

## Taxonomic Studies of *Cirsium* (Asteraceae) in Japan VIII. *Cirsium shidokimontanum*, a New Species from Middle Honshu

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**Abstract** *Cirsium shidokimontanum* Kadota is here described from middle Honshu. *Cirsium shidokimontanum* is distinguished from *C. abukumense* and *C. nipponicum* var. *incomptum* by having fleshy leaf blades, cylindrical involucre and 9–11-seriate involucre phyllaries. *Cirsium shidokimontanum* is endemic to Japan and is distributed in Fukushima, Tochigi and Nagano Prefectures.

**Key words:** *Cirsium*, *Cirsium abukumense*, *Cirsium albrechtii*, *Cirsium heianum*, *Cirsium nipponicum* var. *incomptum*, *Cirsium shidokimontanum*, Honshu, Japan, new species.

In the course of systematic studies on the genus *Cirsium* of Japan I have conducted extensive field works throughout Japan and have reported some results of the studies (Kadota, 1989, 1990, 1991, 1993, 1995a, 1995b, 1996, 1997a, 1997b, 1998a, 1998b, 1999, 2000).

In 1995 I found unknown thistles near Ogawa, Kita-Ibaraki, Ibaraki Pref., the Kanto District, middle Honshu. I had made field researches repeatedly in the Abukuma Highlands because the locality “Ogawa” is located around the southern end of the Highlands. As a result it is clarified that this thistle belongs to a distinct species and is distributed in throughout the Abukuma Highlands. Further field explorations have revealed that this species is also distributed in Tochigi and Nagano Prefectures. Here I will describe this new species of *Cirsium* as *C. shidokimontanum* because the first discovery site “Ogawa” is located near the River Shidokigawa, a tributary of the River Samekawa which runs to the Pacific Ocean.

### Taxonomic treatment

Sect. **Onotrophe** (Cass.) DC., Prodr. 6: 644 (1837).

Subsect. **Tubelosae** Kitam. in Acta Phytotax.

Geobot. 3: 5 (1934), p. p.

***Cirsium shidokimontanum*** Kadota, sp. nov.  
[Figs. 1–3]

*Cirsium heianum* auct. non Koidz.: Okuhara, Shinshu-no-Yaso 91, bottom photo (1990)–Kadota in T. Shimizu & al., Fl. Nagano Pref. 1137 (1997).

Differt ab *Cirsio abukumense* et *C. nipponico* var. *incompto* laminis foliorum carnosus, involucri cylindricis et phyllariis 9–11-serialibus.

**TYPUS.** JAPAN: Honshu; Fukushima Pref., Higashi-shirakawa-gun, Furudono-machi, Mt. Mikabuyama, alt. 585 m, along a stream in tall herbal stand, 26 September 1999, Y. Kadota 997001 (TNS–holotypus; Fig. 1). Ibaraki Pref., Kita-Ibaraki-shi, Ogawa, alt. 700 m, along a tributary of the River Shidokigawa, Y. Kadota 997008 (TNS–paratypus).

A robust perennial herb, 1.2–2.4 m tall. Rootstock well developed, stout, horizontal, up to 10 cm in diameter, with cord-like roots. Stem erect, well branched from the middle part of the stem, covered with brownish multicellular hairs and arachnoid in the upper half. Basal leaves withering at anthesis. Middle cauline leaves green above, fleshy, broadly ovate to broadly elliptic, 30–40 cm long, 15–26 cm wide, medially to deeply pinnatilobate with 5–7-juga or sometimes



Fig. 1. Holotype of *Cirsium shidokimontanum* Kadota (Honshu, Fukushima Pref., Higashi-shirakawa-gun, Furudono-machi, Mt. Mikabayama, alt. 585 m, 26 September 1999, Y. Kadota 997001, TNS). Right corner inset shows a close-up of capitulum of the same individual.



Fig. 2. Habit of *Cirsium shidokimontanum* Kadota (Honshu, Fukushima Pref., Higashi-shirakawa-gun, Furudono-machi, Mt. Mikabuyama, the type locality, alt. 585 m, on 26 September 1999). Right corner inset shows a nodding capitulum with ascending involucrel phyllaries of the same individual.



Fig. 3. Habit of *Cirsium shidokimontanum* Kadota. (Honshu, Tochigi Pref., Nasu-gun, Nasu-machi, Otani, alt. 430 m, on 5 October 1999). Right corner inset shows an oblique capitulum with patent or slightly reflexed involucrel phyllaries of the same individual.

simple and serrulate, provided with weak spines 2–3 mm long along margin, glabrous on the adaxial side, pubescent with brownish multicellular hairs along veins on the abaxial side, shortly petiolate. Flowers in September to October. Capitula 5–7 in a loose terminal raceme, nodding (Fig. 2) or sometimes ascending to erect (in the case of sessile or shortly pedunculate capitula; Fig. 3); peduncles 0.5–4 cm long or sessile, covered with brownish multicellular hairs and/or arachnoid; subtending leaf solitary or absent, narrowly lanceolate, ca. 1 cm long, provided with weak spines 1 mm long. Involucres cylindrical, more or less purplish, not glutinous or sometimes slightly glutinous, 16–20 mm long, 6–10 mm (*in vivo*) and 16–20 mm (*in sicco*) in diameter, sparingly arachnoid. Phyllaries 9–11-seriate, herbaceous, terminated with weak spines ca. 1 mm long; glandular bodies absent or sometimes with elliptic glandular bodies on the abaxial side

of middle phyllaries; inner ones narrowly ovate, ca. 1.5 cm long, erect; outer ones narrowly ovate with acuminate tips, 5–8 mm long, reflexed to ascending, highly variable in extending direction of the middle and the outer phyllaries. Corollae pale violet, 15–17 mm long; lobes ca. 3 mm long; throats ca. 6 mm long; tubes 7–8 mm long, longer than the throats. Achenes grayish brown, 3–4 mm long, smooth; pappi sordid, 12–17 mm long.

Chromosome number:  $2n=4x=68$  (Fig. 4).

Japanese name: Shidoki-yama-azami (nov.).

Distribution: Honshu (Fukushima, Ibaraki, Tochigi and Nagano Prefs.; Fig. 5). Endemic to Japan. Along streams and lakes in herbal stands and on the margin of summer-green or mixed forests: 400–800 m.

Specimens examined:

JAPAN: Honshu; **Fukushima Pref.**, Soma-gun, Katsurao-mura, Noboritae Pass, alt. 580 m, 27 September 1999, Y. Kadota 997022–997023

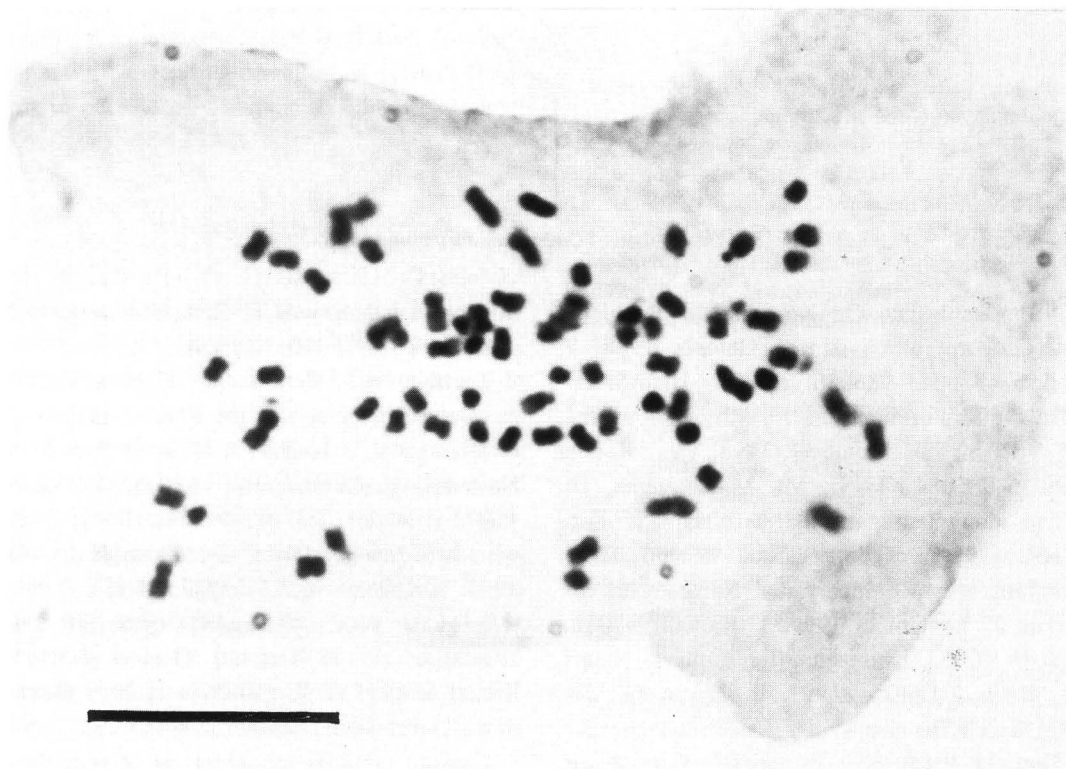


Fig. 4. Somatic chromosomes of *Cirsium shidokimontanum* Kadota (Voucher specimen: Honshu, Nagano Pref., Chino-shi, the Lake Tateshina, alt. 1235 m, Y. Kadota 201227, TNS 710037).

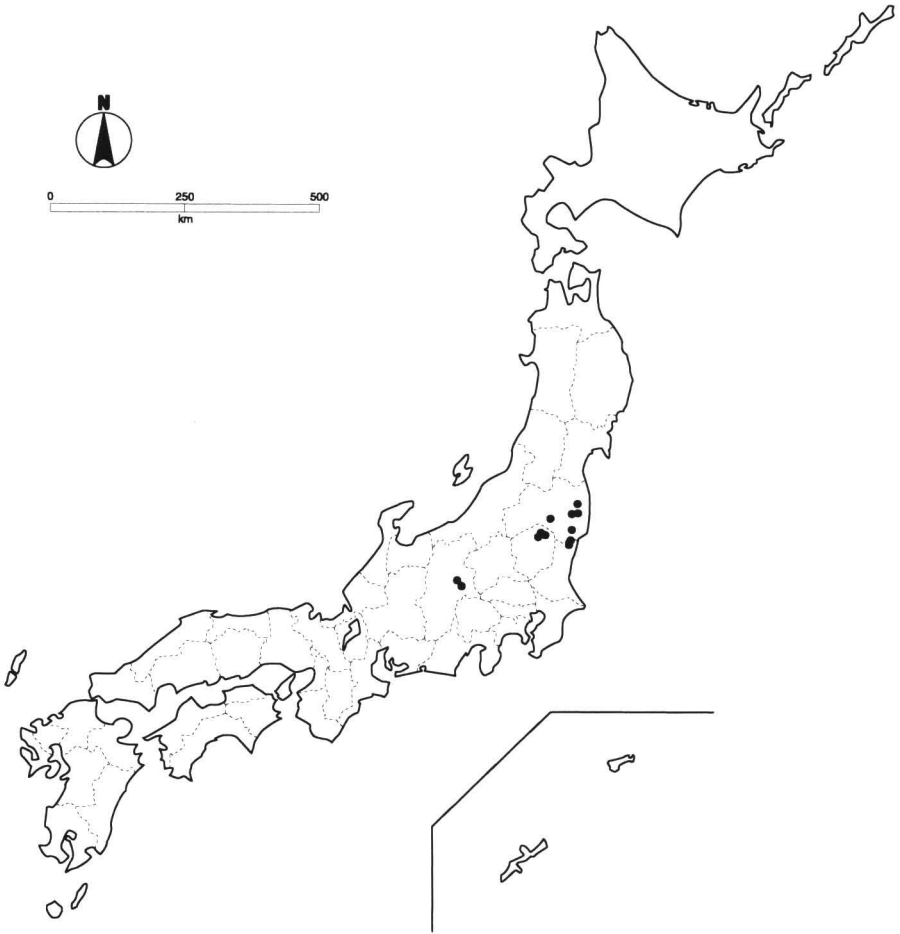


Fig. 5. Distribution of *Cirsium shidokimontanum* Kadota.

(TNS). Tamura-gun, Ogoe-machi, Mt. Otakineyama, Onigoro, alt. 790 m, 5 October 1998, Y. Kadota 986043–986056 (TNS). Higashi-shirakawa-gun, Furudono-machi, Mt. Mikabuyama, alt. 620 m, 6 October 1998, Y. Kadota 986076–986084 (TNS); Mt. Mikabuyama, alt. 585 m, along a stream in tall herb stand, 26 September 1999, Y. Kadota 997002–997006 (TNS). Koriyama-shi, Mt. Ippaiyama, Nanatsuwan, alt. 560 m, 27 September 1999, Y. Kadota 997015–997018 (TNS). Iwase-gun, Ten'ei-mura, Hatori, alt. 710 m, 7 October 1999, Y. Kadota 997107–997111 (TNS).

**Ibaraki Pref.**, Kita-Ibaraki-shi, Ogawa, alt. 700 m, 4 October 1998, Y. Kadota 986006–986015, 986017–986018 (TNS); Ogawa, alt. 700

m, along a tributary of the River Shidokigawa, Y. Kadota 997009–997013 (TNS).

**Tochigi Pref.**, Kuroiso-shi, Miyama, alt. 570 m, along a tributary of the River Nakagawa, 5 October 1999, Y. Kadota 997023–997035 (TNS). Nasu-shi, Kofukabori, alt. 480 m, 4 October 1999, Y. Kadota 997102–997102 (TNS). Nasu-gun, Nasu-machi, Otani, alt. 430 m, 5 October 1999, Y. Kadota 997112–997123 (TNS).

**Nagano Pref.**, Chino-shi, near the Lake Tateshina, alt. 1235 m, 10 October 2001, Y. Kadota 201227 (TNS 710037; voucher specimen of the chromosome number  $2n=4x=68$ ).

*Cirsium shidokimontanum* is distinguished from *C. abukumense* Kadota and *C. nipponicum* (Maxim.) Matsum. var. *incomptum* Kitam. ex

Ohwi by having fleshy cauline leaves, cylindrical involucre and 9–11-seriate involucre phyllaries. The three taxa are distributed together in middle Honshu (chiefly on the Pacific Ocean side). *Cirsium shidokimontanum* prefers rather wet places (along streams and lakes) while *C. abukumense* and *C. nipponicum* var. *incomptum* are found in grassland and on the margin of forests on xeric soils. In this way habitat segregation among the three taxa is observed especially on the Pacific Ocean side of middle Honshu in the lowland tetraploid species group.

*Cirsium heitianum* Koidz. from northern Honshu (a distinct entity from Hokkaido populations = *C. albrechtii* (Maxim.) Kudo ex Tatew.; Kadota, unpublished) and *C. congestissimum* Kitam. from western Honshu are superficially similar to *C. shidokimontanum* in having well-branched and erect stem, numerous capitula with cylindrical involucre and 9-seriate involucre phyllaries. However, *C. shidokimontanum* is discriminated from *C. heitianum* and *C. congestissimum* by the ploidy level ( $2n=4x=68$  vs.  $2n=2x=34$ ) and the extending direction of capitula (nodding or occasionally oblique to suberect vs. erect to oblique).

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