

Coronilla vaginalis – a species new for the flora of Poland

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Abstract

Coronilla vaginalis Lam., a Central European montane species, is reported for the first time from Poland, from the Tatra Mountains. A general map of the taxon's distribution is given, and the location of the newly recorded stand is shown on a map of Poland and the Tatra National Park. Its habitat, calcareous grassland of the order *Seslerietalia*, is characterized in detail.

Keywords: *Coronilla vaginalis*; Poland; Tatra Mountains; calcareous grassland; new locality

Introduction

The vascular plant flora of Poland is so well known that except for native microspecies and alien newcomers we do not expect to discover previously unknown indigenous representatives of this group. All the more interesting, then, to find a new montane species, in such a well-researched area as the Tatra Mountains. The wrong season or bad weather is enough to make one overlook a new species; another visit to the same spot might produce such a record. That was the case with the present find, in Tatra National Park, of *Coronilla vaginalis*, a species not reported from there or anywhere else in Poland. It is a Central European mountain species known from the Western Carpathians but has not been previously reported from its northern section, including the Polish part of the range.

Area of the Tatra Mountains, in particular some calcareous ranges of its western part, it is a place of exceptional accumulation of rare, threatened and unique elements of flora in the scale both of Tatra Mountains, the Carpathians as well as Poland. Apart from Czerwone Wierchy range, undoubtedly the part of Tatra National Park most abounding with occurrence of such kinds of vascular plants [1] also an area of the widely understood massif of the Kominiarski Wierch is significant. This is a place where another species of vascular plants, new for the flora of Poland were found, what is still enhancing this special position of listed area.

New discoveries of this type being all at the same time discoveries of some geographical element are affecting phytogeographical discussions both in regional and general

scale, getting in the process out of the side phytogeographical identity of the flora and are supplementing our knowledge about history. This is why such aspects are discussed in the paper.

Material and methods

The stand is characterized based on data collected during the 2013 field season. The species was determined from material collected at the locality (fragment of fruiting stem), which is deposited as voucher material in the herbarium of the W. Szafer Institute of Botany, Polish Academy of Sciences (KRAM).

Results

Locality

The newly discovered locality is near the trail leading to the Polana na Stołach glade (ca. 1125 m a.s.l., 49°15'06.6" N, 19°51'46.6" E, Datum: WGS-84; Fig. 1).

Habitats

At the recently discovered locality, *Coronilla vaginalis* was found on a rocky calcareous ridge ca. 150 m above the bottom of the Dolina Kościeliska valley (Fig. 2).

The habitat of the plant is calcareous grassland related to *Carici sempervirentis-Festucetum tatrae* with admixture of species characteristic of the alliance *Pulsatillo slavicae-Pinion (Erico-Pinion)* [2,3], developed on shallow rendzina soil. The locality is on a very steep slope (50–70°) with a SSE exposure (Fig. 3).

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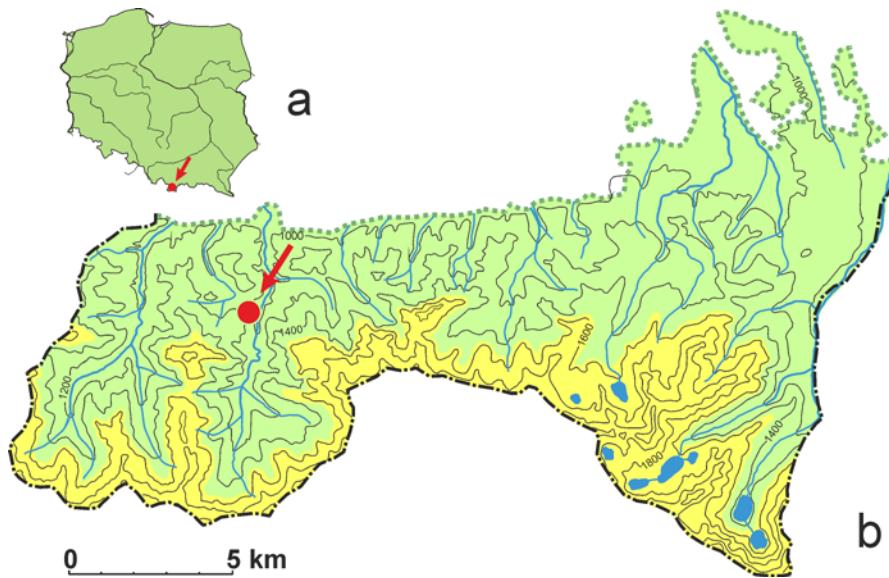


Fig. 1 Locality of the newly discovered stand of *Coronilla vaginalis* on a map of Poland and Tatra National Park.



Fig. 2 View of the locality of *Coronilla vaginalis* (arrow) from the bottom of the Dolina Kościeliska valley.



Fig. 3 Closer view of the habitat of *Coronilla vaginalis*.

Species characteristics

The description provided is based on specimens found in the locality; supplemented with the information from flora of Poland [4], flora of Slovakia [5] and flora of Europe [6].

Coronilla vaginalis Lam., Small Scorpion vetch, is a perennial plant often having a lignified stem base (semi-shrub, chamaephyte), blue-green in color (Fig. 4, Fig. 5).

Stem prostrate to ascending, lignified in lower part, 5–25 cm tall, usually unbranched, leaves petiolate, imparipinnate with 2–6 leaflet pairs. Leaflets relatively thick, somewhat fleshy, with weakly marked venation and scarious margin, obovate, broadly elliptic or roundish, often with asymmetrical wedge-shaped base, rounded at top, more rarely emarginate and mucronulate, 3–12.5 mm long and 2–9 (11) mm wide. Stipules large, membranous, connate, forming a sheath opposite the peduncle base. Head inflorescence, 4–7-flowers, apparently terminally standing on peduncles up to three times (and more) longer than the leaves supporting them. Flowers \pm nodding, 8–9 mm long, on pedicels 2–2.5 (3) mm long (\pm equal to length of calyx). Bracts very small. Calyx campanulate, membranous; sepals very short, broadly triangular, upper ones \pm fused. Corolla bright yellow (greenish when dried); petals on unguis slightly longer than tubes of calyx; vexillum (standard) in upper part \pm circular, with red-brown venation, cut at top, with small ears at base; wings as long as vexillum or slightly longer, with edges of lamina often folded pouch-like; keel tapering, almost half the length of other petals. Pods hanging

or protruding, \pm bent, light-brown (often reddish) or blackish purple, 9–35 mm long and 2–3 mm broad, lomentaceous, consisting of (1)3–7(8) segments, 6-angled, 4 of the angles winged. Seeds cylindrical, brown. Flowering June–July.

Coronilla vaginalis differs from its only relative in the flora of Poland, *Coronilla varia* L. [also known as *Securigera varia* (L.) Lassen], mostly by corolla color, which is white, pink or purple in the latter. *Coronilla varia* is a perennial herbaceous plant (hemicryptophyte) with lesser, free and herbaceous stipules; also unlike *Coronilla vaginalis* its pods are erect. Another representative of the genus not occurring in Poland but known from localities close to the country's southern and eastern borders is *Coronilla coronata* L., differing from *Coronilla vaginalis* in having more flowers (12–24) in the heads, longer pedicels (4–6.5 mm), an obovate vexillum (standard) and unwinged, 4-angled pods consisting of 1–4(5) segments.

General distribution

Coronilla vaginalis is a Central European-submediterranean oreophyte (Fig. 6). Its center of distribution is in the Alps and Dinarides, where it is common; the Western Carpathian sites form the northeast section of the range. To the north its distribution reaches central Germany (isolated enclaves in Thuringia and the Franconian Jura). Only a few sites have been recorded in the central and southern parts of the Apennine Peninsula, and a single one (the easternmost) in the Southeastern Carpathians in Romania [7]. Its

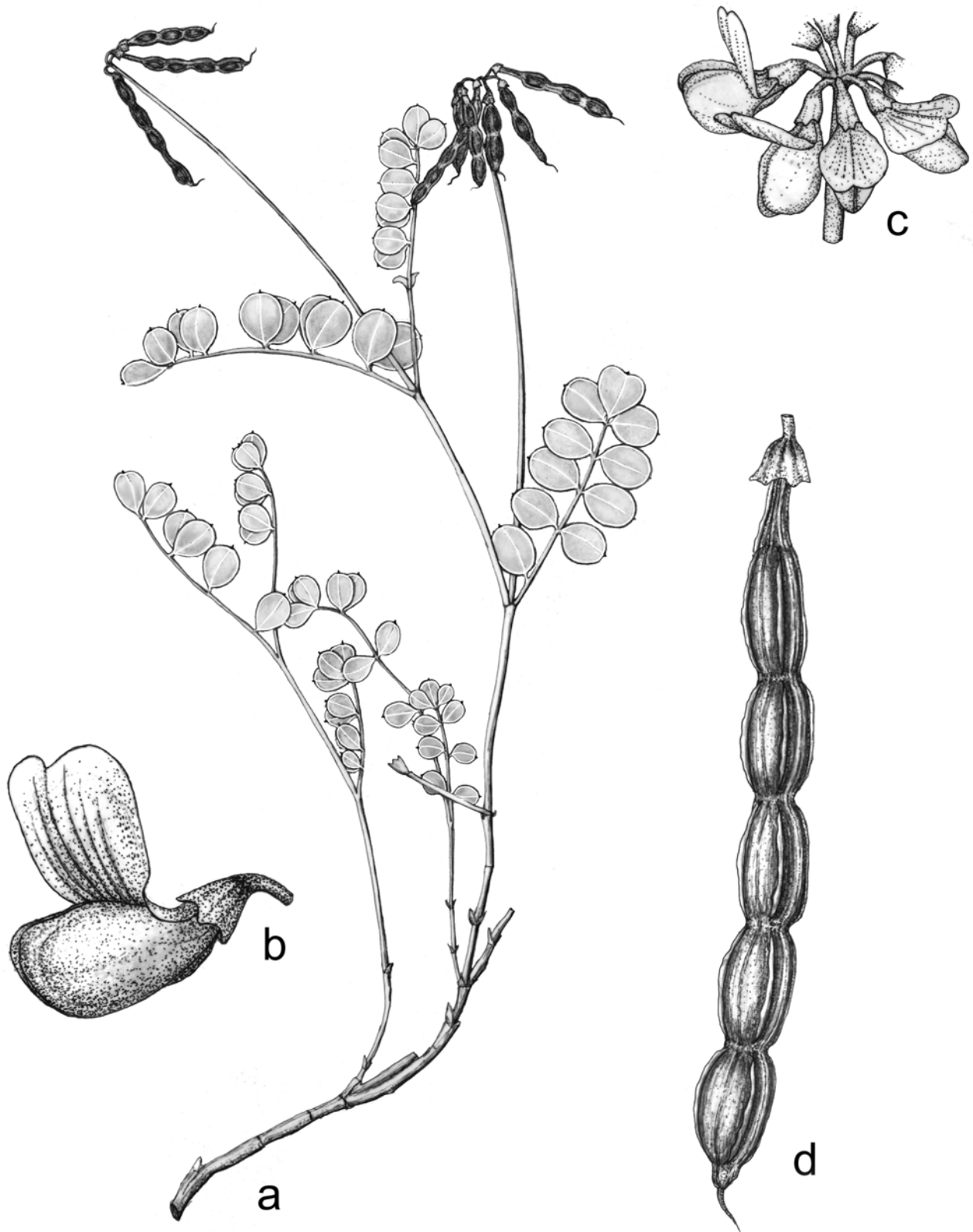


Fig. 4 *Coronilla vaginalis*: habit (a), flower (b), inflorescence (c), pod (d). Original drawing based on herbarium sheet (a,d) and photos of living individuals (b,c) by Jolanta Urbanik.

distribution known thus far, characterized above, includes France, Germany, Switzerland, Austria, the Czech Republic, Slovakia, Hungary, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Albania, Serbia and Romania [6,8], and now also Poland.

Closest sites

The Tatra site is the northeasternmost locality of *Coronilla vaginalis* across the species range and is not very distant from the relatively compact Western Carpathian section of its range (Fig. 6).



Fig. 5 Living *Coronilla vaginalis* plants at the described locality above the Dolina Kościeliska valley.

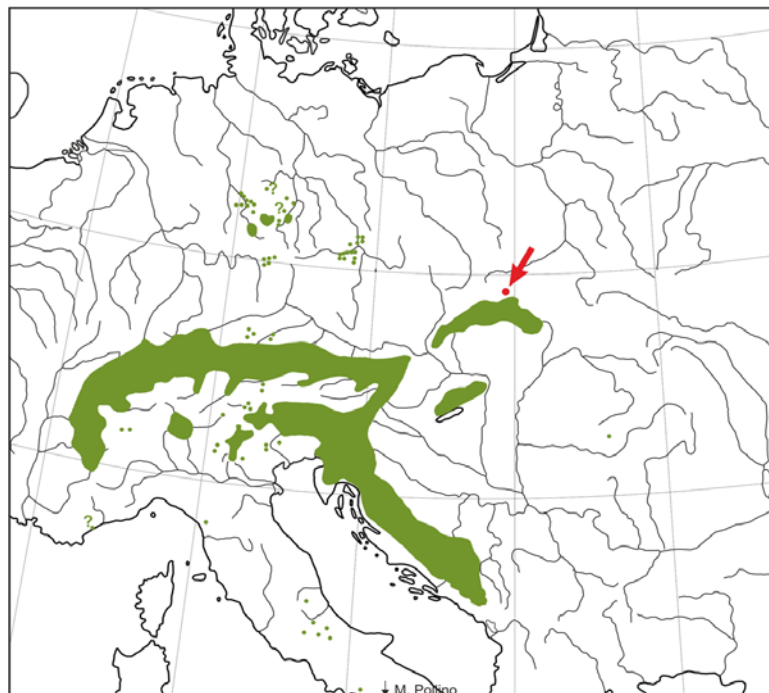


Fig. 6 General distribution of *Coronilla vaginalis* (according to Meusel et al. [7] – modified).

The closest sites in the Liptov Basin, western part of Choč and the Sivý Vrch range [5] lie ca. 20–27 km (straight-line distance) to the south and southwest of the site in the Polish Tatras.

Discussion

Possible origins of the site in the Tatras. Three scenarios might explain the origin of the site above the Dolina Kościeliska valley.

The species is a relict of the warmest postglacial period and moved into the Tatras 7500–7000 years ago [9,10].

The species is a newcomer and has reached the Tatras very recently, perhaps as late as the last quarter-century, in a period of considerable warming and “Atlantisation” of the climate. Some examples argue for that scenario; *Galium hercynicum* Weig. (subatlantic species) is one of them [11,12].

The species was deliberately or accidentally introduced.

It is difficult to resolve the case. One can only assign a higher or lower likelihood to each of these scenarios. The third is least likely. Nearly a century ago, alpine species were planted on experimental plots in the Polana na Stołach glade [13,14], and some of the species planted at that time spread out in the immediate vicinity of the plots [15,16], with some, such as *Crepis aurea*, surviving on that clearing even today. Hence one might wonder whether *Coronilla* could have got here that way; however, the cited sources give detailed

lists of the taxa planted, which do not include *Coronilla vaginalis*. Also, the new locality of *Coronilla* is relatively well isolated and distant from the sites of the experimental plots mentioned above. It is true that when the area was under intensive grazing the entire area was penetrated by sheep. That would have mattered to our considerations if there were any mentions of the species having been planted, but there are none. The site where *Coronilla* grows is off the trail and can be visited only sporadically by someone wandering away from it. Lastly, there is no evidence of active reforestation on previously grazed mountain meadows, nor any evidence of the use of seeds originating from outside of Poland. So the third scenario is highly unlikely.

The circumstances presented above, as well as the general phytogeography of the species (Central European-submediterranean montane) indicate that it may have appeared at the newly discovered site spontaneously. This leaves only the first two scenarios, but without evidence for one or the other. The fact that very rare species of similar nature are long known to be present both in the part of the Kominy Tylkowe mountain pasture and in other sections of the West Tatras points to the first scenario positing the locality's older age and relict nature; but as the population of *Coronilla vaginalis* there is extremely sparse – only two or three plants at the discovered site – the locality might be very young indeed. All that can be said with much certainty is that the site most likely is a natural one and that its anthropogenic origin is very unlikely.

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Authors' contributions

The following declarations about authors' contributions to the research have been made: field research, determination of species, writing the manuscript, preparation of distribution maps and illustrations: ZM, AN, ŁW.

Competing interests

No competing interests have been declared.

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