



Some nomenclatural and taxonomic notes on *Salvia dumetorum* (Lamiaceae)

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Abstract

In this paper, some nomenclatural and taxonomic questions on *Salvia dumetorum* are discussed in order to avoid confusion in the use of its name. One collection from LECB is designated as a lectotype of *S. dumetorum*. Based on a complex of diagnostic features, it is proposed to consider *S. dumetorum* as a separate species which is distinct from its close relative *S. pratensis*.

Key words: *Salvia*, nomenclature, taxonomy, typification, Andrzejowski

Introduction

The genus *Salvia* Linnaeus (1753: 23) is the largest in the mint family with some 900 species centered in the temperate and subtropical regions of the Old and New World (Harley *et al.* 2004, Safaei *et al.* 2016). One of its representatives, *Salvia dumetorum* Andr. in Besser (1821: 3), grows in steppe and forest-steppe plains from Central Europe (West Ukraine, Romania) to Altai and Dzungaria (Hedge 1972, Meusel *et al.* 1978). Nomenclature and taxonomy of this species need revision in order to avoid confusion in the use of its name (e.g. Briquet 1895, Szafer *et al.* 1924, Desiatova-Shostenko 1932, Pobedimova 1954, 1978, Klokov 1960, Hedge 1972, Čiocârlan 2009, Govaerts *et al.* 2017).

Materials and methods

The present work is based on examination of relevant literature, critical studies of herbarium specimens deposited in the herbaria: KRAM, KW, and digital images of specimens stored at LECB (V.A. Bubyreva, in e-mail), LE (I.V. Tatanov, in e-mail), P (<https://science.mnhn.fr/institution/mnhn/collection/p/item/search/form>), UPS (M. Hjertson, in e-mail). Nomenclatural treatment and typification follow the *International Code of Nomenclature for algae, fungi, and plants* (McNeill *et al.* 2012). The acronyms of herbaria are given according to Thiers (2017 onwards).

Protologue citation

Salvia dumetorum was first described in 1821 in the preliminary edition of a part of work by W. Besser (1784–1842), teacher of zoology and botany and director of the lyceum's botanical garden in Kremenets (currently the territory of Ukraine), who ascribed the authorship of this name to his student A. Andrzejowski (1785–1868). In 1822 Besser published his work in full, with pages [1]–79 being identical to those of the preliminary edition (Stafleu & Cowan 1976). The respective publications (Besser 1821, 1822) provide Besser's short diagnosis of the species followed

by an extended description with the distribution details which was written by A. Andrzejowski (marked with the abbreviation “A.”). Hence, the author of *S. dumetorum* is A. Andrzejowski, to whom both the name and validating description were ascribed, regardless of that Besser was the author of the respective publication from 1821 (Art. 46.2 of the ICN; McNeill *et al.* 2012).

W. Besser’s short diagnosis ends with the phrase: “*S. Pratensis* var. flor. minor. *Catal. des plantes du Jard. bot. de Krzemieniec 1811. n 288*”, which is a reference to his earlier work (Besser 1811). This reference has mistakenly been considered by some botanists (e.g. Desiatova-Shostenko 1932, Pobedimova 1954, 1978, Hedge 1972) as the citation of the work in which the name *S. dumetorum* was originally published and from which the diagnosis was reproduced without changes in the citing publication (i.e., Besser 1821). However, this earlier work (Besser 1811), being the catalogue of cultivated plants from Kremenets botanical garden, contains in fact no mention of the name *S. dumetorum*, neither its diagnosis, and instead the varietal designation “[*Salvia pratensis*]—var. flor. minoribus” is presented on page 96 under the number 2884 (this number was cited in the later works with a typographic error as “n 288”; Besser 1821, 1822). Therefore, Besser’s work from 1811 cannot be regarded as the place of original publication of the name *S. dumetorum*. The modern nomenclatural and taxonomic on-line databases (e.g., Euro+Med 2006 onwards, The Plant List 2013 onwards, Govaerts *et al.* 2017, IPNI 2017) credited to the later work (Besser 1821) indicating, however, the publication page as “40”. This page in fact presents only relations between *S. dumetorum* and allied taxa, whereas the diagnosis is given on page 3 which, therefore, should be regarded as the place of the original publication of *S. dumetorum* name.

Type material

The protologue of *S. dumetorum* (Besser 1821) lacks the mention of any specimen (holotype or syntypes) on which the diagnosis is based. Our search for lectotypification of *S. dumetorum*, which could have been effected previously, has provided uncertain results. N.A. Desiatova-Shostenko (1932) was the first to match the diagnosis from the protologue with a specimen from herbarium of N.S. Turczaninow (1796–1863), namely by mentioning the following: “Этому описанию вполне соответствует экземпляр из гербария Турчанинова с этикеткою ? “*Salvia dumetorum* Andrz. In apricis, Besser” [This description matches well the specimen from Turczaninow’s herbarium with a label ? “*Salvia dumetorum* Andrz. In apricis, Besser”]”. However, failure to use the term “type” or its equivalent made this specimen citation inconsistent with Art. 7.10 of the ICN (McNeill *et al.* 2012) and hence it cannot be considered a type designation. In addition, lack of more detailed information on the specimen in this text, such as the place of its deposition, prevents from clear determination of this material. The main part of Turczaninow’s collection is currently held by KW and additionally many specimens are stored in other herbaria worldwide (HUH 2013). Also, the mention of sign “?” before the label citation by Desiatova-Shostenko makes it uncertain whether this citation is identical to the original label and that the author actually saw the specimen prior to publication of her paper (i.e., 1932).

Other publications do not mention any particular type material of *S. dumetorum* but only suggest its probable location: “Тип в Киеве? [Type in Kyiv?]” (Pobedimova 1954) or *locus classicus*: “Тип: Украина (“in Volhinia”) [Type: Ukraine (“in Volhinia”)]” (Pobedimova 1978). L. Krytska (2013), in her paper on typification of some Lamiaceae species described from Ukraine, presents a citation of a specimen from herbarium LE that was selected by N. Tzvelev in 1996 as a lectotype of *S. dumetorum*: “*Salvia dumetorum* Andrzej. In elatis Volhyn. Herb. W. Besser”. This specimen (LE barcode LE01026005 [digital photo!]) contains *notae criticae* of N. Tzvelev dating from 1996, although we are unaware of any his publication regarding the typification of *S. dumetorum* (see the lists of Tzvelev’s publications in Geltman 1995, Geltman *et al.* 2016). Since the formal typification procedure requires effective publication (see Art. 7.9, 29, 30 of the ICN; McNeill *et al.* 2012), this lectotype was not designated by N. Tzvelev.

As follows from the above, the nomenclatural type of *S. dumetorum* appears to be currently not designated and typification of this name is highly desirable (McNeill *et al.* 2012). With this purpose we searched for the original material among collections of W. Besser and A. Andrzejowski, most of which (including type material) are stored at KW and a great part is scattered among other herbaria (Stafleu & Cowan 1976, HUH 2013). As the original material (Art. 9.3 of the ICN; McNeill *et al.* 2012) we consider the following specimens from herbaria KRAM, KW, LE, LECB, and P that were originally determined as *S. dumetorum*:—Sine loco, “in pratis sylvaticis frequens”, undated, *s. coll.*, ut “*Salvia dumetorum* nob.” (LECB barcode LECB0001080 [digital photo!]; the original label on the specimen was handwritten by A. Andrzejowski). UKRAINE: In apricis Volh.[yn], undated, *s. coll.*, ut “*Salvia dumetorum* Andrzej.” with printed note “Herb. W. Besser” (KW *s. n.*! (in personal collection of N.S. Turczaninow). UKRAINE:

In elatis Volhyn, undated, *s. coll.*, ut “*Salvia dumetorum* Andr.” with printed note “Herb. W. Besser” (LE barcode LE01026005 (mounted on a single sheet together with LE barcode LE01026004), P barcode P03281394 [digital photos!]). UKRAINE: In campis Volhyn, undated, *s. coll.*, ut “*Salvia dumetorum* Andr.” with handwritten note “Herb. Besser” (LE barcode LE01026004 (mounted on a single sheet together with LE barcode LE01026005) [digital photo!]). Sine loco, undated, *Besser s. n.*, ut “613 *Salvia dumetorum* [um] flor[e]sco” (LE barcode LE01026006 [digital photo!]). Sine loco, undated, *Andrzejowski s. n.*, ut “*Salvia dumetorum* Andr.” (KRAM182994!, KRAM182995!, KRAM182996!, KRAM182997!, KRAM182998!, KRAM182999!, KRAM182615!). Of these, the specimen LECB0001080 (Fig. 1) is the most representative and most completely matches the diagnosis in the protologue. Namely, it contains the entire plant at the flowering stage with well-preserved leaves, the lamina being cordate-oblong with undulate-dentate margin and sparsely hairy on both sides. Upper leaves are sessile, surrounding the stem with their auriculate base. The stem is four-sided and hirsute, the features being especially evident in the upper internode and in the inflorescence. The specimen’s stem height is 70 cm (i.e., 2.3 feet), which is within the range mentioned in the protologue (Besser 1821): “Caulis 2–3 pedalis... [Stem 2–3-foot...]”. The flowers are in 4–6 flowered verticillasters, the verticillasters being 1.9–2.9 cm (0.7–1.1 inches) apart (the maximal values generally correspond to the ranges mentioned in the protologue (Besser 1821): “Verticilli a 6 usque ad 10 flori, internodia 1–2 pollicaria [Verticils 6–10 flowered, internodes 1–2-inch]”). Fully matching the protologue is the structure of specimen’s bracts, flower corolla, calyx, and style. But due to lacking in the collection place indication on the label, this specimen cannot be verified to correspond to the *locus classicus* “in pratis elatis Volhyniae et Podoliae” provided in the protologue (Besser 1821), which, however, we consider to be of minor importance in this case. Based on the correspondence of this specimen to the original description and that its label was handwritten by the taxon’s author, we designate it as the lectotype of the name *S. dumetorum* according to Art. 9.11, 9.12 of the ICN (McNeill *et al.* 2012). The other specimen among those listed above:—UKRAINE: In apricis Volh.[yn], undated, *s. coll.*, ut “*Salvia dumetorum* Andrzej.” with printed note “Herb. W. Besser” (KW *s. n.*! (in personal collection of N.S. Turczaninow), which is most likely the one indicated by N.A. Desiatova-Shostenko (1932; *see* discussion above), is evidently less representative and corresponding to the species diagnosis in the protologue. In particular, it contains fragments of the plant’s upper part with an inflorescence and several apical leaves which are damaged. Therefore, this specimen is less suitable for lectotypification. Also, not sufficiently representative and suitable for typification is the specimen LE01026005 proposed by N. Tzvelev (*see* discussion above).

Taxonomic remarks

It has rather been uncertain for a long time whether *S. dumetorum* deserves the status of a separate taxon. In view of its affinity with *S. pratensis* Linnaeus (1753: 25), many botanists propose placing *S. dumetorum* within the latter. Namely, J. Briquet (1895) treats *S. dumetorum* as a variety *S. pratensis* var. *dumetorum* (Andrz.) Briquet (1895: 530). J. Hedge (1972) in *Flora Europaea* considers *S. dumetorum* as a species with uncertain taxonomic status, which, in his opinion, better fits the rank of subspecies of *S. pratensis*. V. Ciocârlan (2009) adopted Hedge’s idea by publication of the name *S. pratensis* subsp. *dumetorum* (Andrz.) Ciocârlan (2009: 660). Other workers (Khitrovo 1910, Schostenko-Dessjatova 1940) claim *S. dumetorum* to be just female individuals of *S. pratensis* usually bearing smaller flowers (one of the main diagnostic features of *S. dumetorum*), and in this case it would by no means deserve a separate taxonomic rank. Szafer *et al.* (1924), following the species author’s concept, treated *S. dumetorum* as a species, which was then adopted in a number of European floras (Pobedimova 1954, 1978, Klokov 1960), plant identification guides (e.g. Prokudin 1987), checklists and taxonomic databases (e.g. Mosyakin & Fedoronchuk 1999; The Plant List 2013 onwards).

According to current views (Pobedimova 1954, 1978, Hedge 1972, Szafer *et al.* 1986), the main diagnostic features of *S. pratensis* include erect and branched stem up to 100 cm high with basal leaves being long petiolate, ovate or ovate-oblong, cordate at base, and crenate or serrate at margin. Verticillasters contain 4–6 hermaphrodite or female flowers. Corolla is more than twice longer than calyx. Corolla of hermaphrodite flowers is (15–)20–30 mm long, with falcate upper lip. *S. dumetorum* is distinguished from the former by narrower leaves, being oblong or cordate-oblong, verticillasters containing 4–10 flowers, corolla less than twice exceeding calyx, and corolla of hermaphrodite flowers being 10–20 mm with slightly bent or almost straight upper lip.

The specimen of *S. dumetorum* proposed for lectotypification has cordate-oblong leaves and verticillasters with 4–6 hermaphrodite flowers. Corolla is 15–19 mm long, which less than twice (or exactly twice) exceeds the length



FIGURE 1. Lectotype of *Salvia dumetorum* (LECB0001080).

of calyx, and its upper lip is slightly bent. These features fully correspond to today's conception of *S. dumetorum*. For comparison, we examined the lectotype specimen of *S. pratensis* stored at UPS (Del Carratore *et al.* 1998):—Sine loco, “In Bavaria, Austria, Helvetia, Spania”, undated, *s. coll.*, ut “*Horminum pratense foliis serratis* Bauh.” (UPS-Burser 13: 111 [digital photo!]). This specimen features a straight unbranched stem 28 cm long, with basal leaves being long petiolate, ovate-oblong and crenate. Verticillasters contain 4–6 hermaphrodite flowers. Corolla is 15–19 mm long, being the minimal values for *S. pratensis* (see the linear sizes above), and is more than twice longer than calyx (5–6 mm), with falcate upper lip.

In addition, *S. dumetorum* and *S. pratensis* can be distinguished by the chromosome counts, being $2n=14$ for *S. dumetorum* (Patudin *et al.* 1975, Pobedimova 1978) and $2n=18$ or rarely $2n=16$ for *S. pratensis* (Hedge 1972, Patudin *et al.* 1975). Geographical ranges of these two species partially coincide. The range of *S. pratensis* is of the European type and covers almost the whole Europe up to the Great Britain, northern Germany, and north-central Russia on the north, while *S. dumetorum* has Danubian—Pontian—South Siberian range overlapping with that of *S. pratensis* on the west (Hedge 1972; Meusel *et al.* 1978). The above features suggest possible hybridization between these two species in the overlapping parts of their ranges, with the hybrids having the predictable chromosome count $2n=16$ (consisting of the half chromosome numbers of the parental species). This can explain the occurrence of the above chromosome count reported by Patudin *et al.* (1975) for some individuals identified as *S. pratensis* from the eastern part of the species range. Hybridization between *S. dumetorum* and *S. pratensis* can also be corroborated by their tendency to intercross with other species of *Salvia* (see Błocki 1888, Borbás 1902, Nachychko *et al.* 2017).

Based on the above reasoning, we consider *S. dumetorum* as a separate species differing from its ally *S. pratensis* by a number of characters listed in Table 1.

TABLE 1. Diagnostic features of *S. dumetorum* and *S. pratensis*.

Characters	<i>S. dumetorum</i>	<i>S. pratensis</i>
Basal leaves	oblong or cordate-oblong	ovate or ovate-oblong, cordate at base
Verticillasters	4–10 flowered	4–6 flowered
Length of corolla ÷ length of calyx	≤ 2	> 2
Corolla of hermaphrodite flowers	10–20 mm	(15–)20–30 mm
Corolla's upper lip	slightly bent or almost straight	falcate
Chromosome count	$2n=14$	$2n=(16)18$

Salvia dumetorum Andr. in Besser (1821: 3)

Lectotype (designated here):—Sine loco, “in pratis sylvaticis frequens”, undated, *s. coll.*, ut “*Salvia dumetorum* nob.” (LECB barcode LECB0001080 [digital photo!]; the original label on the specimen was handwritten by A. Andrzejowski).

≡ *Salvia pratensis* var. *dumetorum* (Andrz.) Briquet (1895: 530).

≡ *Salvia pratensis* subsp. *dumetorum* (Andrz.) Ciocârlan (2009: 660), *comb. inval.* (Art. 41.5 of the ICN; McNeill *et al.* 2012).

≡ *Sclarea dumetorum* (Andrz.) Soják (1983: 22).

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