



Article

A new form of *Salix recurvigemmata* A.K.Skvortsov (Salicaceae)Sergey A. Shumikhin,^{1*} Olga V. Epanchintseva² and Irina V. Belyaeva^{2,3}¹Botanical Garden of Perm State University, Bukireva str., 15, Perm, 614990, Russian Federation*Corresponding author. Email: sergshum@yandex.ru, botgard@psu.ru²Botanical Garden RAS, 8 Marta str., 202A, Yekaterinburg, 620144, Russian FederationEmail: olgae06@mail.ru³Royal Botanic Gardens, Kew, Richmond, TW9 3AE, UKEmail: i.belyaeva@kew.org, willow.belyaeva2017@yandex.com

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Abstract

A new form, *Salix recurvigemmata* A.K.Skvortsov f. *variegata* Shumikh., O.V.Epanch. & I.V.Belyaeva, is described and recommendations for its cultivation are given.

Keywords: Salicaceae, *Salix recurvigemmata*, new form

Introduction

Since 2006, by order of the Ministry of Natural Resources, Forestry and Ecology of the Perm Region, one of the scientific targets of the A.G. Genkel Botanical Garden of Perm State University (BG PSU) is to study the biology of the plants listed in the *Red Book of the Perm Region* (Baklanov, 2018). The Botanical Garden of PSU undertakes annual sustainable collections of endangered species for cultivation with the purpose of reintroduction to their natural habitats. The programmes developed by the PSU Botanical Garden staff (Shumikhin, 2006; Shumikhin *et al.*, 2011, 2015) include studies of rare plants in cultivation, their reintroduction and annual monitoring of endangered species in nature.

Among collections of rare species listed in *The Red Book of Perm Region* (Baklanov, 2018) made on 22 August 2008 and grown at the Botanical Garden of PSU since that time, there were a few seedlings of *Salix recurvigemmata* A.K.Skvortsov, which included a young individual with variegated foliage. The variegated form was collected by Sergey A. Shumikhin at 58°21'06.6"N, 56°27'24.7"E, in Lunezhskiye Gory, a Landscape Nature Reserve of Regional Significance.

Material and methods

The specimens of *Salix recurvigemmata* were studied in the herbaria LE, MHA, MW, NSK, PERM, SVER, VBG (Herbarium codes are given as in Thiers, 2020). The names of the

taxa, authors' abbreviations and places of publication follow the nomenclatural database, International Plant Name Index (IPNI, 2020). Taxonomy is given as in Belyaeva & Govaerts (2020). The names of taxa accepted by the authors of this paper are given in bold. For distribution the World Geographical Scheme for Recording Plant Distribution (Brummitt, 1992) is used.

Nomenclature and taxonomy

Among willows two variegated forms are described. One is [*Salix cinerea* L. f. *variegata* \(Weston\) Rehder](#) that is listed in the '[Checklist for cultivars of *Salix* L. \(willow\)](#)' as cultivars 'Tricolor' and 'Variegata' (Kuzovkina, 2015: 60). The other is [*Salix integra* Thunb. f. *albovariegata* Kimura](#) that is listed by Kuzovkina (2015: 91) as cultivars 'Flamingo' and 'Hakuro-Nishiki'.

A.K. Skvortsov ([1956: 13](#)) first published the name *Salix recurvigemmis* without a Latin description and thus invalidly. Later this name was validated as *Salix recurvigemmata* (Skvortsov, 1957: 37). However, Skvortsov continued to use the name *S. recurvigemmis* in his subsequent publications (Skvortsov, 1966, 1968, 1974, 1976, 1981, 1999, 2000; Skvortsov and Svyazeva, 1977; Argus *et al.*, 1999) in protest against the unnecessary change of the epithet '*recurvigemmis*' in Skvortsov's original manuscript to '*recurvigemmata*' by the editor of the Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. without his consent (pers. comm., Skvortsov, 2007). Skvortsov even made special comments about this species name twice: "Not. Syst. Herb. Inst. Bot. Komarov 18: 37 (descr. latin., sed nomen sphalmate "*recurvigemmata*")." (Argus *et al.*, 1999: 400) and "The species name with the ending "-ata" instead of the more correct "-is" was printed against the author's will and should be considered a misprint." (Skvortsov, 2000: 106). The name *S. recurvigemmis* was widely used by other authors of checklists and regional floras (Malyshev and Peshkova, 1979; Czerepanov, 1981; Bolshakov, 1992; Belyaeva, 1994; Nedoluzhko, 1995; Argus *et al.*, 1999; Belyaeva *et al.*, 2003; Belyaeva *et al.*, 2006; Baklanov, 2018; Valyagina-Malyutina, 2018), also written on most herbarium specimens. Sennikov (2006) resurrected the name *Salix recurvigemmata* and made its lectotypification. The latter name has been used in recent publications and taxonomic databases (Kovtonyuk and Belyaeva, 2015; Stepanova *et al.*, 2020; Belyaeva and Govaerts, 2020; Catalogue of Life, CoL, 2020; GBIF, 2020).



Figure 1. Generative and vegetative buds of *Salix recurvigemmata* A.K.Skvortsov f. *recurvigemmata*



Figure 2. Leaves and stipules of *Salix recurvigemmata* A.K.Skvortsov f. *recurvigemmata*

Salix recurvigemmata A.K.Skvortsov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 18: 37. 1957. (Figs. 1–2).

Type: Russia, Perm Region, near Dobryanka, gypsum-rich slopes along Kama River, 24.VIII.1899 [top right fragment with leaves], *F. Teplouchov* 854 [Herb. Fl. Perm.] ([MW0591820](#)) – lectotype, designated by Sennikov, 2006: 141).

– *Salix recurvigemmis* A.K.Skvortsov, Sist. Zametki Mater. Gerb. Krylova Tomsk. Gosud. Univ. Kuybysheva, 79–80: 13. 1956, **nom. inval.**

– *Salix rectijulis* Ledeb. ex Trautv. var. *latifolia* Popov, Konspekt Fl. Pober. Baikal: 214. 1966, **nom. inval.**

– *Salix rectijulis* Ledeb. ex Trautv. var. *angustifolia* Popov, Konspekt Fl. Pober. Baikal: 214. 1966, **nom. inval.**

– *Salix lanata* L. var. *glabra* Popov, Konspekt Fl. Pober. Baikal: 214. 1966, **nom. inval.**

[*Salix rhamnifolia* auct., non Pall. – Nasarov, Fl. USSR 5: 120. 1936 (plants in vegetative state only); Karavaev, Konspekt Fl. Yakutii: 83. 1958].

Detailed descriptions of *Salix recurvigemmata* f. *recurvigemmata* are provided by Skvortsov (Skvortsov, 1957, 1966, 1981, 2000; Skvortsov and Svyazeva, 1977) and other botanists (Malyshev and Peshkova, 1979, Bolshakov, 1992; Nedoluzhko, 1995; Belyaeva *et al.*, 2006; Baklanov, 2018; Valyagina-Malyutina, 2018). *Salix recurvigemmata* in cultivation in the Middle Urals was evaluated by Belyaeva and colleagues (Belyaeva *et al.*, 2003).

Etymology: The specific epithet refers to the recurved form of the buds (Stepanova *et al.*, 2020).

Distribution: Eastern Europe to Siberia (Skvortsov, 1968, 1999; Skvortsov and Svyazeva, 1977; Bolshakov, 1992; Nedoluzhko, 1995; Belyaeva *et al.*, 2006; Baklanov, 2018; Belyaeva and Govaerts, 2020).



Figure 3. Sergey A. Shumikhin next to *Salix recurvigemmata* A.K.Skvortsov f. *variegata* Schumikh., O.E.Epanch. & I.V.Belyaeva. Photo by Marina A. Chertkova



Figure 4. *Salix recurvigemmata* A.K.Skvortsov f. *variegata* Schumikh., O.E.Epanch. & I.V.Belyaeva

Salix recurvigemmata A.K.Skvortsov f. *variegata* Shumikh., O.V.Epanch. & I.V.Belyaeva, **f. nov.**

(urn:lsid:ipni.org:names: 77211821-1)

Type: East European Russia, Perm Region, Perm, the Botanical Garden of Perm State University (BG PSU), 11.VIII.2020, *S.A. Shumikhin* 2256, cultivated since 23.VIII.2008 (holotype – MHA!; isotypes LE!, NSK!, PERM!, SVER!, WSY!), collected as a young individual from Lunezhskiye Gory Landscape Nature Reserve of Regional Significance, 58°21'06.6"N, 56°27'24.7"E.

Description: *Habit:* cultivated shrub, 2.8 m tall with ascending curved gnarled greyish brown branches (Figs. 3–4). *Branchlets* greenish brown, tomentose. Buds ovate-lanceolate, greyish brown, more or less hairy, dimorphic. *Generative buds* 9–12 mm long, thick with drawn and recurved apex; *vegetative ones* smaller, 4–6 mm long (Fig. 5). *Leaves* on one-year-old shoots



Figure 5. Generative and vegetative buds of *Salix recurvigemmata* A.K.Skvortsov f. *variegata* Schumikh., O.E.Epanch. & I.V.Belyaeva



Figure 6. One-year-old shoot of *Salix recurvigemmata* A.K.Skvortsov f. *variegata* Schumikh., O.E.Epanch. & I.V.Belyaeva

heteromorphic (Fig. 6), lanceolate or oblanceolate, 50–80 mm long and 20–35 mm wide, with acute, often folded and twisted apex and cuneate base, glandular-serrate and with slightly

revolute margin, thick, almost leathery, glabrous or more or less pubescent on both sides, variegated (dark-green with white) shiny above, dull below. *Stipules* lanceolate to ovate, 8–17 mm long, glandular, more or less persistent (Figs. 6–7). *Petioles* 5–9 mm long, pubescent. *Catkins* male, very densely flowered, sessile or subsessile with 1–3 small leaflets at base to 35



Figure 7. Leaves and stipules of *Salix recurvigemmata* A.K.Skvortsov f. *variegata* Schumikh., O.E.Epanch. & I.V.Belyaeva

mm long (Figs. 8–9). *Floral bracts* lanceolate, 3.0–5.0 mm long, acute, blackish at apex, trimmed on both sides with long straight hairs. *Stamens* 2, with glabrous, free filaments and



Figure 8. Catkins of *Salix recurvigemmata* A.K.Skvortsov f. *variegata* Schumikh., O.E.Epanch. & I.V.Belyaeva

reddish yellow anthers. *Nectary* one, cylindrical, to 0.5 mm long. *Flowering*: precocious, from end of April to beginning of May. *Propagation*: by cuttings, very low rooting capacity (5%). *Diseases and pests*: can be damaged by sooty fungus, sometimes by aphids, resistant to powdery mildew. *Habitat*: it occurs on well drained, rocky, stony or gravelly substrates, growing mainly on chalk bedrock. *Practical use*: ornamental. *Common name*: Variegated recurved-bud willow.

Important diagnostic characters: *Salix recurvigemmata* f. *variegata* differs from *S. recurvigemmata* f. *recurvigemmata* by variegated leaves.

Etymology: *Salix recurvigemmata* f. *variegata* named because of its variegated leaves.

Distribution: East European Russia, Perm Region, Lunezhskiye Gory Landscape Nature Reserve of Regional Significance, 58°21'06.6"N, 56°27'24.7"E. Map in Bakalov (2018: 82 and <http://redbook.permecology.ru/Plant.aspx>).

Recommendations for cultivation: *Salix recurvigemmata* f. *variegata* is highly ornamental because of its variegated, shiny leaves and spectacular reddish yellow anthers in spring and early summer. It needs protection from sooty fungus and aphids. It is difficult to propagate by cuttings because of its low rooting capacity.



Figure 9. Catkins of *Salix recurvigemmata* A.K.Skvortsov f. *variegata* Schumikh., O.E.Epanch. & I.V.Belyaeva

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Authors' contributions

Sergey A. Shumikhin (SS) initiated the project, collected and cultivated plants, prepared herbarium material and photographs, participated in preparation of the description of a new form and discussion of the manuscript.

Olga V. Epanchintseva (OE) helped in preparation of the manuscript, analysing material and participated in discussion of the manuscript.

Irina V. Belyaeva (IB) analysed all available material and resources prepared by SS and OE, participated in discussion of the manuscript, prepared the final version of the manuscript and coordinated the project.

All photographs are from the personal archive of Sergey A. Shumikhin and taken by him unless stated otherwise.

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