

FAUNISTIC RECORDS OF SLOVAK ORIBATIDS II. ORIBATID MITES (ACARINA) OF BUSOV MOUNTAINS, NORTH-EAST SLOVAKIA

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Abstract: Oribatid fauna of selected localities in Busov Mountains was studied. Altogether, 114 species of oribatid mites from 36 families were found in 11 qualitative samples from years 1988 and 1990. *Hydrozetes lemnae* (Coggi, 1899) is recorded for the first time from the territory of Slovakia. *Cultroribula confinis* Berlese, 1908 and *Oribatella brevipila* Bernini, 1977 known until now only from Pieniny are recorded for the second time from Slovakia.

Key words: faunistics, Busov Mountains, soil oribatid mites, new species for the fauna, East Slovakia.

INTRODUCTION

Busov Mountains is a small mountain unit in north-eastern Slovakia, belonging to the Nízke Beskydy (Low Beskid) Mountain range, part of Outer Eastern Carpathians. The mountains reach elevations up to 1002 m (Mt. Busov).

Territory of Busov Mountains was never researched for oribatid mites. However, some information is available from other parts of Slovak Eastern Carpathians. Few species are known from adjacent ranges, such as Ondavská vrchovina and Nízke Beskydy – Bukovské vrchy – Poloniny range, from unpublished work of KUNST (1968). Broader information about oribatids was published by MIKO (1987) from closely adjacent, western part of Nízke Beskydy. Comprehensive study is available also from not very remote area of Pieniny national park and from Jarabinský prielom natural reserve (MIKO 2011).

Present paper brings first information about oribatid fauna of Busov Mountains, based on few ad-hoc taken samples from highest parts of the range, complemented by samples from swampy areas and peat-bogs in the valleys (Cigel'ka, Regetovka).

MATERIAL AND METHODS

Qualitative samples were taken in years 1988 and 1990 in the sites and from habitats as indicated in overview below and indicated on Fig. 1. Samples were extracted in modified Berlese-Tullgren apparatus for one week. Extracted material was fixed in 75% alcohol, and for further study macerated in lactic acid. Part of determined material is kept in collection of the author, remaining material is stored in the collection of Faculty of Sciences of Pavel Josef Šafárik University in Košice (Ľ. Kováč). Large part of the material was however lost in the past moves. This did not allow re-determining the species which were originally determined only to genus level (*Phthiracarus* spp.). For taxonomy of species, the approach of WEIGMANN (2006) was followed with some minor adjustments.

List of analysed samples

- 1 Sample LM-124-90. Cigel'ka, litter and upper soil layer from mixed forest (*Fagus*, *Acer*, *Betula*). 21.6.1990, Ladislav Miko lgt.



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- 2 Sample LM-128-90. Cigel'ka, moist litter from mixed forest (*Fagus*, *Acer*, *Corylus*, *Betula*). 21.6.1990, Ladislav Miko lgt.
- 3 Sample LM-129-90. Cigel'ka, litter and upper soil layer from beech forest (*Fagus*) near the small water stream. 21.6.1990, Ladislav Miko lgt.
- 4 Sample LP-04-88. Busov (1002 m), north-west slope, beech forest with maple admixture (*Fagus*, *Acer*), mosses from rotting stumps. 4.9.1988, Ľubomír Panigaj lgt.
- 5 Sample LP-05-88. Busov (1002 m), north slope under the top, litter and soil from beech forest with maple admixture (*Fagus*, *Acer*). 4.9.1988, Ľubomír Panigaj lgt.
- 6 Sample LP-03-88. Stebnícka Magura (900 m), north slope, litter and soil from fir-beech forest (*Abies*, *Fagus*). 4.9.1988, Ľubomír Panigaj lgt.
- 7 Sample LP-01-88. Stebnícka Magura (900 m), top of the mountain, litter and soil from fir-beech forest (*Abies*, *Fagus*). 4.9.1988, Ľubomír Panigaj lgt.
- 8 Sample LM-303-88, LM-304-88, LM-125-90 and LM-126-90. Regetovka peat-bog. Wet *Sphagnum*, with other mosses, *Drosera*, *Carex* and *Juncus* in central part of peat bog. 20.8.1988 and 21.6.1990, Ladislav Miko lgt.
- 9 Sample LM-306-88 and LM-307-88. Regetovka peat-bog. Litter, mosses and upper soil layer from alder growth (*Alnus*) in upper part of peat bog. 20.8.1988, Ladislav Miko lgt.
- 10 Sample LM-305-88. Regetovka peat-bog. Eutrophic grassland at the southern margin of peat-bog with *Urtica* and *Rumex*, very wet. 20.8.1988, Ladislav Miko lgt.
- 11 Sample LM-308-88, LM-122-90 and LM-123-90. Regetovka peat-bog. Litter and upper soil layer from beech forest (*Fagus*) on the margin of peat-bog. 20.8.1988 and 21.6.1990, Ladislav Miko lgt.

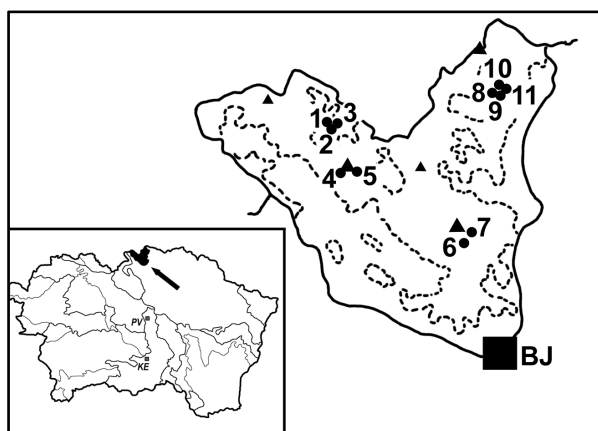


Figure 1. Schematic map of Busov Mountains (East Carpathians, Slovakia), with indication of sampling sites. Numbers of sampling sites correspond to those in Material and Methods. Dashed line indicates limits of forested areas, black triangles indicate highest peaks. BJ – town of Bardejov.

RESULTS

Altogether, 111 taxons of oribatid mites from 36 families were identified in Busov Mountains. As under *Phthiracarus* sp. there are at least 4 different species referred to, overall number of found species is 114. All of the species are first time recorded from this particular part of Slovakia, and one species – *Hydrozetes lemnae* (Coggi, 1899) was not yet recorded from Slovakia and represent new species for Slovak fauna. *Cultroribula confinis* Berlese, 1908) and *Oribatella brevipila* Bernini, 1977 are only known from Pieniny and the finding represents second record for Slovak fauna. The species found are in following list.

List of oribatid species found

For each species, the locality is given by number code corresponding with numbering in overview of samples above. Number of determined individuals is given for each sample in parentheses. This number does not necessarily corresponds to all individuals in sample, which may be higher than given (the numbers were counted only partly, as all samples were qualitative and not quantitative). Species first time recorded from territory of Slovakia is indicated by asterisk (*).

Brachychthoniidae

1. *Liochthonius muscorum* Forsslund, 1964 – 8 (4)
2. *Liochthonius sellnicki* (Thor, 1930) – 6 (1)

Hypochthoniidae

3. *Hypochthonius rufulus* C. L. Koch, 1835 – 8 (2)

Eulohmaniidae

4. *Eulohmannia ribagai* (Berlese, 1910) – 11 (1)

Phthiracaridae

5. *Phthiracarus globosus* (C. L. Koch, 1841) – 4 (1); 9 (2)
6. *Phthiracarus peristomaticus* Willmann, 1948 – 6 (1)
7. *Phthiracarus* spp. (4 species) – 4 (8); 5 (1); 7 (1); 11 (1)
8. *Steganacarus spinosus* (Sellnick, 1920) – 8 (2)

Euphthiracaridae

9. *Euphthiracarus monodactylus* (Willmann, 1919) – 2 (1)

Malaconothridae

10. *Malaconothrus monodactylus* (Michael, 1888) – 3 (1)
11. *Trimalaconothrus foveolatus* Willmann, 1931 – 8 (3)
12. *Trimalaconothrus maior* (Berlese, 1910) – 8 (13)

Nothridae

13. *Nothrus palustris* C. L. Koch, 1839 – 2 (1)
14. *Nothrus silvestris* Nicolet, 1855 – 11 (3)

Camisiidae

15. *Platynothrus* (s. str.) *peltifer* (C. L. Koch, 1839) – 4 (2); 5 (1); 9 (5); 10 (2)
16. *Platynothrus* (*Capillonothrus*) *thori* (Berlese, 1904) – 8 (1); 10 (1)

Nanhermanniidae

17. *Nanhermannia coronata* Berlese, 1913 – 8 (2)
18. *Nanhermannia nana* (Nicolet, 1855) – 11 (2)

Damaeidae

19. *Belba bartosi* Winkler, 1955 – 1 (4); 2 (1)
 20. *Belba corynopus* (Hermann, 1804) – 5 (1); 6 (2); 11 (1)
 21. *Damaeobelba minutissima* (Sellnick, 1920) – 4 (1)
 22. *Damaeus riparius* Nicolet, 1855 – 12 (2)
 23. *Metabelba papillipes* (Nicolet, 1855) – 11 (1)
 24. *Metabelba pulverosa* Strenzke, 1953 – 2 (4); 4 (1); 5 (15)

Ameridae

25. *Amerus polonicus* Kulczynski, 1902 – 2 (2)

Eremaeidae

26. *Eremaeus hepaticus* C. L. Koch, 1835 – 2 (3); 3 (10); 5 (10); 11 (1)

Zetorchestidae

27. *Zetorchestes falzonii* Coggi, 1898 – 2 (1)

Microzetidae

28. *Microzetes septentrionalis* (Kunst, 1963) – 11 (1)

Astegistidae

29. *Cultroribula confinis* Berlese, 1908 – 7 (1)
 30. *Cultroribula bicultrata* (Berlese, 1905) – 11 (1)

Peloppiidae

31. *Ceratoppia bipilis* (Hermann, 1804) – 2 (2); 3 (1); 4 (1)
 32. *Ceratoppia quadridentata* (Haller, 1882) – 1 (1); 4 (1); 11 (1)

Carabodidae

33. *Carabodes coriaceus* C. L. Koch, 1835 – 5 (2); 11 (1)
 34. *Carabodes femoralis* (Nicolet, 1855) – 4 (7)
 35. *Carabodes rugosior* Berlese, 1916 – 4 (5)

Tectocephidae

36. *Tectocephus minor* Berlese, 1903 – 6 (1); 7 (7)
 37. *Tectocephus velatus alatus* Berlese, 1913 – 7 (3)
 38. *Tectocephus velatus sarekensis* Trägårdh, 1910 – 1 (4); 3 (3); 9 (11); 10 (3)
 39. *Tectocephus velatus velatus* (Michael, 1880) – 1 (6); 2 (3); 11 (2)

Quadroppiidae

40. *Quadroppia maritalis* Lions, 1982 – 2 (2); 6 (1); 11 (1)
 41. *Quadroppia monstrosa* Hammer, 1979 – 5 (8)
 42. *Quadroppia quadricarinata* (Michael, 1885) – 4 (1); 11 (2)

Oppiidae

43. *Berniniella bicarinata* (Paoli, 1908) – 5 (4); 8 (1); 11 (1)
 44. *Berniniella conjuncta* (Strenzke, 1951) – 2 (1)
 45. *Berniniella hauseri* (Mahunka, 1974) – 9 (2)
 46. *Berniniella sigma* (Strenzke, 1951) – 4 (2); 11 (2)
 47. *Dissorhina ornata* (Oudemans, 1900) – 3 (4); 5 (1); 8 (1); 11 (1)
 48. *Microppia minus* (Paoli, 1908) – 2 (4)
 49. *Multioppia glabra* (Mihelčič, 1955) – 1 (2); 2 (6); 7 (1); 11 (4)
 50. *Oppiella* (s. str.) *marginodentata* (Strenzke, 1951) – 1 (2); 2 (7); 4(4); 5 (1); 11 (7)

51. *Oppiella* (s. str.) *nova* (Oudemans, 1902) – 1 (7); 2 (5)

52. *Oppiella* (s. str.) *uliginosa* (Willmann, 1919) – 8 (34); 9 (3)

53. *Oppiella* (s. str.) sp. – 4 (1)

54. *Oppiella* (*Rhinoppia*) *loksai* (Schalk, 1966) – 2 (2); 11 (3)

55. *Oppiella* (*Rhinoppia*) *nasuta* (Moritz, 1965) – 11 (1)

56. *Oppiella* (*Rhinoppia*) *subpectinata* (Oudemans, 1920) – 4 (14); 5 (4); 6 (1); 7 (1)

57. *Oppiella* (*Rhinoppia*) sp. – 11 (4)

Suctobelbidae

58. *Suctobelba altvateri* Moritz, 1970 – 11 (3)

59. *Suctobelba discrepans* Moritz, 1970 – 11 (1)

60. *Suctobelba granulata* van der Hammen, 1952 – 1 (2); 2 (1)

61. *Suctobelba lapidaria* Moritz, 1970 – 4 (5)

62. *Suctobelba reticulata* Moritz, 1970 – 4 (5); 11 (2)

63. *Suctobelba secta* Moritz, 1970 – 11 (1)

64. *Suctobelbata prelli* (Märkel et Meyer, 1958) – 4 (2); 11 (1)

65. *Suctobelbella acutidens* (Forsslund, 1941) – 1 (3); 2 (14); 4 (6); 5 (9); 6 (2); 7 (3); 11 (1)

66. *Suctobelbella arcana* Moritz, 1970 – 4 (8); 6 (2); 7 (1)

67. *Suctobelbella carcharodon* (Moritz, 1966) – 5 (2)

68. *Suctobelbella similis* (Forsslund, 1941) – 2 (1)

69. *Suctobelbella subcornigera* (Forsslund, 1941) – 1 (12); 2 (4); 5 (4); 11 (4)

Autognetidae

70. *Conchogneta dalecarlica* (Forsslund, 1947) – 1 (7); 2(1); 8 (1); 11 (3)

Thyrisomidae

71. *Oribella pectinata* (Michael, 1885) – 32 (1); 11 (1)

72. *Pantelozetes paolii* (Oudemans, 1913) – 11 (2)

Hydrozetidae

73. **Hydrozetes lemnae* (Coggi, 1899) – 9 (1)

Scutoverticidae

74. *Scutovertex minutus* (C. L. Koch, 1835) – 9 (2)

Phenopelopidae

75. *Eupelops occultus* (C. L. Koch, 1835) – 10 (1)

76. *Eupelops plicatus* (C. L. Koch, 1835) – 3 (3); 11 (1)

Achipteriidae

77. *Achipteria coleoptrata* (Linné, 1758) – 4 (11); 5 (4); 10 (1)

78. *Anachipteria deficiens* Grandjean, 1932 – 1 (2); 2 (27); 3 (1); 4 (61); 5 (1)

Oribatellidae

79. *Oribatella brevipila* Bernini, 1977 – 1 (4); 2 (3)

80. *Oribatella calcarata* (C. L. Koch, 1835) – 1 (1); 3 (1); 11 (2)

81. *Oribatella quadricornuta* Michael, 1880 – 9 (1)

82. *Oribatella dudichi* Willmann, 1938 – 4 (2); 5 (2); 11 (3)

Galumnidae

83. *Acrogalumna hungarica* (Willmann, 1938) – 8 (5)

84. *Acrogalumna longipluma* (Berlese, 1904) – 4 (3)

85. *Galumna obvia* (Berlese, 1915) – 10 (1); 11 (1)
 86. *Galumna* sp. – 5 (9)
 87. *Pergalumna altera* (Oudemans, 1915) – 2 (1)
 88. *Pergalumna formicaria* (Berlese, 1914) – 4 (3);
 6 (1)

Ceratozetidae

89. *Ceratozetes gracilis* (Michael, 1884) – 2 (1); 4 (17)
 90. *Ceratozetes peritus* Grandjean, 1951 – 7 (2); 11 (1)
 91. *Diapterobates humeralis* (Hermann, 1804) – 9 (1)
 92. *Melanozetes mollicomus* (C. L. Koch, 1839) – 3 (3);
 4 (14)
 93. *Sphaerozetes piriformis* (Nicolet, 1855) – 4 (17);
 9 (1)

Chamobatidae

94. *Chamobates borealis* (Trägårdh, 1902) – 3 (15);
 4 (24); 5 (95); 6 (1); 9 (1); 11 (1)
 95. *Chamobates cuspidatus* (Michael, 1884) – 3 (3);
 8 (2)
 96. *Chamobates spinosus* Sellnick, 1928 – 2 (1); 4 (2)
 97. *Chamobates voigtsi* (Oudemans, 1902) – 1 (12); 2
 (37); 3 (12); 6 (2); Rb; 11 (7)

Mycobatidae

98. *Minunthozetes pseudofusiger* (Schweizer, 1922)
 – 2 (1); 3 (1); 4 (65); 5 (38); 6 (9); 7 (2)
 99. *Minunthozetes semirufus* (C. L. Koch, 1841)
 – 8 (2); 9 (1)
 100. *Punctoribates punctum* (C. L. Koch, 1839) – 2 (4);
 4 (14); 5 (4)

Euzetidae

101. *Euzetes globulus* (Nicolet, 1855) – 1 (1); 10 (1)

Parakalummidae

102. *Neoribates aurantiacus* (Oudemans, 1914) – 11 (1)
 103. *Neoribates neglectus* Willmann, 1953 – 5 (4)

Scheloribatidae

104. *Scheloribates (Hemileius) initialis* (Berlese, 1908)
 – 5 (1)
 105. *Scheloribates* (s. str.) *fimbriatus* Thor, 1930 – 8 (2)
 106. *Scheloribates* (s. str.) *labyrinthicus* Jeleva, 1962
 – 10 (1)
 107. *Scheloribates* (s. str.) *laevigatus* (C. L. Koch, 1836)
 – 8 (6); 10 (5)

Oribatulidae

108. *Oribatula tibialis* (Nicolet, 1855) – 2 (11); 4 (1)
 109. *Oribatula pannonica* Willmann, 1949 – 10 (1)
 110. *Oribatula* sp. – 9 (1)
 111. *Zygoribatula exilis* (Nicolet, 1855) – 6 (1)

DISCUSSION

The finding of *Hydrozetes lemnae* (Coggi, 1899), recorded here for the first time from Slovak territory, is remarkable. The species is living in submerse vegetation in swamps and peat-bogs, and even in

the places of its presence may be rather abundant, it is found only locally. Species *Cultroribula confinis* Berlese, 1908 reported from Slovakia first time from Pieniny mountains (MIKO 2011), is known more from southern part of Europe, but was found in the Czech Republic as well (KUNST 1968). As the species seems to prefer xerotherm habitats, its finding in fir-beech forest located at higher elevation of Busov was not expected. On the other hand, it may not be preferring necessarily warm climate, but rather dry and well insulated patches in the free landscape, which are present also in this part of Slovakia. Also *Oribatella brevipila* Bernini, 1977 was first time found in Pieniny mountains (MIKO 2011). However, this species may be expected in Slovakia from more places as it is assumed that it was earlier not distinguished from similar species, particularly it could have been misidentified as *Oribatella quadricornuta* Michael, 1880.

High representation of species from superfamily Oppioidea is known from all parts of Slovak Eastern Carpathians, and is most probably linked to still rather broad presence of well-preserved beech forests in the region. Particularly interesting is finding of high number of closely related species of the genus *Suctobelba* (6 species).

As overall number of ad-hoc taken samples was quite low, presence of 114 species indicates a species-rich oribatid community and potentially high conservation value of studied habitats.

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