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A new record of *Arabis recta* Vill. (Brassicaceae) from Poland

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Abstract: *Arabis recta* Vill. is a therophyte currently considered to be endangered in Poland (EN category). The species has been reported from ca. 20 localities situated mainly in the Nida Basin (south-eastern Poland). *Arabis recta* is usually a component of xero-thermophile grasslands, but it can also grow in arable fields or fallows. An abundant population of *A. recta* was found on slopes of the Góra Sosnówka hill (Małopolska Upland) in 2017. This newly discovered locality is currently the northernmost in Poland. The distribution of *A. recta* in Poland as well as collected phytosociological documentation are presented.

Key words: annual rockcress, threatened species, red-listed species, Małopolska Upland, Central Europe

Introduction

Arabis recta Vill. (English: annual rockcress) is a species growing mostly in Mediterranean, Pontic and Irano-Turanic biogeographical regions (Meusel et al. 1965). In Central Europe the species reaches the northernmost limit of its range. It is very rare and red-listed in Poland (Kaźmierczakowa et al. 2016), in Germany (Korneck et al. 1996) and in the Czech Republic (Grulich 2012).

The first localities of *Arabis recta* in Poland were discovered in Skorocice and Przęślin Nature Reserve, both in the Nida Basin (Medwecka-Kornaś 1959). Then, the species was reported from hills near Stawiany in the Nida Basin (Trzcińska-Tacik et al. 1998) and from a railway embankment between Mydlniki and Zabierzów in the Krakowsko-Częstochowska Upland (Kornaś et al. 1959). At the beginning of the 21th century, the occurrence of *Arabis recta* was confirmed only in Skorocice (Mirek & Kaźmierczakowa 2001). Due to the decrease in the number of localities and extreme rarity, the species was considered to be critically endangered (CR category) in Poland (Mirek & Kaźmierczakowa 2001). Later, it was even supposed to become extinct (EX category) (Mirek et al. 2006).

Recent research confirmed the occurrence of *A. recta* in most of the previously known localities situated in the Nida Basin. Moreover, several new localities of the species were recorded in: Winiary, between Bronina and Owczary, Nowa Zagość, Sułkowice, Zagaje Kikowskie, Kików, Górki near Wiślica, between Skowronno and Pińczów, Skowronno Nature Reserve, between Sędziejowice and Chomentówek, near Gartatowice, between Stawiany and Samostrzałów (Nobis et al. 2007; Nobis & Nobis 2012). In total, the species has been reported from ca. 20 localities scattered in the area of the Nida Basin. It has been estimated that more than one million individuals of the species occur in Poland (Nobis & Nobis 2012). Thus, *Arabis recta* is currently regarded as an endangered species (EN category) (Kaźmierczakowa et al. 2014, 2016).

The species grows mostly in the gaps in the xero-thermophile grasslands, and rarely in the arable fields or fallows. The number of individuals observed in successive years may vary considerably (Mirek & Kaźmierczakowa 2001; Nobis et al. 2007; Nobis & Nobis 2012). Fluctuations in population size result from differences in weather conditions as well as from

gaps in plant cover. The latter guarantees successful germination of seeds and is absolutely crucial for the existence of species, because within too dense vegetation *Arabis recta* is eliminated (Nobis et al. 2007; Nobis & Nobis 2012).

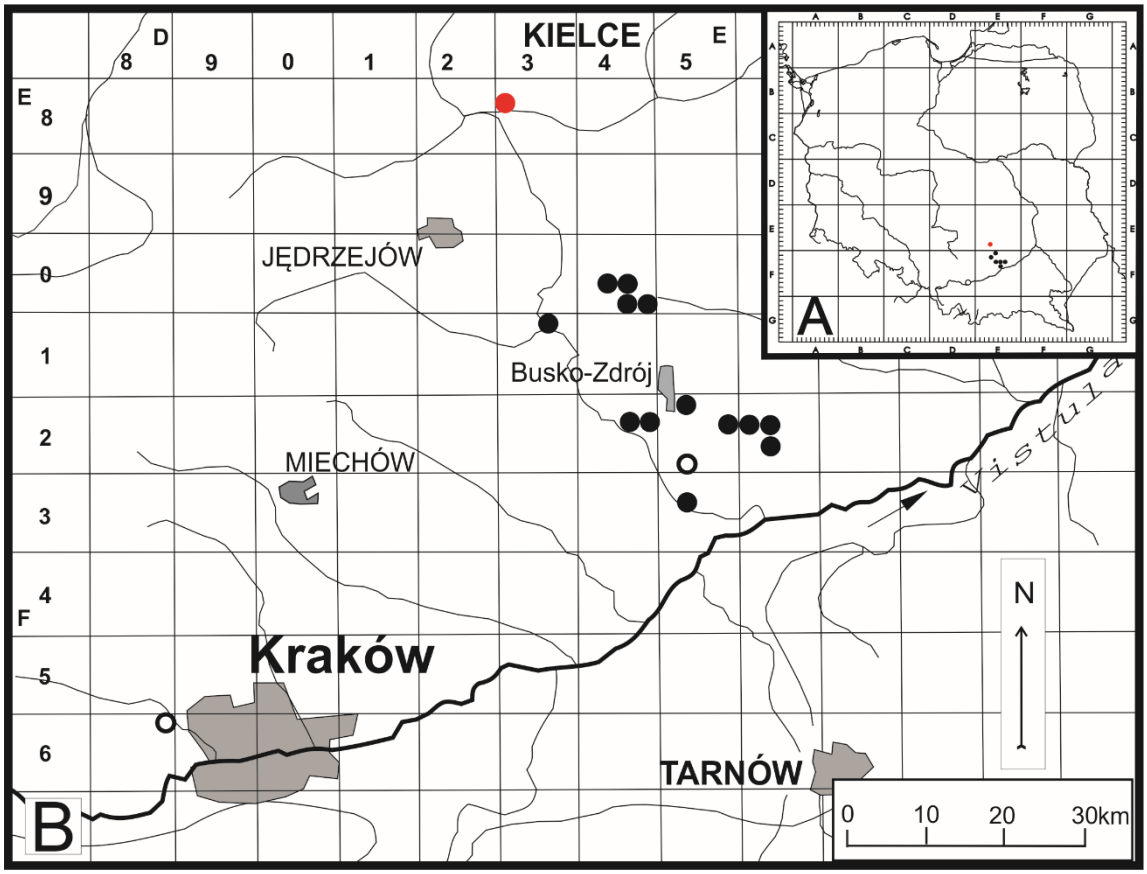

Fig 1: Distribution maps of *Arabis recta* Vill.: A – in Poland (in the ATPOL grid of squares 10 km^2), and B – in the Małopolska Upland (in the ATPOL grid of squares 2.5 km^2); ● – locality existing at present; ○ – locality not confirmed; ● – new locality

New record

A new locality of *Arabis recta* was found on the slopes of the Góra Sosnówka hill, near Chęciny (Kielecka Upland) during field studies conducted in 2017. This locality is currently the northernmost in Poland. The closest localities of *A. recta* are situated ca. 20 km southwards. Current distribution of the species (Fig. 1) was presented using the ATPOL system, in cartogram units of 10 km × 10 km and 2.5 km × 2.5 km (Zając 1978). On the south-eastern, south and south-western facing slopes of the Góra Sosnówka hill more than several hundred individuals of annual rockcress were noted. The species occurs there on limestone soils within grasslands representing *Festuco-Brometea* class (Fig. 2). Four homogenous patches of vegetation were documented using standard Braun-Blanquet method. All the phytosociological relevés are included in Table 1.

It is worth emphasizing that *Arabis recta* can be easily overlooked by the botanists during field studies as it is a quite small plant which undergoes very short life cycle lasting approximately six weeks. Thus, it is highly probable that the number of species localities in Poland is much higher than currently stated.

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Tab 1: Plant communities with *Arabis recta* documented on the slopes of the Góra Sosnówka hill.

No. of relevé	1	2	3	4
Date	15.06.2017	15.06.2017	15.06.2017	15.06.2017
Geographic coordinates	N 50° 48’ 8.3” E 20° 26’ 6.3”	N 50° 48’ 8.6” E 20° 26’ 12.6”	N 50° 48’ 8.6” E 20° 26’ 12.6”	N 50° 48’ 8.7” E 20° 26’ 11.5”
Area of relevé [m^2]	4	4	2	4
Exposure	S	SW	SW	SSW
Inclination [°]	5	10	10	5
Altitude a.s.l. [m]	283	285	285	284
Cover of C layer [%]	70	65	70	65
Cover of D layer [%]	60	55	10	50
Ch. Ass. *Sisymbrio-Stipetum capillatae*				
Arabis recta	1	1	2	1
Ch. O. *Festucetalia valesiacae*				
Achillea pannonica	.	+	.	.
Campanula sibirica	+	+	.	+
Potentilla arenaria	+	+	1	+
Thymus marschallianus	2	1	1	2
Thesium linophyllon	2	2	.	2
Ch. Cl. *Festuco-Brometea*				
Acinos arvensis	.	+	+	+
Anthyllis vulneraria	+	+	.	1
Arabis hirsuta	.	+	.	.
Artemisia campestris	.	+	.	+
Asperula cynanchica	1	.	.	+
Brachypodium pinnatum	2	2	1	.
Carex caryophyllea	2	2	.	1
Centaurea scabiosa	.	.	1	+
Centaurea stoebe	1	1	+	+
Dianthus carthusianorum	+	+	+	+
Euphorbia cyparissias	2	2	2	.
Festuca rupicola	2	2	1	.
Helianthemum nummularium subsp. *obscurum*	2	2	1	1
Poa compressa	.	+	2	.
Saxifraga tridactylites	.	.	.	1
Veronica spicata	1	+	+	1
Ch. Cl. *Trifolio-Geranietea sanguinei*				
Galium verum	+	1	.	.
Ch. et D. All. *Geranion sanguinei*				
Anthericum ramosum	.	+	.	1
Fragaria viridis	.	+	+	
Vincetoxicum hirundinaria	.	+	.	+
Others				
Arenaria serpyllifolia var. *viscida*	.	1	2	.
Asperula tinctoria	.	+	.	.
Briza media	+	+	.	1
Camelina microcarpa subsp. *sylvestris*	.	.	1	.
Chamaecytisus ratisbonensis	+	.	.	.
Erigeron acris	.	+	.	.
Falcaria vulgaris	+	.	.	.
Festuca rubra	.	.	.	2
Galium boreale	.	.	+	+
Hieracium pilosella	+	+	.	.
Holosteum umbellatum	+	.	.	.
Hypericum perforatum	.	.	+	.

Melampyrum arvense	+	.	+	+
Peucedanum oreoselinum	1	.	1	+
Pimpinella saxifraga	.	.	+	.
Prunella grandiflora	2	.	.	.
Salvia pratensis	.	+	.	.
Sanguisorba minor	1	2	2	1
Sanguisorba muricata	.	+	.	.
Scabiosa sp.	.	+	.	+
Sedum acre	2	+	.	.
Silene otites	+	+	.	.
Mosses and lichens (D)				
Abietinella abietina	3	3	1	3
Ceratodon purpureus	.	+	.	.
Didymodon ridigulus	.	.	.	+
Fissidens cristatus	.	.	+	.
Hypnum cupressiforme	.	1	.	1
Tortella tortuosa	1	1	.	1
Cladonia sp.	.	.	.	2

Fig 2: Habitat of *Arabis recta* Vill. on the Góra Sosnówka hill (photography by M. Nobis, 15.06.2017)

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