriacus auct.

Chromatoiulus projectus dioritanus auct.

Chromatoiulus projectus dioritanus auct.

Chromatoiulus projectus kochi auct.

Megaphyllum projectum kochii auct.

Distribution

AT, BY, CZ, DE, HR, HU, LT, MD, NL, PL, RO, RU-KGD, SI, SK, UA. Central European.

Habitat

Forest, e.g., *Quercus*, *Carpinus*, *Fagus*, *Acer*, *Fraxinus*, *Pinus*. Slope woodland. Under stones in thick litter and in areas with dead wood on the ground. *Alnus* swamp woodland, “responsible for the mass transformation of decaying litter with its large abundance” (Korsós & Lazányi 2008).

398. *Megaphyllum recticauda* (Attems, 1903)

Brachyiulus recticauda Attems, 1903.

Chromatoiulus recticauda auct.

Chromatoiulus recticauda discrepans Strasser, 1976.

Distribution

GR-GRC (Corfu).

Remarks

The only species of *Megaphyllum* on Corfu, found in various places.

399. *Megaphyllum rhodopinum* (Verhoeff, 1928)

Brachyiulus rhodopinus Verhoeff, 1928.

Chromatoiulus rhodopinus auct.

Distribution

BG, GR-GRC. East Balkan.

Habitat

Deciduous and coniferous forests, meadows, pastures and caves. Decaying wood. From 550 to 2100 m altitude (Golovatch & Kondeva 1992; Vagalinski & Stoev 2007).

400. *Megaphyllum rosenauense* (Verhoeff, 1897)

Brachyiulus rosenauensis Verhoeff, 1897.

Chromatoiulus rosenauensis auct.

Distribution

MD, RO, UA.

Habitat

Woodland; edge in sandstone gorge, under leaves and in sand; under pine needles; arable land; limestone quarry.

401. *Megaphyllum rossicum* (Timotheew, 1897)

Iulus rossicus Timotheew, 1897.

Brachyiulus strandschanus Verhoeff, 1937.

Chromatoiulus rossicus auct.

Chromatoiulus rossicus strandschanus auct.

Distribution

BG, GR-GRC, RU-RUC, RU-RUE, RU-RUS, UA.

Habitat

Forest-steppe and steppe. Frequently in *Quercus* forest; calciphytic steppe, limestone denudations; meadows, orchards, 0–300 m.

Remarks

Two subspecies are recognized. According to Golovatch (1990) the nominal subspecies is a Pleistocene relict with a disjunct distribution east of the Dniepr River. The subspecies *Megaphyllum rossicum strandschanum* (Verhoeff, 1937) occurs in southeast Bulgaria and Greece (Thrace).

402. *Megaphyllum rubidicolle* (Verhoeff, 1901)

Brachyiulus rubidicollis Verhoeff, 1901.

Chromatoiulus rubidicollis auct.

Distribution

GR-GRC.

Habitat

Found on Velouchi, the highest peak of Mount Timfristos. In subalpine forest and in the alpine zone near a snowfield in the month of May.

Remarks

Known only from the type series, which consists of a female and some juveniles. Strasser (1976) and Lažanyi *et al.* (2012) gave the altitude as 2315 m, but there is no altitude information in the original description; 2315 m is the height of the Velouchi peak.

403. *Megaphyllum sapphicum* (Strasser, 1976)

Chromatoiulus sapphicus Strasser, 1976.

Distribution

GR-GRC (Lesbos). – Also Asiatic Turkey (W coast).

Habitat

Found at altitudes of 600–930 m.

Remarks

Recently identified from the Turkish mainland (B. Vagalinski, unpubl.).

404. *Megaphyllum silvaticum* (Verhoeff, 1898)

Brachyiulus silvaticus Verhoeff, 1898.

Chromatoiulus silvaticus auct.

Distribution

AT, HR, HU, IT-ITA, MD, PL, RO, SI, SK, UA. East Central Europe.

Habitat

Tends to be found in mountainous country, sometimes at high elevations, e.g., 1900 m under alpine grass (Verhoeff 1900), 1520 m in the Rodna Mountains (Lázanyi & Korsós 2009). Beech (*Fagus*) forest; limestone rocks on pasture.

Remarks

Verhoeff (1900) stated that the species favours high places but is not confined to mountains. Golovatch (1992) finds it a typical Carpathian species. It also occurs in the SE and Dinaric Alps as well as some lowland areas.

Lázanyi & Korsós (2010) found three different types of male gonopod in this variable species but only one type of female vulva, explaining why the subspecies *discolor* Verhoeff, 1907, is not valid.

405. *Megaphyllum sjaelandicum* (Meinert, 1868)

Julus sjaelandicus Meinert, 1868.

Brachyiulus wolterstorffi Verhoeff, 1904.

Brachyiulus seelandicus Verhoeff, 1907.

Brachyiulus sjaelandicus auct.

Chromatoiulus sjaelandicus auct.

Distribution

BY, DE, DK-DEN, EE, FI, LT, LV, PL, RU-KGD, RU-RUC, RU-RUE, RU-RUN, RU-RUW, SE, UA. Northern Central and East Europe. – Also Siberia.

Habitat

Boreo-nemoral habitats in the east from taiga in the north, through mixed coniferous and broad-leaved woods to forest-steppe in the south. Some particular assemblages mentioned are swamp and marshy woodland with *Carex*, *Filipendula*, *Iris*, *Oxalis*; Alder (*Alnus*) carr (*Ribeso-nigri Alnetum*, *Glutinoso-Alnetum aegopodosium*); *Betula*, *Fagus*, *Carpinus* (*Carpinetum-aegopodosium*); *Pinus* forest in Russia (Prisnyi 2001). Cemeteries.

Remarks

A forest-dwelling species found from the taiga in the north down to the forest-steppe belt of Russia and the Ukraine. This European species also occurs in the Altai Region of Siberia and possibly Kazakhstan (Mikhaljova *et al.* 2013). It is very unusual to find a species that occurs in Europe further east than the Ural Mountains.

406. *Megaphyllum syrense* (Verhoeff, 1903)

Brachyiulus syrensis Verhoeff, 1903.

Chromatoiulus syrensis auct.

Distribution

GR-CYC (Syros).

407. *Megaphyllum tauricum* (Attems, 1907)

Brachyiulus tauricus Attems, 1907.

Distribution

UA (Crimea).

Habitat

Forests in the hilly southern areas of the Crimea.

Remarks

In retaining this species Golovatch (1990) comments on the similarities between this species and several congeners, but suggests regarding it a separate species, a point of view supported by Lazányi & Vagalinsky (2013) in their revision of the genus.

408. *Megaphyllum taygetanum* (Attems, 1903)

Brachyiulus taygetanum Attems, 1903.

Chromatoiulus taygetanus auct.

Distribution

GR-GRC (Peloponnese).

Habitat

Open wood, rocky *Acer* forest; 490–680 m (Lazányi *et al.* 2012).

409. *Megaphyllum taygeti* (Strasser, 1976)

Chromatoiulus taygeti Strasser, 1976.

Distribution

GR-GRC (Peloponnese), GR-KRI.

Habitat

Mountains from 1000 to 2000 m.

410. *Megaphyllum transsylvanicum* (Verhoeff, 1897)

Brachyiulus transsylvanicus Verhoeff, 1897.

Chromatoiulus transsylvanicus auct.

Distribution

BA, BG, GR-GRC?, HR, HU, MD, MK, RO, RU-RUS, SB, TR-TUE, UA. Eastern Central Europe.

Habitat

Forests, more broad-leaved than coniferous: *Quercus*, *Carpinus*, *Fagus*, *Pinus*. Coastal rocks, grassland and bush. Pastures. Steppe. In litter; under stones on grass, under dung. Sometimes found in caves. From sea level to at least 1300 m.

411. *Megaphyllum unilineatum* (C.L. Koch, 1838)

Julus unilineatus C.L. Koch, 1838.

Chromatoiulus unilineatus auct.

Julus gilvolineatus L. Koch, 1881.

Julus balearicus L. Koch, 1881.

Brachyiulus genuinus Verhoeff, 1907.

Distribution

AL, AT, BA, BG, CZ, DE, ES-BAL, GR-GRC, HR, HU, IT-ITA, MK, MN, PL, RO, SB, SI, SK. Balkan, extending into Central Europe.

Habitat

Generally in dry habitats such as grasslands on karst, the Pannonian Plain, and disturbed areas. Under stones, along roadsides, in ruins, quarries, urban habitats, caves. Coniferous forests, e.g., *Pinus*, *Picea*; *Robinia* and *Quercus* woodland. Under *Salix* leaves by a stream. Regarded as a stenotopic xerobiont open land species with preference for xeric/mesoxeric meadows, fields and fallows in Saxony-Anhalt, Germany (Voigtländer 2011). Mass swarmings have been reported by, e.g., Paszlawsky (1878), Ćurčić & Makarov (1995, lasting nearly four weeks) and Korsós (1998).

Remarks

The species has not been recorded from the Balearic Islands since Koch (1881), possibly based on a now extinct population (see Enghoff & Vicente 2000). In his fauna of Moldavia, Jawłowski (1935) quoted three sites for this species, as *Chromatoiulus projectus genuinus* (Verhoeff, 1907); these are Braşeu (=Braşov), Socola and Barnova, all of which are in Romania.

412. *Megaphyllum vicinum* (Verhoeff, 1903)

Brachyiulus vicinus Verhoeff, 1903.

Chromatoiulus vicinus auct.

Distribution

GR-GRC.

Remarks

The description was based on a single male found at Etoliko (Stolico, Aitoliko) in Dytiki Province; to this day the species has not been rediscovered.

Genus *Mesoiulus* Berlese, 1886

Baskoiulus Mauriès, 1982.

413. *Mesoiulus berlesei* Silvestri, 1898

Distribution

IT-ITA (Piedmont).

Habitat

Under stones.

414. *Mesoiulus cavernarum* (Verhoeff, 1938)

Baskoiulus cavernarum Verhoeff, 1938.

Mesoiulus chappuisi Mauriès, 1964.

Distribution

ES-SPA (Guipuzcoa and Santander Provinces).

Habitat

Cavernicolous.

415. *Mesoiulus derouteae* Mauriès, 1971

Distribution

ES-SPA (Santander Province).

Habitat

Cavernicolous. Known only from the Cueva del Agua at Matienzo.

416. *Mesoiulus drescoi* Mauriès, 1971

Distribution

ES-SPA (Oviedo and Santander Provinces).

Habitat

Cavernicolous.

Remarks

Found in three caves; it is very similar to *Mesoiulus stammeri*. Mauriès & Vicente (1977) suggested that it might be a variety of the latter.

417. *Mesoiulus gridellii* Strasser, 1934

Mesoiulus franzi Attems, 1944.

Distribution

AT, IT-ITA (Venezia).

Habitat

Found in garden litter beach debris in Venice (Strasser 1934). Thaler & Christian (2003) reported the species from the catacombs below St. Stephen's cathedral in central Vienna. Also found in a palm house in Frankfurt, Germany; this record is not shown on the map.

Remarks

When Attems (1944) described *Mesoiulus franzi* he drew attention to its similarity with *M. gridellii* and remarked on its northerly situation with respect to all the other pachyiulines which are found in the Mediterranean zone. He considered it to be a relict in the warmest part of Austria.

418. *Mesoiulus henroti* Mauriès, 1971

Distribution

ES-SPA (Navarra Province).

Habitat

Cavernicolous. Known only from Akelar Cave at Lecumberri.

419. *Mesoiulus kosswigi* Verhoeff, 1936

Distribution

TR-TUE.

Habitat

Cavernicolous.

420. *Mesoiulus mauriesi* Strasser, 1974

Distribution

GR-GRC (Attica).

Habitat

Found on the east side of Hymittos Mountain up to 600 m, apparently not cavernicolous.

421. *Mesoiulus paradoxus* Berlese, 1886

Distribution

HU, IT-ITA (Venezia).

Habitat

Gardens, fields, e.g., dominant in alfalfa fields in NE Italy (Paoletti *et al.* 1988). Korsós (1992) recorded it from anthropogenic sites in Hungary.

422. *Mesoiulus rusticanus* Mauriès & Vicente, 1977

Distribution

ES-SPA (Tarragona Province).

Habitat

Soil.

423. *Mesoiulus siculus* Silvestri, 1902

Distribution

IT-SI.

Habitat

Under a stone.

424. *Mesoiulus stammeri* (Verhoeff, 1936)

Baskoiulus stammeri Verhoeff, 1936.

Distribution

ES-SPA (Santander, Viscaya, Guipuzcoa and Burgos Provinces).

Habitat

Cavernicolous.

Genus *Metaiulus* Blower & Rolfe, 1956

425. *Metaiulus pratensis* Blower & Rolfe, 1956

Distribution

FR-FRA, GB-GRB. Atlantic.

Habitat

Heavy soils of farmland, woodland and wetland; in caves in the south of its range in Aquitaine.

Remarks

Four subspecies have been described from French caves by Demange (1958, 1965), Mauriès (1965) and Ceuca (1968). This little-recorded species was reviewed by Lee (2006).

Genus *Micropachyiulus* Verhoeff, 1899

426. *Micropachyiulus paucioculatus* (Verhoeff, 1899)

Pachyiulus paucioculatus Verhoeff, 1899.

Distribution

RO (Caras-Severin and Hunedoara Provinces).

Habitat

Cavernicolous. However, Verhoeff (1899) found it under leaves and in humus below a beech tree (*Fagus*) and it has also been found in a *Betula* wood.

Remarks

There are only four records.

Genus *Ommatoiulus* Latzel, 1884

Archiulus Berlese, 1886, preoccupied.

Mesoiulus Verhoeff, 1893, preoccupied.

Palaioiulus Verhoeff, 1894.

Schizophyllum Verhoeff, 1895.

This is a large genus; 47 European species are included here, mostly from the Iberian Peninsula, where many new species are currently being found. On the other hand, many species have quite variable gonopods, and some of the species recognized here may turn out to be synonyms of others.

427. *Ommatoiulus albolineatus* (Lucas, 1845)

Iulus albolineatus Lucas, 1845.

Schizophyllum albolineatum parvum Brolemann, 1920.

Schizophyllum olivarum Verhoeff, 1921.

Schizophyllum albolineatum tenebrosus Schubart, 1961.

Distribution

ES-SPA, FR-FRA, IT-ITA, MC. – Also Morocco.

Habitat

In Mediterranean vegetation.

Remarks

Most records come from the French and Italian Rivas, from Toulon to Menton in France, Monaco and from San Remo in Italy. There is one record from Mont Ventoux in the Vaucluse, ca 1900 m altitude (Schubart 1961). The very distant isolated Spanish records are both from the interior, and Brolemann named them *Schizophyllum albolineatum parvum*. The two sites where it was found in Spain and which were recorded by Brolemann are Pozuelo de Calatrava, which is on an extensive plateau at an altitude of about 630 m, and La Granja, Peñalara, which is at least 1180 m above sea level. This evidence suggests that *Ommatoiulus parvus* might be a separate species. On the other hand, *Schizophyllum olivarum*, described by Verhoeff from San Remo and listed as a separate species in *Fauna Europaea* (Enghoff & Kime 2009), seems to be a synonym of *O. albolineatus* (N. Akkari, pers. comm.).

428. *Ommatoiulus andalusius* (Attems, 1927)

Archiulus andalusius Attems, 1927.

Schizophyllum andalusium auct.

Distribution

ES-SPA.

Remarks

Attems described the species from an unknown locality in Andalusia. The species has not been found subsequently.

429. *Ommatoiulus armatus* (Verhoeff, 1910)

Schizophyllum armatum Verhoeff, 1910.

Schizophyllum cornigerum Verhoeff, 1921.

Schizophyllum ceratophorus Attems, 1952.

Distribution

ES-SPA.

Habitat

Found under stones up to an altitude of about 2000 m in the Sierra de Guadarrama, and on a motorway station in Cantabria.

Remarks

Hoffman (1975) regarded the synonymy of *ceratophorus* under *armatus* as “very likely”, and it has been confirmed by N. Akkari (pers. comm.)

430. *Ommatoiulus aurozonatus* (Berlese, 1886)

Julus aurozonatus Berlese, 1886.

Archiulus latinus Attems, 1927.

Schizophyllum aprutianum Verhoeff, 1932.

Schizophyllum aurozonatus auct.

Distribution

IT-ITA.

431. *Ommatoiulus baenai* Akkari & Enghoff, 2012

Distribution

ES-SPA (Andalusia, Granada, Casas de Carrasco).

432. *Ommatoiulus baileyi* Akkari & Enghoff, 2012

Ommatoiulus sp. 1 – Bailey & De Mendonça 1990.

Distribution

ES-SPA (Andalusia, Doñana National Park S of Sevilla).

Habitat

Found in leaf litter of *Halimium* sp. on sand dunes (Bailey & De Mendonça, 1990).

433. *Ommatoiulus bavayi* (Brölemann, 1897)

Schizophyllum bavayi Brölemann, 1897.

Distribution

ES-SPA (Murcia and Cadiz Provinces).

434. *Ommatoiulus bipartitus* (Verhoeff, 1910)

Schizophyllum bipartitum Verhoeff, 1910.

Schizophyllum fissum Verhoeff, 1921.

Schizophyllum involutum Verhoeff, 1925.

Distribution

ES-SPA, FR-FRA, PT-POR.

Habitat

Common in various largely rural habitats in Galicia and Asturias.

Remarks

Located in the provinces of Braga in Portugal (as *Schizophyllum involutum*) and Pontevedra, La Coruña, Lugo, Oviedo, Segovia (as *Schizophyllum fissum*) and Madrid (as *Schizophyllum fissum*) in Spain.

Mauriès & Vicente (1977) synonymised these species. *O. lienharti* is very similar and may be another synonym (N. Akkari in litt.).

435. *Ommatoiulus buchneri* (Verhoeff, 1940)

Schizophyllum buchneri Verhoeff, 1940.

Distribution

IT-ITA, IT-SI.

Habitat

Offshore islands in the south (Ischia, Capri, Lipari Islands) and the south of the Calabrian Peninsula.

436. *Ommatoiulus cervinus* (Verhoeff, 1910)

Schizophyllum cervinum Verhoeff, 1910.

Distribution

PT-POR.

Remarks

Almost certainly a synonym of *O. moreleti* (N. Akkari in litt.).

437. *Ommatoiulus cingulatus* (Attems, 1927)

Archiulus cingulatus Attems, 1927.

Schizophyllum cingulatum auct.

Distribution

PT-POR (South).

Habitat

One site was a heath with *Calluna*, *Erica*, *Ulex*, *Rosmarinus*, *Cistus* and grasses. Bailey & De Mendonça (1990) mostly found it in grassland, but also in *Cistus* litter.

Remarks

Attems gave “Peisha” as the *locus typicus* of this species. This presumably should be the town of Beja in the old province of Baixo Alentejo. It has subsequently been found in Setubal and Faro Provinces on either side of Beja.

438. *Ommatoiulus clavigerus* (Verhoeff, 1921)

Schizophyllum clavigerum Verhoeff, 1921.

Distribution

ES-SPA (Madrid Province).

Habitat

Alpine. Found at an altitude of about 2000 m in the Sierra de Guadarrama.

439. *Ommatoiulus corsicus* (Brölemann, 1903)

Schizophyllum corsicum Brölemann, 1903.
Archiulus corsicus schulzei Schubart, 1931.

Distribution

FR-COR.

Habitat

Large altitudinal range. Skeletal soils. Under *Genista*. Under stones at above 2000 m on Monte Rotondo.

440. *Ommatoiulus corunnensis* (Verhoeff, 1910)

Schizophyllum corunnense Verhoeff, 1910.

Distribution

ES-SPA (Galicia).

441. *Ommatoiulus demangei* Vicente & Rodriguez, 1992

Distribution

ES-SPA (Lugo Province).

Habitat

In woodland (Bosque de Penedal) of *Quercus robur*, *Quercus pyrenaica* and *Salix fragilis* at about 1000 m in the Sierra de los Ancares.

442. *Ommatoiulus diplurus* (Attems, 1903)

Schizophyllum diplurum Attems, 1903.
Schizophyllum hoplites Verhoeff, 1910.
Ommatoiulus diplurus mauriesi Hoffman, 1975.

Distribution

ES-SPA (Andalucia). – Also (doubtfully) Algeria.

Habitat

Common in grasslands (Bailey & De Mendonça 1990) but also in leaf litter under *Quercus* and under small rocks on clay-loam soil.

Remarks

Hoffman (1975) and Akkari & Enghoff (2012) reviewed the different taxa which are now referred to *O. diplurus*. The nominal subspecies *appendiculatus* Brolemann, 1926, from Algeria is based only on females; the occurrence of *O. diplurus* in North Africa is therefore doubtful.

443. *Ommatoiulus dorsovittatus* (Verhoeff, 1893)

Julus dorsovittatus Verhoeff, 1893.
Schizophyllum dorsovittatum estrellanum Verhoeff, 1910.
Schizophyllum calatravanum Brolemann, 1920.
Palaioiulus dorsovittatus auct.
Schizophyllum dorsovittatum auct.

Distribution

ES-SPA (Albacete, Ciudad Real, Badajoz and Jaén Provinces), PT-POR (Coimbra Province).

Habitat

Open sites; under stones on road verge beside arable land, waste ground below Medellin Castle.

444. *Ommatoiulus fuentei* (Brolemann, 1920)

Schizophyllum fuentei Brolemann, 1920.

Distribution

ES-SPA (Ciudad Real, Badajoz and Córdoba Provinces).

Habitat

Litter of shrub with *Halimium* spp. (Baiely & De Mendonça 1990).

445. *Ommatoiulus haackeri* Mauriès, 1969

Distribution

ES-SPA, FR-FRA. Basque Region, Pyrenees.

446. *Ommatoiulus hoffmani* Akkari & Enghoff, 2012

Distribution

ES-SPA (Almería Province).

Habitat

Dry rocky hill, under stones.

447. *Ommatoiulus ibericus* Ceuca, 1974

Distribution

ES-SPA (East).

Habitat

From 300 m in *Buxus sempervirens* and *Ulex parviflorus* on Monte Caro in Tarragona Province up to 1900 m on Monte Peñarroya in Teruel Province (Vicente 1985).

448. *Ommatoiulus ilicis* (Brölemann, 1897)

Schizophyllum ilicis Brölemann, 1897.

Schizophyllum nivale Schubart, 1959.

Ommatoiulus nivalis – Mauriès 1969b.

Distribution

ES-SPA (Sierra Nevada, Granada Province), FR-FRA (Central and Eastern Pyrenees).

Habitat

At foot of elm tree. In fallen trunk. In old trunks of evergreen *Quercus* sp. In a small valley, moist, dense shrub, in leaf litter. From near sea level in France up to 2900 m in Spanish Sierra Nevada.

Remarks

Akkari & Enghoff (2012) synonymised *nivalis* under *ilicis*. This species has a remarkably disjunct distribution: the Pyrenees in the north and Sierra Nevada and Sierra de Grazalema in the south.

449. *Ommatoiulus imminutus* (Brolemann, 1926)

Schizophyllum imminutum Brolemann, 1926.

Distribution

FR-FRA (Pyrénées Orientales).

450. *Ommatoiulus inconspicuus* (L. Koch, 1881)

Julus inconspicuus L. Koch, 1881.

Julus nigratarsus L. Koch, 1881.

Schizophyllum ibizanum Verhoeff, 1924

Distribution

ES-BAL, ES-SPA (Alicante and Almería Provinces).

Habitat

Pinewoods (*Pinus halepensis*) under bark, Mediterranean shrubs (macquis), under stones in open rocky areas and in leaf litter in a dried, yet moist, riverbed with a lush herb layer.

Remarks

Known from the Balearic Islands Cabrera, Ibiza, Menorca and Mallorca (Enghoff & Vicente 2000), as well as from the coastal provinces of Alicante and Almería on the Spanish mainland (Akkari & Enghoff 2012).

451. *Ommatoiulus jaenensis* Akkari & Enghoff, 2012

Distribution

ES-SPA (Jaén Province).

452. *Ommatoiulus kimei* Akkari & Enghoff, 2012

Ommatoiulus sp. 3 – Bailey & De Mendonça, 1990.

Distribution

ES-SPA (Córdoba Province).

Habitat

Litter of *Quercus suber* forest and shrub with *Cistus* spp. (Bailey & De Mendonça 1990).

453. *Ommatoiulus lienharti* (Brolemann, 1921)

Schizophyllum moreleti Lienharti Brolemann, 1921.

Distribution

ES-SPA (Alava and Guipuzcoa Provinces), FR-FRA. (Gironde Department). Atlantic.

Habitat

Alava: *Fagus* forest with some *Quercus*; in leaf litter, 830 m. Guipuzcoa: *Pinus* woodland. Gironde: in woods around Arcachon.

Remarks

Very similar to, and possibly a synonym of *O. bipartitus* (N. Akkari in litt.).

454. *Ommatoiulus lusitanus* (Verhoeff, 1895)

Schizophyllum lusitanum Verhoeff, 1895.

Distribution

PT-POR.

Remarks

Almost certainly a senior synonym of *O. cingulatus* (N. Akkari in litt.).

455. *Ommatoiulus martensi* Mauriès, 1969

Distribution

ES-SPA (Western Pyrenees, Picos de Europa), PT-POR (Serra da Estrela). Atlantic.

Habitat

Alpine. Often below stones. Records from 1600 m to 2200 m altitude.

456. *Ommatoiulus moreleti* (Lucas, 1860)

Iulus moreleti Lucas, 1860.

Julus lusitanicus Karsch, 1881.

Julus karschi Verhoeff, 1892.

Scizophyllum moreletii auct.

Palaioiulus karschi auct.

Distribution

ES-CNY, ES-SPA, PT-AZO, PT-MDR, PT-POR. – Also introduced into the Afrotropical and Australian regions, and to Bermuda.

Habitat

Abundant in several habitats in Macaronesia, Portugal and Western Spain, with a large altitudinal range. On a site where it coexists with *O. cingulatus* and *O. oliveirae*, Bailey & de Mendonça (1990) found it in *Quercus* and *Cistus* litter but not in grassland where *O. oliveirae* predominated. In Australia it is regarded as a pest due to its sometimes extreme abundance see, e.g., <http://www.polydesmida.info/tasmanianmultipedes/milli-jul-exo.html>.

Remarks

Quite a variable species (see, e.g., Baker 1984). *O. cervinus* is most likely a synonym of *O. moreleti* (N. Akkari in litt.).

457. *Ommatoiulus navasi* (Brölemann, 1918)

Schizophyllum navasi Brölemann, 1918.

Distribution

ES-SPA (Sierra de Moncayo, Zaragoza Province; Sierra de la Demanda, Rioja Province).

Habitat

Alpine, above 2000 m.

458. *Ommatoiulus niger* (Attems, 1952)

Schizophyllum nigrum Attems, 1952.

Distribution

ES-SPA (Cádiz, Sevilla, Almería, Granada, Jaén, Málaga and Madrid Provinces).

Habitat

Mountains. Litter of *Olea europaea* crops (Bailey & De Mendonça 1990). Litter of low bush; in soil, under grass between limestone stones and pebbles (Akkari & Enghoff 2012).

459. *Ommatoiulus oliveirae* (Verhoeff, 1893)

Julus oliveirae Verhoeff, 1893.

Palaioiulus oliveirae auct.

Schizophyllum oliveirae auct.

Distribution

PT-POR.

Habitat

Under stones in grassland, in cork litter, in litter under *Quercus suber* and *Cistus*, and in grassland (Bailey & De Mendonça 1990).

460. *Ommatoiulus oxypygus* (Brandt, 1841)

Iulus oxypygus Brandt, 1841.

Iulus brandti Berlese, 1886.

Schizophyllum oxypygum auct.

Distribution

IT-ITA, IT-SI, MT.

Habitat

A wide variety of biotopes below 600 m.

461. *Ommatoiulus parallelus* (C.L. Koch, 1847)

Julus parallelus C.L. Koch, 1847.

Julus cavannae Berlese, 1886.

Schizophyllum parallelum auct.

Distribution

IT-ITA (Lombardy, Emilia-Romagna, Tuscany, Umbria).

Habitat

Found on dry, gravelly slopes with *Erica*, *Cistus*, *Genista*, *Castanea*, *Ilex* and *Pinus* on the island of Capri by H.W. Waldén (HE det., unpublished material in the Natural History Museum of Gothenburg).

462. *Ommatoiulus porathi* (Verhoeff, 1893)

Julus porathi Verhoeff, 1893.

Palaioiulus porati auct.

Schizophyllum porathi auct.

Distribution

PT-POR.

Remarks

Known only from the type locality near Coimbra.

463. *Ommatoiulus pseudoflagellatus* Akkari & Enghoff, 2012

Distribution

ES-SPA (Sevilla and Málaga Provinces).

Habitat

Under bark of *Eucalyptus* tree, *Pinus* forest (Akkari & Enghoff 2012).

464. *Ommatoiulus recueroi* Akkari & Enghoff, 2012

Distribution

ES-SPA (Jaén Province).

465. *Ommatoiulus reipi* Akkari & Enghoff, 2012

Ommatoiulus sp. 5 – Bailey & De Mendonça 1990.

Distribution

ES-SPA (Córdoba and Sevilla Provinces).

Habitat

Leaf litter of oak forests with *Quercus suber* and *Quercus ilex* (Bailey & Mendonça 1990).

466. *Ommatoiulus robustus* Ceuca, 1972

Distribution

ES-SPA (Huesca Province).

Habitat

Pyrenean mountain grassland, 1250–2000 m. Alpine pasture, brushwood with *Echinopartum horridum* on skeletal soil (Serra *et al.* 1996).

467. *Ommatoiulus rutilans* (C.L. Koch, 1847)

Julus rutilans C.L. Koch, 1847.
Julus mediterraneus Latzel, 1884.
Schizophyllum hispanicum Verhoeff, 1910.
Schizophyllum rutilans auct.
Palaioiulus rutilans auct.

Distribution

BE, CH, DE, ES-SPA, FR-FRA, IT-ITA, LU, NL, SM. Atlanto-Mediterranean. – Also Morocco.

Habitat

Warm, dry calcareous grassland, submediterranean in the north of its range. Found up to 1400 m in Switzerland (Pedroli-Christen 1993). Frequently under stones. *Juniperus* forest in Spain.

Remarks

This species is often found wandering on the ground after rain. Regarded as highly endangered in Germany (Voigtländer *et al.* 2011).

468. *Ommatoiulus sabinarensis* Akkari, Mauriès & Enghoff, 2012

Distribution

ES-SPA (Almería Province).

469. *Ommatoiulus sabulosus* (Linnaeus, 1758)

Julus sabulosus Linnaeus, 1758.
Julus aimatopodus Risso, 1826.
Archiulus sabulosus auct.
Palaioiulus sabulosus auct.
Schizophyllum sabulosum auct.
Archiulus irregularis Attems, 1927.
Ommatoiulus irregularis auct.

Distribution

AL, AT, BA, BE, BG, BY, CH, CZ, DE, DK-DEN, ES-SPA, FI, FR-FRA, GB-CI, GB-GRB, GB-NI, HR, HU, IE, IT-ITA, LT, LU, LV, MC, MK, NL, NO-NOR, PL, RO, RU-KGD, RU-RUC, RU-RUE, RU-RUN, SB, SE, SI, SK, UA. Most of Europe, from the Mediterranean to the Boreal Zones and east to the Ural Mts.

Habitat

Eurytopic, with an altitudinal range of nearly 3000 m, though it is particularly associated with warm habitats and sandy areas. It is often abundant in sand dune systems and is closely associated with heaths but may be found on limestone as well as sandstone. It is common in more or less open woods on lighter soils but, in Belgium at least, it is almost never observed in large closed forests. Yet, in Eastern Europe it is dominant in some *Quercus* and *Picea* stands in the Byelovezskaya Puzcha (Tarasevich 1992) and it occurs in the taiga. Adults wander into a very wide variety of habitats from lowland woodlands and grasslands to alpine meadows, usually during the summer. In winter it appears to be more restricted to damper places occurring in the leaf litter and superficial layers of well drained soil. There are several references to its occurrence in wetlands and on moors, including peat bogs.

Remarks

One of the most widely dispersed millipedes in Europe, from 38° N in Calabria to 64° N in the taiga of Finland. It has not yet been recorded from Greece, some major Mediterranean islands and much of Iberia, where many other species of *Ommatoiulus* occur. Records from Portugal are not reliable (N. Akkari, pers. comm.) It is active in summer when many other species are dormant, spatially very patchy and it undergoes large population fluctuations. Mass swarming has been observed on many occasions (e.g., Ehrnsberger 2002; Helb 1975; Kania & Tracz 2005; Voigtländer 2005). An entirely black form without the two characteristic orange dorsal stripes, *O.s.aimatopodus* (Risso, 1826), is known from some southern departments of France. We treat *O. irregularis* as a synonym of *O. sabulosus* on the advice of Nesrine Akkari, who has seen Attems' type specimen. *O. irregularis* was included in the Italian checklist (Strasser & Minelli 1984) with a question mark, but excluded from the later list of Foddai *et al.* (1995). Numerous other forms have been named but are not listed here.

470. *Ommatoiulus schubarti* Akkari & Enghoff, 2012

Distribution

ES-SPA (Granada Province).

Remarks

Only known from the type specimens collected in 1863.

471. *Ommatoiulus teruelensis* Ceuca, 1974

Ommatoiulus teruelensis auct. (lapsus calami).

Distribution

ES-SPA (Teruel Province).

Habitat

Two records from mountains at 1600–1900 m.

472. *Ommatoiulus tridentifer* Ceuca, 1974

Distribution

ES-SPA (Teruel Province).

473. *Ommatoiulus variolosus* (Silvestri, 1898)

Iulus variolosus Silvestri, 1898.

Schizophyllum variolosum auct.

Distribution

IT-SAR (Cagliari Province).

Genus *Ophiulus* Berlese, 1884

Taueriulus Verhoeff, 1913.

474. *Ophiulus aspidiorum* (Verhoeff, 1913)

Taueriulus aspidiorum Verhoeff, 1913.

Ophiulus alpinus Attems, 1927.

Distribution

AT.

Habitat

Coniferous forest under *Aspidium* ferns; under *Alnus incana* and *Aspidium* at a snowfield (Schubart 1934).

475. *Ophiulus bastiensis* Verhoeff, 1943

Distribution

FR-COR (found on one occasion at Fango, near Bastia).

476. *Ophiulus castanearum* Verhoeff, 1930

Distribution

IT-ITA (Tuscany and Piedmont).

Habitat

Castanea and *Robinia* forests, gorge with *Quercus laurifolia*, bushland.

477. *Ophiulus cerii* Verhoeff, 1942

Distribution

IT-ITA (Island of Capri).

478. *Ophiulus chilopogon* (Latzel, 1884)

Iulus chilopogon Latzel, 1884.

Iulus barbatus Verhoeff, 1908.

Iulus holdhausi Attems, 1908.

Ophiulus barbatus auct.

Distribution

FR-COR, IT-ITA (Tuscany, Emilia-Romagna).

Habitat

A wide range of open and closed habitats, including grassland, sward by the sea, limestone cliffs, maquis; deciduous, evergreen and coniferous forests: *Castanea*, *Quercus*, *Pinus*, *Eucalyptus*, with *Ilex*, *Ruscus*, *Helleborus*, *Rubus*, ferns and xerophytic vegetation. In litter, soil, under wood and stones. Up to well above 1000 m.

Remarks

Mauriès (1969b) clarified the synonymy of *barbatus* with *chilopogon*.

479. *Ophiulus collaris* Verhoeff, 1930

Ophiulus collaris Verhoeff, 1930.

Distribution

IT-ITA (Veneto).

Habitat

Scree hill, under litter.

480. *Ophiulus corsicus* Verhoeff, 1943

Distribution

FR-COR (found once, at Pietracorbara).

481. *Ophiulus curvipes* (Verhoeff, 1898)

Julus (Leptoiulus) fallax curvipes Verhoeff, 1898.

Distribution

AT, BA, HR, IT-ITA, SB, SI.

Habitat

Karst.

482. *Ophiulus germanicus* (Verhoeff, 1896)

Julus germanicus Verhoeff, 1896.

Ophiulus strandi Attems, 1927.

Distribution

DE, ES-SPA, IT-ITA (mainly apennine from Campania to Liguria).

Habitat

Woodland with *Castanea*, *Quercus*, *Carpinus*, *Corylus*, *Fraxinus*, *Hedera*, *Clematis*, *Rubus*. Collected at 14–1600 m at Mt Turbon, Huesca, Spain (M. and G. Osella leg., H. Enghoff det.).

Remarks

Despite its name, this species has only very recently been recorded from Germany, where it is obviously introduced (Decker & Hannig 2011).

483. *Ophiulus italianus* Attems, 1927

Distribution

IT-ITA (Gargano Peninsula, Apulia).

484. *Ophiulus jeekeli* Strasser, 1974

Distribution

IT-SAR.

Remark

Possibly a synonym of *O. lostiae* Silvestri, 1898.

485. *Ophiulus lostiae* Silvestri, 1898

Ophiulus lostiae Silvestri, 1898.

Distribution

IT-SAR.

Remark

Might include *O. jeekeli*.

486. *Ophiulus macchia* Verhoeff, 1930

Distribution

IT-ITA (Tuscany).

Habitat

Maquis, apparently coastal.

Remark

Verhoeff (1935) stated that it is endemic on Mt Argentario; there appear, however, to be other references to the Tuscan coast.

487. *Ophiulus minimus* Strasser, 1958

Ophiulus minimus Strasser, 1958.

Distribution

IT-ITA (Lazio, Alban Hills south of Rome).

Habitat

In *Castanea* woodland, under leaf litter, 370–900 m.

488. *Ophiulus muelleri* Strasser, 1937

Ophiulus mülleri Strasser, 1937.

Distribution

IT-ITA (Veneto).

Habitat

In leaf litter, mostly *Fagus*. 430–550 m.

489. *Ophiulus napolitanus* (Attems, 1903)

Julus napolitanus Attems, 1903.

Ophiulus glandulosus Verhoeff, 1910.

Distribution

FR-COR, IT-ITA (Campania).

490. *Ophiulus nigrofuscus* (Verhoeff, 1894)

Julus nigrofuscus Verhoeff, 1894.

Distribution

AT, CH, DE, IT-ITA. East-central Alps (Vorarlberg-Nordtirol, Engadine, Allgäu, Tre Venezie).

Habitat

Eurytopic in forest, pastures and alpine meadows but almost entirely between 1000 m and 2900 m, chiefly alpine and subalpine. Regarded as highly endangered in Germany (Voigtländer *et al.* 2011).

491. *Ophiulus osellai* Strasser, 1970

Distribution

IT-ITA.

Habitat

Alpine; from 2000 m, reaching 2458 m on Monte Gorzano in the Apennines.

492. *Ophiulus pilosus* (Newport, 1842)

Iulus pilosus Newport, 1842.

Iulus longabo C.L. Koch, 1847.

Iulus fallax Meinert, 1868.

Ophiulus major Bigler, 1920.

Ophiulus fallax auct.

Ophiulus fallax major auct.

Leptoiulus fallax minor Verhoeff, 1908.

Ophiulus fallax lobatus Attems, 1927.

Distribution

AT, BA, CH, CZ, DE, DK-DEN, FR-FRA, GB-CI, GB-GRB, GB-NI, IT-ITA, HR, HU, IE, NL, NO-NOR, PL, RO, RU-KGD, SE, SI, SK. An unusual distribution in mainly Central Europe, Britain, Ireland and southern Scandinavia. – Also introduced into New Zealand and North America.

Habitat

It has been found in a wide variety of habitats but shows a preference for humid deciduous woodland (Blower 1985) often beside lakes and rivers (Pedroli-Christen 1993): *Alnus* woods, boggy ground. In dune-slacks, wetland behind coastal dunes, often wooded. Found under stones in meadows and parks. Sometimes in caves (Blower & Gabutt 1964; Blower & Miller 1974).

Remarks

Ophiulus major Bigler, 1920 has been regarded as a subspecies or synonym of *pilosus* by several authors, e.g., Attems (1927, as *O. fallax lobatus*) and Pedroli-Christen (1993). Due to difficulties in distinguishing *major* from ‘true’ *pilosus* the map combines records of both nominal taxa. Specific records of *major* are available from Switzerland (Bigler’s original locus typicus), Germany (southern Bavaria), Austria and Slovenia as well as the northern half of Italy and Croatia. It would be useful if genetic studies were performed on this group in order to settle the synonymy. The proposed separate taxa are sympatric in Central Europe. While *O. pilosus s.s.* is very common in Britain and Ireland, in northern France it has been found only in damp woodland immediately behind the dunes in the Pas de Calais and Somme departments. There are similar records from the Netherlands but it has not yet been recorded from inland France or anywhere in Belgium. The very unusual distribution of *Ophiulus pilosus* may partly relate to its pioneering abilities, as revealed in the New World.

493. *Ophiulus renosensis* Mauriès, 1969

Distribution

FR-COR.

Habitat

High mountain species found from beechwoods (*Fagus*) at 1200 m up to 2200 m on Monte Renoso.

494. *Ophiulus rubrodorsalis* (Verhoeff, 1900)

Julus (Leptoiulus) rubrodorsalis Verhoeff, 1900.

Distribution

CH, IT-ITA. Southern Central Alps of Ticino and Lombardy.

Habitat

Thermophile forests, abandoned fields and coppices at low altitude around 200–400 m, but it does reach 1080 m on warm slopes (Pedroli-Christen 1993). Frequent in the litter of *Castanea* woods in Lombardy.

495. *Ophiulus sardus* Attems, 1927

Ophiulus sardus Attems, 1927.

Distribution

IT-SAR.

Habitat

One record from a cave at Arizzo.

496. *Ophiulus solitarius* Bigler, 1929

Distribution

CH (Engadine).

Habitat

Alpine.

Remarks

The description of this species was based on a single male from the Engadine. Pedroli-Christen (1993) suggested that it may relate to a gonopod variation of the extremely similar *O. nigrofuscus* which occurs in the area.

497. *Ophiulus spezianus* Verhoeff, 1936

Distribution

IT-ITA (Liguria).

Habitat

Forested gorge under *Castanea* litter; quarry; *Olea* plantation, *Quercus* shrubbery.

498. *Ophiulus targionii* Silvestri, 1898

Ophiulus targionii Silvestri, 1898.
Ophiulus targionii verruculiger Verhoeff, 1910.
Ophiulus verruculiger auct.
Ophiulus fretarius Attems, 1927.

Distribution

ES-BAL, IT-ITA, IT-SI, MT. Southern and Central Italy, with islands. – Also introduced into the Australian region.

Habitat

Quercus laurifolia forest, quarry, limestone mountains, open, sunny slope. Up to 2300 m in Sicily. In Malta, it occurs in leaf-litter in woodland and macquis (Enghoff & Schembri 1989). Has been found in caves (Minelli 1985).

Remarks

Quite a variable species; several subspecies have been described.

499. *Ophiulus velebiticus* Attems, 1927

Distribution

HR (Velebit Mountains).

Genus *Pachyiulus* Berlese, 1883

Diploiulus Berlese, 1883.
Megaiulus Verhoeff, 1894.
Oxyiulus Verhoeff, 1896.

A thermophile genus found mainly in the E Mediterranean zone. Taxonomically very complicated.

500. *Pachyiulus apfelbecki* Verhoeff, 1901

Distribution

GR-GRC (Epirus, Central Greece and Ionian Islands).

Habitat

From sea level up to 1600 m on Kefallonia (Mt. Ainos).

Remarks

Pachyiulus apfelbecki was synonymised under *P. varius* (Fabricius, 1781) by Mauriès *et al.* (1997). In light of the study by Frederiksen *et al.* (2012) we treat *P. apfelbecki* as a separate species. See also *P. flavipes* (C.L. Koch, 1847), *P. oenologus* (Berlese, 1885) and *P. varius*.

501. *Pachyiulus asiaeminoris* Verhoeff, 1898

Pachyiulus oenologus auct.
Pachyiulus flavipes auct.

Distribution

GR-DOD, GR-KRI. – Also the Near East.

502. *Pachyiulus cattarensis* (Latzel, 1884)

Iulus cattarensis Latzel, 1884.

Pachyiulus longelobatus Attems, 1906.

Pachyiulus venetus Verhoeff, 1926.

Pachyiulus flavipes catterensis auct.

Distribution

AL, BA, BG, GR-GRC, HR, IT-ITA, MK, MN, SB, TR-TUE. – Also Asiatic Turkey.

Habitat

Forests and open areas from sea level up to 2400 m in the Epirus Mountains. *Fagus*, *Quercus*, *Carpinus* woods; pastures, meadows; limestone areas; caves, ruins, scrub, grave, under stones, litter and bark. Sometimes synanthropic.

Remarks

A common Balkan species. Recorded by Attems (1929) from “Prinkipo” which is the old name of the Island of Büyükada on the Asiatic side of the Sea of Marmara. So far this is the only record from Turkey (overlooked by Enghoff 2006).

503. *Pachyiulus dentiger* Verhoeff, 1901

Distribution

AL, GR-GRC.

Habitat

Beside Kanalaktion Lake at Prevesa, 100 m.

504. *Pachyiulus flavipes* (C.L. Koch, 1847)

Iulus flavipes C.L. Koch, 1847.

Distribution

AL, BG, ES-BAL, FR-FRA, GR-CYC, GR-DOD, GR-GRC, GR-KRI, HR, IT-ITA, IT-SAR, IT-SI, MT, TR-TUE, UA. – Also Asiatic Turkey, Cyprus, Middle-East, Caucasus.

Habitat

Synanthropic, frequently found in towns and villages where it is often observed in large numbers climbing walls.

Remarks

A very common, expansive Ponto-Mediterranean species. Synonymised under *P. varius* by Mauriès *et al.* (1997). In light of the study by Frederiksen *et al.* (2012) we treat *P. flavipes* as a separate species. See also *P. apfelbecki*, *P. oenologus* (Berlese, 1885) and *P. varius* (Fabricius, 1781).

505. *Pachyiulus humicola* Verhoeff, 1910

Distribution

IT-SIC.

506. *Pachyiulus hungaricus* (Karsch, 1881)

Julus hungaricus Karsch, 1881.

Distribution

AL, BA, BG, GR-GRC, HR, MK, MN, RO, SB. Carpathian-Balkan.

Habitat

Chiefly deciduous (*Fagus*, *Quercus*, *Carpinus*) but also mixed and coniferous (*Pinus*, *Picea* and *Abies*) forests up to an altitude of at least 1500 m. It was found at the top of the tree zone on Mt Ljubeten. Collected under stones and in rotting wood. Also climbing trees at Avala Mt in Serbia, up to 3 m. It frequents open scrub and grassland habitats and has been found in caves.

Remarks

A common Balkan species. Kondeva (1998) studied its feeding biology.

507. *Pachyiulus marmoratus* Verhoeff, 1901

Distribution

GR-GRC.

Habitat

Koras Mt, below *Quercus* trees.

508. *Pachyiulus oenologus* (Berlese, 1885)

Iulus oenologus Berlese, 1885.

Distribution

FR-COR, IT-ITA, IT-SI.

Habitat

Deciduous forest.

Remarks

Pachyiulus oenologus was synonymised under *P. varius* by Mauriès *et al.* (1997). In light of the study by Frederiksen *et al.* (2012) we treat *P. oenologus* as a separate species. See also *P. apfelbecki*, *P. flavipes* and *P. varius*.

509. *Pachyiulus silvestrii* Verhoeff, 1923

Distribution

IT-ITA (Campania).

510. *Pachyiulus speciosus* Verhoeff, 1900

Distribution

GR-GRC.

511. *Pachyiulus valonensis* Verhoeff, 1901

Distribution

AL, GR-GRC.

512. *Pachyiulus varius* (Fabricius, 1781)

Iulus varius Fabricius, 1781.

Julus nigripes C.L. Koch, 1847.

Julus unicolor C.L. Koch, 1847.

Distribution

AL, BA, BG, FR-FRA, GR-GRC, HR, IT-ITA, MK, MN, RO, SB, SI, TR-TUE. – Also Georgia.

Habitat

Common on karst. Collected from forest litter and rotting wood. Several records from caves.

Remarks

Pachyiulus varius is the oldest available name for a group of species which are notoriously difficult to distinguish. Mauriès *et al.* (1997) provided a good discussion of the problem and synonymised several other nominal species under *P. varius*. Recent studies by Frederiksen *et al.* (2012) suggest, however, that there are several species hiding under *P. varius sensu* Mauriès *et al.* (1997). We therefore treat *P. apfelbecki*, *P. flavipes* and *P. oenologus* as separate species, although we realize that additional studies may yet change the picture. Numerous infraspecific forms have been named within the complex – their status is largely unresolved.

Genus *Pachypodoiulus* Verhoeff, 1901

513. *Pachypodoiulus eurypus* (Attems, 1895)

Iulus eurypus Attems, 1895.

Distribution

AT, CZ, DE, HU. Eastern Alps and Bohemian hills.

Habitat

Largely subalpine in damp or wet woods, bogs and swampy ground. Often found in decaying wood, also in litter among rocks (Richter 1967).

Genus *Parastenophyllum* Verhoeff, 1899

514. *Parastenophyllum frondicola* (Verhoeff, 1899)

Julus frondicola Verhoeff, 1899.

Distribution

RO (Caras-Severin, Mehedinti, Braşov & Suceava Provinces).

Habitat

Deciduous forests.

Genus *Pteridoiulus* Verhoeff, 1913

515. *Pteridoiulus aspidiorum* Verhoeff, 1913

Distribution

AT, DE, SI. East Alpine.

Habitat

Upper montane and subalpine woods; also alpine (far above the tree line in Slovenia). The type series was taken in a conifer forest under moss and *Aspidium* ferns. Most data are from the “Kalkalpen”, limestone mountains.

Remarks

The several records from Germany are limited to the Alps near the Königsee in Bavaria.

Genus *Rhamphidoiulus* Attems, 1905

516. *Rhamphidoiulus bujukderensis* Attems, 1905

Distribution

TR-TUE (Büyükdere on the west side of the Bosphorus).

Genus *Rhodopiella* Strasser, 1966

517. *Rhodopiella beroni* (Strasser, 1966)

Apfelbeckiella beroni Strasser, 1966.

Mesoiulus bulgaricus Gulička, 1967.

Distribution

BG, GR-GRC, MK. East Balkan.

Habitat

Caves in Greece, Macedonia, the Danubian Plain and the Rhodope Mountains of Bulgaria (ssp. *beroni*), and in the Strandzha Mountains (ssp. *saetigera*).

Genus *Rossiulus* Attems, 1926

Sarmatiulus Lohmander, 1927.

518. *Rossiulus kessleri* (Lohmander, 1927)

Schizophyllum kessleri Lohmander, 1927.

Rossiulus strandi Attems, 1927.

Sarmatiulus kessleri auct.

Distribution

BY, RU-RUC, RU-RUE, RU-RUN, RU-RUS, UA. East European.

Habitat

Forest, forest-steppe and northern steppe zones of Russia and Belarus in a wide variety of habitats, e.g., primary oak forest, mixed forest, pine forest, flood-plain forest, meadows, agricultural land, limestone

denudations, calciphytic *Stipa* steppe with *Thymus*, *Hyssopus* and *Artemisia*. Abundant and often predominating in diplopod communities of both natural and anthropogenic habitats (Striganova 1996).

Remarks

This calciphilous subendemic of the Russian plain ranges from Central Belarus in the west to the regions of Bashkir and Orenburg in the east and from the Archangelsk region in the north (northernmost record: Severnaya Dvina River delta N of Archangelsk) southwards to Dagestan, beyond our European frontier.

Prisnyi (2001) gave ecological details and showed a map suggesting a disjunct distribution based on the large river valley systems in the nemoral belt (Dnieper, Don, Volga). He described new varieties of the species and stated that these show increasing body miniaturisation and tegument sclerotisation towards the hotter and dryer south-east. The variety *stepposa* approaches *Rossiulus vilnensis* (Jawłowski, 1925) in the form of the opisthomerite and, as the two species occur together in Belarus, Prisnyi suggests that the status of the latter remains to be confirmed. Striganova (1996) studied the life cycle and reproductive strategy of *R. kessleri*.

519. *Rossiulus vilnensis* (Jawłowski, 1925)

Schizophyllum vilnense Jawłowski, 1925.

Distribution

BY, CZ, DE, EE, LT, LV, PL, RU-KGD. (North) Central European.

Habitat

Moist and wet habitats, river valleys; lush meadows, hayfields, heaths, swamps, bogs, inundation forests – *Alnus* woods, e.g., Medio-European stream ash-alder wood (*Fraxino-Alnetum*), *Glutinosa-abietum*, *Populus* woodland.

Genus *Rumaniulus* Attems, 1926

520. *Rumaniulus mammosus* Attems, 1927

Distribution

RO (Cluj Province).

Habitat

Garden in Cluj City, otherwise in forest.

Genus *Serboiulus* Strasser, 1962

Balkaniulus Gulička, 1967.

521. *Serboiulus deelemanni* Strasser, 1971

Serboiulus lucifugus deelemanni Strasser, 1971.

Distribution

SB (Vlaška Planina).

Habitat

Cavernicolous.

Remarks

Upgraded to full species by Makarov *et al.* (2005).

522. *Serboiulus kresnik* Makarov, 2013

Distribution

SB (Mt. Tupižnica).

Habitat

Cavernicolous.

523. *Serboiulus lucifugus* Strasser, 1962

Distribution

SB (Svrljiške Planine Mts).

Habitat

Cavernicolous.

524. *Serboiulus spelaeophilus* Gulička, 1967

Serboiulus popovi Strasser, 1969.

Distribution

BG, SB (Western Stara Planina and Danubian plain).

Habitat

Cavernicolous.

Genus *Stenophyllum* Verhoeff, 1897

525. *Stenophyllum hermannimuelleri* Verhoeff, 1897

Distribution

RO (Eastern Carpathians).

Habitat

Litter of deciduous forests.

526. *Stenophyllum primitivum* Verhoeff, 1897

Distribution

RO.

Habitat

Under decomposing, moist leaf litter in a bush grove.

527. *Stenophyllum semenicense* Ceuca, 1989

Distribution

RO (Western Carpathians, Semenic Mountains).

Habitat

Mixed forest.

528. *Stenophyllum tabacarui* Vanoaica, 2003

Distribution

RO (Eastern Carpathians, Braşov Province).

Habitat

Trogloxene, known only from a small cave near Vârghişului.

Genus *Styrioiulus* Verhoeff, 1928

529. *Styrioiulus pelidnus* (Latzel, 1884)

Iulus pelidnus Latzel, 1884.

Enantiulus pelidnus auct.

Distribution

AT, BA, HR, HU, IT-ITA, SI. Mainly East Alpine.

Habitat

Fagus and *Larix* woods, records in Slovenia from 1200 to 1700 m (Strasser 1940).

Remarks

Records from N Tirol (AT) shown on the map were disputed by Thaler *et al.* (1993).

530. *Styrioiulus styricus* (Verhoeff, 1896)

Iulus styricus Verhoeff, 1896.

Leptophyllum styricum auct.

Metaleptophyllum styricum auct.

Distribution

AT (Steiermark County), HU (Zala County).

Habitat

Fagus woodland in Hungary.

Remarks

A rare species occasionally found in the mountainous country around Graz in Austria and found only once in Hungary at Balatongyörök on Meleg Hill in the Keszthely Mountains.

Genus *Symphyoius* Verhoeff, 1898

531. *Symphyoius impartitus* (Karsch, 1888)

Iulus impartitus Karsch, 1888.

Iulus postsquamatus Verhoeff, 1898.

Symphyoius densestriatus Verhoeff, 1941.

Distribution

GR-GRC. – Also Asiatic Turkey (Anatolia).

Habitat

Pinus halepensis forest with a shrub layer of *Quercus coccifera*, *Phillyrea media* and *Arbutus unedo* (Karamaouna 1992). Found on an open field under rosettes of *Verbascum* in western Anatolia.

Genus *Syniulus* Strasser, 1974

Paratyphloiulus Mauriès, 1983, validation of *Paratyphloiulus* Ceuca, 1971, proposed without a type species.

532. *Syniulus bolivari* (Ceuca, 1971)

Paratyphloiulus bolivari Ceuca, 1971.

Distribution

ES-SPA (Tarragona Province, Cambra Cave near the summit of Mola de Cati Mt).

Habitat

Cavernicolous.

533. *Syniulus lagari* (Ceuca, 1971)

Paratyphloiulus lagari Ceuca, 1971

Distribution

ES-SPA (Barcelona Province, caves at Sant Pau de Ordal and Esparraguera).

Habitat

Cavernicolous.

534. *Syniulus puddui* Strasser, 1974

Distribution

IT-SAR.

Habitat

Cavernicolous.

Genus *Syrioiulus* Verhoeff, 1914

535. *Syrioiulus andreevi* Mauriès, 1984

Distribution

GR-CYC (Paros Isl.).

Habitat

Marble quarry and cave at Marathi.

Genus *Tachypodoiulus* Verhoeff, 1893

Ischiolobus Attems, 1951.

536. *Tachypodoiulus niger* (Leach, 1814)

Julus niger Leach, 1814.

Julus albipes C.L. Koch, 1838.

Ischiolobus niger Attems, 1951.

Ommatoiulus (Phylommatoiulus) montanus Ceuca, 1974.

Tachypodoiulus albipes auct.

Distribution

AT, BE, CH, CZ, DK-DEN, DE, ES-SPA, FR-FRA, GB-CI, GB-GRB, GB-NI, IE, LU, NL. Extended Atlantic.

Habitat

Eurytopic and generally very common throughout its range, with large population densities in woodland, especially on limestone, while it is found on most other types of soil as well. It is very scarce on peaty soils, rare or absent from polders in Holland and Belgium. In some areas it is markedly associated with forest and hedges. In Britain, however, the very large bank of records does not particularly confirm this (Lee 2006); perhaps owing to its abundance, it is found in many different habitats. It readily climbs trees and often shelters under dead bark. It has been trapped high above the ground and has even been found in Malaise traps.

Remarks

North of the Mediterranean zone it is one of the most abundant millipedes in Western Europe. While it occurs in the north of Spain and the French Pyrenees, it appears to be uncommon or missing from low ground in the warmer parts of southern France (Mauriès, pers. comm.). Its southern limits are all in the mountains. A very active species, easily observed and thus one of the most recorded species in Western Europe.

Genus *Telsonius* Strasser, 1976

537. *Telsonius nycteridonis* Strasser, 1976

Distribution

GR-GRC (Chalkidiki).

Habitat

Cavernicolous. In a bat cave near Petralona.

Genus *Titanophyllum* Akkari, Stoev & Enghoff, 2011

538. *Titanophyllum spiliarum* Akkari, Stoev & Enghoff, 2011

Distribution

GR-GRC (Magnesia, Othri Mts).

Habitat

Cavernicolous, collected at the bottom of a vertical shaft.

Genus *Trogloiulus* Manfredi, 1931

A genus of Italian endemic cavernicolous species. Most sites are listed in Minelli (1985).

539. *Trogloiulus binii* Enghoff, 1985

Distribution

IT-ITA (Lombardia).

Habitat

Cavernicolous, found in very muddy places (Enghoff 1985a).

Remarks

Its mouthparts are modified (reduced biting parts, hypertrophied pectinate lamellae), like those of *T. vailatii* Strasser, 1978 and some species of *Typhoiulus*, probably an adaptation to living in very wet places (Enghoff 1985b).

540. *Trogloiulus boldorii* Manfredi, 1940

Trogloiulus tamaninii Verhoeff, 1941.

Distribution

IT-ITA (Lombardia, Veneto).

Habitat

Mainly caves, including artificial galleries (Enghoff 1985a), but also found in deep soil outside caves (Strasser 1977).

541. *Trogloiulus comensis* Strasser, 1977

Distribution

IT-ITA (Lombardia).

Habitat

Cavernicolous.

542. *Trogloiulus concii* Manfredi, 1948

Distribution

IT-ITA (Trento).

Habitat

Cavernicolous.

543. *Trogloiulus minimus* Manfredi, 1935

Distribution

IT-ITA (Lombardia).

Habitat

Cavernicolous, also found under rotten wood in an artificial gallery (Enghoff 1985a).

544. *Trogloiulus mirus* Manfredi, 1931

Distribution

IT-ITA (Lombardia).

Habitat

Cavernicolous.

545. *Trogloiulus osellai* Strasser, 1977

Distribution

IT-ITA (Lombardia).

Habitat

Under deeply imbedded stones.

546. *Trogloiulus vailatii* Strasser, 1978

Distribution

IT-ITA (Lombardia, cave at Serle, Cariadeghe).

Habitat

Cavernicolous. Strasser (1978b) cited the notes of the collector, D. Vailati: “the millipedes were collected in an active meander in the abovementioned cave, called ‘branch of the waterfalls’ because of the presence of many waterfalls. The waterfalls change, in periods of little flow, into a film of water running over the vertical parts of the canal excavated in the rock. When collected, the adult diplopods were heading upstream, covered by at least a couple of millimetres of water, whereas the juvenile stadia could be found at the sides, where only the spray was reaching” (translated from Italian).

Remarks

Its mouthparts are modified like those of *T. binii* (q.v.).

Genus *Typhloiulus* Latzel, 1884

Haploprotopus Verhoeff, 1899.

Spelaeoblaniulus Ceuca, 1956.

Spelaeoiulus Strasser, 1962.

A large genus of cavernicolous species from Italy, Hungary and especially the Balkans; while most are troglobionts a few may be found above the ground as well.

547. *Typhloiulus acutunguis* Ceuca, 1979

Typhloiulus actunguis auct. (lapsus calami).

Distribution

RO (Vladeasa Mountain Range, Cluj Province).

Habitat

Coniferous woodland.

Remark

A dubious species, known only from one female specimen.

548. *Typhloiulus albanicus* Attems, 1929

Distribution

MK, SB.

Habitat

Cavernicolous and above ground (*Fagus* forest.)

Remarks

Attems (1929) gave Kačanik, Ljubeten and Cviljen as localities in Albania. Kačanik is in southern Kosovo, the Ljubeten is a mountain south-west of Kačanik whose summit is on the border with Macedonia and Cviljen is a mountain south of Prizren in Kosovo further west. While Cviljen is only about 10 km from the border, no Albanian record has come to light. The only certain records are from Serbia and Macedonia. Makarov *et al.* (2004) gave details and a map of distribution.

549. *Typhloiulus ausugi* Manfredi, 1953

Distribution

IT-ITA (Veneto, Venezia Tridentina, Friuli-Venezia Giulia).

Habitat

Cavernicolous. There are indications that it prefers very wet caves. Its mouthparts are modified like those of *Trogloiulus binii* (q.v.), *Typhloiulus edentulus* and *T. serbani*, probably an adaptation to living in very wet places (Enghoff 1985b).

Remarks

Strasser (1971) described two subspecies of *T. ausugi*.

550. *Typhloiulus beroni* Mauriès, Golovatch & Stoev, 1997

Distribution

AL (Korcë District, Pustec).

Habitat

Found in an artificial gallery.

551. *Typhloiulus bosniensis* Strasser, 1966

Distribution

BA (Bosnia, Govednica Cave at Banja Stijena).

Habitat

Cavernicolous.

552. *Typhloiulus bureschi* Verhoeff, 1926

Distribution

BG (Stara Planina and Predbalkan).

Habitat

Cavernicolous.

Remarks

Found in a large number of caves situated between 250 m and 830 m above sea level (Vagalinski & Stoev 2007).

553. *Typhloiulus carniolensis* Strasser, 1940

Distribution

SI.

Habitat

Discovered in *Fagus* forest under deeply embedded stones, 750 m.

554. *Typhloiulus edentulus* Attems, 1951

Distribution

BA (Hercegovina, Vjetrenica Cave on the Popovo Polje, and Dolnja Pečina Cave in Kijev Do).

Habitat

Cavernicolous.

Remarks

The mouthparts of this species are modified like those of *Trogloiulus binii* (q.v.).

555. *Typhloiulus ganglbaueri* (Verhoeff, 1898)

Julus ganglbaueri Verhoeff, 1898.

Haploprotopus ganglbaueri auct.

Distribution

IT-ITA, HR, MN.

Habitat

Under stones.

Remark

The inclusion of this species in the Italian checklist by Foddai *et al.* (1995) is based on an otherwise unpublished find at a riverbank near Veggiano, Padova (M.G. Paoletti leg., H. Enghoff det.).

556. *Typhloiulus gellianae* Makarov & Rađa, 2006

Distribution

HR.

Habitat

Cavernicolous.

557. *Typhloiulus georgievi* Strasser, 1962

Distribution

BG (Predbalkan).

Habitat

Cavernicolous.

Remarks

Known from four caves.

558. *Typhloiulus giganteus* Ćurčić & Makarov, 2002

Distribution

MK (Momiček Cave in Dautica Mountain north-east of Makedonski Brod).

Habitat

Cavernicolous.

559. *Typhloiulus hauseri* Strasser, 1974

Distribution

GR-GRC (Kefhalonia, Peloponnese).

Habitat

Not in caves, found near a beach and in a gorge.

560. *Typhloiulus illyricus* Verhoeff, 1929

Typhloiulus illyricus stygis Verhoeff, 1933.

Distribution

HR, SI.

Habitat

Troglobiont. The subspecies *stygis* was found in a *very* wet cave.

561. *Typhloiulus incurvatus* Verhoeff, 1899

Distribution

BA (Hercegovina), SB.

Habitat

Fagus forest, in litter. A cave in Serbia (Antić *et al.* 2013).

562. *Typhloiulus insularis* Strasser, 1938

Distribution

HR (Cres Island, cave at Petrićevi).

Habitat

Cavernicolous.

563. *Typhloiulus kotelensis* Jawłowski, 1938

Distribution

BG (Eastern Stara Planina and Sredna Gora Mts).

Habitat

Forest: quoted from *Fagus sylvatica*, *Quercus petraea*, *Q. cerris*, *Q. dalechampii*, *Carpinus orientalis*. There is one cave listed (Vagalinski & Stoev 2007).

564. *Typhloiulus lobifer* Attems, 1951

Distribution

HR (Brač Island, Jama Žejava).

Habitat

Cavernicolous.

565. *Typhloiulus longinquus* Strasser, 1966

Distribution

IT-ITA (Lazio, Abruzzi-Molise).

Habitat

Quoted from caves in the provinces of Pescara and Roma (Minelli 1985).

566. *Typhloiulus longipes* Strasser, 1973

Distribution

BG (Stara Planina).

Habitat

Cavernicolous.

Remarks

Known from Belyar Cave situated at 860 m in the Vrachanska Planina, and possibly from a second location (Vagalinski & Stoev 2007).

567. *Typhloiulus maximus* Verhoeff, 1929

Distribution

IT-ITA (Tre Venezie).

Habitat

Cavernicolous, but also found outside caves on a few occasions (Strasser 1962).

568. *Typhloiulus montellensis* Verhoeff, 1930

Distribution

IT-ITA (Treviso Province in Veneto).

Habitat

Cavernicolous.

569. *Typhloiulus motasi* Tabacaru & Gava, 1992

Distribution

RO.

Habitat

In soil in *Quercus* forest.

570. *Typhloiulus nevoi* Makarov, Mitić & Ćurčić, 2002

Distribution

SB (known from few caves in Odorovci Karst Field, between Vidlič and Stara Planina).

Habitat

Cavernicolous.

571. *Typhloiulus polypodus* (Loksa, 1960)

Allotyphloiulus polypodus Loksa, 1960.

Allotyphloiulus bükkensis Loksa, 1962.

Cylindroiulus polypodus auct.

Distribution

HU (Bükk Mts).

Habitat

Cavernicolous.

Remarks

See Korsós (1994) for a discussion of this poorly known species.

572. *Typhloiulus psilonotus* (Latzel, 1884)

Iulus psilonotus Latzel, 1884.

Distribution

BA, HR, MN (S Dalmatia, S Hercegovina, W Montenegro).

Habitat

Coastal regions under stones, in *Quercus* woods and *Olea* groves.

573. *Typhloiulus sculterorum* Brölemann, 1905

Distribution

FR-FRA (Alpes Martimes).

Habitat

Deep in the soil under stones and logs in humid ravines.

574. *Typhloiulus serbani* (Ceuca, 1956)

Spelaeoblaniulus serbani Ceuca, 1956.

Spelaeoblaniulus serbani unilineatus Ceuca, 1961.

Typhloiulus (Spelaeoiulus) serbani auct.

Distribution

RO (Apuseni Mts).

Habitat

Cavernicolous.

575. *Typhloiulus serborum* Ćurčić & Makarov, 2005

Distribution

SB

Habitat

Known from several caves in eastern Serbia, as well as one site outside cave, under a huge stone on Svrljiske Planine (Antić *et al.* 2013).

576. *Typhloiulus staregai* Strasser, 1973

Distribution

BG (W Stara Planina).

Habitat

Only known from the Prelaz Cave near Salas, at 1050 m.

577. *Typhloiulus strictus* (Latzel, 1882)

Iulus strictus Latzel, 1882.

Distribution

BG, RO, SB. Carpathian-Balkan.

Habitat

Often in deep leaf litter or in the humus of forests, particularly noted from *Quercus* woodland. Endogeic and troglophile, widespread in caves in the region indicated on the map.

578. *Typhloiulus tobias* (Berlese, 1886)

Iulus tobias Berlese, 1886.

Distribution

IT-ITA (Tre Venezie).

Habitat

Cavernicolous, but also found outside caves on a few occasions (Strasser 1962).

579. *Typhloiulus uncinifer* Strasser, 1974

Distribution

GR-GRC (Cephalonia Island).

Habitat

Not in a cave.

Remarks

A dubious species, known only from a juvenile. Akkari *et al.* (2011) suggested that the species may be related to *Titanophyllum spiliarum*.

Genus *Unciger* Brandt, 1841

Oncoiulus Verhoeff, 1899.

580. *Unciger foetidus* (C.L. Koch, 1838)

Iulus foetidus C.L. Koch, 1838.

Oncoiulus foetidus auct.

Distribution

AT, BA, CH, CZ, DE, DK-DEN, EE, FI, GB-GRB, HR, HU, IT-ITA, LT, LV, NL, NO-NOR, PL, RO, RU-KGD, SB, SE, SI, SK, UA. Central European, extending northwards.

Habitat

Hygrophile. Closed, undisturbed deciduous forests (Lázanyi & Korsós, 2009). Recorded in old *Quercus* woodland and also in *Fagus*, *Fraxinus*, *Carpinus*, *Castanea*, *Tilia*, *Alnus*, *Acer*. Also recorded from *Pinus* forest. In beechwood (*Fagus*) up to 1100 m in Slovenia (Strasser 1940). Found on afforested

colliery spoil heaps with garden rubbish (Decker & Hannig 2010). Common in gardens (Schubart 1934). Synanthropic, particularly in the north. Common in gardens (Schubart 1934).

Remarks

Thaler (1989) reported on a mass occurrence in Innsbruck, Austria. In the introduction to this volume we have indicated the ubiquity of *U. foetidus* in Central Europe and here we draw attention to the range shown on the map. The two imprecise records are from districts for which we have no precise record.

581. *Unciger transsilvanicus* (Verhoeff, 1899)

Oncoiulus foetidus transsilvanicus Verhoeff, 1899.

Distribution

AT, BG, CZ, HU, MD, PL, RO, RU-RUS, SB, SK, UA. Central European. Also found in Stavropol, northern Caucasus, Russia (Zuev 2014).

Habitat

Broad-leaved forest: *Fagus sylvatica*, *Quercus* sp. Open meadowland and alpine grassland up to 1900 m.

Genus *Xestoiulus* Verhoeff, 1893

Microiulus Verhoeff, 1895.

582. *Xestoiulus bjelasnicensis* (Verhoeff, 1898)

Iulus bjelasnicensis Verhoeff, 1898.

Microiulus bjelasnicensis auct.

Distribution

BA, HR. West Balkan.

583. *Xestoiulus carpathicus* (Verhoeff, 1907)

Iulus carpathicus Verhoeff, 1907.

Microiulus carpathicus auct.

Distribution

PL, SK. Northern Carpathians.

Habitat

Cave entrance.

584. *Xestoiulus dalmaticus* Mršić, 1987

Distribution

HR (Biokovo).

Habitat

Valleys and a cave.

585. *Xestoiulus fimbriatus* (Attems, 1904)

Iulus (Femoriferus) fimbriatus Attems, 1904.

Microiulus fimbriatus auct.

Distribution

HR (Dalmatia: Dubrovnik).

586. *Xestoiulus fontisherculus* (Verhoeff, 1899)

Iulus fontisherculus Verhoeff, 1899.

Microiulus fontisherculus auct.

Microiulus urbanskii Strasser, 1969.

Distribution

BG, RO, SB. Carpathian-Balkan.

Habitat

Leaf-litter in *Fagus* and *Quercus* forests. Meadows. From sea level to 1300 m.

587. *Xestoiulus graciliventris* (Verhoeff, 1898)

Iulus graciliventris Verhoeff, 1898.

Microiulus graciliventris auct.

Distribution

BA (mountains around Sarajevo).

Habitat

Leaf litter of bushy woodland.

588. *Xestoiulus imbecillus* (Latzel, 1884)

Iulus imbecillus Latzel, 1884.

Microiulus imbecillus auct.

Leptoiulus imbecillus auct.

Iulus blanuloides Verhoeff, 1893.

Iulus Moebiusi Verhoeff, 1897.

Microiulus imbecillus obscuratus Attems, 1927.

Leptoiulus muscivagus Verhoeff, 1930.

Microiulus bezkidensis Loksa, 1967.

Distribution

AT, BA, HR, HU, IT-ITA, RO, SB, SI, UA.

Habitat

Quercus forest, *Alnus* and *Tilia* woodland. *Alnus* gallery along stream in *Fagus* forest (Korsós & Lazányi 2008); shrub on sunny slope; between calcareous rocks.

Remark

The occurrence of this species in SK is doubtful (Mock 2001).

589. *Xestoiulus laeticollis* (Porat, 1889)

Iulus laeticollis Porat, 1889.

Microiulus laeticollis auct.

Microiulus laeticollis mierzeyewskii Jawłowski, 1925.

Microiulus dudichi Verhoeff, 1927.

Distribution

BY, DE, DK-DEN, EE, HU, LT, LV, NL, PL, RO, RU-KGD, RU-RUC, RU-RUW, SE, UA.

Habitat

This millipede is particularly associated with damp habitats: Swamps and marshes, wet woodland: *Fraxinus* and *Alnus* forests and *Alnus* swamps (*Fraxino-Alnetum*, *Ribeso-nigri Alnetum*, *Alnetum-Quercetum fluvialis*). *Pinus* woods. Meadows. Regarded as a stenotopic hygrobiont woodland species with preference for floodplains and swamp forests in Saxony-Anhalt, Germany (Voigtländer 2011). The subspecies *mierzeyewskii* found in *Quercus* and *Pinus* forest in Russia (Prisnyi 2001).

Remarks

Several subspecies have been described in addition to the frequently cited ssp. *mierzeyewskii*.

590. *Xestoiulus luteus* (Attems, 1951)

Microiulus luteus Attems, 1951.

Distribution

BA (Brataljevića Cave, Kladanj), SB.

591. *Xestoiulus pirinicus* (Gulička, 1967)

Microiulus pirinicus Gulička, 1967.

Distribution

BG (Pirin Mountains, Demyanitsa Valley).

592. *Xestoiulus rebeli* (Attems, 1904)

Iulus rebeli Attems, 1904.

Microiulus rebeli auct.

Distribution

BG (E Stara Planina, near Sliven).

593. *Xestoiulus rucneri* (Ceuca, 1990)

Microiulus rucneri Ceuca, 1990.

Distribution

HR (Hvar Isl.).

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Ukraine: S.I. Golovatch
United Kingdom: British Myriapod & Isopod group, particularly A.D. Barber, A. Fowles, S. Gregory, R.E. Jones, P. Lee, J.G.E. Lewis, H.J. Read, J.P. Richards

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Printed versions of all papers are also deposited in the libraries of the institutes that are members of the *EJT* consortium: Muséum national d'Histoire naturelle, Paris, France; Botanic Garden Meise, Belgium; Royal Museum for Central Africa, Tervuren, Belgium; Natural History Museum, London, United Kingdom; Royal Belgian Institute of Natural Sciences, Brussels, Belgium; Natural History Museum of Denmark, Copenhagen, Denmark; Naturalis Biodiversity Center, Leiden, the Netherlands; Museo Nacional de Ciencias Naturales-CSIC, Madrid, Spain; Real Jardín Botánico de Madrid CSIC, Spain.

Appendix 1: post 2014 papers

The following papers, published after the cut-off date (end of 2014) for data to be included in the atlas, contain significant new data and are therefore briefly summarized:

Akkari N., Enghoff H. & Metscher B. 2015. A new dimension in documenting new species: High-detail imaging for myriapod taxonomy and first 3D cybertype of a new millipede species (Diplopoda, Julida, Julidae). *PLoS ONE* 10 (8): e0135243. <https://doi.org/10.1371/journal.pone.0135243>; <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0135243>. Describes *Ommatoiulus avatar* Akkari & Enghoff, 2015, from ES-SPA (Andalusia).

Akkari N. & Enghoff H. 2017. Revision of the genus *Ommatoiulus* Latzel (Julida, Diplopoda) in Portugal, with description of six new species. *European Journal of Taxonomy* 295: 1–42. <https://doi.org/10.5852/ejt.2017.295>. Describes *Ommatoiulus alacygni* Akkari & Enghoff, 2017, *O. camurus* Akkari & Enghoff, 2017, *O. denticulatus* Akkari & Enghoff, 2017, *O. litoralis* Akkari & Enghoff, 2017, *O. staglae* Akkari & Enghoff, 2017, *O. stellaris* Akkari & Enghoff, 2017, all from PT-POR. – Synonymizes *O. cervinum* (Verhoeff, 1910) under *O. moreleti* (Lucas, 1860), *O. cingulatus* (Attems, 1927) under *O. lusitanus* (Verhoeff, 1895), and *O. lienharti* (Brolemann, 1921) under *O. bipartitus* (Verhoeff, 1910). – Gives new records of several *Ommatoiulus* species, including the first Portuguese records of *O. andalusius* (Attems, 1927), *O. fuentei* (Brolemann, 1920) and *O. martensi* Mauriès, 1969.

Antić D.Ž., Mock A. & Enghoff H. 2015. Two new species of the millipede family Blaniulidae (Diplopoda, Julida) from caves in eastern and southeastern Europe. *Zootaxa* 3985 (4): 523–540. <https://doi.org/10.11646/zootaxa.3985.4.3>. Describes *Cibiniulus slovacus* Antić, Mock & Enghoff, 2015, from SK, and *Thassoblaniulus radjai* Antić & Enghoff, 2015, from AL.

Barber T. 2016. Centipedes and millipedes from Ventnor Botanic Gardens including a species new to Britain. *Proceedings of the Isle of Wight Natural History and Archaeological Society* 30: 88–93. Records *Cylindroiulus apenninorum* (Brölemann, 1897) and *Haplopodoiulus spathifer* (Brölemann, 1897) from a botanical garden, the former species as new to the British Isles.

Decker P., Voigtländer K. & Reip H.S. 2015. On distribution patterns of very rare Chilopoda and Diplopoda in Germany. *Acta Societatis Zoologicae Bohemicae* 79: 169–181. Provides distribution maps for eight species of Julidae in Germany: *Brachyiulus bagnalli* (Brolemann, 1924), *Cylindroiulus luridus* (C.L. Koch, 1847), *Julus terrestris* Linnaeus, 1758, *Leptoiulus bertkai* (Verhoeff, 1896), *L. cibdellus* (Chamberlin, 1921), *L. trilobatus* (Verhoeff, 1894), *L. noricus* Verhoeff, 1913 (as *L. marcomannius* Verhoeff, 1913) and *Ommatoiulus rutilans* (C.L. Koch, 1847).

Evsyukov A.P. 2016. A new species of the millipede genus *Julus* from the Rostov-on-Don region, southern Russia (Diplopoda: Julida: Julidae). *Arthropoda Selecta* 25 (3): 241–245. Describes *Julus alexandrae* Evsyukov, 2016, from RU-RUS, bank of Metchetka River, near Metchetinskaya, Rostov-on-Don Region.

Vagalinski B., Stoev P. & Enghoff H. 2015. A review of the millipede genus *Typhloiulus* Latzel, 1884 (Diplopoda: Julida: Julidae), with a description of three new species from Bulgaria and Greece. *Zootaxa* 3999 (3): 334–362. <https://doi.org/10.11646/zootaxa.3999.3.2>. Describes *Typhloiulus bulgaricus* Vagalinsky, Stoev & Enghoff, 2015 and *T. orpheus* Vagalinsky, Stoev & Enghoff, 2015, both from BG, and *T. rhodopinus* Vagalinsky, Stoev & Enghoff, 2015 from BG and GR-GRC (Thrace). – Synonymizes *T. staregai* Strasser, 1973 under *T. strictus* (Latzel, 1882). – Gives new records of several species of *Typhloiulus*.

Appendix 2: maps



1. *Acipes andalusius*
Enghoff & Mauriès, 1999



2. *Acipes atlanticus* Attems, 1935
10. *Acipes serratus* Enghoff, 1983
11. *Acipes waldeni* Enghoff, 1983



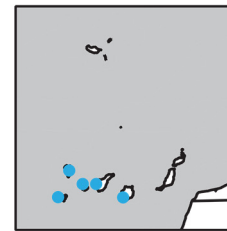
3. *Acipes bifilum*
Enghoff & Reboleira, 2013



4. *Acipes continentalis*
Enghoff, 1986



5. *Acipes decolor* Enghoff, 1983
7. *Acipes lateralis* Enghoff, 1983
9. *Acipes portosantoensis*
Enghoff, 1983



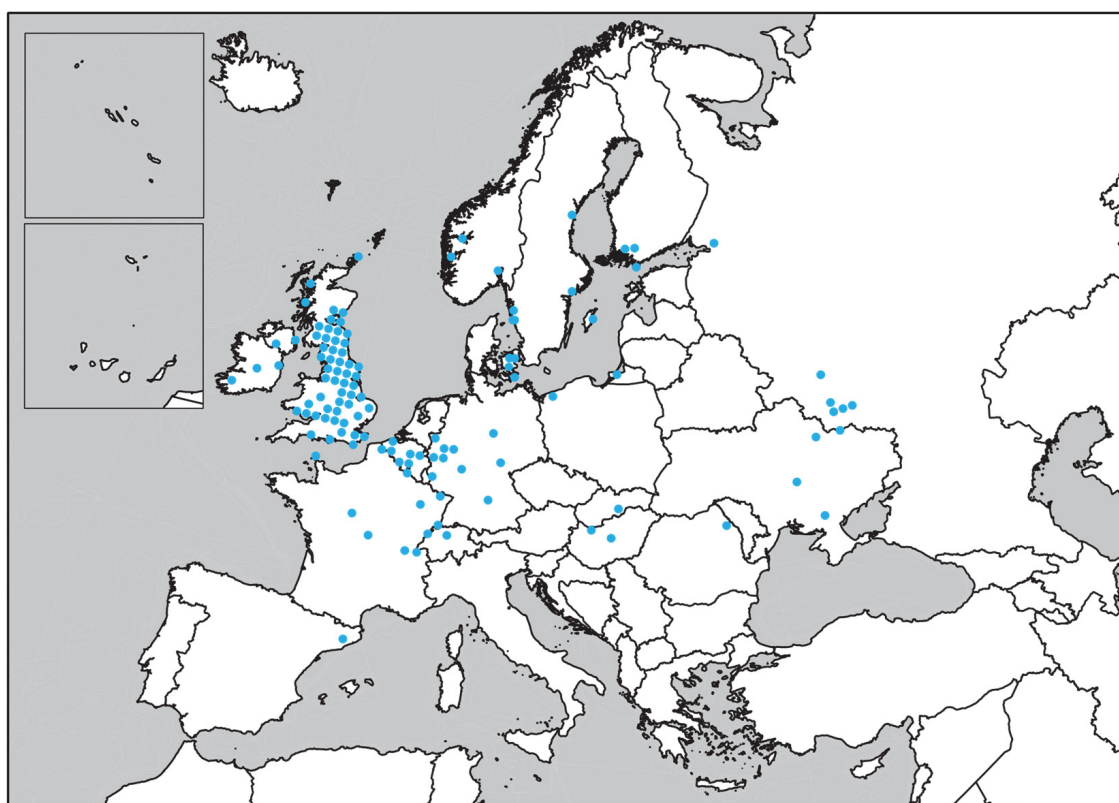
6. *Acipes franzi*
(Loksa, 1967)



8. *Acipes machadoi*
Enghoff & Reboleira, 2013



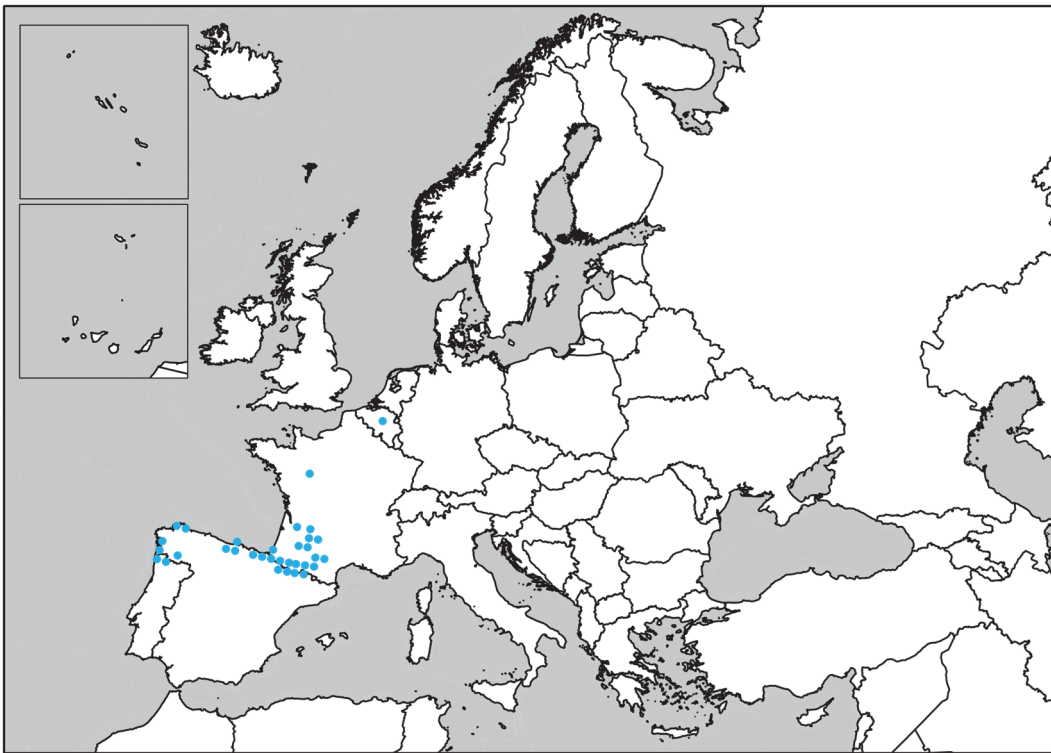
12. *Alpiobates peyerimhoffi*
(Brölemann, 1900)



13. *Archiboreoiulus pallidus* (Brade-Birks, 1920)



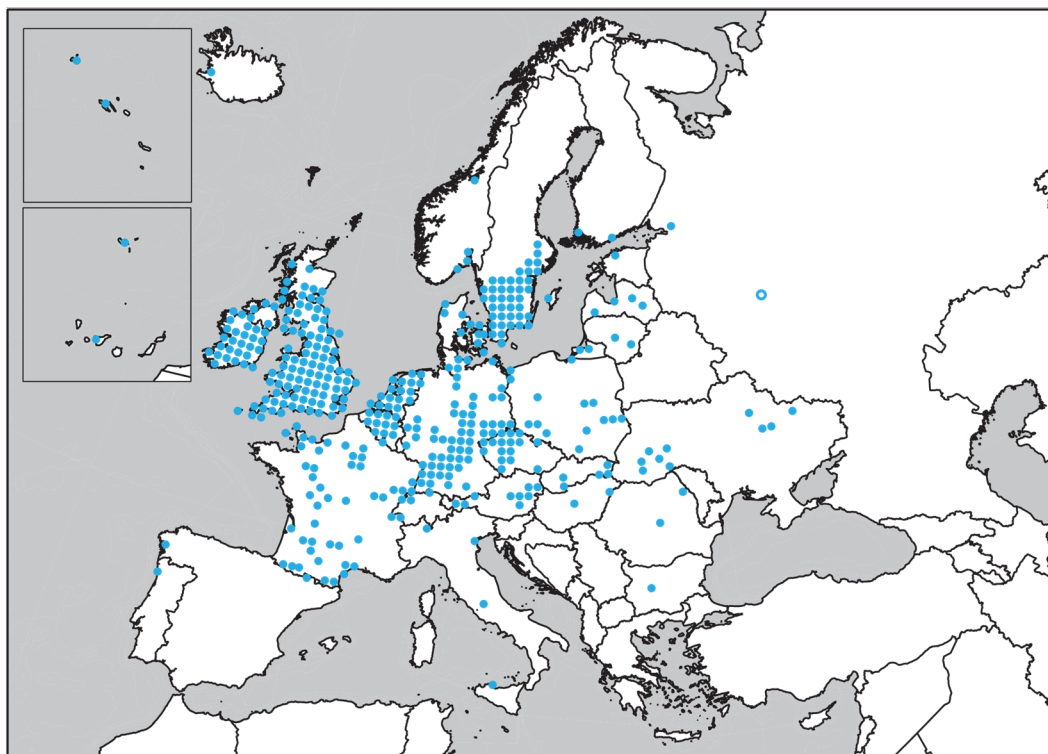
14. *Archiboreoiulus sollaudi*



15. *Blaniulus dollfusi* Brölemann, 1894



16. *Blaniulus eulophus*
Silvestri, 1903



17. *Blaniulus guttulatus* (Fabricius, 1798)



18. *Blaniulus lichtensteini*
Brolemann, 1921



19. *Blaniulus lorifer*
(Brolemann, 1921)



20. *Blaniulus mayeti*
(Brölemann, 1902)



21. *Blaniulus orientalis*
Brolemann, 1921



22. *Blaniulus troglobius*
Latzel, 1886



23. *Blaniulus troglodites*
Brölemann, 1898



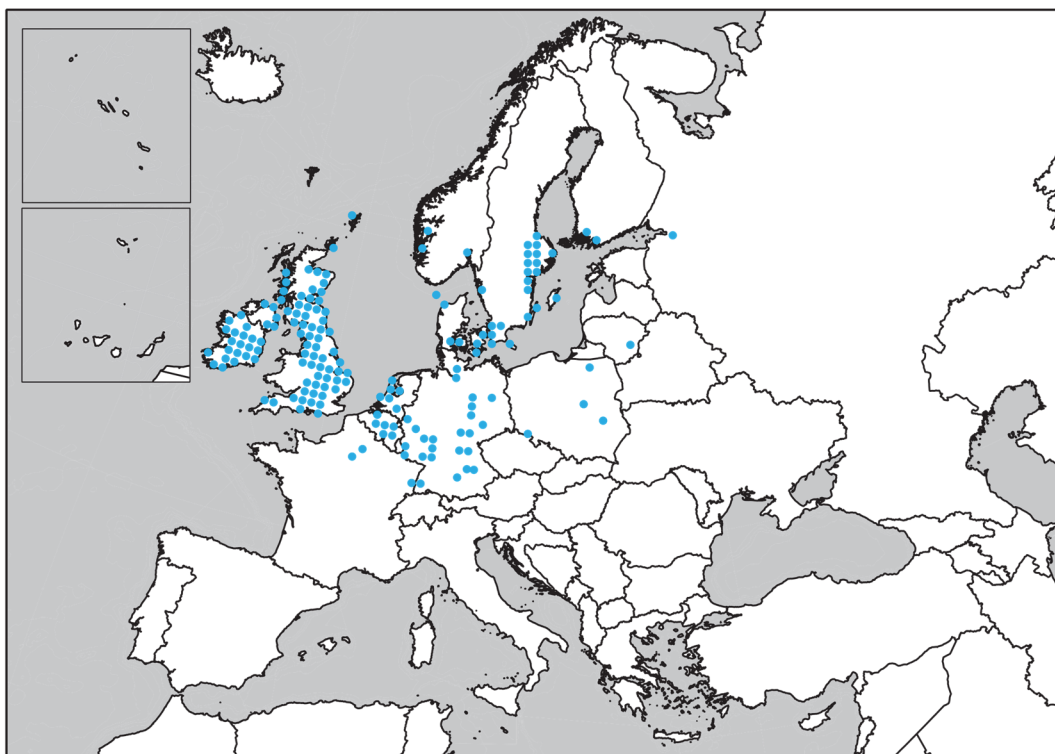
24. *Blaniulus velatus*
Ribaut, 1954



25. *Blaniulus virei*
Brölemann, 1900



26. *Boreoiulus simplex*
Brölemann, 1921



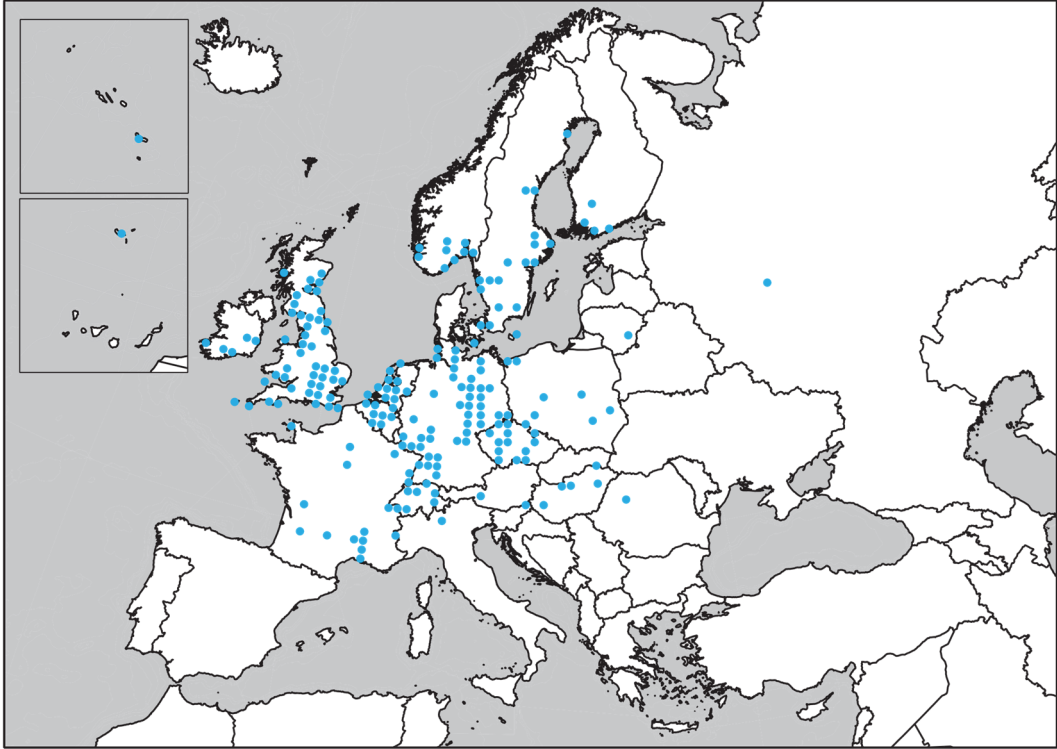
27. *Boreoiulus tenuis* (Bigler, 1913)



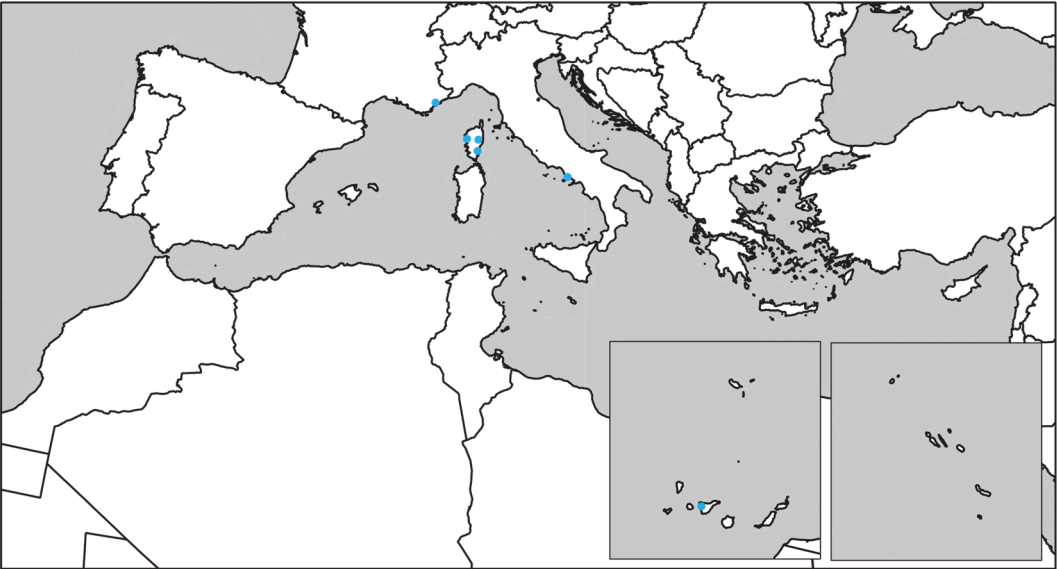
28. *Choneiulus faunaeuropaeae*
Enghoff, 2002



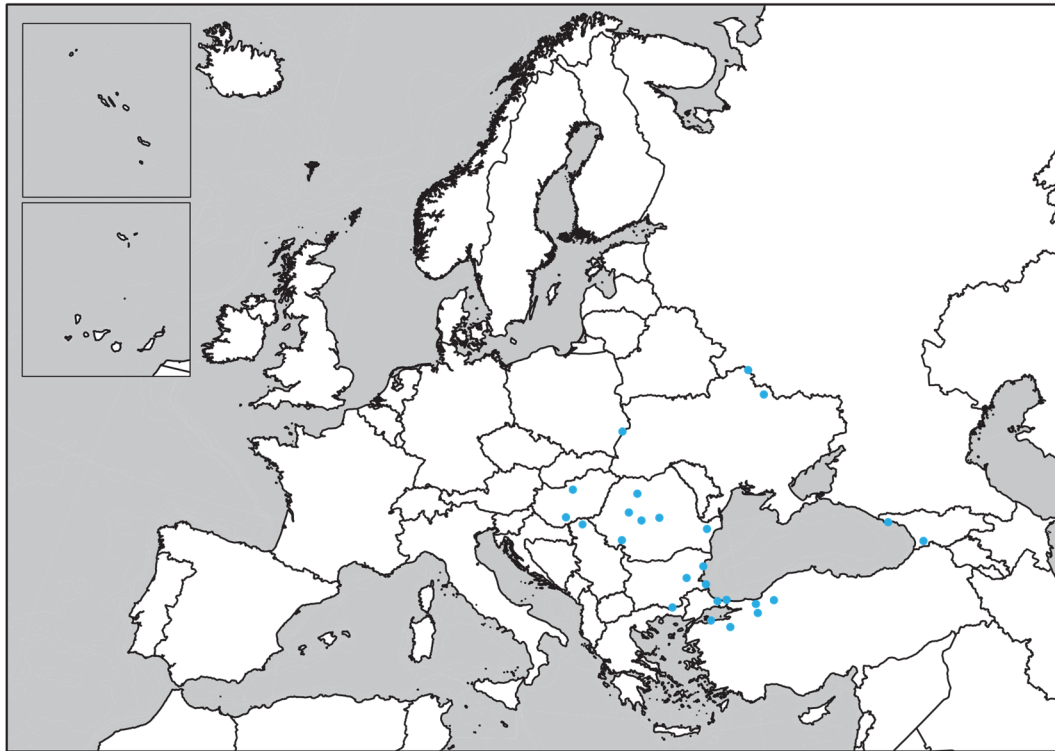
29. *Choneiulus lacinifer*
Strasser, 1980



30. *Choneiulus palmatus* (Němec, 1895)



31. *Choneiulus subterraneus* (Silvestri, 1903)



32. *Cibiniulus phlepsii* (Verhoeff, 1897)



33. *Euzdakiulus sarensis*
Mauriès, 1970



34. *Iberoiulus brevili*
Ceuca, 1967



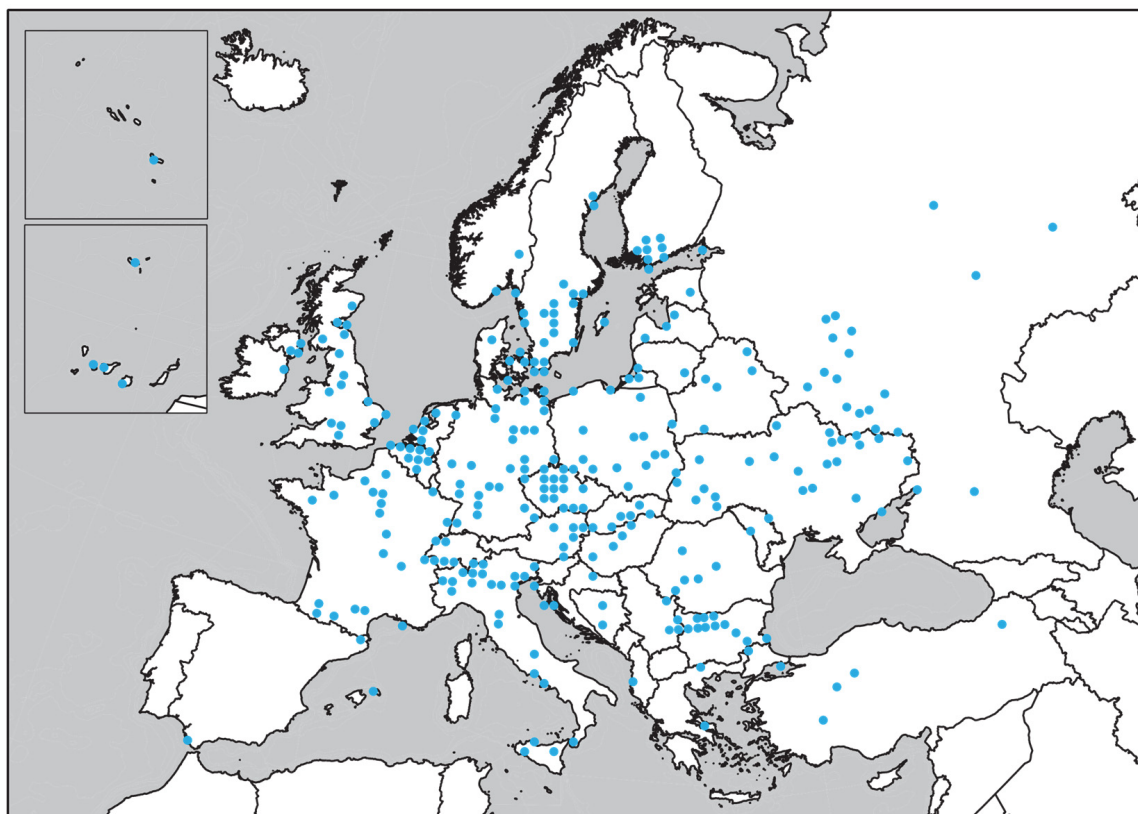
35. *Iberoiulus cavernicola*
Ceuca, 1967



36. *Mesoblaniulus serrula*
(Brölemann, 1905)



37. *Monacobates monoecensis*
(Brölemann, 1905)



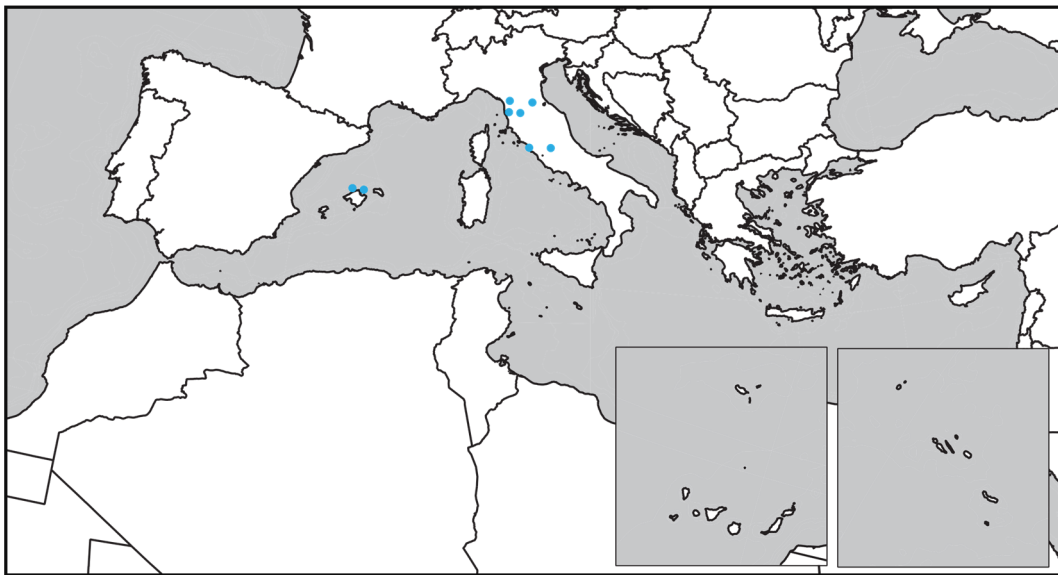
38. *Nopoiulus kochii* (Gervais, 1847)



39. *Occitaniulus rouchi*
Mauriès, 1965



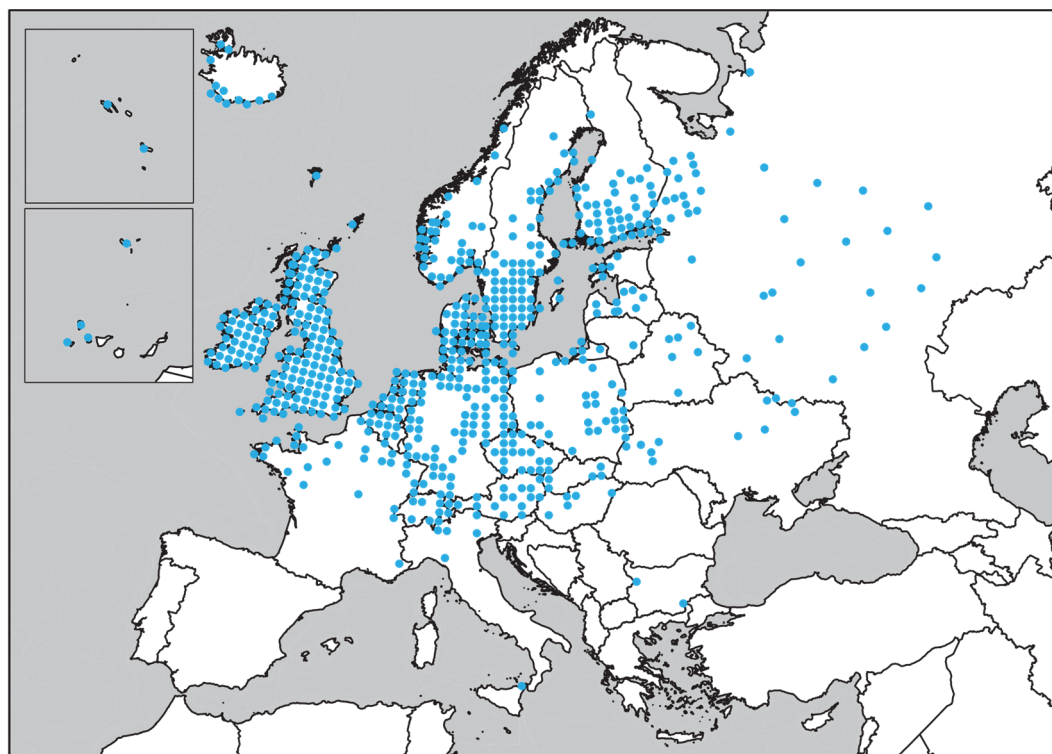
40. *Orphanoiulus dinapolii*
Strasser, 1960



41. *Orphanoiulus religiosus* (Silvestri, 1903)



42. *Proteroiulus broelemanni*
Lohmander, 1925



43. *Proteroiulus fuscus* (Am Stein, 1857)



44. *Proteroiulus hispanus*
Schubart, 1959



45. *Sardoblaniulus annae*
Manfredi, 1956



46. *Tarracoblaniulus lagari*
Mauriès & Vicente, 1977



47. *Tarracoblaniulus phantasmanus*
Enghoff, Serra & Martínez, 2009



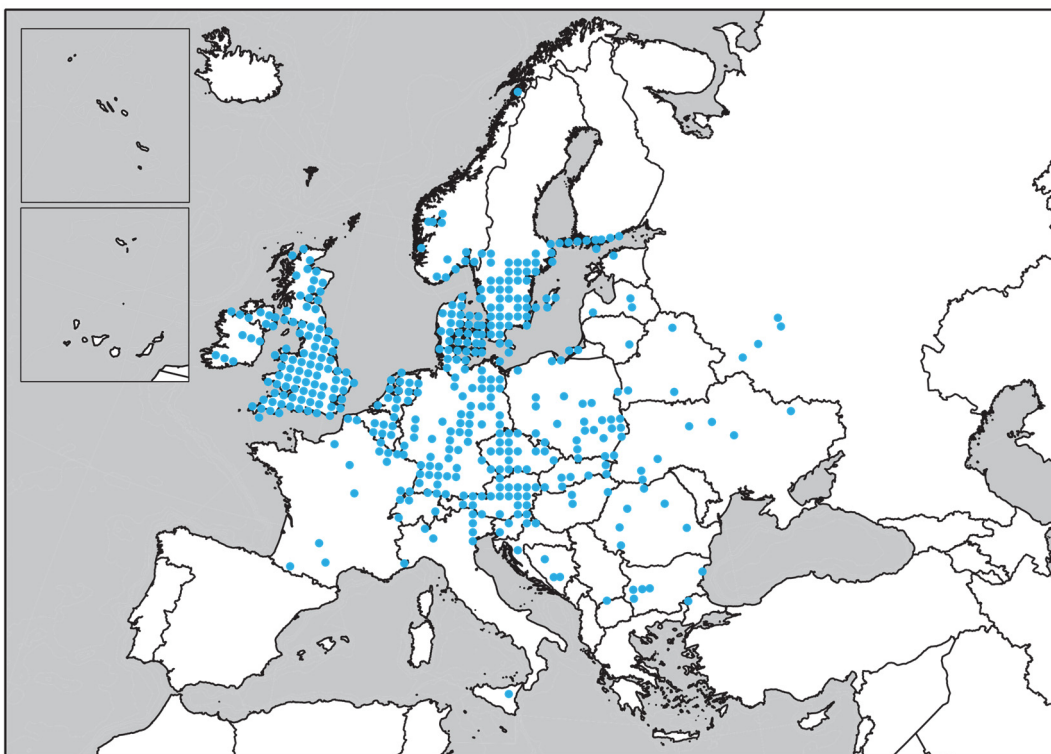
48. *Thassoblaniulus simplarius* Mauriès, 1985



49. *Vascoblaniulus cabidochei*
Mauriès, 1967



50. *Galliobates gracilis*
(Ribaut, 1909)



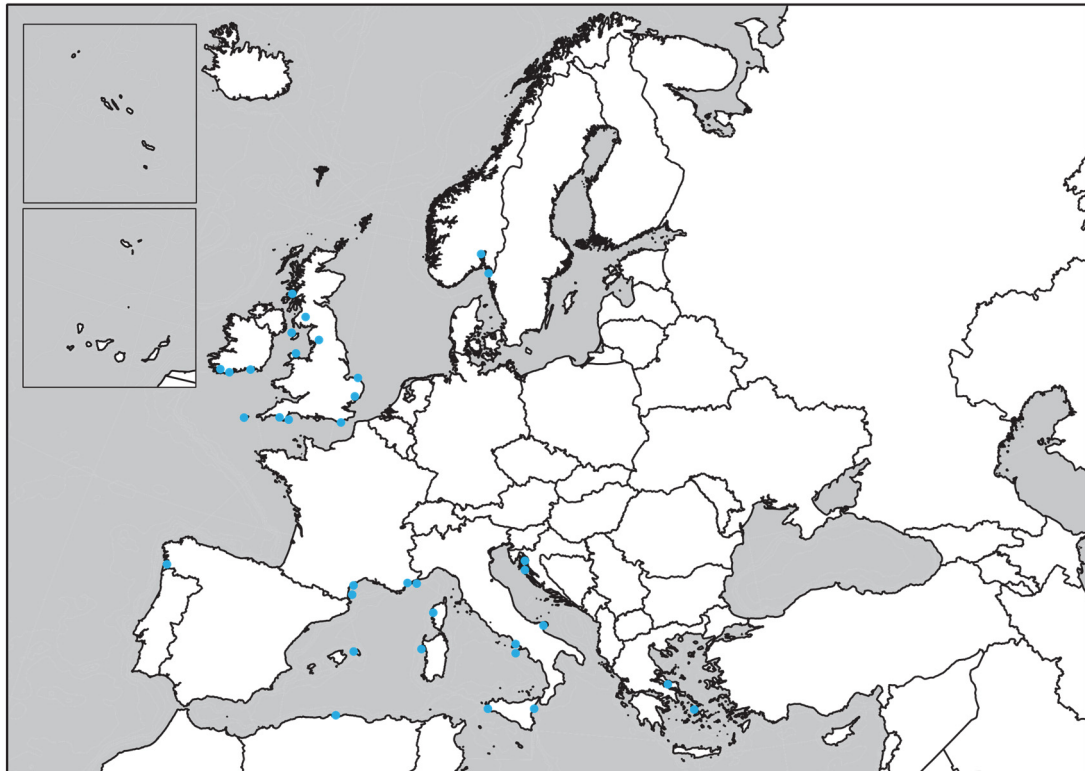
51. *Nemasoma varicorne* C.L. Koch, 1847



52. *Thalasssobates almeriensis*
Enghoff, 2013



53. *Thalasssobates emesesensis*
Enghoff, 2013



54. *Thalassisobates littoralis* (Silvestri, 1903)



55. *Rhopaloiulus cameratanus*
Attems, 1927



56. *Trichoblaniulus cavernicola*
Brölemann, 1905



57. *Trichoblaniulus hirsutus*
(Brölemann, 1889)



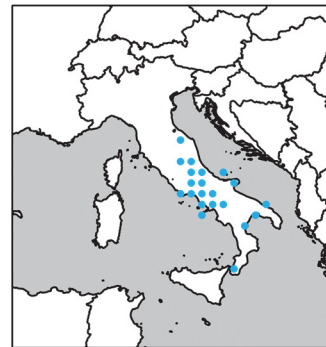
58. *Trichoblaniulus lamuginosus*
Ribaut, 1947



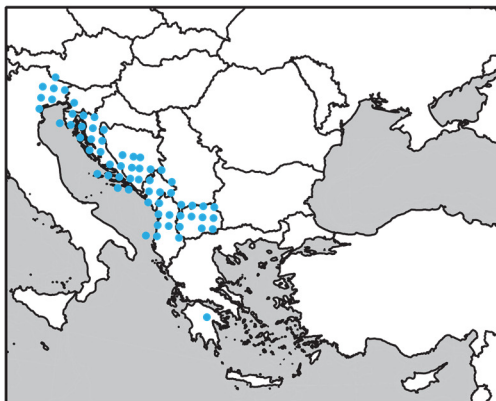
59. *Trichoblaniulus tarraconensis*
Mauriès & Vicente, 1977



60. *Trichonemasoma peloponesius*
(Mauriès, 1966)



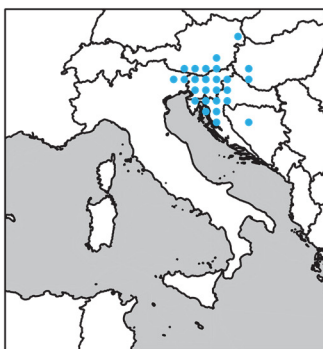
61. *Acanthoiulus cassinensis*
(Verhoeff, 1910)



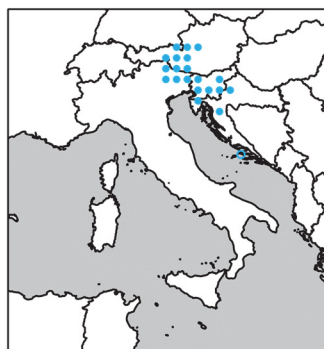
62. *Acanthoiulus fuscipes*
(C.L. Koch, 1847)



63. *Afropachyiulus maritimus*
Strasser, 1970



64. *Allajulus dicentrus*
(Latzel, 1884)



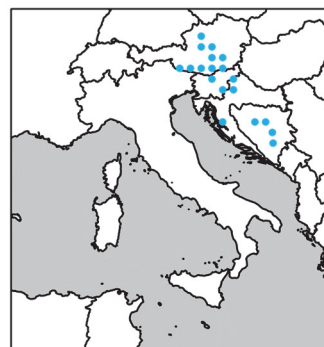
65. *Allajulus groedensis*
(Attems, 1899)



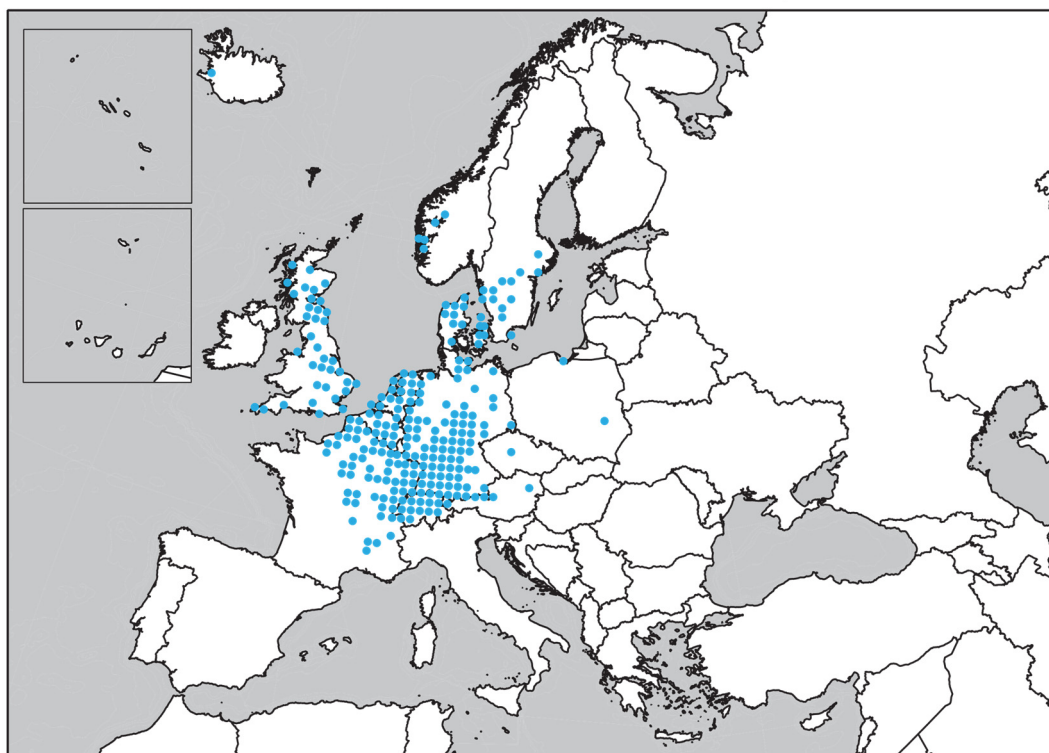
66. *Allajulus infossus*
(Verhoeff, 1930)



67. *Allajulus marguareisi*
(Strasser, 1970)



68. *Allajulus molybdinus*
C.L. Koch, 1847



69. *Allajulus nitidus* (Verhoeff, 1891)



70. *Allajulus spinosus*
(Ribaut, 1904)



71. *Allopodoiulus schiodtei*
(Verhoeff, 1898)



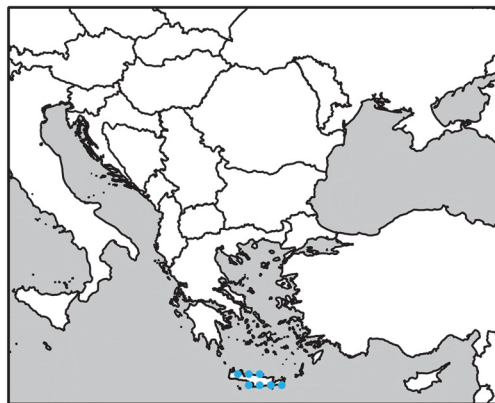
72. *Allopodoiulus verhoeffi*
(Jawłowski, 1931)



73. *Alpityphlus seewaldi*
Strasser, 1967



74. *Amblyiulus aphroditae*
(Attems, 1902)



75. *Amblyiulus creticus* (Verhoeff, 1901)



76. *Amblyiulus kovali* Golovatch, 2008



77. *Amblyiulus sporadensis*
(Verhoeff, 1901)



78. *Apfelbeckiella bulgarica*
Verhoeff, 1926



79. *Apfelbeckiella byzantina*
Verhoeff, 1901



80. *Apfelbeckiella dobrogica*
Tabacaru, 1966



81. *Apfelbeckiella golemanskyi*
Ceuca, 1973



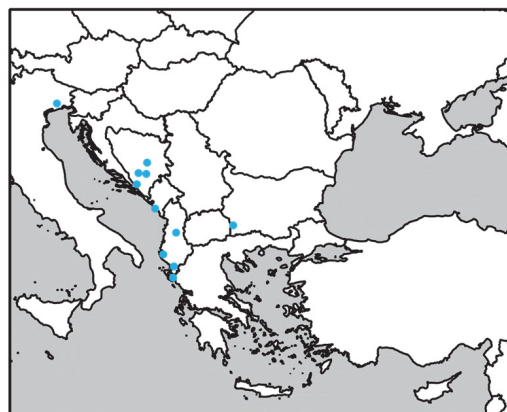
82. *Apfelbeckiella trnovensis*
(Verhoeff, 1928)



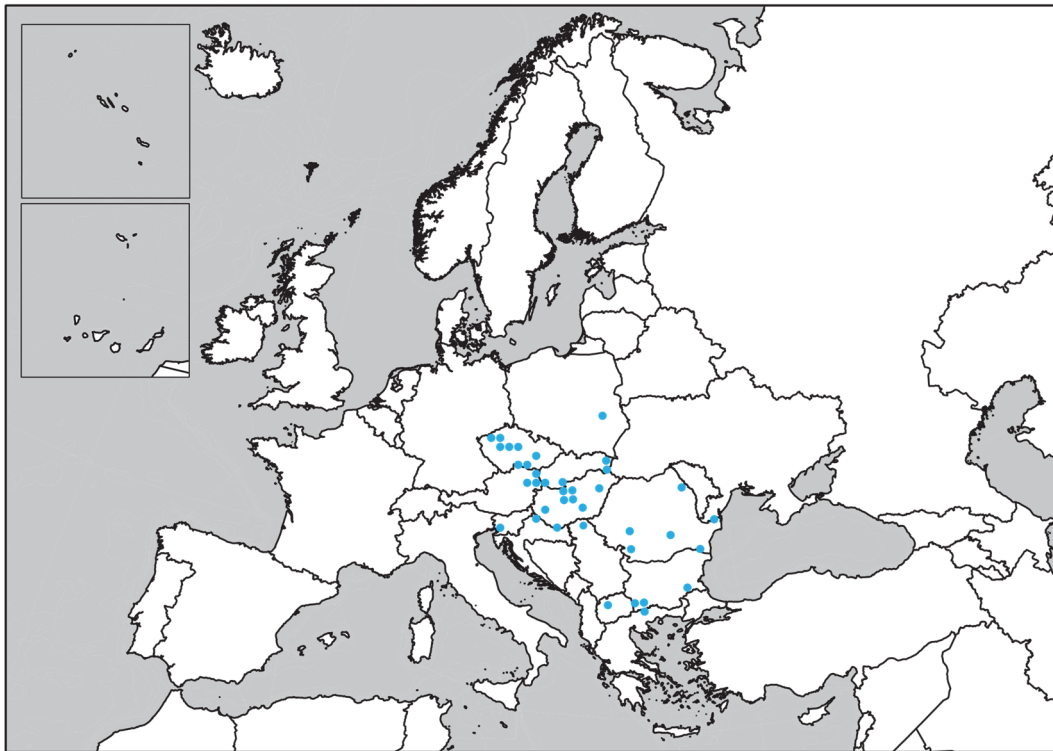
83. *Balkanophoenix borisi*
Verhoeff, 1937



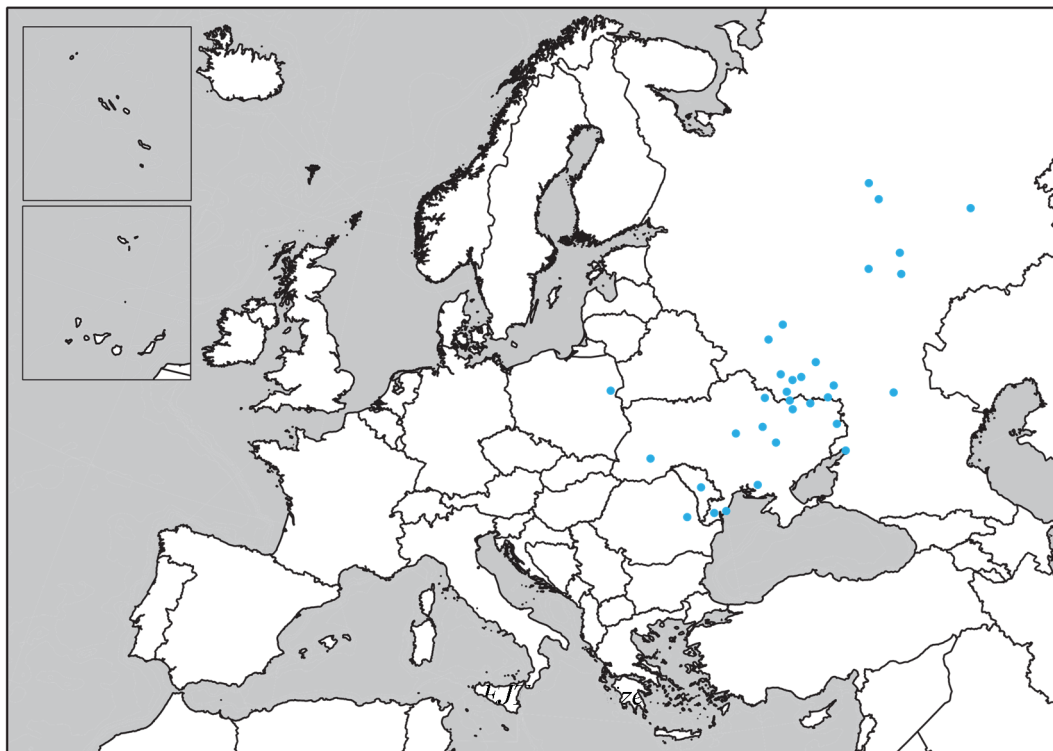
84. *Banatoiulus troglobius*
Tabacaru, 1985



85. *Brachyiulus apfelbecki*
Verhoeff, 1898



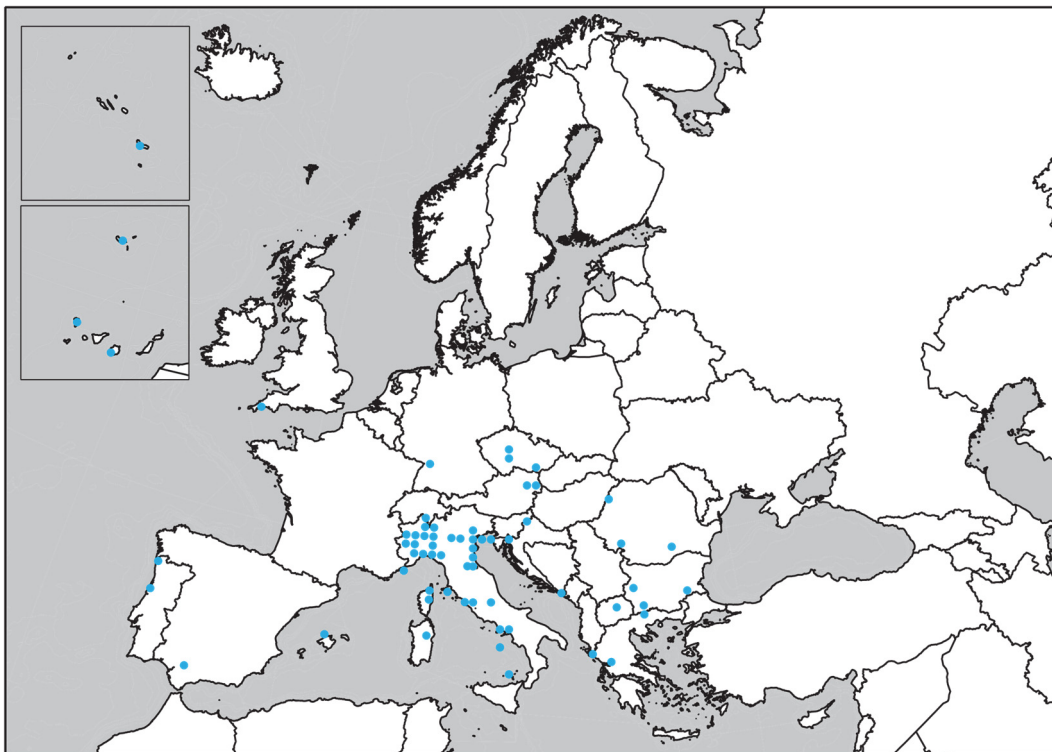
86. *Brachyiulus bagnalli* (Brolemann, 1924)



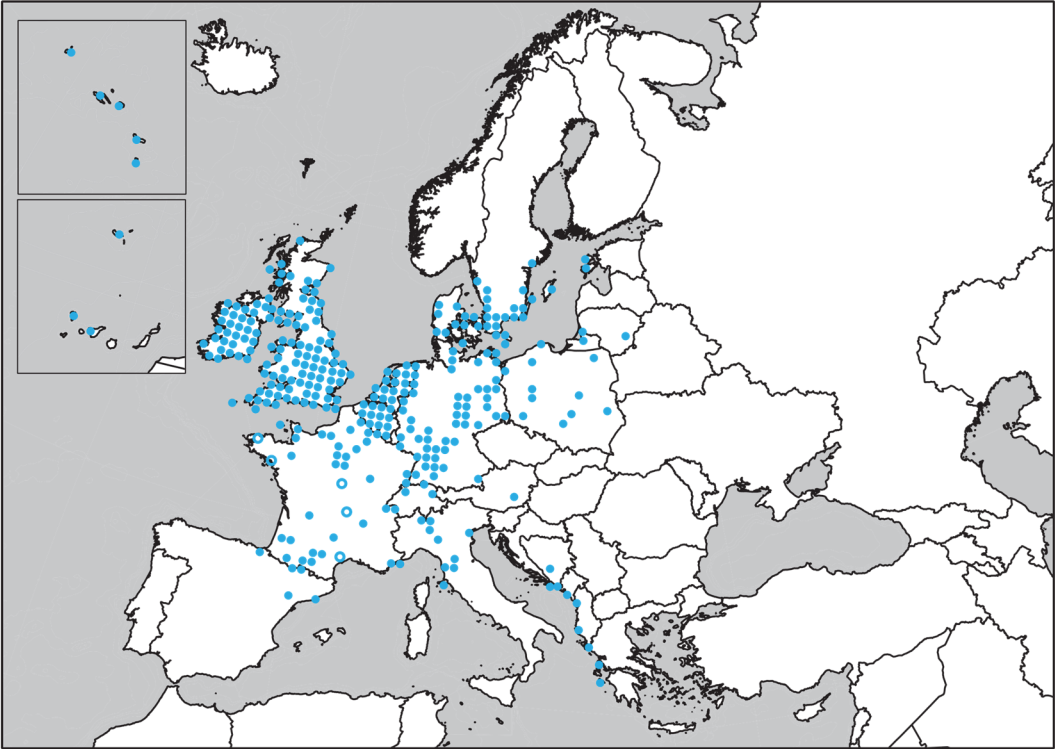
87. *Brachyiulus jawlowskii* Lohmander, 1928



88. *Brachyiulus klisurensis*
Verhoeff, 1903



89. *Brachyiulus lusitanus* Verhoeff, 1898



90. *Brachyiulus pusillus* (Leach, 1814)



91. *Brachyiulus stuxbergi* (Fanzago, 1875)



92. *Brachyiulus varibolinus*
Attems, 1904



93. *Buchneria cornuta*
Verhoeff, 1941



94. *Buchneria sicula*
Strasser, 1959



95. *Chaetoleptophyllum montanum*
(Verhoeff, 1898)



96. *Chaitoiulus spinifer*
(Verhoeff, 1895)



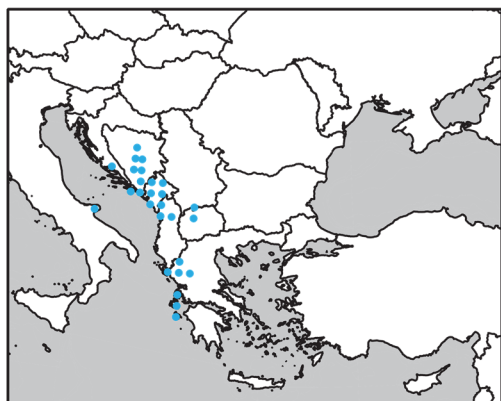
97. *Chersoius ciliatus*
Strasser, 1938



98. *Chersoiiulus sphinx*
Strasser, 1940



99. *Chromatoiulus hamuligerus*
(Verhoeff, 1932)



100. *Chromatoiulus podabrus*
(Latzel, 1884)



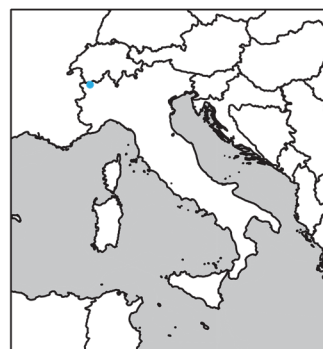
101. *Cyldroiulus abaligetanus*
Verhoeff, 1901



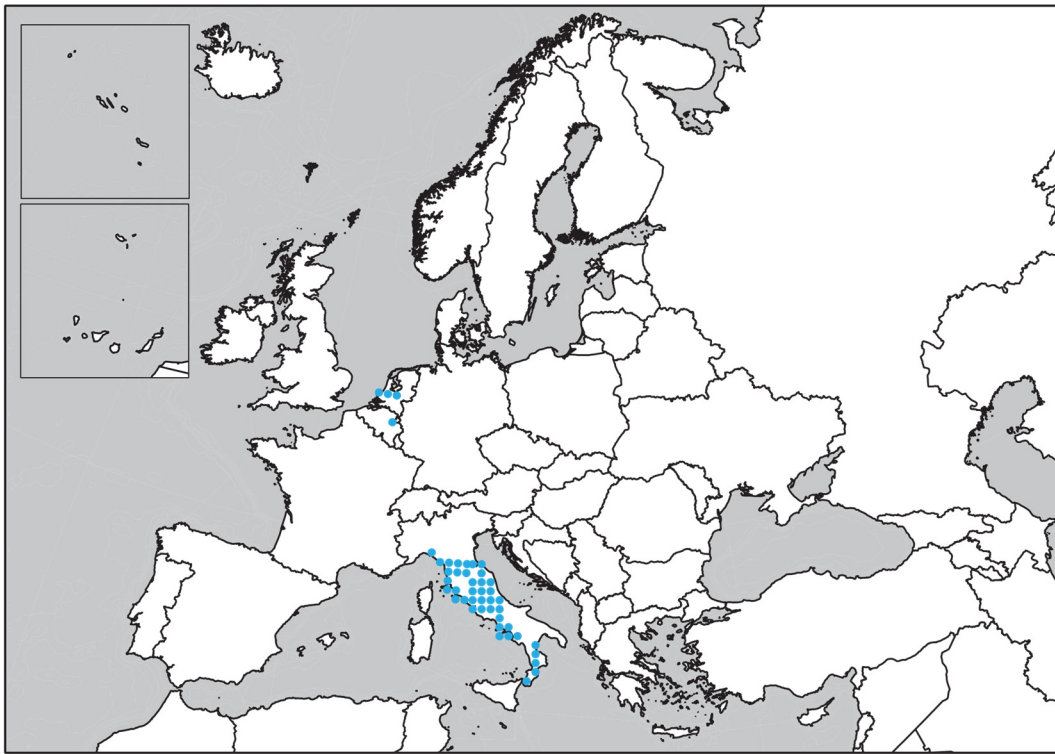
102. *Cyldroiulus aetnensis*
Verhoeff, 1910



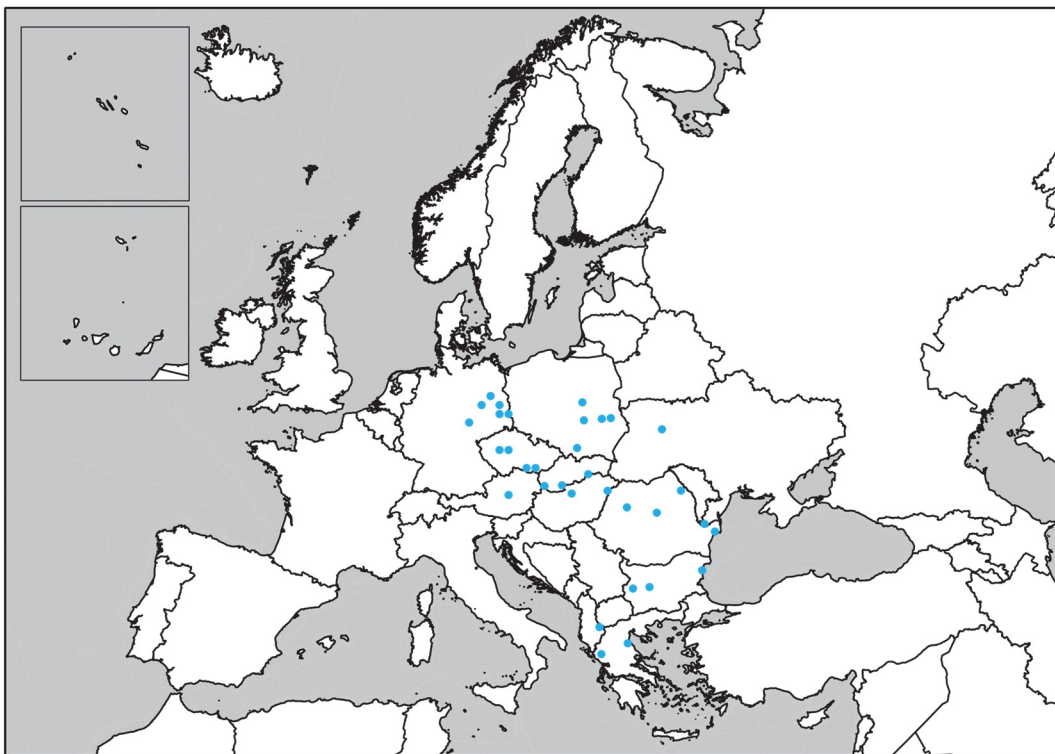
103. *Cyldroiulus anglilectus*
Read, 2007



104. *Cyldroiulus aostanus*
Verhoeff, 1932



105. *Cylindroiulus apenninorum* (Brölemann, 1897)



106. *Cylindroiulus arborum* Verhoeff, 1928



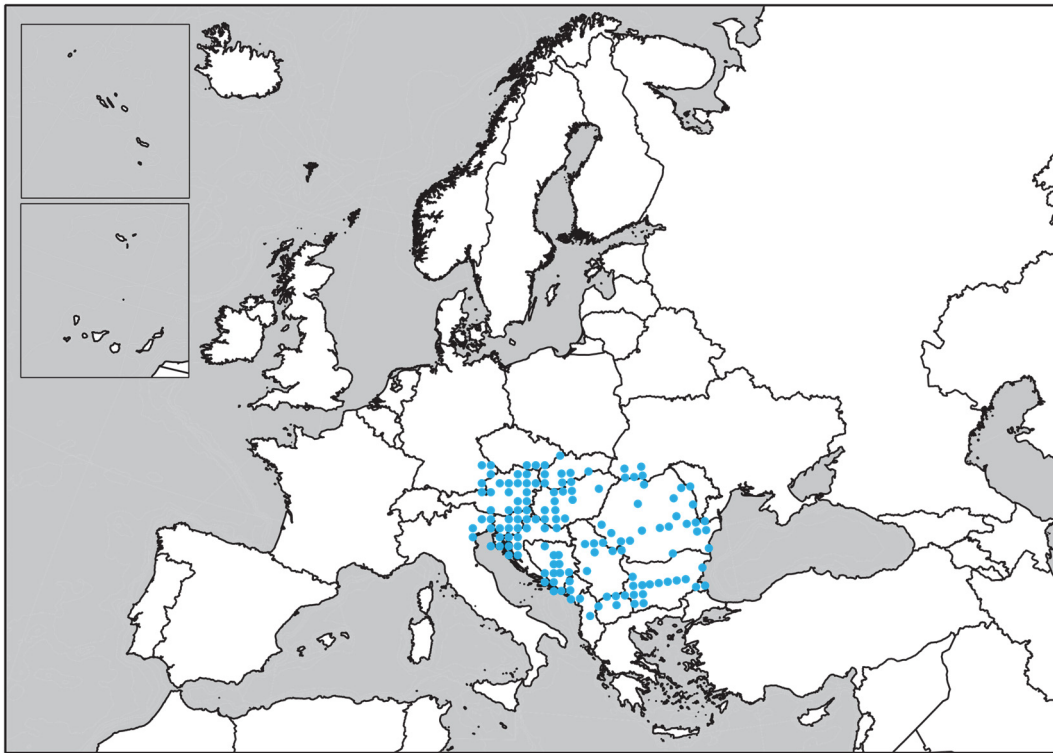
107. *Cylindroiulus aternamus*
Verhoeff, 1930



- | | |
|--|---|
| 108. <i>Cylindroiulus attenuatus</i> Enghoff, 1982 | 153. <i>C. laurisilvae</i> Enghoff, 1982 |
| 112. <i>C. brachyiuloides</i> Enghoff, 1982 | 156. <i>C. lundbladi</i> Lohmander, 1955 |
| 119. <i>C. caramujensis</i> Lohmander, 1955 | 162. <i>C. obscurior</i> Enghoff, 1982 |
| 121. <i>C. cristagalli</i> Enghoff, 1982 | 163. <i>C. oromii</i> Reboleira & Enghoff, 2014 |
| 124. <i>C. digitus</i> Enghoff, 1982 | 164. <i>C. pallidior</i> Enghoff, 1982 |
| 127. <i>C. exiguus</i> Enghoff, 1982 | 171. <i>C. quadratistipes</i> Enghoff, 1982 |
| 130. <i>C. fimbriatus</i> Enghoff, 1982 | 172. <i>C. rabacalensis</i> Lohmander, 1955 |
| 134. <i>C. gemellus</i> Enghoff, 1982 | 186. <i>C. speluncaris</i> Lohmander, 1955 |
| 139. <i>C. hirticauda</i> Enghoff, 1982 | 195. <i>C. uroxiphos</i> Enghoff, 1982 |
| 143. <i>C. infernalis</i> Lohmander, 1955 | 196. <i>C. velatus</i> Enghoff, 1982 |
| 144. <i>C. insolidus</i> Lohmander, 1955 | 200. <i>C. waldeni</i> Read, 1989 |
| 146. <i>C. julesvernei</i> Reboleira & Enghoff, 2014 | 201. <i>C. xynon</i> Read, 1989 |
| 147. <i>C. julipes</i> Enghoff, 1982 | 202. <i>C. ynnox</i> Read, 1989 |
| 148. <i>C. kappa</i> Enghoff, 1982 | 203. <i>C. zarcoi</i> Read, 1989 |



109. *Cylindroiulus bellus* (Lignau, 1903)

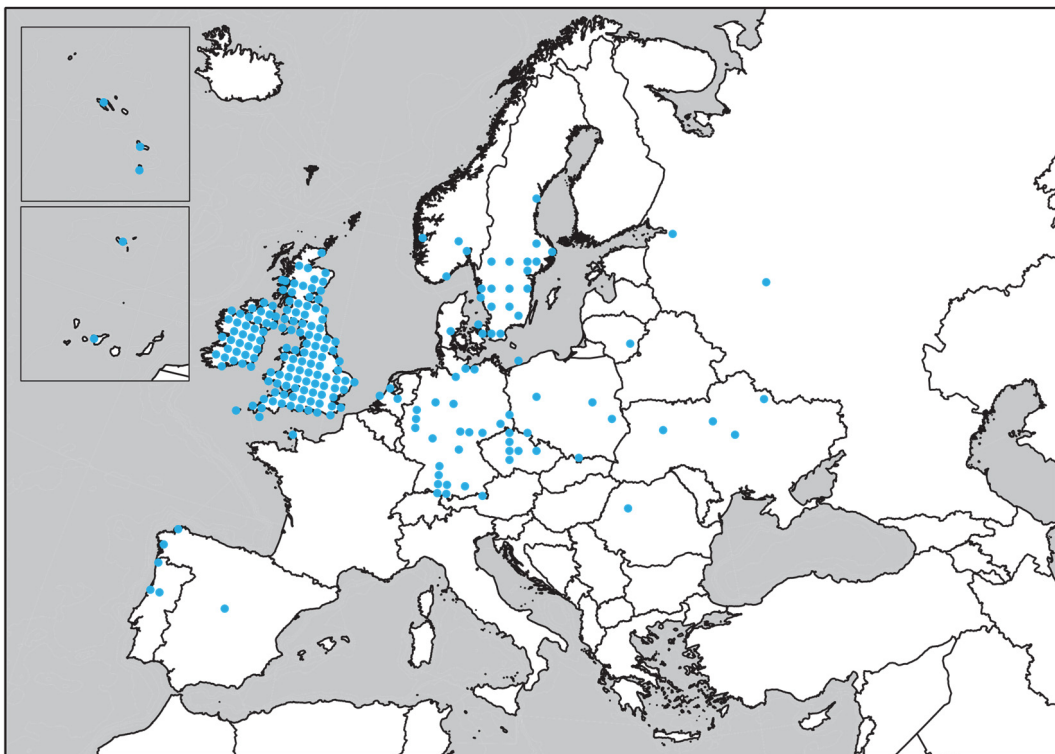


110. *Cylindroiulus boleti* (C.L. Koch, 1847)



111. *Cylindroiulus boreoibericus* Read, 2007

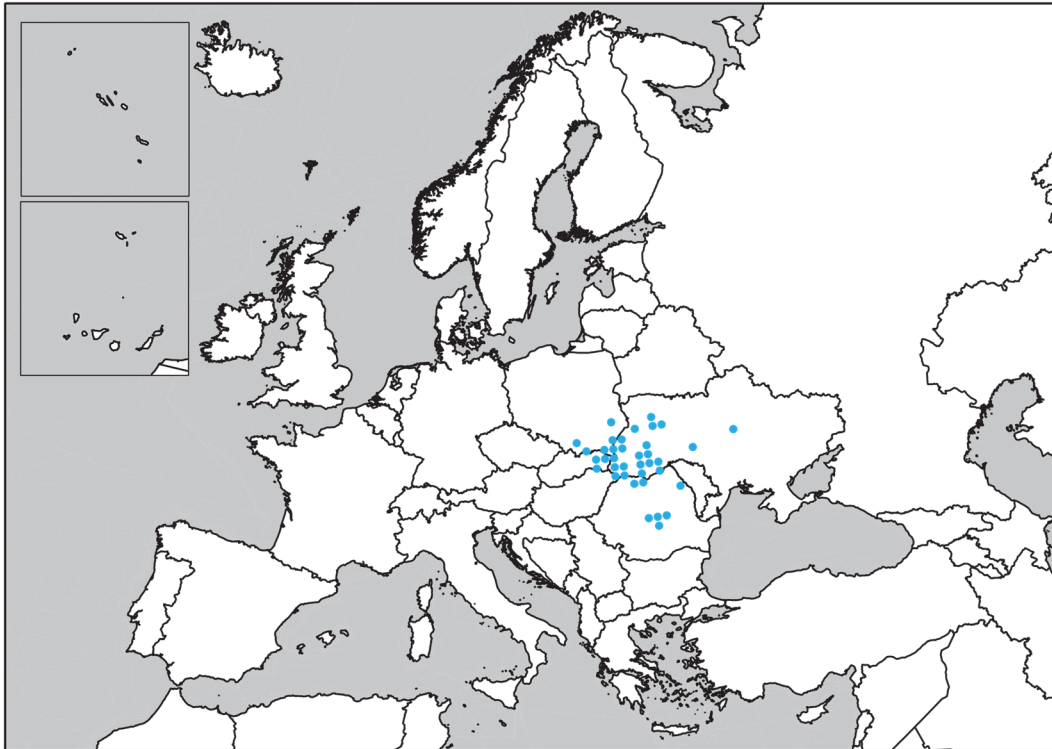
112. *Cylindroiulus brachyiuloides*
see p. 53



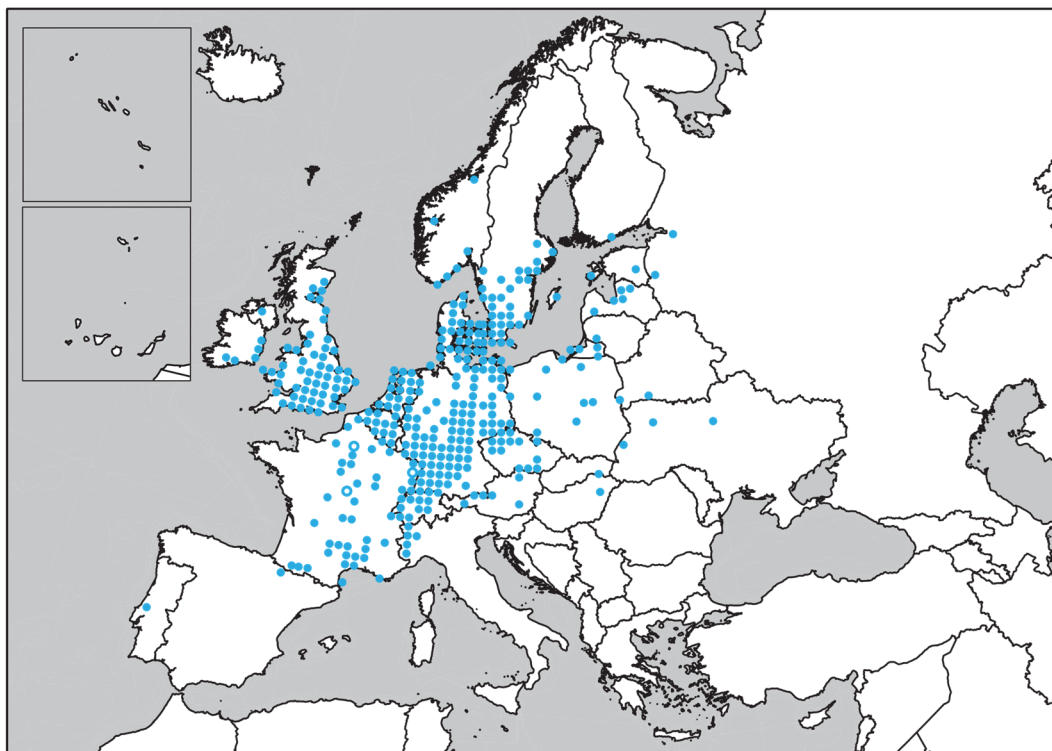
113. *Cylindroiulus britannicus* (Verhoeff, 1891)



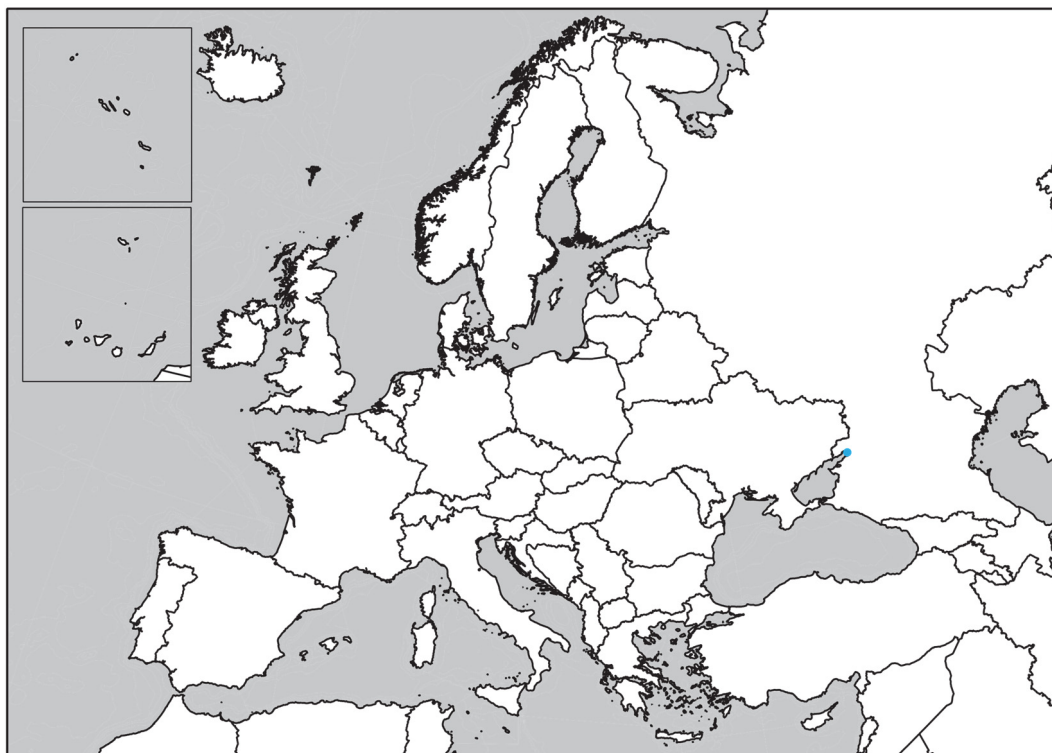
114. *Cylindroiulus broti*
(Humbert, 1893)



115. *Cylindroiulus burzenlandicus* Verhoeff, 1907



116. *Cylindroiulus caeruleocinctus* (Wood, 1864)



117. *Cylindroiulus cambio* Korsós & Read, 1994



118. *Cylindroiulus cantonii*
(Brölemann, 1892)

119. *Cylindroiulus caramujensis*
see p. 56

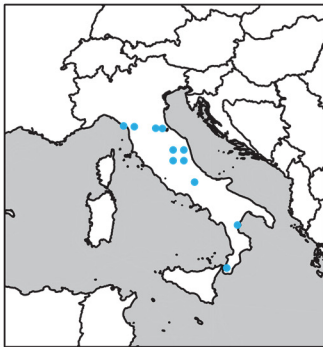


120. *Cylindroiulus chalandei*
(Ribaut, 1904)

121. *Cylindroiulus cristagalli*
see p. 56



122. *Cylandroiulus dahli* Demange, 1970

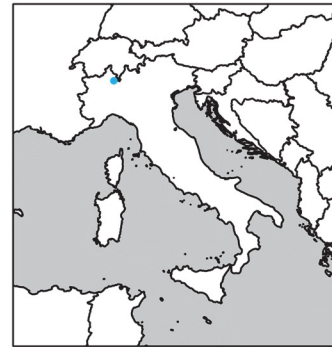


123. *Cylandroiulus decipiens*
(Berlese, 1885)

124. *Cylandroiulus digitus*
see p. 57



125. *Cylandroiulus disjunctus*
Read, 1989



126. *Cylandroiulus dubius*
Verhoeff, 1930

127. *Cylandroiulus exiguus*
see p. 58



128. *Cylandroiulus fenestratus*
Read, 1989



129. *Cylandroiulus festai*
Manfredi, 1939

130. *Cylandroiulus fimbriatus*
see p. 58



131. *Cylindroiulus fnitimus*
(Ribaut, 1905)



132. *Cylindroiulus franzi*
Attems, 1952



133. *Cylindroiulus fulviceps*
(Latzel, 1884)

134. *Cylindroiulus gemellus*
see p. 59



135. *Cylindroiulus generosensis*
Verhoeff, 1900



136. *Cylindroiulus gestri*
(Silvestri, 1898)

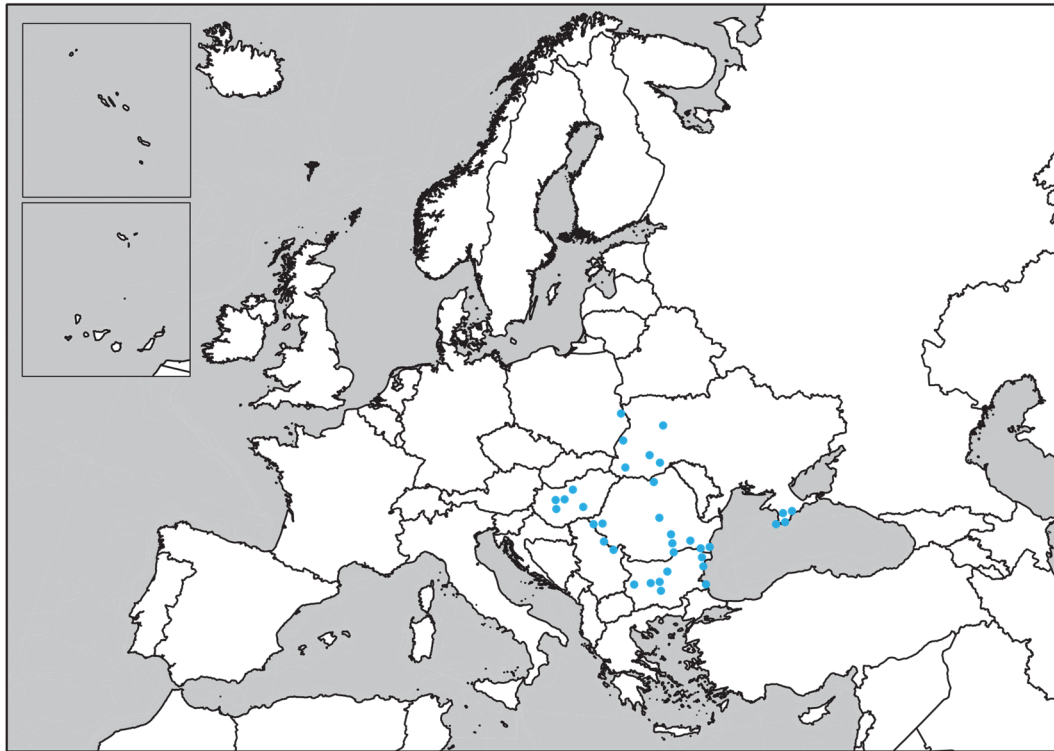


137. *Cylindroiulus gigas*
Verhoeff, 1932



138. *Cylindroiulus gregoryi*
Read, 2007

139. *Cylindroiulus hirticauda*
see p. 60



140. *Cylindroiulus horvathi* (Verhoeff, 1897)



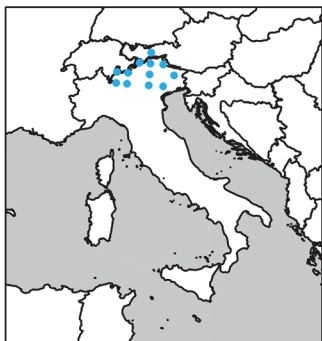
141. *Cylindroiulus ibericus*
Brölemann, 1913



142. *Cylindroiulus iluronensis*
Brölemann, 1912

143. *Cylindroiulus infernalis*
see p. 61

144. *Cylindroiulus insolidus*
see p. 61



145. *Cylindroiulus italicus*
(Latzel, 1884)

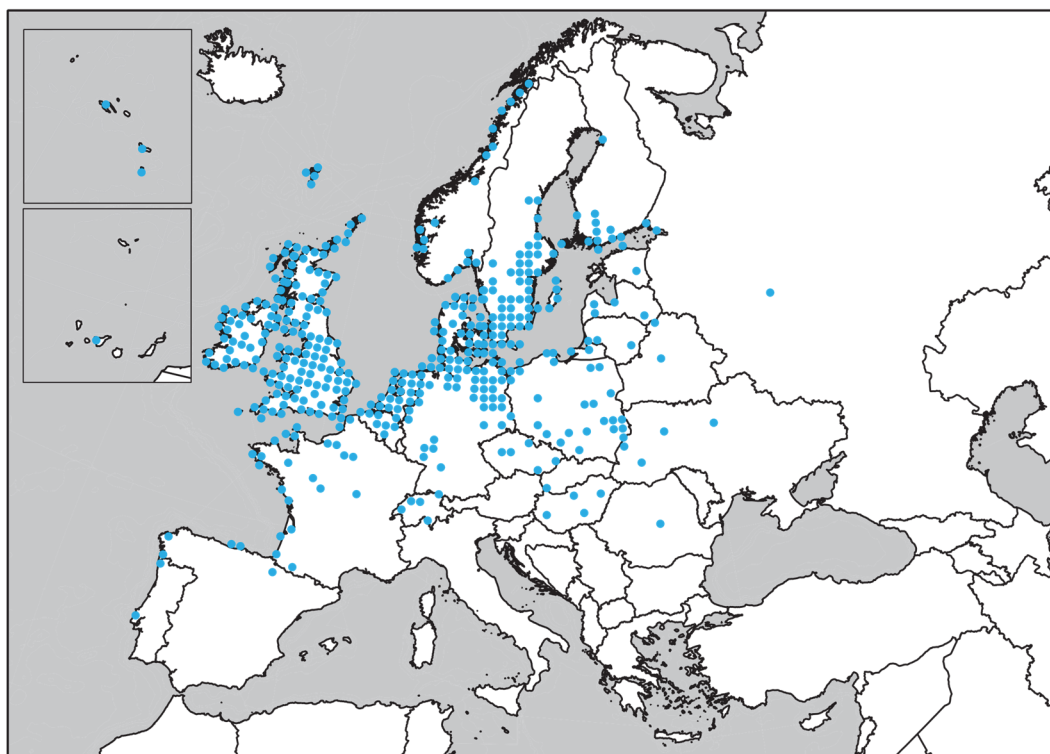
146. *Cylindroiulus julesvernei*
see p. 62

147. *Cylindroiulus julipes*
see p. 62

148. *Cylindroiulus kappa*
see p. 62



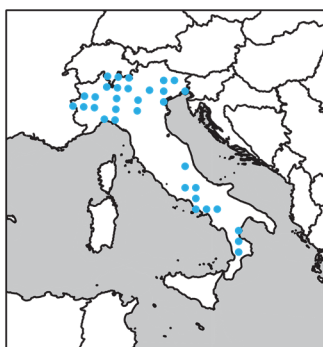
149. *Cylindroiulus lagrecai*
Manfredi, 1957



150. *Cylindroiulus latestriatus* (Curtis, 1845)



151. *Cylindroiulus latro*
Attems, 1927

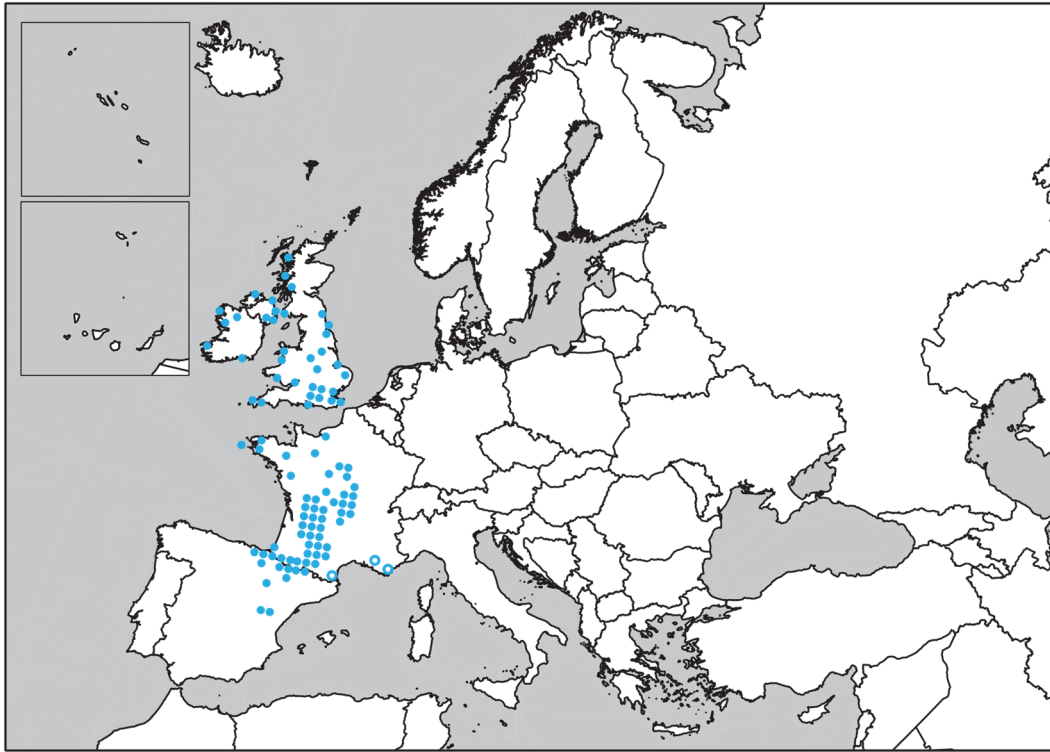


152. *Cylindroiulus latzeli*
(Berlese, 1884)

153. *Cylindroiulus laurisilvae*
see p. 63

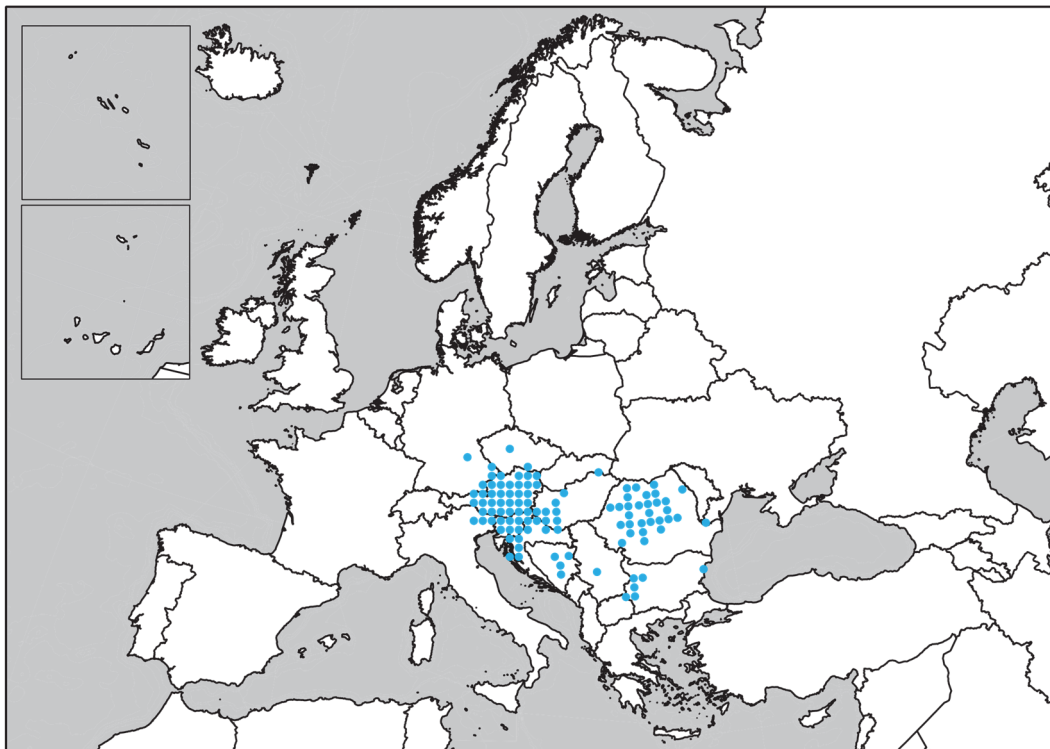


154. *Cylindroiulus limitaneus*
(Brölemann, 1905)



155. *Cylandroiulus londinensis* (Leach, 1814)

156. *Cylandroiulus hundbladi*, see p. 64



157. *Cylandroiulus luridus* (C.L. Koch, 1847)



158. *Cylindroiulus madeirae* Attems, 1937



159. *Cylindroiulus meinerti*
(Verhoeff, 1891)



160. *Cylindroiulus molisius*
Verhoeff, 1932

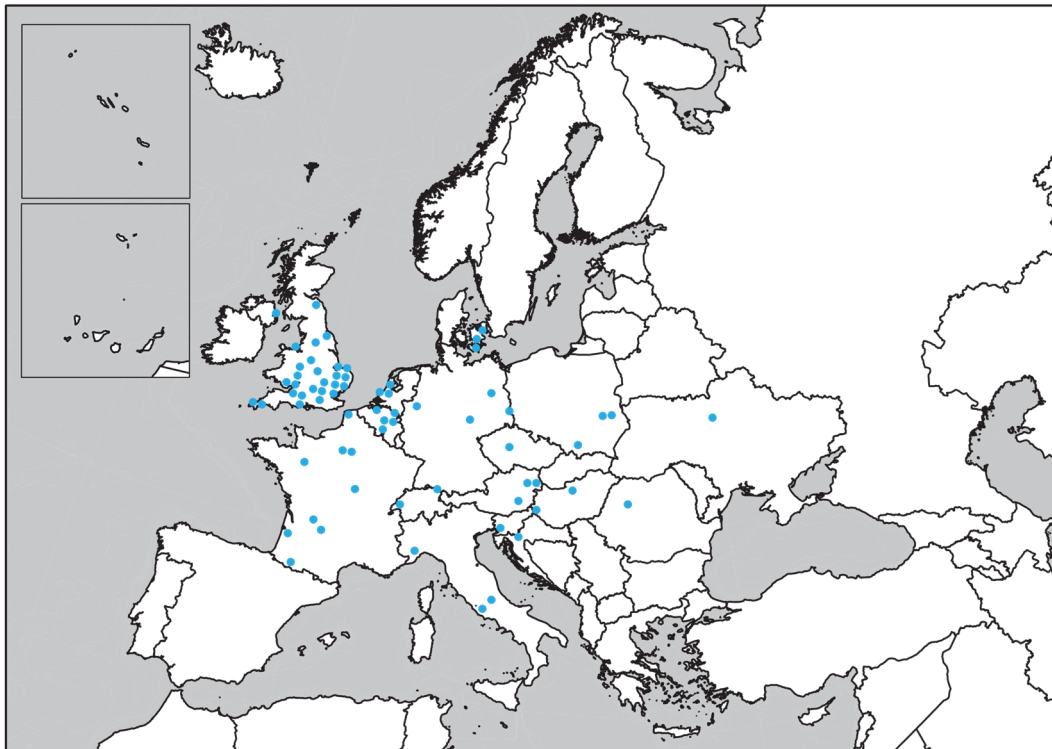


161. *Cylindroiulus numerosus*
Enghoff, 1982

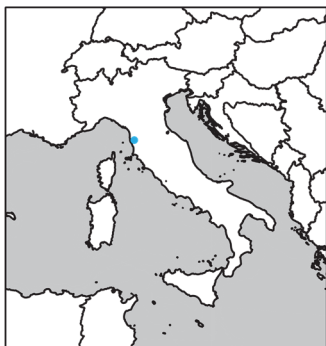
162. *Cylindroiulus obscurior*
see p. 66

163. *Cylindroiulus oromii*
see p. 66

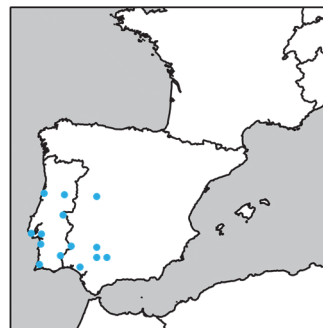
164. *Cylindroiulus pallidior*
see p. 66



165. *Cylindroiulus parisiorum* (Brölemann & Verhoeff, 1896)



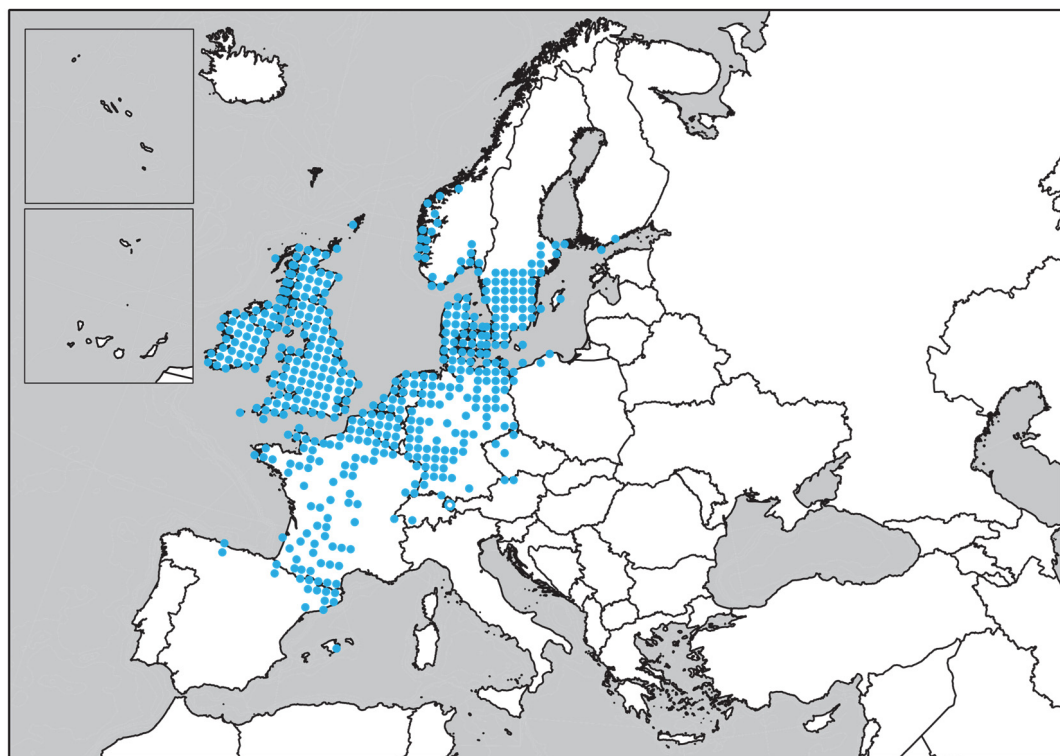
166. *Cylindroiulus pelatensis*
Verhoeff, 1930



167. *Cylindroiulus perforatus*
Verhoeff, 1905



168. *Cylindroiulus propinquus* (Porat, 1870)



169. *Cylindroiulus punctatus* (Leach, 1815)



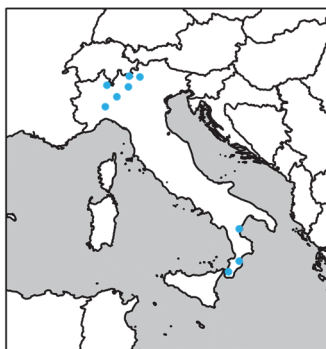
171. *Cylindroiulus quadratistipes*
see p. 68

172. *Cylindroiulus rabacalensis*
see p. 68



173. *Cylindroiulus rubidicollis*
Verhoeff, 1930

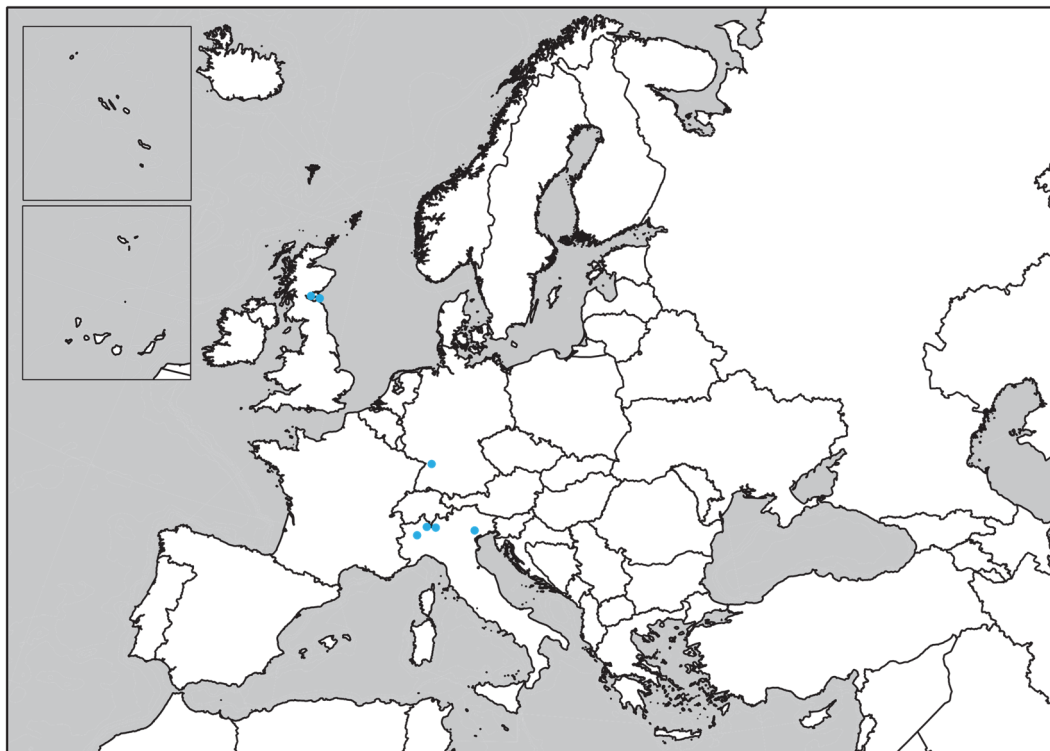
170. *Cylindroiulus pyrenaicus*
(Brölemann, 1897)



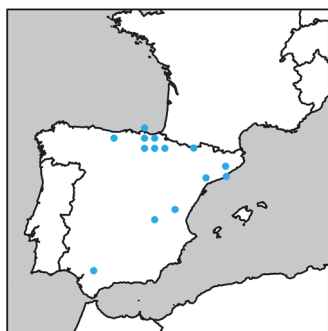
174. *Cylindroiulus rufifrons*
(C.L. Koch, 1847)



175. *Cylindroiulus sagittarius*
(Brölemann, 1897)



176. *Cylindroiulus salicivorus* Verhoeff, 1908



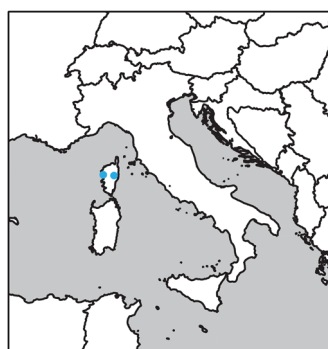
177. *Cyldroiulus sanctimichaelis*
Attems, 1927



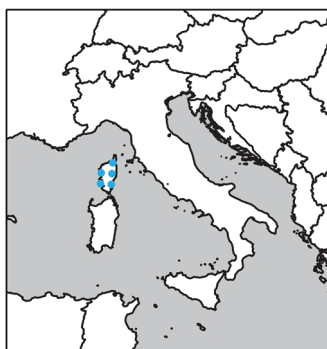
178. *Cyldroiulus sangramus*
(Verhoeff, 1932)



179. *Cyldroiulus sardous*
(Silvestri, 1898)



180. *Cyldroiulus schubarti*
Verhoeff, 1943



181. *Cyldroiulus segregatus*
Brölemann, 1903



182. *Cyldroiulus siculus*
Silvestri, 1897



183. *Cyldroiulus solarius*
Verhoeff, 1942

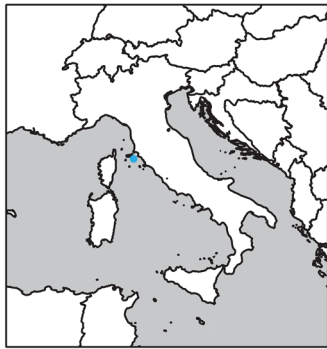


184. *Cyldroiulus solis*
Verhoeff, 1908



185. *Cyldroiulus sorrentinus*
Verhoeff, 1912

186. *Cyldroiulus speluncaris*
see p. 72



187. *Cylandroiulus strasseri*
Verhoeff, 1930



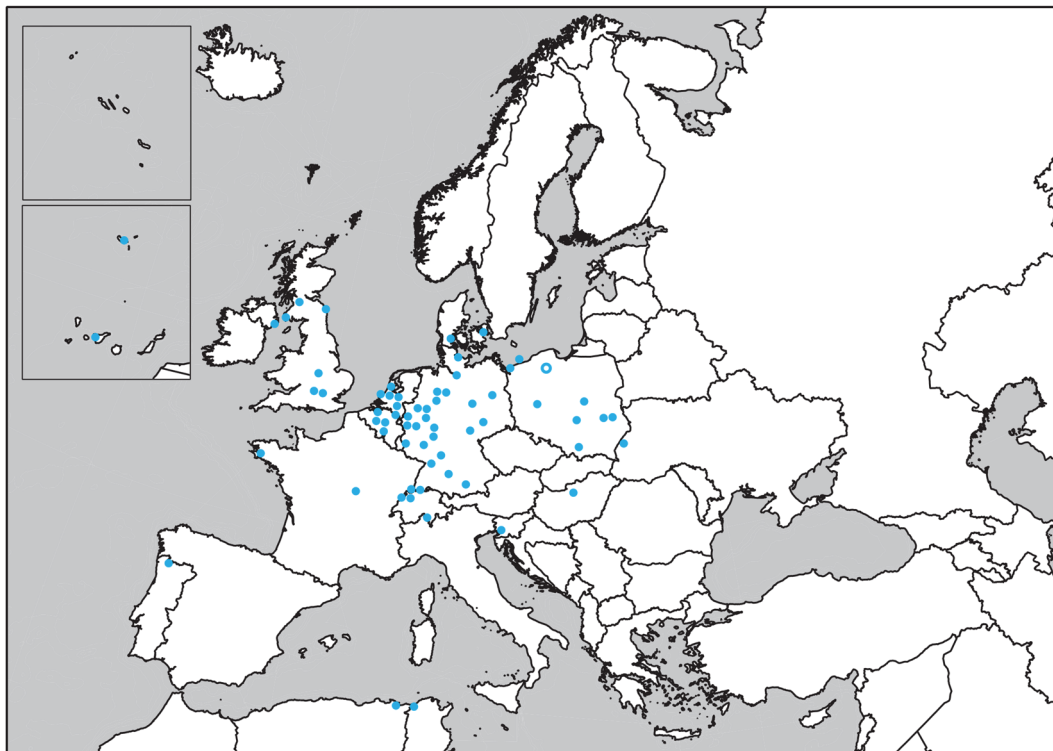
188. *Cylandroiulus tirolensis*
Verhoeff, 1901



189. *Cylandroiulus transmarinus*
Enghoff, 1982



190. *Cylandroiulus tricuspis*
Verhoeff, 1932



191. *Cylandroiulus truncorum* (Silvestri, 1896)



192. *Cylandroiulus turinensis*
(Brölemann, 1897)



193. *Cylandroiulus unciger*
Attems, 1952



194. *Cylandroiulus uncinatus*
Strasser, 1969

195. *Cylandroiulus uroxiphos*
see p. 74

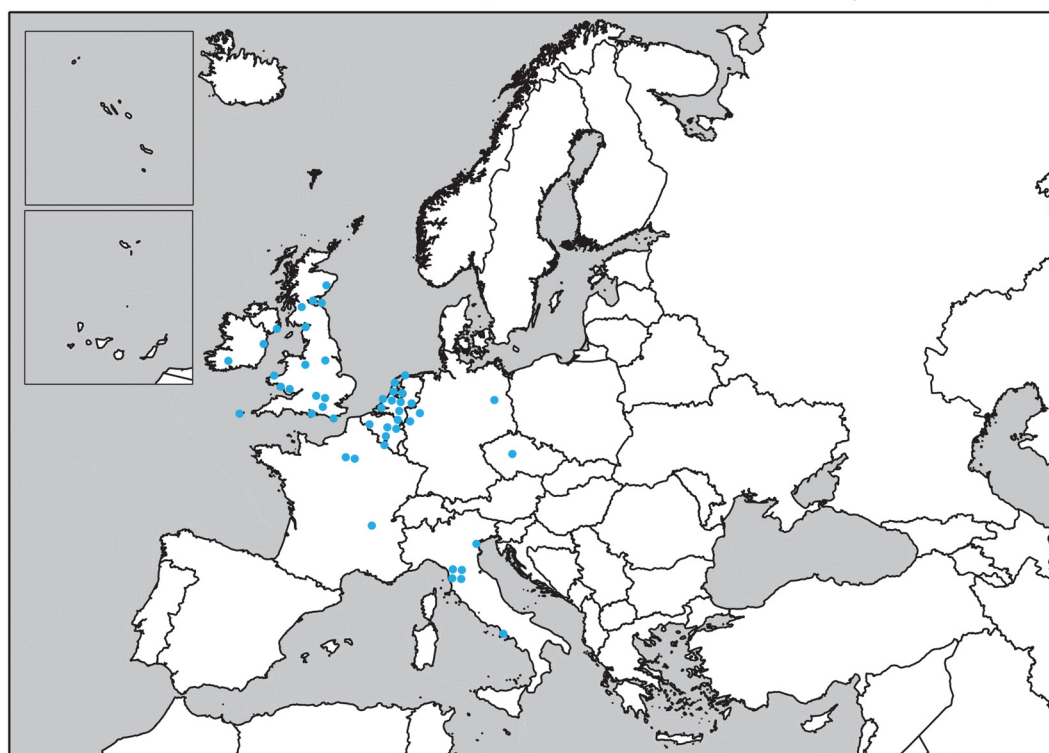
196. *Cylandroiulus velatus*
see p. 74



197. *Cylandroiulus ventanaea*
Read, 2007



198. *Cylandroiulus verhoeffi*
(Brölemann, 1896)



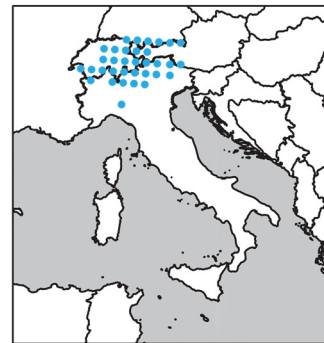
199. *Cylandroiulus vulnerarius* (Berlese, 1888)

200. *Cylindroiulus waldeni*
see p. 75

202. *Cylindroiulus ynnox*
see p. 75

201. *Cylindroiulus xynon*
see p. 75

203. *Cylindroiulus zarcoi*
see p. 76

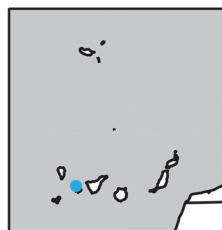


204. *Cylindroiulus zinalensis*
(Faës, 1902)



- 205. *Dolicho-iulus alluaudi* (Brölemann, 1901)
- 208. *D. architheca* Enghoff, 1992
- 213. *D. carolineae* Enghoff, 1992
- 218. *D. fjellbergi* Enghoff, 1992
- 221. *D. heliophilus* Enghoff, 1992
- 232. *D. longunguis* Enghoff, 2012
- 234. *D. martini* Enghoff, 1992
- 237. *D. oromii* Enghoff, 2012
- 238. *D. oskari* Enghoff, 1992
- 239. *D. parcestriatus* (Brölemann, 1901)
- 251. *D. typhlocanaria* Enghoff, 1992
- 253. *D. ultimus* Enghoff, 2012
- 261. *D. zygodon* Enghoff, 1992

- 206. *Dolicho-iulus altitenerife* Enghoff, 1992
- 207. *D. aquasilvae* Enghoff, 1992
- 209. *D. axeli* Enghoff, 1992
- 210. *D. baezi* Enghoff, 1992
- 211. *D. blancatypa* (Enghoff, 1992)
- 212. *D. canariensis* (Pocock, 1893)
- 214. *D. chioensis* Enghoff, 1992
- 215. *D. dendromystax* Enghoff, 1992
- 223. *D. hyaena* Enghoff, 1992
- 225. *D. ingeae* Enghoff, 1992
- 226. *D. insularis* (Brölemann, 1901)
- 229. *D. kraepelinorum* (Latzel, 1895)
- 230. *D. labradae* Enghoff, 1992
- 231. *D. lasiurus* Enghoff, 1992
- 235. *D. mystax* (Brölemann, 1901)
- 236. *D. nemasoma* Enghoff, 1992
- 241. *D. quasimystax* Enghoff, 1992
- 255. *D. vosseleri* (Verhoeff, 1900)
- 259. *D. xylomystax* Enghoff, 1992
- 260. *D. ypsilon* Enghoff, 1992



- 216. *Dolicho-iulus dubiosus* Enghoff, 1992
- 220. *D. gara* Enghoff, 1992
- 228. *D. jonay* Enghoff, 1992
- 240. *D. praesenilis* Enghoff, 1992
- 242. *D. rectangulus* Enghoff, 1992
- 244. *D. sansebastianus* (Attems, 1911)
- 245. *D. senilis* (Attems, 1911)
- 248. *D. tiendarius* (Attems, 1911)



217. *Dolicho-iulus eumadeirae* Enghoff, 1992



219. *Dolichoiiulus fuerteventurae*
Enghoff, 1992

227. *D. jandiensis* Enghoff, 1992



222. *Dolichoiiulus hercules*
(Schubart, 1960)



224. *Dolichoiiulus ibericus*
Ceuca, 1973



233. *Dolichoiiulus madeiramus*
(Mauriès, 1970)



243. *Dolichoiiulus salvagicus*
(Latzel, 1895)



246. *Dolichoiiulus silvahierro*
Enghoff, 1992

250. *D. troglhierro*
Enghoff, 1992

257. *D. xerohierro*
Enghoff, 1992



247. *Dolichoiiulus silvapalma*
Enghoff, 1992

258. *D. xeropalma*
Enghoff, 1992



249. *Dolichoiiulus tongiorgii*
(Strasser, 1973)



252. *Dolichoium typhlops* Ceuca, 1973



254. *Dolichoium variabilis*
Enghoff, 1992



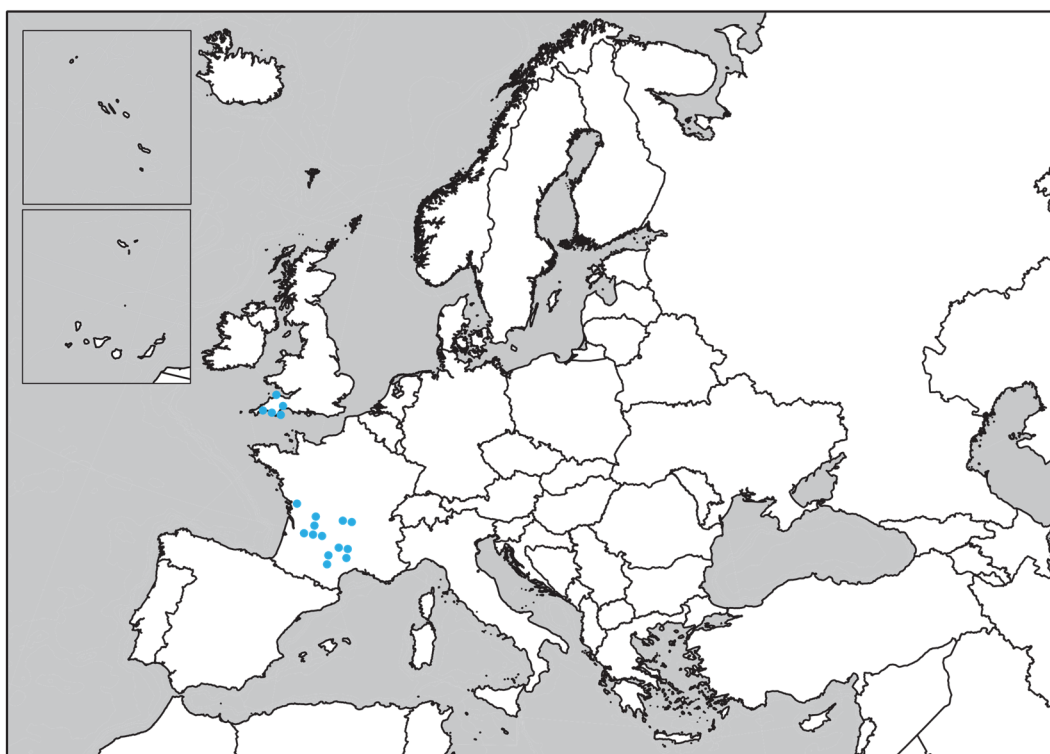
256. *Dolichoium wunderlichi*
Enghoff, 1992



262. *Elbaiulus carpinorum*
Verhoeff, 1930



263. *Elbaiulus chrysopygus*
(Berlese, 1888)



264. *Enantiulus armatus* (Ribaut, 1909)



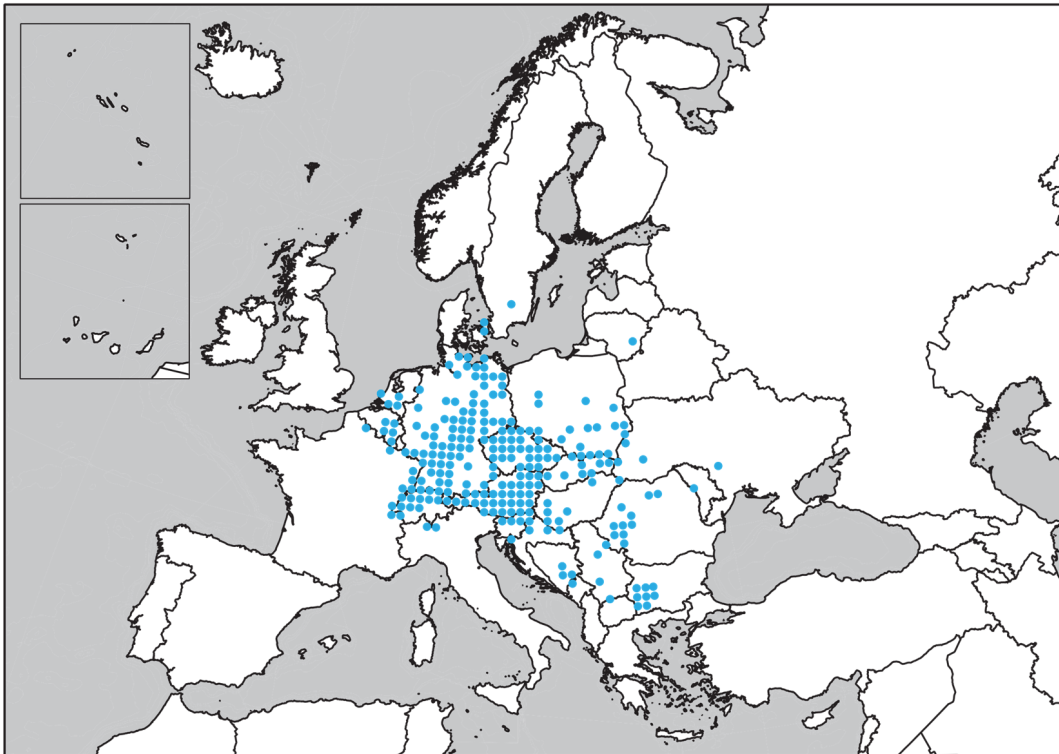
265. *Enantiulus austriacus*
(Verhoeff, 1896)



266. *Enantiulus dentigerus*
(Verhoeff, 1900)



267. *Enantiulus karawankianus*
(Verhoeff, 1908)



268. *Enantiulus nanus* (Latzel, 1884)



269. *Enantiulus simplex*
(Verhoeff, 1926)



270. *Enantiulus tatranus*
(Verhoeff, 1907)



271. *Enantiulus transsilvanicus*
(Verhoeff, 1899)



272. *Enghophyllum naxium*
(Verhoeff, 1901)



273. *Enghophyllum sifnium*
Lazányi & Vagalinski, 2013



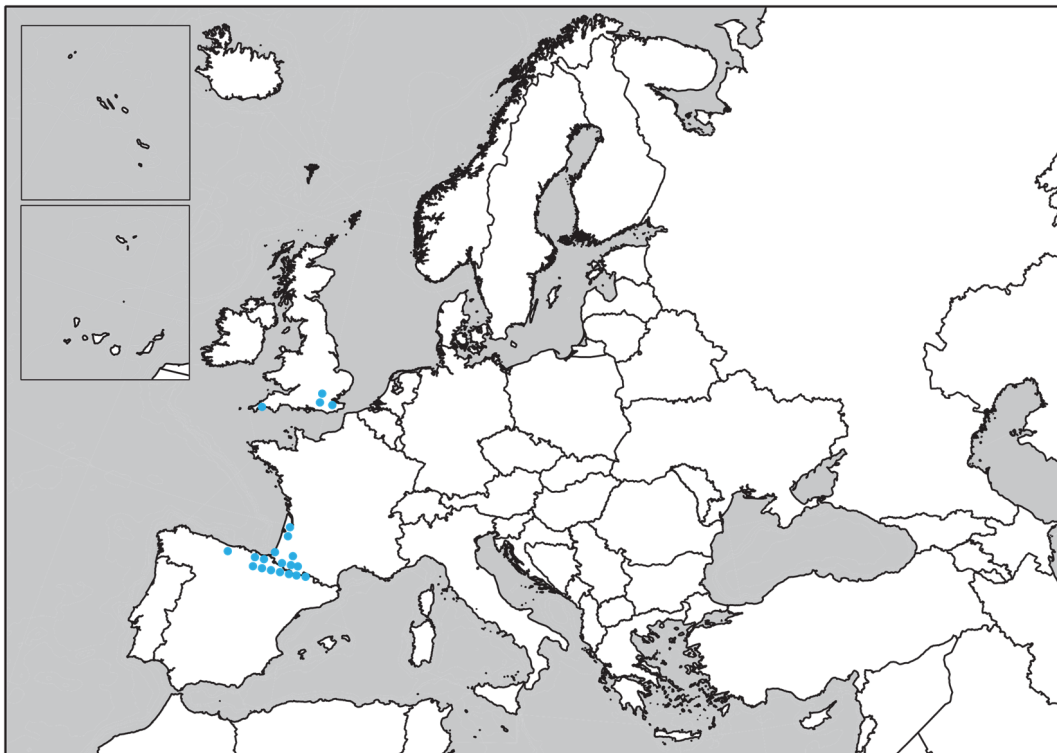
274. *Geopachyiulus negreai*
Tabacaru, 1978



275. *Geopachyiulus nematodes*
(Latzel, 1884)



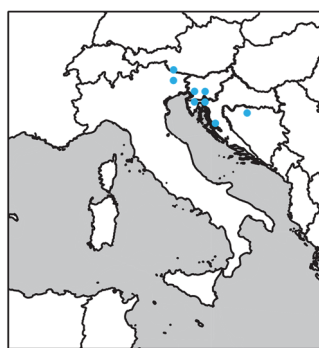
276. *Haplophyllum mehelyi*
(Verhoeff, 1897)



277. *Haplodoiulus spathifer* (Brölemann, 1897)



278. *Heteroiulus intermedius*
(Brölemann, 1892)



279. *Hylopachyiulus pygmaeus*
(Attems, 1904)



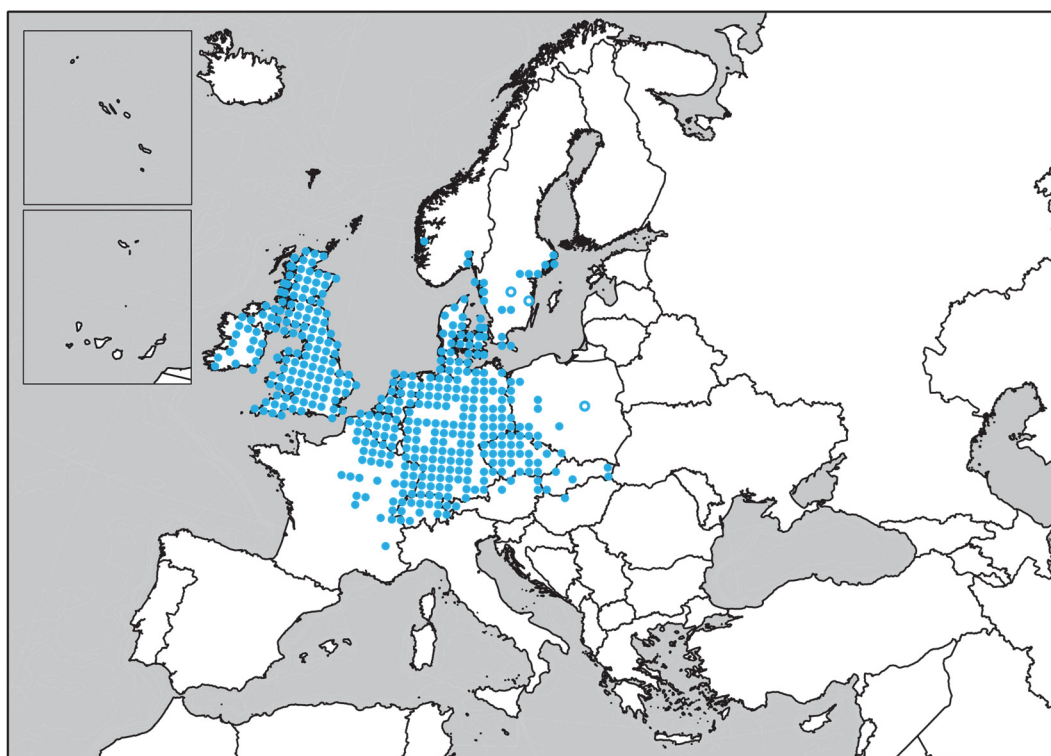
280. *Hypsoiulus alpivagus*
(Verhoeff, 1897)



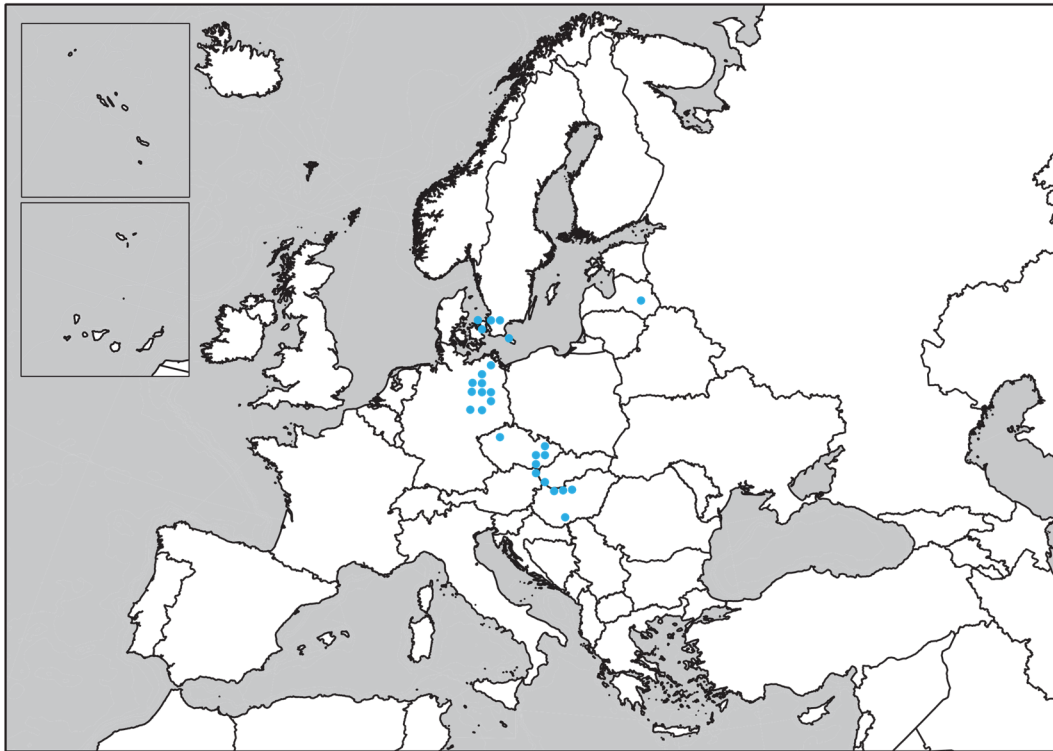
281. *Interleptoiulus cernagoramus*
Mršić, 1988



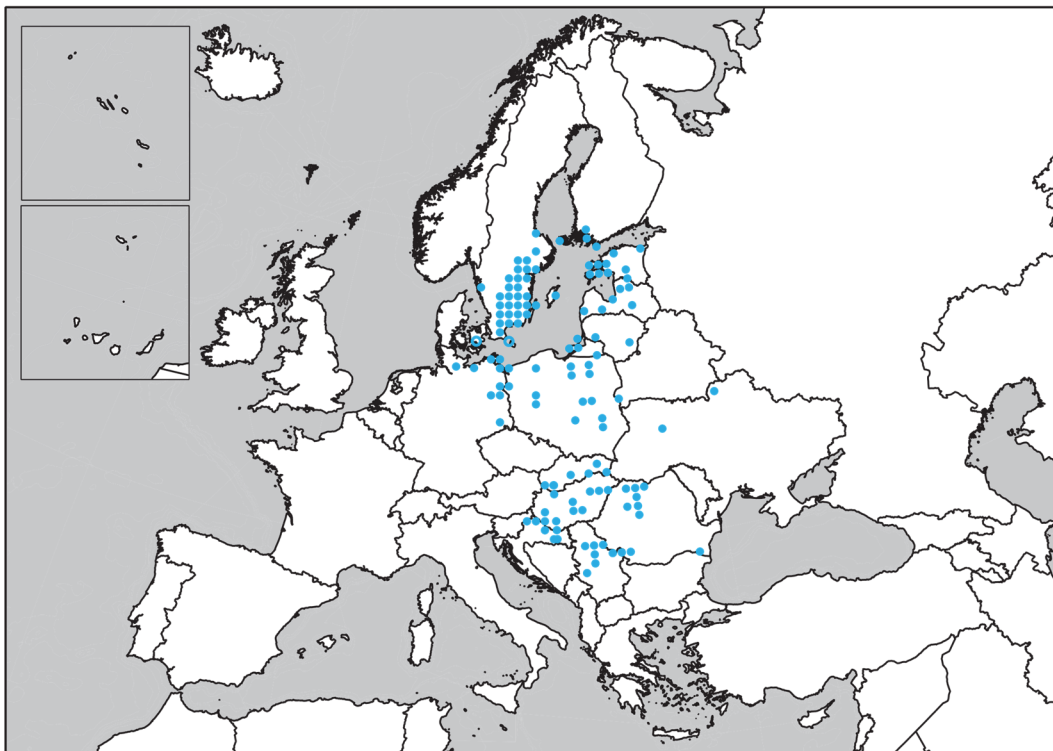
282. *Julus curvicornis*
Verhoeff, 1899



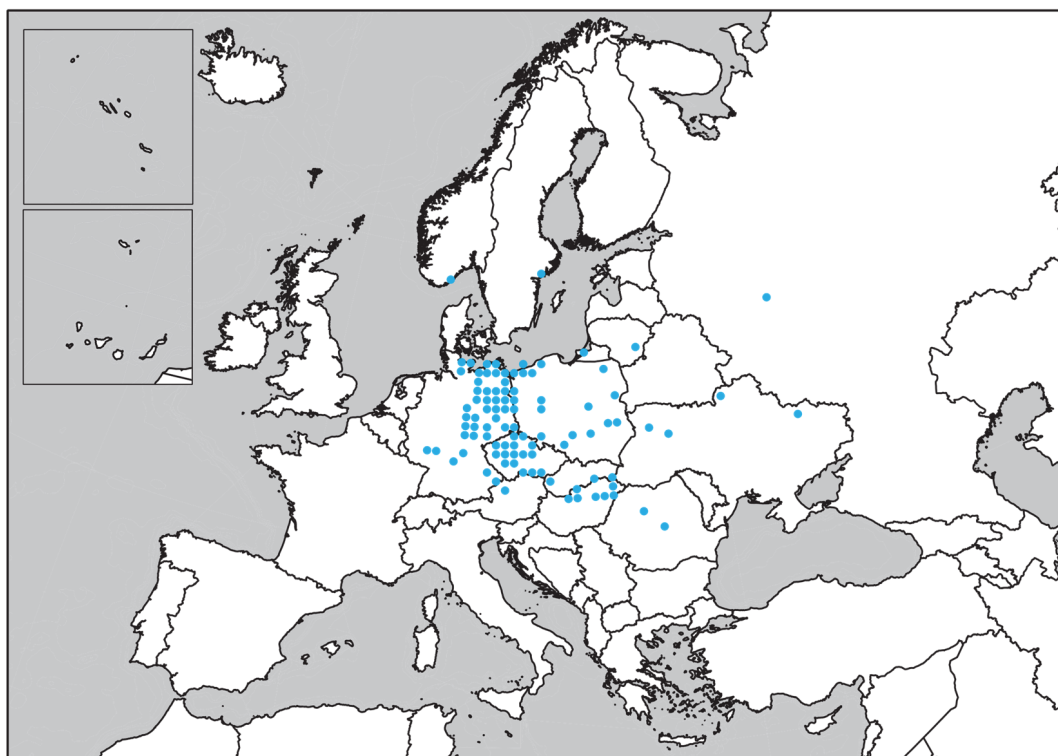
283. *Julus scandinavus* Latzel, 1884



284. *Julus scanicus* Lohmander, 1925



285. *Julus terrestris* Linnaeus, 1758



286. *Kryphioiulus occultus* (C.L. Koch, 1847)



287. *Lamellotyphlus belevodae*
Makarov, 2008



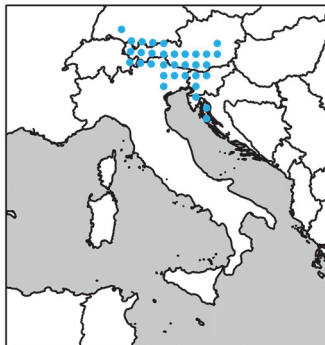
288. *Lamellotyphlus mehedintzensis*
(Tabacaru, 1976)



289. *Lamellotyphlus sotirovi*
Makarov, Mitić & Ćurčić, 2002



290. *Leptoiulus abietum*
Verhoeff, 1914



291. *Leptoiulus alemannicus*
(Verhoeff, 1894)



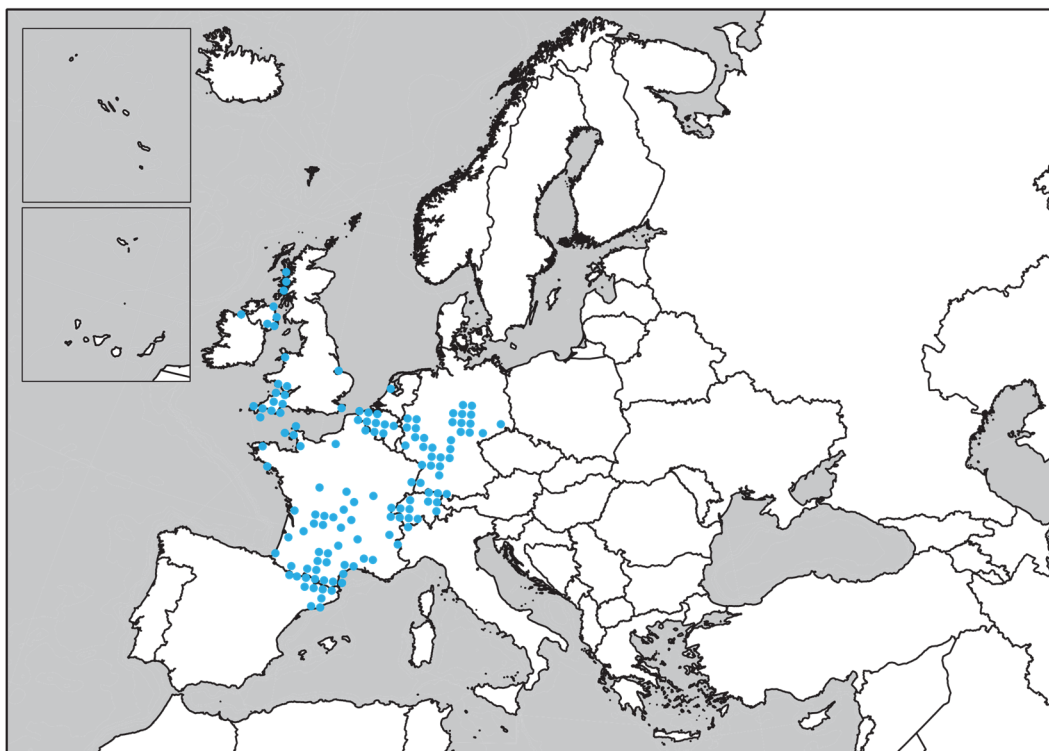
292. *Leptoiulus arelatus*
Bigler, 1919



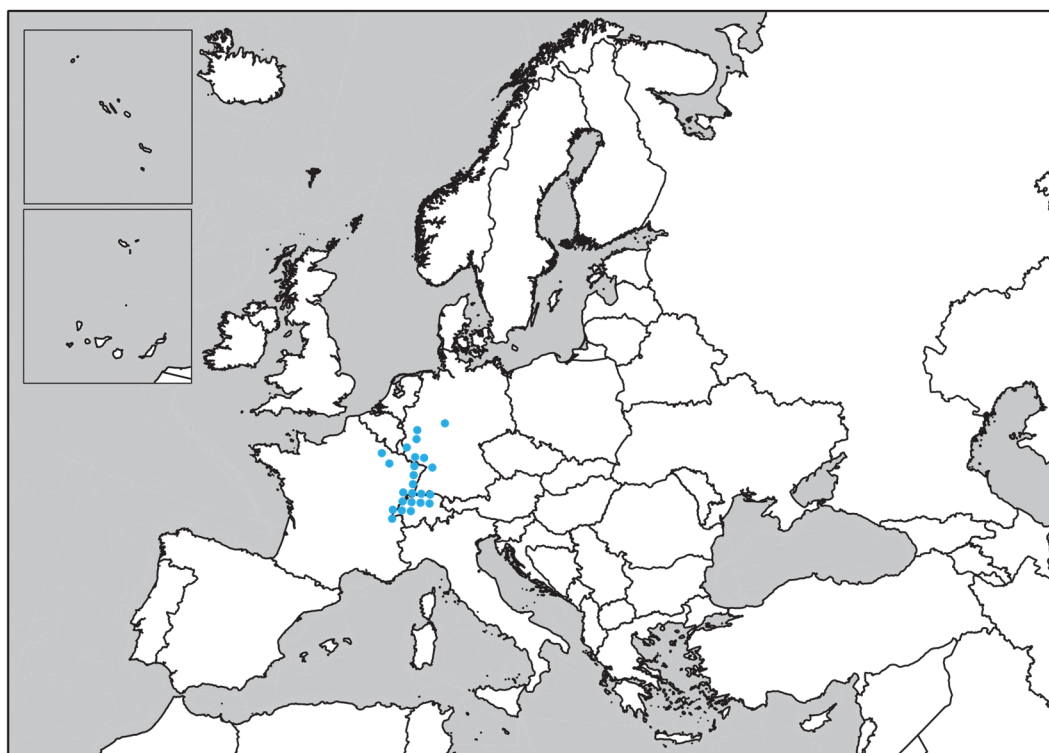
293. *Leptoiulus atticus*
Strasser, 1970



294. *Leptoiulus baconyensis*
(Verhoeff, 1899)



295. *Leptoiulus belgicus* (Latzel, 1884)



296. *Leptoiulus bertkaui* (Verhoeff, 1896)



297. *Leptoiulus borisi*
Verhoeff, 1926



298. *Leptoiulus brentanus*
Verhoeff, 1926



299. *Leptoiulus brevivelatus*
Bigler, 1919



300. *Leptoiulus broelemanni*
(Verhoeff, 1895)



301. *Leptoiulus bryanti*
Ribaut, 1951



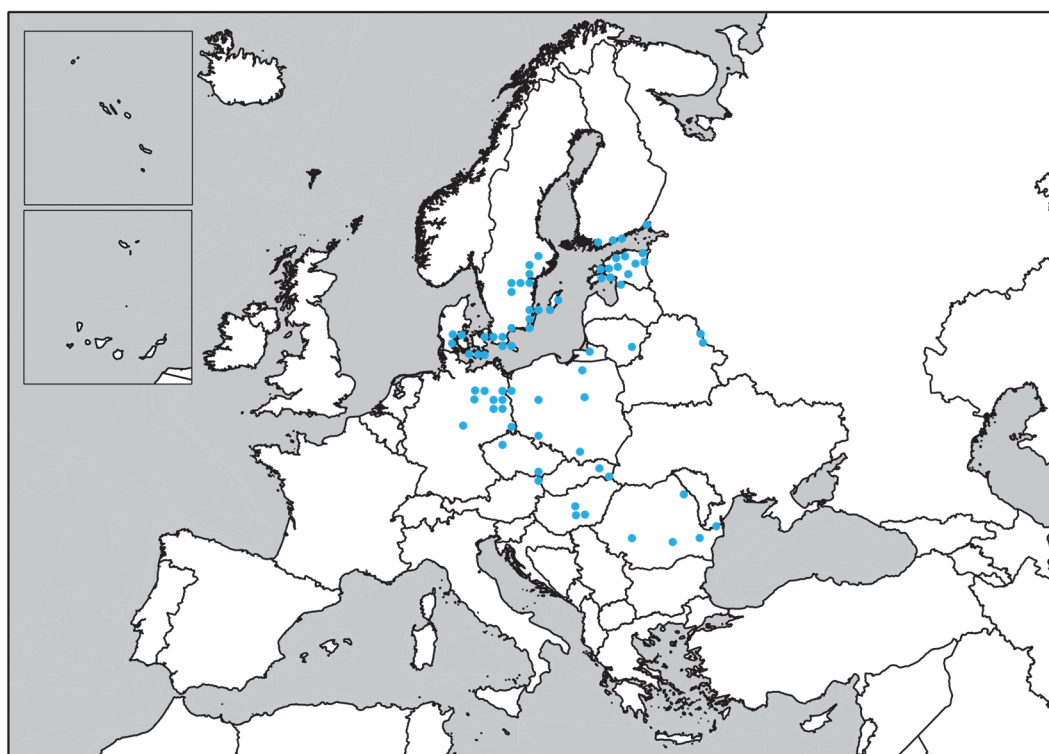
302. *Leptoiulus carpinorum*
Verhoeff, 1929



303. *Leptoiulus cernagoramus*
(Attems, 1927)



304. *Leptoiulus chiesensis* Verhoeff, 1934



305. *Leptoiulus cibdellus* (Chamberlin, 1921)



306. *Leptoiulus czarnohoricus* Jawlowski, 1928



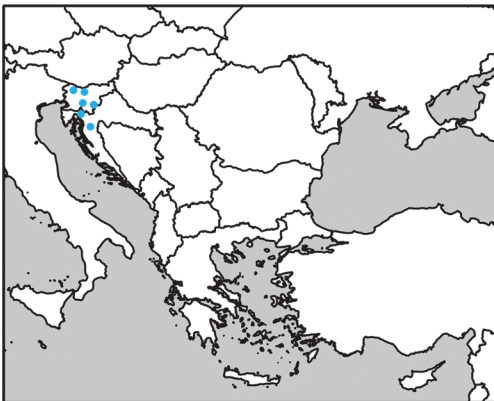
307. *Leptoiulus demangei* Schubart, 1962



308. *Leptoiulus deubeli*
(Verhoeff, 1897)



309. *Leptoiulus discophorus*
(Attems, 1927)



310. *Leptoiulus dolinensis*
Verhoeff, 1928



311. *Leptoiulus durmitorius*
(Attems, 1927)



312. *Leptoiulus faesi*
Bigler, 1919



313. *Leptoiulus frigidarius*
Verhoeff, 1913



314. *Leptoiulus garumnicus*
(Ribaut, 1904)



315. *Leptoiulus gilvicollis*
Verhoeff, 1932



316. *Leptoiulus hauseri*
Strasser, 1976



317. *Leptoiulus helveticus*
(Verhoeff, 1894)



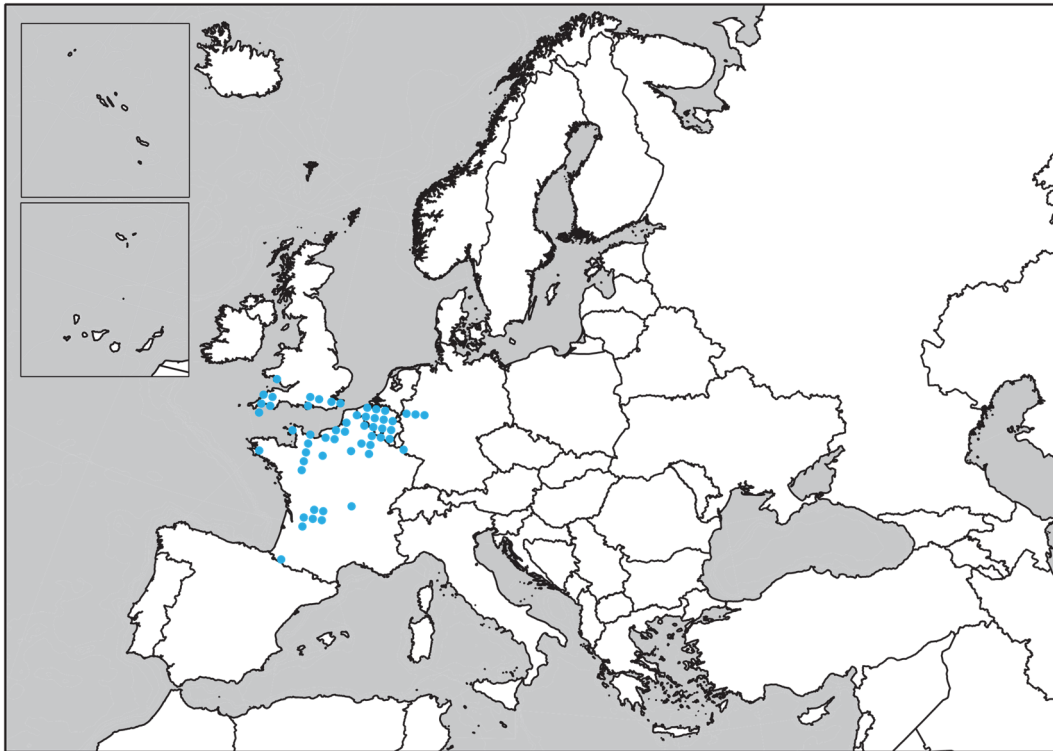
318. *Leptoiulus hospitelli*
Brölemann, 1901



319. *Leptoiulus ivanjicae*
Ćurčić & Makarov, 1997



320. *Leptoiulus juvenilis*
(Ribaut, 1908)



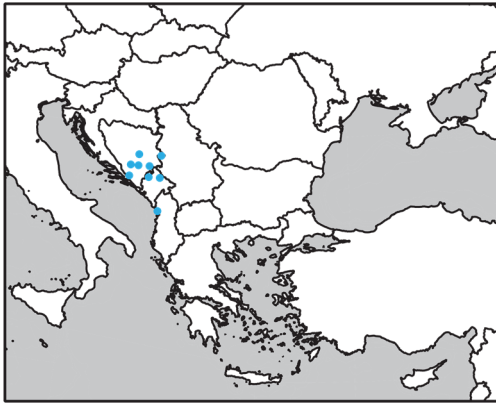
321. *Leptoiulus kervillei* (Brölemann, 1896)



322. *Leptoiulus korongsius*
(Attems, 1904)



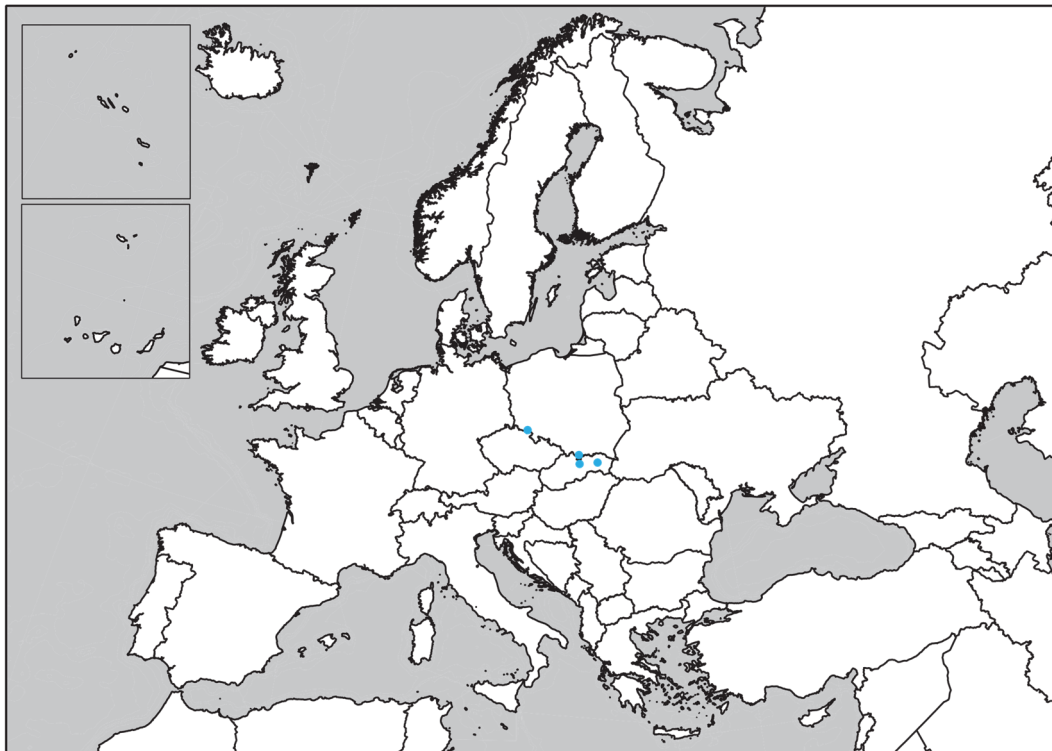
323. *Leptoiulus krueperi*
(Verhoeff, 1900)



324. *Leptoiulus laetedorsalis*
(Verhoeff, 1898)



325. *Leptoiulus legeri*
(Brölemann, 1897)



326. *Leptoiulus liptauensis* (Verhoeff, 1899)



327. *Leptoiulus macedonicus*
(Attems, 1927)



328. *Leptoiulus magnus*
Bigler, 1919



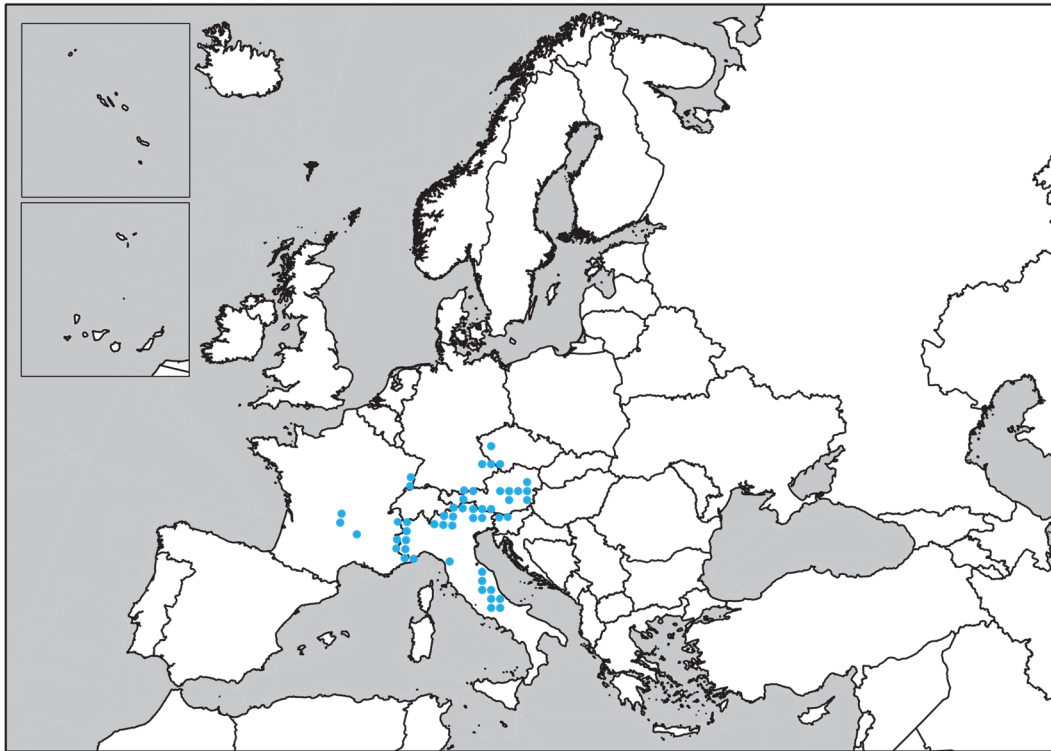
329. *Leptoiulus mariae*
Gulička, 1952



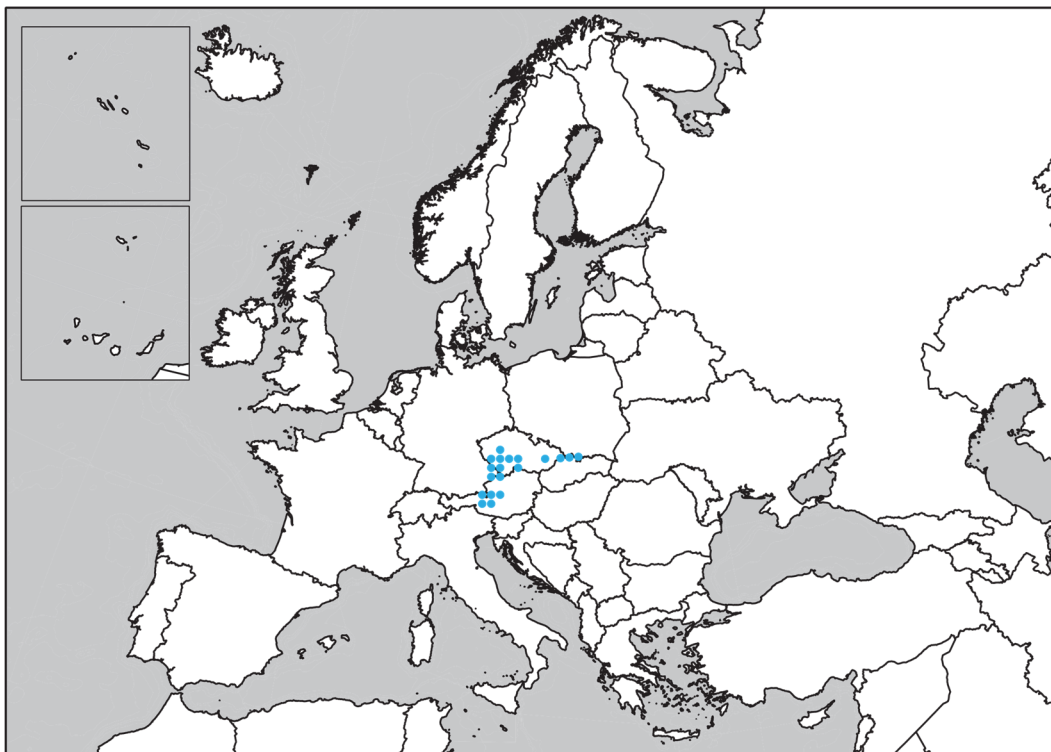
330. *Leptoiulus matulicii*
(Verhoeff, 1901)



331. *Leptoiulus meridionalis*
(Brölemann, 1897)



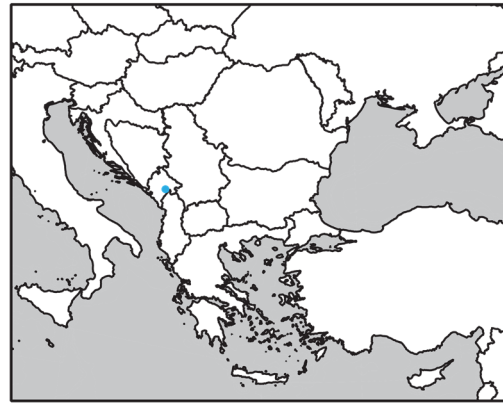
332. *Leptoiulus montivagus* (Latzel, 1884)



333. *Leptoiulus noricus* Verhoeff, 1913



334. *Leptoiulus oribates*
(Latzel, 1884)



335. *Leptoiulus pentheri*
(Attems, 1927)



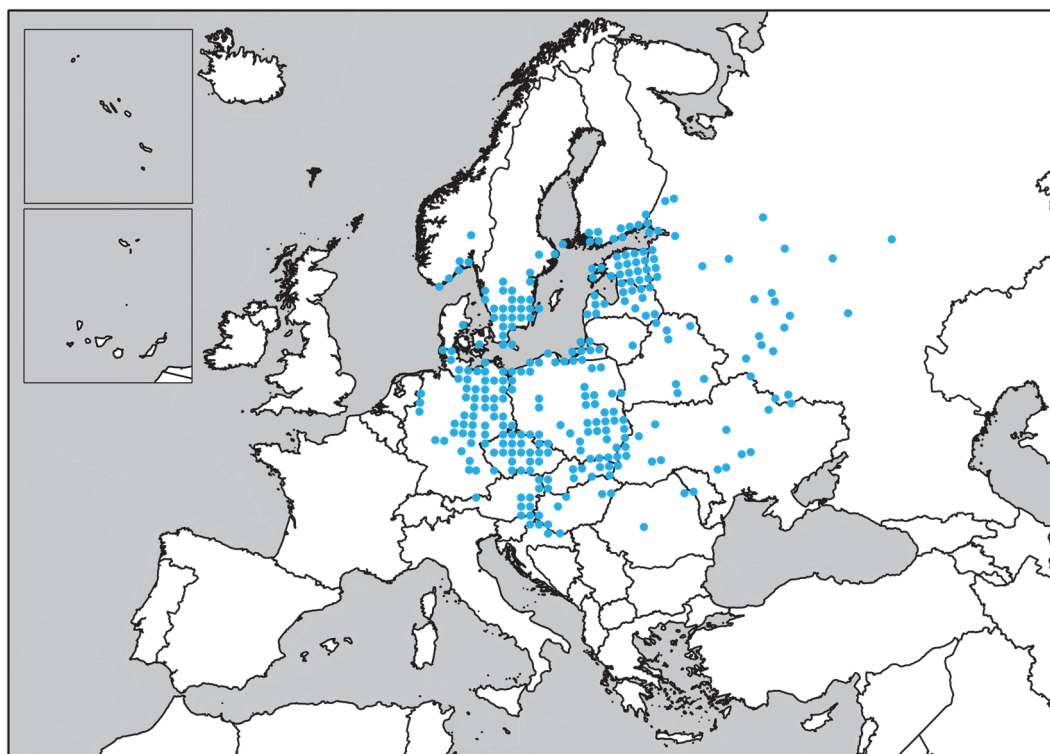
336. *Leptoiulus piceus* (Risso, 1826)



337. *Leptoiulus polonicus*
Jawłowski, 1930



338. *Leptoiulus pretneri*
Strasser, 1940



339. *Leptoiulus proximus* (Němec, 1896)



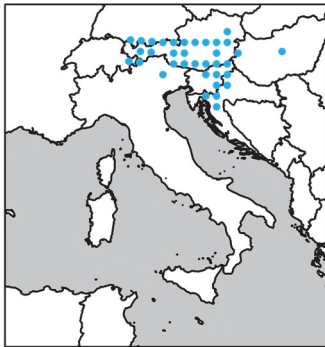
340. *Leptoiulus remyi*
Schubart, 1962



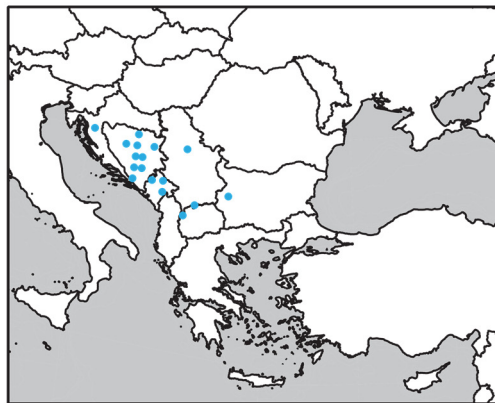
341. *Leptoiulus riparius*
(Verhoeff, 1894)



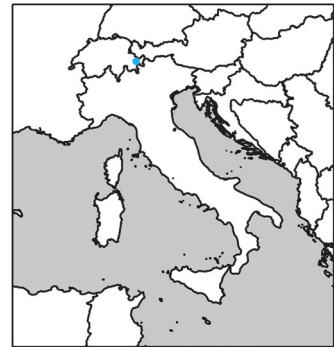
342. *Leptoiulus roszkowskii*
Jawłowski, 1930



343. *Leptoiulus saltuvagus*
(Verhoeff, 1898)



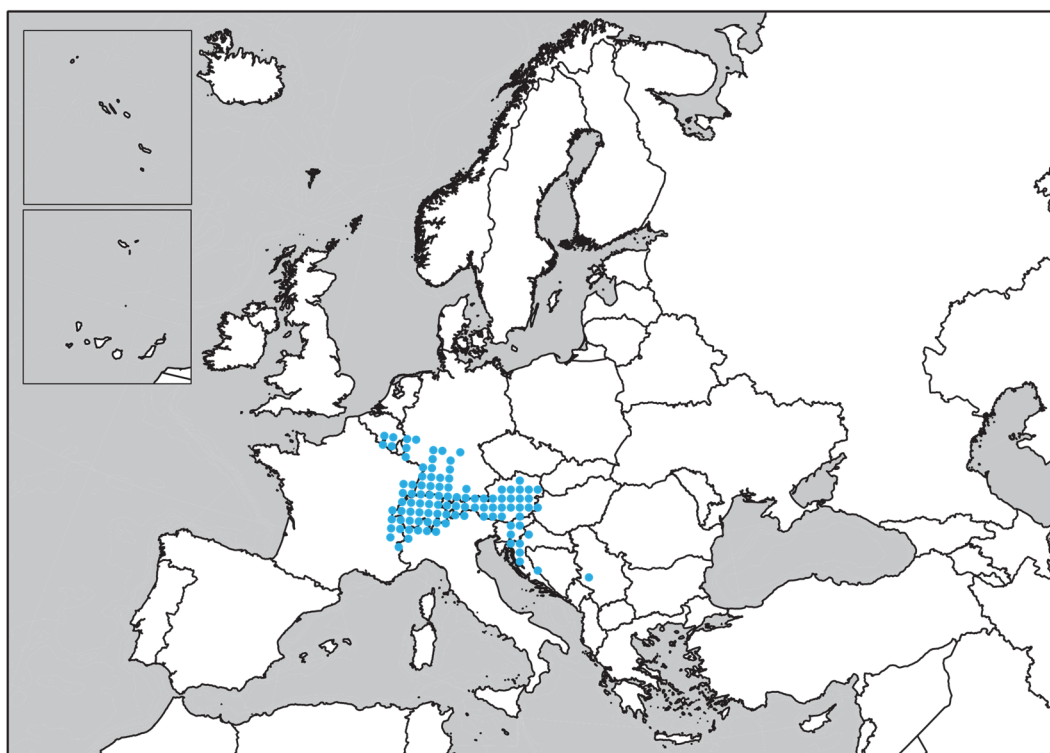
344. *Leptoiulus sarajevensis*
(Verhoeff, 1898)



345. *Leptoiulus sarasini*
Bigler, 1929



346. *Leptoiulus semenkevitchi* Lohmander, 1928



347. *Leptoiulus simplex* (Verhoeff, 1894)



348. *Leptoiulus storkani*
Verhoeff, 1932



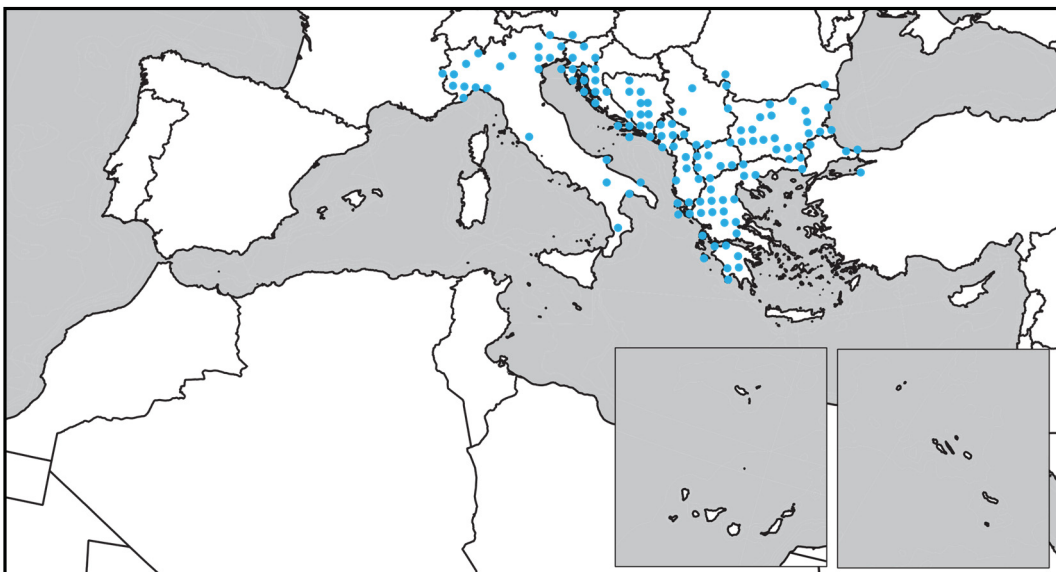
349. *Leptoiulus tatricus*
Gulička, 1956



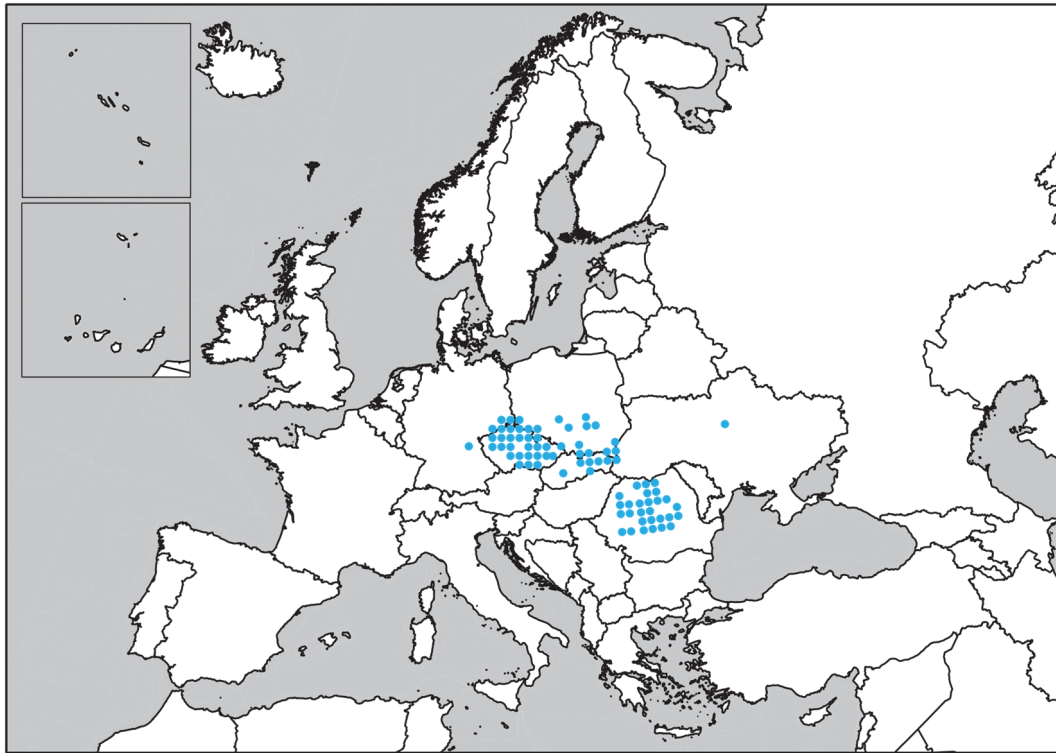
350. *Leptoiulus tendanus*
Verhoeff, 1930



351. *Leptoiulus transsylvanicus*
(Daday, 1889)



352. *Leptoiulus trilineatus* (C.L. Koch, 1847)



353. *Leptoiulus trilobatus* (Verhoeff, 1894)



354. *Leptoiulus tussilaginis*
(Verhoeff, 1907)



355. *Leptoiulus umbratilis*
(Ribaut, 1905)



356. *Leptoiulus uncinatus*
Ribaut, 1951



357. *Leptoiulus vagabundus*
(Latzel, 1884)



358. *Leptoiulus vieirae*
(Verhoeff, 1900)



359. *Leptoiulus zagrebensis*
Verhoeff, 1929



360. *Leptotyphloiulus coeruleoalbus*
(Verhoeff, 1899)



361. *Leptotyphloiulus dolinensis*
(Verhoeff, 1901)



362. *Macheiroiulus compressicauda*
Verhoeff, 1901



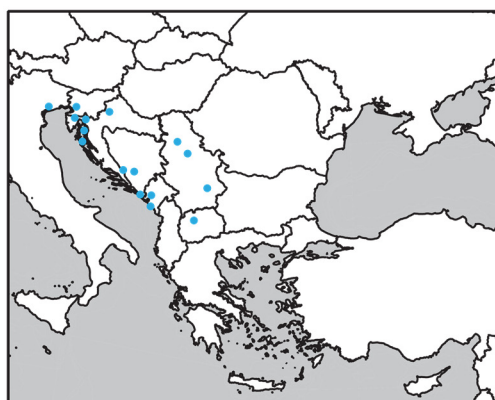
363. *Mammamia profuga*
Akkari, Stoev & Enghoff, 2011



364. *Megaphyllum anatolicum*
(Attens, 1926)



365. *Megaphyllum argolicum*
(Verhoeff, 1900)



366. *Megaphyllum austriacum*
(Latzel, 1884)



367. *Megaphyllum beroni*
(Strasser, 1973)



368. *Megaphyllum bicolor*
(Loksa, 1970)



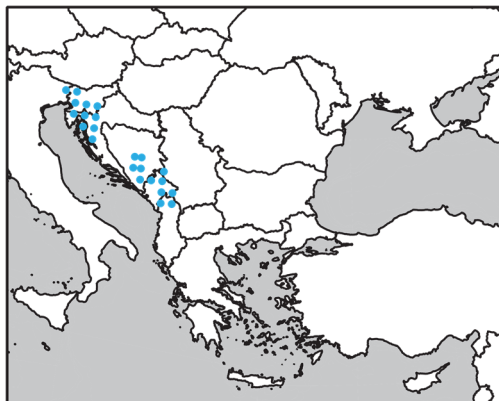
369. *Megaphyllum bosniense*
(Verhoeff, 1897)



370. *Megaphyllum brachyurum* (Attems, 1899)



371. *Megaphyllum byzantinum*
(Verhoeff, 1901)



372. *Megaphyllum carniolense*
(Verhoeff, 1897)



373. *Megaphyllum cephalonicum*
(Strasser, 1974)



374. *Megaphyllum chiosense*
Lazányi & Korsós, 2012



375. *Megaphyllum crassum*
(Attems, 1929)



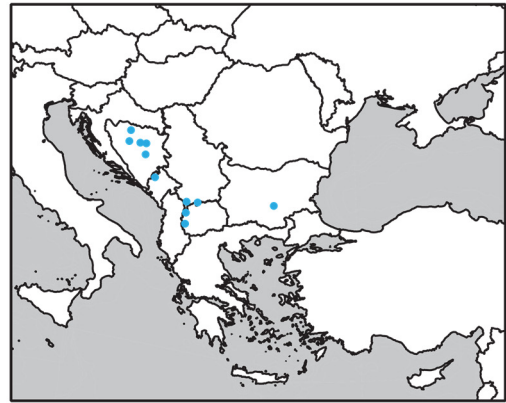
376. *Megaphyllum creticum*
(Strasser, 1976)



377. *Megaphyllum cygniforme*
Lazányi & Korsós, 2012



378. *Megaphyllum danyi*
Lazányi & Korsós, 2012



379. *Megaphyllum dentatum*
(Verhoeff, 1898)



380. *Megaphyllum digitatum*
Lazányi & Korsós, 2012



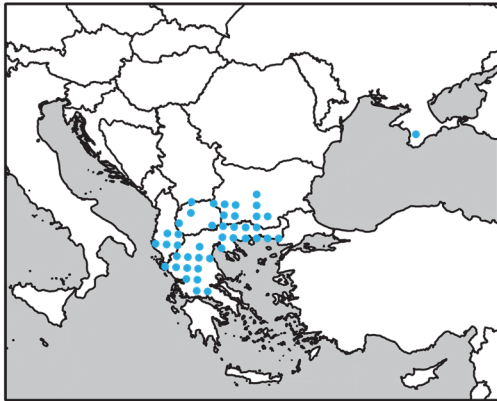
381. *Megaphyllum erythronotum*
(Latzel, 1884)



382. *Megaphyllum euphorbium*
(Verhoeff, 1900)



383. *Megaphyllum glossuliferum*
(Schubart, 1934)



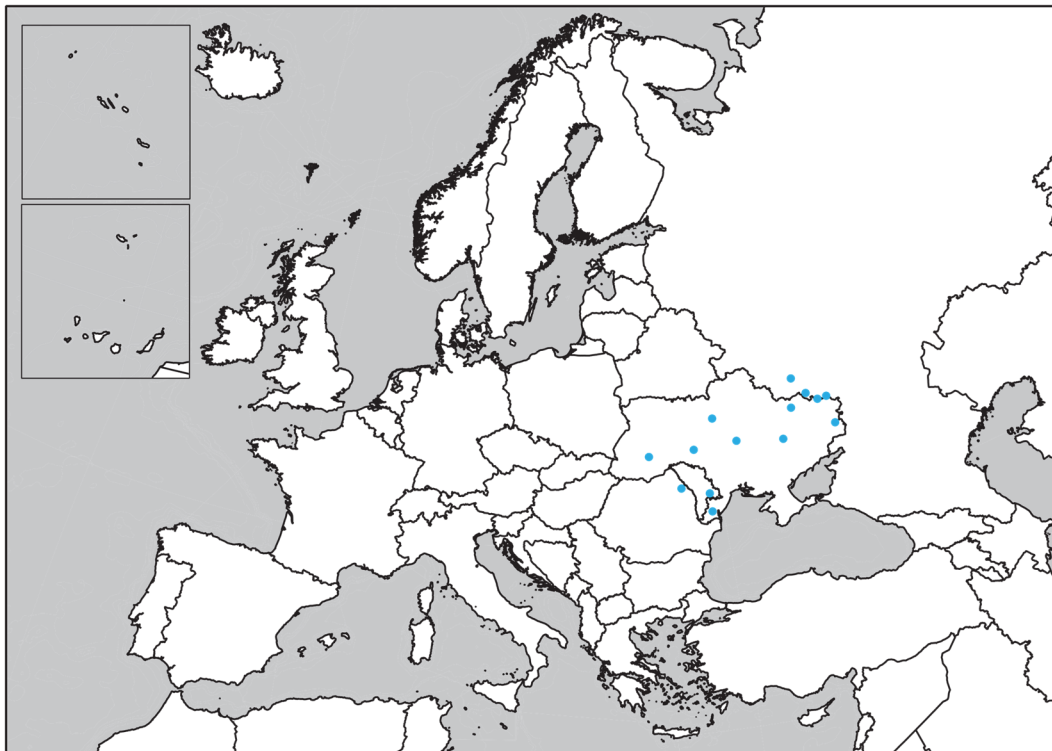
384. *Megaphyllum hercules* (Verhoeff, 1900)



385. *Megaphyllum imbecillum* (Attems, 1935)



386. *Megaphyllum karschi*
(Verhoeff, 1901)



387. *Megaphyllum kievense* (Lohmander, 1928)



388. *Megaphyllum lamelliferum*
(Strasser, 1974)



389. *Megaphyllum leucadium*
(Attems, 1929)



390. *Megaphyllum lictor*
(Attems, 1904)



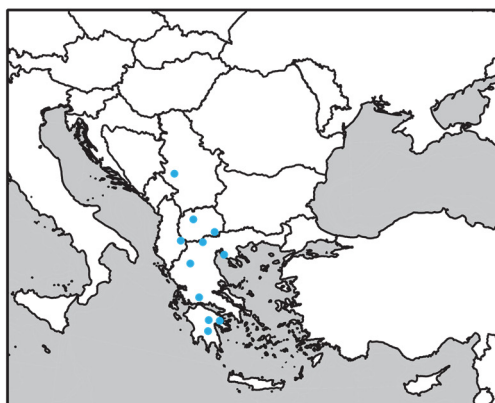
391. *Megaphyllum loebli*
(Strasser, 1904)



392. *Megaphyllum margaritatum* (Fanzago, 1875)



393. *Megaphyllum metsovoni*
(Strasser, 1976)



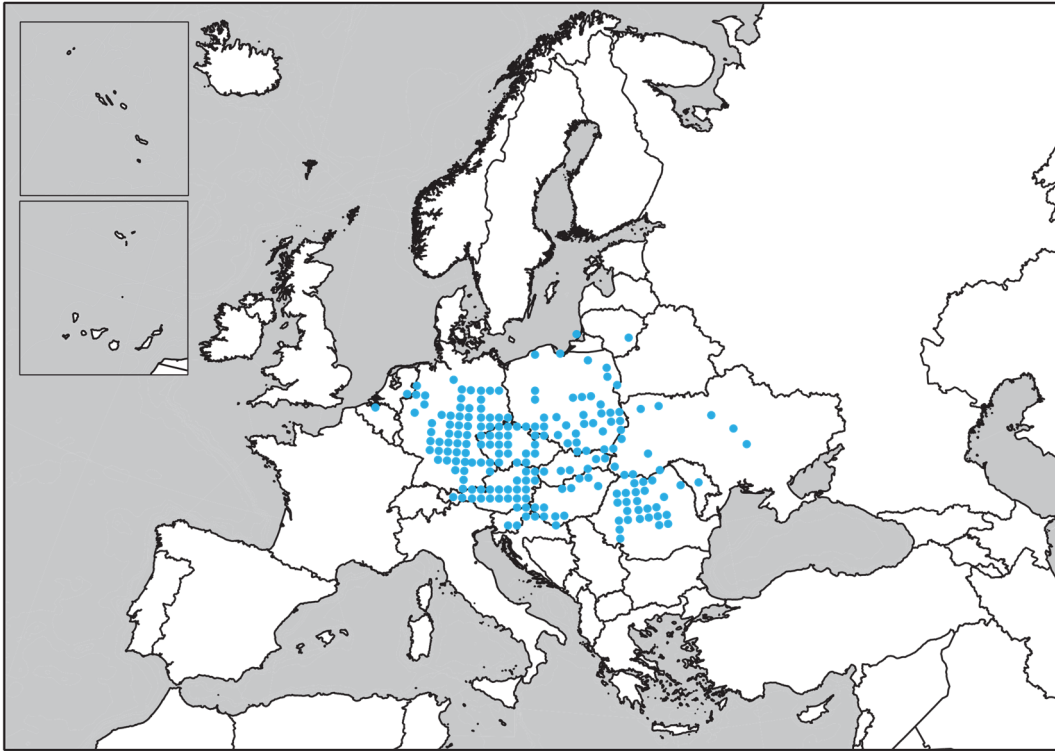
394. *Megaphyllum montivagum*
(Verhoeff, 1901)



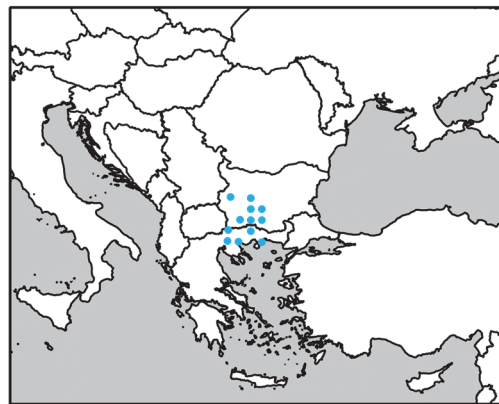
395. *Megaphyllum mueggenburgi*
(Verhoeff, 1901)



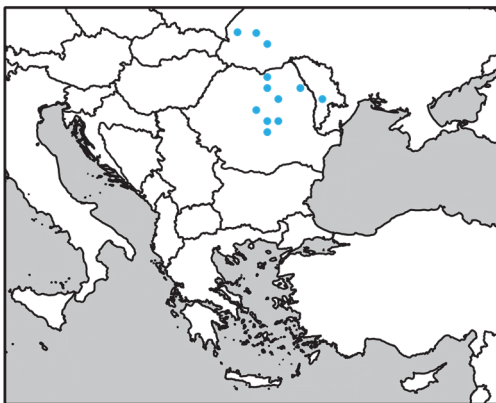
396. *Megaphyllum platyurum*
(Latzel, 1884)



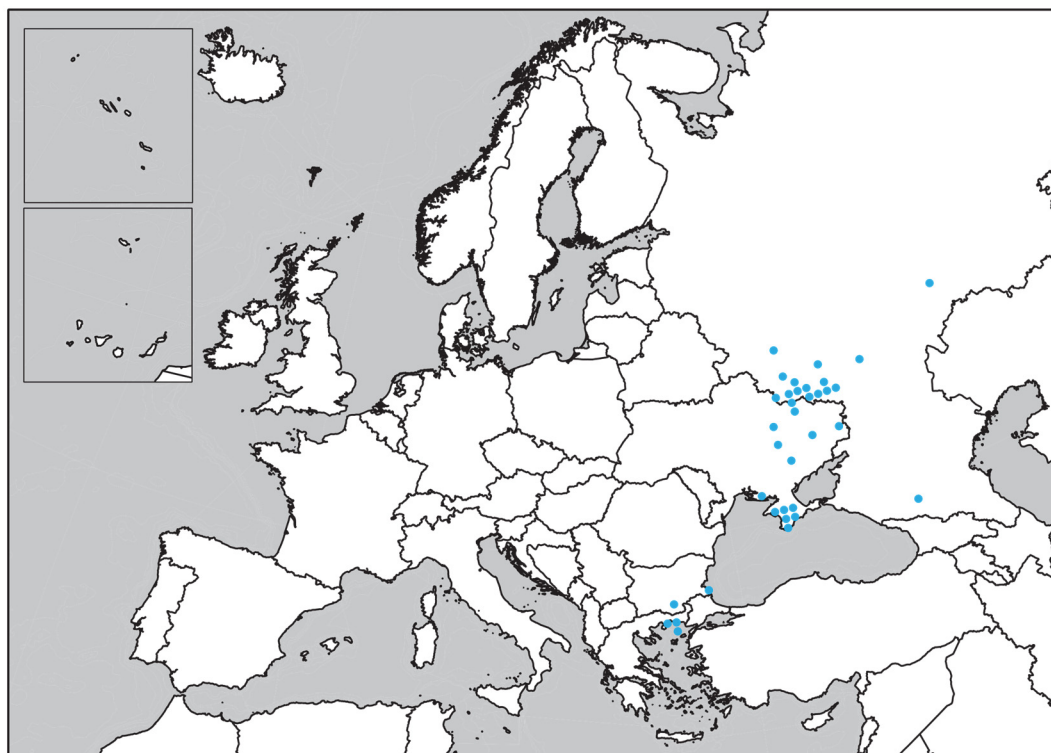
397. *Megaphyllum projectum* Verhoeff, 1894



398. *Megaphyllum recticauda* (Attems, 1903) 399. *Megaphyllum rhodopinum* (Verhoeff, 1928)



400. *Megaphyllum rosenauense*
(Verhoeff, 1897)



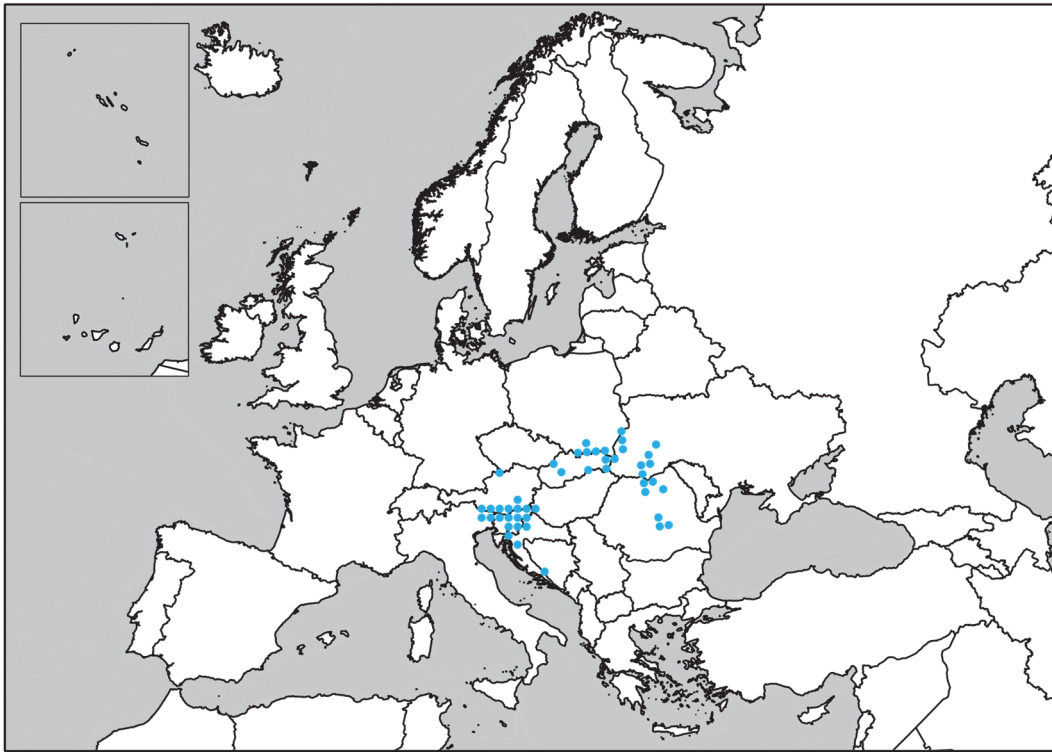
401. *Megaphyllum rossicum* (Timotheew, 1897)



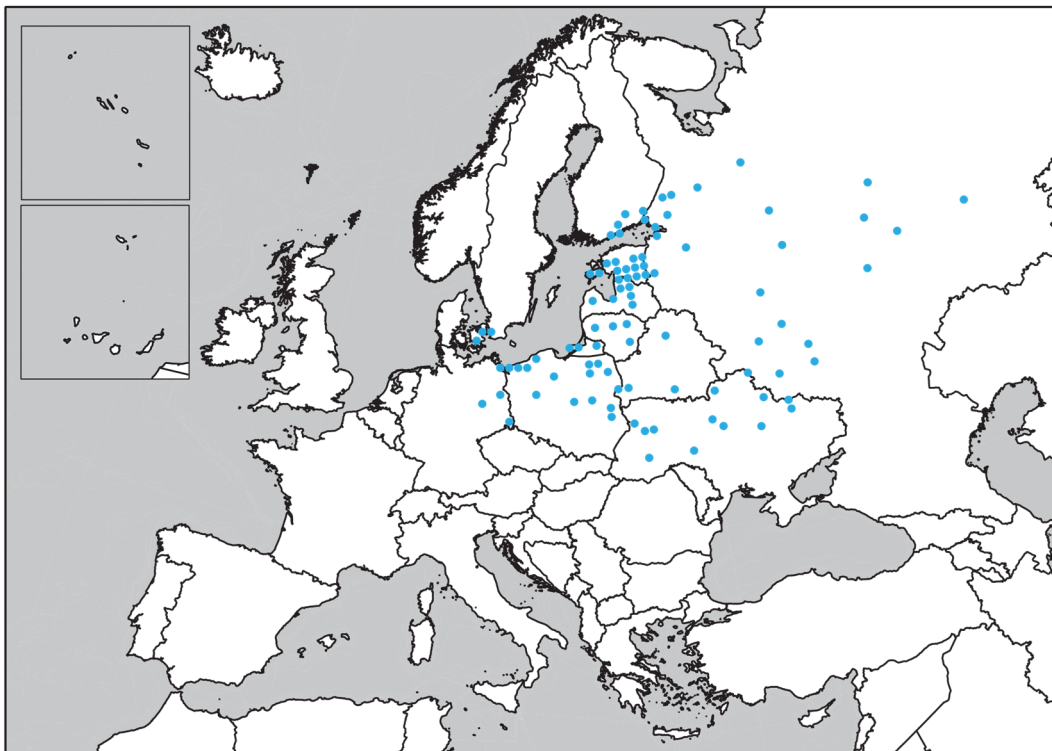
402. *Megaphyllum rubidicolle*
(Verhoeff, 1901)



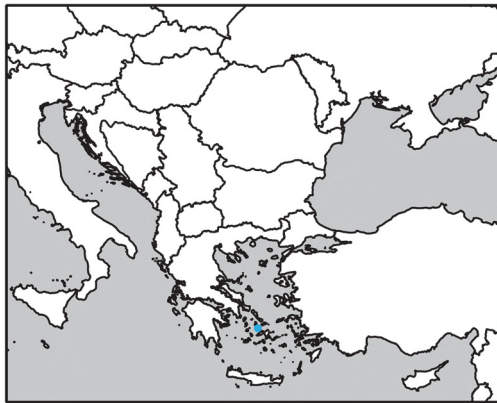
403. *Megaphyllum sapphicum*
(Strasser, 1976)



404. *Megaphyllum silvaticum* (Verhoeff, 1898)



405. *Megaphyllum sjaelandicum* (Meinert, 1868)



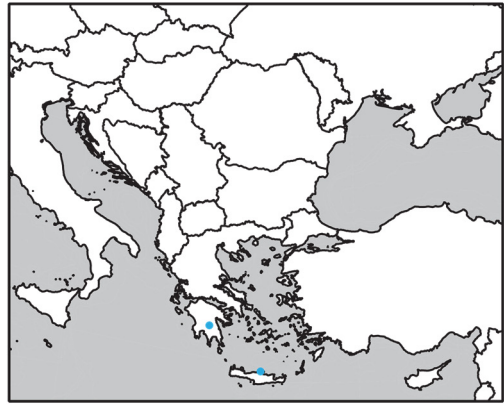
406. *Megaphyllum syrense*
(Verhoeff, 1903)



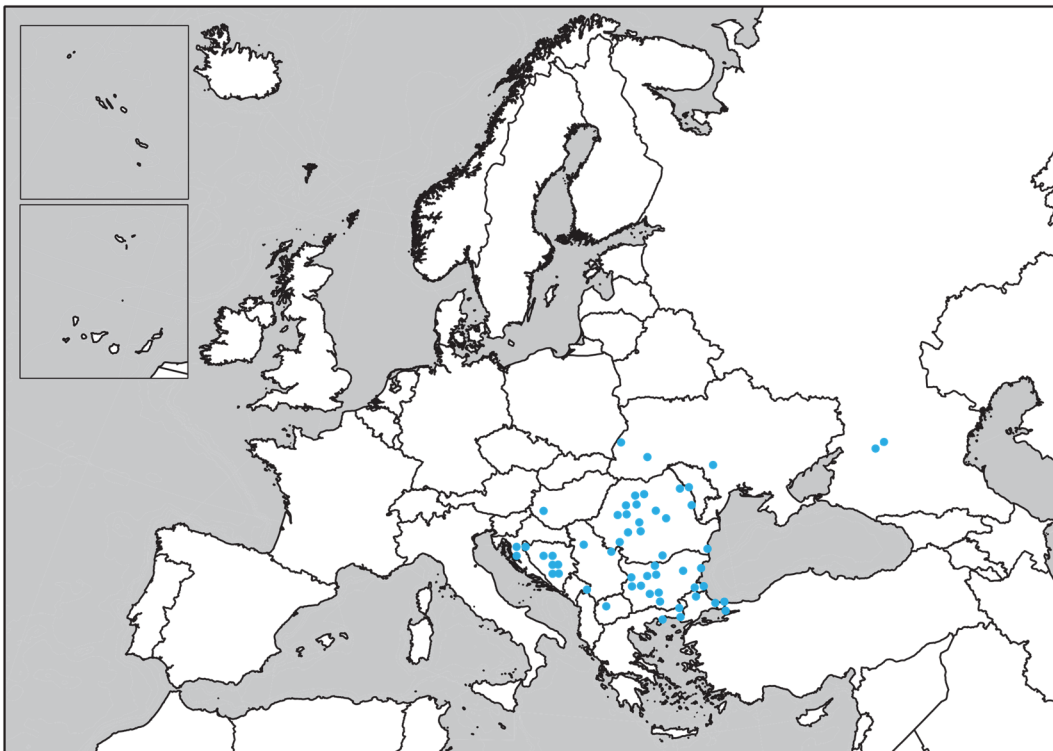
407. *Megaphyllum tauricum*
(Attems, 1907)



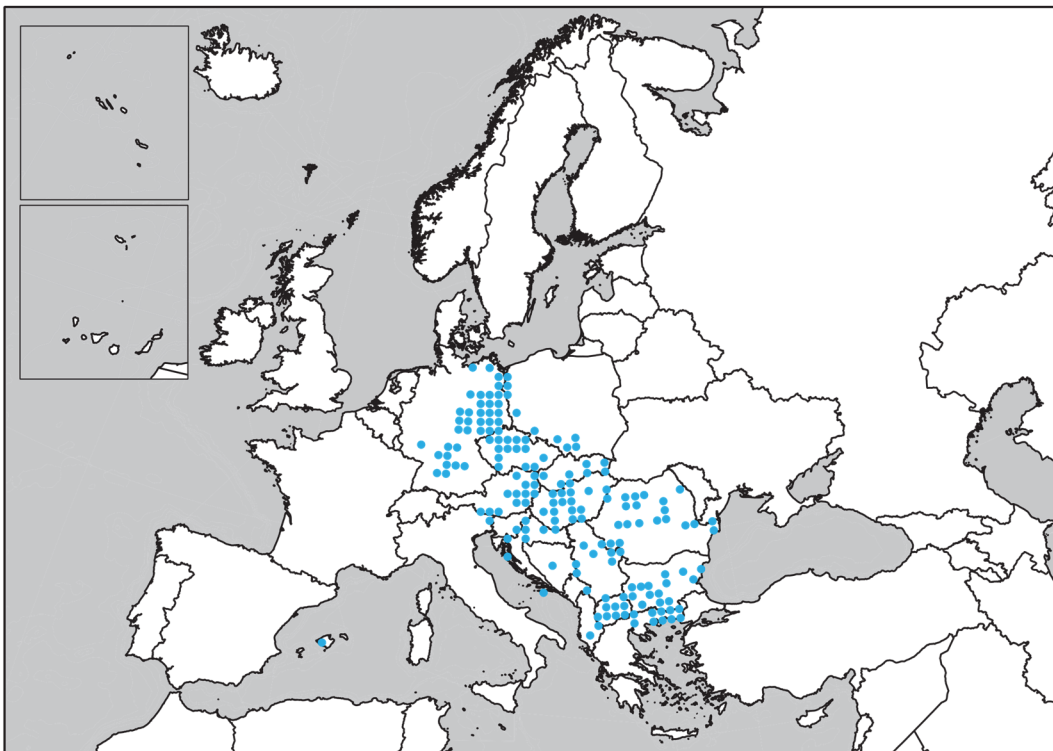
408. *Megaphyllum taygetanum*
(Attems, 1903)



409. *Megaphyllum taygeti*
(Strasser, 1976)



410. *Megaphyllum transsylvanicum* (Verhoeff, 1897)



411. *Megaphyllum unilineatum* (C.L. Koch, 1838)



412. *Megaphyllum vicinum*
(Verhoeff, 1903)



413. *Mesoiulus berlesei*
Silvestri, 1898



414. *Mesoiulus cavernarum*
(Verhoeff, 1938)



415. *Mesoiulus derouteae*
Mauriès, 1971



416. *Mesoiulus drescoi*
Mauriès, 1971



417. *Mesoiulus gridellii*
Strasser, 1934



418. *Mesoiulus henroti*
Mauriès, 1971



419. *Mesoiulus kosswigi*
Verhoeff, 1936



420. *Mesoiulus mauriesi*
Strasser, 1974



421. *Mesoiulus paradoxus*
Berlese, 1886



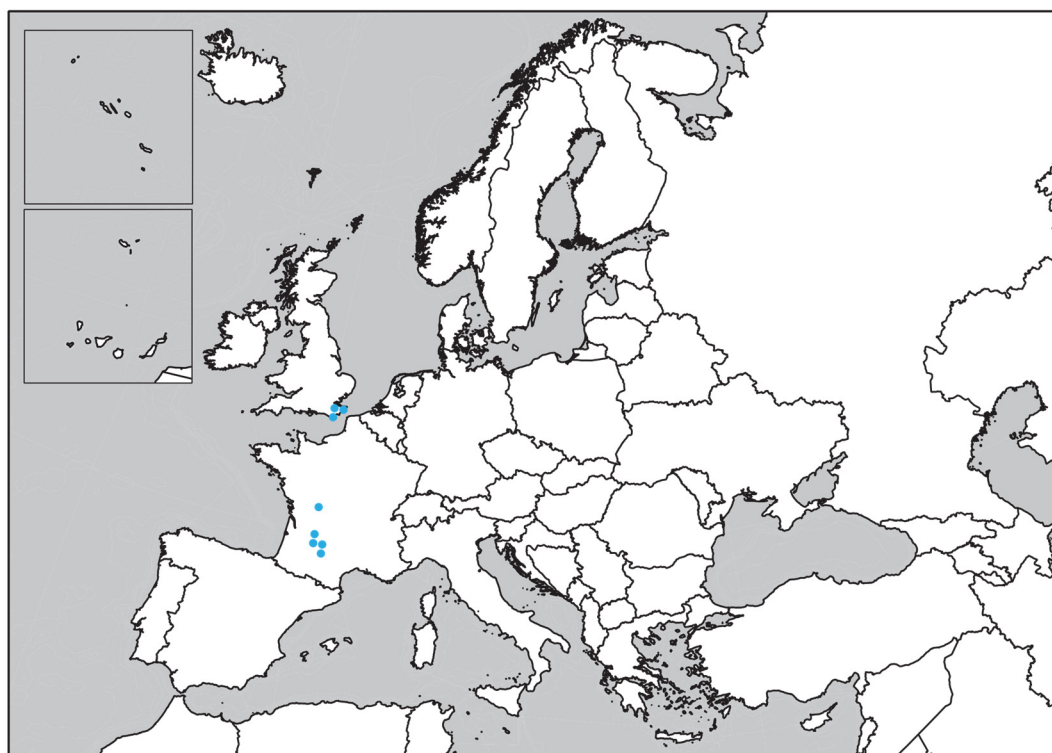
422. *Mesoiulus rusticanus*
Mauriès & Vicente, 1977



423. *Mesoiulus siculus*
Silvestri, 1902



424. *Mesoiulus stammeri*
(Verhoeff, 1936)



425. *Metaiulus pratensis* Blower & Rolfe, 1956



426. *Micropachyiulus paucicellatus*
(Verhoeff, 1899)



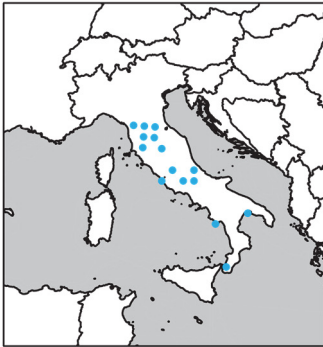
427. *Ommatoiulus albolineatus*
(Lucas, 1845)



428. *Ommatoiulus andalusius* (Attems, 1927)



429. *Ommatoiulus armatus* (Verhoeff, 1910)



430. *Ommatoiulus aurozonatus*
(Berlese, 1886)



431. *Ommatoiulus baenai*
Akkari & Enghoff, 2012



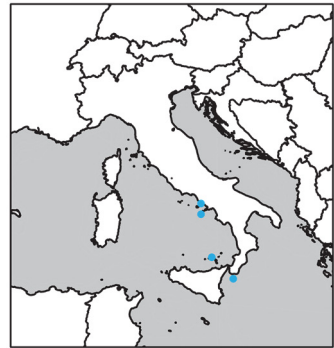
432. *Ommatoiulus baileyi*
Akkari & Enghoff, 2012



433. *Ommatoiulus bavayi*
(Brölemann, 1897)



434. *Ommatoiulus bipartitus*
(Verhoeff, 1910)



435. *Ommatoiulus buchneri*
(Verhoeff, 1940)



436. *Ommatoiulus cervinus*
(Verhoeff, 1940)



437. *Ommatoiulus cingulatus*
(Attems, 1927)



438. *Ommatoiulus clavigerus*
(Verhoeff, 1921)



439. *Ommatoiulus corsicus*
(Brölemann, 1903)



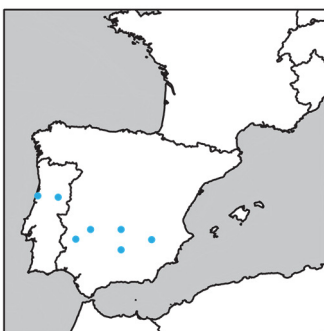
440. *Ommatoiulus corunnensis*
(Verhoeff, 1910)



441. *Ommatoiulus demangei*
Vicente & Rodriguez, 1992



442. *Ommatoiulus diplurus*
(Attems, 1903)



443. *Ommatoiulus dorsovittatus*
(Verhoeff, 1893)



444. *Ommatoiulus fuentei*
(Brolemann, 1920)



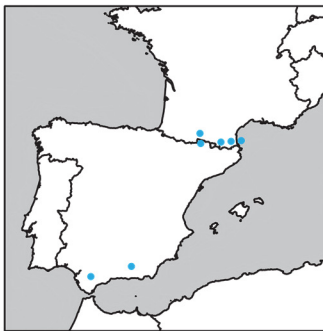
445. *Ommatoiulus haackeri*
Mauriès, 1969



446. *Ommatoiulus hoffmani*
Akkari & Enghoff, 2012



447. *Ommatoiulus ibericus*
Ceuca, 1974



448. *Ommatoiulus ilicis*
(Brölemann, 1897)



449. *Ommatoiulus imminutus*
(Brölemann, 1926)



450. *Ommatoiulus inconspicuus*
(L. Koch, 1881)



451. *Ommatoiulus jaenensis*
Akkari & Enghoff, 2012



452. *Ommatoiulus kimei*
Akkari & Enghoff, 2012



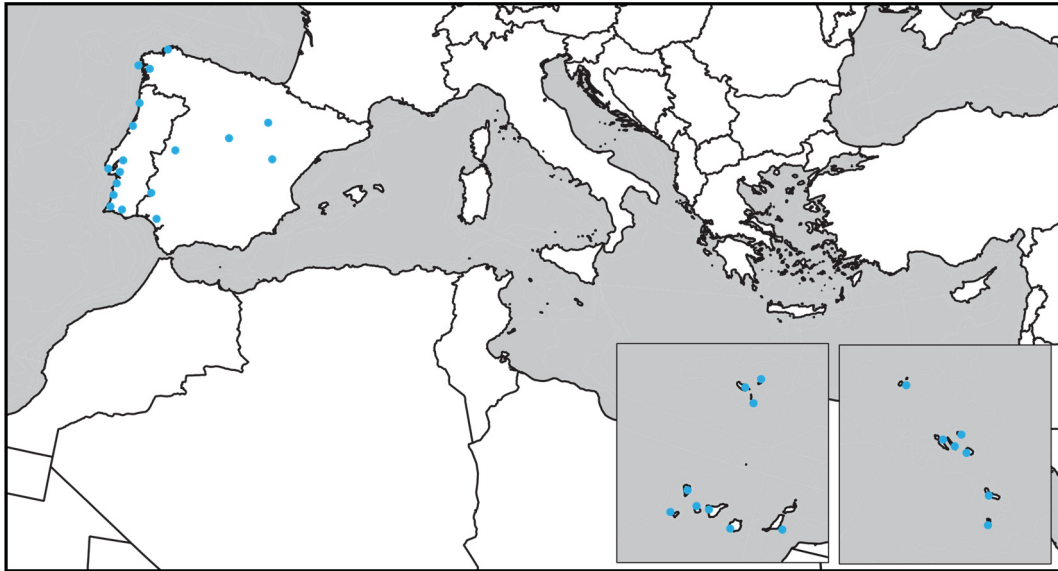
453. *Ommatoiulus lienharti*
(Brölemann, 1921)



454. *Ommatoiulus lusitanus*
(Verhoeff, 1895)



455. *Ommatoiulus martensi*
Mauriès, 1969



456. *Ommatoiulus moreleti* (Lucas, 1860)



457. *Ommatoiulus navasi*
(Brölemann, 1918)



458. *Ommatoiulus niger*
(Attems, 1952)



459. *Ommatoiulus oliveirae*
(Verhoeff, 1893)



460. *Ommatoiulus oxypygus*
(Brandt, 1841)



461. *Ommatoiulus parallelus*
(C.L. Koch 1847)



462. *Ommatoiulus porathi*
(Verhoeff, 1893)



463. *Ommatoiulus pseudoflagellatus* Akkari & Enghoff, 2012



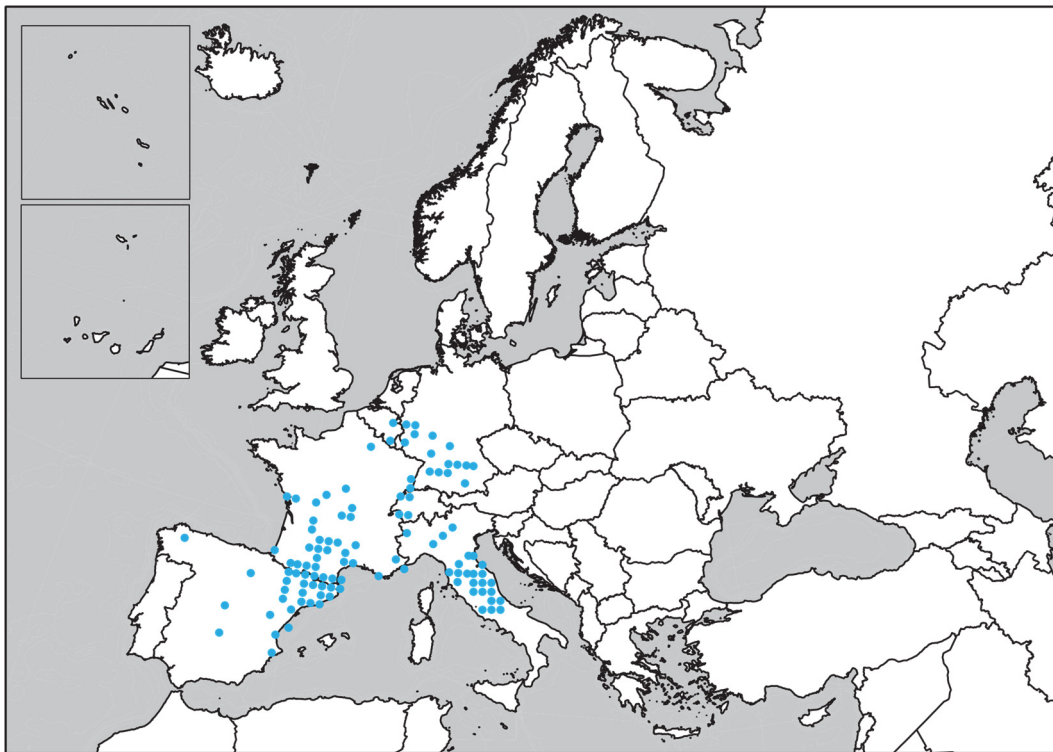
464. *Ommatoiulus recueroi* Akkari & Enghoff, 2012



465. *Ommatoiulus reipi* Akkari & Enghoff, 2012



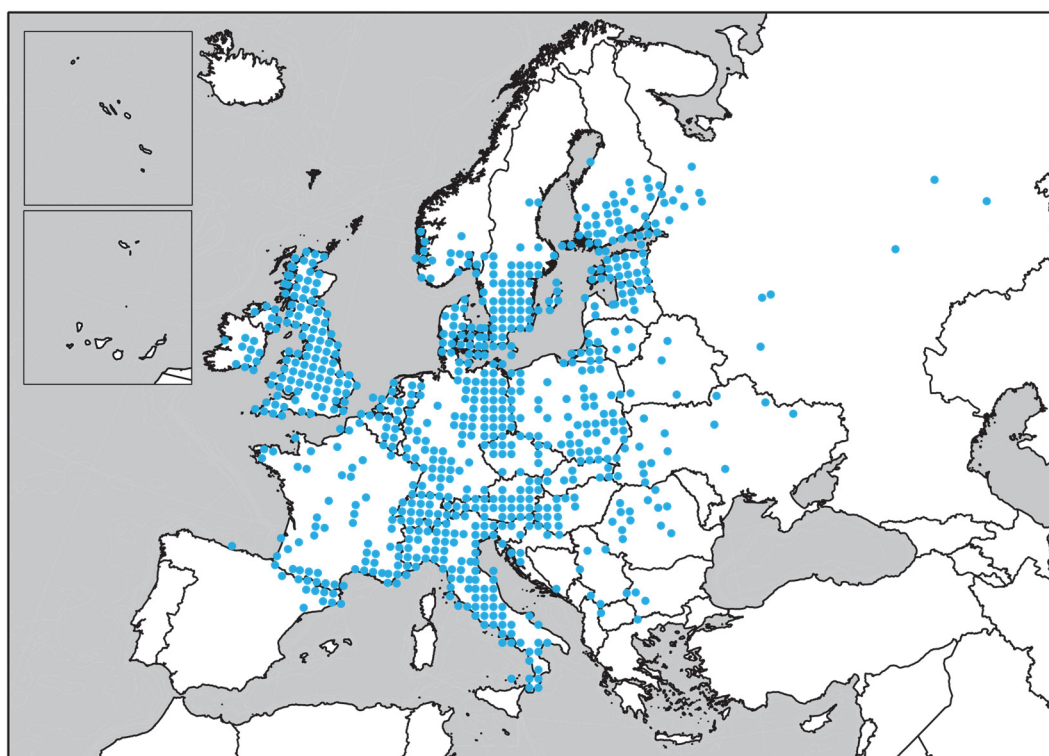
466. *Ommatoiulus robustus* Ceuca, 1972



467. *Ommatoiulus rutilans* (C.L. Koch, 1847)



468. *Ommatoiulus sabinarensis* Akkari, Mauriès & Enghoff 2012



469. *Ommatoiulus sabulosus* (Linnaeus, 1758)



470. *Ommatoiulus schubarti*
Akkari & Enghoff, 2012



471. *Ommatoiulus teruelensis*
Ceuca, 1974



472. *Ommatoiulus tridentifer*
Ceuca, 1974



473. *Ommatoiulus variolosus*
(Silvestri, 1898)



474. *Ophiulus aspidiorum*
(Verhoeff, 1913)



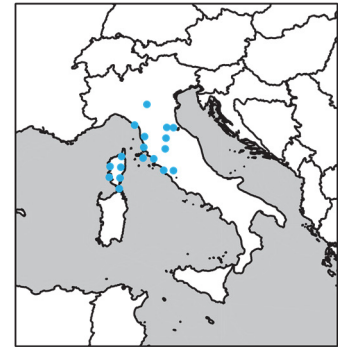
475. *Ophiulus bastiensis*
Verhoeff, 1943



476. *Ophiulus castanearum*
Verhoeff, 1930



477. *Ophiulus cerii*
Verhoeff, 1942



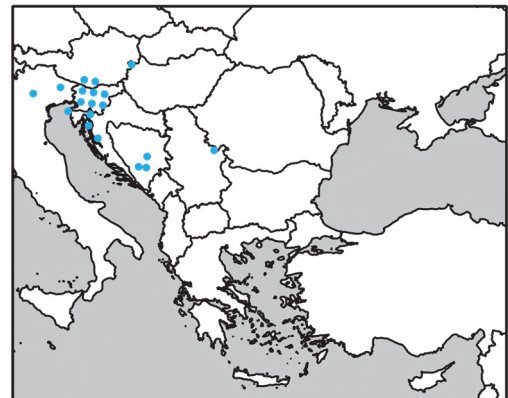
478. *Ophiulus chilopogon*
(Latzel, 1884)



479. *Ophiulus collaris*
Verhoeff, 1930



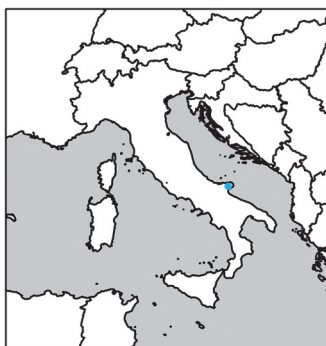
480. *Ophiulus corsicus*
Verhoeff, 1943



481. *Ophiulus curvipes*
(Verhoeff, 1898)



482. *Ophiulus germanicus* (Verhoeff, 1896)



483. *Ophiulus italicus*
Attems, 1927



484. *Ophiulus jeekeli*
Strasser, 1974



485. *Ophiulus lostiae*
Silvestri, 1898



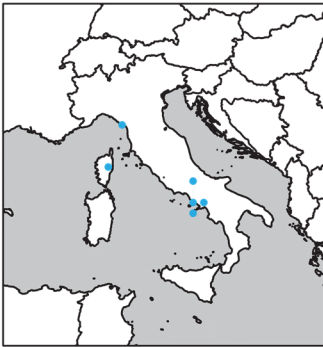
486. *Ophiulus macchiaiae*
Verhoeff, 1930



487. *Ophiulus minimus*
Strasser, 1958



488. *Ophiulus muelleri*
Strasser, 1937



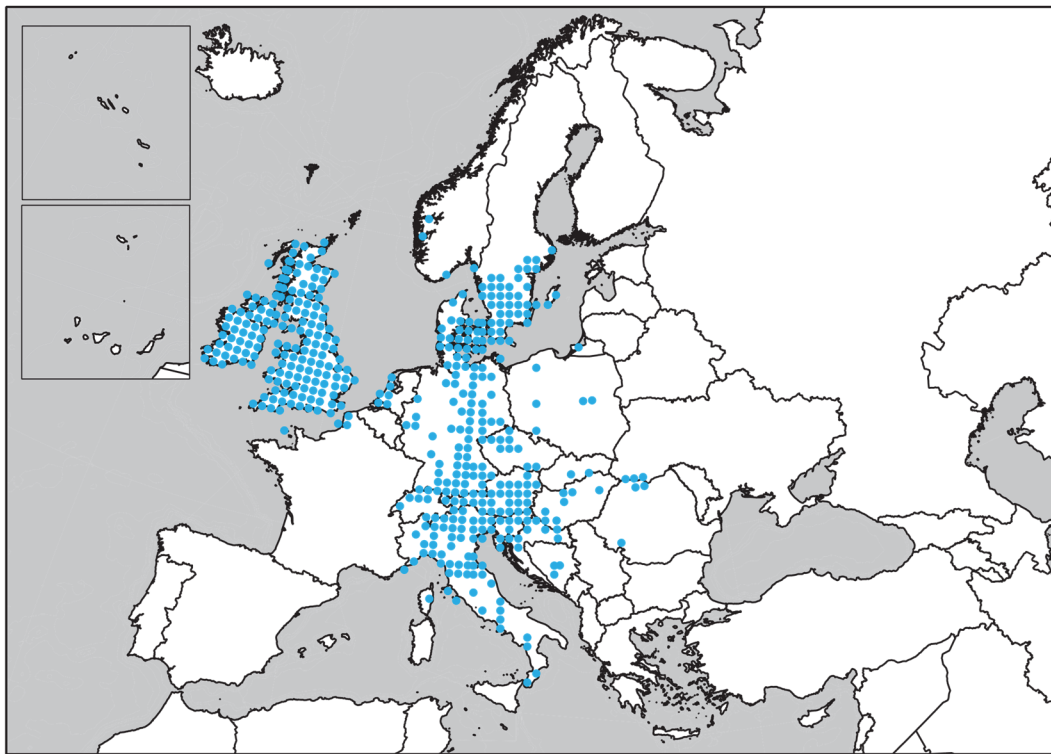
489. *Ophiulus napolitanus*
(Attems, 1903)



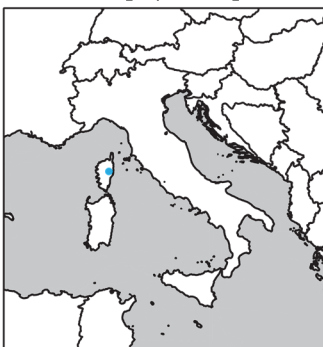
490. *Ophiulus nigrofuscus*
(Verhoeff, 1894)



491. *Ophiulus osellai*
Strasser, 1970



492. *Ophiulus pilosus* (Newport, 1842)



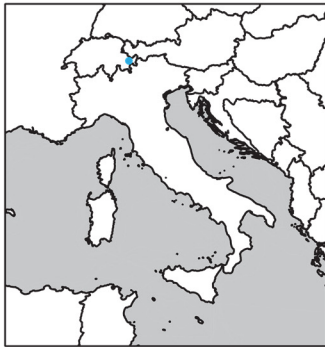
493. *Ophiulus renosensis*
Mauriès, 1969



494. *Ophiulus rubrodorsalis*
(Verhoeff, 1900)



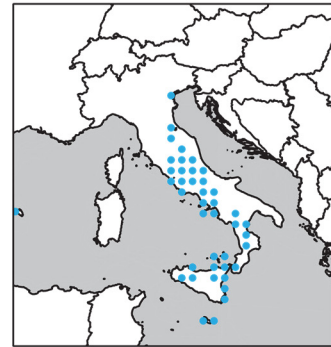
495. *Ophiulus sardus*
Attems, 1927



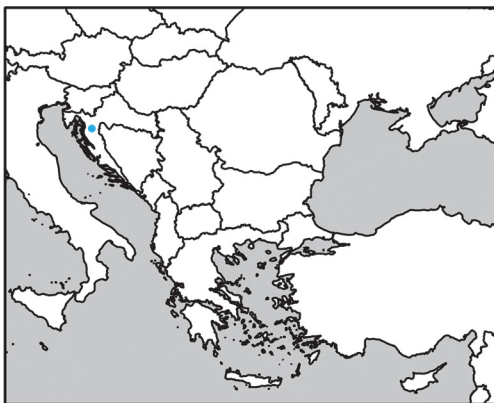
496. *Ophiulus solitarius*
Bigler, 1929



497. *Ophiulus spezianus*
Verhoeff, 1936



498. *Ophiulus targionii*
Silvestri, 1898



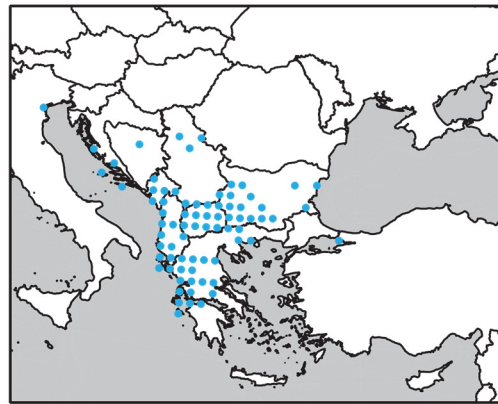
499. *Ophiulus velebiticus*
Attens, 1927



500. *Pachyiulus apfelbecki*
Verhoeff, 1901



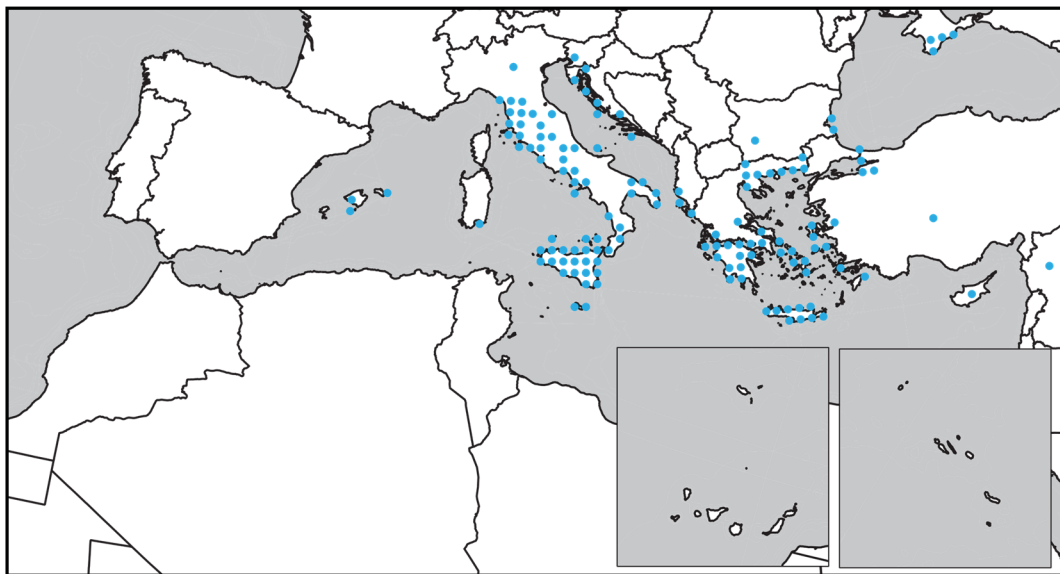
501. *Pachyiulus asiaeminoris*
Verhoeff, 1898



502. *Pachyiulus cattarensis*
(Latzel, 1884)



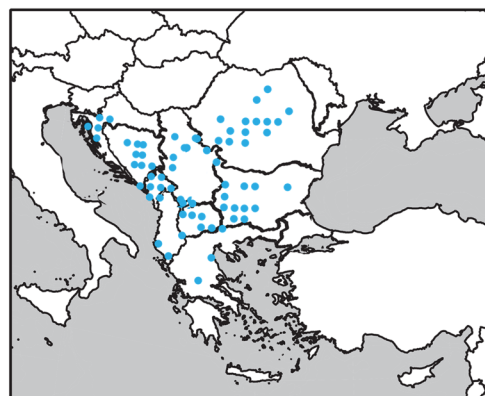
503. *Pachyiulus dentiger*
Verhoeff, 1901



504. *Pachyiulus flavipes* (C.L. Koch, 1847)



505. *Pachyiulus humicola*
Verhoeff, 1910



506. *Pachyiulus hungaricus*
Verhoeff, 1910



507. *Pachyiulus marmoratus*
Verhoeff, 1901



508. *Pachyiulus oenologus*
(Berlese, 1885)



509. *Pachyiulus silvestrii*
Verhoeff, 1923



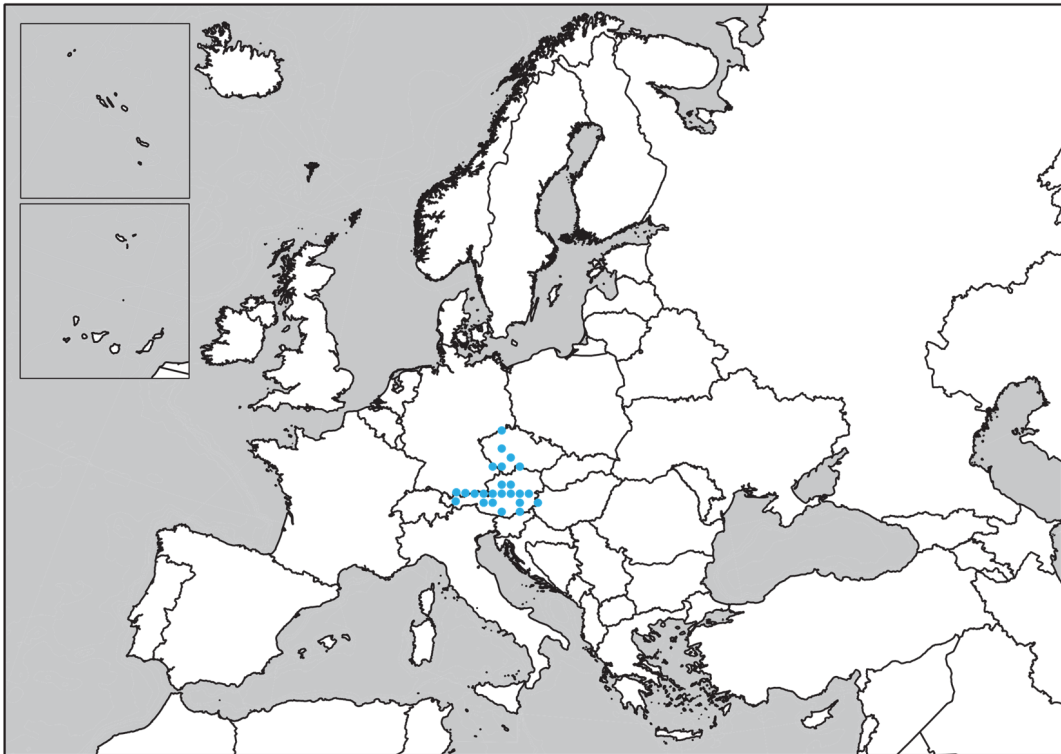
510. *Pachyiulus speciosus*
Verhoeff, 1900



511. *Pachyiulus valonensis*
Verhoeff, 1901



512. *Pachyiulus varius* (Fabricius, 1781)



513. *Pachypodoiulus eurypus* (Attems, 1895)



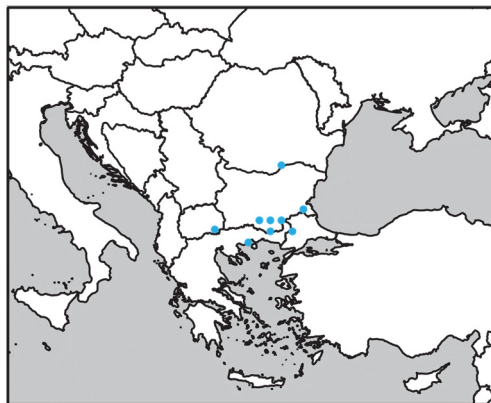
514. *Parastenophyllum frondicola*
(Verhoeff, 1899)



515. *Pteridoiulus aspidiorum*
Verhoeff, 1913



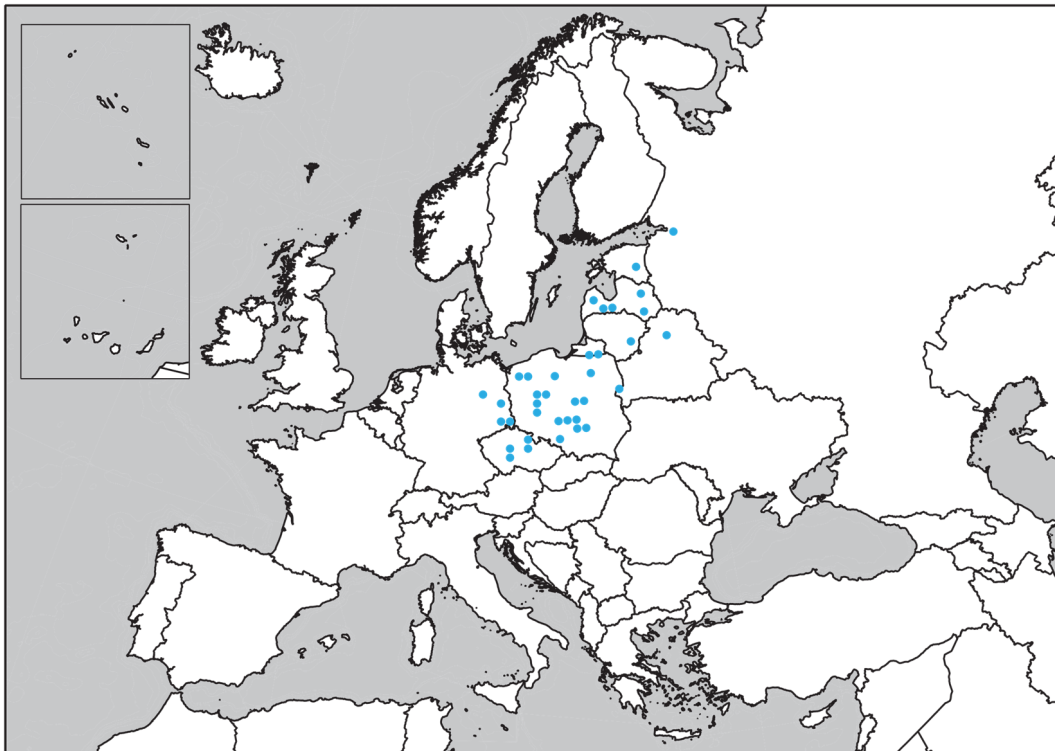
516. *Rhamphidoiulus bujukdurensis*
Attems, 1905



517. *Rhodopiella beroni*
(Strasser, 1966)



518. *Rossiulus kessleri* (Lohmander, 1927)



519. *Rossiulus vilnensis* (Jawłowski, 1925)



520. *Rumaniulus mammosus*
Attems, 1927



521. *Serboiulus deelemani*
Strasser, 1971



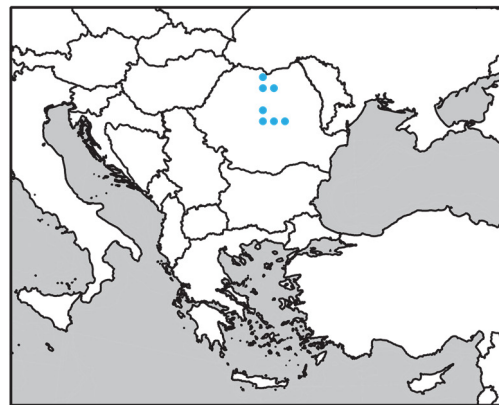
522. *Serboiulus kresnik*
Makarov, 2013



523. *Serboiulus lucifugus*
Strasser, 1962



524. *Serboiulus spelaeophilus*
Gulička, 1967



525. *Stenophyllum hermannimuelleri*
Verhoeff, 1897



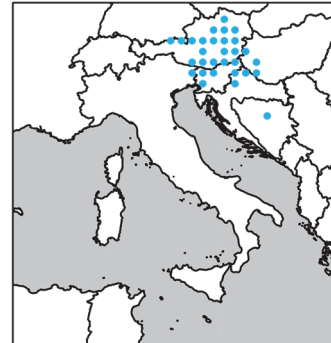
526. *Stenophyllum primitivum*
Verhoeff, 1897



527. *Stenophyllum semenicense*
Ceuca, 1989



528. *Stenophyllum tabacarui*
Vanoaica, 2003



529. *Styrioiulus pelidnus*
(Latzel, 1884)



530. *Styrioiulus styricus*
(Verhoeff, 1896)



531. *Symphyoius imparitius*
(Karsch, 1888)



532. *Syniulus bolivari*
(Ceuca, 1971)

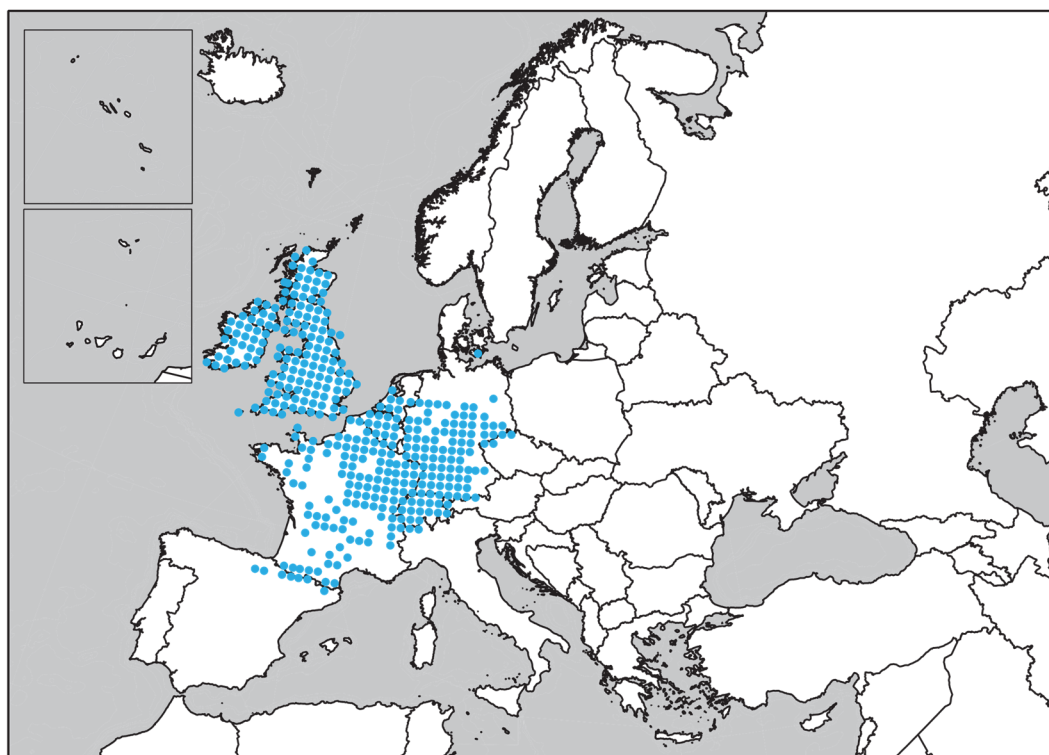


533. *Syniulus lagari*
(Ceuca, 1971)



534. *Syniulus puddui*
Strasser, 1974

535. *Syriojulius andreevi*
Mauriès, 1984



536. *Tachypodoiulus niger* (Leach, 1814)

537. *Telsonius nycteridonis*
Strasser, 1976

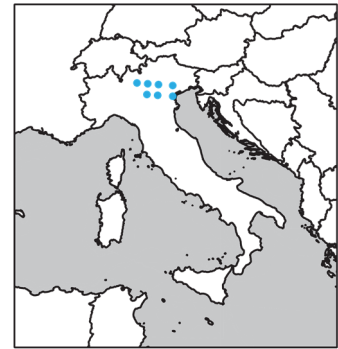




538. *Titanophyllum spiliarum*
Akkari, Stoev & Enghoff, 2011



539. *Troglolulus binii*
Enghoff, 1985



540. *Troglolulus boldorii*
Manfredi, 1940



541. *Troglolulus comensis*
Strasser, 1977



542. *Troglolulus concii*
Manfredi, 1948



543. *Troglolulus minimus*
Manfredi, 1935



544. *Troglolulus mirus*
Manfredi, 1931



545. *Troglolulus osellai*
Strasser, 1977



546. *Troglolulus vailatii*
Strasser, 1978



547. *Typhloiulus acutunguis*
Ceuca, 1979



548. *Typhloiulus albanicus*
Attems, 1929



549. *Typhloiulus ausugi*
Manfredi, 1953



550. *Typhloiulus beroni*
Mauriès, Golovatch & Stoev, 1997



551. *Typhloiulus bosniensis*
Strasser, 1966



552. *Typhloiulus bureschi*
Verhoeff, 1926



553. *Typhloiulus carniolensis*
Strasser, 1940



554. *Typhloiulus edentulus*
Attems, 1951



555. *Typhloiulus ganglbaueri*
(Verhoeff, 1898)



556. *Typhloiulus gellianae*
Makarov & Rada, 2008



557. *Typhloiulus georgievi*
Strasser, 1962



558. *Typhloiulus giganteus*
Ćurčić & Makarov, 2002



559. *Typhloiulus hauseri*
Strasser, 1974



560. *Typhloiulus illyricus*
Verhoeff, 1929



561. *Typhloiulus incurvatus*
Verhoeff, 1899



562. *Typhloiulus insularis*
Strasser, 1938



563. *Typhloiulus kotelensis*
Jawłowski, 1938



564. *Typhloiulus lobifer*
Attems, 1951



565. *Typhloiulus longinquus*
Strasser, 1966



566. *Typhloiulus longipes*
Strasser, 1973



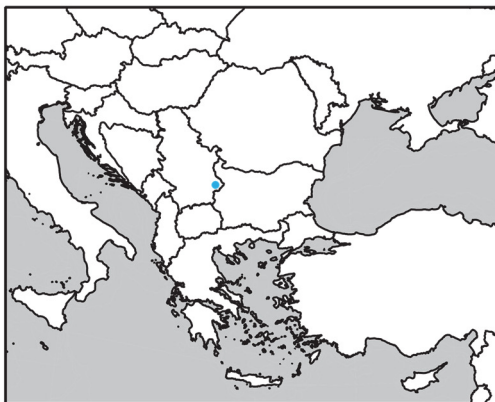
567. *Typhloiulus maximus*
Verhoeff, 1929



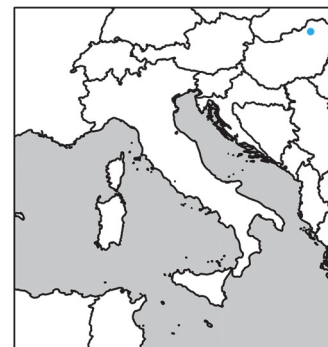
568. *Typhloiulus montellensis*
Verhoeff, 1930



569. *Typhloiulus motasi*
Tabacaru & Gava, 1992



570. *Typhloiulus nevoi*
Makarov, Mitić & Ćurčić, 2002



571. *Typhloiulus polypodus*
(Loksa, 1960)



572. *Typhloiulus psilonotus*
(Latzel, 1884)



573. *Typhloiulus sculterorum*
Brölemann, 1905



574. *Typhloiulus serbani*
(Ceuca, 1956)



575. *Typhloiulus serborum*
Ćurčić & Makarov, 2005



576. *Typhloiulus staregai*
Strasser, 1973



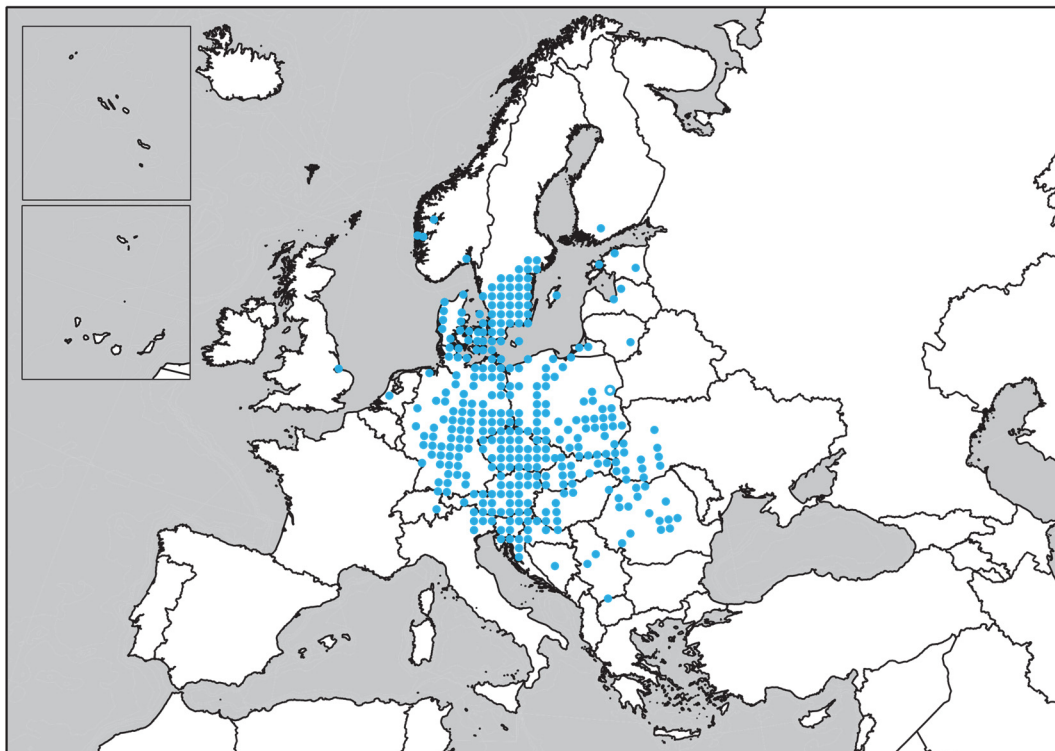
577. *Typhloiulus strictus*
(Latzel, 1882)



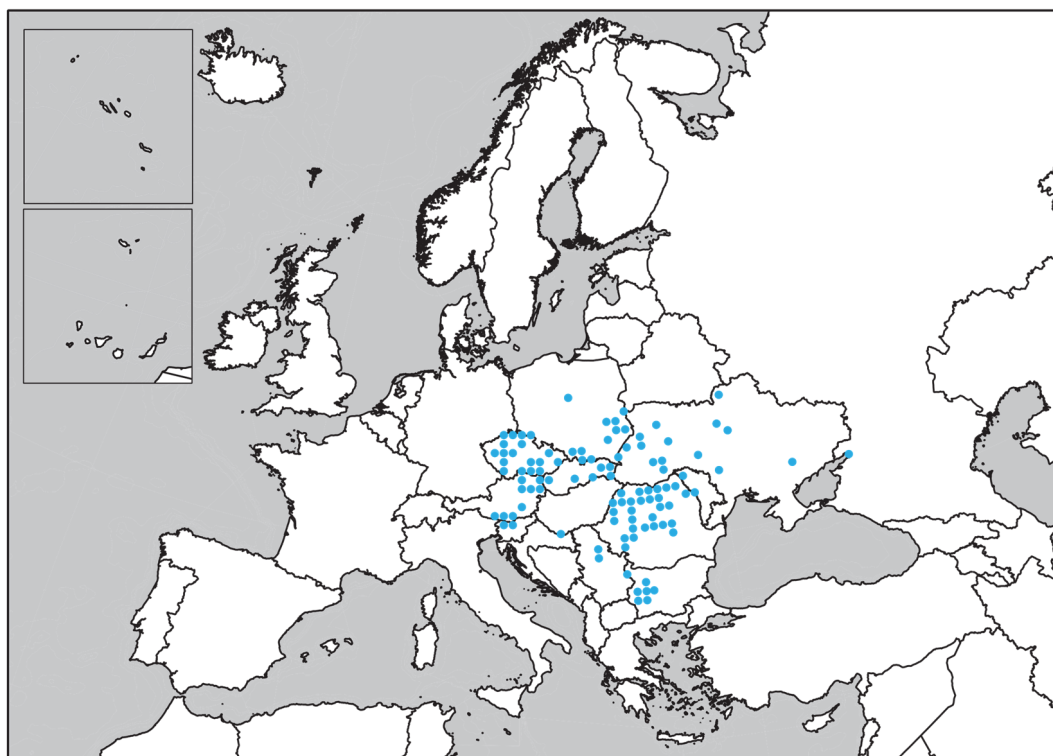
578. *Typhloiulus tobias*
(Berlese, 1886)



579. *Typhloiulus uncinifer*
Strasser, 1974



580. *Unciger foetidus* (C.L. Koch, 1938)



581. *Unciger transsilvanicus* (Verhoeff, 1899)



582. *Xestoiulus bjelasnicensis*
(Verhoeff, 1898)



583. *Xestoiulus carpathicus*
(Verhoeff, 1907)



584. *Xestoiulus dalmaticus*
Mršić, 1987



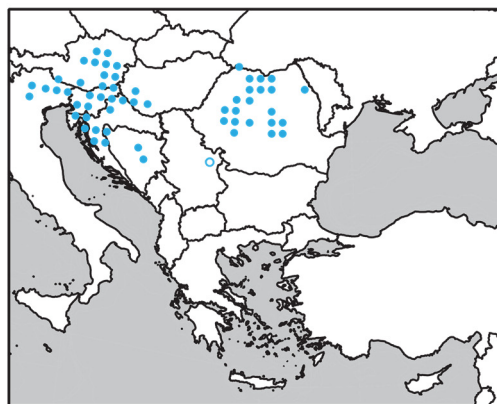
585. *Xestoiulus fimbriatus*
(Attems, 1904)



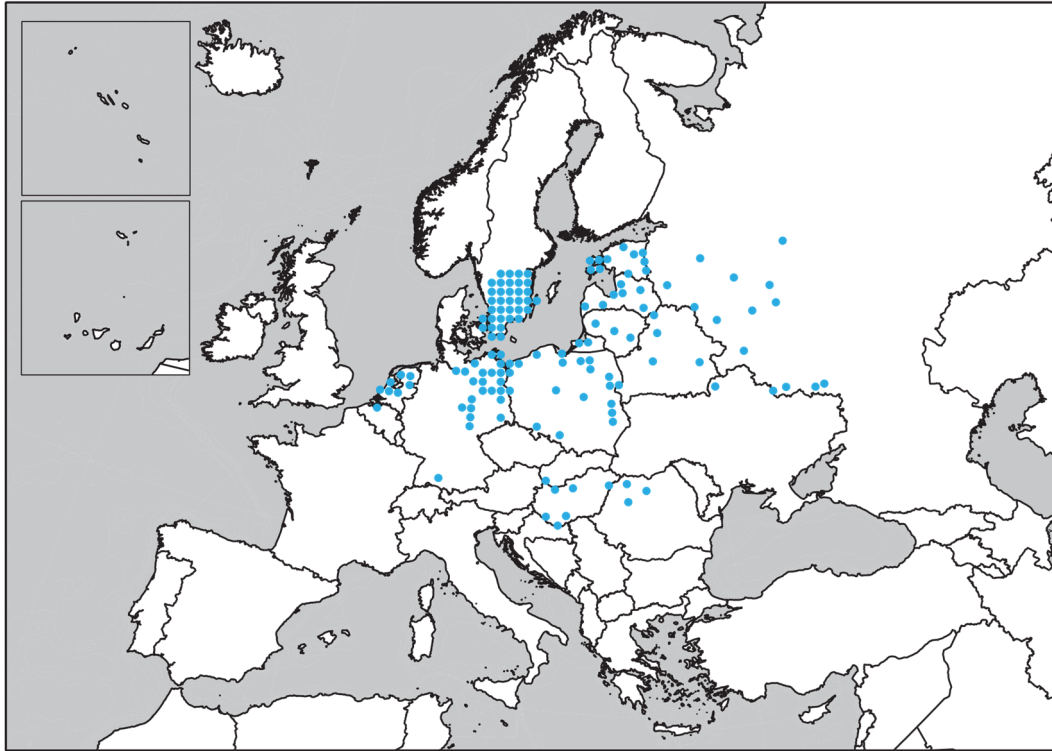
586. *Xestoiulus fontisherculus*
(Verhoeff, 1899)



587. *Xestoiulus graciliventris*
(Verhoeff, 1898)



588. *Xestoiulus imbecillus*
(Latzel, 1884)



589. *Xestoiulus laeticollis* (Porat, 1889)



590. *Xestoiulus luteus*
(Attems, 1951)



591. *Xestoiulus pirinicus*
(Gulička, 1967)



592. *Xestoiulus rebeli*
(Attems, 1904)



593. *Xestoiulus rucneri*
(Ceuca, 1990)