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Short note

Dracocephalum ruyschiana (Lamiaceae): first record for Spain

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Abstract. *Dracocephalum ruyschiana* L. is an Eurasian continental species with a fragmented distribution extending from the boreal regions to the Asian steppes and European mountains. In the Pyrenees it is only known from three locations in France, but two of them have not been rediscovered in modern times, and there are no citations in Spain or Andorra. In summer 2021 a population was found in the Val d'Aran (Catalan Pyrenees, Spain). A complete description is presented, and an identification key is included as an amendment for their taxonomic treatment in *Flora iberica*. Its current Pyrenean distribution, habitat and phenology are also reported. The conservation status is evaluated under the IUCN regional and national levels.

Keywords. *Dracocephalum ruyschiana*, *Flora iberica*, Iberian Peninsula, Pyrenees, taxonomy.

Resumen. *Dracocephalum ruyschiana* L. es una especie Euroasiática continental con una distribución fragmentada que se extiende desde las regiones boreales hasta las estepas asiáticas y montañas europeas. En los Pirineos solo se conoce de tres localidades en Francia, pero dos de ellas no han sido redescubiertas en tiempos modernos, y no hay citaciones en España o Andorra. En el verano de 2021 se encontró una población en el valle de Aran (Pirineos Catalanes, España). Se presenta una descripción completa y una clave de identificación como enmienda al tratamiento taxonómico de *Flora iberica*. Se aporta información sobre la distribución actual en el Pirineo, el hábitat y fenología. Se evalúa el estado de conservación siguiendo los criterios UICN a escala regional y estatal.

Palabras clave. *Dracocephalum ruyschiana*, *Flora iberica*, Península Ibérica, Pirineos, taxonomía.

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Title in Spanish: *Dracocephalum ruyschiana* (Lamiaceae): primer registro para España.

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Dracocephalum ruyschiana L. is an Eurasian continental species with a fragmented distribution extending from the boreal regions to the steppes and European mountains (GBIF Secretariat 2021; POWO 2021). In Europe is a rare species but widely extended, mainly distributed in the central part of the continent but extends northwards to Norway and Sweden and southwards to Alps, Dinaric Alps, Carpathians and Pyrenees (Heywood 1972; GBIF Secretariat, 2021). It is considered a relict species that migrated from the Russian and Asian steppes to Europe during the warm and dry interglacial periods (Lazarević & al. 2009). In the Pyrenees it is only known in France, but it has never been reported in Spain or Andorra (Heywood 1972; Morales 2010). In the French Pyrenees, the species is known since the 19th Century (Dulac 1867), and it is reported from the departments of Haute-Garonne (commune of Casaus de Larbost) and Hautes-Pyrénées (communes of Lus e Sent Sauvaire and Cauterets) in the Midi-Pyrénées region, but the current distribution and status is unclear. According to

Tela Botanica (<https://www.tela-botanica.org>), *D. ruyschiana* is only reported in Hautes-Pyrénées as “Présence”. However, according to SIFlore (<http://siflore.fcbrn.fr>, Just & al. 2015) the species is confirmed with only one observation after the year 2000 in Haute-Garonne, but in Hautes-Pyrénées there are no modern observations, and the only reported observation is from Dulac (1886). Moreover, according to the Atlas of the flora of the Pyrenees (<http://www.atlasflorapyreneaea.eu>), there is another locality in the Lutor valley (commune of Cauterets) reported by Dulac (1867). Finally, Leblond & Gourvil (2012) indicated that in the Pyrenees, *D. ruyschiana* is a relict species with currently only one locality confirmed and with two historical localities not found in modern times.

With these data, *D. ruyschiana* was assessed as Endangered (EN D) in the Midi-Pyrénées (Corriol 2013) and vulnerable (VU) in the whole Pyrenees (Reteau, 2019). The species was also included in the Appendix I of the Convention on the Conservation of European Wildlife and

Natural Habitats (Bern Convention), and was assessed as Least Concern (LC) in the European Red List of Vascular Plants (Bilz 2011) but it is considered threatened in its extremes of distribution, like Norway (Vulnerable VU A4(a,c); Henriksen & Hilmo 2015) or most of the southern European mountain ranges: Endangered in the Carpathians (Witkowski & al. 2003), Endangered EN B2ab(iii) in Italy (Rossi & al. 2013), Critically Endangered CR B2ab(iii); C2b in Serbia (Lazarević & al. 2009), and also in some regions of the Alps: Vulnerable A3c; B2ab(iii) in the north side of the Swiss Alps (Bornand & al. 2019) and Possibly extinct CR(PE) in the south side of the Swiss Alps (Bornand & al. 2019).

In July 2021, during the field work of the project “Habitat cartography of Catalonia, 3rd version (CHC25v3) 1:25:000 scale” a population of *Dracocephalum ruyschiana* was found out in the Val d’Aran county (Lleida province), central Pyrenees, Catalonia (Spain), in the Artiga de Lin valley (Vielha e Mijaran), and it becomes the first record of this species in Spain. Some specimens from this population were collected on 2 and 18 July 2021 and deposited to BC herbarium (BC 983298, BC 983299) to carry out a morphological study.

The taxonomic identification was made using European floras and other territories with the presence of *D. ruyschiana*

(Bubani 1897; Coste 1906; Heywood 1972; Li & Hedge 1994; Morales 2010; Schischkin 1976).

Identification key

In order to add *Dracocephalum ruyschiana* to the identification key of the genus in *Flora iberica* (Morales 2010) and thereby facilitating further identification an identification key is provided to distinguish between these two species:

1. Steam hairy, with short and long hairs; leaves pinnatipartite, as well as undivided, aristate; bracts pinnatipartite, aristate; flowers ca. 4 cm ... 1. *D. austriacum*
- Steam glabrous or shortly hairy; leaves and bracts linear to lanceolate, undivided, non-aristate; flowers 2,1–2,8 cm 2. *D. ruyschiana*

Morphology.—The descriptive terminology follows Morales (2010) and Heywood (1972) and is based on the collected material in the Aran Valley (BC 983298, BC 983299).

Perennial, suffrutescent, up to 50 cm (Fig. 1a). Stems ± woody at the base, erect, with short hairs, retrorse or appressed. Leaves sessile or subsessile, 14–50 × 1–4 mm, linear to lanceolate, obtuse, ± revolute, with marked midrib, short hairy on margin, the reduced axillary shoots with narrower leaves

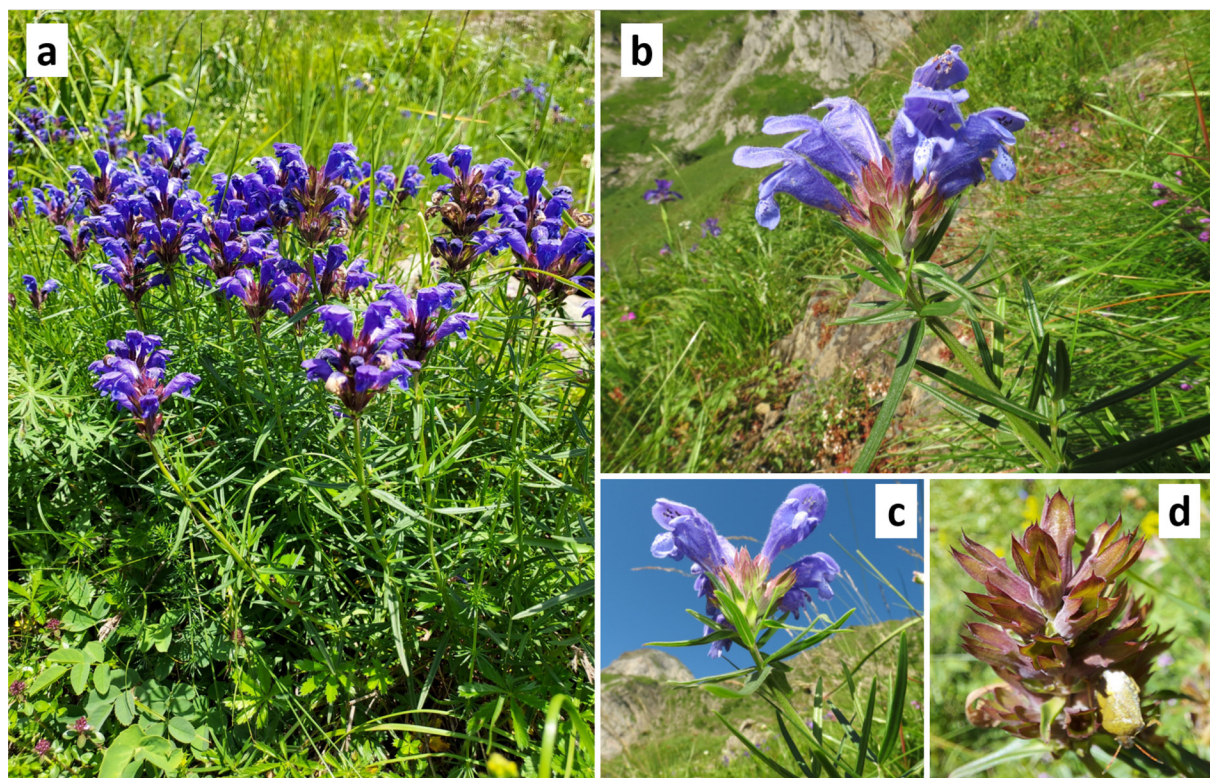


Fig. 1. *Dracocephalum ruyschiana* in the Artiga de Lin valley: **a**, habit; **b-c**, floriferous steams, glabrous or with short hairs, with simple leaves and bracts; **d**, detail of the calyx [photos: M. Guardiola].

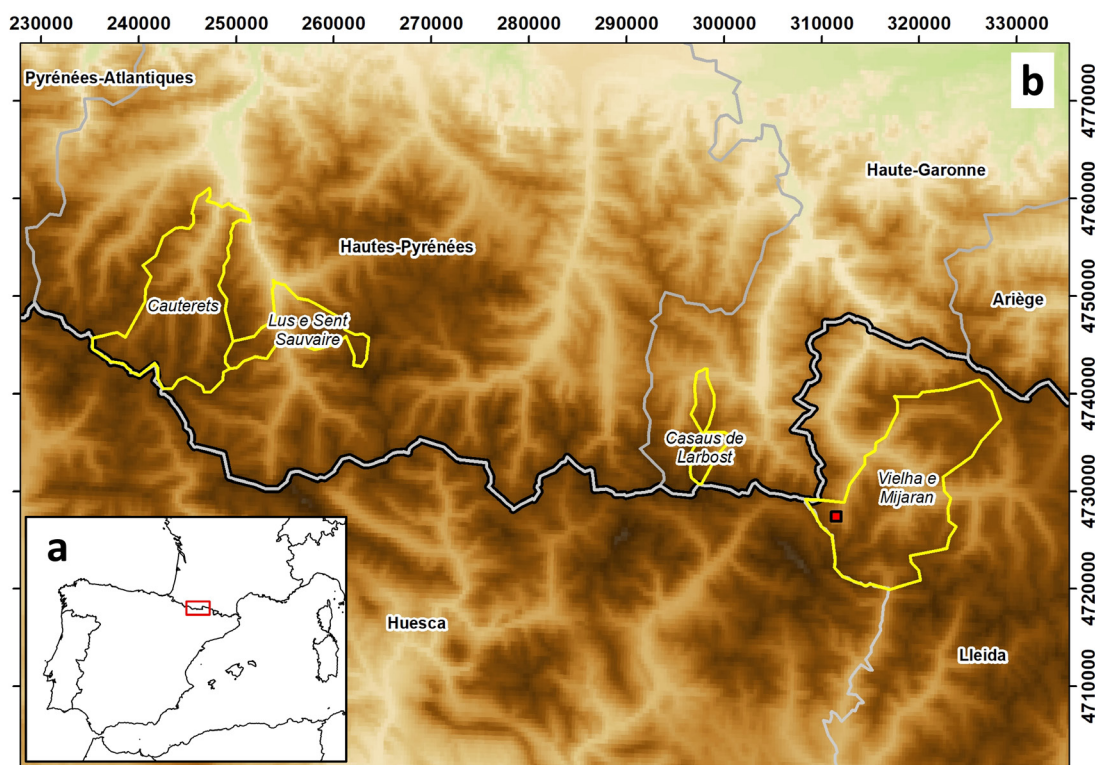


Fig. 2. Distribution map of *Dracocephalum ruyschiana* in the Pyrenees: **a**, map showing the broad situation of the species in the Pyrenees (red square); **b**, detailed map of the species distribution in the Pyrenees. Black and grey lines represent the border between France and Spain; grey lines represent the limits of autonomous communities in Spain and regions in France; yellow polygons represent the limits of the municipalities with known populations of *D. ruyschiana*; red square represents the 1x1 km UTM square where the new population was found.

(Fig. 1b, c). Inflorescence 3.5–6 cm, formed by verticillasters $\pm$ close, the lower sometimes distant, with 4–6 flowers each. Bracts ovate-lanceolate or lanceolate, $\pm$ acuminate, 11–30 mm, with marked midrib, ciliated at margins; bracteoles ovate-lanceolate or lanceolate, $\pm$ acuminate, 4–10 mm (Fig. 1c). Flowers with pedicel of 1–2 mm. Calyx 7–12 mm, tubular, densely pubescent; upper center tooth 5–7 $\times$ 3 mm, broad, rounded on top, acuminate, densely pubescent, upper lateral teeth and lower teeth 5–6 $\times$ 1 mm, fine, acute, densely pubescent, all reticulated (Fig. 1d). Corolla 21–28 mm, $\pm$ conical, violet-blue color, pubescent outside, lanate within only on upper lip; upper lip 5–7 cm, lower lip with 3 lobes, the central one larger, whitish with blue spots in the middle. Stamens included (but some exerted in preserved specimens), inserted more than 10 mm above base of corolla; $\pm$ hairy filaments specially at the base; anthers with cottony hairs, with the theca separated at the base, connivent. Stigma bifid with equal branches. Núcles c. 3 mm, dark brown.

Distribution and habitat.—Meso-xerophile grasslands of the subalpine stage, 1700–1900 m. From Russia and Mongolia to central Europe extending locally northwards to Norway and southwards to mountain ranges of Europe (Alps, Dinaric Alps, Carpathians and Pyrenees). In Spain the new popu-

lation of *D. ruyschiana* is located in the Central Pyrenees of Catalonia, Artiga de Lin valley, between the Tuc de Pomèro peak and the Barranc dera Ribèra (Val d’Aran county, Lleida province), 31T CH1127 (ETRS89), 1700–1900 m (Fig. 2), on a hillside oriented to the south-east (Fig. 3a). This new population is located more than 10 km far from its nearest population in the French commune of Casaus de Larbost.

The new population of *Dracocephalum ruyschiana* occurs in a very restricted area, about less than 20.000 m², in a transition zone between acidic sandstones and lutites, and calcareous marbles. At the lower-flat zones at the bottom of the valley, there are mesophile silicicolous grasslands of the montane and subalpine belts of the Pyrenees (habitat CORINE 35.122⁺; see Carreras & al. 2016), and in the steep slopes of the south-east hillside there are mesophile deep soil *Festuca spadicea* L. grasslands (CORINE 36.3312) and subalpine calcicolous semi-dry grasslands with *Festuca spadicea* L. and *Rhaponticum centauroides* (L.) O.Bolòs of the sunny slopes of the Pyrenees (CORINE 34.32613⁺) clumpered with rock outcrops. *Dracocephalum ruyschiana* is restricted to the borders of rock outcrops, in a thin zone with deep soils but where the subalpine mesophile grasslands are not dense (Fig. 3b, c). The species

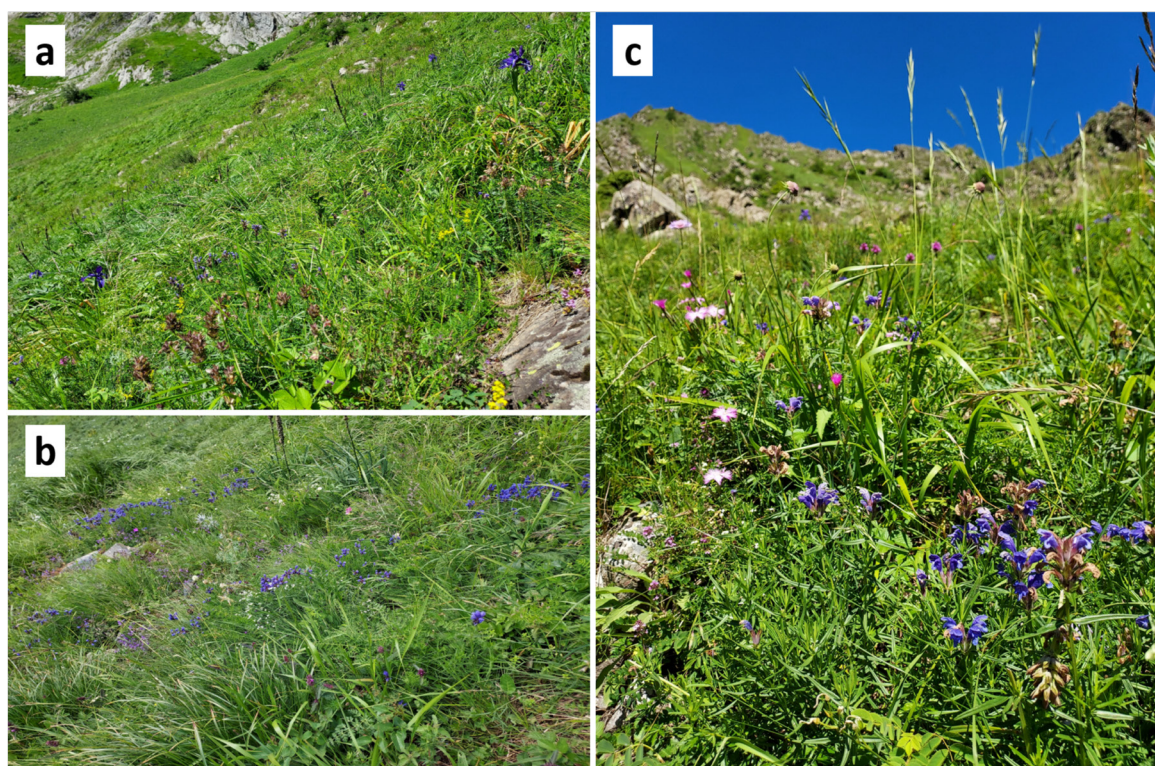


Fig. 3. Habitat of *Dracocephalum ruyschiana*: **a**, the species occurs on a steep slope oriented to south-west in a narrow zone between rocky habitats and dense subalpine mesophile grasslands; **b**, individuals appeared isolated or clumped nearby rock outcrops; **c**, the species prefers zones with low cover of *Gramineae* and avoid the dominant dense tallgrass grasslands [photos: M. Guardiola].

grows together with *Anthericum liliago* L., *Asphodelus albus* Mill., *Aster alpinus* L., *Carduus defloratus* subsp. *argemone* (Pourr. ex Lam.) O. Bolòs & Vigo, *Centaurea nigra* L., *Clinopodium alpinum* (L.) Kuntze, *Crepis pyrenaica* (L.) Greuter, *Cruciata glabra* Ehrend., *Dianthus hyssopifolius* L., *Festuca spadicea* L., *Galium verum* L., *Geranium sanguineum* L., *Globularia nudicaulis* L., *Hippocrepis comosa* L., *Hypericum richeri* Vill., *Iris latifolia* (Mill.) Voss, *Laserpitium latifolium* L., *Laserpitium siler* L., *Phyteuma orbiculare* subsp. *anglicum* (Rich. Schulz) P. Fourn., *Potentilla neumaniana* Rchb., *Potentilla rupestris* L., *Rhaponticum centauroides* (L.) O. Bolòs, *Rosa pendulina* L., *Scabiosa columbaria* L., *Sedum rupestre* L., *Stachys alopecuroides* (L.) Benth., *Stachys officinalis* (L.) Trevis., *Stachys recta* L. and *Thymus ovatus* Mill.

Phenology.—According to field observations, the species blooms between June and July.

Conservation status.—To evaluate the vulnerability of *Dracocephalum ruyschiana*, the IUCN (2012a) methodology was applied. Considering the Spanish Pyrenees, the species is restricted to one location included in one 1×1 km, with a population of less than 250 mature individuals (although a precise prospection should be done in the future). With this data, *D. ruyschiana* should be assessed as “Endangered” EN D (IUCN 2012a). However, applying a regional and national

correction (IUCN 2012b) to the IUCN criteria, the category is downlisted to VU° D1+2 because the recolonisation from the neighbouring French populations is possible.

There are currently no major impacts for the newly discovered population and no signs of damaged individuals, population decline or fluctuations, neither indication of reduction in geographic range were detected. But as Leblond & Gourvil (2012), vegetation closure or encroachment, harvesting and isolation are the main threats for the French Pyrenees plant populations. The new population occurs in a narrow zone between rocky habitats and a dense subalpine mesophile grassland, and nor individuals have been seen inside the dense grassland neither in rocky soils. The species occurs near the Artiga de Lin refuge, and some hiking trails pass by near the population, so harvesting by hikers or botanical collectors is a potential threat due to the attractiveness of the flowers. Finally, problems due to isolation could be important because the new population has less than 250 individuals, is restricted to an area of less than 20.000 m² and the nearest population is located further away than 10 km.

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