

Taxonomic Studies of *Cirsium* (Asteraceae) in Japan VI.
Two New Species, *Cirsium hidakamontanum* and *Cirsium zawoense*
from Northern Japan

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Abstract Two new species of *Cirsium*, *C. hidakamontanum* Kadota and *C. zawoense* Kadota are described here. *Cirsium hidakamontanum* described from the Hidaka Mountain Range, Hokkaido, is discriminated from *C. kamtschaticum* by having 1) bloody reddish black heads, 2) ribbed achenes, 3) 5-seriate involuclral phyllaries, 4) simple, serrulate, sessile, broadly ovate to broadly elliptic or ovate cauline leaves with auriculate bases. *Cirsium zawoense* described from Mt. Zawosan, northern Honshu, is distinguished from *C. norikureense* by having 1) glutinous involucre (the presence of glandular bodies on the midribs of inner and middle involuclral phyllaries) and 2) cauline leaves glabrous on the abaxial side, and from *C. nipponicum* var. *nipponicum* by having 3) the small number of capitula, 4) the presence of glandular bodies on the midribs of inner and middle involuclral phyllaries and 5) patent outer involuclral phyllaries.

Key words: *Cirsium hidakamontanum* sp. nov., Hidaka Mountains, *Cirsium zawoense* sp. nov., Mt. Zawosan, Japan

As part of a systematic study on the genus *Cirsium* of Japan (Kadota, 1989–1998) I have conducted extensive field works throughout Japan. Here I will describe two new species of *Cirsium*, *C. hidakamontanum* from the Hidaka Mountain Range, Hokkaido, and *C. zawoense* from Mts. Zawosan, the Owu Range, northern Honshu.

1. ***Cirsium hidakamontanum*** Kadota, sp. nov. [Sect. *Onotrophe* (Cass.) DC. subsect. *Borealicola* Kitam.] [Figs. 1, A–B, 2]

Cirsium amplexifolium auct. non Kitam.: Ko. Ito in J. Jpn. Bot. **71**(5): 300 (1996).

Haec species ab *Cirsio kamtschatico* capitulis atosanguineis, acheniis porcatis, phyllariis involuclrorum 5-seriatis et foliis caulinum late ovatis vel late ellipticis vel ovatis simplicibus serrulatis plerumque sessilibus valde auriculatis differt.

TYPE: HOKKAIDO; Tokachi-shicho, Kasai-gun, Nakasatsunai-mura, the Hidaka Mountain Range, Mt. Kamui-Ekuuchikaushi, the Hachi-no-sawa Cirque alt. 1500 m, 6 September 1998, S. Umezawa 98001 (TNS 672568-holotype; Fig. 2).

Japanese name: Hidaka-azami (nov.).

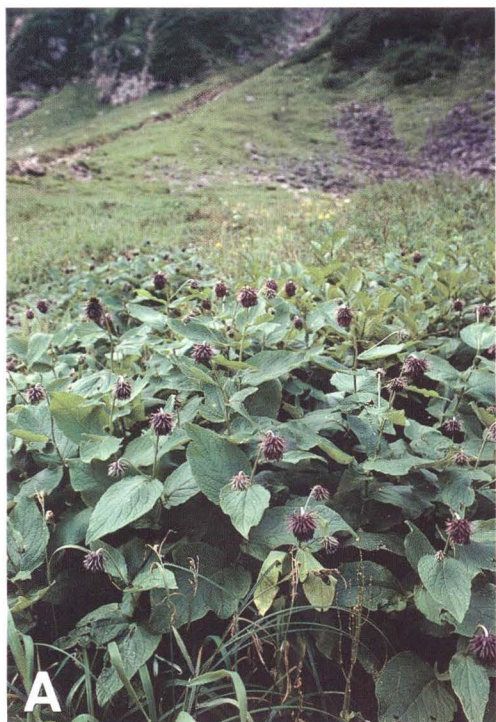
A perennial herb, 1–2 m tall. Rootstock well developed, stout, horizontal, up to 5 cm in diameter, with cord-like roots. Stem suberect, 1–2 times to well branched in the upper part, covered with brownish multicellular hairs and scarcely arachnoid in the upper half. Basal leaves withering at anthesis. Middle cauline leaves deep green above, somewhat fleshy, broadly ovate to broadly elliptic or ovate, simple, serrulate, 10–29 cm long, 6–17.5 cm wide, provided with weak spines ca. 1 mm long along margin, glabrous on the adaxial side, pubescent with brownish multicellular hairs and sparingly arachnoid on the abaxial side, sessile or petiolate (in some cases of lower cauline leaves), strongly auriculate. Flowers in June to August. Capitula nodding, 2–3 in a loose raceme; peduncles 1–11 cm long, densely covered with brownish multicellular hairs and/or arachnoid; subtending leaf solitary or absent, linear, 5–10 mm long, provided with weak spines less than 1 mm long. Involucres campanulate, purplish red to purplish green, not glutinous, 15–20 mm long, 20–25 mm (in vivo) and 20–35 mm (in sicco) in diameter, glabrous. Phyllaries 5-seriate, herbaceous, terminated with weak spines ca. 1 mm long; glandular bodies absent; inner ones narrowly ovate, ca. 2 cm long, ascending to patent; outer ones narrowly ovate with acuminate tips, ca. 1 cm long, reflexed. Corollae bloody reddish black, 15–16 mm long; lobes ca. 4 mm long; throats 6–7 mm long; tubes 5–6 mm long, shorter than the throats. Anthers bluish black. Achenes brown, ca. 4 mm long, prominently ribbed; pappi sordid, 13–14 mm long.

Chromosome number: $2n=2x=34$ (Fig. 3).

Specimens examined: HOKKAIDO; Tokachi-shicho, Kasai-gun, Nakasatsunai-mura, the Hidaka Mountain Range, Mt. Kamui-Ekuuchikaushi, Hachi-no-sawa alt. 950 m, 6 September 1998, S. Umezawa 98008 (TNS); Obihiro-shi, Valley Esaoman-Tattabetsu, 7 July 1993, S. Umezawa s.n. (TNS). Hidaka-shicho, Saru-gun, Hidaka-cho, Mt. Penke-Nushi, Valley Panke-Nushi, Roku-no-sawa alt. 1480 m, 3 October 1998, S. Umezawa 98010 (TNS).

Cirsium hidakamontanum is distinguished from *C. kamtschaticum* by having bloody reddish black flowers, ribbed achenes, 5-seriate involucre phyllaries, simple, serrulate, broadly ovate to broadly elliptic or ovate leaves with strongly auriculate bases and the chromosome number ($2n=34$ vs. $2n=68$; e.g., Nishikawa 1982, 1988). *Cirsium kamtschaticum* has frequently simple cauline leaves, however, their bases are decurrent and not auriculate. The strongly auriculate bases of cauline leaves are characteristic of *C. hidakamontanum*. For this reason Ito (1996) considered this plant as

Fig. 1. Habit of *Cirsium hidakamontanum* and *C. zawoense*. A & B: *C. hidakamontanum*. A. Habit (Hokkaido, the Hidaka Range, Mt. Kamui-Ekuuchikaushi, the Hachi-no-sawa Cirque alt. 1550 m, 17 August 1991, by Mr. S. Umezawa). B. Capitula (the Hidaka Range, Mt. Pisenai alt. 450 m, 30 July 1993, by Mr. S. Umezawa). C & D: *C. zawoense*. C. Habit. D. Capitula (C: Honshu, Yamagata Pref., Mt. Zawosan, near the Katakai-numa Pond 1310 m, 26 September 1998).



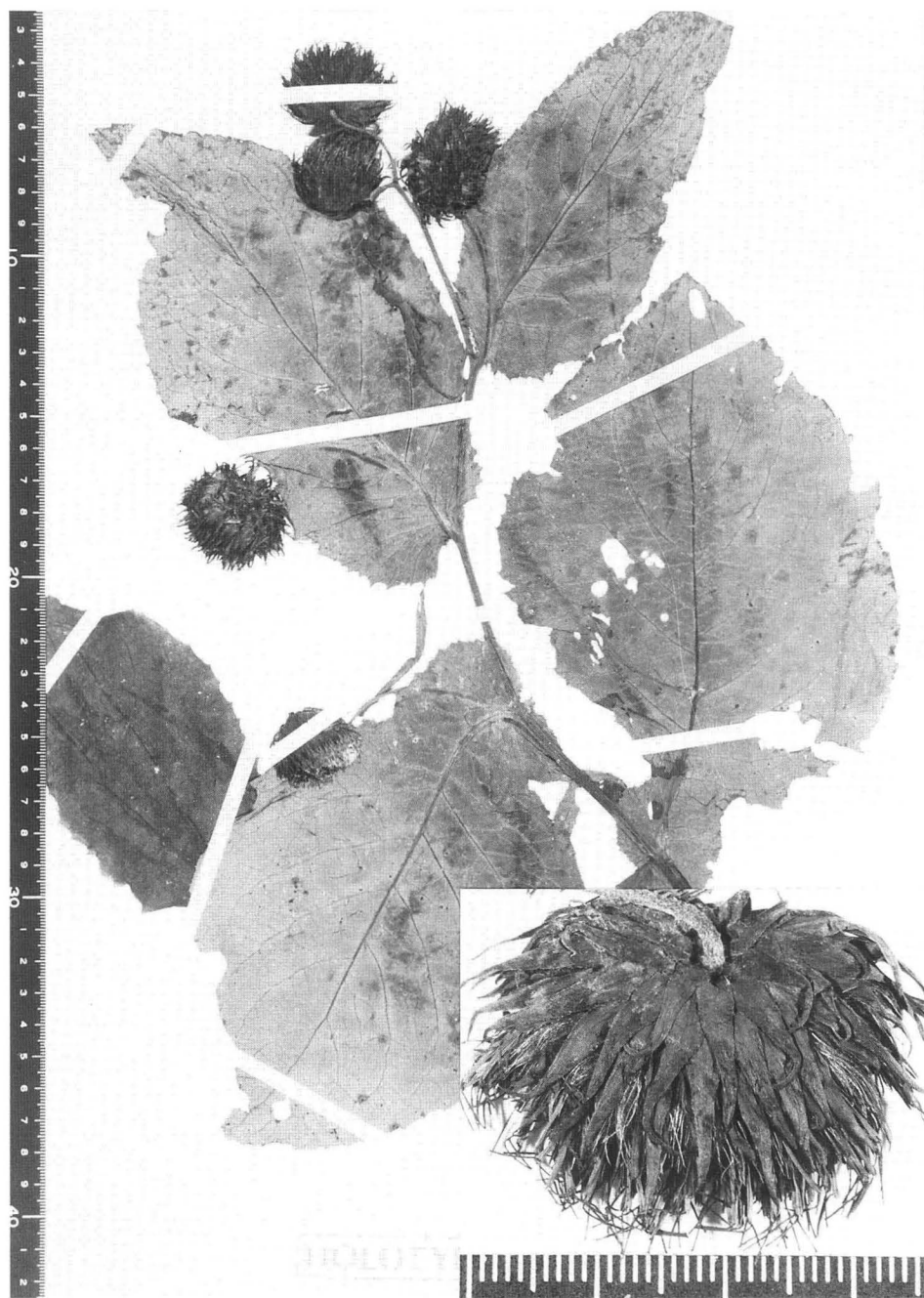


Fig. 2. Holotype of *Cirsium hidakamontanum* Kadota (Hokkaido, the Hidaka Range, Mt. Kamui-Ekuuchikaushi, Hachi-no-sawa Cirque alt. 1500 m, 6 September 1998, S. Umezawa 98001, TNS 672568). Bottom right. A capitulum of the isotype specimen.

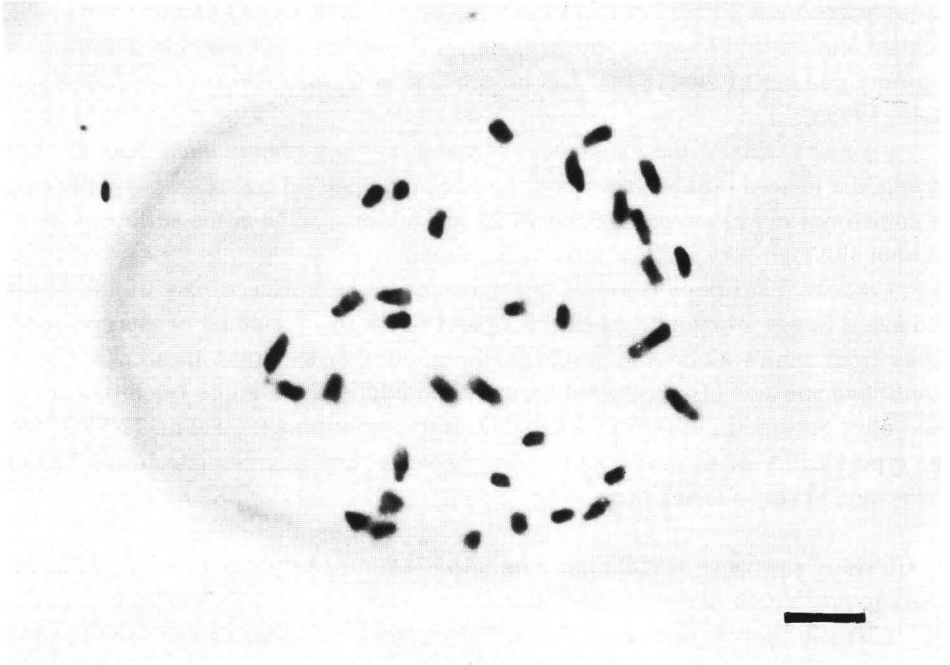


Fig. 3. Somatic chromosomes $2n=34$ of *Cirsium hidakamontanum* (voucher: S. Umezawa 98001, holotype).



Fig. 4. Comparison between *Cirsium hidakamontanum* and *C. kamtschaticum* in seed coat surface under SEM microscopy. Left. *C. hidakamontanum* (Umezawa 98001, Hokkaido, the Hidaka Range, Mt. Kamui-Ekuuchikaushi, holotype, TNS 672568). Right. *C. kamtschaticum* (Koyama & Fukuoka 3138, Hokkaido, Prov. Hidaka, Shizunai-gun, at the vicinity of Petekarisano 400 m, 25 July 1970, TNS 271851).

"*C. amplexifolium* Kitam." which is also characterized by having amplexicaul and auriculate leaf bases. However, true *C. amplexifolium* has erect capitula and the chromosome number of $2n=68$ and has no relation to *C. hidakamontanum* (cf., Kadota 1995, 1998b).

Figure 4 shows the difference between *C. hidakamontanum* and *C. kamtschaticum* in seed coat surface. In *C. hidakamontanum* several ridges (usually seven or sometimes more) are recognized while in *C. kamtschaticum* the surface is almost smooth although very shallow furrows are found.

Cirsium hidakamontanum is an endemic of the northern part of the Hidaka Mountain Range, Hokkaido, northern Japan (Fig. 5, disk). Habitat of this species extends from stands along streamside in the basal area to alpine meadows. *Cirsium kamtschaticum* was also collected around the middle of the gorge Hachi-no-sawa of the Valley Satsunaigawa (Umezawa 98002, Hachi-no-sawa alt. 1000 m, TNS 672569), the type locality of *C. hidakamontanum*, however, any intermediate forms between them were never collected there.

2. ***Cirsium zawoense*** Kadota, sp. nov. [Sect. *Onotrophe* (Cass.) DC. subsect. *Nipponocirsium* Kitam. ser. *Alpicola* Kitam.] [Figs. 1, C–D, 6]

Cirsium alpicola auct. non Nakai: Yuhki, New Fl. Yamagata 277 (1992), sub *C. inundatum* Makino subsp. *alpicola* (Nakai) Kitam.

Haec species ab *Cirsio norikurenso* involucris plus minusve glutinosis, glandibus phyllariorum interiorum et mediorum anguste lanceolatis, foliis subter glabris differt; ab *C. nipponico* var. *nipponico* involucrorum capitulis paucis, involucris 6-seriatis, glandibus phyllariorum interiorum et mediorum anguste lanceolatis, phyllariis exterioribus patentibus differt.

TYPE: HONSHU; Yamagata Pref., Yamagata-shi, the Owu Mountain Range, Mts. Zawosan, in the vicinity of the Katakai-numa Pond, along *Fagus crenata* summer-green forests, alt. 1310 m, 26 September 1998, Y. Kadota 985142 (TNS 678975-holotype; Fig. 6).

Japanese name: Zawo-azami (nov.).

A perennial herb, 1–1.5 m tall. Rootstock well developed, stout, horizontal, up to 10 cm in diameter, with thick cord-like roots. Stem suberect, 2–5 times branched in the upper part, sparingly covered with brownish multicellular hairs and arachnoid in the upper half. Basal leaves withering at anthesis. Middle cauline leaves deep green above, subcoriaceous, elliptic to narrowly elliptic in outline, 17–29 cm long, 8–11 cm wide, medially pinnatilobate with 4–6-jugate, (if pinnatilobate) to coarsely serrate, provided with sharp spines 2–5 mm long, almost glabrous but sparingly covered with brownish multicellular hairs along veins on both sides, acuminate, cuneate at base, sessile, slightly auriculate and not decurrent. Flowers in August to September. Capitula nodding, 2–4 in a loose raceme; peduncles 1–6 cm long or sometimes sessile, densely arachnoid; subtending leaves 2–3, linear and leafy, apparently longer than the

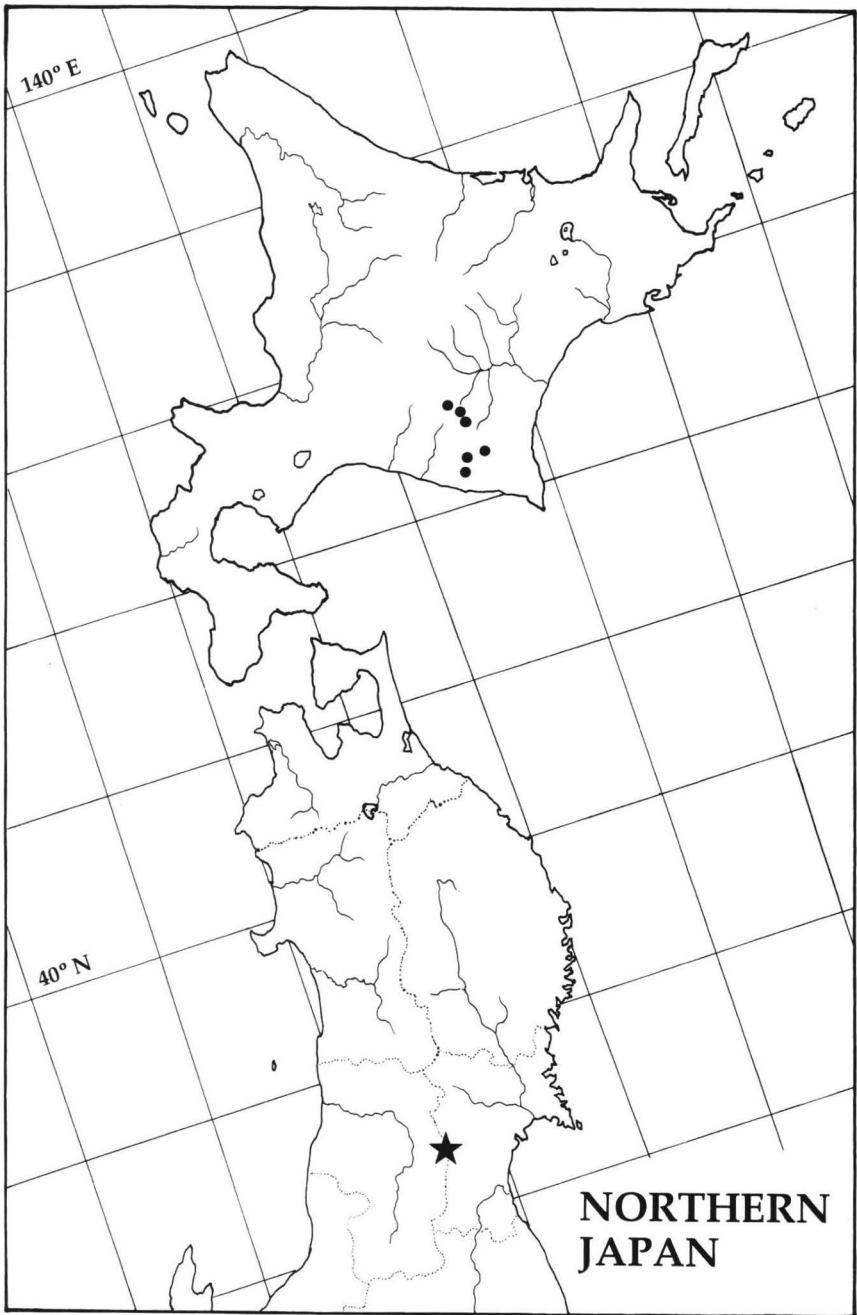


Fig. 5. Distribution of *Cirsium hidakamontanum* (disk) and *C. zawoense* (star).



Fig. 6. Holotype of *Cirsium zawoense* Kadota (Honshu, Yamagata Pref., Yamagata-shi, the Owu Mountain Range, Mts. Zawosan, in the vicinity of the Katakai-numa Pond, along *Fagus crenata* summer-green forests, alt. 1310 m, 26 September 1998, Y. Kadota 985142 (TNS 678975). Bottom right. A capitulum of the holotype specimen.

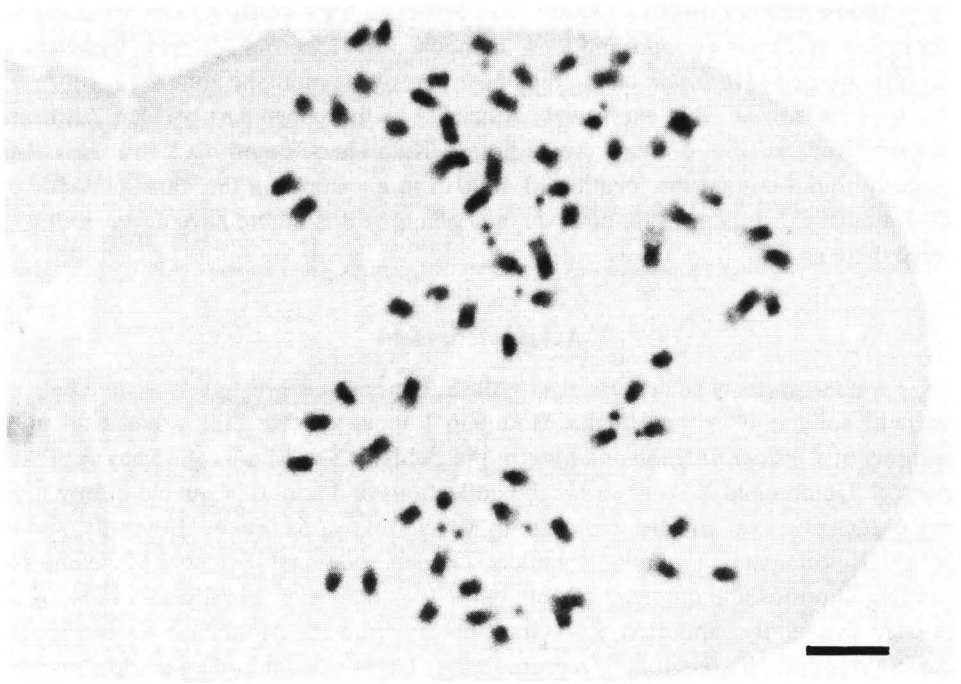


Fig. 7. Somatic chromosomes $2n=68$ of *Cirsium zawoense* (voucher: S. Kato 9701, TNS 651370).

heads, provided with sharp spines 1–3 mm long. Involucres campanulate, purplish to purplish black, glutinous, 16–18 mm long, ca. 1 cm (in vivo) and 20–35 mm (in sicco) in diameter, sparingly arachnoid. Phyllaries 6-seriate, terminated with sharp spines ca. 2 mm long; glandular bodies narrowly lanceolate to linear, situated on the midribs of inner and middle phyllaries; inner ones broadly linear, ca. 18 mm long, membranous, adpressed; outer ones broadly ovate with acuminate tips, ca. 15 mm long, subcoriaceous, patent. Corollae violet, 18–20 mm long; lobes ca. 5 mm long; throats 5–6 mm long; tubes 7–9 mm long, clearly longer than the throats. Anthers pale violet. Achenes yellowish brown, 4–4.5 mm long, smooth on the surface; pappi sordid, 13–17 mm long.

Chromosome number: $2n=4x=68$ (Fig. 7).

Specimens examined: HONSHU; Yamagata Pref., Yamagata-shi, the Owu Mountain Range, Mts. Zawosan, in the vicinity of the Katakai-numa Pond, alt. 1360 m, 26 Sept. 1997, S. Kato 9701–9702 (TNS); the Katakai-numa Pond, 9 Sept. 1998, S. Kato 98001–98003 (TNS); the Katakai-numa Pond, alt. 1310 m, 26 Sept. 1998, Y. Kadota 985139–985149 (TNS). Miyagi Pref., Katta-gun, Zawo-cho, Mt. Sugigamine, on northeastern slope, alt. ca. 1680 m, 3 Oct. 1998, Y. Yuzawa 21797–21798 (TNS).

Cirsium zawoense grows along margin of summer-green forests which were dominated by *Fagus crenata* and were composed of *Acer* spp., *Betula*, *Hydrangea*, *Corylus*, *Weigela*, *Viburnum* etc. in the upper part of the montane zone.

Cirsium zawoense is exclusively restricted to the upper part of Mts. Zawosan, northern Honshu (Fig. 5, star). According to Kato (pers. comm.) *C. zawoense* was formerly found around the location of 1500 m in elevation on the Yamagata side of Mt. Kattadake, Mts. Zawosan, however, any plants of this thistle have never been collected there so far.

Acknowledgment

I wish to give my sincere thanks to Mr. S. Umezawa for his guidance and help of the field collection in the Hidaka Mountain Range, and for taking beautiful photographs of *Cirsium hidakamontanum* in the fields and to Messrs. S. Kato, S. Takahashi, S. Domon and Y. Yuzawa for the collections and a lot of valuable information on *Cirsium zawoense* in Mts. Zawosan; to Mr. S. Yokoyama, Fukui University, and to Dr. G. Kokubugata, Tsukuba Botanical Garden, National Science Museum, for counting chromosome numbers of both two *Cirsium* species. Field works in Hokkaido were financially supported by a Grant-in-Aid from the Monbusho Scientific Research Programs No. 09440258 (representative: Dr. H. Katakura, Hokkaido University). Field examinations made in the Tohoku District were financially supported by a Grant-in-Aid from the Fujiwara Natural History Foundation.

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摘 要

門田裕一：日本産アザミ属植物（キク科）の分類学的研究 VI. 北日本産の2新種、ヒダカアザミとザオウアザミ

北海道・日高山脈からのヒダカアザミ *Cirsium hidakamontanum* と、東北地方・蔵王山からザオウアザミ *C. zawoense* を記載した。ヒダカアザミ（ナンブアザミ節チシマアザミ亜節）は日高山脈中部以北の地域の固有種であり、花期に根生葉が生存せず、大型の頭花を点頭させる点でチシマアザミに近縁である。しかし、ヒダカアザミは頭花が血赤色で、瘦果に稜があり、総苞片は5列で、総苞外片が披針形で内片の半長ほど、茎葉が広卵形～広楕円形あるいは卵形で分裂せず基部が著しく耳状に抱茎する点でチシマアザミとははっきり区別される。チシマアザミは北海道の全域に広く分布し、日高山脈にも分布しており、日高山脈の十勝側では両種の混棲が見られるが中間的な個体はこれまでに見いだされていない。ヒダカアザミは $2n=2x=34$ の2倍体種である。

ザオウアザミ（ナンブアザミ節ナンブアザミ亜節キソアザミ列）も花期には根生葉が生存しないグループで、中型で少数の頭花を点頭させ、総苞片は開出～反曲することで特徴付けられる。このような点では本州・中部山岳地帯の固有種ノリクラアザミに近いが、ザオウアザミは葉の下面が無毛で綿毛に被われないこと、総苞内片に披針形の腺体があって総苞がやや粘ること、茎葉の基部が明瞭に抱茎することなどで明瞭にノリクラアザミから区別される。また、山形県内の低地に普通に分布するナンブアザミ *C. nipponicum* var. *nipponicum* は頭花が総状に多数付くこと、総苞片が8–9列であること、腺体は総苞内片に認められるもの披針形でやや痕跡的になることでザオウアザミから容易に区別できる。ザオウアザミは $2n=4x=68$ の4倍体種で、蔵王山のブナ帯上部以上の地域の固有種である。

