

Taxonomic Studies of *Cirsium* (Asteraceae) in Japan V.
Cirsium umezawanum, a New Species from Island Rishiri, Hokkaido
and a New White-Flowered Form of *Cirsium amplexifolium* Kitam.

Yuichi Kadota

Department of Botany, National Science Museum,
4-1-1 Amakubo, Tsukuba, 305-0005 Japan

Abstract A new species of *Cirsium*, *C. umezawanum* Kadota, and a new white-flowered form of *C. amplexifolium* Kitam. are described here. *Cirsium umezawanum* is described based on the collection from Isl. Rishiri, Hokkaido, and is characterized by having 1) erect capitula, 2) 8–9-seriate involucreal phyllaries, 3) the absence of glandular bodies on inner phyllaries, 4) patent phyllaries with long recurved tips and 5) longer corolla throats than corolla tubes. *Cirsium amplexifolium* Kitam. f. *albiflorum* Kadota is described from Yamagata, northern Honshu, and is characterized by white corollae.

Key words: *Cirsium umezawanum* sp. nov., Isl. Rishiri, *Cirsium ganjuense* Kitam., *Cirsium amplexifolium* Kitam. f. *albiflorum*, f. nov.

A new species of *Cirsium* from Hokkaido and a new form of *Cirsium amplexifolium* Kitam. from northern Honshu will be described in this paper as part of a systematic study on the genus *Cirsium* of Japan (Kadota, 1989–1998).

1) A new species of *Cirsium* from Island Rishiri, Hokkaido

Cirsium umezawanum Kadota, sp. nov. [Sect. *Onotrophe* (Cass.) DC. Subsect. *Amplexifolia* Kadota; Figs. 1–2]

Differt ab *Cirsio ganjuenso* caule robusto ramosissimo, phyllariis involucreorum 8–9-seriatis et vittis phyllariorum interiorum deficientibus vel vestigialis; ab *C. amplexifolio* phyllariis involucreorum 8–9-seriatis, capitulis magnis et pedunculis capitulosum crassis.

A perennial herb, 1–2 m tall. Rootstock well developed, stout, horizontal, up to 4.5 cm in diameter; roots cord-like, thick, ca. 9 mm in diameter. Stem erect, stout, leafy, well branched in the upper part, almost glabrous or sparingly covered with brownish hairs in the upper part, striate, up to 28 mm in diameter at base; branches elongate, divaricate. Basal leaves withering at anthesis. Cauline leaves yellowish green on the adaxial side, sessile and slightly amplexicaul; blades elliptic to broadly elliptic in outline, 16–32 cm long, 8–24 cm wide, glabrous on both sides or sometimes pubescent with long adpressed hairs in particular along veins on the abaxial



Fig. 1. Holotype of *Cirsium umezawanum* Kadota, sp. nov. (Hokkaido, Isl. Rishiri, Minamihama, 1 August 1997, Kadota 971009, TNS).

side, subentire to coarsely serrate or sometimes shallowly to medially pinnatilobate; lobes, if pinnatilobate, 3–5-jugate, ovate to narrowly ovate, 2.5–10.5 cm long, 2–5 cm wide, with weak spines less than 2 mm long. Flowers in July to August. Capitula several in a loose corymb, erect to oblique; peduncles (0.5–) 1.5–6 cm long, covered with brownish short hairs throughout the surface and sparingly arachnoid in the upper part; subtending leaf solitary or absent, linear, ca. 1.5 cm long, with sharp spines 2 mm long or devoid of spines. Involucre campanulate, purplish, 18–20 mm long, (9–) 11–13 (–14) mm (*in vivo*) or 20–25 mm (*in sicco*) in diameter, sparingly arachnoid. Phyllaries 8–9-seriate, patent; glandular bodies absent, if present, glandular bodies present exclusively on the abaxial side of inner phyllaries and vestigial, eglutinous; outer ones broadly ovate with long, attenuate patent tips, 15–20 mm long, terminated with weak spines ca. 1 mm long. Corolla pale reddish purple, 17–21 mm long; lobes 4–5 mm long; throat 5–6 mm long; tube 8–10 mm long, clearly longer than throat. Achenes brownish gray, ca. 3 mm long, tapering to base; pappus sordid, 15–17 mm long.

TYPE: JAPAN, Hokkaido, Soya-shicho, Rishiri-gun, Island Rishiri, Higashirishiri-cho, Kanesaki, 40 m alt., along summer-green forest margin, 31 July 1997, Y. Kadota 971009 (TNS 648593–holotype). Island Rishiri, Higashirishiri-cho, Minamihama, 20 m alt., in maritime herbal stands facing to south, 1 August 1997, Y. Kadota 971017 (TNS 648454–paratype).

Japanese name: Rishiri-azami (nov.)

Chromosome number: $2n=68$ (Fig. 3).

Distribution: Hokkaido, Island Rishiri (endemic).

Specimens examined: JAPAN, Hokkaido, Soya-shicho, Rishiri-gun, Island Rishiri, Higashirishiri-cho, Kanesaki, 1 August 1996, S. Umezawa s.n. (TNS); Island Rishiri, Higashirishiri-cho, Kanesaki, 40 m alt., 31 July 1997, Y. Kadota 971001–971008, 971010 (TNS; 26 sheets). Island Rishiri, Higashirishiri-cho, Minamihama, 20 m alt., 1 August 1997, Y. Kadota 971016, 971016–971020 (TNS; 17 sheets).

Cirsium umezawanum belongs to Sect. *Onotrophe* (CASS.) DC. Subsect. *Amplexifolia* KADOTA (Fl. Jap. IIIb: 137, 1995) as a new member of the subsection because this species is characterized by the absence of basal leaves at anthesis, erect capitula with patent involucre phyllaries and the chromosome number $2n=68$. Subsect. *Amplexifolia* comprises other two species, *C. ganjuense* Kitam. and *C. amplexifolia* Kitam., besides *C. umezawanum*. Morphological characters discriminating *C. umezawanum* from *C. ganjuense* and *C. amplexifolium* as follow.

Cirsium ganjuense is distinguished from *C. umezawanum* by having simple stem, 6-seriate involucre phyllaries (Fig. 4, right) and glutinous involucre. In *C. ganjuense* lanceolate glandular bodies are present on the abaxial side of inner involucre phyllaries and involucre are glutinous. *Cirsium umezawanum* grows in the maritime region. On the contrary *C. ganjuense* is found in alpine meadow of Mt. Hayachinesan and Mt. Iwatesan, northern Honshu. As is usual with alpine species of



Fig. 2. Habit (left) and capitulum (right) of *Cirsium umezawanum* Kadota, sp. nov. Photos were taken at Kanesaki, Isl. Rishiri, by S. Umezawa.

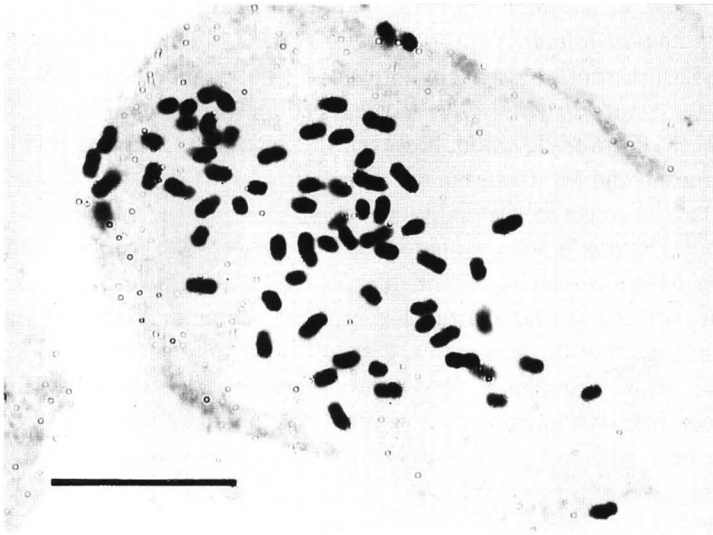


Fig. 3. Somatic chromosomes $2n=68$ of *Cirsium umezawanum* Kadota, sp. nov. Living materials were collected from Kanesaki, Isl. Rishiri. Scale: 10 μm . Photo was taken by S. Yokoyama.



Fig. 4. Habit and capitulum of *Cirsium ganjuense* Kitam. Photos were taken at Mt. Hayachinesan, northern Honshu, on 30 August 1990.

Japanese *Cirsium*, *C. ganjuense* has erect simple stem (Fig. 4, left).

Cirsium amplexifolium is discriminated from *C. umezawanum* by 6-seriate involuclral phyllaries, shorter outer phyllaries and smaller involuclres [(5–) 7–9 mm vs. (9–) 11–13 (–14) mm *in vivo*] with slender peduncles. *Cirsium amplexifolium* also grows in places of lower elevation, however, this species is found in inland region. In Mt. Hayachinesan and Mt. Iwatesan the distribution areas of *C. ganjuense* and *C. amplexifolium* are segregated vertically: *C. ganjuense* grows in alpine herbal stands while *C. amplexifolium* is seen along montane summer-green forest margin.

Cirsium umezawanum is an endemic of Island Rishiri and is restricted to the southeastern part of the island (from Kanesaki to Minamihama, ca. 4 km in beeline distance) while another thistle species, *C. kamschaticum* characterized by large nodding capitula, grows abundantly almost throughout the island. *Cirsium umezawanum* has never been found in Island Rebun neighboring to Island Rishiri (Miyamoto, pers. comm.). At the type locality, Kanesaki, *C. umezawanum* grows along summer-green forests margin with *Acer mono*, *Quercus crispula*, *Rhus trichocarpa*, *Reynoutria sachalinensis*, *Artemisia montana*, *Aster glehni*, etc. The Minamihama population locates on the coastal tall herbal stand where *Angelica ursina*, *Adenophora triphylla*, *Eupatium chinense* subsp. *sachalinense*, *Miscanthus chinensis* grow. At Minamihama the sympatric occurrence of *C. umezawanum* and *C. kamschaticum* is observed and a lot of intermediate forms in morphological attributes have been also found. These intermediate forms are tentatively considered to be of hybrid origin between both species in question. The situation of this natural hybridization will be reported elsewhere.

2) A new form of *Cirsium amplexifolium* Kitam.

Cirsium amplexifolium Kitam., *Cirs. Nov. Or.-Asiat.* 16 (1931); *Compos. Jap.* I: 121, pl. IV, fig. 2, pl. VII, fig. 1 (1937); *Col. Illust. Herb. Pl. Jap.* I: 35, pl. 10, fig. 69 (1980); *Wild Fl. Jap.* III: 219, pl. 197-5 (1981) – H. Hara, *Enum. Sperm. Jap.* I: 168 (1952) – Ohwi, *Fl. Jap. rev. ed.* 1384 (1972) – Kadota, *Makino's New Illust. Fl. Jap.* 806, fig. 3221 (1989); *Fl. Jap.* IIIb: 137 (1995) – *Cirsium nipponicum* (Maxim.) Makino var. *amplexifolium* Nakai in *Bot. Mag. Tokyo* 26: 323, 367 (1912), pro parte; *Bot. Mag. Tokyo* 46: 628 (1932). See Kadota (1995a; p. 137) for detailed synonymy of *C. amplexifolium*.

TYPE (Nakai, 1932): JAPAN, Honshu, Iwate Pref., Mt. Iwatesan, Onigori, 25 June 1907, G. Nakahara s.n. (TI–holotype; Fig. 5).

forma **albiflorum** Kadota, **f. nov.**

Corollae albae cetera ut in typo.

TYPE: JAPAN, Honshu, Yamagata Pref., Tsuruoka-shi, Ioka, Sept., 1990, Shin'ei KATO s.n. (TNS 650170–holotype; Fig. 6).

Japanese name: Shirobana-dakibahimeazami (nov.).



Fig. 5. Holotype of *Cirsium amplexifolium* Kitam. (Iwate Pref., Mt. Iwatesan, 25 June 1907, G. Nakahara s.n., T1).

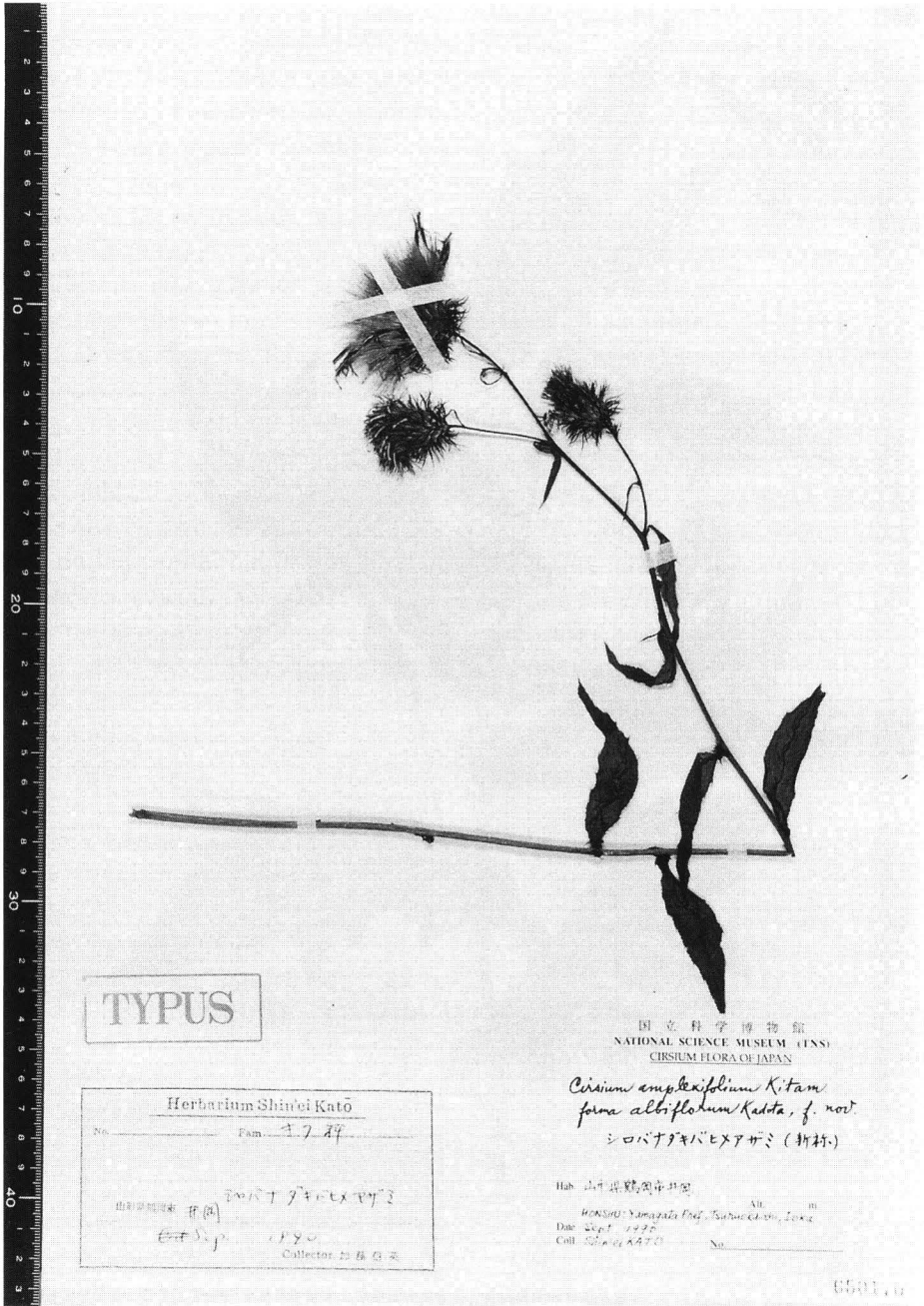


Fig. 6. Holotype of *Cirsium amplexifolium* Kitam. f. *albiflorum* Kadota, f. nov. (Yamagata Pref., Tsuruoka, Ioka, September 1990, S. Kato s.n., TNS).

Acknowledgements

I am grateful to Mr. Shun Umezawa for his guidance and help of the field collection in Island Rishiri, Hokkaido, for taking beautiful photographs of *Cirsium umezawanum* in the fields and for a lot of valuable information on *Cirsium* in Hokkaido; to Mr. Masahiko Sato, Rishiri Town Museum and to Mr. Kazuki Kosugi, Informative Center for Natural Environment of Rishiri for assistance of field examinations in Island Rishiri, to Mr. Seiichiro Miyamoto for searching for *C. umezawanum* in Isl. Rebun, Hokkaido, to Mr. Shun-ichi Yokoyama, Fukui University, for counting chromosome number of this species, and to Mr. Shin'ei Kato for giving a specimen of *C. amplexifolium* f. *albiflorum*. Field works in Hokkaido were financially supported by the Grant-in-Aid from the Monbusho Scientific Research Programs No. 09440258 (representative: Dr. Haruo Katakura, Hokkaido University). Comparative field examinations made in the Tohoku District were financially supported by the Grant-in-Aid from the Fujiwara Natural History Foundation. I should also thank the Curators of the Herbaria (TNS, TI and SHIN).

References

- Hara, H. 1952. Genus *Cirsium*. Enumeratio spermatophytorum Japonicarum vel a bibliographic enumeration of flowering plants indigenous to or long cultivated in Japan and its adjacent islands. Pars secunda, pp. 167–187. Iwanami Shoten, Tokyo (in Japanese).
- Kadota, Y. 1989. Genus *Cirsium*. In M. Ono *et al.* (eds.), Makino's New Illustrated Flora of Japan, pp. 799–807. Hokuryukan, Tokyo (in Japanese).
- Kadota, Y. 1990. Taxonomy and distribution of *Cirsium brevicaulis* A. Gray and its related species (Asteraceae). *Mem. Natn. Sci. Mus., Tokyo*, (23): 51–61.
- Kadota, Y. 1991. Taxonomic studies of *Cirsium* (Asteraceae) of Japan I. Alpine species of central Honshu—the *Cirsium fauriei* group. *Bull. Natn. Sci. Mus., Tokyo*, Ser. B, **17** (3): 123–139.
- Kadota, Y. 1993. Lectotypification of six species and a new species of Japanese *Cirsium* (Asteraceae). *Bull. Natn. Sci. Mus., Tokyo*, Ser. B, **19** (2): 45–57.
- Kadota, Y. 1995 a. Genus *Cirsium* (Asteraceae). In T. Yamazaki *et al.* (eds.), Flora of Japan new English ed., 2nd ed. **IIIb**: 119–151. Maruzen, Tokyo.
- Kadota, Y. 1995 b. Taxonomic studies of *Cirsium* (Asteraceae) of Japan II. Three new species and a new variety of *Cirsium nipponicum* (Maxim.) Makino from central Honshu. *Bull. Natn. Sci. Mus., Tokyo*, Ser. B, **20** (1): 13 T.27.
- Kadota, Y. 1996. *Cirsium abukumense*—a new species of *Cirsium* (Asteraceae) from the Abukuma Mountains, northeastern Japan. *Mem. Natn. Sci. Mus., Tokyo*, (29): 93–93.
- Kadota, Y. 1997. Taxonomic studies of *Cirsium* (Asteraceae) of Japan III. *Cirsium occidentalinipponense*, sp. nov. with special reference to the lectotypification of *Cirsium borealinipponense* Kitam. *Bull. Natn. Sci. Mus., Tokyo*, Ser. B, **23** (3): 115–125.
- Kadota, Y. 1998. Taxonomic studies of *Cirsium* (Asteraceae) in Japan IV. Notes on *Cirsium lucens* Kitam. from southwestern Japan. *Mem. Natn. Sci. Mus., Tokyo*, (30): 65–71.
- Kadota, Y. & Nagase, H. 1988. A new species of *Cirsium* (Asteraceae; Cynareae) from Hida Province, central Japan. *Bull. Natn. Sci. Mus., Tokyo*, Ser. B, **14** (1): 9–20.
- Kitamura, S. 1931. *Cirsia* Nova Orientali-Asiatica. pp. 1–23. Kioto.

- Katamura, S. 1937. Genus *Cirsium*. Compositae Japonicae. Pars prima. *Mem. Coll. Sci., Kyoto Imper. Univ., Ser. B*, **13**: 33–134, pls. I–XVIII.
- Kitamura, S. 1979. Genus *Cirsium*. In S. Kitamura, G. Murata & M. Hori (eds.), Coloured Illustrations of Herbaceous Plants of Japan (Sympetalae), rev. ed. **I**: 30–40, pls. 8–12, figs. 9–11. Hoikusha, Osaka (in Japanese).
- Kitamura, S. 1981. Genus *Cirsium*. In Y. Satake *et al.* (eds.), Wild Flowers of Japan, Herbaceous Plants (Including Dwarf Subshrubs) **III**: 212–220, pls. 188–200. Heibonsha Ltd., Tokyo (in Japanese).
- Nakai, T. 1912 a. Notulae ad plantas Japonicae et Coreae VIII. *Bot. Mag. Tokyo*, **26**: 323–328.
- Nakai, T. 1912 b. De Cirsio Japonico et Coreano: tentamen systematis generis Cirsii praecipue in Japonia et in Corea crescentis. *Bot. Mag. Tokyo*, **26**: 351–383.
- Ohwi, J. 1972. Genus *Cirsium*. Flora of Japan, rev. ed. pp. 1368–1386. Shibundo, Tokyo (in Japanese).