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A new status and typification of six names in *Syringa* (Oleaceae)

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Abstract A new status and a new synonym in the genus *Syringa* are proposed based on population sampling, examination of herbarium specimens, character analysis and multivariate analysis. *Syringa wolfii* C. K. Schneid. is here treated as *S. villosa* ssp. *wolfii* rather than *S. reflexa* ssp. *wolfii*, and its lectotype is designated here. Also designated are the lectotypes of five synonyms: *S. bretschneiderii*, *S. emodi* var. *rosea*, *S. villosa* var. *hirsuta*, *S. formosissima*, and *S. robusta*.

Key words *Syringa*, *Syringa villosa* ssp. *wolfii*, new status, new synonymy, typification.

Syringa villosa was described as new by Vahl (1804) based on Incarville's specimen from Beijing. Cornu (1888) named Bretschneider's plants from Beijing as *S. emodi* var. *rosea*, which is a wrong determination. *Syringa bretschneiderii* first appeared in Lemoine's catalogue in 1890 and Brown (1910) considered that it was from northern China and had larger leaves and flowers and more copious panicles than *S. villosa*. Schneider (1910) described *S. villosa* var. *hirsuta* and *S. wolfii* as new, stating that the former was distributed in northern Korea and Manchuria, while the latter was cultivated in St. Petersburg and probably originated from northern China. Nakai (1917) described *S. formosissima* as new based on Korean specimens. He later (Nakai, 1918) raised Schneider's *S. villosa* var. *hirsuta* to *S. hirsuta* and reduced *S. formosissima* to *S. hirsuta* var. *formosissima*, stating that *S. hirsuta* differed from *S. bretschneiderii* in having pendent inflorescences. Nakai (1921) also described *S. robusta* as new, considering that it resembled *S. villosa*, but differed in having larger leaves and more robust branches. McKelvey (1928) treated Schneider's *S. villosa* var. *hirsuta* and Nakai's *S. formosissima* and *S. robusta* as synonymy of *S. wolfii*, considering their differences not distinct. She also treated *S. emodi* var. *rosea* and *S. bretschneiderii* as synonymy of *S. villosa*. Qu and Chen (Chen & Qu, 1989) treated *S. wolfii* as *S. reflexa* ssp. *wolfii* on the basis of their morphological similarity. However, Chang (1992) and Chang et al. (1996) recognized *S. villosa* and *S. wolfii* as distinct species, which is in accordance with McKelvey's treatment. They considered *S. villosa* having corolla tube subcylindrical and corolla lobes spreading, whereas *S. wolfii* having corolla tube funnelform and corolla lobes upright.

These taxa belong to ser. *Villosae* (C. K. Schneid.) Rehder and their distribution ranges from North China, Northeast China, the Far East of Russia to the Korean Peninsula. They differ from *S. reflexa* and *S. komarowii* C. K. Schneid. of the same series in having inflorescences usually upright, while the latter two taxa have inflorescences pendulous and are distributed in western China including Hubei, Shaanxi, Gansu, and Sichuan provinces. In order to better understand taxonomy of the former taxa (*S. villosa* complex), we sampled four

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populations (BA, WL, WA, JL) in Beijing, Hebei and Jilin of China and examined about one hundred specimens from the Korean Peninsula, the Far East of Russia and China (Table 1). To compare the shape of corolla tube (CTS) effectively, we used the formula CTS = (diameter of corolla throat – diameter of corolla base)/length of corolla tube. The result shows that CTS varies continuously among the populations (Table 1). Corolla tube is usually funnelform in the populations of Korea and Northeast China (KO, EN, JL, WA) and it is usually cylindrical in the populations of North China (WL, BA, XW, SH), but the difference is not distinct. Similarly, diameter of corolla throat and length of leaf blades in populations KO, EN, JL and WA are frequently larger than those in WL, BA, XW and SH (Table 1). Corolla lobes are usually upright in the populations KO, EN, JL and WA, while from upright to spreading in WL, BA, XW and SH, and they are frequently shorter in the former populations than those in the latter populations (Table 1). All these characters cannot be used to distinctly divide the complex even though two groups are more or less recognizable.

Table 1 Character variation in *Syringa villosa* complex*

	Length of leaf blades (cm)	Diameter of corolla throat (mm)	Shape of corolla tube (CTS)	Length of corolla lobes (mm)	Pose of corolla lobes
KO	(5.4–)6.1–13.6(–17)	(1–)1.7–3.5(–4)	(0.06–)0.1–0.24(–0.3)	(2–)2.1–3.5(–4)	1(14); 2(2)
EN	(7.5–)8–10.8(–11)	(1.2–)1.7–2.8(–3)	(0.03–)0.1–0.25	2–2.9(–3)	1(9)
JL	(7–)8–12.2(–14)	(2–)2.2–3	(0.11–)0.14–0.27 (–0.38)	(2–)2.2–3.1(–3.5)	1(13)
WA	(9–)10.2–14.6 (–16.5)	(2–)2.6–4.1(–4.5)	(0.11–)0.14–0.24 (–0.26)	2–3.2(–4)	1(14); 2(2)
WL	(6–)7.6–11.2(–11.5)	(1.5–)1.6–2.5(–3)	(0.04) –0.05–0.12(–0.17)	(3–)3.3–4.7(–5)	1(4); 2(6); 3(1)
BA	(3.5–)5.9–10.2 (–12.2)	(1–)1.5–2	(0–)0.06–0.14	(2–)2.6–4.3(–5)	1(13); 2(3); 3(1)
XW	(4.5–)5.7–9.3(–12)	(1.5–)1.6–2.2 (–2.5)	(0.06–)0.08–0.15(–0.2)	(2.5–)2.7–3.9 (–4.5)	1(14); 2(2)
SH	8–10.2(–10.5)	(0.8–)1.2–2.9(–3)	0.05–0.19(–0.21)	2–3.5(–4)	1(3); 2(1); 3(1)

* KO, the Korean Peninsula; EN, Amur region, Heilongjiang; JL, Mt. Changbai, Jilin; WA, Wangou, Jilin; WL, Mt. Wuling, Hebei; BA, Mt. Baihua, Beijing; XW, Mt. Xiaowutai, Hebei; SH, Shanxi. Pose of corolla lobes: 1, upright; 2, spreading; 3, reflexed; number in the parenthesis stands for individuals observed. Quantitative characters are shown as average ± standard deviation and the range of variation.

Principal coordinate analysis of about 50 characters shows that no obvious morphological gap can be seen in the complex and that populations KO, EN, JL, WA and populations WL, BA, XW, SH overlap on the PCO plot (Fig. 1). Furthermore, the former populations are from the Korean Peninsula and Northeast China and the latter populations are from North China. One species with two subspecies may be appropriate for the taxonomy of the complex when all the pieces of evidence are considered. Populations WL, BA, XW and SH are recognized as *S. villosa* ssp. *villosa* and populations KO, EN, JL and WA are here recognized as *S. villosa* ssp. *wolfii* according to morphology and distribution range. The two taxa are separated by the Northeast Plain as they usually grow in semi-shaded, moist forests, but they are not very clearly differentiated in morphology.

1. Syringa villosa Vahl, Enum. Pl. 1: 38. 1804. Type: China. Beijing (北京), *d'Incarville 50* (holotype, P!).

Deciduous shrubs to 3 m tall, branchlets gray, usually lenticellate. Leaves elliptic, ovate to obovate, (3.5–)5.7–14.6(–17) cm long, (1.2–)2.6–6.6(–7.8) cm broad, adaxially green, glabrous, rarely pubescent, abaxially pale green, sparsely to densely pubescent, rarely glabrous, apex acuminate to acute, base cuneate, rarely rounded, lateral veins 5–9 pairs; petioles green, glabrous, rarely pubescent, 0.4–2.5 cm long. Panicles terminal, with leaves at base, 10–30 cm long, (3–)3.5–12.4(–15) cm broad; inflorescence rachises green, terete to quadrangular, pubescent to glabrous, usually lenticellate; calyx campanulate, pubescent to glabrous, 1–4×1–2.5 mm; corolla tube cylindrical to funnelform, purple, pink to whitish, (4.5–)6.1–13.4(–15) mm long, base 0.5–2 mm broad, throat (0.8–)1.2–4.1(–4.5) mm broad; corolla lobes upright to spreading, elliptic to triangular, pink, lilac to whitish, (2–)2.1–4.7(–5)

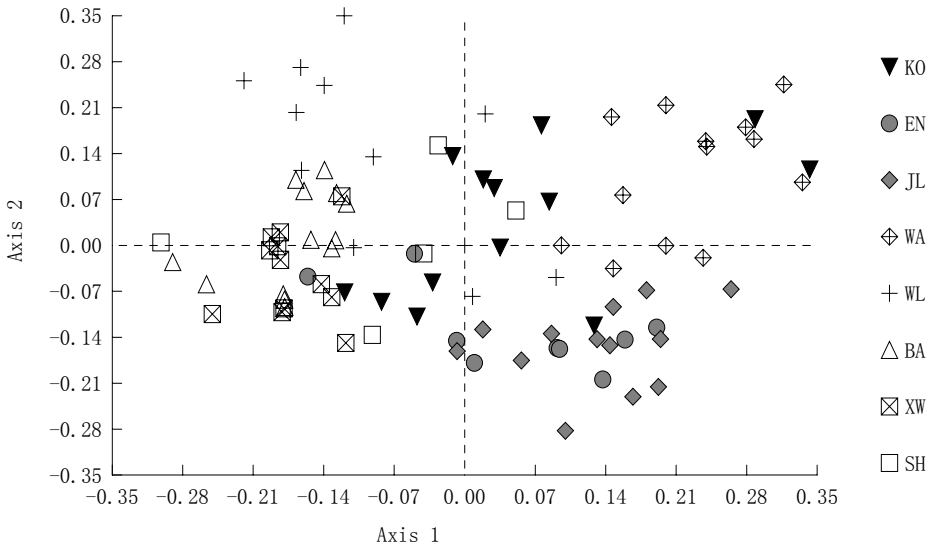

Fig. 1. Scatter plot resulted from principal coordinate analysis of *Syringa villosa* complex (population explanation see Table 1).

mm long, (1–)1.2–2.9(–3) mm broad; anthers 1.5–3 mm long, yellow, inserted 0–1(–1.5) mm below corolla throat; pistil 1.5–4 mm long. Capsule oblong, 8–17×3–6 mm, sparsely lenticellate to smooth, mucronate to obtuse.

It is distributed in the Korean Peninsula, the Far East of Russia, and North and Northeast China, usually growing in moist forests, at the edge of forests or by streams. Flowering in June. Chromosome number $2n = 46, 48$.

Two subspecies are recognized in the species, which are keyed out below:

Corolla tube usually cylindrical with throat (0.8–)1.2–2.9(–3) mm broad; corolla lobes upright to spreading, 2–4.7(–5) mm long ……**1a.** ssp. **villosa**

Corolla tube usually funnelform with throat (1–)1.7–4.1(–4.5) mm broad; corolla lobes usually upright, 2–3.5(–4) mm long ……**1b.** ssp. **wolfii**

1a. Syringa villosa ssp. **villosa**

S. bretschneiderii Lemoine ex Wien., Illustr. Gart. Zeit. 369. 1890; Brown in Bot. Mag. 136: t8292. 1910. Type: Brown's tab. cited (lectotype designated here).

S. emodi Wall. ex G. Don var. *rosea* Cornu in Rev. Hort. 492. with figure. 1888.——S. *villosa* Vahl var. *rosea* (Cornu) C. K. Schneid. in Repert. Spec. Nov. Regni Veg. 9: 81. 1910. Type: Cornu's fig. cited (lectotype designated here).

S. villosa var. *limprichtii* Lingelsh. in Engl. Pflanzenr. 72 (IV-243): 80. 1920. Type: China. Hebei (河北): Mt. Xiaowutai (小五台山), *H. Limpricht 599* (holotype, WRSL?).

Leaves oblong, rarely ovate or obovate, (3.5–)5.7–11.2(–12.2) cm long, (1.2–)2.6–5.5(–7.6) cm broad, adaxially glabrous, abaxially pubescent. Panicles 10–26 cm long, (3–)3.6–10(–12) cm broad; inflorescence rachises usually lenticellate, pubescent to glabrous; calyx pubescent to glabrous, 2–4×1.5–2 mm; corolla tube cylindrical to subcylindrical, (5–)6.6–12.6(–14) mm long, base 0.8–1.5 mm broad, throat (0.8–)1.2–2.9(–3) mm broad; corolla lobes upright to spreading, elliptic to triangular, (2–)2.6–4.7(–5) mm long, (1–)1.2–2.5(–3) mm broad; anthers inserted 0–0.9(–1.5) mm below corolla throat. Capsule oblong, 11–17×3–6 mm, sparsely lenticellate to smooth, mucronate.

It is distributed in Beijing, Hebei, Shanxi and Nei Mongol of China, growing in the

deciduous forests or by streams, at an altitude between 900 and 2200 m.

Representative specimens examined:

China. Beijing (北京): Mt. Baihua (百花山), J. Y. Chen (陈进勇) 04129, 04131 (PE), A. David 2239 (P); Miyun (密云), Beijing Normal University (北师大) 3304, 3486 (PE). **Hebei** (河北): Dongling (东陵), H. T. Tsai (蔡希陶) 50016, 50320 (PE); Chicheng (赤城), Anonymous 4563 (PE); Laishui (涞水), C. G. Yang (杨朝广) 103 (PE); Laiyuan (涞源), K. M. Liou (刘继孟) 2421 (PE); Mt. Xiaowutai (小五台山), H. W. Kung (孔宪武) 1298, 3758 (PE), Y. Liu (刘瑛) 12557, 12563 (PE), Ö. V. Möllendorff s.n. (K), H. Smith 927 (UPS); Zhuolu (涿鹿), C. G. Yang (杨朝广) 1547 (PE). **Nei Mongol** (内蒙古): Ordos (鄂尔多斯), E. Licent 6777 (K). **Shanxi** (山西): Fanshi (繁峙), Loess Plateau Exped. (黄土高原队) 3616 (WUK), W. Z. Wang (王文中) 605 (PE); Hunyuan (浑源), Y. W. Tsui (崔友文) 2511 (PE); Ningwu (宁武), K. M. Liou (刘继孟) 1979 (PE), Shanxi Exped. (山西队) 168 (PE), Loess Plateau Exped. (黄土高原队) 3340 (WUK); Wutai (五台), Y. L. Chen (陈艺林) 1511 (PE), Shanxi Exped. (山西队) 694 (PE), W. Hancock s.n. (K).

1b. Syringa villosa ssp. **wolfii** (C. K. Schneid.) J. Y. Chen & D. Y. Hong, stat. nov.——*S. wolfii* C. K. Schneid. in Repert. Spec. Nov. Regni Veg. 9: 81. 1910; Schneider, Ill. Handb. Laubholzk. 2: 782, figs. 489: i–k, 490: o–r. 1911.——*Syringa reflexa* C. K. Schneid. ssp. *wolfii* (C. K. Schneid.) S. Z. Qu & X. L. Chen in J. Northw. Forest. Coll. 4: 74. 1989, syn. nov. Type: Schneider's figs. cited (lectotype designated here).

S. villosa var. *hirsuta* C. K. Schneid. in Repert. Spec. Nov. Regni Veg. 9: 81. 1910.——*S. hirsuta* (C. K. Schneid.) Nakai in Bot. Mag. Tokyo 32: 132. 1918. Types: Korea. Atokryong, *T. Nakai 2197* (lectotype designated here, TI); Hotaisan, *M. Furumi 195* (syntype, TI).

S. formosissima Nakai in Bot. Mag. Tokyo 31: 105. 1917.——*S. hirsuta* var. *formosissima* Nakai in Bot. Mag. Tokyo 32: 133. 1918. Type: Korea. Piraibon, 1914-10-06, *T. Nakai 2205* (lectotype designated here, TI!), *2208* (syntype, TI); Atokryong, *T. Nakai 2198* (Syntype, TI!); Kanggei, *T. Nakai 2195* (syntype, TI); Birubon, *T. Nakai 5754* (syntype, TI); Miroppon, *T. Nakai 5753* (syntype, TI).

S. robusta Nakai, Fl. Sylv. Kor. 10: 57. 1921. Type: D. P. R. Korea. P′yŏngannam-do (平安南道): Yangdŏk (阳德), 1928-06-15, *T. Nakai 12436* (lectotype designated here, TI!)

Leaves elliptic, ovate to obovate, (5.4–)6.1–14.6(–17) cm long, (2.8–)3–6.6(–7.8) cm broad, adaxially glabrous, rarely pubescent, abaxially sparsely to densely pubescent, rarely glabrous. Panicles 13–30 cm long, (3.3–)3.5–12.4(–15) cm broad, inflorescence rachises usually pubescent and lenticellate; calyx pubescent, 1–3×1–2.5 mm; corolla tube generally funnelform, (4.5–)6.1–13.4(–15) mm long, base 0.5–2 mm broad, throat (1–)1.7–4.1(–4.5) mm broad; corolla lobes usually upright, triangular, (2–)2.1–3.5(–4) mm long, (1–)1.2–2.9(–3) mm broad; anthers inserted 0–1 mm below corolla throat. Capsule oblong, 8–14×3–5 mm, sparsely lenticellate to smooth, acute to obtuse.

It is distributed in the Korean Peninsula, the Far East of Russia and Northeast China, growing in moist deciduous forests, at the edge of forests or by brooks, at an altitude between 600 and 1600 m.

Representative specimens examined:

China. Heilongjiang (黑龙江): Hailin (海林), P. Y. Fu et al. (傅沛云等) 3393 (IFP); Luobei (罗北), C. S. Wang (王崇书) 638 (HNWP); Shangzhi (尚志), G. Z. Wang et al. (王光正等) 1399 (IFP), Y. C. Zhu (朱有昌) 77, 78 (IFP). **Jilin** (吉林): Antu (安图), P. Y. Fu (傅沛云) 1061 (PE), H. Qian (钱宏) 05233 (IFP); Changbai (长白), S. X. Li (李书心) 772 (PE), L. Q. Qiu (邱莲卿) 4353 (WUK); Fusong (抚松), J. Y. Chen (陈进勇) 0511, 05126 (PE); Helong (和龙), Yanbian No. 2 Group (延边二组) 625 (PE); Jiangyuan (江源), J. Y. Chen (陈进勇) 05111, 05116 (PE); Jiaohe (蛟河), Jilin Forestry College (吉林林学院) 9517 (PE), Y. L. Zhang (张玉良) 946 (PE); Linjiang (临江), T. N. Liou (刘慎谔) 881, 883 (PE); Manjiang (漫江), Temperate Forestry Group (温带森林组) 168, 182 (PE). **Liaoning** (辽宁): Benxi (本溪), C. Q. Lin (林长青) 1285 (PE),

J. Y. Li & Y. A. Chen (李冀云, 陈佑安) 1329 (IFP); Huanren (桓仁), S. X. Li & S. Z. Liu (李书心, 刘淑珍) 6817 (IFP).

Korea. Hamgyong-Bukdo, T. Nakai 7385, 7388 (TI); Heian, E. H. Wilson 8687 (K); Taiyudo, E. H. Wilson 8614 (K); Kankyo, E. H. Wiilson 8925 (K); Kogen, Kongosan, E. H. Wilson 10470, 10488 (K); Kangwando, K. Kondo 5916 (TI), M. Jin & S. C. Ko 21013 (TI), T. Nakai s.n. (TI); Serak-san, M. Hagman et al. 60 (UPS); Musang, V. L. Komarov 1258 (P).

Russia. Shkotovo, M. Flanagan & A. Kirkham 15 (K); Vladivostok, S. Kharkevich & T. Buch s.n. (K).

This taxon differs from *S. reflexa* (*S. komarowii* ssp. *reflexa*) in having panicles upright and broader, while the latter having panicles pendulous and narrower. Furthermore, the two taxa are disjunct in distribution. It seems inappropriate to treat *S. wolfii* as *S. reflexa* ssp. *wolfii*, while it is more appropriate to treat it as *S. villosa* ssp. *wolfii*. Since *Syringa wolfii* was described from a cultivated plant and no type specimen has been designated for it. We here choose Schneider (1911)'s figures as the lectotype.

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木犀科丁香属的一个新等级和六个名称的模式指定

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摘要 在居群取样、标本查阅、性状分析和多变量分析的基础上, 提出了丁香属*Syringa*一个新等级和一个新异名: 辽东丁香*S. wolfii* C. K. Schneid.被处理为红丁香的亚种*S. villosa* ssp. *wolfii*而不是垂丝丁香的亚种*S. reflexa* ssp. *wolfii*, 并且其后选模式被指定。同时还指定了五个异名的后选模式, 它们是*S. bretschneiderii*、*S. emodi* var. *rosea*、*S. villosa* var. *hirsuta*、*S. formosissima*和*S. robusta*。

关键词 丁香属; 辽东丁香; 新等级; 新异名; 模式指定