

Fauna, Distribution, Habitat Preference and Abundance of Harvestmen (Opiliones) in Latvia

VOLDEMĀRS SPUNĢIS

Department of Zoology and Animal Ecology, Faculty of Biology, University of Latvia, 4 Kronvalda Blvd., LV-1586, Rīga, Latvia; e-mail: adalia@lanet.lv

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Abstract: In total, 16 species harvestmen species are known in Latvia, of them *O. saxatilis* is new to the fauna of Latvia. Distribution, habitat preference and abundance data of species are presented.

Keywords: Opiliones, fauna, habitat preference, abundance, Latvia.

Introduction

Harvestmen are common and abundant chelicerates in Latvia. As predators they are significant in natural ecosystems. Opiliones are frequent in samples collected by use of pitfall traps, sweep net, yellow traps or soil samples. These animals are insufficiently studied in Latvia and there is a need to update faunal and ecological data.

J.B.Fischer (1778) and E.A.Grube (1859) reported fragmentary data on species. V.Tumšs developed diploma theses in 1938 (handwritten manuscript) and many years later published the same data supplemented with few new data (Tumšs 1963). Zoological museum of the University of Latvia is a probable location of his collection. B.P.Chevrizov (1978, 1979a, 1979b) used data published by V.Tumšs. Up to now 15 Opiliones species are known in Latvia.

Methods

Harvestmen were collected mainly in 2003-2007 by the author. Other collectors are mentioned in the text. The main method was collecting of visible individuals. Individuals were collected also by entomological sweep net. Rather extensive material was obtained by use of pitfall traps used for collecting epigeic invertebrates. Diameter of traps was 7.5 cm, traps were arranged on transect in the habitat. 10 or 30 traps were exposed per habitat; the exposure period varied for different sets of

traps. Trapping data were used to calculate abundance (ind./trapmonth). Collection of plant litter and sieving through beetle sieve, with the following sorting of samples in laboratory was also used for collecting harvestmen. Harvestmen were collected during the whole vegetation season in the whole territory of Latvia.

To estimate habitat preference and relative abundance the faunal data were analysed taking into consideration presence of species in particular habitats and number of collected individuals. In all cases the number of collected specimens depended on sampling effort and obtained data cannot be used for deeper ecological analysis. The relative occurrence of harvestmen in the particular habitat type was expressed in three classes: 1 – rare (single individuals in one or few localities); 2 – common (several individuals in few to many localities); 3 – very common (numerous individuals in numerous localities).

Individuals were preserved in 80% ethyl alcohol and identified by use of keys (Martens 1978, Chevrizov 1979a). A collection of investigated harvestmen is deposited in the Department of Zoology and Animal Ecology, Faculty of Biology, University of Latvia.

Abbreviations used in the text: R. – references; M. – collected material; Distr. – administrative district; ind. – individuals; n – numerous individuals. The species are ordered by families in accordance with taxonomy (Martens 1978). The records are ordered by administrative districts of Latvia (all underlined) and

localities alphabetically, sampling dates – chronologically. Then follows method (optionally), number of collected individuals, habitat data and collector's name (if not collected by the author).

Results

Trogulidae SUNDEVALL, 1833

Trogulus tricarinatus (LINNAEUS, 1758)

R. Tumšs 1938, 1963, Eglītis 1954, Chevrizov 1979a.

M. Aizkraukle Distr.: Pērse river valley, 08.10.2005, 1 ind., calcareous deciduous forest; Stukmaņi, 08.10.2005, 4 ind., young deciduous forest. Tukums Distr.: Antiņciems, 12.10.2005, 1 ind., calcareous deciduous forest.

Nemastomatidae SIMON, 1872

Nemastoma lugubre (O.F.MÜLLER, 1776)

R. Grube 1859 (*Phalangium bimaculatum* FABR.), Eglītis 1954, Tumšs 1938, 1963.

M. Aizkraukle Distr.: Aizkraukle bog, Liepu island, 21.10.2006, 2 ind., calcareous broadleaved forest, leg. K.Vilks; Ērberģe, 15.10.2006, 1 ind., deciduous forest; Krasti, 15.10.2006, 3 ind., deciduous forest; Nereta-Aizkraukle crossroad, 15.10.2006, 1 ind., wet poplar forest; Pērse river valley, 08.10.2005, 3 ind., elm forest, 8 ind., wet calcareous broadleaved forest; Skrīveri arboretum, 09.10.2005, 2 ind., rotten oak leaves; Stukmaņi, 08.10.2005, 2 ind., young deciduous forest on dolomites. Alūksne Distr.: Vireši, Randatu cliffs, 17.08.2006, 15 ind., calcareous broadleaved forest. Bauska Distr.: Jumprava, 09.11.2005, 7 ind., calcareous broadleaved forest; Pilsrundāle, 09.11.2005, 7 ind., ash forest. Cēsis Distr.: Inesis lake islands and coast, Akmens island, 25.08-05.09.2003, pitfall traps, 5 ind., deciduous forest, Bābas island, pitfall traps, 14 ind., deciduous forest, Inesieši peninsula, pitfall traps, 5 ind., deciduous forest, Mīlestības island, pitfall traps, 3 ind., deciduous forest, Siena island, pitfall traps, 1 ind., deciduous forest, Žīdītes island, pitfall traps, 4 ind., deciduous forest, leg. L.Irša; Kazu ravine, 29.10.2005, 1 ind., mixed forest; Lodesmuiža, 03-08.07.2004, pitfall traps, 5 ind., small-leaved forest, leg. L.Irša, D.Vainauska, E.Dzenis, 2 ind., spruce forest, leg. R.Matisons, Ž.Osmāne, A.Vaiders, 01-06.07.2006, pitfall traps, 5 ind.,

birch-white alder forest, leg. Žagare, M.Grunskis, L.Sabule, 3 ind., birch-white alder forest edge, leg. Ie.Kalnciema, N.Stasjukeviča, I.Puzarele. Daugavpils Distr.: Balta river valley, 08.10.2005, 3 ind., white alder floodplain forest; Medumi, 15.10.2006, 6 ind., deciduous forest; Pilskalnes Siguldiņa, 15.10.2005, 2 ind., deciduous forest. Jēkabpils Distr.: Laukezers, 16.12.2006, 1 ind., black alder forest; Sauka, 15.10.2005, 6 ind., deciduous forest. Jelgava Distr.: Vilce river valley, 01-28.05.2006, pitfall traps, 1 ind., deciduous floodplain forest. Krāslava Distr.: Ezernieki, Pahatnieki oak forest, 09.10.2005, 4 ind., broadleaved forest. Kuldīga Distr.: Īvande, 22.10.2006, 1 ind., deciduous forest; Kuldīga, Venta river valley, 22.10.2006, 5 ind., deciduous forest; Rudbārži, 16.10.2005, 8 ind., deciduous forest; Šķervelis river valley, 09.08.2006, 7 ind., deciduous floodplain forest. Liepāja Distr.: Lišķi, 16.10.2005, 11 ind., ash-oak forest; Rucava, 16.10.2005, 2 ind., black alder forest, 13 ind., spruce-deciduous forest, 22.10.2006, 7 ind., pine-oak forest, 28.10.2006, 2 ind., wet calcareous birch forest; Rucava, Līgupīte river valley, 16.10.2005, 10 ind., deciduous floodplain forest; Rucava, Sventāja river valley, 16.10.2005, 6 ind., white alder floodplain forest. Limbaži Distr.: Randa meadows, 18-25.08.2006, pitfall traps, 5 ind., wet coastal meadow, leg. K.Vilks, 07.10.2006, 4 ind., black alder forest; Vitrupe river valley, 07.10.2006, 2 ind., deciduous floodplain forest. Preiļi Distr.: Jāņupe river valley, 09.10.2005, 1 ind., white alder floodplain forest. Rīga: Botanical garden of University of Latvia, 15-29.11.2004, pitfall traps, 1 ind., greenhouse. Rīga Distr.: Ķekava, 26.05.2005, 2 ind., white alder forest; Ķemerī, 12.10.2005, 3 ind., black alder floodplain forest; Salaspils, 10.10.2005, 8 ind., deciduous forest. Saldus Distr.: Ciecere river valley, 22.10.2005, 1 ind., deciduous forest. Talsi Distr.: Dundaga, 28.10.2006, 5 ind., deciduous park; Saunags, 11-18.07.2004, pitfall traps, 2 ind., black alder forest; Slītere, 11-18.07.2004, pitfall traps, 7 ind., broadleaved forest, 3 ind., wet spruce forest. Tukums Distr.: Antiņciems, 19.09.2003, 1 ind., calcareous fen, 12.10.2005, 8 ind., calcareous deciduous forest, 8 ind., calcareous fen; Čužu fen, 21.05-18.06.2003, pitfall traps, 7 ind., calcareous fen with *Potentilla fruticosa*;

Engure, 16.05-13.06.2003, pitfall traps, 1 ind., calcareous fen; Kandava, 16.10.2005, 1 ind., calcareous broadleaved forest; Lestene, Priedulāji, 11-23.09.2007, pitfall traps, 2 ind., burned mesophytous meadow, 5 ind., mesophytous meadow, leg. L.Jukāme; Pļieņciems dune, 12.10.2005, 8 ind., pine forest; Slampe, 28.10.2006; 9 ind., deciduous forest. Valka Distr.: Rauza river valley, 13-17.08.2006, pitfall traps, 4 ind., mixed forest, Leg. G.Akmentiņš; Šepka river valley, 13-17.08.2006, pitfall traps, 6 ind., birch-spruce forest, Leg. G.Akmentiņš. Valmiera Distr.: Mellupīte river mouth, 29.10.2005, 6 ind., broadleaved forest. Ventspils Distr.: Jūrkalne, 22.10.2006, 2 ind., pine forest; Jūrkalne, Muižupīte river valley, 22.10.2006, 1 ind., deciduous forest; Rīva river mouth, 28.10.2006, 7 ind., deciduous forest.

***Mitostoma chrysomelas* (HERMANN, 1804)**

R. Tumšs 1938 (*Nemastoma*), 1963, Chevrizov 1979a.

M. Aizkraukle Distr.: Pērse river valley, 08.10.2005, 1 ind., elm forest. Tukums Distr.: Pļieņciems dune, 12.10.2005, 2 ind., calcareous pine forest; Lestene, Priedulāji, 11-23.09.2007, pitfall traps, 1 ind., burned mesophytous meadow, leg. L.Jukāme.

Phalangiidae SUNDEVALL 1833

***Phalangium opilio* LINNAEUS, 1758**

R. Fischer 1778, Tumšs 1938: 14, 1963: 56.

M. Alūksne Distr.: Virgulīca, 11.06.2004, 1 ind., deciduous floodplain forest. Cēsis Distr.: Taurene, Apšu graveyard, 07.07.2007, 3 ind., on building. Jēkabpils Distr.: Gārsene, 15.10.2006, 2 ind., deciduous park. Jelgava Distr.: Glūda, 27.06-24.07.2004, yellow traps, n ind., cultivated meadow. Kuldīga Distr.: Diļļu meadows, 27.06-19.07.2003, yellow traps, n ind., calcareous wet meadow. Liepāja Distr.: Grobiņa, 18.10.2003, 2 ind., on building; Pape, 15.05-13.06.2002, pitfall traps, 2 ind., grey dune, 02.10.2004, 1 ind., grey dune; Vītiņi meadows, 27.06-19.07.2003, yellow traps, n (30) ind., calcareous wet meadow, 25.06-24.07.2005, pitfall traps, n (60) ind., calcareous wet meadow; Ziemeupe, 21.09.2003, 1 ind., grey dune, Ziemeupe, 28.08.2004, 1 ind., grey dune, 10-24.08.2005, pitfall traps, 34 ind., grey dune.

Limbaži Distr.: Kuiviži, 14.08.2006, netting, 10 ind., coastal meadow, 25.07.2006, netting, 18 ind., coastal meadow, leg. A.Karpa, 18-25.08.2006, pitfall traps, 49 ind., dry coastal meadow, 110 ind., dry pasture, 32 ind., wet coastal meadow, 35 ind., wet pasture, leg. K.Vilks. Madona Distr.: Barkava, 26.06-24.07.2004, yellow traps, n (10) ind., old-field; Lautere, 12.08.2006, 1 ind. on grass. Rīga: Bierīņi, Mārupīte river coast, 01.07.2004, 2 ind., on tree trunk; Dārziņi, 09.10.2004, 1 ind., garden, 15.10.2004, 1 ind., garden, 02.10.2005, 1 ind., garden; Kronvalda park, on buildings, 16.08.2003, 7 ind., 16.08.2004, 1 ind., 07.09.2004, 2 ind., 13.09.2004, 1 ind., 12.09.2004, 5 ind., 05.10.2004, 3 ind., 03.11.2004, 11 ind., 08.11.2004, 2 ind., 13.11.2004, 3 ind., 08.07.2005, 2 ind., 3.08.2005, 1 ind., 18.08.2005, 1 ind., 03.10.2005, 1 ind., 16.09.2005, 1 ind.; Ķengarags, 29.08.2004, 1 ind., on building; Mangaļsala 16.05.2003, 8 ind., pine forest. Rīga Distr.: Baldone, 27.08.2004, 1 ind., deciduous park; Cenas bog, 31.07.2005, 2 ind., pine forest. Talsi Distr.: Kolka, 23.07.2003, 1 ind., dry meadow, 04.08.2003, 4 ind., foredune, 11-18.07.2004, pitfall traps, 3 ind., dune meadow; 1 ind., foredune, 13.07.2004, 1 ind., foredune, 16.07.2004, 7 ind., wet meadow, 18.07.2004, 2 ind., wet meadow, 25.07.2005, 2 ind., on pine trunk, 02.09.2006, 4 ind., foredune; Pēterezers lake, 11-18.07.2005, pitfall traps, 1 ind., raised bog; Stikli, 29.06.2005, 1 ind., dry meadow. Tukums Distr.: Bērziems, 19.07.2005, 9 ind., dry meadow, 21.07.2005, 6 ind., dry meadow; Engure, 18.07.2006, netting, 1 ind., calcareous mesophytic meadow, 5 ind., pine forest, 1 ind., wet birch forest, 1 ind., wet meadow, leg. K.Vilks, 01.09.2006, 3 ind., foredune, 09.08.2006, netting, 1 ind., coastal meadow, 3 ind., dry meadow, 1 ind., pine forest, leg. K.Vilks; Lapmežciems, 10.08.2004, 16 ind., dry meadow; Lestene, Priedulāji, 11-23.09.2007, pitfall traps, 25 ind., burned mesophytous meadow, 9 ind., mesophytous meadow, leg. L.Jukāme; Pļieņciems dune, 10.07.2003, 1 ind., pine forest, 10.07.2005, 2 ind., pine forest. Valka Distr.: Palsmane, Paltnīca meadows, 17.08.2006, 3 ind., on grass, leg. M.Kalniņš; Strenči, 05.08.2006, 1 ind., on grass, 17.08.2006, 1 ind., on grass. Valmiera Distr.:

Kauguri, 12.07.2007, 3 ind., on building; Mazsalaca, 04.08.2006, ind., 2 ind., on grass. Ventspils Distr.: Užava, 02.10.2004, 1 ind., pine forest.

***Opilio parietinus* (DEGEER, 1778)**

R. Grube 1859 (*O. parietinus* HERBST), Eglītis 1954, Tumšs 1938, 1963.

M. Daugavpils Distr.: Nīcgale, 11.10.2003, 3 ind., on building. Jēkabpils Distr.:

Trepe, 08.10.2005, 2 ind., on building. Liepāja Distr.: Grobiņa, 18.10.2003, 1 ind., on building; Ziemepe, 12.09.2004, 1 ind., grey dune. Ogre Distr.: Lobes krogs, 08.10.2006, 2 ind., on building. Preiļi Distr.: Preiļi castle 09.10.2005, 4 ind., on building. Rīga: Kronvalda park, on buildings, 01.08.2004, 1 ind., 31.08.2004, 2 ind., 12.09.2004, 1 ind., 13.09.2004, 1 ind., 11.10.2004, 1 ind., 27.10.2004, 3 ind., 08.11.2004, 4 ind., 08.07.2005, 1 ind., 18.08.2005, 1 ind., 05.11.2005, 1 ind., 11.11.2005, 1 ind. Rīga Distr.: Zvejniekciems, 26.07.2006, 1 ind., on grass, leg. A.Karpa. Saldus Distr.: Ciecere river valley, 22.10.2005, 1 ind., on wooden building. Valmiera Distr.: Kauguri, 08.08.2004, 2 ind., garden, 12.07.2007, 1 ind., garden.

***Opilio dinaricus* SILHAVY, 1938**

R. Chevrizov 1979a.

M. Aizkraukle Distr.: Ērberģe, 15.10.2006, 1 ind., rotten birch wood. Cēsis Distr.: Lodesmuiža, 01-06.07.2006, pitfall traps, 192 ind., birch-white alder forest, leg. I.Žagare, M.Grunskis, L.Sabule, 181 ind., birch-white alder forest edge, leg. Ie.Kalnciema, N.Stasjukeviča, I.Puzarele; Taurene, Apšu graveyard, 07.07.2007, 1 ind., on building. Kuldīga Distr.: Diļļu meadows, 27.06-24.07.2004, pitfall traps, 14 ind., calcareous wet meadow; Šķervelis river valley, 10.08.2006, 2 ind., on grass. Liepāja Distr.: Vītiņi meadows, 27.06-19.07.2004, pitfall traps, 21 ind., calcareous wet meadow; Ziemepe, 10-24.08.2005, pitfall traps, 1 ind., grey dune. Limbaži Distr.: Kuiviži, 25.07.2006, 1 ind., coastal meadow. Rīga Distr.: Kauguri, 10.1.2006, 1 ind., on building; Kemeru NP, at Kauguru channel, 09.08.2006, 1 ind., on tree trunk; Lielie Kangari, 18.06.2006, 1 ind., rotten poplar wood. Tukums Distr.: Engure,

09.08.2006, 1 ind., coastal meadow. Valmiera Distr.: Kauguri, 12.07.2007, 1 ind., on building. Ventspils Distr.: Jūrkalne, Muižupīte river valley, 22.10.2006, 1 ind., deciduous floodplain forest.

***Opilio saxatilis* C.L.KOCH, 1839**

M. Liepāja Distr.: Ziemepe, 10-24.08.2005, pitfall traps, 1 ind., grey dune, 18.09.2005, 1 ind., pine forest on dunes. Rīga: Citadeles str., 11.10.2006, 1 ind., on building.

***Rilaena triangularis* (HERBST, 1799)**

R. Grube 1859 (*Opilio corniger* HERM.), Eglītis 1954 (*Platybunus*), Tumšs 1938 (*Platybunus*), 1963 (*Platybunus*).

M. Aizkraukle Distr.: Krasti, 15.10.2006, 2 ind., deciduous park; Nereta-Aizkraukle crossroad, 15.10.2006, 1 ind., wet poplar forest; Pērse river valley, 08.10.2005, 4 ind., deciduous forest, 1 ind., elm forest; Stukmaņi, 08.10.2005, 7 ind., young deciduous forest on dolomites. Alūksne Distr.: Korneti-Peļli, 16.06.2003, 1 ind., mixed forest. Bauska Distr.: Pilsrundāle, 09.11.2005, 1 ind., deciduous forest. Cēsis Distr.: Dāvida springs, 24.03.2007, 1 ind., deciduous forest; Inesis lake coast, 29.05-26.06.2004, pitfall traps, n (1) ind., spruce forest, leg. L.Irša; Kazu ravine, 29.10.2005, 1 ind., dolomite karsts funnels; Lodesmuiža, 03-08.07.2004, pitfall traps, 1 ind., mesophytous meadow, leg. R.Gajevska, 2 ind., small-leaved forest, 1 ind., wet meadow, leg. Ie.Lībeka, 05.07.2005, 1 ind., pine forest, 01-06.07.2006, pitfall traps, 4 ind., birch-white alder forest edge, leg. Ie.Kalnciema, N.Stasjukeviča, I.Puzarele, 2 ind., birch-white alder forest, leg. I.Žagare, M.Grunskis, L.Sabule; Sudas bog, 05.06-05.07.2002, pitfall traps, 2 ind., pine bog forest; Ungurmuiža, 24.03.2007, 1 ind., rotten oak wood. Daugavpils Distr.: Balta river valley, 08.10.2005, 3 ind., white alder floodplain forest; Medumi, 15.10.2006, 2 ind., deciduous forest; Pilskalnes Siguldiņa, 15.10.2005, 3 ind., deciduous forest. Jēkabpils Distr.: Laukezers, 16.12.2006, 1 ind., black alder forest; Sauka lake coast, 15.10.2005, 4 ind., deciduous forest; Trepe, 08.10.2005, 1 ind., young small-leaved forest. Krāslava Distr.: Ezernieki, Pahatnieki oak forest, 09.10.2005, 3 ind., broadleaved forest. Kuldīga Distr.: Diļļu meadows, 27.06-19.07.2003, pitfall traps, 7 ind.,

calcareous wet meadow, 27.06-24.07.2004, pitfall traps, 8 ind., calcareous wet meadow; Īvande, 22.10.2006, 1 ind., deciduous forest; Kuldīga, Venta river valley, 22.10.2006, 1 ind., deciduous forest. Liepāja Distr.: Lišķi, 16.10.2005, 7 ind., broadleaved forest; Rucava, 16.10.2005, 1 ind., black alder forest, 2 ind., wet deciduous-spruce forest; Rucava, Līgupīte river valley, 16.10.2005, 3 ind., deciduous forest; Vītiņi meadows, 27.06-19.07.2003, pitfall traps, 2 ind., calcareous wet meadows, 27.06-24.07.2004, pitfall traps, 1 ind., calcareous wet meadows, 25.06-24.07.2005, pitfall traps, 1 ind., calcareous wet meadows. Limbaži Distr.: Randa meadows, 07.10.2006, 1 ind., black alder forest; Vitrupe river valley, 07.10.2006, 2 ind., deciduous forest. Madona Distr.: Barkava, 26.06-24.07.2004, yellow traps, 2 ind., old-field; Teiči bog, 22.07.1999, 1 ind., raised bog. Preiļi Distr.: Jāņupe river valley, 09.10.2005, 4 ind., white alder floodplain forest; Livāni, 15.05.2004, yellow traps, 12 ind., mesophytous meadow, leg. G.Malceniece. Rīga: Krēmeri, 29.04-21.05.2006, pitfall traps, 1 ind., small-leaved forest. Rīga Distr.: Cenas bog, 21.05-18.06.2005, pitfall traps, 1 ind., raised bog; Galkalne, 17.06.2007, 1 ind., wet meadow; Kaņieris lake coast, 12.10.2005, 2 ind., calcareous fen; Ķemeri, 12.10.2005, 1 ind., black alder forest; Lielie Kangari, 30.04.2006, 1 ind., mixed forest, 30.04-27.05.2006, pitfall traps, 56 ind., mixed forest; Priedaine, 19.05.2007, 1 ind., black alder forest; Salaspils, 10.10.2005, 5 ind., deciduous forest, 27.09.2006, 2 ind., deciduous forest, 2 ind., wet pine forest; Sudas bog, 18.05-14.06.2003, pitfall traps, 1 ind., raised bog; Tumšupe river valley, 27.05.2005, 4 ind., white alder forest. Saldus Distr.: Zvārde, Ķērklīņi church, 13.05.2006, 1 ind., deciduous park; Zvārde church, 13.05.2006, 1 ind., white alder forest. Talsi Distr.: Dundaga, 28.10.2006, 3 ind., deciduous park. Tukums Distr.: Čužu fen, 21.05-18.06.2003, pitfall traps, 5 ind., calcareous fen with *Potentilla fruticosa*; Engure, 19.06.2006, netting, 1 ind., calcareous fen with *Mirica gale*, 2 ind., dry meadow, 1 ind., pine forest, 1 ind., dry meadow, leg. K.Vilks; Kandava, 01.05.2003, 1 ind., rotten deciduous wood, 16.10.2005, 3 ind., deciduous forest. Ķemeri bog, 16.05-13.06.2003, pitfall traps, 11 ind.,

pine bog forest; Lamiņi, 12.06.2005, 1 ind., deciduous park; Lestene, Priedulāji, 11-23.09.2007, pitfall traps, 1 ind., burned mesophytous meadow, 1 ind., mesophytous meadow, leg. L.Jukāme; Slampe, 28.10.2006, 1 ind., deciduous forest. Ventspils Distr.: Jūrkalne, Muižupīte river valley, 22.10.2006, 5 ind., deciduous forest; Klāņu bog, 21.05-18.06.2005, pitfall traps, 4 ind., raised bog; Rīva river mouth, 28.10.2006, 1 ind., deciduous forest; Vasenieku bog, 21.05-18.06.2005, pitfall traps, 12 ind., raised bog.

***Lophopilio palpinalis* (HERBST, 1799)**

R. Tumšs 1963 (*Odiellus*), Chevrizov 1979a.

M. Aizkraukle Distr.: Nereta-Aizkraukle crossroad, 15.10.2006, 1 ind., wet poplar forest; Pērse river valley, 08.10.2005, 2 ind., elm forest; Skrīveri arboretum, 09.10.2005, 1 ind., oak forest. Alūksne Distr.: Vireši, Randatu cliffs, 17.08.2006, 2 ind., deciduous forest. Cēsis Distr.: Inesis lake, 25.08-05.09.2003, pitfall traps, deciduous forests, on Akmens island, 82 ind., on Bābas island, 18 ind., on Inesieši peninsula, 4 ind., on Inesis peninsula, 14 ind., on Mīlestības island, 16 ind., on Siena island, 27 ind., on Židītes island, 8 ind., leg. L.Irša. Daugavpils Distr.: Medumi, 15.10.2006, 1 ind., deciduous forest; Pilskalnes Siguldiņa, 15.10.2005, 2 ind., deciduous forest. Jēkabpils Distr.: Sauka lake coast, 15.10.2006, 1 ind., deciduous forest. Kuldīga Distr.: Rudbārži, 16.10.2005, 1 ind., deciduous forest. Liepāja Distr.: Rucava, 16.10.2005, 4 ind., wet deciduous-spruce forest; Rucava, Līgupīte river valley, 16.10.2005, 4 ind., deciduous floodplain forest. Saldus Distr.: Saldus, Ciecere river valley, 22.10.2005, 1 ind., deciduous forest. Tukums Distr.: Lestene, Priedulāji, 11-23.09.2007, pitfall traps, 3 ind., burned mesophytous meadow, 3 ind., mesophytous meadow, leg. L.Jukāme. Valka Distr.: Rauza river valley, 13-17.08.2006, pitfall traps, 131 ind., mixed forest, leg. G.Akmentiņš; Šepka river valley, 13-17.08.2006, pitfall traps, 3 ind., birch-spruce forest, leg. G.Akmentiņš.

***Oligolophus tridens* (C.L.KOCH, 1836)**

R.: Tumšs 1938: 14, 1963: 55.

M. Aizkraukle Distr.: Pērse river valley, 08.10.2005, 4 ind., elm forest, 3 ind., wet

calcareous broadleaved forest; Skrīveri arboretum, 09.10.2005, 1 ind., rotten oak leaves; Stukmaņi, 08.10.2005, 5 ind., young deciduous forest on dolomites. Alūksne Distr.: Vireši, Randatu cliffs, 17.08.2006, 1 ind., on grass. Bauska Distr.: Pilsrundāle, 09.11.2005, 3 ind., ash forest. Cēsis Distr.: Kazu ravine, 29.10.2005, 1 ind., mixed forest. Daugavpils Distr.: Medumi, 15.10.2006, 1 ind., deciduous forest; Pilskalnes Siguldiņa, 15.10.2005, 1 ind., rotten deciduous wood. Dobeles Distr.: Annenieki, 16.08.2007, 1 ind., deciduous park. Jēkabpils Distr.: Gārsene, 15.10.2006, 1 ind., rotten deciduous wood. Krāslava Distr.: Ezernieki, Pahatnieki oak forest, 09.10.2005, 1 ind., broadleaved forest. Kuldīga Distr.: Alsunga, 22.10.2006, 1 ind., pine-oak forest. Liepāja Distr.: Lišķi, 16.10.2005, 1 ind., ash-oak forest; Luknas, 18.10.2003, 1 ind., deciduous forest; Pērkone, 21.09.2003, 2 ind., deciduous trees in dune slack; Rucava, 16.10.2005, 1 ind., black alder forest, 1 ind., spruce-deciduous forest; Rucava, Sventāja river valley, 16.10.2005, 5 ind., white alder floodplain forest. Limbaži Distr.: Randa meadows, 07.10.2006, 1 ind., black alder forest; Vitrupe river valley, 07.10.2006, 2 ind., deciduous forest. Madona Distr.: Gaiziņkalns, 12.10.2003, 1 ind., mixed forest. Ogre Distr.: Vērgale, 12.10.2003, 1 ind., deciduous park. Preiļi Distr.: Jāņupe river valley, 09.10.2005, 1 ind., white alder floodplain forest. Rīga: Bierīņi, Mārupīte river coast, 01.07.2004, 1 ind., rotten black alder wood; Dārziņi, 05.10.2003, 1 ind., garden, 15.10.2004, 10 ind., garden; Nordeķi, 24.09.2005, 1 ind., deciduous park, 08.10.2005, 6 ind., deciduous park. Rīga Distr.: Babīte, 05.06.2003, 4 ind., pine forest; Beberbeķi, 04.10.2003, 1 ind., black alder forest; Doles sala, 20.08.2007, 1 ind., calcareous deciduous forest; Krimulda park, 09.08.2007, 3 ind., deciduous park; Salaspils, 07.10.2004, 3 ind., deciduous forest, 21.09.2005, 7 ind., deciduous forest, 10.10.2005, 8 ind., deciduous forest. Saldus Distr.: Saldus, Ciecere river valley, 22.10.2005, 3 ind., deciduous forest. Talsi Distr.: Dundaga, 28.10.2006, 1 ind., deciduous forest; Kolka, 28.08.2005, 3 ind., on tree trunk. Tukums Distr.: Antiņciems, 12.10.2005, 2 ind., calcareous deciduous forest, 5 ind., calcareous fen; Bērzciems, 09.09.2006, 1 ind., calcareous

pine forest; Kandava, 16.10.2005, 1 ind., calcareous broadleaved forest; Lestene, Priedulāji, 11-23.09.2007, pitfall traps, 59 ind., burned mesophytous meadow, 101 ind., mesophytous meadow, leg. L.Jukāme. Valka Distr.: Laukkalne, 13-17.08.2006, pitfall traps, 22 ind., elm forest, leg. G.Akmentiņš; Rauza river valley, 13-17.08.2006, pitfall traps, 20 ind., mixed forest, leg. G.Akmentiņš; Šepka river valley, 13-17.08.2006, pitfall traps, 560 ind., birch-spruce forest, leg. G.Akmentiņš. Ventspils Distr.: Jūrkalne, Muižupīte river valley, 22.10.2006, 2 ind., deciduous forest.

Oligolophus hansenii (KRAEPELIN, 1896)

R. Tumšs 1938, 1963, Chevrizov 1979a (Baltic states).

Lacinius ehippiatus (C.L.KOCH, 1835)

R. Tumšs 1938, 1963, Eglītis 1954.

M. Alūksne Distr.: Vireši, Randatu cliffs, 12.07.2006, 1 ind., rotten deciduous wood. Cēsis Distr.: Inesis lake islands and coast, 25.08-05.09.2003, pitfall traps, on Akmens island, 135 ind., deciduous forests, on Bābas island, 31 ind., deciduous forests, on Inesieši peninsula, 19 ind., deciduous forests, on Inesis peninsula, 327 ind., on Mīlestības island, 83 ind., deciduous forests, on Siena island, 7 ind., deciduous forests, on Žīdītes island, 61 ind., deciduous forests, leg. L.Irša; Kvēpene, 08.07.2007, 1 ind., deciduous forest; Lodesmuiža, 03-08.07.2004, pitfall traps, 12 ind., mesophytous meadow, leg. R.Gajevska, 12 ind., small leaved forest, 1 ind., spruce forest, leg. Ž.Osmāne, R.Matisons, A.Vaiders, 6 ind., wet meadow, leg. Ie.Lībeka, 01-06.07.2006, pitfall traps, 63 ind., birch-white alder forest, leg. I.Žagare, M.Grunskis, L.Sabule, 111 ind., birch-white alder forest edge, leg. Ie.Kalnciema, N.Stasjukeviča, I.Puzarele, 17 ind., cultivated meadow, leg. I.Bodnieks, G.Ūsele. Jelgava Distr.: Vilce river valley, 01-28.05.2006, pitfall traps, 11 ind., deciduous floodplain forest. Kuldīga Distr.: Diļļu meadows, 27.06-19.07.2003, pitfall traps, 3 ind., calcareous wet meadow, 27.06-24.07.2004, pitfall traps, n (1) ind., calcareous wet meadow; Riežupe river valley, 09.08.2006, 2 ind., rotten deciduous wood. Liepāja Distr.: Rucava, Līgupīte river valley, 16.10.2005, 2 ind., deciduous floodplain

forest; Vītiņi meadows, 27.06-19.07.2003, pitfall traps, 3 ind., calcareous wet meadow. Limbaži Distr.: Randa meadows, 18-25.08.2006, pitfall traps, 82 ind., dry coastal meadow, 24 ind., dry pasture, 197 ind., wet coastal meadow, 65 ind., wet pasture, leg. K.Vilks. Madona Distr.: Barkava, 26.06-24.07.2004, yellow traps, 4 ind., old-field; Vestiena, 02.08.2004, 3 ind., rotten deciduous wood. Rīga: Bierīni, Mārupīte river coast, 01.07.2004, 3 ind., rotten black alder wood, 01-09.07.2004, pitfall traps, 17 ind., deciduous forest. Talsi Distr.: Slītere, 11-18.07.2004, pitfall traps, 22 ind., black alder forest, 2 ind., broadleaved forest, 30 ind., wet spruce forest. Tukums Distr.: Čūžu fen, 21.05-18.06.2003, pitfall traps, 11 ind., calcareous fen with *Potentilla fruticosa*; Lestene, Priedulāji, 11-23.09.2007, pitfall traps, 1 ind., burned mesophytous meadow, leg. L.Jukāme. Valka Distr.: Rauza river valley, 13-17.08.2006, pitfall traps, 178 ind., mixed forest, leg. G.Akmentiņš; Šepka river valley, 13-17.08.2006, pitfall traps, 504 ind., birch-spruce forest, leg. G.Akmentiņš.

***Lacinius horridus* (PANZER, 1794)**

R. Tumšs 1963, Chevrizov 1979a.

M. Liepāja Distr.: Ziemepe, grey dunes, 10-24.08.2005, pitfall traps, 13 ind., 12.09.2004, 1 ind., 21.09.2003, 1 ind. Talsi Distr.: Kolka, 25.07.2005, 1 ind., on pine trunk. Tukums Distr.: Pliņciems dune, 10.07.2005, 2 ind., dunes.

***Mitopus morio* (FABRICIUS, 1779)**

R. Tumšs 1938, 1963.

M. Aizkraukle Distr.: Vesetas paliene fen, 15.06.2005, 1 ind., rotten birch wood, 1 ind., rotten spruce wood. Cēsis Distr.: Inesis lake coast, 29.05-26.06.2004, pitfall traps, n (3) ind., spruce forest, leg. L.Irša; Lodesmuiža, 03-08.07.2004, pitfall traps, 1 ind., small-leaved forest, leg. L.Irša, D.Vainauska, E.Dzenis, 4 ind., spruce forest, leg. R.Matisons, Ž.Osmāne, A.Vaiders, 06.07.2005, 1 ind., wet meadow, 07.07.2007, 1 ind., spruce forest. Limbaži Distr.: Augstroze, 21.07.2007, 2 ind., black alder forest. Madona Distr.: Barkava, 26.06.2005, 1 ind., deciduous forest. Rīga: Bierīni, Mārupīte river coast, 01.07.2004, 2 ind., rotten black alder wood, 01-09.07.2004, pitfall

traps, 2 ind., deciduous forest; Nordeķi, 05.10.2003, 1 ind., deciduous park, 24.09.2005, 7 ind., deciduous park. Rīga Distr.: Cenas bog, 31.07.2005, 1 ind., pine forest; Salaspils, 22.10.2005, 1 ind., deciduous forest; Ķemeri, 27.08.1999, 4 ind., on birch trunk. Talsi Distr.: Kolka, 11-18.07.2004, pitfall traps, 1 ind., pine forest, 1 ind., wet meadow; Slītere, 11-18.07.2004, pitfall traps, 7 ind., broadleaved forest, 4 ind., wet spruce forest, 20.07.2004, 1 ind., broadleaved forest, 6 ind., on tree trunk; Talsu pauguraine, 23.06.2006, 1 ind., on white alder stunk. Tukums Distr.: Kandava, 25.06.2005, 1 ind., calcareous broadleaved forest; Pliņciems dune, 10.07.2005, 1 ind., pine forest. Valka Distr.: Mežole, 12.08.1999, 6 ind., on aspen trunk; Šepka river valley, 13-17.08.2006, pitfall traps, 1 ind., birch-spruce forest, leg. G.Akmentiņš. Ventspils Distr.: Moricsala, 27.08.2005, 1 ind., on hazelnut trunk; Usma, 13.08.2006, 1 ind., rotten deciduous wood.

***Leiobunum rotundum* (LATREILLE, 1798)**

R. Grube 1859 (*Opilio hemisphaericus* HERBST), Tumšs 1963 (*Liobunum*), Chevrizov 1979a.

M. Aizkraukle Distr.: Vesetas paliene fen, 15.06.2005, 2 ind., on tree trunk. Alūksne Distr.: Vireši, Randatu cliffs, 12.07.2006, 1 ind., rotten deciduous wood. Cēsis Distr.: Līgatne, 18.09.2004, 1 ind., on tree trunk; Lodesmuiža, 05.07.2005, 1 ind., pine forest. Kuldīga Distr.: Kuldīga, Venta river valley, 22.10.2006, 6 ind., on dolomite cliffs; Lēnas, 17.09.2006, 1 ind., rotten deciduous wood. Madona Distr.: Bērzaune, 08.08.2007, 3 ind., on building; Vestiena, 02.08.2004, 2 ind., rotten deciduous wood, 01.08.2005, 3 ind., on building. Preiļi Distr.: Jaunaglona, 09.10.2005, 3 ind., deciduous park. Rīga: Bierīni, Mārupīte river coast, 01.07.2004, 1 ind., rotten black alder wood; Kronvalda park, 01.09.2005, 1 ind., on building; Doles sala, 20.08.2007, 9 ind., on dolomite cliffs. Saldus Distr.: Saldus, Ciecere river valley, 22.10.2005, 9 ind., on wooden building. Talsi Distr.: Kolka, 22.07.2004, 2 ind., ruins, 28.07.2005, 1 ind., rotten deciduous wood, 02.09.2006, 2 ind., on juicing birch, 15.07.2007, 1 ind., on juicing birch. Valmiera Distr.: Kauguri, 12.07.2007, 1 ind., on building.

***Leiobunum rupestre* (HERBST, 1799)**

R. Tumšs 1938 (*Liobunum*), 1963 (*Liobunum*), Chevrizov 1979a.

M. Aizkraukle Distr.: Ērberģe, 15.10.2006, 1 ind., rotten birch wood; Koknese, 11.10.2003, 1 ind., rotten deciduous wood; Krasti, 15.10.2006, 2 ind., deciduous forest; Vesetas paliene fen, 15.06.2005, 1 ind., on tree trunk. Daugavpils Distr.: Pilskalnes Siguldiņa, 15.10.2005, 1 ind., rotten deciduous wood. Krāslava Distr.: Ezernieki, 09.10.2005, 3 ind., on building. Kuldīga Distr.: Īvande, 22.10.2006, 2 ind., on building. Limbaži Distr.: Mērnieki, 14.08.2007, 1 ind., on wooden building. Madona Distr.: Bērzaune, 08.08.2007, 3 ind., on building. Rīga: Botanical garden of University of Latvia, 15-29.11.2004, pitfall traps, 1 ind., greenhouse; Dārziņi, 24.09.2006, 1 ind., on wooden building; Nordeķi, 05.10.2003, 1 ind., deciduous

park, 24.09.2005, 3 ind., deciduous park; Rīga Distr.: Salaspils, 21.09.2005, 3 ind., deciduous forest; Tumšupe river valley, 22.08.2007, 5 ind., on white alder trunk. Saldus Distr.: Saldus, Ciecere river valley, 22.10.2005, 9 ind., on wooden building. Talsi Distr.: Dundaga, 28.10.2006, 1 ind., deciduous park; Kolka, 28.08.2005, 7 ind., on wooden building, 31.08.2007, 1 ind., on wooden building. Valmiera Distr.: Kauguri, 08.08.2004, 1 ind., garden. Ventspils Distr.: Usma, 13.08.2006, 9 ind., rotten deciduous wood.

Habitat preference, occurrence and abundance of harvestmen in habitats

Harvestmen selected habitats specific for particular species and every species occurred more frequently in the definite habitats (Table 1).

Table 1. Occurrence of the harvestmen species in various habitats. Explanations: 1 – rare; 2 – common; 3 – very common.

Habitats	Species															
	<i>Trogulus tricarlinatus</i>	<i>Nemastoma lugubre</i>	<i>Mitostoma chrysomelas</i>	<i>Phalangium opilio</i>	<i>Opilio dinaricus</i>	<i>O. parietinus</i>	<i>O. saxatilis</i>	<i>Rilaena triangularis</i>	<i>Lophopilio palpinalis</i>	<i>Oligolophus hansenii</i>	<i>O. tridens</i>	<i>Lacinius ephippiatus</i>	<i>L. horridus</i>	<i>Mitopus morio</i>	<i>Leiobunum rotundum</i>	<i>L. rupestre</i>
Broadleaved forests	1	3	1		1			1	3	1	3	3		2	1	2
Small-leaved forests		3		1	2			1	3		2	3		1	1	1
Pine forests		2	1	2			1	1			1			1	1	
Spruce forests		1			1			2				2		1		
Mixed forests		1						2	2		2	2				
Dunes				3	1	1	1				1		1			
Dry meadows				3	1			1				2				
Mesophytous meadows		1	1	3	2			1	1		1	2				
Wet meadows		1		3				1			2	1		1		
Calcareous meadows and fens			1	1	2			2			1	1				
Peat moss bogs				1				2						1		
Settlements and parks		1		2	1	3	1	1			2			1	2	2

Abundance of epigeic harvestmen species is presented in the Table 2. Collecting of more

samples in the particular habitat at different localities showed high variability in abundance.

Table 2. Abundance (ind./trapmonth) of harvestmen species collected by use of pitfall traps in various habitats in 2003-2007.

Habitat	Species and abundance (ind./trapmonth)										
	<i>Lacinius ephippiatus</i>	<i>Lophopilio palpinalis</i>	<i>Mitopus morio</i>	<i>Nemastoma lugubre</i>	<i>Oligolophus tridens</i>	<i>Opilio dinaricus</i>	<i>Rilaena triangularis</i>	<i>Mitostoma chrysomelas</i>	<i>Phalangium opilio</i>	<i>Opilio saxatilis</i>	<i>Lacinius horridus</i>
Broadleaved forests	3.60-89.18	1.09-22.36	0.43-6.43	0.27-3.82							
Small-leaved forests	2.00-15.86			0.43-0.71		25.86-27.43	0.13-0.57	0.17			
Spruce forests	0.12-12.86		0.67-1.71	0.33-1.29							
Mixed forests	8.90-25.20	0.15-6.55	0.05	0.20-0.30	1.00-28.00		6.00				
Dunes						0.07		0.03-2.43	0.07	0.93	
Dry coastal meadows								1.29			
Mesophytous meadows	0.25-2.43	0.75		0.50-1.25	14.75-25.25		0.17-0.25	0.25	2.25-6.25		
Wet meadows	0.04-1.00		0.43			0.52-0.75	0.03-0.30		0.04-2.08		
Calcareous fens	0.41			0.04-0.26			0.19				
Peat moss bogs			0.43				0.04-0.43		0.43		

Discussion

Fauna

In total 16 harvestmen species are stated for Latvia. *Opilio saxatilis* is new to the fauna of Latvia. Comparison with the number of species in the neighbouring countries is relative as harvestmen are poorly investigated. 20 species are known from Lithuania (www.tinklapis.lt/lietvora). Only four species *Phalangium opilio*, *Opilio parietinus*, *Lacinius ephippiatus*, *Nemastoma bimaculatum* (M.Martin pers. comm.) are officially reported from Estonia. *N. bimaculatum* in accordance with J.Martens (1978) is distributed in West

Europe and Estonian specimens, probably, belong to *N. lugubre*. 11-12 species are reported from Finland and 24 species for the Nordic countries (Stol 2007). 58 species are known in the European part of former USSR (Chevrizov 1979a), of them 11 species – from the Leningrad district and 17 species are known from the Baltic States (Kaliningrad district, Lithuania, Latvia and Estonia) (Chevrizov 1981). Consequently the harvestmen fauna of Latvia is completely investigated.

Distribution area of species

In accordance with J.Martens (1978) and B.P.Chevrizov (1979a, 1979b) the majority of

species found in Latvia are distributed in the West Palaearctic, except *Opilio parietinus*, *Mitopus morio* and *Phalangium opilio* having Palaearctic or/and Holarctic distribution.

For six species, namely *Trogulus tricarinatus*, *Mitostoma chrysomelas*, *Oligolophus hanseni*, *Opilio saxatilis*, *Leiobunum rotundum* and *Opilio saxatilis*, the northern boarder of their distribution range crosses Latvia. That explains the rarity of mentioned species in Latvia. *Lacinius horridus* and *Opilio saxatilis* are distributed mainly in the West and South Europe. That explains the recording of species in the coastal dunes – the “warm” habitats in the southwest districts of Latvia. Daugava river valley could be the distinct distribution northern boarder for *Trogulus tricarinatus*. The rest of the species are situated in the main distribution area and are more or less common in Latvia.

Based on historical (Tumšs 1963) and recent data it can be supposed that some gradient of reduction of number of species can be observed from the southwest to the northeast districts of Latvia. This cannot be clearly proved, as all districts of Latvia were not investigated properly.

Habitat preference

The most of harvestmen species had definite habitat preference. *Rilaena triangularis*, *Oligolophus tridens* and *Opilio dinaricus* did not show clear habitat preference and can be regarded as ecologically plastic species. *Nemastoma lugubris*, *Lophopilio palpinalis*, *Mitopus morio* and *Lacinius ephippiatus* showed preference to forests than meadows. *Leiobunum rotundum* and *L. rupestre* showed clear preference to forest habitats. These two species were found also in the settlements and parks, more common on wooden buildings. The latter imitate natural conditions as in natural habitats individuals were found sitting on the trunks. *Phalangium opilio* showed clear preference to open habitats – meadows and dunes, also dry pine forests and settlements, but was rare in forests. *Lacinius horridus* had clear preference to dunes, *Opilio parietinus* – to settlements.

Abundance

Data on abundance of epigeic harvestmen species are fragmentary and incomplete. The samples were gathered during five years in different habitats and in different seasons. Based on preliminary data it can be concluded that deciduous forests and wet meadows were habitats with highest abundance of harvestmen. Deciduous forests harboured the higher species diversity. Dry and calcareous meadows, dunes and peat moss bogs were unfavourable habitats for harvestmen. These differences obviously could be explained by the peculiarities of biology and ecology of species, sheltering opportunities provided by particular habitat and feeding habits. These are topics for further research.

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