

A New Species of *Ranunculus* (Ranunculaceae) from Hokkaido, Northern Japan

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A new species of *Ranunculus* (Ranunculaceae), *R. horieanus* Kadota, is described from Hokkaido, northern Japan. It resembles *R. acris* subsp. *novus* (H. Lév. & Vaniot) Vorosch. [= *R. acris* var. *nipponicus* H. Hara] but is distinguished from the latter by having obovate petals with short claws, hemispherical, small nectary pits, smaller nectary appendages, bi-bracteolate pedicels, patent sepals, divaricate, elongated branches and pedicels at fruiting time and smaller fruiting heads. *Ranunculus horieanus* is distributed in the northernmost part and the central part of Hokkaido and grows along mountain streams of lowlands (alt. 100–200 m).

Key words: Hokkaido, Japan, new species, *Ranunculus horieanus*, rheophyte.

In 2005 I was asked to determine some *Ranunculus* plants from Dôhoku District of Hokkaido, northern Japan, by Dr. Kenji Horie, Asahikawa, Hokkaido, Japan. At that time the plants were considered as variants of *R. acris* subsp. *novus* (H. Lév. & Vaniot) Vorosch. [= *R. acris* var. *nipponicus* H. Hara, *R. acris* subsp. *nipponicus* (H. Hara) Hultén] despite the differences in the shape of nectary pits and appendages (Kadota 1990, 2006a, 2006b). Visiting Dôhoku District to make field studies on rheophytic *Trollius* plants in June, 2006, I was aware that the *Ranunculus* plants in question grew along mountain streams of lower elevations almost sympatrically with the *Trollius* plants. In order to study their achenes I revisited Dôhoku District at the end of July, 2006. It was revealed that the *Ranunculus* plants had divaricate, well elongated branches and pedicels at fruiting time. Such characteristics are not known in *R. acris* subsp. *novus*. As a result of detailed comparison it was clarified

that the *Ranunculus* plants in question belong to an undescribed species. This new species is described as *Ranunculus horieanus* after the name of the discoverer.

***Ranunculus* L., Sp. Pl. I: 548 (1753).**

Subgenus ***Ranunculus***: Kadota, Fl. Jpn. **IIa**: 312 (2006).

Sect. ***Acris*** Schur, Enum. Pl. Transsilv. 17 (1866): Kadota, Fl. Jpn. **IIa**: 316 (2006).

***Ranunculus horieanus* Kadota, sp. nov.**

[Figs. 1–2, 4, 5A]

Affine *Ranunculo acris* subsp. *novo*, sed petalis obovatis breviter unguiculatis, foveis nectariorum minoribus hemisphaericis, appendicibus nectariorum minoribus, pedicellis bi-bracteolatis, sepalis patentibus, ramis et pedicellis bene productis post anthesin et capitulis fructuum minoribus differt.

TYPE: JAPAN: Hokkaido; Sôya Subpref., Esashi-gun, Nakatonbetsu-cho, Heian, Peichan-gawa, the Garô Bridge, 44°54'28'' N 142°21'07'' E, alt. 100 m, 26 June 2007,



Fig. 1. Holotype of *Ranunculus horieanus* Kadota. JAPAN: Hokkaido; Sôya Subpref., Esashi-gun, Nakatonbetsu-cho, Heian, Peichan-gawa, the Garô Bridge, 44°54'28"N 142°21'07"E, alt. 100 m, 26 June 2007, Y. Kadota 071206 (TNS 764446).



Fig. 2. Habit of *Ranunculus horieanus* Kadota (JAPAN: Hokkaido; Sôya Subpref., Esashi-gun, Nakatonbetsu-cho, Heian, Peichan-gawa, near the Garô Bridge, on 27 June 2007).

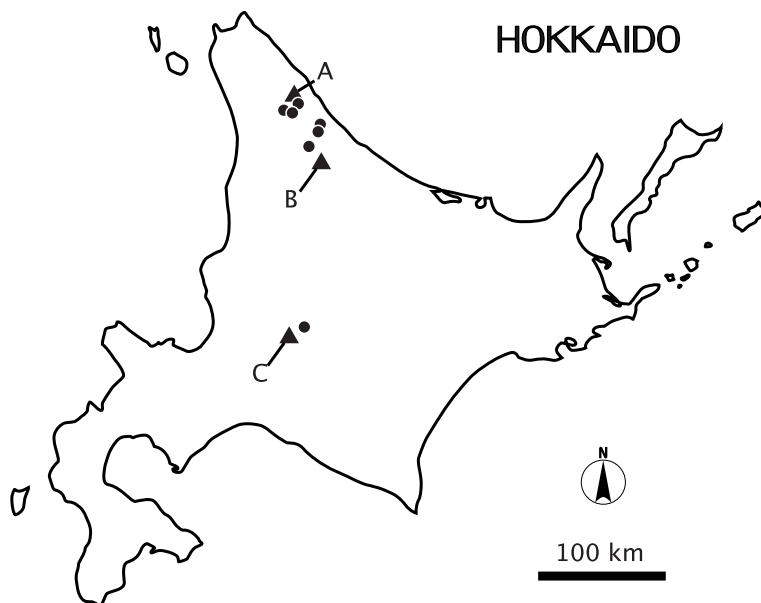


Fig. 3. Distribution of *Ranunculus horieanus* Kadota (disc). A. Mt. Poropuri-yama. B. Mt. Piyashiri-yama. C. Mt. Ashibetsu-dake.

fl. & fr., Y. Kadota 071206 (TNS 764446–holotype, Fig. 1).

Japanese name: Sôya-kinpôge (nom. nov.).

A herbaceous perennial, 50–80 cm tall, growing in a bundle with 2–4 stems. Roots cord-like, slightly thickened at base. Rhizome thick and short, 0.8–2 cm in diameter, ca. 1.5 cm long, erect. Stem terete, striate, 2–3 times branched, sericeous with whitish adpressed hairs in the upper part, glabrous in the lower part; branches elongated, divaricate at fruiting time; collar clothed with fibrous remains of petioles, frequently provided with the preceding year's stem persisting. Basal leaves 2–4; blades dark green, not lustrous, reniform, 4–9 cm long, 6.5–10 cm wide, medially trilobed, shallowly to deeply cordate, glabrous on both sides; middle lobes incised with ovate laciniae 4–7 mm wide; lateral lobes shallowly divided into two segments; petioles 8–20 cm long, glabrous, long vaginate at base; leaf-sheaths densely hirsute with long (ca. 2

mm) hairs. Middle cauline leaves 6–8 cm long, 9–10 cm wide, glabrous on both sides or very sparingly sericeous with long hairs on the abaxial side, shallowly cordate at base, petiolate; petioles 1–3 cm long, vaginate at base; leaf-sheaths hirsute with long hairs. Upper cauline leaves 5–7 cm long, 7–9 cm wide, deeply trilobed with lobes 5–10 mm wide, sparingly sericeous on the adaxial side, glabrous on the abaxial side, subsessile, vaginate and amplexicaul at base. Flowers in June to July, bright yellow, 1.5–2.7 cm in diameter, 4–5 in a cyme; pedicels 1.5–5 cm long, elongated to 13 cm long at fruiting time, densely sericeous, bi-bracteolate; bracteoles narrowly lanceolate, 2–7 mm long, ca. 1 mm wide. Sepals 5, elliptic, 4–8 mm long, 2–3 mm wide, convex, membranous along margin, tinged with brownish violet and densely sericeous on the abaxial side, patent at anthesis (Fig. 4D). Petals 5(–8), 12–15 mm long, 8–10 mm wide, obovate, emarginate to undulate or entire, slightly overlapping with each other;

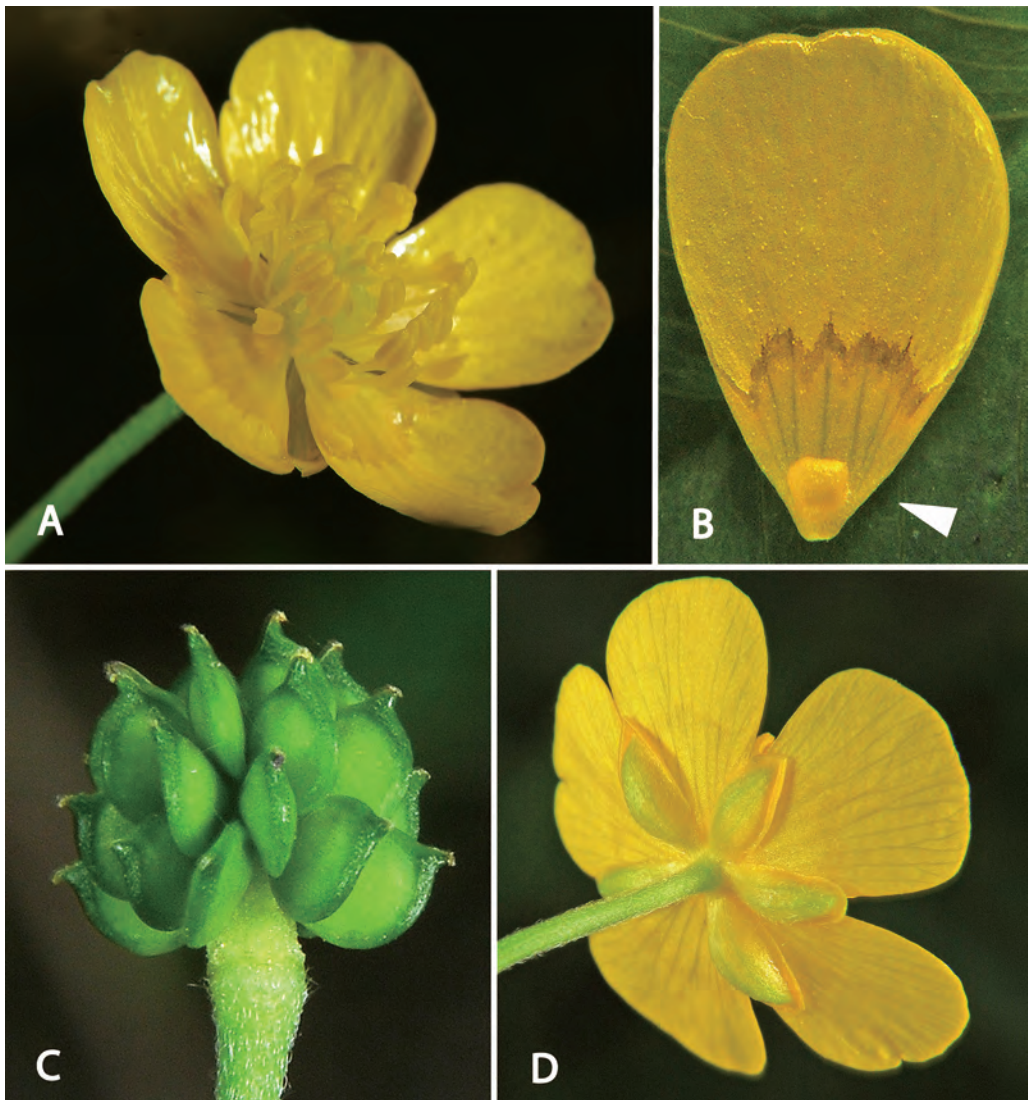


Fig. 4. Flowers and fruits of *Ranunculus horieanus* Kadota. A. Flower. B. Petal. Arrowhead indicates nectary appendage. C. Fruiting head. D. The abaxial side of flower, showing patent sepals. All the photographs were taken near the Garô Bridge, Peichan-gawa, Heian, Nakatonbetsu-cho, Hokkaido, on 27 June 2007.

claws 0.5–1 mm long; nectaries hemispherical, 0.8 mm in diameter, covered with scaly appendages; scales 1–1.5 mm long, 1–1.2 mm wide, rectangular to triangular (Fig. 4B). Anthers narrowly elliptic, ca. 2 mm long, dorsifixed and latrorse; filaments 3–4 mm long, dilated above. Fruits in July to August. Fruiting heads broadly obovoidal (Fig. 4C),

4.5–5 mm in diameter, 5 mm long; receptacles glabrous. Achenes obovate, flattened, 2 mm long, glabrous; beaks ca. 0.5 mm long, thick, intensely recurved (Fig. 5). Chromosome number $2n = 14$.

Other specimens examined. JAPAN: HOKKAIDO; Sôya Subpref., Esashi-gun, Utanobori-cho, 3 June 1972, M. Yamanoi 122 (TNS 319437). Esashi-cho,

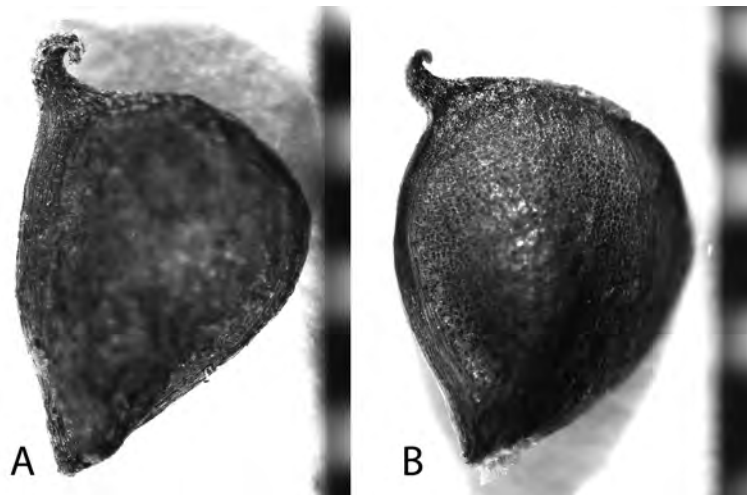


Fig. 5. Comparison of *Ranunculus horieanus* and *R. acris* subsp. *novus* in achene shape. A. *R. horieanus* (Hokkaido, Esashi-gun, Nakatonbetsu-cho, the Garô Bridge, TNS 757723, paratype). B. *R. acris* subsp. *novus* (Hokkaido, Shibetsu-shi, Mt. Teshio-dake, TNS 758353).

Utanobori, Tokushibetsu-gawa River, 18 June 2006, K. Horie 063038 (TNS 757801); Utanobori, Shibiutan, Tokushibetsu-gawa River, the Hinode-bashi Bridge, 44°45'30"N 142°36'39"E, alt. 60 m, 26 June 2007, Y. Kadota 071304–071318 (TNS); Utanobori, Shibiutan, Tokushibetsu-gawa River, Ômagari, 44°40'01"N 142°34'15"E, alt. 190 m, 27 June 2007, Y. Kadota 071507–071513 (TNS). Nakatonbestu-cho, Heian, Peichan-gawa, alt. 90 m, 8 June 2004, K. Horie 05–02 (TNS 744995–745996); Nakatonbetsu-cho, Heian, Peichan-gawa, the Garô Bridge, 44°53'N 142°21'E, alt. 100 m, 31 July 2006, fr., Y. Kadota 064001 (TNS 757721–757722); the Garô Bridge, alt. 100 m, 26 June 2007, Y. Kadota 071205–071215 (TNS). Kamikawa Subpref., Nakagawa-gun, Bifuka-cho, Niupu, along Penke-niupu-gawa River, 44°30'01"N 142°29'05"E, alt. 130 m, 27 June 2007, Y. Kadota 071601–071614 (TNS). Furano-shi, Yamabe, along the Sorachi-gawa River, alt. 210 m, 29 May 2004, K. Horie 05–01 (TNS 744993–744994); along the Sorachi-gawa River, alt. 230 m, 3 July 2007, K. Horie 07-01–07-05 (TNS).

Distribution: The northernmost part and the central part of Hokkaido, Japan (Fig. 3). Endemic.

Habitat: Growing along mountain streams: alt. (60–)100–200(–230) m.

Ranunculus horieanus is similar to *R.*

acris subsp. *novus* (H. Lév. & Vaniot) Vorosch. but the former is distinguished from the latter by having obovate petals with short claws, hemispherical, small nectary pits, smaller nectary appendages (Fig. 4B, arrowhead; cf. Kadota 1990, figs. 1–3), bi-bracteolate pedicels, patent sepals (Fig. 4D), divaricate, elongated branches and pedicels at fruiting time and smaller fruiting heads.

There are slight differences in the attributes of achene between *R. horieanus* and *R. acris* subsp. *novus* (Fig. 5). Although beaks (styles) are strongly recurved in both taxa, beaks of *R. horieanus* are thicker than those of *R. acris* subsp. *novus*. Ventral and dorsal keels of *R. horieanus* are wider than those of *R. acris* subsp. *novus*.

There is a difference also in habitat preference between the two taxa. *Ranunculus acris* subsp. *novus* is a representative of Japanese alpine plants and grows in mesic meadows of the alpine zone in Honshu and Hokkaido (Kadota 1990, 2006a, 2006b). On the contrary *R. horieanus* is exclusively found along mountain streams of lowlands (alt. 100–200

m). The habitat will be flooded in the case of the rise in the water level after rainfall.

In this habitat the following plants were observed: *Salix caprea*, *Salix gracilistyla*, *Ulmus laciniata*, *Alnus crispa* subsp. *maximowiczii*, *Filipendula camtschatica*, *Artemisia montana*, *Parasenecio hastatus* subsp. *orientalis*, *Petasites japonicus* subsp. *giganteus*, etc.

I wish show my sincere thanks to Dr. K. Horie for his guidance to the localities of *Ranunculus horieanus* and presenting herbarium specimens of this species; to Prof.

Dr. T. Nishikawa for the counting of the chromosome number of *R. horieanus*.

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門田裕一：北海道道北地方産キンポウゲ属（キンポウゲ科）の1新種，ソウヤキンポウゲ

北海道道北地方からキンポウゲ科キンポウゲ属の新種ソウヤキンポウゲ *Ranunculus horieanus* Kadota を記載した。ソウヤキンポウゲはミヤマキンポウゲ *R. acris* L. subsp. *novus* (H. Lév. & Vaniot) Vorosch. から次のような特徴で区別される；①花弁が倒卵形で短いながらも爪が明瞭なこと，②蜜腺は半球形でより小型であること，③蜜腺の付属体がより小さいこと，④花柄に小苞があること，⑤萼片が平開すること，⑥枝や花柄は開出し，果期に著しく伸長すること，⑦集合果はより小さい

こと，などである。ソウヤキンポウゲは宗谷地方のポロヌプリ山南部から空知地方の空知川流域にかけての地域に分布し，標高100–200 m のゆるやかな溪流沿いに生育している。

ソウヤキンポウゲの学名 *R. horieanus* は，この植物の発見者であり，著者に研究の機会を与えてくださった堀江健二博士（旭川市・北邦野草園）への献名である。

(国立科学博物館植物研究部)