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Note

Oreopteris limbosperma (Bellardi ex All.) J. Holub, rediscovered for the flora of Serbia

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ABSTRACT: During a field study of the forest flora carried out on Javor mountain (vicinity of the village Kladnica between Ivanjica and Sjenica) we collected a few individuals of the rare fern *Oreopteris limbosperma* (Bellardi ex All.) J. Holub on on the edge of the forest close to the local stream. Its last known record from Serbia supported with herbarium evidence dates back to 1875. This species was supposed to be extinct in the flora of Serbia and this is its first confirmed record after almost 140 years.

Key words: chorology, pteridology, Special Nature Reserve "Paljevine".

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The relic genus *Oreopteris* Holub includes three species (*O. limbosperma* (Bellardi ex All.) J. Holub, *O. quelpaertensis* (Christ) J. Holub and *O. elwesii* (Hooker fil. & Baker) Holttum) distributed disjunctly in temperate and boreal regions of the Northern hemisphere (Holttum 1981). They have been variously treated by pteridologists in mutually different genera, resulting in their final placement in the newly established genus *Oreopteris* Holub separated from the other lypteroid-cyclosoroid ferns on the basis of morphological and karyological characteristics of its members and validity of the generic name *Thelypteris* Schmidel (Holub 1969; Holttum 1981; Smith & Cranfill 2002). The only autochthonous representative of this genus in Serbia is *O. limbosperma* (Bellardi ex All.) J. Holub (Vukićević 1992). With its last known herbarium and literature records from 1875 and 1929, it was supposed to be extinct in Serbia (Niketić 1999).

During our floristical investigations of the forests in the Special Nature Reserve "Paljevine" on Javor mountain (western Serbia) in 2013, we found a few specimens of *O. limbosperma* (Bellardi ex All.) J. Holub.

Herbarium material was deposited in the Natural History Museum in Belgrade (BEO) (Thiers 2013) and the Institute for Nature Conservation of Vojvodina province in Novi Sad (PZZP). The taxon description follows Niketić (1999), Jermy & Paul (1993), Vukićević (1992), Mayer & Horvatić (1967) and Newman (1854), with some additional comments based on the specimens collected by the authors. Distribution data in Serbia have been mapped on the 10 × 10 km UTM grid system (Lampinen 2001).

Oreopteris limbosperma (Bellardi ex All.) J. Holub, *Folia Geobot. Phytotax.* (*Praha*) **4(1)**: 48 (1969).

Syn. *Polypodium limbospermum* Bellardi ex All., *Auct. Fl. Pedem*. 49-50 (1789) [basion.]; *Polypodium thelypteris* Hudson, *Fl. Angl.* **2**: 457 (1778) sensu Bingley [non (L.) F. W. Weiss 1770] [*nom. illeg.*]; *Polypodium pterioides* Lam., Fl. France **1**: 18 (1778) (excl. ß) [*nom. illeg.*]; *Polypodium montanum* Vogler, *Dissert. Polypod. mon.* 3 (1781) [non Lam. 1778] [*nom. illeg.*]; *Polypodium oreopteris* Ehrh. in Willd., *Fl. Berol. Prodr.* 292 (1787); Ehrh., *Beitr. naturk. Wiss.* **4**: 44 (1789); *Polypodium pterioides* Villars, *Hist. Pl. Dauph*. **3(2)**: 841 (1789) [*nom. illeg.*]; *Polystichum montanum* (Vogler) Roth, *Tent. Fl. Germ.* **3(1)**: 74 (1799), *Archiv* (Römer) **2/1**: 106 (1799); *Polystichum oreopteris* (Ehrh.) Bernh., *J. Bot.* (Schrader) **1799(1)**: 305 (1799); *Aspidium oreopteris* (Ehrh.) Swartz, *J. Bot.* (Schrader) **1800(2)**: 35 (1801); *Aspidium odoriferum* S. F. Gray, *Nat. Arr. Brit. Pl.* **2**: 6 (1821); *Nephrodium oreopteris* (Ehrh.) Desv., *Mem. Soc. Linn. Paris* **6(3)**: 257 (1827); *Filix mas-*

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montana (Vogler) Farwell, *Amer. Midl. Naturalist* **12**: 255 (1831); *Lastrea oreopteris* (Ehrh.) C. Presl, *Suppl. Tent. Pteridogr.*: 76 (1836); *Hemestheum montanum* (Vogler) Newman, *Phytologist* **4**, *App.* XXII(1851); *Phegopteris oreopteris* (Ehrh.) Fée, *Mém. Foug.* **5**,*Gen. Fil.* 243 (1852); *Lastrea montana* (Vogler) Newman, *Hist. Brit. Ferns*, ed. **3**: 130 (1854); *Aspidium montanum* (Vogler) Aschers., *Fl. Brand*. **3**: 133 (1859), non Sw. 1801 [*nom. illeg.*]; *Aspidium approximatum=contiguum* Kit. ex Kanitz, *Linnaea* **32**: 270(1863); *Phegopteris montana* (Vogler) Watt, *Canad. Naturalist* **II(13)**: 159 (1867); *Polystichum glandulosum* Dulac, *Fl. Dep. Hautes Pyren.*32 (1867) [non Presl 1836]; *Nephrodium montanum* (Vogler) Baker in Hooker & Baker, *Syn. Fil.* 271 (1868); *Dryopteris montana* (Vogler) O. Kuntze, *Revis. Gen. Pl.* **2**: 813 (1891); *Hemestheum oreopteris* (Ehrh.) P. Parm., *Ann. Sci. nat., Bot. sér.* **8,9**: 300 (1899); *Dryopteris oreopteris* (Ehrh.) Maxon, *Proceed. U.S. nat. Mus.* **23**: 638 (1901); *Polypodium subpubescens* J. Bergeret, *Fl. Basses Pyren.* 757 (1909); *Filix montana* (Vogler) Farwell, *Annual Rep. Michigan Acad. Sci.* **18**: 79 (1916); *Thelypteris oreopteris* (Ehrh.) Slosson ap. Rydb., *Fl. Rocky Mts.* 1043 (1917); *Nephrodium pterioides* [Lam.] Degen, *Fl. Velebit.***1**: 461 (1936) [non J. Sm. 1857] [*nom. illeg.*]; *Thelypteris limbosperma* (Bellardi ex All.) H. P. Fuchs, *Amer. Fern Jour.* **48**: 144 (1958); *Dryopteris limbosperma* (Bellardi ex All.) Becherer, *Jahresber. naturf. Ges. Graubünden* **88**: 6 (1959); *Lastrea limbosperma* (Bellardi ex All.) J. Holub & Pouzar, *Preslia* **33**: 400 (1961); *Lastrea limbosperma* (Bellardi ex All.) Ching, *Acta phytotax. sinica* **10**: 299 (1963).

Description. Perennial, suberect tufted plant. *Rhizome* short, stout, almost erect, with numerous radicles, its apex densely covered with remains of the bases of the dead leaves. *Leaves* suberect, crowded at the apex of the rhizome, 30-100 cm long, pinnate. Petioles sulcate, straw coloured, (1/3)1/5 -1/8 (1/10) as long as the lamina, scarcely covered with ovate-lanceolate to lanceolate, brownish to pale scales. Lamina oblanceolate to lanceolate in outline, soft, yellowish-green, covered over the entire underside with yellow spherical glands which are adhesive to the touch and when crushed emit a lemon-scented odour [these glands are also present on the rachis]. Along the rachis and venation of the lower surface of pinnae (mainly on midrib) short, whitish, unicelullar trichomes are present [they are remotely present on the upper surface of pinnae as well]. Pinnae (18-30 pairs) almost sessile, linear-lanceolate, deeply pinnatisect, acute at the apex, the longest 5-12 cm, gradually becoming shorter towards the base of the frond. Lower pinnae reduced, quite short and almost triangular with flat or only little recurved margins [which are ± covered with minute, imbricate, translucent denticle- to scale-like projections]. Pinnulae rounded, entire or slightly crenulate with alternately arranged, simple or forked veins passing to their margin or ceasing just before the margin. *Sori* orbicular, placed near the pinnulae margin ("*limbosperma*"), remaining ± separate at maturity, covered with small, reniform, irregularly toothed, glandular, vestigial to caducous indusium. *Spores* bilateral, winged with raised reticulum. 2n= 68. Sporulation time: VII-IX.

Fig. 1. *Oreopteris limbosperma* (Bellardi ex All.) J. Holub, specimen from the Herbarium of the Institute for Nature Conservation of Vojvodina province (PZZP).

Distribution. This is a subatlantic-european species of montane-subalpine areas (Soó 1964) distributed from the Azores and Madeira across most of Western, Northwestern, Central and parts of Southern, Southeastern and Eastern Europe to the Caucasus and Caspian Sea. It was described from the vicinity of Giaveno [*in montibus Javenensibus*] in Piedmont, Italy and recorded in Azores, Madeira, Spain, France, Ireland, Britain, Belgium, Luxembourg, Netherlands, Denmark, Corsica, Switzerland, Italy, Austria, Germany, Czech Republic, Slovakia, Hungary, Romania, Poland, Sweden, Norway, Russia (Jalas & Suominen 1972; Jermy & Paul 1993), Slovenia, Croatia, Bosnia and Herzegovina, Serbia (Mayer & Horvatić

1967; Vukićević 1992; Niketić 1999), Estonia, Latvia, Lithuania, Ukraine, Georgia, Turkey, Azerbaijan, Iran (Christenhusz & Raab-Straube 2013; Mazooji & Salimpour 2014), while in Greece it was not reconfirmed after its first reported finding (Sibthorp & Smith 1813). Records from temperate and boreal Eastern Asia, Pacific North America and Newfoundland refer to the vicariant species *O. quelpaertensis* (Christ) Holub, which was formerly erroneously interpreted as *O. limbosperma* (Holttum 1981; Smith 1993).

Distribution in Serbia. **NW Serbia**: DP18 **Povlen**: Bukovi; DP09 Lelić and Leskovice, in the woods (Majstorović 1929: 23). **W Serbia**: DP22 **Mučanj**: Katići (*Pančić, J.* 1875, BEOU; subn. *Thelypteris limbosperma* (All.) H. P. Fuchs, Vukićević 1970: 88; 1992: 136; Niketić 1999: 126), Katići-Moravička valley, in ditches on the way (subn. *Polystichum Oreopteris* DC., Pančić 1884: 248); DP 20 **Javor**: Kladnica, Special Nature Reserve "Paljevine", Ogorijevac, ≈ 1100 m (*Panjković, B., Perić, R.* 19-Jul-2013, BEO; PZZP) (Figure 1, 2).

General data: Serbia (subn. *Thelypteris limbosperma* (All.) Fuchs, Mayer & Horvatić 1967: 116; subn. *Thelypteris limbospermum*, Gajić 1980: 136), within the borders before 1913 (subn. *Nephrodium Oreopteris* (Ehrh.) Desv., Hayek 1927: 26).

Habitat. Mesophilic broadleaved and coniferous forests, in relatively open places, especially along the streams and rivers, on clearings, screes, from montane to subalpine zone. Individuals from Kladnica were collected near a forest road close to the local stream, on the edge of a mixed forest community *Piceo-Fago-Abietetum* Čolić. Geological substrate is represented with Permian-Triassic and Triassic rock formations (most important are slates, feldspar greywackes, argilophyllites, quartz conglomerates and sandstones) (Brković *et al.* 1968; Šehovac 2008). Pedological substrate is distric cambisol and alluvial-deluvial soils near streams (Kiš 2008). The following accompanying taxa were recorded: *Abies alba* Mill., *Athyrium filix-femina* (L.) Roth, *Dryopteris carthusiana* (Vill.) H. P. Fuchs, *D. dilatata* (Hoffm.) A. Gray, *Fagus moesiaca* (K. Mály) Czecz., *Gymnocarpium dryopteris* (L.) Newman, *Picea abies* (L.) H. Karst.

Threat status in Serbia. The species is strictly protected in Serbia by national law ("Sl. Glasnik RS" 5/10) and listed in "The Red Data Book of Flora of Serbia 1" (Stevanović 1999) as supposed to be extinct (EX/DD). Its present habitat on Javor mountain is protected within the borders of the Special Nature Reserve "Paljevine". Further investigations concerning population trends and distribution need to be done to fulfil the IUCN Red List Categories and Criteria (2001) and to define its threatened status in Serbia, but considering its single recent location in Serbia, it is likely that it will be evaluated as critically endangered (CR).

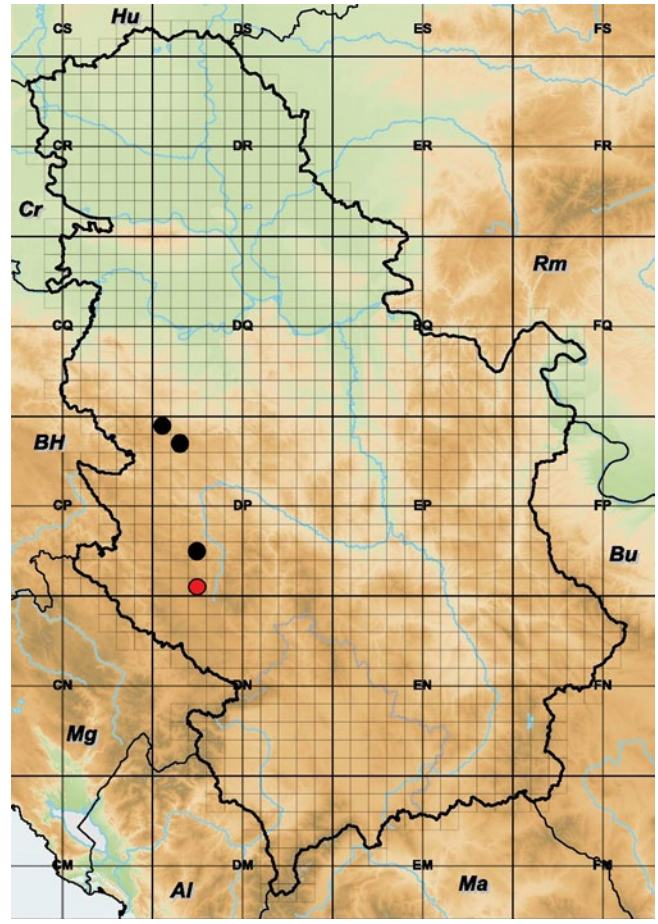

Fig. 2. Known distribution of *Oreopteris limbosperma* (Bellardi ex All.) J. Holub in Serbia; black circles: previously published records, red (gray) circle: new record.

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REZIME

Oreopteris limbosperma (Bellardi ex All.) J. Holub, ponovo otkrivena za floru Srbije

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Prilikom terenskih istraživanja šumske flore na planini Javor (okolina sela Kladnica između Ivanjice i Sjenice) na rubu šume uz lokalni potok je sakupljeno nekoliko jedinki retke paprati *Oreopteris limbosperma* (Bellardi ex All.) J. Holub. Poslednji nalaz ove vrste potkrepljen dokaznim herbarijumskim primerkom potiče iz 1875. godine, zbog čega se pretpostavljalo da je iščezla iz flore. Ovo je njen prvi potvrđeni nalaz nakon skoro 140 godina.

Ključne reči: horologija, pteridologija, Specijalni rezervat prirode „Paljevine".