

**EXTENSIVELY USED GROUND ROADS SUPPORT THE MAINTENANCE OF  
*AIRA CARYOPHYLLEA* L. (POACEAE) IN OPOLE SILESIA**

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**ABSTRACT:** In 2011 two new localities of rare in Opole Silesia grass species - *Aira caryophyllea* were found. Newly populations occupy small areas within ground road in eastern part of Opawskie Mts. Details of newly discovered sites with short description of their habitats and plant association are given. A list of locations based on the literature data of *Aira caryophyllea* in the Opole Silesia region is also presented.

**KEY WORDS:** new sites, threatened species, vascular plants, distribution, flora conservation, Opawskie Mts, SW Poland

### **Introduction**

*Aira caryophyllea* is an annual plant that grows 5-30 cm in height with erect or erecto-patent, slender stems. The plant has glabrous, convolute leaves up to 5x0,3 mm. The sheaths are retrorsely scabridulous, not inflated, the uppermost far below the panicle. The ligule is 5 mm long, denticulate at apex. The panicle is open and spreading, with ascending branches and silvery spikelets. Pedicels are gradually thickened at apex. Glumes are ovate, acuminate, scabridulous on the keel, 1- to 3-veined, shining. The lemma is  $\frac{3}{4}$  as long as glumes, scabridulous towards the apex, with short hairs at base. Both florets are awned. The awn is exerted and arising ca.  $\frac{1}{3}$  of the way from base to apex (Tutin et al. 2005; Rutkowski 2008).

*Aira caryophyllea* grows well in dry, sandy or rocky, acid or neutral soils. It occurs in open habitats, in unfertile swards, on rocks, road verges and embankments (Oberdorfer 1994, Tutin et al. 2005). According to Matuszkiewicz (2007), it is a characteristic taxon of the *Airo-Festucetum ovinae* R. Tx. 1955 association.

*Aira caryophyllea* is a subatlantic-submediterranean species. It occurs mainly in southern, western and Central Europe, extending to southern Sweden (Tutin et al. 2005). In Poland, it is a sporadically appearing taxon, occurring in western part of the country (Czeczottowa 1928, Frey 1994, Zając A. and Zając M. 2001). In Opole Silesia *Aira caryophyllea* was reported from nine locations: Góra św. Anny, leg. Szafarkiewicz

16.06.1850 and 28.05.1854 (Frey 1994); Rogów Opolski – limestone quarries (Schube 1909), Eichberg – (Dębowa Góra) near Krzyżkowice (Schube 1914), Prudnik (Zeisigmühle; Schube 1929); Osowiec Śląski, leg. 30.05.1939, OPOL; Kały – sandy fallows, leg. Białucha 23.06.1940, OPOL (Michalak 1965, Nowak A. and Nowak S. 2005), Marszów – roadside (leg. Ciaciura 18.07.1963, KRAM; Ciaciura 1966, Frey 1994), Opole – railway embankment near quarry in Zakrzów (Michalak 1970), Praszka (Pawelec 1975, npbl. ATPOL; Fig. 1).

*Aira caryophyllea* is a red-listed species, regarded as an extinct in the Opole Silesia region (RE category; Nowak A. et al. 2008). In neighbouring regions the threat status of this taxon is assessed differently, obtaining lower categories; NT (near threatened) in Lower Silesia (Kački et al. 2003), LR (lower risk species) in Silesia province (Bernacki et al. 2000) and LC (least concern) in Wielkopolska (Jackowiak et al. 2007). *Aira caryophyllea* was also given a very high threat category (CR) in the Czech Republic (Procházka 2001) and category EN in Saxony – Germany (Korneck et al. 1996).

### **Methods**

Geobotanical investigations aimed at finding new sites of *Aira caryophyllea* and checking the literature ones were carried out within the territory of Opole Silesia in 2011. Relevés were made using the Braun-Blanquet method (Braun-Blanquet 1964). The syntaxonomical classification is given due to Matuszkiewicz (2007). The nomenclature of plants follows Mirek et al. (2002).

The description of new localities comprises exact stand location, population size, plant assemblage in which *Aira caryophyllea* occurs and threats on new sites.

### **Results**

As a result of geobotanical studies conducted within the area of Opole Silesia, two new sites of *Aira caryophyllea* were found. This species was noticed in three patches of *Airo caryophylleae-Festucetum ovinae*, on ground, sandy roads at the fringe of forest *Luzulo luzuloidis-Quercetum*.

These new locations are given below:

1. Dobieszów (N 50° 10' 25,9"; E 17° 41' 14,0" and N 50° 10' 27,3"; E 17° 41' 12,0"; 347 m; ATPOL square: CF53); ca. 200 specimens. The population grows on the ground road verge which is located in the vicinity of wood *Luzulo luzuloidis-Quercetum petraeae*, from southern side. The road is extensively used mainly by forest administration during the thinning or clearance works and sporadically by farmers. The plants were flowering and fruiting at the time of monitoring in 2011.

2. Krasne Pole (N 50° 07' 13,1"; E 17° 31' 46,4"; 434 m; ATPOL square: CF53); ca. 100 individuals occur in the *Airo caryophylleae-Festucetum ovinae* R.Tx. 1955 association (Tab. 1, relevé 1). The population grows within the central part of the ground road which is located on southern side of forest *Luzulo luzuloidis-Quercetum petraeae*. The road is extensively used mainly by forest administration during the thinning or clearance works. The plants were flowering and fruiting at the time of monitoring in 2011.

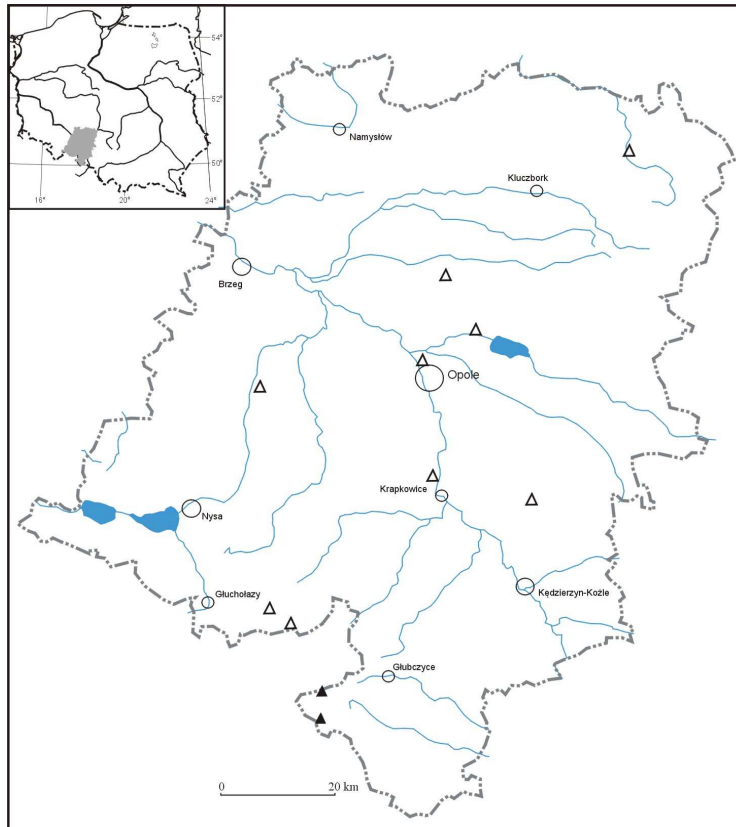


Fig. 1 Distribution map of *Aira caryophyllea* L. in Opole Silesia. ▲ - new locality, △ - literature locality not confirmed after 1990

### Conclusions

*Aira caryophyllea* is extremely rare taxon in Opole Silesia. In all research periods the species had no more than several populations within the region. Scarcity of suitable natural habitats, distance to other locations in the Czech Republic and other neighboring voivodeships in Poland make the species a very sporadic, fulfilling the criteria for critically endangered taxon. For a long time *Aira caryophyllea* has not been confirmed within the region, thus, it was categorized as an extinct species in Opole province. It is interesting, that the species was often sheltered in man made habitats. Formerly, *Aira caryophyllea* was reported from quarries, fallow lands, railways and road verges. Nowadays all populations of the species grow in loose grasslands on extensively used ground roads. Therefore, the maintenance of the species depends on intensity of usage of these anthropogenic habitats, which can neither be legally protected nor undergo special conservation management. The newly found populations of *Aira caryophyllea* will be monitored. Seeds of several specimens were collected and stored in gene bank of the Polish Academy of Sciences in Warsaw.

Tab. 1. *Aira caryophyllea* L. in the *Airo caryophylleae-Festucetum ovinae* R.Tx. 1955 association

Successive number of relevé day	1	2	3
Date: month	15	10	10
year	7	7	7
North latitude	2011	2011	2011
East longitude	50 <sup>0</sup> 07'13",1	50 <sup>0</sup> 10'25",9	50 <sup>0</sup> 10'27",3
Altitude a.s.l. (m)	17 <sup>0</sup> 31'46",6	17 <sup>0</sup> 41'14"	17 <sup>0</sup> 41'12"
Cover of herb layer c (%)	434	347	347
Relevé area (m <sup>2</sup> )	90	55	35
Locality	2	2	2
Number of species	Krasne Pole	Dobieszów	Dobieszów
	22	17	11
<b>Ch.Ass. <i>Airo-caryophylleae-Festucetum ovinae</i></b> <i>Aira caryophyllea</i>	1	1	1
<b>Ch.,D.*All. <i>Vicio lathyroidis-Potentillion argenteae</i></b> <i>Hypochoeris radicata</i>	1	.	+
Sporadic species: <i>Dianthus deltooides</i> 1; <i>Plantago lanceolata</i> s.l.* 1(1); <i>Potentilla argentea</i> 1.			
<b>Ch.O = Ch.CI. <i>Corynephorretalia canescentis, Koelerio glaucae-Corynephorretea canescentis</i></b> <i>Agrostis vinealis</i>	4	1	1
<i>Festuca ovina</i>	.	3	3
<i>Dianthus carthusianorum</i>	.	2	1
<i>Filago minima</i>	+	+	.
Sporadic species: <i>Rumex acetosella</i> 2(1); <i>Thymus serpyllum</i> 1(1); <i>Trifolium arvense</i> 1(1).			
<b>Accompanying species</b> <i>Hieracium pilosella</i>	3	1	+
<i>Trifolium aureum</i>	1	+	.
<i>Hypericum perforatum</i>	+	.	1
<i>Achillea millefolium</i>	+	.	+
<i>Melampyrum pratense</i>	.	+	+
<i>Quercus petraea</i> c	.	+	+
Sporadic species: <i>Arrhenatherum elatius</i> 1; <i>Centaureum erythraea</i> 1(1); <i>Chamaecytisus supinus</i> 2(1); <i>Euphorbia cyparissias</i> 1; <i>Euphrasia stricta</i> 1(2); <i>Genista tinctoria</i> 2(1); <i>Gypsophila muralis</i> 2; <i>Hieracium lachenalii</i> 2; <i>Juncus tenuis</i> 2; <i>Lotus corniculatus</i> 1; <i>Luzula luzuloides</i> 3; <i>Melampyrum nemorosum</i> 1; <i>Pimpinella saxifraga</i> 1(1); <i>Polygala comosa</i> 1; <i>Stellaria graminea</i> 1; <i>Veronica officinalis</i> 2; <i>Viscaria vulgaris</i> 2.			

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