

NEW TAXA AND NEW COMBINATIONS IN CHINESE PLANTS

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ABSTRACT

This paper describes two new conifers found in boreal China, namely, *Larix gmelini* (Rupr.) Rupr. *genhensis* S.Y. Li & K.T. Adair and *Pinus sylvestris* L. var. *manguiensis* S.Y. Li & K.T. Adair. Also, it presents two new combinations, *Polemonium hingganicum* (P.H. Huang & S.Y. Li) S.Y. Li & K.T. Adair and *Penthorum sedoides* L. subsp. *chinense* (Pursh) S.Y. Li & K.T. Adair.

RESUMEN

En este artículo se describen dos coníferas nuevas que se encuentran en el norte de China, *Larix gmelini* (Rupr.) Rupr. subsp./var. *genhensis* S.Y. Li & K.T. Adair y *Pinus sylvestris* L. var. *manguiensis* S.Y. Li & K.T. Adair. También se presentan dos combinaciones nuevas *Polemonium hingganicum* (P.H. Huang & S.Y. Li) S.Y. Li & K.T. Adair y *Penthorum sedoides* L. subsp. *chinense* (Pursh) S.Y. Li & K.T. Adair.

This article describes two new taxa and two new combinations from China. The study is largely based on collections Shiyou Li made in a four-year forest resource investigation in Northeast China during 1984–1987. The specimens are mainly deposited in the herbarium of Northeast Forestry University (NEFI) China.

***Larix gmelini* (Rupr.) Rupr. var. *genhensis* S.Y. Li & K. T. Adair, var. nov.**
(Fig. 1)

A var. *genhensis* brachlis longis et pendula differt.

Larix gmelini (Rupr.) Rupr. var. *genhensis* (GENHEN LARCH) is distinguished from var. *gmelini* (DAHURIAN LARCH) by its long, slender and pendulous branches. The first-year branches of var. *genhensis* are about two times longer than those of var. *gmelini*. The tree reaches 20 meters tall and 50 cm in diameter in favorable conditions.

TYPE: CHINA. NEIMONGGU: Genhe, 4 Jul 1986, S.Y. Li 861-643 (HOLOTYPE: NEFI!).

Larix gmelini (Rupr.) Rupr. var. *genhensis* is sparsely distributed in Genhe, Da Xingan Ling, Neimonggu, China (Fig. 3). It usually grows in wetlands or occasionally in the *Larix gmelini* (Rupr.) Rupr. var. *gmelini* forest on lower



FIG. 1. *Larix gmelini* (Rupr.) Rupr. var. *genbensis*.

slopes. It has withstood temperatures of -45°C . This larch should receive horticultural attention because of pendulous branching and cold tolerance.

***Pinus sylvestris* L. var. *manguiensis* S.Y. Li & K. T. Adair, var. nov. (Fig. 2)**

Differt a *Pinus sylvestris* L. var. *sylvestris*, var. *mongolica* Litvin., var. *sylvestrifomis* (Takenouchi) Cheng et C.D. Chu foliis 0.5–4.0 cm longis.

Pinus sylvestris L. var. *manguiensis* is one of the shortest leaf pines in the world. This variety can be distinguished from other varieties of *Pinus sylvestris* by its extremely short and slightly or non-twisted needles (Table 1).



FIG 2. *Pinus sylvestris* L. var. *manguiensis*.

TYPE: CHINA. NEIMONGGU: Mangui, 26 Jun 1986, S. Y. Li 861-917 (HOLOTYPE: NEFI!).

Additional specimens examined: CHINA. NEIMONGGU: Jinhe, 20 Jun 1986, S. Y. Li 860-300 (NEFI).

Pinus sylvestris L. var. *manguiensis* (SHORT-LEAF SCOTCH PINE) occurs in pure stands on dry rocky slopes (400–800 m at elevation) in Mangui and Jinhe, Da Xingan Ling, Neimonggu, China (Fig. 3). *Pinus sylvestris* L. var. *manguiensis* predominates the canopy and is occasionally associated with *Larix gmelini*. The regeneration seedlings under canopy are common, especially in gaps. The common shrubs in undergrowth are *Rhododendron mucronulatum* Turcz., *Spiraea sericea* Turcz., *Rosa acicularis* Lindl., *Vaccinium vitis-idaea* L., and *Rubus* sp. Main associated herbaceous plants include: *Carex* spp., *Calamagrostis* sp., *Iris ensata* Thunb., *Pyrola incanata* Fisch., *Artemisia* sp., *Convallaria majalis* L., *Fragaria orientalis* Lozinsk., and *Sanguisorba officinalis* L.

The new pine is a beautiful large tree with a short crown and a straight reddish-brown trunk. It is usually 20–25 m tall and 50 cm in diameter. It is adapted to an extremely continental climate. It has withstood temperatures of -47°C . The new pine should be managed for timber.

Polemonium hingganicum (P.H. Huang & S.Y. Li) S.Y. Li & K.T. Adair, comb. et stat. nov. BASIONYM: *Polemonium boreale* Adams subsp. *hingganicum* P.H.

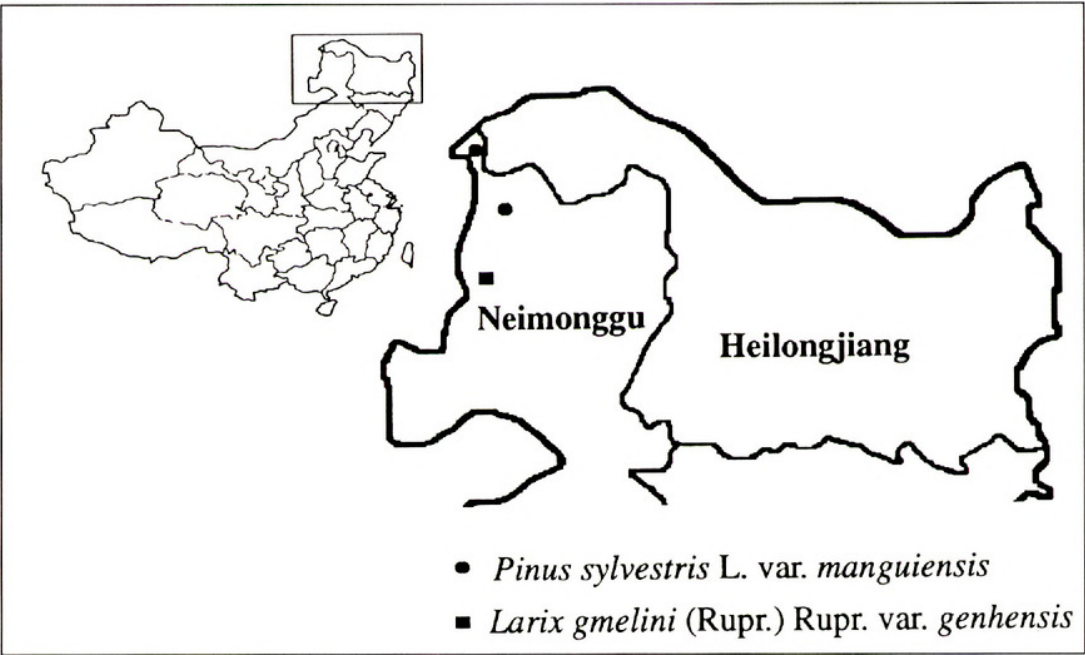


FIG. 3. Distribution of *Pinus sylvestris* L. var. *manguiensis* and *Larix gmelini* (Rupr.) Rupr. var. *genhensis*.

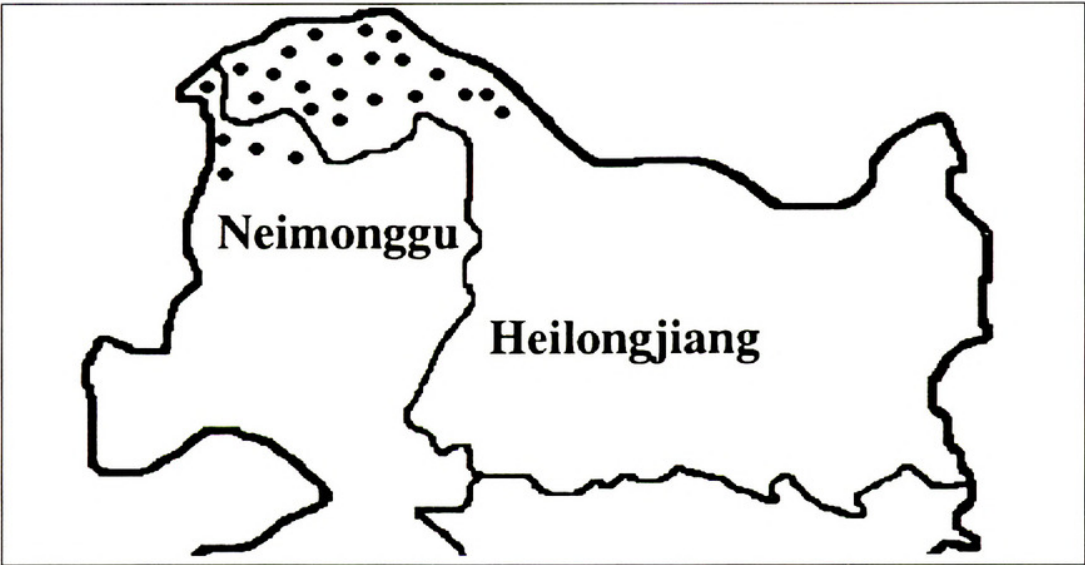


FIG. 4. Distribution of *Polemonium hinganicum*.

Huang & S.Y. Li, Bull. Bot. Res. 5:151–154. 1985. TYPE: CHINA. HEILONGJIANG: Da Xingan Ling, S.Y. Li 841-372 (HOLOTYPE: NEFI!).

Polemonium hinganicum (XINGAN JACOBS-LADDER) was named by P.H. Huang and S.Y. Li in 1985 and treated as a subspecies of the circumboreal *P. boreale*. Recently, we reexamined this taxon with its closely related taxa. The data (Table 2) indicate that the taxon should be treated as a separate

TABLE 1. Gradient Analysis of needle length of *Pinus sylvestris* population with geographic location in China.

Location	Sample Size	Specimen Cited	Needle Length (cm)		Taxon Name
			Range	Mean±s.d.*	
Mohe, Heilongjiang	1030	NEFI 3589	3.1–7.1	5.35±0.94	var. <i>sylvestris</i>
Gulian, Heilongjiang	630	Wang 109	3.5–8.0	5.57±1.30	var. <i>sylvestris</i>
Mordaga, Neimonggu	760	Li 861–604	2.0–6.2	4.06±1.29	var. <i>sylvestris</i>
Nenjiang, Heilongjiang	160	Wang 105	3.4–8.4	6.08±0.93	var. <i>sylvestris</i>
Jixi, Heilongjiang	76	NEFI 0005	2.0–7.0	4.62±1.78	var. <i>sylvestris</i>
Mangui, Neimonggu	1078	Li 861–917	0.8–3.7	2.43±0.73	var. <i>manguiensis</i>
Jinhe, Neimonggu	950	Li 860–300	0.5–3.9	2.81±0.58	var. <i>manguiensis</i>
Hailar, Neimonggu	108	NEFI 630004	4.0–8.9	7.41±1.10	var. <i>mongolica</i>
Honghuarji, Neimonggu	240	NEFI 630087	4.6–7.0	5.76±1.10	var. <i>mongolica</i>
Yirsi, Neimonggu	85	NEFI 630082	3.1–7.3	5.09±0.83	var. <i>mongolica</i>
Guegang, Neimonggu	88	Dong 355, 357	2.1–7.9	5.24±1.21	var. <i>mongolica</i>
Antu, Jilin	350	NEFI 4001	3.4–7.7	4.98±0.80	var. <i>sylvestriformis</i>
Harbin, Heilongjiang	667	Li H-0086	7.3–11.0	9.48±0.73	var. <i>sylvestriformis</i>

* standard deviation

species because it can be distinguished by densely glandular pubescence in parts of the plant, large plant size, mostly stem leaves, a long pedicel, short corolla, and exposed stamens and stigma. *Polemonium hingganicum* is similar to *Polemonium pulchellum* in Siberia, but differs from the latter with large size, mostly stem leaves, campanulate corolla, and exposed stamens and stigma.

Penthorum sedoides L.

Penthorum is a perennial herbaceous genus with a disjunct distribution between eastern Asia and eastern North America. Although it is a small genus, the taxonomic treatment of species is in dispute. Gray (1846) once doubted that the Asian plants (*P. chinense* and *P. humile*) would be the same as the eastern North American *P. sedoides*. Maximowicz (1883) treated *P. chinense* as a variety of *P. sedoides*, and considered *P. humile* as possibly based on abnormal specimens. However, in this century, most scholars tend to recognize two species *P. sedoides* and *P. chinense* in the genus. Li (1952) clearly stated that *P. chinense* differs from *P. sedoides* in that stems are usually simple or few-branched, narrow leaves, has fewer flowered more corybose-like inflorescences and white flowers. In *P. sedoides*, as Li mentioned, the stems are usually many-branched, the leaves broader, the inflorescences more paniculate and the flowers greenish. Li's opinion is widely accepted by many scholars.

The natural range of *P. chinense* is the northeastern Asia, including Far East Russia, Northeast and North China, Korea, and Japan. We examined all available Chinese specimens of *Penthorum* and related literature and collected

TABLE 2. Morphological comparison of *Polemonium hingganicum* and its closely related species.

	<i>P. acutiflorum</i>	<i>P. boreale</i>	<i>P. hingganicum</i>	<i>P. pulcherrimum</i>	<i>P. pulchellum</i>
Distribution	Europe, Siberia, & western North America	circumboreal	boreal region of China	western North America	Siberia
Habitat	moist & grassy slopes	dry rocky slopes	moist & fertile sites	calcareous rocky slopes	rocky hills
Stature	10–80 cm	5–22 (40) cm	30–90 cm	10–40 (55) cm	8–25 cm
Stem	glabrous below & glandular pubescent above	glandular pubescent above	densely short glandular pubescent	spreading-hair to glandular pubescent	short glandular pubescent
Leaves	basal & stem	mostly basal	mostly stem	mostly basal	mostly basal
Leaflet	15–27 (23)	13–23	15–25	up to 31	11–25
Leaf surfaces	glabrous	viscid-pubescent	glandular pubescent	viscid-pubescent	glandular pubescent
Pediceal length	>calyx	<calyx	>calyx	>calyx	=calyx
Calyx Length	6–11 mm	5–10 mm	5–7 mm	4–7 mm	4–8 mm
Calyx lobe length	>tube	>tube	=tube	>tube	>tube
Calyx surfaces	glabrous	pubescent	pubescent	glabrous	pubescent
Corolla length	11–22 mm	14–25 mm	6–10 mm	8–13 mm	7–12 mm
Stamens	not exposed	not exposed	exposed	not exposed	not exposed
Stigma	not exposed	not exposed	exposed	not exposed	not exposed
Specimens Cited			Li 841-9008	Raines 1313	
References	Ohwi 1965, Polunin 1959	Polunin 1959, Welsh 1974	Huang & Li 1985	Polunin 1959, Welsh	Polunin 1959 1974

hundreds of accounts of specimens during 1985–1987. In 1989, we examined the American *P. sedoides* in both herbarium and field. Finally, we found the Asian and American plants to be almost the same in all characteristics in nature, with the exception of leaf shape. However, descriptions are often individual in flower color. Asian plant flowers have been observed and recorded as white, yellow white, and light green; American ones have been described as green or yellow-green in much of the literature (e.g. Correll and Johnston 1979). Some field notes of specimens are also different: e.g. *McCrary 1044* (Texas, 20 Jul 1984) recorded the flowers as yellow-green, and *Nixon 15992* (Texas, 10 Sep 1987) recorded flowers as white. According to our field observations in the last few years, the corollas of Chinese and American plants are both white in nature, but they are often inconspicuous and fall early while other parts of flowers are all green in color. In most cases, the white sepals do not remain or at most are restricted to the upper flowers in the inflorescences so that many observers recorded the flowers as green. Thus, flower color is not a character on which to distinguish between Asian and American plants.

Further, according to our observations, some Asian plants have simple or few-branched stems as Li (1952) described. Others have many-branched stems especially in dry and disturbed sites. Therefore, it seems there is no difference in stems between Asian and American populations. Also, Li's descriptions on the fewer flowered more corybose-like inflorescences (Asian plants) and more paniculate (American plants), seem a result of partial observations. According to our specimen examinations, there is no distinct difference in inflorescences between Asian and American taxa. In addition, anatomical data (Haskins and Hayden 1987) failed to show any significant difference between these two taxa.

Actually, the only morphological difference between Asian and American taxa is the former has narrow and long willow-like leaves, while the latter has wide and shorter glabrous leaves. Geographically, they occupy similar habitats on separate continents. Thus, we treat the Asian taxon as a geographic subspecies of the American species. As a result, *Penthorum* becomes one of five monospecific disjunct genera in eastern Asia and North America.

Penthorum sedoides* L. subsp. *sedoides

Distribution. Eastern United States.

Representative specimens examined. UNITED STATES. Arkansas: *D. Demaree 34302* (ASTC). Iowa: *H.B. Weyland 406* (ASTC). Louisiana: *C. Smith 1853* (ASTC). Massachusetts: *H.E. Ables 90326* (ASTC). Texas: *L.E. Brown 3732* (ASTC); *M. McCrary 1044* (ASTC); *E.S. Nixon 7649, 10717, 15992* (ASTC); *E.S. Nixon and C. Burandt 7078* (ASTC); *E.S. Nixon and M. McCrary 3591* (ASTC); *E.S. Nixon and J.R. Ward 10863, 12390, 12422, 12434, 12547, 12922, 13043, 13136* (ASTC); *C. Waters 174* (ASTC).

***Penthorum sedoides* L. subsp. *chinense* (Pursh) S.Y. Li & K.T. Adair, comb. et stat. nov.** BASIONYM: *Penthorum chinense* Pursh, Fl. Amer. Sept. 323. 1811; Koma-rov, Fl. Manshur. 2:403. 1903; Kitagawa, Lin. Fl. Manshur. 246. 1939; Liou, Key Pl. NE China 122. 1959. *Penthorum sedoides* L. var. *chinensis* (Pursh) Maxim., Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Pétersbourg. 11:774. 1883.

Distribution. Korea, Japan, eastern China southward to Indochina.

Specimens examined. CHINA. Heilongjiang: S.L. Dong 11040 (NEFI); S.Y. Li 123, 84-103 (NEFI), S.Q. Nie 964 (NEFI); Y.L. Zhang 1926 (IFP). Jilin: S.Y. Li 10043 (NEFI). Liaoning: S.Y. Li 853007 (NEFI).

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