Thalictrum koikeanum (Ranunculaceae), a New Species from Hiroshima Prefecture, Western Honshu, Japan

Tetsuya SERA\textsuperscript{a}, Nobuya HAMADA\textsuperscript{b} and Yuichi KADOTA\textsuperscript{c,*}

\textsuperscript{a}Hiroshima Botanical Garden, 3-495, Saeki-ku, Hiroshima, 731-5156 JAPAN;
\textsuperscript{b}Onomichi-Higashi High School, 12-1, Higashikubo-machi, Onomichi, Hiroshima, 722-0043 JAPAN;
\textsuperscript{c}Department of Botany, National Museum of Nature and Science, 4-1-1, Amakubo, Tsukuba, 305-0005 JAPAN
*Corresponding author: kadota@kahaku.go.jp

(Accepted on January 7, 2011)

A new species of Thalictrum (Ranunculaceae), \textit{T. koikeanum} Sera, N. Hamada & Kadota, is described from Hiroshima Pref., western Honshu, Japan. \textit{Thalictrum koikeanum} belongs to sect. \textit{Purpurea} (Tamura) Emura and is distinguished from \textit{T. rochebrunianum} Franch. & Sav. in having smaller flowers, white and shorter sepals, foliaceous, green bracteoles and fewer achenes. It occurs in damp places in the northeastern part of Hiroshima Pref.

Key words: Japan, new species, Ranunculaceae, sect. Purpurea, Thalictrum koikeanum, \textit{Thalictrum rochebrunianum}.

\textit{Thalictrum kubotae} Kadota has been recently described as a new species from the northeastern part of Hiroshima Prefecture, western Honshu, Japan (Kadota 2005). Furthermore unknown plants of \textit{Thalictrum} were additionally found in the same area of Hiroshima Prefecture.

In July 2005, Mr. Shuji Koike, Shôbara, Hiroshima Prefecture, found some tall \textit{Thalictrum} plants with numerous white and yellow flowers inhabiting in damp places which were located along small streams and roadside passing through a planted forest in Shôbara, Hiroshima Prefecture, western Honshu, Japan. Subsequently he sent some materials to us. The flowers were unique in Japanese \textit{Thalictrum} because they were provided with persistent white sepals and deep yellow anthers. Among the species of Japanese \textit{Thalictrum}, \textit{T. rochebrunianum} Franch. & Sav. and \textit{T. kubotae} Kadota are hitherto known to have persistent sepals (Kadota 2005, 2006). After taxonomic examination it was clarified that the plant in question is clearly different from the two species not only by flower color but also by the other characteristics. This plant will be described as a new species in this paper.

Taxonomic treatment

Genus \textit{Thalictrum}.


\textit{Thalictrum koikeanum} Sera, N. Hamada & Kadota, sp. nov. \[Figs. 1, 2\]  
Affine \textit{Thalictro rochebruniano}, sed floribus parvis, sepalis albidis brevioribus acutis, bracteolis foliaceis viridis, achenis paucioribus differt.

Type: JAPAN. Honshu: Hiroshima Pref.,
Fig. 1. Holotype of *Thalictrum koikeanum* Sera, H. Hamada & Kadota (T. Sera s.n., TNS 1112778). Details of the type locality are concealed for conservation.
Shôbara-shi, alt. ca. 500 m, 12 July 2009, fl., T. Sera s.n. (TNS 1112778–holotype, Fig. 1; TNS 1112775 [hbg*-17658], TNS 1112776 [hbg*-17657], TNS 1112777 [hbg*-17655]–isotype). *Duplicate specimens preserved at the Herbarium of Hiroshima Botanical Garden, Hiroshima, Japan.

A perennial, glabrous herb, 50–180 cm tall, with thickened rhizome. Stem erect, 1–2 times branched, dark purplish brown, striate, estoloniferous. Basal leaves withering at anthesis. Cauline leaves 2–5, 4- to 6-ternate; blades grayish dark green on the adaxial side, glaucous on the abaxial side, 10–40 cm long, 6–50 cm wide; leaflets obovate to ovate or oblong, 13–35 mm long, 10–30 mm wide, tricuspidate, midribs and lateral veins slightly rised on the abaxial side, flat on the adaxial side, obtuse at apex, rounded to cuneate at base, petioles (0–)10–25(–70) mm long; stipules 4–10 mm long, membranaceous, vaginate, amplexicaul, estipellate. Inflorescence paniculate, many-flowered, 8–30 cm long, 3–10 cm wide; bracts foliaceous, green, simple to 3-ternate; bracteoles foliaceous, green, simple and oblong to ternate, 1–6 mm long, 1–10 mm wide; pedicels 0.3–1.7 cm long, glabrous. Flowers in July, 0.5–0.7 cm in diameter, pendulous. Sepals 4, ovate to oblong, boat-shaped, acute at apex, basally strongly reflexed to the pedicels at full bloom, 3–5 mm long and 1.5–2 mm wide, white on both sides, persistent. Stamens 24–35, 2–4 mm long; anthers narrowly ellipsoidal, bright yellow; filaments filiform, 1.0–2.7 mm long, white; connectives yellow, shortly exserted. Styles ca. 1–2 mm long; stigmas oblong, not triangular. Achenes 10–15(–18) per flower, 3–6 mm long, fusiform, not compressed, glabrous, pericarp thick, ca. 4-ribbed on both sides, oblique, stipes ca. 1 mm long, beaks ca. 1 mm long, slightly incurved.

Japanese name: Shirokane-karamatsu (nom. nov.).

新和名: シロカネカラマツ

Other specimens examined: JAPAN. Honshu: Hiroshima Pref., Shôbara-shi, 10 July 2010, fl., T. Sera s.n. (TNS 1112781 [hbg-18708], TNS 1112783 [hbg-18709]).

Etymology: The specific epithet “koikeanum” is dedicated to Mr. Shuji Koike, who is the discoverer of this new species.

Note: Thalictrum koikeanum is clearly distinguished among the Japanese species of the genus Thalictrum in having persistent, showy, white sepals (Fig. 2) and is classified into sect. Purpurea, which is delineated by filiform filaments with short-exerted connectives, oblong (not triangular) stigmata, many narrowly fusiform (not flattened) achenes with thick ribs. Within the sect. Purpurea, T. koikeanum is different from T. rochebrunianum in flower size (5–7 mm vs. ca. 10 mm in diameter), sepal size and color (3–5 × 1.5–2 mm and white vs. 6–8 × 2.5–3.5 mm and pale pinkish purple), the texture and color of bracteoles (foliaceous and green vs. scaly and brownish) and the number of achenes (10–15(–18) vs. 20 or more).

Thalictrum kubotae Kadota (2005) is superficially similar to T. koikeanum in having persistent sepals as stated above. However, T. kubotae is characterized by the glandular pubescence of plant bodies, sessile achenes and triangular stigmata and belongs to sect. Thalictrum. In this way T. kubotae is apparently discriminated from T. koikeanum.

Sect. Comptonotum Prantl subsect. Violacea (W. T. Wang & S. H. Wang) Tamura (1992, 1995; the Sino-Himalayan region) is similar to sect. Purpurea (Japan and Korea) in having persistent, showy sepals and stipitate achenes, however, the former is different from the latter in having flattened achene bodies (Tanaka et al. 2010).

After the discovery in 2005, Thalictrum koikeanum has been known only from the type locality. The population size of the species varied year by year. In 2009 several dozen plants were found at the type locality. The site is located in half-shady, wet places along streams and roadsides at the bottom of a narrow valley under Chamaecyparis obtusa plantations.
Fig. 2. *Thalictrum koikeanum*. A. Habit (10 July 2010). B. Part of inflorescence (12 July 2009). C. Part of infructescence (1 August 2009). All photos were taken in Shōbara, Hiroshima Pref., western Japan, by T. Sera.
In the same year 2009, another locality of *T. koikeanum* was found at the site about 1.6 km away from the type locality by Mr. Shigeo Takasugi. This site is situated in a low moor left also under *Chamaecyparis obtusa* plantations, and is more sunny and damp than the first locality. It seems that low moors like the second locality may be inherent natural habitat of *T. koikeanum* because many plants of this species were growing more vigorously in the second than in the first locality.

We are deeply indebted to Mr. Shuji Koike, Shōbara, Hiroshima Prefecture, for his gift of living materials, valuable information on *Thalictrum koikeanum*, and for giving an opportunity to study and describe this new species; to Mr. Shigeo Takasugi, Hiroshima, Hiroshima Prefecture, for his valuable information on natural habitat of *T. koikeanum*. We should also thank the volunteers of Hiroshima Botanical Garden.

**References**


