

**CONTRIBUTION TO THE MOSS FLORA OF THE POPRAD LANDSCAPE PARK
(WESTERN CARPATHIANS, POLAND)**

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ABSTRACT: Distributional data for 83 mosses from the Poprad Landscape Park, including 13
new, 37 protected and 11 threatened species are provided.

KEY WORDS: mosses, threatened species, protected species, distributional data, Poprad
Landscape Park, Beskid Sądecki range, Carpathians, Poland.



Introduction

Poprad Landscape Park (Popradzki Park Krajobrazowy in Polish) was established in 1987 and covers an area of 54 392.7 ha. It comprises a large part of the Beskid Sądecki and a small part of the Czerchów range situated in the Western Carpathians in southern Poland (Fig. 1). The highest point is the Mt Radziejowa (1262 m a.s.l.). Its landscape is typical to the Western Beskidy Mountains. Large part is covered by forest, mainly deciduous, such as Carpathian beech forest *Dentario glandulosae-Fagetum*. The most interesting parts are protected in 13 nature reserves (www.zpkwm.pl). Muscological investigations started in this area in the second half of nineteenth century (Rehman 1869; Krupa 1882, 1885; Szafran 1954; Myczkowski and Grabski 1962; Kuc 1963; Mickiewicz 1965, 1969; Karczmarz and Mickiewicz 1970, 1971; Mamczarz 1971; Karczmarz et al. 1974, 1975) and were summarised by Mamczarz (1977). Since that time several papers have been published (Bednarek-Ochyra 1995; Bednarek-Ochyra et al. 2011; Cykowska 2008; Ochyra et al. 2008, 2011; Stebel 2013; Stebel and Vončina 2011; Stebel et al. 2011; Vončina and Stebel 2012).

The paper provides information about new localities of 83 moss species, including 13 species new to the flora of the investigated area, 37 protected and 11 threatened with extinction in Poland.

Materials and methods

Field investigations were carried out in the years 2009 and 2012. List of taxa are arranged alphabetically. The species names follow mainly Ochyra et al. (2003). Species protected by law in Poland were taken after 'Regulation of the Minister of Environment'

(2014) whereas threatened according to Żarnowiec et al. (2004).



Fig. 1. Location of the Poprad Landscape Park.

For each species the following information is provided: ATMOS (Atlas of distribution of mosses in Poland; Ochyra and Szmajda 1981) grid square, locality, habitat and altitude. Voucher specimens are housed in Herbarium of the Department of Pharmaceutical Botany of the Medical University of Silesia in Katowice (SOSN) and in the Herbarium of the Institute of Botany of the Polish Academy of Sciences in Kraków (KRAM).

List of species and localities

Key: * - species new to the moss flora of the Poprad Landscape Park; ! - species partly protected in Poland; in the square brackets - species threatened in Poland with threat categories.

!Abietinella abietina (Hedw.) M.Fleisch. – [Ge36] Wierchomla Wielka, Potasznia stream valley, old concrete wall, 555 m.

!Andreaea rupestris Hedw. – [Ge36] between 'Bacówka nad Wierchomlą' mountain hut and Mt Runek, sandstone in beech forest, 930-940 m.

!Anomodon attenuatus (Hedw.) Huebener – [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, old beech, 470 m; [Ge25] Składziszowska Skalka, sandstone, 1000 m; [Ge26] Czaczów-Piętkówka, bark of wayside *Fraxinus excelsior*, 424 m; [Ge35] Piwniczna-Zdrój, stone wall near the church, 388 m; [Ge46] Żegiestów-Zdrój, old wall, 505 m and bark of beech, 556 m.

!Anomodon viticulosus (Hedw.) Hook. & Taylor – [Ge35] Piwniczna-Zdrój, stone wall near the church, 388 m.

Atrichum tenellum (Röhl.) Bruch & Schimp. – [Ge35] Piwniczna-Zdrój Cichoniówka, soil on path, 720-740 m; [Ge36] Mt Wielka Pusta, SW slope, wayside along black hiking trail, 960-985 m; [Ge36] Jaworzynka, N slope, wayside along blue hiking trail, 972 m.

***Blindia acuta** (Hedw.) Schimp. – [Ge25] Baranowiec-Klimczakówka, Czaczowiec stream valley, wet sandstone on bank of the stream, 680-700 m.

***[R] Brachydontium trichodes** (F.Weber) Milde – On sandstone boulders in forest. Commonly with sporophytes. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 493-510 m; [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, below Paszkowa mountain pasture, 660 m; [Ge25] ‘Baranowiec’ nature reserve, 855-860 m; [Ge25] Baranowiec-Klimczakówka, Czaczowiec stream valley, 680-700 m; [Ge35] Trześniowa Hala mountain pasture, E part, 920 m; [Ge36] ‘Wierchomla’ nature reserve, W part, 923 m; [Ge36] Wyżne Młaki mountain pasture near Wierchomla Mała, 896 m.

***Bryum dichotomum** Hedw. [= *Bryum bicolor* Dicks.] – [Ge24] Roztoka

Ryterska, Roztoka Ryterska stream valley, wayside near the stream, 441 m.

Bucklandiella microcarpa (Hedw.) Bednarek-Ochyra & Ochyra – [Ge36] between ‘Bacówka nad Wierchomlą’ mountain hut and Mt Runek, sandstone, 930-940 m.

!Calliergonella cuspidata (Hedw.) Loeske – Brown-moss fen communities, wet places, waysides. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, below Paszkowa mountain pasture, 660 m; [Ge34] Piwniczna-Zdrój Obidza, 795 m; [Ge34] Obidza pass, W part, 948-952 m; [Ge35] Piwniczna-Zdrój, near the Poprad river; 368 m; [Ge35] Łomnica-Zdrój Podjezior, 691 m; [Ge36] between ‘Bacówka nad Wierchomlą’ mountain hut and Wierchomla Mała, 780 m; [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, 500-520 m.

Campylium stellatum (Hedw.) Lange & C.E.O.Jensen var. **protensum** (Brid.) Bryhn – [Ge34] Piwniczna-Zdrój Obidza, wayside, 845 m.

[I]Campylostelium saxicola (F.Weber & D.Mohr) Bruch & Schimp. – Sandstone boulders in forest. Commonly with sporophytes. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 460-510 m; [Ge25] Baranowiec-Klimczakówka, Czaczowiec stream valley, 680-700 m; [Ge36] ‘Wierchomla’ nature reserve, W part, 917 m.

!Climacium dendroides (Hedw.) F.Weber & D.Mohr – Brown-moss fen communities, wet places, waysides. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 460 m; [Ge25] Baranowiec-Klimczakówka, upper part of the Czaczowiec stream valley, 760-770 m;

[Ge34] Piwniczna-Zdrój Sucha Dolina, 710-730 m; [Ge34] Obidza pass, W part, 948-952 m; [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, 500-520 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, 555 m.

!Ctenidium molluscum (Hedw.) Mitt. – [Ge36] Mt Wielka Pusta, near the summit, sandstone in beech forest, 1050-1060 m.

Cynodontium polycarpon (Hedw.) Schimp. – [Ge25] Składziszowska Skałka (Czarci Kamień) near Mt Wierch nad Kamieniem, sandstone, *c. spor.*, 990-1020 m.

***Cynodontium strumiferum** (Hedw.) Lindb. – [Ge36] Długie Młaki mountain pasture near Wierchomla Mała, bark of wayside *Fagus sylvatica*, *c. spor.*, 890 m.

***Dicranella rufescens** (Dicks.) Schimp. – [Ge25] Baranowiec-Klimczakówka, upper part of the Czaczowiec stream valley, wet soil on path, *c. spor.*, 800 m; [Ge25] Mt Wierch nad Kamieniem, wayside near the summit, *c. spor.*, 1075 m.

!Dicranum scoparium Hedw. – On ground in coniferous forest, bark of trees, sandstones, rotten wood. [Ge25] Składziszowska Skałka (Czarci Kamień) near Mt Wierch nad Kamieniem, 990-1020 m; [Ge34] Piwniczna-Zdrój Sucha Dolina, 710-730 m; [Ge34] Mt Wielki Rogacz, S slope, 1050-1060 m; [Ge36] Mt Wielka Pusta, near the summit, 1050-1060 m; [Ge36] Wierchomla Mała, black hiking trail, 627 m; [Ge46] Żegiestów-Zdrój, 556 m.

Didymodon fallax (Hedw.) R.H.Zander – [Ge36] between ‘Bacówka nad Wierchomlą’ mountain hut and Wierchomla Mała, soil in grassland near black hiking trail, 819 m.

Didymodon ferrugineus (Besch.) M.O.Hill – [Ge35] Piwniczna-Zdrój, stone wall near the Poprad river, 368 m.

Didymodon spadiceus (Mitt.) Limpr. – [Ge36] Wierchomla Mała, near black hiking trail, bank of path, 627 m; [Ge46] Mt Stawiska, western slope, sandstone, 660 m.

Drepanocladus polycarpos (Voit) Warnst. – [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, wet concrete wall, 500 m; [Ge34] Obidza pass, western part, brown-moss fen community overgrown by thicket, 948-952 m.

Dryptodon hartmanii (Schimp.) Limpr. – Sandstone in forest. Commonly with gemmae. [Ge25] Cyrla mountain pasture, 837 m; [Ge25] Bukowa pass, 994 m; [Ge25] between Bukowa pass and Łomnica Zdrój-Jasiona, 930-940 m; [Ge25] Składziszowska Skałka (Czarci Kamień) near Mt Wierch nad Kamieniem, 990-1020 m; [Ge36] Mt Jaworzyna Krynicka, ‘Diabelski Kamień’ nature monument, 965 m; [Ge36] Mt Wielka Pusta, near the summit, 1050-1060 m; [Ge36] ‘Wierchomla’ nature reserve, W part, 960 m.

!Eurhynchium angustirete (Broth.) T.J.Kop. – On ground in forest. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 493-510 m; [Ge25] ‘Baranowiec’ nature reserve, 855-860 m; [Ge25] Baranowiec-Klimczakówka, Czaczowiec stream valley, 680-700 m; [Ge34] Piwniczna-Zdrój Obidza, 845 m; [Ge34] Piwniczna-Zdrój Sucha Dolina, 710-730 m; [Ge35] Piwniczna-Zdrój, near the Poprad river; 368 m; [Ge35]; Piwniczna-Zdrój Bziniaki, 470-475 m; [Ge36] Wierchomla Mała, black hiking

trail, 627 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, 565 m.

!Homalia trichomanoides (Hedw.) Schimp. – [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, old beech, *c. spor.*, 470 m; [Ge25] ‘Baranowiec’ nature reserve, sandstone, 855-860 m; [Ge25] Składziszowska Skalka (Czarci Kamień) near Mt Wierch nad Kamieniem, sandstone, 990-1020 m.

Homalothecium sericeum (Hedw.) Schimp. – [Ge36] Mt Jaworzyna Krynicka, ‘Diabelski Kamień’ nature monument, bark of *Fagus sylvatica*, 965 m.

Homomallium incurvatum (Brid.) Loeske – [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, sandstone, 555-570 m.

!Hylocomiadelphus triquetrus (Hedw.) Ochyra & Stebel [= *Rhytidiadelphus triquetrus* (Hedw.) Warnst.] – Grassy slopes, waysides. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 493-510 m; [Ge34] Piwniczna-Zdrój Obidza, 845 m; [Ge34] Piwniczna-Zdrój Sucha Dolina, 710-730 m; [Ge35] Piwniczna-Zdrój Bziniaki, 470-475 m; [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, 500-520 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, 550 m; [Ge35] Piwniczna-Zdrój, near the Poprad river, 368 m.

!Hylocomium splendens (Hedw.) Schimp. – Grassy slopes, on ground in coniferous forest. [Ge34] Piwniczna-Zdrój Sucha Dolina, 710-730 m; [Ge34] Mt Radziejowa, near the summit, 1265 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, 555 m; [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, 500-520 m; [Ge36]

Wierchomla Wielka, Potasznia stream valley, 565 m.

Hymenoloma crispulum (Hedw.) Ochyra – [Ge36] Wyzne Młaki mountain pasture near Wierchomla Mała, sandstone in beech forest, 903 m.

Leskea polycarpa Hedw. – [Ge46] Żegiastów, bark of wayside *Populus* sp., *c. spor.*, 419 m.

!Leucobryum glaucum (Hedw.) Ångstr. – [Ge25] Rytro-Za Zamcze, wayside slope in mixed forest, 451 m.

Mnium hornum Hedw. – [Ge25] Baranowiec-Klimczakówka, upper part of the Czaczowiec stream valley, sandstone, 800 m; [Ge35] Piwniczna-Zdrój, wet place in ‘Leśny Park Zdrojowy’, 405 m.

Mnium marginatum (Dicks.) P.Beauv. – [Ge25] Baranowiec-Klimczakówka, bank of the Czaczowiec stream, 680-700 m.

! [R] Neckera besserii (Lobarz.) Jur. – [Ge25] Składziszowska Skalka (Czarci Kamień) near Mt Wierch nad Kamieniem, sandstone, 990-1020 m; [Ge36] Mt Jaworzyna Krynicka, ‘Diabelski Kamień’ nature monument, sandstone crevices, 965 m.

!Neckera complanata (Hedw.) Huebener – [Ge25] ‘Baranowiec’ nature reserve, sandstone, 855-860 m.

!Neckera crispa Hedw. – [Ge25] ‘Baranowiec’ nature reserve, sandstone, 855-860 m.

Niphotrichum elongatum (Frisv.) Bednarek-Ochyra & Ochyra – [Ge34] Obidza pass, wayside, 943 m.

Oligotrichum hercynicum (Hedw.) Lam. & DC. – [Ge25] between Hala Baranowska and Hala Pisana mountain pastures, wayside, 1042 m.

**Orthothecium intricatum* (Hartm.) Schimp – [Ge25] Składziszowska Skalka (Czarci Kamień) near Mt Wierch nad Kamieniem, sandstone crevices, 1000 m.

Orthotrichum affine Brid. – [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, bark of *Ulmus scabra*, 506 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, bark of *Populus* sp., 535 m.

Orthotrichum anomalum Hedw. – [Ge35] Piwniczna-Zdrój, stone wall near the church, 388 m.

Orthotrichum diaphanum Brid. – [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, bark of wayside *Acer pseudoplatanus*, c. *spor.*, 475 m; [Ge26] Czaczów-Piętkówka, bark of wayside *Fraxinus excelsior*, c. *spor.*, 424 m.

Orthotrichum obtusifolium Brid. – Bark of deciduous trees. Commonly with gemmae. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 475 m; [Ge34] Obidza pass, 935 m; [Ge36] between 'Bacówka nad Wierchomlą' mountain hut and Runek, 903 m; [Ge35] Piwniczna-Zdrój, near Zdrojowa Street, 385 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, 505 m; [Ge46] Łopata Polska, 423 m.

**Orthotrichum pallens* Brid. – [Ge25] Hala Baranowska, bark of *Fagus sylvatica*, c. *spor.*, 1050 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, bark of *Populus* sp., 535 m and *Fraxinus excelsior*, c. *spor.*, 540 m.

*[R] *Orthotrichum patens* Brid. – [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, bark of wayside *Acer pseudoplatanus* and *Fraxinus excelsior*, c. *spor.*, 475 m; [Ge35] Piwniczna-Zdrój

Cichoniówka, bark of solitary *Fraxinus excelsior*, c. *spor.*, 760 m.

Orthotrichum pumilum Sw. ex anon. – Bark of deciduous trees. Commonly with sporophytes. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 475 m; [Ge34] Piwniczna-Zdrój Obidza, 900 m; [Ge34] Obidza pass, 935 m; [Ge35] Łomnica-Zdrój-Jarzębaki, 675 m; [Ge36] between 'Bacówka nad Wierchomlą' mountain hut and Mt Runek, 903 m; [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, 530 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, 535 m; [Ge36] Wierchomla Wielka, near the church, 482 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, 505 m; [Ge46] Łopata Polska, 423 m; [Ge46] Żegiestów, 419-436 m.

Orthotrichum speciosum Nees – [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, bark of *Fraxinus excelsior*, c. *spor.*, 530 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, bark of *Salix fragilis*, c. *spor.*, 505 m; [Ge46] Łopata Polska, bark of *Salix* sp., c. *spor.*, 423 m.

[V]*Orthotrichum stramineum* Brid. – Bark of *Fagus sylvatica*. Commonly with sporophytes. [Ge35] Trześniowa Hala mountain pasture, W part, 975-980 m; [Ge36] between 'Bacówka nad Wierchomlą' mountain hut and Mt Runek, 903 m; [Ge36] Długie Młaki mountain pasture near Wierchomla Mała, 885 m; [Ge36] Mt Jaworzyna Krynicka, NE slope near green hiking trail, 870 m; [Ge36] Mt Jaworzyna Krynicka, 'Diabelski Kamień' nature monument, 965 m; [Ge36] 'Wierchomla' nature reserve, W part, 923 m; [Ge36] Wyżne Młaki mountain pasture near Wierchomla Mała, 904 m.

!Palustriella commutata (Hedw.) Ochyra – Springs and brown-moss fen communities. [Ge25] Baranowiec-Klimczakówka, upper part of the Czaczowiec stream valley, 800 m; [Ge36] Wierchomla Mała, black hiking trail, 568 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, 550 m.

!Palustriella decipiens (De Not.) Ochyra – [Ge25] Baranowiec-Klimczakówka, upper part of the Czaczowiec stream valley, springs, 760-770 m.

*!**[R]Philonotis caespitosa** Jur. – [Ge34] Obidza pass, W part, brown-moss fen community overgrown by thicket, 948-952 m.

!Philonotis calcarea (Bruch & Schimp.) Schimp. – [Ge36] between ‘Bacówka nad Wierchomlą’ mountain hut and Wierchomla Mała, springs, 780 m; [Ge36] Wierchomla Mała, black hiking trail, springs, 568 m.

!Philonotis fontana (Hedw.) Brid. – [Ge25] Baranowiec-Klimczakówka, Czaczowiec stream valley, wayside ditch, 680-700 m; [Ge35] Łomnica-Zdrój Podjezior, brown-moss fen community, 691 m.

*!**[I]Philonotis tomentella** Molendo – [Ge34] Piwniczna-Zdrój Obidza, wayside landslide, wet place, 795 m.

Platygyrium repens (Brid.) Schimp. – Bark of deciduous trees. Commonly with gemmae. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 475 m; [Ge34] Obidza pass, 930 m; [Ge34] Mt Trześniowy Groń, 1010-1020 m; [Ge35] Łomnica-Zdrój-Jarzębaki, 675 m; [Ge36] Długie Młaki mountain pasture near Wierchomla Mała, 885 m; [Ge36] ‘Wierchomla’ nature reserve, W part, 948

m; [Ge36] Wierchomla Wielka, near the church, 482 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, 506 m; [Ge46] Żęgiestów-Zdrój, 556 m.

!Pleurozium schreberi (Brid.) Mitt. – On ground in coniferous forest, grassy slopes. [Ge25] Rytro-Za Zamcze, 451 m; [Ge34] Piwniczna-Zdrój Sucha Dolina, 710-730 m; [Ge34] Żłobki pass, 1106 m; [Ge34] Mt Radziejowa, near the summit, 1265 m; [Ge36] Długie Młaki mountain pasture near Wierchomla Mała, 893 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, 779 m.

!Polytrichum commune Hedw. – On ground and slopes in coniferous forest. [Ge25] Mt Wierch nad Kamieniem, N of the summit, 1070 m; [Ge34] Mt Wielki Rogacz, S slope, 1050-1060 m; [Ge35] Piwniczna-Zdrój Cichoniówka, 720-740 m; [Ge35] Trześniowa Hala mountain pasture, W part, 975-980 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, 565 m.

Polytrichum piliferum Hedw. – [Ge25] between Bukowa pass and Łomnica Zdrój-Jasiona, insolated wayside, 930-940 m; [Ge36] between ‘Bacówka nad Wierchomlą’ mountain hut and Mt Runek, grassland, 923 m.

Pseudoleskea incurvata (Hedw.) Loeske – [Ge36] Mt Jaworzyna Krynicka, ‘Diabelski Kamień’, boulders in *Fagus sylvatica* forest, 965 m; [Ge36] Mt Wielka Pusta, sandstone in beech forest near the summit, 1050-1060 m.

!Pseudoscleropodium purum (Hedw.) Broth. – [Ge25] Rytro-Za Zamcze, wayside slope in mixed forest, 451 m.

Pseudotaxiphyllum elegans (Brid.) Z.Iwats. – [Ge35] Piwniczna-Zdrój, soil in wet place in ‘Leśny Park Zdrojowy’, 405 m.

Rhynchostegium murale (Hedw.) Schimp. – [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, wayside sandstone, 565 m.

Rhytidiadelphus loreus (Hedw.) Warnst. – [Ge34] Mt Radziejowa, on ground in mixed forest near the summit, 1265 m.

!*Rhytidiadelphus squarrosus* (Hedw.) Warnst. – Grassy places and wayside slopes. [Ge34] Piwniczna-Zdrój Sucha Dolina, 710-730 m; [Ge34] Roztoka Ryterska, Roztoka Ryterska stream valley, 540-550 m; [Ge35] Piwniczna-Zdrój, near the Poprad river; 368 m; [Ge35] Trześniowa Hala, W part, 975-980 m; [Ge36] Długie Młaki mountain pasture near Wierchomla Mała, 893 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, 555 m; [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, 500-520 m.

******Schistidium crassipilum* H.H.Blom – [Ge34] Roztoka Ryterska, Roztoka Ryterska stream valley, concrete wall of bridge, *c. spor.*, 518 m and abandoned quarry, sandstone, *c. spor.*, 540-550 m; [Ge35] Piwniczna-Zdrój, stone wall near the Poprad river, *c. spor.*, 368 m; [Ge35] Piwniczna-Zdrój, stone wall near the church, *c. spor.*, 388 m.

******Schistidium dupretii* (Thér.) Weber – [Ge34] Mt Radziejowa, concrete wall of monument on the summit, *c. spor.*, 1266 m.

Sciuro-hypnum oedipodium (Mitt.) Ignatov & Huttunen – [Ge25] Baranowiec-Klimczakówka, Czaczowiec stream valley,

litter in coniferous forest, 680-700 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, log in mixed forest, 779 m.

Sciuro-hypnum plumosum (Hedw.) Ignatov & Huttunen – [Ge25] Baranowiec-Klimczakówka, bank of the Czaczowiec stream, 680-700 m.

[R] *Serpoleskea subtilis* (Hedw.) Loeske – [Ge34] Mt Radziejowa, SE slope near the summit, bark of *Fagus sylvatica* in mixed forest, *c. spor.*, 1251 m.

!*Sphagnum capillifolium* (Ehrh.) Hedw. – [Ge34] Mt Wielki Rogacz, S slope, wayside in *Picea abies* forest, 1050-1060 m.

!*Sphagnum fallax* (H.Klinggr.) H.Klinggr. – [Ge34] Mt Wielki Rogacz, S slope, wayside in *Picea abies* forest, 1050-1060 m; [Ge35] Piwniczna-Zdrój Cichoniówka, wayside in *Picea abies* forest, 720-740 m.

!*Sphagnum girgensohnii* Russow – [Ge34] Mt Wielki Rogacz, S slope, wayside in *Picea abies* forest, 1050-1060 m; [Ge35] Piwniczna-Zdrój Cichoniówka, wayside in *Picea abies* forest, 720-740 m.

!*Sphagnum teres* (Ångstr.) Schimp. – [Ge34] Obidza pass, western part, brown-moss fen community overgrown by thicket, 948-952 m.

!**[R]** *Syntrichia papillosa* (Wilson) Jur. – [Ge26] Czaczów-Piętkówka, bark of wayside *Fraxinus excelsior*, *c. gem.*, 424 m; [Ge35] Łomnica-Zdrój Wnęki, bark wayside log of *Fraxinus excelsior*, *c. gem.*, 500 m.

!**[R]** *Syntrichia virescens* (De Not.) Ochyra – [Ge35] Piwniczna-Zdrój, near Zdrojowa Street, bark of *Fraxinus excelsior*, 386 m;

[Ge36] Wierchomla Wielka, bark of old *Tilia platyphyllos* near the quarry, 409 m.

Taxiphyllum wissgrillii (Garov.) Wijk & Margad. – [Ge25] ‘Baranowiec’ nature reserve, sandstone, 855-860 m; [Ge25] Baranowiec-Klimczakówka, Czaczowiec stream valley, sandstone, 680-700 m; [Ge25] Składziszowska Skalka (Czarci Kamień) near Mt Wierch nad Kamieniem, sandstone, 990-1020 m.

!Thuidium delicatulum (Hedw.) Schimp. – [Ge35] Piwniczna-Zdrój, grassy slope near the Poprad river; 368 m.

!Thuidium assimile (Mitt.) A.Jaeger. – Grassy places, wayside slopes. [Ge34] Piwniczna-Zdrój Obidza, 845 m; [Ge36] Wierchomla Wielka, near red hiking trail to Mt Wielka Pusta, 555 m; [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, 500 m; [Ge36] Wierchomla Wielka, Potasznia stream valley, 550-555 m; [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 440-460 m.

!Thuidium tamariscinum (Hedw.) Schimp. – Wet place in forest. [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, 460-470 m; [Ge25] Baranowiec-Klimczakówka, Czaczowiec stream valley, 680-700 m; [Ge25] Roztoka Ryterska, Roztoka Ryterska stream valley,

441 m; [Ge25] Składziszowska Skalka (Czarci Kamień) near Mt Wierch nad Kamieniem, 990-1020 m; [Ge25] Rytro-Za Zamcze, 495 m; [Ge34] Piwniczna-Zdrój Sucha Dolina, 710-730 m; [Ge35] Piwniczna-Zdrój, near the Poprad river, 368 m; [Ge35] Piwniczna-Zdrój, ‘Leśny Park Zdrojowy’, 405 m; [Ge35] Łomnica-Zdrój Podjezior, 699 m; [Ge36] Wierchomla Mała, black hiking trail, 627 m.

Tortella inclinata (R.Hedw.) Limpr. – [Ge36] Wierchomla Wielka, Potasznia stream valley, concrete wall, 555 m.

Tortula muralis Hedw. – [Ge35] Łomnica-Zdrój Jasionowa, wayside sandstone near yellow hiking trail, *c. spor.*, 733 m; [Ge36] Mt Jaworzyna Krynicka, ‘Diabelski Kamień’ nature monument, sandstone crevices, *c. spor.*, 965 m.

! [V] *Ulota crispa* (Hedw.) Brid. – [Ge24] Roztoka Ryterska, Roztoka Ryterska stream valley, bark of wayside *Acer platanoides*, *c. spor.*, 475 m; [Ge36] between ‘Bacówka nad Wierchomlą’ mountain hut and Mt Runek, bark of *Fagus sylvatica*, *c. spor.*, 930 m; [Ge36] Wierchomla Wielka, Baraniecki Potok stream valley, bark of *Fraxinus excelsior*, *c. spor.*, 530 m.



Fig. 2. View on the Poprad Landscape Park from Obidza near Piwniczna-Zdrój (photo by A. Stebel, 28 September 2012).



Fig. 3. *Sphagnum teres*, species new to the flora of the Poprad Landscape Park.

Discussion

The most interesting species reported in this paper are 13 mosses new to the Beskid Sądecki range. Among these species four groups could be distinguished: (1) species rather frequent in the Polish part of the Carpathians, the occurrence of which was expected in this area, for example *Bryum dichotomum* and *Dicranella rufescens*, (2) rare species, which could have been overlooked by previous bryologists, for example *Blindia acuta*, *Orthothecium intricatum* and *Sphagnum teres*, (3) mosses variously treated from taxonomical point of view or recently described, for example *Philonotis tomentella* and *Schistidium crassipilum* (Blom 1996) and (4) species the number of localities of which has increased in the Carpathians, for example *Brachydontium trichodes* (Stebel 2008), *Orthotrichum pallens* and *O. patens*. The moss flora of the Poprad Landscape Park needs further detailed investigations.

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