



Article

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The application of scientific names to plants:***Salix alba* L. f. *tristis* Gaudin and related taxa (Salicaceae)**Irina V. Belyaeva,^{1,2*} Olga V. Epanchintseva,² Kevin McGinn³ and Rafaël H.A. Govaerts¹¹Royal Botanic Gardens, Kew, Richmond, TW9 3AE, UKr.govaerts@kew.org²Botanical Garden, RAS, 8 Marta str., 202A, Yekaterinburg, 620144, Russiaolgae@mail.ru³National Botanic Gardens of Wales, Llanarthne, Carmarthenshire, SA32 8HG, Wales, UKKevin.McGinn@gardenofwales.org.uk*Corresponding author. E-mail: i.belyaeva@kew.org, willow.belyaeva2017@yandex.com

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Abstract

The use of ranks of infraspecific names in *Salix* L. published by Gaudin in *Flora Helvetica* (1830) is reconsidered and the identity, nomenclature and taxonomy of *Salix alba* L. f. *tristis* Gaudin and related taxa are clarified. A new combination, *S.* × *pendulina* nothof. *tristis* is made which is established as the correct name with new synonyms. The epitype for *S.* × *pendulina* nothof. *tristis* is designated.

Keywords: correct name, epitypification, new combination, new synonyms, nomenclature, *Salix pendulina* nothof. *salamonii*, *Salix pendulina* nothof. *tristis*, taxonomic ranks, taxonomy

Introduction

Most of the infraspecific names published by Gaudin that are registered in the *International Plant Name Index* (IPNI, 2021) have ranks of “subspecies”, “unranked” or “varieties”, and rarely “forms.” On 17 September 2011 Kanchi N. Gandhi added a comment on the record [ID:1121-2](#) of Gaudin’s *Flora Helvetica* (1828–1833): “Infraspecific Rank: Greek letters designate varieties (e.g., in observations); Roman-numerals designate either subspecies or forma; if forma, it is a misplaced rank, and such names are not validly published (on misplaced ranks, see Vienna Code Art. 33.9). Other names (lacking Greek letters or Roman numerals) are unranked, but validly published” (IPNI, 2021). The taxonomic database *The World Checklist of Vascular Plants* (WCVP, 2021) contains 971 infraspecific names published by Gaudin (37 of which are not validly published) comprising 150 names in the rank of subspecies (18 of which are not validly published), 794 names in the rank of variety (16 of which are not validly published), 25 names in the rank of form (3 of which are not validly published).

published) and only 2 names are treated as unranked. Both, IPNI (2021) and WCVP (2021), have 78 names of *Salix* L. published validly by Gaudin (1830) comprising one species and 77 infraspecific names (2 subspecies, 67 varieties, 7 forms and one name without a rank). Working on names in *Salix*, the authors of the current paper noticed that the same names published by Gaudin appeared in different databases under different ranks. For example, *Salix alba* L. f. *tristis* Gaudin is recorded as a form in IPNI, *The World Checklist of Vascular Plants* (WCVP, 2021) and *Plants of the World Online* (POWO, 2021). It is treated in TROPICOS (2021) as a variety and, in our earlier publication (Belyaeva *et al.*, 2018), as a taxon without rank and it is not recorded in other taxonomic databases such as *Catalogue of Life* (CoL, 2016–), *The Euro+Med PlantBase* (2006–), *World Flora Online* (WOF, 2021), *World Plants* (Hassler, 2004–2021). This all is nomenclaturally and taxonomically confusing.

The issue concerning ranks in Gaudin's *Flora Helvetica* (1828–1833) is longstanding and not an easy one to understand and is a very good example where taxonomists have different opinions on the ranks of the same taxa. There is not, in the preface or elsewhere in this Flora, a clear explanation of the Greek letters and their combinations that were used by the author. However, there is in the preface ([Gaudin, 1828: XXXII](#)), a sentence “*Quantum fieri potuit, plantas perperam pro genuinis venditatas speciebus ad propriam sedem reposui; sed ingenue fateor, etiam nunc in mea Flora non paucas superesse formas, quae omnino varietatis potius quam speciei lege describi debuissent: quam opinionem ceterum loco proprio ipse fere perpetuo enuntiavi.*” [As far as I could, I put plants that were mistakenly interpreted as true species in their places; but to be honest, even now there are many forms left in my Flora, which in all respects should be legally described as varieties rather than species: I almost always expressed my opinion instead of taking on others.] which describes Gaudin’s method – to understand infraspecific variation not as ranks or groups but just as the variability and differences between plants of the same species.

From a formal point of view, the single Greek letters in his treatment of *Salix* L. were used for varieties. One can see that he does not make any distinctions between varieties and forms as such ([Gaudin, 1830: 206](#)) in the same way as we do now. He follows Seringe (1815) and actually named them in the same way: “*S. vitellina* ββ *tristis*” and “*S. vitellina* βγ *sericea*”. More obviously, it can be seen here when he used for *Salix hastata* L. infraspecific names: “γβ *viburnoides undulata*” and “γγ *viburnoides macrostachya*” ([Gaudin, 1830: 226](#)). Looking through all the volumes, one can also find places where Gaudin defined the symbols as follows: Roman numbers – subspecies ([Gaudin, 1830: 224](#)), “Inter subspecies I and II limites certe nulli dantur”; single Greek letters – varieties ([Gaudin, 1828: 2](#)), “Obs. 1. Var. β *tota immersa*” and

even used a hierarchy of subspecies and variety ([Gaudin, 1830: 225](#)), “Praeter var. II ϑ nostrum omnes quantum”; double Greek letters – forms ([Gaudin, 1828: 354](#)), “ $\alpha\beta$ eiusdem formae”.

Greuter (1968), discussing ranks in Gaudin’s *Flora Helvetica* (1828–1833), came to the conclusion that Gaudin recognised two taxonomic ranks below species. He writes on page 96: “Les épithètes à chiffre romain sont implicitement subspécifiques (sauf celles désignées comme formae dans le texte, qui sont invalids); Les épithètes à letter grecque sont variétales.” [Roman numeral epithets are implicitly subspecific (except those designated as formae in the text, which are invalid); The Greek letter epithets are varietal]. He also pointed out (Greuter, 1968: 92): “Malheureusement, le terme choisi par Gaudin pour le degré hiérarchiquement supérieur est celui de *forma* (voir par exemple, dans le premier volume, p. 23: “Formae I et II...” pour *Veronica Teucrium* I. *latifolia* et II. *Vahlia*; p. 187: “Formas I, II, III, IV...” pour *Agrostis alba* I. *pallens*, II. *decumbens*, III. *patula* et IV. *major*). Or, le Code (art. 33, note 2) déclare que la publication de “forms” divisées en variétés n’est pas valide;” [Unfortunately, the term chosen by Gaudin for the hierarchically superior degree is that of forma (see for example, in the first volume, p. 23: “Formae I and II...” for *Veronica Teucrium* I. *latifolia* and II. *Vahlia*; p. 187: “Formas I, II, III, IV...” for *Agrostis alba* I. *pallens*, II. *Decumbens*, III. *Patula* and IV. *Major*). However, the Code (art. 33, note 2) declares that the publication of “forms” divided into varieties is not valid;].” However, Greuter left Gaudin’s ranks designated with double Greek letters without comments, i.e. unranked.

Clearly, Gaudin used the term ‘form’ throughout his work with different meanings, although mostly not in the sense of taxonomic rank but colloquially. Examples of the colloquial use of the word ‘forma’ are commonplace and some are given here. Referring to the *Pentandria*, Gaudin wrote: “habitu foliorum calycisque forma” when describing the calyx ([Gaudin, 1828, 2: 62](#)); “huius varietatis forma recedit”, when talking about the common form of this variety ([Gaudin, 1828, 3: 402](#)); “quae forma mihi non occurit” when discussing the species *Aquilegia pyrenaica* DC. not occurring in a particular region ([Gaudin, 1828, 3: 478](#)); he referred to the infraspecific taxon α as “Forma princeps” but in the comments he used “var.” for the rank ([Gaudin, 1828, 2: 201](#)). Therefore, we do not agree with Greuter (1968) that in Gaudin’s *Flora Helvetica* (1828–1833) the use of the word ‘form’ or its equivalents is always an indication of the rank of a taxon but rather a term generally used. Moreover, we listed above at least one instance of a Greek letter being referred to as “forma”, contradicting Greuter’s conclusion, always taking the usage of ‘form’ as an indication of rank. Other terms, such as subspecies and variety, are not used by Gaudin in the same random way but only with single Roman numerals

and Greek letters respectively. Thus, when taking the entire work into consideration, a certain hierarchy emerges without any misplaced ranks.

During recent discussion about the infraspecific taxonomic ranks of the names published by Gaudin (1828–1833) the authors of the current publication came to an agreement that Art. 37.5 of the *International Code of Nomenclature for Algae, Fungi and Plants* (ICN, Turland *et al.*, 2018) is useful for this and other similar cases for distinguishing ranks of infraspecific names in old literature. According to Article 37.5, “any statement made therein designating the rank of taxa included in the work must be considered as if it had been published together with the first instalment.” Thus, any indication of rank in the seven volumes of Gaudin’s Flora should be considered as statement throughout whole work.

Materials and methods

The protologues of taxa mentioned in the current publication and herbarium specimens held in A, GH, K, LE, LINN, MHA, MO, MW, NHM, NY, **P**, S, SVER, UPS, W, WU (Herbarium codes follow Thiers, 2021; in bold – accessed via *JSTOR Global Plants* [2021], *Global Biodiversity Information Facility* [GBIF, 2021] and *Virtual Herbaria* [2011–]) were studied. All necessary nomenclatural acts were made according to the ICN (Turland *et al.*, 2018). The nomenclatural status of the names is given as in IPNI (2021), and taxonomy follows Belyaeva and Govaerts (2021).

Nomenclature and taxonomy

Whilst working on the application of scientific names to plants related to *Salix vitellina* L. ([Belyaeva *et al.*, 2018: 50, fig. 4](#)), a new combination *Salix* × *pendulina* Wender. nothof. *salamonii* (Carrière) I.V.Belyaeva was made. Accepting ranks of infraspecific names published by Gaudin (1830) as mentioned above, *S. alba* L. f. *tristis* Gaudin ([1830: 206](#)) is the earliest legitimate name for the same infraspecific taxon, and thus a new combination is needed for establishing a correct name.

Salix × *pendulina* Wender. nothof. *tristis* (Gaudin) I.V.Belyaeva, **comb. nov.**

(= *S. babylonica* L. × *S. fragilis* L. f. *vitellina* (L.) I.V.Belyaeva)

(urn:lsid:ipni.org:names:77219497-1).

Basionym: *S. alba* f. *tristis* Gaudin, Fl. Helv. [6: 206](#). 1830.

≡ *S. alba* var. *vitellina-tristis* Ser., [Essai Saules Suisse 83. 1815](#), **syn. nov.** ≡ *S. alba* var. *tristis* (Gaudin) Trautv., [Fl. Altaic. \(C.F. Ledebour\) 4: 256. 1833](#) ≡ *S. × sepulcralis* Simonk., [Természetráji Fü. 12: 157. 1890](#).

Type: ‘Herbarium Helveticum, N.C. Seringe 1498’ (GH00277403! – lectotype, designated by I. V. Belyaeva in Belyaeva *et al.*, [2018: 50](#)). Fig. 1. ‘Herbarium Kewense, Cultivated Plants, RBG, Kew, location: 310 11, 26.IV.2016, Kevin McGinn 1973-19883’ [K000335433! – epitype, **designated here** by I. V. Belyaeva]. Fig. 2.

Note: Herbarium specimen GH00277403 selected here as the lectotype contains a small fragment with only male catkins and a small fragment with young leaves that belong to the same taxon. As *Salix × pendulina* Wender. nothof. *tristis* could have male, female and hermaphroditic catkins on the same tree, the designated lectotype does not show all relevant characters of the taxon in question. Thus, the epitype, K000335433, with female catkins was selected here in accordance with Art. 9.9, Ex. 10 of the ICN (Turland *et al.*, 2018) to support the selected lectotype.

= *S. babylonica* [infrasp. unranked] *salamonii* Carrière, Hort. Franc. 339. 1864. ≡ *S. × salamonii* (Carrière) Carrière, Rev. Hort. [Paris]. 49: 444. 1869 ≡ *S. × pendulina* Wender. nothof. *salamonii* (Carrière) I.V.Belyaeva, [Skvortsovia 4\(2\): 50. 2018](#), **syn. nov.**

Type: France, 93 Seine-Saint-Denis, Aulnay-sous-Bois, April 1974, G.Sag 849 (P05598756! – neotype, designated by I. V. Belyaeva in Belyaeva *et al.*, [2018: 50](#)).

= *S. chrysocoma* Dode, [Bull. Soc. Bot. France 55: 655. 1909](#), **syn. nov.** ≡ *Salix × sepulcralis* Simonk. nothovar. *chrysocoma* (Dode) Meikle, Watsonia 15(3): 274. 1985.

Type: ‘Hortus Späth, 25 April 1906, E.G. Camus & A. Camus’ (P05514596! – neotype, designated by I. V. Belyaeva in Belyaeva *et al.*, [2018: 50](#)).

= *S. alba* f. *pendula* Rehder, [Möller's Deutsche Gärt.-Zeitung 11: 98. 1896](#), **syn. nov.**

Type: “Park zu Wilhelmshöhe bei Kassel”, **not designated**.

= *S. alba* f. *pendula* C.K.Schneid., [Ill. Handb. Laubholz. 1: 36. 1904](#), **nom. illeg.**, non Rehder, 1896, **syn. nov.**

Type: ‘Hortus Späth, 25 April 1906, E.G. Camus & A. Camus’ (P05514596! – neotype, designated by I. V. Belyaeva in Belyaeva *et al.*, [2018: 50](#)).

– *S. alba* f. *pendula* Kuphaldt, [Mitt. Deutsch. Dendrol. Ges. 24: 233 \(& 373\). 1916](#), **nom. inval.**



Figure 1. Lectotype of *Salix* × *pendulina* Wender. f. *tristis* (Gaudin) I.V.Belyaeva. Permission to reproduce this picture was granted by the Director of Collections of the Herbarium of the Harvard University Herbaria, Michaela Schnull.



Figure 2. Epitype of *Salix* × *pendulina* Wender. f. *tristis* (Gaudin) I.V. Belyaeva.

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Authors' contributions

Irina V. Belyaeva (IB) initiated the project together with RG, studied herbarium material, wrote the first version of the manuscript, made necessary nomenclatural and taxonomic statements, made a new combination and typification, participated in discussion of the results and text of the manuscript with RG, OE and KM and coordinated the project.

Rafaël H.A. Govaerts (RG) together with IB initiated the project, discussed nomenclatural and taxonomic decisions and participated in preparation and discussion of the manuscript.

Kevin McGinn (KM) collected, prepared and identified herbarium specimens together with IB at K, analysed and hosted voucher herbarium specimens at K, participated in preparation and discussion of the manuscript.

Olga V. Epanchintseva participated in preparation and discussion of the manuscript and herbarium material of related taxa stored at SVER.

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