

Article

Not peer-reviewed version

Sideritis royo (*Lamiaceae*), A New Orophilous Species from Northeastern Spain

[Llorenç Sáez](#)*, Rafel Curto, [Manuel B. Crespo](#)

Posted Date: 12 December 2023

doi: 10.20944/preprints202312.0812.v1

Keywords: endemism; orophytes; taxonomy; morphology; Mediterranean basin; Iberian Peninsula



Preprints.org is a free multidiscipline platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Article

Sideritis royai (Lamiaceae), a New Orophilous Species from Northeastern Spain

Llorenç Sáez ^{1,*} and Rafel Curto ² and Manuel B. Crespo ³

¹ Systematics and Evolution of Vascular Plants (UAB) – Associated Unit to CSIC, Dept. BABVE, Autonomous University of Barcelona, ES-08193 Bellaterra, Spain; ORCID: <https://orcid.org/0000-0003-4551-2432>

² Grup EbreRecerca, ES-43500, Tortosa, Tarragona, Spain; rafelalumini@gmail.com; ORCID: <https://orcid.org/0000-0003-0729-0787>

³ Department of Environment Sciences and Natural Resources (dCARN), University of Alicante, P.O. Box 99, ES-03080 Alicante, Spain; crespo@ua.es; ORCID: <https://orcid.org/0000-0002-3294-5637>

* Correspondence: llorens.saez@uab.cat

Abstract: *Sideritis royai* is described from limestone rocky habitats of the Port Massif (southern Catalonia, Spain). The species was first collected by the local botanist Lluís de Torres in the late part of the 20th century, but the specimens have remained unidentified positively in herbaria for over 40 years. *Sideritis royai* likely belongs to section *Sideritis* subsection *Hyssopifoliae* and shows some morphological affinities with the relatively widespread South European species *S. hyssopifolia* L., but it much differs in having subspinescent upper leaves, main surfaces of the leaves glabrous or glabrescent, the main abaxial surface of the bracts without eglandular hairs, and shorter inflorescences. Weaker similarities were also observed with some species belonging to *S.* subsection *Fruticulosae* Obón & D.Rivera. A description for the new orophilous species is provided, along with a detailed illustration, field photographs, and a comparison with closely related species. We include an assessment of its conservation status and a dichotomous key for identification of all the species of *Sideritis* subsection *Hyssopifoliae*.

Keywords: endemism; orophytes; taxonomy; morphology; Mediterranean basin; Iberian Peninsula

1. Introduction

Sideritis L. is a large genus of family *Lamiaceae* Martynov, nom. cons., that includes nearly 150 species, mainly distributed in Europe, North Africa, Macaronesia and Western and Central Asia [1–3], though some of which are introduced or naturalised in other areas. The Port Massif (northeastern Spain, Tarragona Province), exhibits high plant species richness and endemism [4]. During field work and posterior study of herbarium materials from this mountainous area, some specimens of *Sideritis* L. caught our attention due to a combination of characteristics that do not match those of any described species within the genus. The presence in the upper areas of the Port Massif of plants of the genus *Sideritis*, whose identity is uncertain, dates back more than 40 years. These plants had initially been collected by the local botanist Lluís de Torres in 1982 at the base of Caro (the highest mountain in the area), but strikingly it was not listed in the floristic catalogue of the Port Massif [5]. Subsequently, Buira et al. [6], including two of the authors of this paper (LS and RC), tentatively attributed those plants to *S. hyssopifolia* L., but remarking some discordant morphological characters. The most recent reference to the *Sideritis* occurring in the upper parts of the Port Massif is due to Sáez and Aymerich [7], who (in comments on *S. hyssopifolia*) indicated that the taxonomic identity of those populations was unclear.

In order to clarify that point, during field trips between 2021 and 2023 we gathered new specimens of the *Sideritis* from the Port Massif, which had doubtfully been attributed to *S. hyssopifolia*. The study of the material collected, herbarium specimens, literature, photographs and field observations, revealed that the Port Massif plants do not fit with any currently accepted species within the genus and represent a new species, herein described.

2. Materials and Methods

The present morphological and comparative study is based on examination of herbarium specimens. In addition, field observations were made on individuals from the populations of the Port Massif area. Morphological characters, recognised as taxonomically discriminant within *Sideritis*, were studied according to Obón and Rivera [1], Rivera et al. [8,9], and Ríos et al. [10]. Morphological observations of materials were carried out under a binocular stereoscopic microscope Zeiss Stemi DV4. We examined material of morphologically related species held mostly at the herbaria ABH, BC, and MUB. Authors of the taxa cited in the text follow IPNI [11], and the herbarium acronyms accord with Thiers [12]. Representative herbarium material examined is listed in the Appendix. Bioclimatic classification conforms to Rivas-Martínez [13], and biogeographical data follow Rivas-Martínez [14]. To evaluate the conservation status of the new species, the IUCN Red List Categories and Criteria [15,16] were used.

3. Results

The combination of morphological characters with diagnostic value, the biogeographical data, and a review of the foremost regional floras and taxonomic revisions [1,10,17] suggested that the plants collected in the Port Massif area are distinct enough to merit recognition as a new taxon, for which we believe the rank of species to be the most appropriate, and which we describe herein.

3.1. Taxonomic Treatment

Sideritis royoi L.Sáez, R.Curto & M.B.Crespo, *sp. nov.* Figures 1 and 2.

Holotype: SPAIN. Catalonia, Tarragona province: Baix Ebre, Roquetes, La Barcina, 31TBF7723, limestone rocks, 1250 m a.s.l., 16 July 2023, *R. Curto s.n.* (ABH 83741!). **Isotype:** BC 849997!

Diagnosis: *Sideritis royoi* differs from *S. hyssopifolia* by the lower leaves (main surface) glabrous or rarely glabrescent (vs. hairy); the upper leaves subspinescent and narrower than the lower (vs. non-subspinescent and similar to the lower); the adaxial and abaxial surfaces of the bracts lacking eglandular hairs (vs. eglandular hairs present); and the shorter inflorescence, with 1–2(–3) verticillasters (vs. longer inflorescence, with (1–)2–13 verticillasters).

Description: Dwarf shrub. Woody basal parts 7–14 cm including branches, decumbent to suberect. Non-woody branches 8–30 cm long, ascending to erect. Branchlets with goniotrichous and homotrichous trichomes, with scarce to abundant glandular hairs up to 0.1 mm long and lacking glands; trichomes scarce, antrorse, 0.2–1 mm long, with 2–3(4) cells cylindrical, the apical one conical. Leaves greenish subspatulate to sublinear, with main surfaces glabrous or glabrescent, with very scarce eglandular hairs 0.2–0.7 mm long, patent mainly at the margins and at the midrib of the adaxial surface, with scarce glandular hairs up to 0.1 mm long and always lacking sessile glands; lower and middle leaves 8–32 × 3–12 mm, 2–4-dentate, apiculate or mucronate at the apex; upper leaves 6–15 × 2–4 mm, subspinescent, usually 2-dentate, sometimes entire; axillary fascicles of leaves usually absent at the flowering time. Inflorescence commonly yellowish or greenish, ovoid to globose, 0.7–2.5 cm (rarely up to 4 cm) long, with 1–2(–3) verticillasters, the central 3–3.5 mm apart; axis usually yellowish or greenish, with sparse sessile glands and glandular hairs up to 0.1 mm long abundant antrorse eglandular hairs 0.2–0.8 mm long. Bracts greenish to yellowish, erect, ovate, with the widest part towards its basal third; divided to 1/3–1/2 of its width; adaxial surface glabrous, abaxial with sparse (sometimes abundant) glandular hairs up to 0.1 mm long and always lacking sessile glands; eglandular hairs usually absent, sometimes present (very scarce) at the margins, 0.2–0.5 mm long; lower bracts 7–9 × 6–10 mm, with 3–8 teeth on each side; middle bracts 8–10 × 9–12 mm, divided to 1/3–1/2 of its width, with 6–10 teeth on each side. Verticillasters 6-flowered. Calyx campanulate, 8–11 mm long, with five subequal divergent teeth, 4–8 mm long, ending in spines 0.7–2 mm long; the outer surface with scarce to abundant glandular hairs up to 0.15 mm long, sessile glands and antrorse eglandular hairs 0.5–1.8 mm long; carpostegium discontinuous to more or less continuous. Corolla yellowish, 6–9 mm long; upper lip bifid up to 1/5–1/3 of its length; stamens included in the corolla tube, with short filaments 0.3–0.5 mm long; style 1.8–2.5 mm long. Nutlets ovoid, c. 2 × 1.5 mm.

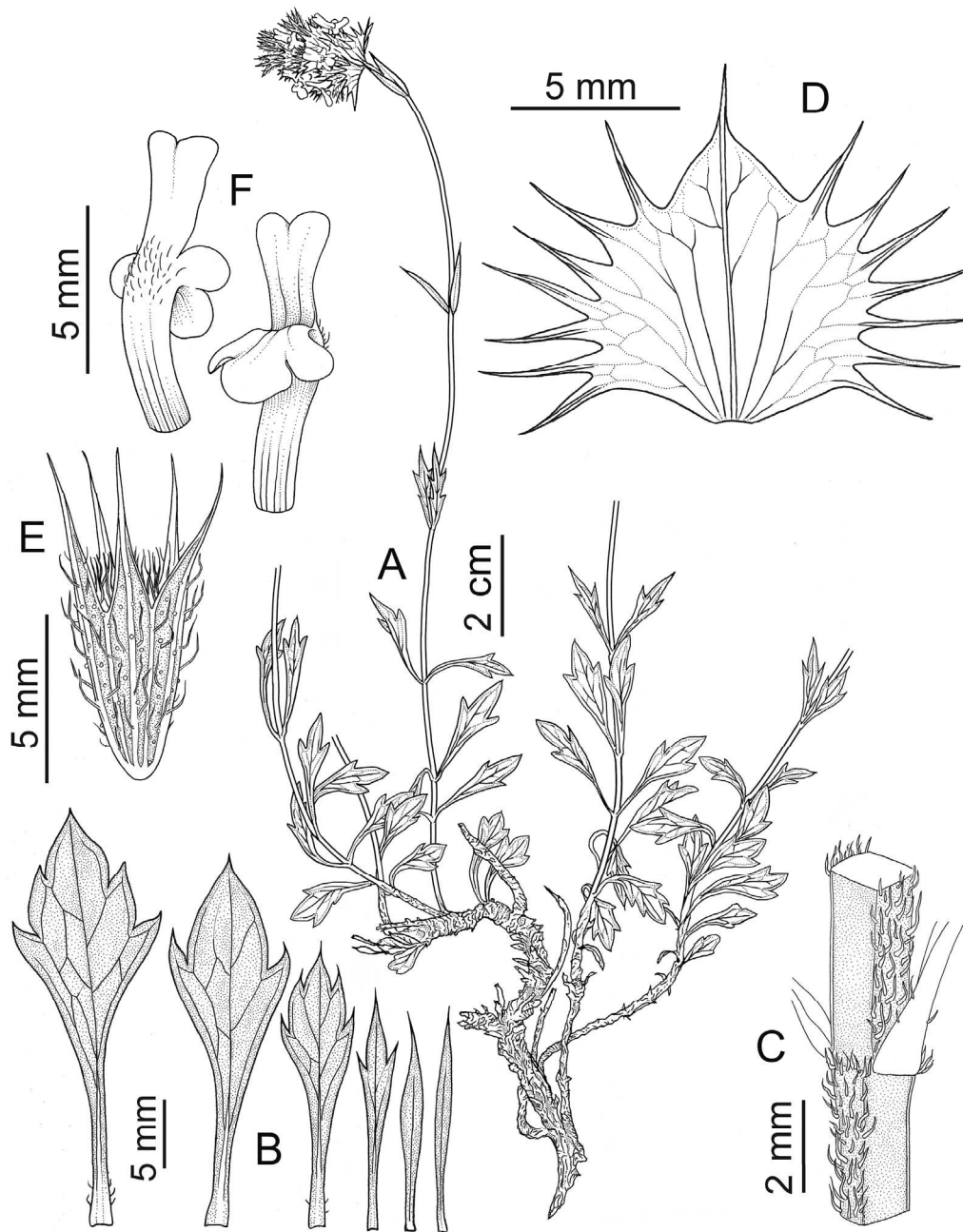


Figure 1. *Sideritis royoi* (holotype: ABH 83741). (A) Habit; (B) Leaves; (C) Middle stem indumentum; (D) Middle bract; (E) Calyx; (F) Corolla, frontal and dorsal views. Drawing: L. Sáez.

Eponymy: The new species is dedicated to the late Ferran Royo Pla (1969–2016), for his outstanding work to improve the botanical knowledge of the Port Massif.

Phenology: Flowering is from June to early July; fruiting is from late July to late August.

Distribution and ecology: *Sideritis royoi* is an orophilous species endemic to a small area in the Port Massif. The new species is found in the rocky slopes and in patches in the understory of the open *Pinus sylvestris* L. forests at the northern face of Caro-La Barcina mountain, between 1080 and 1325 m a.s.l. The known sites of the new species show a pluviseasonal Mediterranean bioclimate, mostly within the Supramediterranean thermotype and with a Subhumid or locally Lower Humid ombrotype [13]. Biogeographically, this area belongs to the Puertobeceitan-Morellan District of the Western-Catalanid subsector (Valencian-Tarraconensian Sector, Catalan-Provencian-Balear Province, Mediterranean Region), according to Rivas-Martínez [14]. The Caro-La Barcina mountain hosts a rich flora including a high number of endemic plant species to northeastern Iberian Peninsula

[4], some of them restricted to the Port Massif. Font Quer [18] first noticed that several plant species occurring in the Port Massif usually showed conspicuous morphological differences compared with other related taxa occurring in other areas of northeastern Iberian Peninsula. The new species grows together with several Puertobeceitan-Morellan endemics, such as *Aquilegia pau* Font Quer, *Arenaria conimbricensis* subsp. *viridis* (Font Quer) Font Quer, *Knautia rupicola* (Willk.) Font Quer, or *Thymus willkommii* Ronniger, as well as more widely distributed orophilous species such *Arctostaphylos uva-ursi* (L.) Spreng., *Erinacea anthyllis* Link subsp. *anthyllis*, *Festuca trichophylla* (Gaudin) K.Richt. and *Teucrium aureum* Schreb. subsp. *aureum*.



Figure 2. *Sideritis royoi* (field images in habitat from Caro-La Barcina mountain). Habit (left); inflorescence (above right); basal and middle leaves (bottom right). Photos: R. Curto.

Conservation status: Based on the present state of knowledge, the extent of occurrence (EOO) and area of occupancy (AOO) of *Sideritis royoi* seem quite restricted (less than 5 km²), which suggest categorising it as “Vulnerable” (VU), mainly according to IUCN criterion D2 [15]. However, further field studies are needed to define a more accurate conservation category of this species.

Additional specimens examined: SPAIN. Tarragona Province: Alfara de Carles, prop de les Clotes, 1080 m a.s.l., 10 July 1982, L.Torres (MMA); per davall del Pas de la Barcina, cara Nord, 1200 m a.s.l., 14 July 2009, Aparicio, Beltran, Curto, Mesa & Royo 6085 (MMA); La Barcina, matollar, 31TBF72, 1270 m a.s.l., 25 July 2021, R.Curto (L. Sáez herb. pers.).

4. Discussion

*Sideritis royo*i shows morphological affinities with taxa of *S.* sect. *Sideritis* subsect. *Hyssopifoliae* Ob3n & D.Rivera and is assumed to belong here, based on its hair covering at the base of branchlets goniotrichous (or slightly holotrichous) with antrorse trichomes [1]. Most of the taxa belonging to this group are found in mountain areas of the Iberian Peninsula and Northern Africa, with a higher concentration in Southern and Eastern Spain. Some of these species are orophyte specialists that are narrowly endemic to a reduced mountain range [1,10]. A comparison of *S. royo*i with morphologically related species belonging to *S.* subsect. *Hyssopifoliae* is shown in Table 1.

Table 1. Main diagnostic morphological characters of *Sideritis royo*i, and related species belonging to *Sideritis* subsect. *Hyssopifoliae*.

Character	<i>S. royo</i> i	<i>S. hyssopifolia</i>	<i>S. pungens</i>	<i>S. tugiensis</i>	<i>S. carbonellii</i>
Arrangement of hair covering at base of branchlets	Goniotrichous	Holotrichous to Goniotrichous	Goniotrichous to holotrichous	Holotrichous	Holotrichous
Type of hair covering at base of branchlets	Homotrichous	Homotrichous	Heterotrichous	Heterotrichous	Heterotrichous
Base of branchlets: hair length (mm)	0.2–1.0	0.2–1.9(–2.0)	0.2–1.5	(0.2–)0.4–0.8	(0.4–)0.6(–0.8)
Lower leaves: size (mm)	6–32 × 3–12	7–50 × 2–11	8–50 × 2–4	12–17 × 2–3	10–25 × 1–1.5
Lower leaves: shape	Subspatulate to sublinear	Spatulate to lanceolate	Linear	Oblanceolate	Linear
Lower leaves: margin	Dentate	Entire to serrate	Entire	Dentate	Entire
Lower leaves: density of trichomes at main surface	Glabrous or almost glabrous	Scarce	Scarce	Scarce	Scarce to very scarce
Lower leaves: arrangement of trichomes at margin	Clearly distinct when present	Clearly distinct	Clearly distinct	Indistinct, except in the basal of leaves	Clearly distinct
Uppermost leaves	Narrower than the lower, subspinescent	Similar to the lower	Similar to the lower or narrower	Bract-like, with 0–4 teeth	Similar to the lower, exceptionally with 1 tooth
Axillary fascicles during flowering time	Usually absent	Occasionally present	Occasionally present	Very frequent	Absent
Number of verticillasters	1–2(–3)	(1–)2–13	3–12	1–2(–4)	1–3(–5)
Distance of central verticillasters (mm)	2–3.5	2–12	3–7	3–6	5–6
Shape of the inflorescence	Ovoid or globose	Cylindrical to globose	Cylindrical	Ovoid or globose	Ovoid or globose

Inflorescence length (cm)	0.7–2.5(–4)	0.8–12	1–7	0.7–2.5	0.5–1.5(–2)
Inflorescence axis: density of glands	Absent	Absent	Very scarce	Very abundant	Absent
Lower bract size (mm)	7–9 × 6–10	4–17 × 3–12	7–12 × 9–12	4.5–5.5 × 6–8	5–6 × 4–7
Teeth on each side of the lower bracts	3–8	0–8(–9)	4–7	2–4(–5)	2–3(–5)
Lower bracts: 1/3 above the greatest width	base	1/5–1/2 above the base	1/8–1/3 above the base	1/3 above the base	1/2 above the base
Middle bracts size (mm)	8–10 × 9–12	3–11 × 6–11	6–12 × 8–13	4–5 × 6–7	4–5 × 5–6
Number of teeth on each side of middle bracts	6–10	3–8(–9)	4–8	3–6	2–3(–5)
Abaxial surface of middle bracts: hairiness	Glabrous	Hairy	Hairy	Glabrous	Glabrous
Middle bracts: hair length (mm)	–	0.8–1.5	0.1–0.5	0.2–0.7	0.3–0.5
Calyx length (mm)	8–11	(5–)6–10(–11)	7–8	6–7	7–8
Calyx: density of glands	Scarce	Scarce or absent	Scarce	Abundant	Scarce or abundant
Calyx: density of trichomes	Scarce	Scarce	Very scarce	Abundant	Scarce
Calyx: length of hairs (mm)	0.5–1.8	1–2.2	0.6–1.3	0.5–1.5	0.9–1.1
Corolla length (mm)	6–9	6–12	7–9	8–9	7–10
Corolla: upper lip	Emarginate	Entire to emarginate	Emarginate or notched	Bifid	Emarginate or notched
Style length (mm)	1.8–2.5	2–4	2–5	3–3.1	1.8–2.2

The type species of this subsection, *S. hyssopifolia*, is quite variable, particularly in habit, and size of stems, leaves and flowers. Several variants are treated at species or infraspecific ranks [1,17,19], or even included in synonymy [17]. This is the case of *S. brachycalyx* Pau ($\equiv$ *S. hyssopifolia* var. *brachycalyx* (Pau) Font Quer), an entity often regarded as a distinct species based mostly on the lack of carpostegium. However, this is also a variable character, even inconstant in *S. brachycalyx*. Therefore, for practical purposes *S. hyssopifolia* is considered in this work in a broad sense to include *S. brachycalyx*, a taxon that in our opinion is best to treat as subspecies or variety in the former [20].

Sideritis hyssopifolia is apparently closely related to *S. royoii*, with which it shares the goniotrichous and homotrichous hair covering at base of branchlets, the general habit and calyx shape, size and indumentum. However, *S. royoii* differs from *S. hyssopifolia* in several striking characters (see Table 1). Most importantly, the leaves glabrous on main surfaces, the subspinescent upper leaves, the absence of eglandular hairs on the main surfaces of the bracts (Figure 1A) and shorter inflorescences, while *S. hyssopifolia* has usually hairy leaves, non subspinescent upper leaves, eglandular hairs on the main surfaces of the bracts and longer inflorescences.

Weaker similarities were also observed with other taxa in *S.* subsection *Hyssopifoliae*. *Sideritis pungens* (including subsp. *vigo* Peris et al., and also for practicality *S. javalambrensis* Pau $\equiv$ *S. pungens* subsp. *javalambrensis* (Pau) Obón & D.Rivera) differ from the new species mainly by heterotrichous hair covering at base of branchlets, entire lower leaves, cylindrical inflorescences, adaxial surface of middle bracts hairy, and shorter calyces with carpostegium continuous. Differences between *S. pungens* and *S. javalambrensis* to other related orophilous taxa were highlighted by López-Udías [21].

Sideritis carbonellii Socorro and *S. tugiensis* S.Ríos et al., two species closely related to each other that occur in southern Spain, are much more different morphologically. They are easily separated from *S. royo* by the base of branchlets with holotrichous hairs and glands, main surface of leaves hairy, longer inflorescence, fewer teeth on middle bracts and shorter calyces. See Ríos et al. [10], López-Udías [21], and table 1 for the differences between *S. carbonellii* and *S. tugiensis*.

Finally, morphological relationships with species belonging to *S.* subsect. *Fruticulosae* Obón & D.Rivera seem to be remote. It was suggested that the plants now described as *S. royo* might be the result of introgression with *S. spinulosa* Barnades ex Asso [6], because of the presence of subespinescent upper leaves in *S. royo*. Our results indicate that the morphological differences between *S. spinulosa* and *S. royo* are notable, allowing for a clear separation between those two species. *Sideritis spinulosa* differs by holotrichous hair covering at base of branchlets, leaves with scarce glands and abundant trichomes 1.5–2.0 mm long, cylindrical inflorescences with 3–15 verticillasters, the abaxial surface of middle bracts with scarce glands and scarce to abundant trichomes (0.5–1.5 mm long) and calyx with carpostegium continuous. Another species of *S.* subsect. *Fruticulosae* occurring in the Port Massif, but in lower areas (up to 750 m a.s.l. altitude) is *S. fruticulosa* Pourr. This species differs from *S. royo* by holotrichous hair covering at base of branchlets, leaves with scarce glands and abundant trichomes 0.3–1.5 mm long, cylindrical inflorescences with 3–7 verticillasters, the abaxial surface of middle bracts with scarce glands and scarce to abundant trichomes (1.0 mm long) and calyx with carpostegium continuous. In a recent and detailed taxonomic revision of *S. fruticulosa* [22], four subspecies are recognized, none of them approaching to the morphological characteristics of *S. royo*. Interestingly, Roselló et al. [22], who were very sensitive to detecting small morphological variations and hybrids, indicate no morphological relationship or existence of hybrids with *S. hyssopifolia*. Further, we have not observed *S. spinulosa* or *S. fruticulosa* in the locations where *S. royo* occurs. Finally, regarding the suggested possible hybrid origin, *S. hyssopifolia* is widespread in Northern Iberian Peninsula, mainly in the Pyrenees [10,23], but the species is not known from the Port Massif [5,23] and thus no range overlap with *S. royo* occurs. Further molecular and cytogenetic work will help to elucidate this point.

Identification key for *Sideritis* subsect. *Hyssopifoliae*

The following key for species of *S.* sect. *Sideritis* subsect. *Hyssopifoliae* is adapted from Obón and Rivera [1], in order to accommodate the new described species. As stated before, and only for practical purposes *S. hyssopifolia* is considered in this work in a broad sense, i. e. including *S. brachycalyx*. Similarly, *S. pungens* here includes *S. javalambrensis*.

1.	Calyces with carpostegium continuous	2
1'.	Calyces with carpostegium discontinuous	7
2.	Central part of verticillasters 2–10 mm apart	3
2'.	Central part of verticillasters 15–35 mm apart	11
3.	Inflorescence axis without glands	4
3'.	Inflorescence axis with glands	5
4.	Base of branchlets with glands, trichomes 0.3–0.7 mm long; inflorescence axis trichomes 0.2–0.4(–1) mm long	<i>S. getula</i> Batt.
4'.	Base of branchlets without glands, trichomes 0.5–2.0 mm long; inflorescence axis trichomes 0.8–1.5 mm long	<i>S. hyssopifolia</i> (s.l.)
5.	Leaves without glands; lower bracts 5–7 × 8–10 mm, with 2–4 teeth on each side; corollas 6–7 mm long	<i>S. maura</i> de Noé
5'.	Leaves with glands; lower bracts 7–12 × 5–12 mm, with 3–8 teeth on each side; corollas 8–10 mm long	6
6.	Middle bracts 7–12 mm; calyx teeth 3 mm long, trichomes 0.6–1.3 mm long	<i>S. pungens</i> (s.l.)
6'.	Middle bracts 5–6 mm; calyx teeth 1–2 mm long, trichomes 2 mm long	<i>S. algarviensis</i> D.Rivera & Obón
7.	Branchlets with glands at base	8
7'.	Branchlets without glands at base	10
8.	Base of branchlets goniotrichous to holotrichous, covered with hairs 0.8–1.5 mm	<i>S. pungens</i> (s.l.)
8'.	Base of branchlets holotrichous, covered with very short hairs up to 0.8 mm	9
9.	Lower leaves entire, 10–25 × 1–1.5 mm, axillary fascicles absent at flowering time; uppermost leaves similar to the lower, entire; calyx with scarce trichomes	<i>S. carbonellii</i>
9'.	Lower leaves dentate, 12–17 × 2–3 mm, axillary fascicles commonly present at flowering time; uppermost leaves bract-like, with 0–4 teeth on each side; calyx with abundant trichomes	<i>S. tugiensis</i>
10.	Main surfaces of the leaves with eglandular hairs; upper leaves non subspinescent; main abaxial surface of the bracts hairy; inflorescences with (1–)2–13 verticillasters	<i>S. hyssopifolia</i> (s.l.)
10'.	Main surfaces of the leaves glabrous or glabrescent; upper leaves subspinescent; main abaxial surface of the bracts without eglandular hairs; inflorescences with 1–2(–3) verticillasters	<i>S. royo</i>
11.	Leaves without glands; lower bracts 6–8 × 3–6 mm, middle bracts 4–5 × 7–8 mm	<i>S. ochroleuca</i> Willk.
11'.	Leaves with glands; lower bracts (8–)10–17 × 3–9(–10) mm, middle bracts 7–10 × 8–10 mm	<i>S. hyssopifolia</i> (s.l.)

Author Contributions: Conceptualisation, L.S., R.C. and M.B.C.; methodology, L.S. and M.B.C.; investigation, L.S., R.C. and M.B.C.; resources, L.S., R.C. and M.B.C.; data curation, L.S., R.C. and M.B.C.; writing—original draft preparation, L.S. and M.B.C.; writing—review and editing, L.S., R.C. and M.B.C.; visualization, L.S., R.C. and M.B.C.; supervision, L.S., R.C. and M.B.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: Not applicable.

Acknowledgments: We thank the staff of the cited herbaria for their help in the study of the herbarium sheets.

Conflict of Interest: The authors declare no conflict of interest.

Appendix: Representative specimens

***Sideritis carbonellii* Socorro:** SPAIN. Granada: Huéscar, pico de La Sagra, embudo de la ladera N, 30SWH385014, 1910 m a.s.l., 13 July 2011, *S.Patino, E.Miguel & V.J.Arán* 7732 (ABH 80790, MA 00868149); Huéscar, Sierra de La Sagra, 30SWH30, 2100 m a.s.l., 29 August 1995, pedregales calizos, *J.L.Solanas, L.Serra, F.Alcaraz & S.Ríos* (ABH 14172); ibidem, La Sagra, 30SWG39, 27 July 1984, *F.Alcaraz* (ABH 43817, MUB); Baza, Sierra de Baza, Calar de Santa Bárbara, 30SWG13, September 1992, *D.Rivera & C.Obón* (ABH 43819, MUB).

***Sideritis fruticulosa* Pourr.:** SPAIN. Huesca: Candanos, Valle de la Valcuerna, 31TBF5396, 3 May 1981, cerros de margas yesíferas, *Alamillo, S.Castroviejo, Fernández Quirós & Nieto* (ABH 53472, MA 436752). Lérida: Castellans, Lo Timorell, plataforma superior, 31TCF1496, 420 m a.s.l., 2 June 2007, matorral calcícola, *V.J.Arán, J.Rebull & R.Valls* 6579 (ABH 52005). Navarra: Cizur, Astráin, Sierra de Erreniega, Las Bordas, 30TXN028324, 755 m a.s.l., 18 July 2013, matorral-pasto mesoxerófilo, sur-suroeste, *L.Romeo, M.Imas & R.Ibáñez* (ABH 70291). Tarragona: Hospitalet de l'Infant, 16 June 1916, *P.Font Quer* (BC 73560). Zaragoza: Tauste, Balsa Tres Montes, 30TXM4950, 280, 13 July 1997, *M.B.Crespo & E.Camuñas* (ABH 35770).

***Sideritis hyssopifolia* L. (s.l.):** FRANCE. Alpius delphiniensibus, [Dépt. 05] Coll de Montginebre, 1750 m a.s.l., 22 July 1973, *O.Bolòs* (BC 609226); Dépt. 01, entre Sur Thoiry et le Reculet, 24 September 1978, *C.Defferrard, P.Braun & A.-M.Frei* CDF-837 (ABH 63405); ibidem, entre Sur Thoiry et le Reculet, 28 August 1992, *C.Defferrard & P.Braun* CDF-7413 (ABH 63406); Dépt. 11, Dulhac, Rouffiac-des-Corbières, Castell de Perapertusa, 31TDH64, 804 m a.s.l., 20 July 2006, sobre les roques calcàries poc inclinades, *J.L.Solanas* (ABH 80011); Dépt. 16, Cognac-Angoulême, Vignac, 100 m a.s.l., 6 July 1990, pelouse sèche, *D.Masson* CDF-DM-1394 (ABH 69098, *S. hyssopifolia* subsp. *guillonii* (Timb.-Lagr.) Nyman). SPAIN. Asturias, Puerto de Pajares, 1800 m a.s.l., 29 July 1935, *W. Rothmaler* (BC 650529, *S. hyssopifolia* subsp. *somedana* Obón & D.Rivera); Peña Ubiña, 2300 m a.s.l., 10 August 1935, *W. Rothmaler* (BC 650529, *S. hyssopifolia* subsp. *somedana* Obón & D.Rivera); cerca de Celorio, 1952 *M.Laínz* (BC 123573, *S. brachycalyx*); Caso, Gobezañes, 30TUN079868, 780 m a.s.l., 19 July 2002, calizas de la Formación Escalada, *E.Alonso & E.de Paz* (ABH 47415, LEB); Onís, Picos de Europa, 30TUN4290, 1500 m a.s.l., 27 June 2003, *M.Mart.Azorín* (ABH 48241). Barcelona: Cabrera, pr. Berga, 1600 m a.s.l., 1 August 1912, *Sennen* (BC 73975, *S. hyssopifolia* subsp. *peyrei* (Timb.-Lagr.) Briq.). Barcelona: La Clusa, 1620 m a.s.l., N Font del Tudó, 5 October 1975, *A.Rosell* (BC 622077); Vallcebre, La Foranca, 1640 m a.s.l., 20 July 2020, *D.Pérez* (BC 982974). Cantabria: Sant Vicente de la Barquera, August 1920, *E. Jiménez* (BC 73959, *S. brachycalyx*); Piélagos, Liencres-Playa de Valdearenas, 30TVP2212, 10 m a.s.l., 24 August 2010, acantilados, *E.Camuñas & M.B.Crespo* (ABH 57387). Huesca: Torla-Ordesa, Valle de Ordesa, 30TYN42, 1300 m a.s.l., 27 July 1970, *A.Rigual* (ABH 20728); Torla-Ordesa, Valle de Otal, río Otal, 30TYN33, 1600 m a.s.l., 06 August 1994, *A.Juan* (ABH 16078); Torla-Ordesa, Ordesa, Valle de Bujaruelo, 30TYN3832, 1900 m a.s.l., 09 August 1996, *A.Juan, E.Camuñas & M.B.Crespo* (ABH 18406); Broto, prox., 30TYN32, 1000 m a.s.l., 27 July 1970, *A.Rigual* (ABH 20699); Bielsa, Sobrarbe, Chisagüés, 31TBH6529, 1700 m a.s.l., 20 June 1996, *M.B.Crespo, L.Serra, A.Juan, J.C.Cristóbal & al.* (ABH 19210); Aísa, Collado de la Magdalena, 30TXN9933, 2020 m a.s.l., 17 July 1997, *M.B.Crespo, E.Camuñas, A.Juan, J.L.Solanas, J.L.Benito & A.Barber* (ABH 68950, *S. hyssopifolia* subsp. *eynensis* (Sennen) Malag.). Panticosa, Ibón de los Asnos, hacia mirador de los Valles, 30TYN2329, 2180 m a.s.l., 22 August 2012, *M.B.Crespo & E.Camuñas* (ABH 59850, *S. hyssopifolia* subsp. *aranensis* (Font Quer) Malag.). Lleida: Pr. Salardú, Vall d'Aran, 18 September 1922, *Gros* (ABH 59850, lectotype of *S. hyssopifolia* subsp. *aranensis*); Espot, estación invernal Super Espot, 31TCH41, August 1991, *M.A.Jover* (ABH 4772). León: Cueto Ancino, a 2 km al N de Nocedo, 1200 m a.s.l., 11 August 1996, *F.Gómez* (BC 827328, subsp. *nocedoi* Obón & D.Rivera); La Pola de Gordón, Santa Lucía de Gordon, 30TTN8450, 1200 m a.s.l., 14 October 1993, *A.Juan, M.Vicedo & M.Á.Alonso* (ABH 6417); San Emiliano, Peña Ubiña, vert. SE, 30TTN5967, 2200 m a.s.l., 30 July 2001, *V.J.Arán & M.J.Tohá* (ABH 45583, *S. hyssopifolia* subsp. *somedana* Obón & D.Rivera); Cabrilanes, Cabrilanes, La Cueta, Collado la Fontanina, 29TQH2868, 1638 m a.s.l., 16 July 2021, roquedos calizos y matorral sobre sustrato silíceo, *A.Buira, L.Medina, S.Andrés*

Sánchez, J.Güemes & al. SA2016 (ABH 82071); San Emiliano, San Emiliano, Torrestío, subida al puerto de la Farrapona, valle Sañedo por encima del puente del río Traspando, 29TQH3870, 1583 m a.s.l., 15 July 2021, calizas, A.Buira, L.Medina, S.Andrés Sánchez, J.Güemes & al. LM11342 (ABH 82023). Lugo: Folgoso do Courel, Visuña, salida S del pueblo, 29TPH5819, 1050 m a.s.l., 8 July 2000, J.Amigo (ABH 44442, *S. hyssopifolia* subsp. *caureliana* Obón & D.Rivera). Navarra: Isaba, Rincón de Belagua, 30TXN7655, 1000 m a.s.l., 29 July 1991, P.M.Uribe-Echebarría (ABH 46453, VIT 5653); Isaba, Larra, 30TXN818597, 1700 m a.s.l., 04 August 2005, pastos pedregosos subalpinos, N.Jáuregui & R.Ibáñez (ABH 49905); Isaba, Macizo de Larra-Belagua, cercanías de la estación de esquí nórdico, sector La Contienda, hacia el Collado de La Piedra de San Martín, 42°57.820'N 0°46.392'W, 3 July 2022, taludes y rocas calizas del karst, M.Martínez Ortega, M.Á.Alonso, M.Mart.Azorín & al. MO6326 (ABH 83077). Orense: Carballeda de Valdeorras, Sierra de Campo Romo, Fonte da Cova, 29TPG8687, 1780 m a.s.l., 29 June 1994, M.B.Crespo, M.D.Lledó, L.Serra, A.Juan & J.C.Cristóbal (ABH 13291). Palencia: Peña Redonda, ca. Cervera de Pisuerga, 9 August 1914, P. Font Quer (BC 73925, subsp. *santanderina* D. Rivera & Obón); Velilla del Río Carrión, Cardaño de Arriba, prox., Pico Espigüete, sima del Anillo, 30TUN5357, 1890 m a.s.l., 12 July 2006, suelos calcáreos karstificados, V.J.Arán & G.Arán 6353 (ABH 52045); Velilla del Río Carrión, Sierra del Brezo, Peña Cueto, 30TUN5646, 1670 m a.s.l., 11 August 1991, pastizales psicroxerófilos calizos, A.Penas, M.E.García & L.Herrero (ABH 74617). Vitoria: Vitoria: Bernedo, Markinez, de Alto Raposeras a Ermita de Beolarra, 30TWN3528, 750 m a.s.l., 23 August 1999, P.M.Uribe-Echebarría (ABH 46454, VIT 61486, *S. hyssopifolia* subsp. *castellana* (Sennen & Pau) Malag.); Lagrán, Sierra de Cantabria, Cruz del Castillo, 30TWN3316, 1375 m a.s.l., 18 July 2006, grietas de peñascos calizos, en la solana, P.M.Uribe-Echebarría (ABH 51864).

***Sideritis pungens* Benth. (s.l.):** SPAIN. Burgos: Briviesca, 30TVN7308, 725 m a.s.l., 23 June 1998, M.B.Crespo, J.C.Cristóbal & al. (ABH 48708); ibidem, 30TVN7409, 780 m a.s.l., 25 July 1999, S.Patino (ABH 42818). Castellón: Vistabella del Maestrat, Penyagolosa, en la base, 30TYK2757, 1500 m a.s.l., 11 July 1995, E.Laguna (ABH 16549); Ares del Maestre, 30TYK4288, 1000 m a.s.l., 24 July 1995, A.de la Torre, M.Vicedo & M.Á.Alonso (ABH 16922); La Pobla de Benifassà, El Coratxà, Tossal de Mitjavila, 31TBF5310, 1340 m a.s.l., 20 June 2001, J.Riera & E.Estrelles (ABH 46363); Xodos (Alcalatén), Massís de Penyagolosa, Roca del Migdia, 30TYK2656, 1400 m a.s.l., 17 July 2018, matorrales calizos sobre suelos pedregosos, J.Riera & F.J.Fabado JRV-9012 (ABH 81808). Granada: Iznalloz, Iznalloz-estación del Piñar, 30SVG6038, 960 m a.s.l., 8 June 2000, V.J.Arán (ABH 69853). Logroño: Los Ábalos, 580 m a.s.l., 29 July 1996, R. Auriault (BC 837198). Navarra: Larraga, Larraga-Tafalla, 30TXN01, 12 July 1993, D.Rivera & C.Obón (ABH 43820, ABH 43821, MUB). Palencia: Hontoria de Cerrato, El Raposillo, 30TUM829426, 827 m a.s.l., 26 June 2019, matorral aclarado en cerro yesoso, S. Andrés-Sánchez & al. SA1573 (ABH 80216). Soria: pr. Numancia 1050 m a.s.l., 10 July 1935, P.Font Quer & W.Rothmaler (BC 638196); Almarza, Portelárbol, 30TWM480385, 1175 m a.s.l., 16 July 2020, encinar abierto en calizas, J.Güemes, C.Molina, A.Prunell, E.Rico, E.Sahuquillo & C.Urones ER8570 (ABH 82270). San Felices, bajando al río Alhama, 30TWM8043, 775 m a.s.l., 13 August 2014, calizas, M.B.Crespo & E.Camuñas (ABH 70704); Cueva de Ágreda, hacia Beratón, 30TWM9521, 1320 m a.s.l., 24 July 1997, M.B.Crespo & E.Camuñas (ABH 36427). Teruel: In monte Javalambre 1923, Pau (subsp. *javallambrensis* (Pau) Obón & D.Rivera, BC 74006); Teruel, pr. Masada Cociero, 30TXK6170, 935 m a.s.l., 9 July 2008, M.B.Crespo (ABH 53733); La Puebla de Valverde, Altos del Buitre, 30TXK7243, 1650 m a.s.l., 20 July 1995, E. Laguna (ABH16552, subsp. *javallambrensis*); Cerro de Javalambre, 30TXK6840, 2000 m a.s.l., 8 August 1996, C.Fabregat & S.López (ABH 44512, subsp. *javallambrensis*); Perales del Alfambra, hacia Visiedo, prox. del pueblo, 30TXK6800, 1160 m a.s.l., 24 July 2005, suelos arcillosos áridos, V.J.Arán & M.J.Tohá 6182 (ABH 51957). Valencia: Alpuente, Muela del Buitre, 30SXX6424, 1460 m a.s.l., 20 July 1996, J.J.Herrero-Borgoñón (ABH 30425). Zaragoza: Tauste, Balsa Tres Montes, 30TXM4950, 280 m a.s.l., 13 July 1997, M.B.Crespo & E.Camuñas (ABH 35771); La Zaida, 30TYL17, 30 July 1985, D.Rivera & C.Obón (ABH 43822, MUB).

***Sideritis spinulosa* Barnades ex Asso subsp. *spinulosa*:** SPAIN. Guadalajara: Tartanedo, La Aguarrosa, 30TWL9137, 1180 m a.s.l., 22 June 1995, L.Serra, A.Juan & J.C.Cristóbal (ABH 13336). Palencia: Alba de Cerrato, 30TUM8727, 800 m a.s.l., 16 July 1980, F.Amich, E.Rico & J.Sánchez (ABH 30820, SALA). Teruel: Aguaviva, 3 July 1919, Rubió (BC 73596); Teruel, pr. Masada Cociero, 30TXK6170, 935 m a.s.l., 9 July 2008, M.B.Crespo (ABH 53735). Zaragoza: Calcena, hacia Ermita San

Cristóbal, 30TXM0711, 900 m a.s.l., 23 July 1997, M.B.Crespo & E.Camuñas (ABH 39876); Borja, La Muela, Cerro del Boquerón, encinar, 30TXM1536, 750 m a.s.l., 18 June 2002, V.J.Arán 5216 (ABH 46677); Pedrola, Barranco de Juan Gastón, 30TXM446247, 289 m a.s.l., 22 May 2014, A.Terrones & A.Vicente (ABH 73535); Ibdes, río Mesa, matorrales próximos, 30TWL96, 12 August 1992, J.L.Solanas (ABH 1847).

Sideritis spinulosa subsp. *subspinosa* (Cav.) Molero: SPAIN. Castellón, Ares del Maestre, 30TYK4288, 1000 m a.s.l., 24 July 1995, A.de la Torre, M.Vicedo & M.Á.Alonso (ABH 16921); Zorita del Maestrazgo, Cerros de la Gallinera, 30TYL4015, 700 m a.s.l., 1 June 2004, A.Juan, M.Á.Alonso & B.Coca (ABH 55250). Teruel: Castellote, Cuevas de Cañart, El Batán, al pie del Salto de San Juan, 30TYL163158, 900 m a.s.l., 13 August 2015, M.Mart.Azorín & Á.Ortiz Lledó (ABH 72452); Pitarque, camino de la Ermita de San Cristóbal y del nacimiento del río Pitarque, 30TYL00, 1082 m a.s.l., 14 June 2016, borde del sendero, M.Velayos, M.Á.Alonso & al. MV13764 (ABH 75815). Tarragona: inter Cenia et Alcanar, 14 July 1921, P.Font Quer (BC 73662); Gandesa, 450 m a.s.l., 17 July 1921, P.Font Quer (BC 73671).

Sideritis tugiensis S.Ríos, M.B.Crespo & D.Rivera: SPAIN. Granada: Castril, Cerro Laguna-Sierra Seca (Sierra de Segura), 30SWG2799, 1980 m a.s.l., 27 July 1998, S.Ríos, M.B.Crespo, J.L. Solanas & E. Camuñas (holotype: ABH 43003; isotypes: ABH 43004, 43005, 43006, MA, MUB); Castril, Sierra Seca, pr. Cerro Laguna, 30SWH2698, 1900 m a.s.l., 21 August 2000, S.Jury, M.B.Crespo, S.Ríos & J.L.Solanas (ABH 45333); Castril, Cañada de la Sabina, 30SWH2800, 1800 m a.s.l., 13 July 2000, S. Ríos, J.L. Solanas & M.B. Crespo (ABH 43660); ibidem, 24 July 1999, J.L.Solanas, S.Ríos, M.B.Crespo & A.Juan (MA 00805836); Castril, Morro del Pocico o de los Cánovas, 30SWG2697, 2030 m a.s.l., 13 July 2000, S.Ríos, J.L.Solanas & M.B.Crespo (ABH 43658); ibidem, 21-08-00, S.Jury, M.B.Crespo, S.Ríos & J.L.Solanas (ABH 45334); Castril, Morro del Buitre, 30SWG2595, 2130 m a.s.l., 13 July 2000, S.Ríos, J.L.Solanas & M.B.Crespo (ABH 43662); ibidem, 21 August 2000, M.B.Crespo, S.Ríos & J.L.Solanas (ABH 45331); Huéscar, Mojón Alto o Tornajuelos, Sierra Seca, 30SWG2696, 2100 m a.s.l., 13 July 2000, S.Ríos, J.L.Solanas & M.B.Crespo (ABH 43659, MA 00779845, MA 00805995); Huéscar, Torca de la Nieve, 30SWG2595, 2060 m a.s.l., 13 July 2000, S.Ríos, J.L.Solanas & M.B.Crespo (ABH 43661).

References

- Obón, C.; Rivera, D. *A taxonomic revision of section Sideritis, genus Sideritis (Labiatae)*; J. Cramer: Berlin, Germany, 1994; 640 pp.
- Rivera, D.; Obón, C. Study of the biogeography and centres of diversity in section *Sideritis* (genus *Sideritis*, *Labiatae*). *Lagascalia* **1997**, 19(1–2), 865–872.
- Mabberley, D.J. *The plant book: a portable dictionary of the vascular plants*, 2nd ed.; Cambridge University Press: Cambridge, UK, 1997; 858 pp.
- Sáez, L.; Aymerich, P.; Blanché, C. *Llibre Vermell de les plantes vasculars endèmiques i amenaçades de Catalunya*; Argania Editio: Barcelona, Spain, 2010; 811 pp.
- Torres, L. *Flora del massís del Port*; Publicacions de la Diputació de Tarragona: Tarragona, Spain, 1989; 463 pp.
- Buira, A.; Balada, R.; Mesa, D.; Álvarez, J.M.; Arrufat, M.; Beltran, J.; Cardero, S.; Curto, R.; Royo, F.; Torres, L. Sáez, L. Noves contribucions al coneixement de la flora vascular del massís del Port (NE de la península Ibèrica). *Orsis* **2009**, 24, 117–140.
- Sáez, L.; Aymerich, P. *An annotated Checklist of the Vascular Plants of Catalonia (northeastern Iberian Peninsula)*; Kit-book Serveis Editorials, S.C.P.: Barcelona, Spain, 2021; 717 pp.
- Rivera, D.; Obón, C.; Tomás-Lorente, F.; Ferreres, F.; Tomás Barberán, F. Infrasectional systematics of the genus *Sideritis* L. section *Sideritis* (Lamiaceae). *Bot. J. Linn. Soc.* **1990**, 103, 325–349.
- Rivera, D.; Obón, C.; Alcaraz, F.; Llorach, R. Systematics of the high mountain taxa of the genus *Sideritis* L., section *Sideritis*, subsection *Fruticulosa* Obón & D. Rivera (Lamiaceae). *Bot. J. Linn. Soc.* **1999**, 129, 249–265.
- Ríos, S.; Crespo, M.B.; Rivera, D. The west Mediterranean orophilous taxa of *Sideritis* L. (Lamiaceae): a new species of subsection *Hyssopifolia* from south-eastern Spain. *Bot. J. Linn. Soc.* **2001**, 136, 247–254.
- IPNI. 2023. The International Plant Names Index. The Royal Botanic Gardens, Kew, Harvard University Herbaria & Libraries and Australian National Herbarium. Available online: <http://www.ipni.org> (continuously updated; accessed on 22 February 2023).
- Thiers, B. 2023. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Available online: <https://sweetgum.nybg.org/science/ih/> (continuously updated; accessed on 14 July 2023).

13. Rivas-Martínez, S. *Avances en Geobotánica*; Real Academia Nacional de Farmacia: Madrid, España, 2005; 128 pp.
14. Rivas-Martínez, S. Mapa de series, geoseries y permaserias de vegetación de España (Memoria del Mapa de vegetación potencial de España). Parte I. *Itinera Geobotanica* **2007**, *17*, 5–435.
15. IUCN. *IUCN Red List Categories and Criteria: Version 3.1*; IUCN Species Survival Commission: Gland, Switzerland and Cambridge, UK, 2012; 32 pp.
16. IUCN. *IUCN Guidelines for Using the IUCN Red List Categories and Criteria: Version 15.1*; Standards and Petitions Subcommittee: Gland, Switzerland and Cambridge, UK, 2022; 114 pp.
17. Morales, R. *Sideritis* L. In *Flora iberica. Verbenaceae-Labiatae-Callitrichaceae*; Morales, R., Quintanar, A., Cabezas, F., Pujadas, A.J., Cirujano, S., Eds.; Real Jardín Botánico de Madrid (C.S.I.C.): Madrid, Spain, 2010; Volume 12, pp. 234–288.
18. Font Quer, P. Contribució al coneixement de la flora catalana occidental. *Treb. Mus. Ci. Nat. Barcelona* **1920**, *5*, 193–233.
19. Malagarriga, T. Font Quer y el nombre de las plantas sennenianas. *Collect. Bot. (Barcelona)* **1968**, *7*(2), 677–695.
20. Socorro, O.; Arrebola, M.L. Nuevas combinacions en el género *Sideritis* L. (Lamiaceae) para la flora ibero-norteafricana. *Lagascalia* **1994**, *17*(2), 356–357.
21. López-Udias, S. Estudio taxonómico de *Sideritis javalambrensis* Pau (Magnoliopsida, Labiatae), patrimonio natural exclusivo de la provincia de Teruel. *Teruel* **2020**, *95–96*, 161–215.
22. Roselló, R.; Ferrer-Gallego, P.P.; Guillén, A.; Riera, J.; Gómez, J.; Laguna, E.; Peris, J.B. Sobre la variabilidad infraespecífica de *Sideritis fruticulosa* Pourr. (Labiatae). *Flora Montiber.* **2018**, *72*, 39–60.
23. Bolòs, O.; Vigo, J. *Flora dels Països Catalans*, vol. 3; Editorial Barcino: Barcelona, Spain, 1996; 1230 pp.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.