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RESEARCH ARTICLE

Nomenclatural notes on *Poa* (*Poaceae*): *Poa pseudoconcinna*, typification and application to *P. bulbosa* sensu stricto, and application of diploid chromosome counts ascribed to *P. bulbosa* and putatively related taxa

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Abstract. The original material of *Poa pseudoconcinna* is evaluated, and LW00213479 described and is designated as the lectotype. The lectotype material appears to be indistinct from *P. bulbosa* s. str. The taxonomic disposition of *P. pseudoconcinna* sensu auct., considered to be a diploid race, subspecies, or variety of *P. bulbosa*, is evaluated, including its relationships to *P. delicatula*, *P. carniolica*, *P. jordanovii*, and *P. perconcinna.* Chromosome count data for *P. bulbosa* and related diploids are summarized, and diploid vouchers are noted. Diploid counts for *P. bulbosa* are doubted. Evidence suggests Nygren's counts for *P. concinna* (≡ *P. perconcinna*) belong to *P. molinerii*. Lectotypes are also designated for the names *P. alpina* var. *multiflora*, *P. concinna*, *P. bulbosa* var. *colorata*, *P. concinna* var. *carniolica*, along with an epitype, and *P. timoleontis*. *Poa badensis* subsp. *molinerii* comb. nov. is validated.

Keywords: *Arenariae*, bulbous bluegrasses, chromosome numbers, lectotypifications, Schur, taxonomy

Introduction

DNA work on the genus *Poa* L. has confirmed the existence of corresponding plastid and nuclear ribosomal clades, including *P. bulbosa* L. and various other species included in *Poa* sect. *Arenariae* (Hegeschw.) Stapf. and *Poa* sect. *Alpinae* (Hegeschw. ex Nyman) Stapf mixed. However, sampling in *P. bulbosa* and its bulbous and non-bulbous relatives needs to be expanded beyond what has been published to date (Soreng et al., 2010, 2020; Cabi et al., 2016, among others). In continental Europe, there are currently up to eight bulbous species of *Poa* accepted by some authors: *P. aitosensis* Kožuharov

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& Stoeva (= *P. timoleontis* var. *timoleontis* proposed here); ***P. bulbosa*** L. (*widespread); *P. bulbosa* subsp. *bulbosa* var. *bulbosa* (the normal-flowered form of the species); *P. bulbosa* subsp. *pseudoconcinna* (Schur) Domin (≡ *P. pseudoconcinna* Schur, a putative diploid race of *P. bulbosa*); *P. bulbosa* var. *vivipara* Koeler; ***P. carniolica*** (Hladnik ex Mutel) Bech. (a Slovenian taxon of uncertain application); ***P. cephalonica*** H. Scholz (*a narrow endemic of Greece); *P. concinna* Gaudin (≡ *P. perconcinna*); ***P. iconia*** Azn. (common in the Aegean Islands and eastward in the Middle East); *P. iconia* var. *pelasgis* (H. Scholz) Soreng (the normal-flowered form of the species); *P. iconia* var. *iconia* Azn. (the pseudoviviparous form); ***P. jordanovii*** Kožuharov & Stoeva (*endemic to Bulgaria); *P. pelasgis* H. Scholz (≡ *P. iconia* var. *pelasgis*); ***P. perconcinna*** J.R. Edm. (*endemic to the Alps; or also the Carpathians?); ***P. perligularis*** H. Scholz (a dubious, poorly known taxon of Mediterranean Europe and perhaps North Africa); *P. sinaica* Steud. (sensu. auct. = *P. iconia*); ***P. timoleontis*** Heldr. ex Boiss. (*Balkan and Greek Europe and eastward, and in Turkey into the Levant); *P. timoleontis* var. *dshilgensis* Tzvelev (the pseudoviviparous form of the species); *P. timoleontis* var. *timoleontis* (the normal-flowered form). Beyond *P. delicatula* Schrad. of the Transcaucasian region, only those taxa asterisked above have diploid counts in the literature. That said, some names need to be lectotypified, and diploid vouchers assessed for further taxonomic herbaria, field, and laboratory work. Here we have tried to sort out types and diploid vouchers for a few names of taxa centered around the application of the putative diploid taxon supposedly based on *P. pseudoconcinna* Schur. Schur published some 47 names in the genus *Poa*, mostly in 1866, but only a few are accepted today. Twenty-two of them were invalid when published, eight more were homonyms, and most of them have been consistently subsumed in synonymy. However, one name in particular, *P. pseudoconcinna*, has remained in use in the *P. bulbosa* group as a putative diploid race. Here we have tried to sort out its application and misapplication, and relationships to diploid *P. delicatula* and *P. perconcinna* J.R. Edm.

Materials and Methods

Many herbaria were consulted in person by RJS or via digital images of specimens in the development of this paper. Tasenkevich et al. (2024) digitized the main herbarium of Philipp Johann Ferdinand Schur (1799–1878) at LW, which was acquired in 1861. This included original material of *Poa pseudoconcinna* Schur, a name still in use at various ranks for the taxon of bulbous *Poa* considered to be a diploid. Chromosome counts and their vouchers were compiled from the original literature, and checking the CCDB — *Chromosome Counts Database* (https://ccdb.tau.ac.il/home/; Rice et al., 2015), *Flora Europaea checklist and chromosome numbers index* (Moore, 1982), and *Index to plant chromosome numbers* (IPCN) on *Tropicos* (http://legacy.tropicos.org/Project/IPCN). We attempted to track down and obtain images of all diploid vouchers attributed to *Poa bulbosa*. Herbarium acronyms follow continuously updated *Index Herbariorum* (Thiers, 2009–onward).

Discussion on and typification of *Poa pseudoconcinna*

The name *Poa pseudoconcinna* Schur is variously accepted as a subspecies, proles (race), or variety of *P. bulbosa* L. (Ascherson, Graebner, 1900; Hegi, 1907; Podpěra, 1925; Domin, 1936; Dostál, 1989; Scholz in Strid, Tan, 1991; Kubát, 1992; Horváth et al, 1995; Marhold, Hindák, 1998; Poldini, 2006; Valdés, Scholz, 2009; Dimopoulos et al., 2013), or treated as a synonym of the species (Nyman, 1882: 836; Nyman, 1890, Suppl. II: 341; Edmondson, 1980; Portal, 2005; Špryňar, Štěpánek, 2024). Here, we evaluate Schur's original material to determine its taxonomic identity.

Poa pseudoconcinna Schur, Enum. Pl. Transsilv. 773 (no. 3991). 1866 ≡ *P. bulbosa* proles *pseudoconcinna* (Schur) Asch. & Graebn, Syn. Mitteleur. Fl. 2: 392. 1900 ≡ *P. bulbosa* subsp. *pseudoconcinna* (Schur) Domin, Acta Bot. Bohem. 11: 31. 1936 ≡ *Poa bulbosa* subsp. *bulbosa* var. *pseudoconcinna* (Schur) Hegi, Ill. Fl. Mitt.-Eur. 1(part 9): 308. 1907 ≡ *Poa protuberata* Schur, Enum. Pl. Transsilv. 773 (no. 3991). 1866, nom. inval., pro. syn. *P. pseudoconcinna* Schur.

Protologue: "*P. protuberata* Schur herb. Transs." [Transylvania] … "Auf Kalkfelsen des Kapellenberg und der Salomonsfelsen, nicht gemein, bei Kronstadt, 2000'–3000'. Mai, Jun."

The distribution of the taxon accepted as "*Poa bulbosa* subsp. *pseudoconcinna* (Schur) Asch. & Graben." ["proles" was the rank applied between subspecies and variety], was recorded (with published sources cited) in *Euro+Med PlantBase* (Valdés, Scholz, 2009; accessed March 2025) from

Austria (with Liechtenstein), Bulgaria, the Czech Republic, Greece, Hungary, Italy (with San Marino and Vatican City), and Slovakia. However, the accepted circumscription [provided by Ascherson and Graebner (1900) and Podpěra (1925), and followed by others, including Nyárády's annotations of 1930 of Schur's herbarium] does not coincide with the original description or the morphology of available syntype material. The name was subsequently applied to vouchers for diploid chromosome counts in the Pannonian region of Europe. Špryňar and Štěpánek (2024) treated the name for the Czech Republic as a synonym of *Poa bulbosa*. They commented [Google translation, https://translate.google.com/?sl=la&tl=en&op=translate]: "The traditional distinction into two subspecies, subsp. *bulbosa* and subsp. *pseudoconcinna*, is artificial, practically difficult to use, and lacking any ecological or geographical sense." [See Ascherson and Graebner, 1897 (Ascherson, Graebner, 1896–1898), Vorrede p. VII–VIII for the ranks they applied]. Portal (2005) included the name in synonymy of *P. bulbosa* var. *bulbosa*.

Here we identify Schur's original material and select a lectotype from material matching the protologue description and cited material. We describe that material anew and confirm its identity as *Poa bulbosa* s. str. Chromosome counts for *P. bulbosa*, and in particular diploid counts attributed to *P. bulbosa*, *P. concinna* Gaudin ≡ *P. perconcinna* J.R. Edm., *P. pseudoconcinna*, and *P. delicatula*, are explored concerning the taxonomy of the species sensu lato.

Tasenkevich et al. (2024) digitized the main herbarium of Philipp Johann Ferdinand Schur at LW which was acquired in 1861. This includes the original specimens cited by Schur (1853, 1866) from "Transsilvania". BRNU, P, and PC herbaria also have some Schur's type material.

Tasenkevich identified six specimens in Schur's herbarium associated with the name *Poa pseudoconcinna* or *P. protuberata*, and shared their images with Soreng. Schur's original labels on the six specimens are as follows, wherein Kronstadt, in Latin, equals Corona (bold text below), corresponding to the protologue):

LW00213468: *Poa carniolica* Hladn. | an var. minor *P. bulbosa* L. ? | in rupestribus alpium calcar. Transsilv. | in monte Koenigstein [Arpás ?]. 6000'.

LW00213477: ***Poa protuberata*** Schur var. prolifera | in rupestribus prope **Coronam Mai | Salomonsfelsen**. **2000'**.

LW00213478A: *Poa carniolica* Hladn. | an forma *minor* P. *bulbosa* L. ? | *micrantha* Schur | locis sic dictis Szokerák prope **Coronam** | Transsilv. Med **Junio** 1854. **2500'.**

LW00213478B: ***Poa protuberata*** **Schur** var. *micrantha triflora* | in rupestribus calcareis. prope Tusnåd | Trachyt. Juli.

LW00213479: ***Poa protuberata*** **Schur** | in rupestribus calcareis prope **Coronam** | **Kapellenberg**. **Mai.**

LW00213480: *Poa concinna* Gaud. | non Rchb. nec Host | *Poa carniolica* Hladn. | In rupium fissuris mont. Transsilvan | e.g. in monto Arpås. calcar. **Juny** 24/1852 | Elevat. 5000'.

Each of the above six LW specimens has an annotation by Erasmus Julius Nyárády ("Nyárády rev Cluj 1930"), four of which Nyárády determined as *P. bulbosa* subsp. *pseudoconcinna*: LW00213468, LW00213478A, LW00213478B, LW00213480. Although these four were annotated as that and represent Schur collections from Transylvania, they are not cited as original material. The other two sheets, LW00213477 and LW00213479, Nyárády identified as *Poa bulbosa* L. These two were originally named by Schur, respectively, as "*Poa protuberata* Schur var. *prolifera*" and "*Poa protuberata* Schur" (both names being invalidly published), and their original locations were cited. Thus, only these qualify as cited syntypes. The names P. *pseudoconcinna* and "*P. protuberata*" and specimens were not cited in the earlier *Sertum Florae Transsilvaniae* (Schur, 1853) or earlier Schur publications on Siebenbürgen [Transylvania] flora (1850, 1851, 1852). The next step to lectotypification is to compare the original description with the two identified original specimens.

Original Description in Latin:

3991. *P. pseudo-concinna* Schur = *P. protuberata* Schur herb. Trans. — Rhizomate fibroso subcaespitoso. Culmo 6–8 poll., erecto, basi incrassato subtriphyllo. Foliis angustis, linearibus; culmeis brevissimis, infimis prolumque novellium longioribus angustioribus subulato-convolutis. Vaginis inflatis folio suo multo longioribus. Ligula protensa acuta. Panicula ovata, sub anthesi expansa denique conferta; ramis 1–2 pedicellisque scabris. Spiculis subsexfloris. Flosculis oblongis villosulis; infimis lana parca protrahenda cohaerentibus; superioribus liberis. Valvis subaequalibus, livescentibus, ovatis, acutis, dorso scabris, floro infimo dimidio brevioribus. Paleis inferioribus obtusiusculis, obsolete nervosis, viridibus,

antice hyalino margenatis, ante marginem utrinque macula aurea notatis. Media inter *P. bulbosa* et *P. concinna*. — Auf Kalkfelsen des Kapellenberg und der Salomonsfelsen, nicht gemein, bei Kronstadt. 2000'–3000'. Mai, Jun.

[Google translation from Latin to English, modified here]:

3991. *P. pseudo-concinna* Schur = *P. protuberata* Schur herb. Trans. — Fibrous rhizome [roots] laxly cespitose. Culm 16.2–21.6 cm, erect, base thickened in sets of three leaves. Leaves narrow, linear; culm leaves short, the lowest and most of the young leaves are longer and narrower, convolute. The inflated culm sheaths of their leaves much longer. Ligules prolonged and acute. Panicles ovate, expanded in anthesis and finally densely contracted; branches 1–2 and pedicels scabrous. Spikelets subsexflora (< 6-flowered). Florets small, oblong, and villous; the lowest (callus) hairs prolonged and cohering together, upper hairs free. Glumes subequal, bluish-grey, ovate, pointed, scabrous on the back, lower glume shorter. Lemmas obtuse, obsoletely nerved, green, with a hyaline margin at the front, marked with a golden spot on both sides of the front edge. Intermediate between *P. bulbosa* and *P. concinna*. — Auf Kalkfelsen des Kapellenberg und der Salomonsfelsen, nicht gemein [not pseudoviviparous], bei Kronstadt. 2000'–3000'. May, June.

The two specimens, LW00213477 and LW00213479, closely correspond to the original description, although the LW00213477 sheet "var. *prolifera*" has more florets per spikelet. Although *prolifera* is sometimes used for pseudoviviparous taxa, the material shows no evidence of pseudovivipary.

However, subsequent descriptions of *Poa pseudoconcinna* differ from the original description.

Ascherson and Graebner (1900) [Google Translation from German modified here] recognized the taxon as *Poa bulbosa* proles *pseudoconcinna* (Schur) Asch. & Graebn.

[*Poa bulbosa*] II. *pseudoconcinna*. Plant usually small, up to 1.5 dm high, usually clearly grey-green. Stems fairly thin, erect or ascending, usually enclosed up to the panicle with the sheaths at the top, which are slightly inflated. Leaves short, with very thin, threadlike, bristly, rough blades, forming dense, tufted turf. Panicle up to 4 cm long, usually narrow. Spikelets small, 4 mm long, usually 3 to 4 flowers, usually mottled green, violet, and white.

On dry hills only in the area of the Pannonian flora. So far only Moravia: Brno, limestone rocks near Julienfeld (Schur!). Transylvania: limestone rocks of the Kapellenberg and the Solomon's Rocks near Kronstadt. Perhaps also near Mehadia (see p. 394) and Budapest (Borbás Budap. és körn. növ. 49). Bl. April-June.

Podpěra (1925) [Google translation from Czech, modified here] as *Poa bulbosa* Rasse II *pseudoconcinna*:

[*Poa bulbosa*] II. *pseudoconcinna* Asch. et Gr. In small densely bundled bunches. Plants up to 15 cm high, mostly distinct, gray-green. The stem is quite thin, straight or ascending, mostly closed up to the panicle by a somewhat swollen sheath. Leaves short, with a very thin blade, filiform, bristle-like, and rough. Panicle up to 4 cm long, mostly narrow. Spikelets small, 4 mm long, mostly 3- to 4-flowered, mostly green, purple or white spotted.

P. bulbosa Race II. *pseudoconcinna* Asch. et Gr. Son. II, 1. 392, 1900; SUPPORT Accessories Sep. 28, 1914. *P. pseudoconcinna* seu *P. protuberata* Schur Enum. 773, 1866; Nyman Consp. 836, 1882. Suppl. II. 341, 1890.

Brno: Specimens cited (= Kalkfelsen bei Julienfeld Schur loc. class.)!!, Red hill!!, Velatic steppe!!, Žuraň!! Prague. Krumlov: Floriánek!!, Leskoun u Vedrovice!!, Miroslav: Markova hora!! Mohelno, on the serpentine. ["!!" indicated Podpěra collections].

The Ascherson and Graebner's and Podpěra's descriptions differ from Schur's original description in several respects. Ascherson and Graebner indicated that they saw the Moravian Brno Julienfeld specimen of *Schur*! (collected around Brno in the early 1870s, before he moved to Poland, where he died in 1878). The Schur voucher is not in Brno, and we do not know if it is extant, but it is not original material. Podpěra copied the previous description and applied the name to six of his collections (Jiří Danihelka, pers. comm, 2025). Moreover, those newer descriptions do not match well with syntype material in Schur's herbarium at LW, but coincide somewhat more with LW00213478A, or A & B (teste Nyárády annotations of 1930).

These newer descriptions indicate the inflorescences are barely emergent from the upper sheaths, unlike any of the cited LW material. They indicate the leaves are very thin, threadlike, bristly, rough blades, forming dense, tufted turf, whereas the two LW syntypes have flaccid blades that are not rough and do not form dense turf. Again, the spikelets are said to be 3–4 flowered, whereas in the cited LW specimens these are (3–)4–5, (or even 6–7-flowered in Schur's herbarium name "*Poa protuberata* var. *prolifera*" from Salomonsfelsen). The plants are said to be up to 15 cm tall, whereas Schur indicated the species to be 6 to 8 poll. tall (16.2–21.6 cm; pollex = 2.7 cm). The plants in the two cited LW sheets are 17–23 cm in LW00213477 and 19–24 cm tall in LW00213479, within the range slightly taller than Schur's measures, but within tolerance considering the first joint of thumbs differ in length among people, and a pollex provides an imprecise ruler.

The spikelets of the var. "*prolifera*" sample are not typical of pseudoviviparous plants, but do show several otherwise normal spikelets in the tops of the panicles with one or two terminal florets with slightly elongated lemma apices, whereas most of the spikelets are quite normal in appearance with 5–7 florets. More to the point, Schur indicated the species was not pseudoviviparous, "nicht gemein". Thus, his "*prolifera*" presumably referred to the greater number of florets. The few oddly shaped lemmas tips might have resulted from insect or fungal infections (if not incipient development of bulbils in a few spikelets).

The selection of lectotype material should include, among them, specimens named *Poa protuberata* by Schur, and collected at the only two places Schur cited, which happen to be within the elevation range cited (2000'–3000'). LW00213477 and LW00213479 do not disagree with the protologue location or elevation (not indicated on LW00213479, but the location fits the elevation range).

LW00213477 and LW00213479 match the two cited protologue locations, **Salomonsfelsen** and **Kapellenberg**, and bear Schur's determination as *Poa protuberata* Schur. LW00213468 and LW00213480 are from much higher elevations and different locations than cited, and respectively bear Schur's determinations as *P. carniolica* Hladn. and *P. concinna* Gaudin (≡ *Poa perconcinna* J.R. Edm., non R. Br.). However, Nyárády determined the first two as *P. bulbosa* L., and the other four as *P. pseudoconcinna* Schur, apparently aligning his concept with Ascherson and Graebner's and Podpěra's descriptions of the taxon.

LW00213478B (label applicable to the upper plant on the LW 213478 sheet) appears to belong to another species complex, related to *Poa badensis* Haenke ex Willd., the shoots are emergent from a tunic of old sheaths (not from a bulbous base), the leaf blades appear strongly greyish and prominently veined/ridged and somewhat firm, the ligules are long and prominent on the basal leaves (to 3 mm long, and longer on culm leaves), the uppermost culm leaf blades are vestigial, the spikelets are smaller than in the other specimens, barely reaching 3 mm long, and are 2–3 flowered. Nyárády put one annotation label, "*Poa bulbosa* subsp. *pseudoconcinna*", on the sheet near LW00213478B, possibly due to a lack of suitable space, but seemingly applying it to A and B. Perhaps there has been some historical mix-up with the B sample, as it is clearly not intermediate between *P. bulbosa* L. and *P. concinna* Gaudin. Anyway, it must be excluded from consideration as suitable type material.

Description of the *Poa pseudoconcinna* Schur, **lectotype** (**here designated**): LW00213479 [LW 213479] (Fig. 1):

> Perennial. Five tufts, all alike, tufts small, each tuft with one, erect to basally geniculate flowering shoot, each with a few leafy lateral pear-shaped bulbs, bulbs ascending divergently from the flowering shoot at about 10–30° (as is typical of *Poa bulbosa* subsp. *bulbosa*), bulbs short, overlapped by old outer sheaths, the inner sheaths up to 1 cm long, the lower indurate portion 4–6 mm long; new shoots intravaginal; prophylls with retrorse and mixed directional prickle hairs along the keels. Culms 19 to 24 cm tall, smooth, with 1 to 2 nodes elevated, uppermost node at about 1/3 the culm height; leaf sheaths smooth, uppermost sheath 5–7 times longer than its blade, margins fused ca. 1/5 (1/4?) their length; basal leaves short, thin (without thickened margins), abaxially smooth, soon withering, basal blades to 2 cm long, mostly folded, narrow (to 1 mm wide, or 0.5 mm folded), culm blades to 2 cm long, uppermost blade 0.5–1.0 cm long; ligules whitish, smooth to sparsely scabrous abaxially, acute, 1.0–1.4 mm on basal leaves, to 3.4 mm long on culm

leaves. Panicles 3.0–3.5 cm long, ovate in anthesis, to elliptical and contracted, branches 1–2(–3) at lowest node, longest branches to 1.5 cm long with 5–8 spikelets, naked in the lower 2/5–1/2, subflexuous, ascending to appressed, pedicles short and scabrous (noted by Schur). Spikelets ca. 4 mm long, with (3–)4–5 florets; glumes broad, thin, 3-nerved, subequal and shorter than adjacent lemmas by ca. 1 mm; rachilla internodes a little exposed (florets not crowded and divergent as in *P. perconcinna*); lemmas ca. 3 mm long, hairs confined to keel and marginal nerves, appressed, body purplish in distal 1/2–1/3 with a golden brown band above that extending to near the acute apex and a narrow, whitish scarious-hyaline margin; palea keels scabrous; anthers immature.

Any differences between the two cited specimens and *Poa bulbosa* s. str. are obscure and minor at best. The Schur specimens are quite typical of small-tufted *P. bulbosa* s. str. plants and are a good match for the lectotype of that [LINN 87.57 *Poa bulbosa* L.; https://linnean.access.preservica.com/?s=87.57: first-step designation by Meikle (1985); second-step designation by Soreng in Cafferty et al. (2000)].

The US National Herbarium has several sheets originally disseminated with "*pseudoconcinna*" determinations at different ranks. Unlike *Poa delicatula* types, they all have smooth culms, longer and smooth ligules, and 3-nerved lower glumes, and all fit *P. bulbosa* subsp. *bulbosa* var. *bulbosa.*

Poa pseudoconcinna, Hungary, Pest, Comit. Pest. In arena mobili insulae Csepel ad Soroksár. Sol. aren., 80 m, 25 May1904, *A. Degen 270* (US-04071889, US-04071875).

Poa bulbosa subsp. *pseudoconcinna*, Flora Čechoslovenica exsiccata, Moravia australis: montes Pavlovské kopce, Šibeničnik prope urbem Mikulov, solo calcareo, 238 m, 16 May1933, *F. Weber 363* (US-04071880).

Poa bulbosa var. *pseudoconcinna*, Bohemicae Slovenicae, Moravia Centr.: Třebíč, in praeruptis aridis, desertis supra Jihlavka fluvium prope urbem Mohelno, solo serpent., 250 m, 26 May 1926, *F. Novacek 292* (US-04071886).

Poa bulbosa var. *pseudoconcinna*, Bohemicae Slovenicae, Moravia Meridionalis, Mikulov: Svatá hora, in declivio stepposo. Slovakia. Solo calcario, 360 m, 19 May 1923, *G. Sirjaev 86* (US-04071879, US-04071887).

Discussion of diploid chromosome counts sometimes attributed to *Poa bulbosa*

We have attempted to track down all diploid vouchers sometimes attributed to *Poa bulbosa.*

It has been presumed by some that diploid counts for European *Poa bulbosa* (exclusive of *P. perconcinna*) belong to *P. bulbosa* subsp. *pseudoconcinna*, but as noted above, the type of that is *P. bulbosa* s. str.

Poa perconcinna is a close relative for which Duckert-Henroid and Favarge (1978) counted $2n = 14$ for six populations of Switzerland.

A chromosome number $2n = 14$ was reported for European *Poa bulbosa* by Guinochet [1943, Mediterranean Alps, France, "murs en pierres sèches à Roubion", herb. Guin. 4107230014 (VIL?). According to *Index Herbariorum* (Thiers, 2009–onward), the VIL Guinochet collections were dispersed in 1999 to Ville De Nice Direction Des Espaces Verts {n.v.}. Although we have been in touch with the Head of the associated herbaria, NICE and JBVN, by email, we have not yet received confirmation of the presence of the voucher or Guinochet's herbarium. However, as subsp. *pseudoconcinna* is not reported for France in *Euro+Med PlantBase* (Valdés, Scholz, 2009), the *Guinochet* diploid voucher is probably *P. perconcinna*. Portal (2005) noted *P. perconcinna* occurred in the Maritime Alps of France and did not mention $2n = 14$ for *P. bulbosa*.

Kožuharov and Stoeva (1983) reported $2n = 14$ for *P. pseudoconcinna* from Bulgaria, east of Kocherinovo at about 700–800 m. alt., [on leached cinnamon forest soil; translation from 1983, p. 155] (voucher: MC-I40 | Rila, east of Kocherinovo, Defileto, | $2n = 14$ X = 7 | 21.IV 1977 | Leg. *Kožuharov & Stoeva*, SOM [SOM1332 image!]): The voucher looks like the taxon as applied by Ascherson and Graebner (1900), non Schur (1866). Considering the filiform leaves in the voucher, it might be *P. perconcinna*. We wonder if the authors held the opinion that *P. pseudoconcinna* was applicable to *P. concinna* Gaudin (non R. Br.). They also reported $2n = 14$ for *P. jordanovii* Kožuharov & Stoeva, which differs in smaller, delicate, open panicles with spikelets and florets lacking callus hairs, the count coming from the type collection population of Bulgaria: Z. Rodopi, reservat "V. Kolarov" skalisti do r. Suisuza, 28 Aug 1975, Stoeva, MS — No. 120, SOM (SOM1433 image!; Fig. 2).

A diploid number for *P. bulbosa* was reported without infraspecies by Hubbard (1954) without

voucher, and the diploid count was removed from his second edition (Hubbard, 1968).

Phitos (1988) reported 2*n* = 14 from the type locality in Greece of *P. cephalonica* H Scholz as that taxon, and 2*n* = 28 for its (unnamed) viviparous form. This name is treated in the CCDB server as a synonym of *P. bulbosa*, but that is incorrect.

One diploid count was attributed to Caucasian or Transcaucasian plants (Tzvelev, 1976; Tzvelev, Probatova, 2019) called *Poa delicatula* Schrad., or *P. delicatula* Wilhelms ex Tzvelev (1973, nom. illeg., a later homonym) or *P. bulbosa* subsp. *delicatula* Tzvelev (1974, 1976). (At LE, there are specimens annotated by Tzvelev in the 1970s from Dagestan, Armenia, Azerbaijan, and Georgia). Tzvelev (1976) also noted *P. bulbosa* subsp. *delicatula* occurred in Iran, but the taxon was not mentioned in Iran by Kavousi et al. (2015). Sokolovskaya and Probatova (1979) published 2*n* = 14 for subsp. *delicatula* (Azerbaijan, *E.B. Alekseev s.n.*, VLA!). The voucher for the diploid count is a clearly bulbous-based plant, but it includes only vegetative material; it may not belong to *P. delicatula* (Tzvelev, 1976, who only suggested the taxon was diploid). Notably, the greenhouse-grown plant does not appear to be bulbous (but see *A* comment on bulbs under *P. carniolica*).

Voucher: (VLA!). Det. N.S. Probatova. n. 4842 2*n* = 14 (Sok., p, 1979). "On the right are the original plants, on the left are the plants from the greenhouse" (Sokolovskaya, Probatova, 1979) [translated from Russian] (RJS photo USER0340!)

Two other Asian diploid counts for *P. bulbosa* without infraspecies were reported from Armenia and India. The voucher cited by Nazarova and Goukasian (1995, ASIA, Armenia, *Nazarova 2018*, ERE) is in the geographic range of *P. delicatula,* but this name was not mentioned in the *Flora of Armenia* (Takhatajan, 2010, where 2*n* = 14 is noted for *P. bulbosa*), despite Tzvelev's 1970s annotations of material at LE from Armenia. The India diploid report by Mubarik et al. (2017, ASIA, India, *N. Mubarik 29338*, PUN) was not specific to locality. Our several requests for images of the ERE and PUN vouchers have not been answered.

All other *Poa bulbosa* counts tabulated from the literature by Soreng are higher (sometimes reported with +1 or +2 B chromosomes): 2*n* = 21(× 3), 24(× 2), 28(× 49), 31(× 1), 32(× 1), 33(× 7), 34(× 1), 35(× 12), 36(× 2), 37(× 3), 39(× 7), 40(× 2), 41(× 2), 42(× 33), 43(× 2), 44(× 3), 45(× 5), 46(× 4), 47(× 1), 48(× 2), 49(× 4), 50(× 2), 54(× 1), 56(× 2), 58(× 1). So, the species is mainly tetraploid and hexaploid. Multiple triploid and other odd multiples of 7, and dysploid counts (off multiples of the base number of x = 7), are generally indicative of apomixis, but some variation may be attributable to B chromosomes. Some 82 of the higher counts were reported from pseudoviviparous plants, while 17 others [2*n* = 21(× 3), 24(× 1), 28(× 2), 35(× 1), 39(× 1), 42(× 4), 44(× 1), 45(× 1), 46(× 2), 48(× 1] were attributed to subspecies or variety *bulbosa*. Fifty-nine more were reported without infraspecies. Stoeva (1983) evaluated 29 populations of *P. bulbosa* (2*n* = 21 to 54) from Bulgaria and the former Soviet Union (republics of Georgia and Tajikistan), half of which exhibited multiple chromosome numbers within populations. See also Duckert-Henriod and Favarger (1987) and the CCDB database.

Diploid counts for *P. bulbosa* attributed to Holub et al. (1971) were database errors, which were reported as *P. badensis* or *P. crassipes* (fide Jiří Danihelka, pers. comm. 2025, and RJS from Holub's publication). This has now been corrected in the CCDB database.

The *Flora Europaea Checklist and Chromosome Index* (Moore, 1982) listed one diploid report for *Poa bulbosa* from Greece, citing "Edmondson ined". However, Moore's account may have predated Edmondson's (1980) treatment of *Poa* in *Flora Europaea*, where no diploid counts were accepted for that species. Portal (2005: 84), covering *Poa* of Belgium, France, and Switzerland, listed "2*n* = 28, 42 (21, 24, 31–37, 39–46, 48, 49, 59)" under *P. bulbosa* var. *bulbosa*, and noted the numbers were probably the same for var. *vivipara* Koeler (cited as "var. *vivipara* Borkh." nom. nud.). In *Flora Iberica* (*Poa* by Ortega-Olivencia, 2020), 2*n* = 21, 28, and 42 were reported for *P. bulbosa* as Iberian counts, while 2*n* = 14 was noted as from outside the flora area. For Russia (Tzvelev, Probatova, 2019), *P. bulbosa* was reported as 2*n* = 42, and var. *vivipara*, as *P. crispa* Thuill., as *2n* = 28 and 42.

At this point, we are highly skeptical of any diploid counts being applicable to *Poa bulbosa* s. str.

Discussion and lectotypification of *Poa concinna* ≡ *Poa perconcinna*

Poa perconcinna J.R. Edm., Bot. J. Linn. Soc. 76(4): 330. 1978 (published as nom. nov.) ≡ *Poa concinna* Gaudin, Agrost. Helv. 196. 1811 (nom. illeg., non. R. Br., 1810) ≡ *Poa bulbosa* var. *concinna* Posp., Fl. Oesterr. Küstenl. 1: 97. 1881. (nom.

Fig. 1. Lectotype of *Poa pseudoconcinna* Schur (LW00213479), courtesy of the Herbarium, Ivan Franko National University of Lviv, Lviv, Ukraine

Fig. 2. Holotype of *Poa jordanovii* Kožuharov & Stoeva (SOM1433), courtesy of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences

nov. for *P. concinna* Gaudin) ≡ *Poa bulbosa* subsp. *concinna* (Posp.) Hayek, Repert. Spec. Nov. Regni Veg. 30(3): 260. 1933.

Protologue: [Switzerland] Hab. In arenosis Valesiae inferioris, et praecipue Seduni. **Type specimen**. "Schleicher exs. of Cent. II. No. 12. Poa molineri Balb." In aridis circa Branson. (**lectotype**, **here designated** by Soreng & Patrice Descombes: G-DC (G01100147) "12. Poa Molineri Balb. In aridis circa Branson" {printed ticket} "Schleicher" {handwritten} (Fig. 3, RJS IMG-4259); isolectotypes: LAU [LAU31572/Accession: G3169B; plant on left side of part B], W [W18890246843; plant on left]; W [W19240005263]).

The lectotype derives from original material named *Poa molinerii* Balbis sensu de Candolle (1805: 62, misapplied, non Balbis, 1801), as noted by Gaudin (1811), and Mutel (1837). Edmondson (1978) did not cite a type, nor did Portal (2005). Portal wrote that the type was at LAU, but there appear to be two gatherings on the LAU isolectotype and W lectotype sheets. By comparison of these and the DC (G) herbarium sheet, we conclude the smaller plants (syntypes) were gathered by *Thomas f.* "prope Seduni" (that sometimes written in pen on the printed ticket), the larger plants correspond to the "*Schleicher* exs." The separate de Candolle herbarium at G has these on separate sheets, and the taller plant has "Schleicher" written on it. Both forms are *P. perconcinna*.

Poa concinna Gaud., Helvetia in Seduni (ex herbier de L'Abbe Daenen received in 1864) G-DC (RJS image 4260) is a syntype. LAU31572 pp. B, right-hand specimen, corresponds to this smaller form collected by *Thomas f.* prope Sedunam.

Poa perconcinna is considered to be a diploid, dwarfish, bulbous based, close relative of *P. bulbosa*, with a webbed callus (mostly, but sparsely), and lemmas ≤ 2.8 mm long, the species occurring from Switzerland and adjacent western valleys in the Alps of France (Duckert-Henriod, Favarger, 1987; Portal, 2005, with description and illustrations). It differs from *P. bulbos*a, *P. delicatula*, and *P. pseudoconcinna*, in the more compact spikelets (rachilla internodes short, hidden), and florets 4–7(–10), closely imbricated and divergent at a wider angle (see Portal p. 136, middle Fig. 4, {less often like the left Fig. 4}), and with dense tufts of early withering, threadlike [0.3–0.4(–0.7, 1.0) mm wide], basal leaf-blades.

Axel Nygren (1962) reported seven counts of $2n = 14$ as *P. concinna* Gaudin (≡ *P. perconcinna*) from France, Switzerland, and Bulgaria. We tried to track down his voucher material, which he cited in detail with collection numbers. None were found in Sweden's Virtual Herbarium (http://herbarium.emg.umu.se/standard_search.html). Nygren worked nearby Upsala at The Royal Swedish Academy of Agricultural Sciences in Ultuna, but his voucher material is absent there today (Patrik Spånning Westerlund, pers. comm. 2025). We requested images of Nygren's vouchers from GB (where some *Nygren* collections are said to be present, but were not found; Claes Gustafsson, pers. comm. 2025) and also from UPS (no Nygren cytological vouchers were found by Mats Hjertson, pers. comm. 2025). Prof. Anna Rosling continues the search in Uppsala University departments, but nothing has been found (pers. comm. July 2025).

We surmise that Nygren's (1962 and earlier) hundreds of diploid counts (from: Bulgaria, vic Klisura, NW of Sophia; France, St. Jean de Marianne, Savoy, 750 m, vic St. Véran, Hautes-Alpes, 2200–2500 m, vic St. Véran, Hautes-Alpes, 2200–2500 m, vic St. Veran, Hautes-Alpes, 2200–2500 m; Switzerland, Sion, Valais, 800 m) for "*P. concinna*" should at least in part, except the Swiss population, be attributed to *P. molinerii* Balb. It is evident from his Fig. 72 range map that he precisely duplicated the range of *P. molinerii* in Buschmann's well-documented treatment (1942, Karte 1, pp. 94–95) of the *Poa badensis* complex, changing the name to *P. concinna*. Buschmann included "*P. molinerii* s. ampl." as one of "Kleinarten" [small species] of variable morphology and wide geographic range within his *P. badensis* s. l., a taxon complex that does not produce bulbs (Edmondson, 1980; Portal, 2005). Nygren (1962) did not mention bulbs in his paper on the origins of *P. alpina* L., nor did he mention *P. molinerii* (but see Müntzing, Nygren, 1955: 416, where the two authors provisionally equated *P. molinerii* with *P. concinna*). *Poa concinna* (≡ *P. perconcinna*) is not morphologically confusable with *P. molinerii* (although de Candolle did it in 1805). The former taxon has bulbs, compact spikelets with numerous short florets, and tender threadlike leaf-blades with intermittent and weekly developed sclerenchyma bands, the later lacks bulbs and has larger fewer-flowered spikelets, rachilla internodes visible, lemmas (2.8–)3.5–3.8(–4) mm long, and broader and firmer blades usually with sclerenchyma bands below all primary and secondary vascular bundles and more or less thickened margins (Buschmann, 1942; Portal, 2005, as *P. badensis* subsp. *molinerii* (Balb.) Duck.-Henr. &

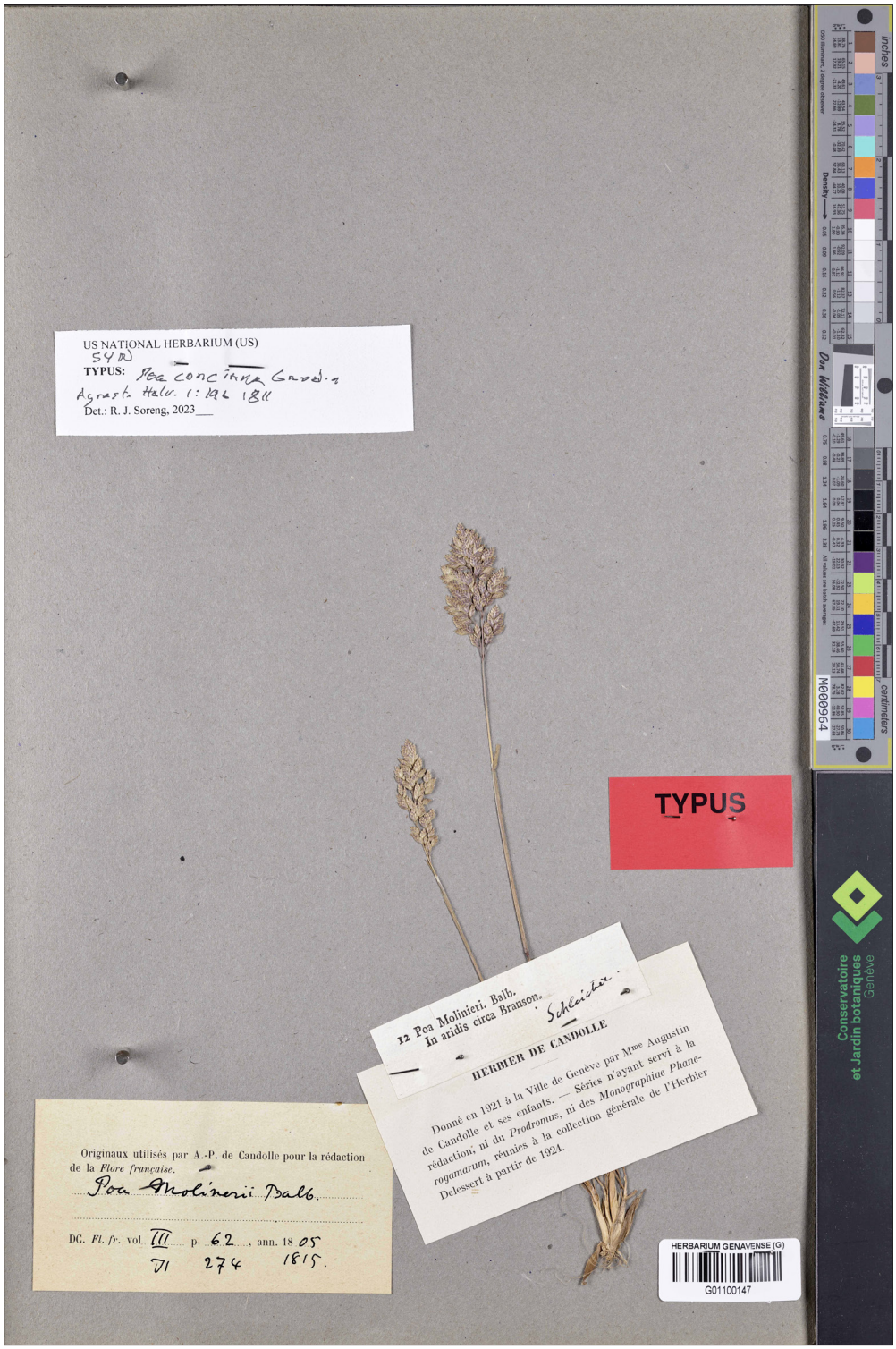

Fig. 3. Lectotype of *Poa concinna* Gaud. (G01100147), courtesy of © Conservatoire et Jardin botaniques de Genève

Favarger). Nygren's misapplication seems to have been noticed by Duckert-Henroid and Favarge (1987) as they did not cite his chromosome reports for *P. perconcinna*, and expressed their doubt (p. 38) concerning his counts under "*P. xerophila*" sensu Nygren. Nygren (1962: 5) mentioned "*P. alpina* subsp. *xerophila*" of Braun-Blanquet as the basis (intended basionym?), but did not effectively make a combination, as there is no clear and direct citation of the place of publication of the basionym (originally *P. alpina* var. *xerophila* Braun-Blanq. [≡ *P. badensis* subsp. *molinerii* (Balb.) var. *xerophila* (Braun-Blanq.) Duck.-Henr. & Favarger, *P. badensis* subsp. *xerophila* (Braun-Blanq.) Kerguélen]. It is clear from Nygren's Fig. 3 (1962) that the voucher is a broad-leaved plant, very unlike bulbous relatives, including *P. perconcinna*, but the precise identity of *P. concinna* (sensu Nygren) in his Fig. 2 is not obvious.

Nomenclature of *Poa badensis* subsp. *molinerii*

Poa badensis Haenke ex Willd. subsp. ***molinerii*** (Balb.) Duckert-Heuriod et Favarger ex Soreng, **comb. et stat. nov.** ≡ *Poa molinerii* Balb., Elenco 85. 1801 [≡ *P. badensis* subsp. *molinerii* (Balb.) Duck.-Henr. & Favarger, 1987, nom. inval., without full and direct citation of the basionym, see Art. 38.13 and 41.5 of the *ICN*: Turland et al., 2025]. **Lectotype** (Buschmann, 1942, p. 113): G ["Ex montib. Tenda, misit Balbis"]; isolectotypes: FI (FI 012615/A: Herb. Webb. 202850, upper middle plant), BM (BM001067238)) ex herb. de Candolle ex herb. Nolte)

= *Poa badensis* var. *multiflora* (Gaudin) Kerguélen, Collection Patrimoines Naturels 8: xv. 1993 ≡ *Poa alpina* var. *multiflora* Gaudin, Flora Helvetica 1: 245–246. 1828. **Type** protologue. "in M. Sempronio ad pylas vallis Ganter" (**lectotype**, **here designated** by Soreng & Descombes: LAU 31563/A: G3165 "Trovee and Point force a entree de la vallee de Ganter sur la route du Simplon, Aug 1809").

Although this taxon is not a bulbous species, we bring it up as the name *Poa molinerii* (sensu DC.) was confused with what is known as *P. perconcinna* by de Candolle (1805) and Nygren (1962). Gaudin (1828), under II *Poa alpina brevifolia* Gaudin (1828: 245) cited "β *multiflora* Gaud. Agr. Helv. 1. p. 194", with description on p. 246, but that name is not present in either *Agrostologia Helvetica* (tomus 1 or 2), nor in their indices. Duckert-Henroid annotated the selected var. *multiflora* lectotype in 1984, as "*Poa badensis* ssp. *molinerii* (Balb.) D.H. et Favarger var. *molinerii*". The subspecies combination is validated here. Kerguélen (1993) treated *Poa molinerii* Balb. as a synonym of his *P. badensis* subsp. *xerophylla* (Braun-Blanq.) Kerguélen (2*n* = 14) var. *multiflora* (2*n* = 28), the inverse of what Duckert-Henroid and Favarge (1987) proposed. The *Poa* epithet *molinerii* is widely applied, whereas that of *xerophylla* is narrowly restricted to diploid populations from close to the type locality Zernez, Chaste Muottas, Switzerland.

Discussion of *Poa carniolica*

Although the names *Poa concinna* var. *carniolica* Hladnik ex Mutel, Fl. Franc. 4: 77. 1837 (≡ *P. carniolica* (Hladnik ex Mutel) Bech., Ber. Schweiz. Bot. Ges., 45: 295. 1936), are sometimes equated with *P. concinna* Gaudin (≡ *P. perconcinna*) (e.g., Pignattii, 1982; Portal, 2005), the original material does not appear to be bulbous based. Mutel (1837) diagnosed the new variety as having culms taller, panicles more lax and elongated, and referred to *P. carniolica* Hladnik and *P. concinna* var. *carniolica* Rchb. {Agrostogr. Germ., 1834 tab. "11" {error for 81} f. 1618. Reichenbach (1834: 34) cited 'Tab. LXXXI f. 1618, var. *carniolica* Hladnik, and "*P. carniolica* Hladnik" | "Bie Lagbach in Karin", without description or diagnosis. (Reichenbach's second edition, 1850, renumbered this as tab. LCIV, f. 384). The Reichenbach figure seems to be the only confirmable original material for typification, and we **here designate** Agrostogr. Germ., 1834, tab. LXXX1, f. 1618 as the **lectotype**.

Karin refers to the former Duchy of Carinthia, which covered parts of southern Austria and adjacent northern Slovenia: Laibach, is an older German name for Ljubljana, Slovenia. There is a sheet S13-29803 in the Agardh herbarium at S (image available on JSTOR Global Plants) labeled TYPUS, with a label "*Poa carniolica* [author illegible] n. sp." | "Prope Laibach" | "[collector illegible]" | noted as "*Hladn*." in a different penciled hand in the upper right corner. Of the five flowering shoots on the Agardh sheet, none is a clear match to Fig. 1618 (which has 30 spikelets, large 7-flowered spikelets). The Agardh specimen panicles are more densely-flowered and more contracted, with 30 to 40 spikelets, and up to 7-flowered spikelets. Otherwise, it is quite like Fig. 1618 in habit. Since we cannot confirm that the Agardh herbarium sheet itself is original material, we **here designate** S13-29803 as

an **epitype** for *P. concinna* var. *carniolica* Hladnik ex Mutel, Fl. Franc. 4: 77. 1837, to interpret Reichenbach's (1834) Fig. 1618. Although Edmondson (1978, p. 330) wrote that the illustration "appears to be merely a variant of *P. bulbosa* L.", and "Attempts to typify the name have been unsuccessful", in his *Poa* treatment in *Flora Europaea*, Edmondson (1980) applied the Reichenbach figure to *P. bulbosa*, and *P. carniolica s. auct*. to *P. perconcinna*. The lectotypification here establishes the figure as the basis of Mutel's name. However, neither the Reichenbach figure, nor the epitype specimen (as far as can be seen online), are bulbous based. We suspect the more open inflorescence in the figure resulted from the illustrator's license to spread the branches. The taxonomic application of *P. carniolica* remains doubtful here, but in our opinion, the name is inapplicable to *P. bulbosa* or *P. perconcinna*, and perhaps not to any bulbous *Poa*.

A comment on bulbs. It is not always possible to be certain of the absence of bulbs in digital images. Even with specimens in hand when bulbs are not obvious (which they usually are), pressing the basal area with a fingertip to feel for a swollen base is usually a good test. Beyond that, a dissection of the base to confirm the presence of thickened, indurate basal sheaths is rarely needed. However, there was a last comment by Ascherson and Graebner (1900: 394) under *P. concinna*: [Google translation] "As Koch (Syn. Ed. 1, 802 {1838}) already noted, the bulbous swelling at the base of the stem (as, incidentally, often also at the previous one {i.e., *P. bulbosa*}) disappears in cultivation." This might account for the absence of bulbs in type and epitype material of *P. carniolica* and type material of *P. delicatula*.

Discussion of type material of *Poa delicatula*

The type specimens of *Poa delicatula* Schrad. and *P. delicatula* Tzvelev material appears to lack bulbs.

Poa delicatula Schrad., in von Schlechtendal, Linnaea 12(4): 448. 1838. **Type**. "H. Petr. pr. com. *P. triv*. 1832 [**lectotype**, designated by Tzvelev in Tzvelev & Probatova, 2019, p. 319): LE-Herb. Schrader | "H. Petr. pr. com. *P. triv*. 1832, LE00019412 p.p. "c" (http://re.herbariumle.ru/00019412); isolectotypes LE00019412 p.p. "a, b", LE-TRIN 2616.01 p.p. "a"] (TRIN = C. B. Trinius Herbarium; Soreng et al., 1995).

= *Poa delicatula* Wilhelms ex Tzvelev, Novosti Sist. Vyssh. Rast. 10: 94. 1973 ≡ *P. bulbosa* subsp. *delicatula* Tzvelev, (Novosti Sist. Vyssh. Rast. 11: 26. 1974 [**holotype**: LE-Cauc. Herb. Ledeb. (RJS image 1899): "Hortus Imperials Petropolitanus | Herb. Ledebour | *Poa delicatula* novo Spec. | Cauc. {"Cauc." penciled in another hand}]", determined in 1917 by Roshevitz as *Poa bulbosa* L.; isotype: US (US04073283) "Ex herbario horti Petropolitani. | *Poa bulbosa* L. | Caucasus | *Wilhelms*")] (Fig. 4).

On the US isotype, the two shoots of p.p. "a" are a perfect match for Tzvelev's *Poa delicatula* holotype, and the lectotype of the Schrader species. Considering the above *comment on bulbs*, we tentatively accept *P. delicatula* as a bulbous species, following Tzvelev and Probatova (2019), as the type material does not match any other species we know of with or without bulbs. More analysis of the taxon will be provided in a separate paper.

Discussion of *Poa bulbosa* var. *colorata*

Poa bulbosa var. *colorata* Hack. ex Asch. & Graebn., Syn. Mitteleur. Fl., 2: 293. 1900. **Type**: C. Baenitz, Herbarium Europaeum (s.n.) *P. bulbosa* L. f. *colorata* Hack. in lit. Flora Hercegovinae: Mostar; Wiese über dem Stolacfelssen, 30/5.97 — 500 m. leg. *C. Baenitz* [**lectotype**, **here designated**: US0472420; isolectotypes: DR058535 [image!], HBG0524299, KFTA0000140 [image!])].

Protologue: Hackel Prosp. Baenitz Herb. Eur. XXXIII (1900) 7 (1899). Distribution: Sardinia and the Balkan Peninsula.

The taxon was effectively described as "Richly flowered, vividly reddish" variety [Google translation from German].

RJS identified one specimen at US (US0472420) as a good match to the Reichenbach Fig. 1618 of *P. concinna* var. *carniolica*. A search of https://JACQ.org revealed three more duplicates of this collection. The KFTA sheet was annotated as "Isotype" of var. *colorata* by Victor Byalt, on 2013-12-23, unpublished. We designate the US sheet as the Lectotype of *P. bulbosa* var. *colorata*. Presumably, this collection was among the material redistributed in additional numbered sets of Baenitz exciccatae. It has tiny bulbs and small tufts of short, slightly withered leaves. It has the broad glumes of *P. bulbosa* and *P. perconcinna*, and compact spikelets with 6–8 divergent florets, with hairs (dense, silky, blunt-tipped) confined to the keel and marginal nerves, palea keels that are scabrous without longer hairs (as is typical of *P. bulbosa* and bulbous allies), anthers 1.2–1.3 mm long, like *P. perconcinna*. It has

Fig. 4. Isotype of *Poa delicatula* Wilhelms ex Tzvelev (US04073283, pp. a), courtesy of the Department of Botany, Smithsonian Institution (pp. b = P. iconia Azn. var. iconia)

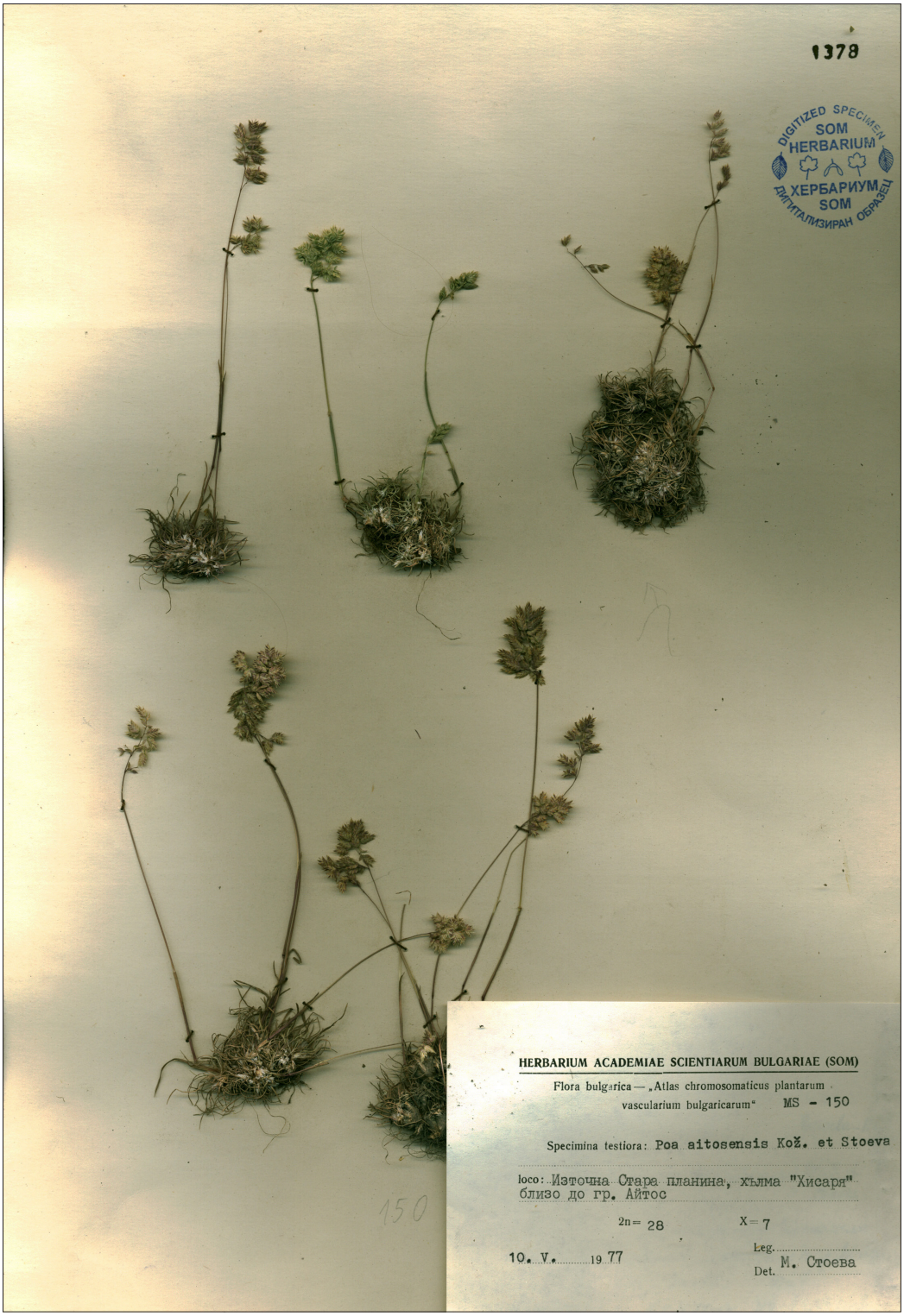

Fig. 5. Holotype of *Poa aitosensis* Kožuharov & Stoeva (SOM1378), courtesy of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences

only 7–22 spikelets (versus 30–40 in the Reichenbach figure of *P. concinna* var. *carniolica*), which, as described, are quite reddish. Previously determined as *P. perconcinna* by RJS, its lemmas are 3 mm long, too long for that, but it also lacks hair on the callus of florets (variably present or absent in *P. perconcinna*), so it does not belong to *P. bulbosa* s. str. nor to *P. pseudoconcinna*. We tentatively accept *P. carniolica* (Mutel) Bech. as a separate species, as done by Valdés and Scholz (2009), and *P. bulbosa* var. *colorata* may belong here.

Lectotype for *Poa timoleontis* and synonymy of *P. aitosensis*

Poa timoleontis Heldr. ex Boiss., Fl. Orient. 5: 607. 1884. **Type specimen**. Attica: in pascuis aridis regionis inferioris a mediae montis Hymentti, alt. 500'–2500', 2 May 1878, *Heldreich 104* [**lectotype**, **here designated**: G (G00382993); isolectotypes: G (G00382992), G-BOIS (G00330289), LE (LE00009716), US (US00731019, ex herb. Hackel, excl. plant on left in early viviparous stage), US (US04072742, ex hb. Hackel)].

= *Poa aitosensis* Kožuharov & Stoeva, Spornik, 90 Godini Akademik Daki Iordanov. 155, f. 6. 1984. **Holotype**: Bulgaria, Vallis Tundzae, supra urbem Aitos, l.d. Hisar, 10 May 1977, *Stoeva MS- No. 150*, SOM1378 (image!) (Fig. 5).

Boissier (1884) cited four collections from Greece and one from Syria of *Poa timoleontis*, a new bulbous species of *Poa*. Although some herbarium sheets have been marked as types or syntypes, to our knowledge, no one has formally published a lectotype. The lectotype selected was received by Boissier in 1883 as *Poa timoleontis* Heldr. spec. nov.

For *Poa timoleontis*, Nygren (1957) published $2n = 14 + 2B$, from a North Macedonia specimen [Topalka Gorge, 200–300 m elev. (misit. W. Koch, Zurich)], and Kožuharov and Stoeva (1983) published $2n = 14$ from a Yugoslavian collection without details. Stoeva and Kožuharov (Löve, 1978) published $2n = 28$ for the species from Bulgaria, but in 1983, they changed the identification of the tetraploid to *P. aitosensis*. They noted their new species differed only in the tetraploid chromosome number from the diploid bulbous taxon *P. timoleontis* Heldr. ex Boiss. The *P. aitosensis* type image has every aspect of the habit, including bulbs, prominent, broadly decurrent, white ligules, and noted absence of a web on the callus, like the later taxon, and we here consider it a synonym of *P. timoleontis*.

Conclusions

In summary, it appears from our study of the lectotype selected here that *Poa pseudoconcinna* Schur s. str. is indistinct from *P. bulbosa* subsp. *bulbosa* var. *bulbosa*. Furthermore, we do not know if it represented a diploid population or not. *Poa delicatula,* as named by Tzvelev (1973), treated as a *P. bulbosa* subspecies in 1974, 1976, or as *P. delicatula* Schrader (1838) by Tzvelev and Probatova (2019), appears to be distinct from *P. bulbosa* s. str. in having smaller spikelets and lemmas. We have attempted to track down all diploid chromosome number voucher material of *P. bulbosa* s. l. and *P. delicatula*. It appears the one confirmed European *P. pseudoconcinna* sensu auct. diploid voucher is distinct from *P. delicatula* as applied to bulbous material, and it might be applied to *P. perconcinna*. The taxonomic disposition of the eastern diploid populations reported as *P. bulbosa* from Armenia and India remains to be seen. Although we have identified and established types and lectotypes here for several taxon names, further study of the diploids of *P. bulbosa* and putative relatives is needed, but we doubt any diploid counts apply to *P. bulbosa* s. str.

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ETHICS DECLARATION

The authors declare no conflict of interest.

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REFERENCES

Ascherson P.F., Graebner K.O.R.P.P. 1896–1898.Vorrede. In: *Synopsis der Mitteleuropaischen Flora.* Vol. 1. Leipzig: Verlag von Wilhem Engelmann, 1–11 pp.

Ascherson P.F., Graebner K.O.R.P.P. 1900. *Gramineae* p. p. *Poa*. In: *Synopsis der Mitteleuropaischen Flora.* Vol. 2(1). Leipzig: Verlag von Wilhem Engelmann, pp. 386–437.

Buschmann A. 1942. Zur Klarung des formenkreises um *Poa badensis* Haenke. *Oesterreichische Botanische Zeitschrift*, 91(2): 83–130.

Cabi E., Soreng R.J., Gillespie L.J., Amiri N. 2016. *Poa densa* (*Poaceae*), an overlooked Turkish steppe grass, and the evolution of bulbs in *Poa*. *Willdenowia*, 46(2): 201–211.

de Candolle A.P. 1805 [1815]. CLXXV. Paturin. *Poa*. In: *Flore Française, ou descriptions succinctes de toutes les plantes qui croissent naturellement en France.* Vol. 3. 3rd ed. Eds J.-B. de Lamarck., A.P. de Candolle. Paris: de l'Imprimerie de Stoupe, pp. 56–66.

Dimopoulos P., Raus T., Bergmeier E., Constantinidis T., Iatroú G., Kokkini S., Strid P.A.K., Tzanoudakis D. 2013. Vascular Plants of Greece. An annotated checklist. *Englera*, 31: 1–372.

Domin K. 1936. Schedae ad Floram Čechoslovenicam exsiccatam, Centuria IV. *Acta Botanica Bohemica*, 11: 3–50.

Dostál J. 1989. *Poa*. In: *Nová Květena ČSSR.* Vol. 2. Bratislava: Academia, pp. 1336–1344.

Duckert-Henriod M.M., Favarger C. 1987. Contribution à la cytotaxonomie et à la cytogéographie des *Poa* (*Poaceae* = *Gramineae*) de la Suisse. *Denkschriften der Schweizerishe Naturforschen Gesellschaft*, 100: 1–130.

Edmondson J.R. 1978. Infrageneric taxa in European *Poa* L. *Journal of the Linnean Society. Botany*, 76: 329–334.

Edmondson J.R. 1980. *Poa*. In: *Flora Europaea.*Vol. 5. Eds T.G. Tutin, V.H. Heywood, N.A. Burges, D.M. Moore, D.H. Valentine, S.M. Walters, D.A. Webb. Cambridge: Cambridge University Press, pp. 159–167.

Gaudin J.F.A.P. 1811. *Agrostologia Helvetica, Definitionem descriptionemque graminum et plantarum eis affinium in Helvetia sponte nascentium complectens.* Vol. 1. Paris; Genevae: J.J. Paschoud, 326 pp.

Gaudin J.F.A.P. 1828. *Flora helvetica; sive, Historia stirpium hucusque cognitarum in Helvetia et in tractibus counterminis aut sponte nascentium aut in hominis animaliumque usus vulgo cultarum continuata.* Vol. 1. Turici: Sumptibus Orellii, Fusslini et Sociorum, xxxii + 515 pp.

Guinochet M. 1943. Recherches de taxonomie expérimentale sur la flore des Alpes et la région méditerranéenne occidentale. I. Notes caryologiques sur quelques Graminées. *Revue de Cytologie et de Cytophysiologie Végétales*, 6: 209–220.

Hegi G. 1907. *Illustrierte Flora von Mittel-Europa.* Band 1. München: Verlag von J.F. Lechmann, clviii + 402 pp.

Holub J., Měsíček J., Javůrková V. 1971. Annotated chromosome counts of Czechoslovak plants (16–30) (Materials for "Flóra ČSSR" — 2). *Folia Geobotanica & Phytotaxonomica*, 6(2): 179–214.

Horváth F., Dobolyi Z. K., Morschhauser T., Lőkös L., Karas L., Szerdahelyi T. 1995. *Flóra adatbázis 1.2. Taxon lista és attribútum állomány*. Vácrátót: MTA Ökológiai és Botanikai Kutatóintézet, 268 pp.

Hubbard C.E. 1954. *Grasses: a Guide to their Structure, Identification, Uses and Distribution in the British Isles.* London: Penguin Books, 402 pp.

Hubbard C.E. 1968. *Grasses: a Guide to their Structure, Identification, Uses and Distribution in the British Isles.* 2nd ed. Harmondsworth, UK: Penguin Books, 480 pp.

Kavousi M., Assadi M., Nejadsattari T. 2015. Taxonomic revision of the genus *Poa* L., new additions to Flora Iranica, and a new identification key. *Turkish Journal of Botany*, 39(1): 105–127.

Kožuharov S.I., Stoeva M.P. 1983. Two new species for section *Bolboforum* Aschers. et Graebn. of the genus *Poa* L. In: *Spornik, 90 Godini Akademik Daki Iordanov.* Livadina: 152–157, f. 1–6.

Koch W.D.J. 1838. *Synopsis der deutschen und schweizer Flora* [...] *Zweite abtheilung*. Frankfurt am Main: Im Verlage von Friedrich Wilmans. ix–lxvi + 529–840 pp.

Kubát K. 1992. *Poa*. In: J. Dostál, M. Červenka (eds.). *Vel'ký kl'úč na určovanie vyšších rastlín II*. Bratislava: Slovenské pedagogické nakladateľstvo, 783 pp.

Löve Á. 1978. IOPB chromosome number reports LXII. *Taxon*, 27(5–6): 519–535. https://doi.org/10.1002/j.1996-8175.1978.tb03875.x

Marhold K., Hindák F. (eds.). 1998. *Zoznam nižších a vyšších rastlín Slovenska* [*Checklist of non-vascular and vascular plants of Slovakia*]. Bratislava: Veda, 688 pp.

Meikle R.D. 1985. *Flora of Cyprus.* Vol. 2. Kew: The Bentham-Moxon Trust Royal Botanic Gardens, 832 pp.

Moore D.M. 1982. *Flora Europaea check-list and chromosome index*. Cambridge: Cambridge University Press, 423 pp.

Mubarik N., Kaur H., Kumari S., Gupta R.C. 2017. IAPT/IOPB chromosome data 25. *Taxon*, 66(5): 2150.

Müntzing A., Nygren A. 1955. A new diploid variety of *Poa alpina* with two accessory chromosomes at meiosis. *Hereditas* (Lund), 41: 405–422.
Mutel P.A.V. 1837. *Poa*. In: *Flore Française destinée aux herborisations.*Vol. 4. Paris; Strasbourg: F.G. Levrault, pp. 72–81.
Nazarova E., Goukasian A. 1995. Reports (528–542). In: Mediterranean chromosome number reports — 5. Eds G. Kamari, G. Felber, F. Garari. *Flora Mediterranea*, 5: 340–345.
Nygren A. 1957. *Poa timoleontis* Heldr., a new diploid species of section *Bolbophorum* A. et G. with accessory chromosomes only in meiosis. *Kungliga lantbrukshögskolans annaler*, 23: 488–495.
Nygren A. 1962. On *Poa badensis*, *Poa concinna*, *Poa pumila*, *Poa xerophila,* and the possible origin of *Poa alpina*. *Annales Academiæ regiae scientiarum Upsaliensis*, 6: 1–29.
Nyman C.F. 1882. *Conspectus florae europaeae (part 4).* Örebro (Sueciae): Typis Officinae Bohlinianae, pp. 677–858.
Nyman C.F. 1890. *Conspectus florae europaeae, Supplementum II*. 2nd ed. Örebro (Sueciae): Typis Officinae Bohlinianae, pp. 255–404.
Ortega-Olivencia A. 2020. *Poa*. In: *Flora Iberica Plantas vasculares de la Peninsula Iberica e Islas Baleares*. Ed. S. Castroviejo Bolíbar. Vol. 19(1). Madrid: Real Jardin Botanico, pp. 113–152.
Phitos D. 1988. Chromosome numbers in some species of the Greek flora. *Botanica Chronika (Patras),* 8: 45–50.
Pignatti S. 1982. *Flora d'Italia*. Vol. 3. Bologna: Edagricole, 1287 pp.
Podpěra J. 1925 [1926]. Květena Moravy ve vztazích systematických geobotanických. Část soustanvná, svazek VI. Část 2: Trávy (*Glumiflorae* Wettst.). *Práce Moravskou přírodovědně-přírodovědné společnosti*, 2(10): 1–512.
Poldini L. 2006. Novità floristiche dal Friuli Venezia Giulia. *Informatore Botanico Italiano*, 38(2): 373–378.
Portal R. 2005. *Poa de France, Belgique et Suisse*. Puy-En-Velay, France: Privately published, 303 pp.
Reichenbach H.G.L. 1834. *Icones florae Germanicae et Helveticae. Agrostographia germanica sistens icones Graminearum et Cyperoidearum quas in Flora germanica recensuit*. Leipzig: Friedrich Hofmeister, [1]: ii–iii, [1]–50, pl. 1–100.
Reichenbach H.G.L. 1850. *Icones florae Germanicae et Helveticae. Agrostographia germanica sistens icones Graminearum quas in Flora germanica recensuit*. 2nd ed. Leipzig: Friedrich Hofmeister, i, [1]–80, pl. 72–191.
Rice A., Glick L., Abadi S., Einhorn M., Kopelman N.M., Salman-Minkov A., Mayzel J., Chay O., Mayrose I. 2015. The Chromosome Counts Database (CCDB) — a community resource of plant chromosome numbers. *New Phytologist*, 206(1): 19–26. https://doi.org/10.1111/nph.13191
von Schlechtendal D.F.L. 1838. Reliquiae Schraderianae. *Linnaea*, 12(4): 353–476.
Scholz H. 1991. *Poa*. In: *Mountain Flora of Greece.*Vol 2. Eds P.A.K. Strid, K. Tan. Edinburgh: Edinburgh University Press, pp. 762–777.
Schur P.J.F. 1850. Verzeichniss der bis jetzt in Siebenbürgen bekannt gewordenen Gräser, Gramineae. *Verhandlungen und Mittheilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt*, 1: 182–187.
Schur P.J.F. 1851. Beitrage sur Kenntniss der Flora von Siebenbürgen. Erster Artikle. Botanische Excursion auf den Fogarascherr Gebirgen Mittle August 1851. *Verhandlungen und Mittheilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt*, 2(10): 167–171.
Schur P.J.F. 1852. Beitrage sur Kenntniss der Flora von Siebenbürgen. Zweiter Artikle Uebersicht der auf den Arpaser Alpeen Ende July 1849 und 50 gesammelten und beobachteten Pflanzen. *Verhandlungen und Mittheilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt*, 3(6): 84–93.
Schur P.J.F. 1853. Sertum Florae Transsilvaniae. *Verhandlungen und Mittheilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt*, 4: 1–94.
Schur P.J.F. 1866. *Enumeratio plantarum Transsilvaniae*. Wien: G. Braumuller, 984 pp.
Sokolovskaya A., Probatova N.S. 1979. Chromosome numbers of some grasses (*Poaceae*) of the flora of the USSR. II. *Botanical Journal*, 64(9): 1245–1258.
Soreng R.J. 2000. *Poa* (254–257). In: Typification of Linnaean plant names in the *Poaceae* (*Gramineae*). Eds S. Cafferty, C.E. Jarvis, N.J. Turland. *Taxon*, 49(2): 2239–2260.
Soreng R.J., Simmons R.H. 2018. Noteworthy Collections, Maryland, Virginia, and North Carolina. *Castanea*, 83(2): 270–271. https://doi.org/10.2179/18-171
Soreng R.J., Bull R.D., Gillespie L.J. 2010. Phylogeny and reticulation in *Poa* based on plastid trnTLF and nrITS sequences with attention to diploids. In: Eds O. Seberg, G. Petersen, A.S. Barfod, I. Davis. *Diversity, phylogeny, and evolution in the Monocotyledons*. Aarhus: Aarhus University Press, pp. 619–644.
Soreng R.J., Peterson P.M., Annable C.R. 1995. *Guide to the microform collection. Trinius Herbarium, Komarov Botanical Institute, St. Petersburg. L.H. Bailey Hortorium, Cornell University, New York.* Zug, Switzerland; Leiden, The Netherlands: Inter Documentation Company, 66 pp.
Soreng R.J., Olonova M.V., Probatova N.S., Gillespie L.J. 2020. Breeding systems and phylogeny in *Poa* L., with special attention to northeast Asia: the problem of *Poa shumushuensis* Ohwi and sect. *Nivicolae* (*Poaceae*). *Journal of Systematics and Evolution*, 58(6): 1031–1058. https://doi.org/10.1111/jse.12647
Špryňar P., Štěpánek J. 2024. *Poa*. In: *Key to the flora of the Czech Republic*. Eds J. Stepánková, Jr. Chrtek, Z. Kaplan Květ. Praha: Academia, pp. 521–546.

Stoeva M.P. 1983. Izmenchivost v khromozomiia broi na lukovichnata livadina (*Poa bulbosa* L.) [Chromosome number variability of *Poa bulbosa* L.]. In: *Spornik, 90 Godini Akademik Daki Iordanov.* Livadina: 86–98.
Takhtajan A.L. 2010. *Flora Armenii*. Vol. 11. Ruggell, Liechtenstein: A.R.G. Gantner Verlag KG, 545 pp.
Tasenkevich L., Skrypets K., Seniv M., Khmil T. 2024. Digitization of the oldest botanical collection in Ukraine (LW Herbarium): a case study. *Biodiversity*: *Research and Conservation*, 75: 1–8. https://doi.org/10.14746/biorc.2024.75.2
Thiers B. 2009–onward. *Index Herbariorum*. A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Available at: http://sweetgum.nybg.org/science/ih (Accessed March 2025).
Tzvelev N.N. 1973. Notae de gramineis florae URSS, 7. *Novitates systematicae plantarum vascularium*, 10: 79–98.
Tzvelev N.N. 1974. De Genere *Poa* L. in URSS. *Novitates systematicae plantarum vascularium*, 11: 24–41.
Tzvelev N.N. 1976. *Zlaki SSSR* [*Grasses of the USSR*]. Leningrad: Nauka, 788 pp.
Tzvelev N.N., Probatova N.S. 2019. *Zlaki Rossii* [*Grasses of Russia*]. Moscow: KMK Scientific Press, 646 pp.
Valdés B., Scholz H. [With contributions from Raab-Straube E. von & Parolly G.]. 2009. *Poaceae* (pro parte majore). In: *Euro+Med PlantBase — the information resource for Euro-Mediterranean plant diversity*. Available at: https://europlusmed.org/ (Accessed March 2025).

Номенклатурні нотатки про *Poa* (*Poaceae*): типіфікація назви *P. pseudoconcinna* та її приналежність до *P. bulbosa* sensu stricto, а також таксономічна приналежність диплоїдних хромосомних чисел, що наводилися для *P. bulbosa* та ймовірно споріднених таксонів

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Розглянуто оригінальний матеріал *Poa pseudoconcinna*; зразок LW00213479 морфологічно охарактеризовано і обрано лектотипом. Очевидно, що цей лектотип не відрізняється від *P. bulbosa* s. str. Розглянуто таксономічну приналежність *P. pseudoconcinna* sensu auct., який вважався диплоїдною расою, підвидом або різновидом *P. bulbosa*, а також співвідношення цієї назви з *P. delicatula*, *P. carniolica*, *P. jordanovii* та *P. perconcinna*. Узагальнено дані щодо кількості хромосом для виду *P. bulbosa* та споріднених з ним диплоїдів, а також вказано контрольні зразки вказівок диплоїдних чисел. Диплоїдні значення для *P. bulbosa* сумнівні. Дані свідчать про те, що хромосомні підрахунки Нюгрена для *P. concinna* (≡ *P. perconcinna*) насправді належать *P. molineiri*. Також обрані лектотипи для назв *P. alpina* var. *multiflora*, *P. concinna*, *P. bulbosa* var. *colorata*, *P. concinna* var. *carniolica* (разом з епітипом), та *P. timoleontis*. Зроблено нову номенклатурну комбінацію *Poa badensis* subsp. *molineiri*, comb. nov.

Ключові слова: *Arenariae*, *Poa*, Schur, хромосомні числа, лектотипіфікація, таксономія