

## Taxonomic Studies of *Cirsium* (Asteraceae) in Japan XI. A New Subsection and Two New Species Belonging to the Subsection, from Southern Kyushu

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**Abstract** A new species of *Cirsium*, *C. nipponense*, is described from the border area between Miyazaki and Ōita Prefectures. *Cirsium nipponense* is characterized by the absence of basal leaves at anthesis, erect or oblique capitula, well-branched stem with divaricate branches, glutinous involucre with narrowly lanceolate glandular bodies and the chromosome number  $2n=68$ . *Cirsium tanegashimense* from Is. Tanegashima, Kagoshima Prefecture, is similar to *C. nipponense*, however the former is different from the latter in the absence of glandular bodies on involucre and 6-seriate involucral phyllaries. *Cirsium tanegashimense* is also described here because the name was a *nomen nudum*. A new subsection of Sect. *Onotrophe* (Cass.) DC., Subsect. *Ramosa*, comprising both *C. nipponense* and *C. tanegashimense*, is described. Subsect. *Ramosa* is endemic to Japan and is restricted to the southern part of Kyushu, southern Japan.

**Key words:** *Cirsium nipponense*, *Cirsium tanegashimense*, Japan, new taxa, Subsect. *Ramosa*.

In October of 2003 field studies on *Cirsium* (Asteraceae) were executed in Kyushu, southern Japan as a part of the taxonomic studies of Japanese *Cirsium* (Kadota and Nagase, 1988; Kadota, 1989–2003). As the result of the field works at the boundary area between Miyazaki and Ōita Prefectures *Cirsium* plants characterized by the absence of basal leaves at anthesis, well-branched stem with divaricate branches, erect to oblique capitula and glutinous involucre with narrowly lanceolate glandular bodies were found out. Later it was clarified that the thistle has the chromosome number of  $2n=68$ . Among the species of sect. *Onotrophe* in the genus *Cirsium* *C. umezawanum* Kadota from Hokkaido, northern Japan (Kadota, 1998) is the only species characterized by the absence of basal leaves at anthesis, erect to oblique capitula and 8–9-seriate involucral phyllaries except for the thistle at issue. Hence a comparison between the thistle and *C. umezawanum* was made. It is consequently clarified that the thistle is significantly different from *C. umezawanum* in the shape and divi-

sion of cauline leaves, the arrangement of heads, the number of involucral subtending leaves and the presence of glandular bodies on involucre. As the result it is concluded that the thistle belongs to a distinct new species. This thistle will be described as *C. nipponense* after its locality name.

*Cirsium tanegashimense* from Is. Tanegashima, Kagoshima Pref., southern Kyushu, is morphologically similar to the above-mentioned *C. nipponense*, however the former is distinguished from the latter by having eglutinous involucre and 5-seriate involucral phyllaries. *Cirsium tanegashimense* is also considered to be a distinct species. However, the name *C. tanegashimense* has never been published. Hence *C. tanegashimense* will be described here as a new species.

*Cirsium nipponense* and *C. tanegashimense* share in common erect and well-branched stem, erect to oblique capitula and several subtending leaves of involucre. The two species resemble the species of subsect. *Amplexifolia* Kadota

(Kadota, 1995, 1998) with respect to having erect capitula. However, *C. nipponense* and *C. tanegashimense* differ from the species of subsect. *Amplexifolia* by the presence of several involucrel subtending leaves. As far as the distributional range is concerned the subsect. *Amplexifolia* is restricted to northern Japan. It is therefore considered that *C. nipponense* and *C. tanegashimense* are included in a distinct subsection. The new subsection, Subsect. *Ramosa*, will be also described in this paper.

This paper aims to describe the new subsection and the two new species which belong to the subsection.

### Taxonomic treatment

Genus *Cirsium* Mill., Gard. Dict. Abrindg. ed. 4, 1 (1754), emend. Scop., Fl. Carn. 355 (1760).

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

Subsect. *Ramosa* Kadota, subsect. nov.

Herba perennis, ramis divaricatis, foliis basalibus emarcidis sub anthesin, eis caulinis pinnatifidis, capitulis terminalibus erectis vel obliquis, involucri campanulatis vel crateriformibus, phyllariis involucriorum plus minusve recurvatis.

Type: *Cirsium nipponense* Kadota (see below).

A perennial herb, well-branched; branches divaricate; basal leaves withering at anthesis; cauline leaves pinnatilobate; capitula erect to oblique; involucrel campanulate to bowl-shaped; involucrel phyllaries more or less recurved.

***Cirsium nipponense*** Kadota, sp. nov. [Figs. 1, 2]

Herba perennis, 1–1.9 m alta. Caudex bene evolutus, crassus, horizontalis, circiter 10 cm in diametro. Caulis erectus, bene e medio ramosus, ramis extensis divaricatis vel raro non extensis, brunneo-pubescentibus, arachnoideis. Folia basalia emarcida sub anthesin. Folia caulinum mediorum coriacea, cinereo-viridi, late vel anguste ovata, 15–45 cm longa, 8–25 cm lata, pinnatilobata 3–8-jugatis, utrinque brunneo-pubescentibus, breviter petiolata vel subsessilia. Flores in Octoberis. Capitula numerosa, in paniculam amplam disposita,

erecta vel obliqua, pedunculis 0.5–1.5 cm longis arachnoideis, foliis subtensis (1–) 3–5 anguste lanceolatis vel linearibus 0.5–4 cm longis. Involucrel campanulata vel crateriformia, glutinosa, 18–21 mm longa, 15–20 mm (*in vivo*) et 20–34 mm (*in sicco*) in diametro, arachnoidea. Phyllaria 8–9-seriata, subcoriacea, spinis acutis circiter 2 mm longis, vittis anguste lanceolatis phyllariis interioribus anguste ovatis 15–17 mm longis, eis exterioribus ovatis caudatis 3–7 mm longis recurvatis. Corollae dilute violaceae, 19–20 mm longa, lobis 4–5 mm longis, faucibus 6 mm longis, tubis 8 mm longis. Achenia laete brunnea, 4 mm longa, laevigata, pappis sorditis 15–17 mm longis. Numerus chromosomatibus  $2n=68$ .

**TYPE:** JAPAN; Kyushu, Miyazaki Pref., Higashi-usuki-gun, Kitaura-chô, Nomi, alt. 10 m, 29 Oct. 2003, Y. Kadota 034915 (holotype–TNS!).

A perennial herb, 1–1.9 m tall. Rootstock well developed, stout, horizontal, ca. 10 cm in diameter, with cord-like roots. Stem erect, well branched from the middle part of the stem, up to 3 cm in diameter at the basal part, covered with brownish multicellular hairs and arachnoid in the upper half. Basal leaves withering at anthesis. Middle cauline leaves grayish green above, coriaceous, broadly ovate to narrowly ovate, 15–45 cm long, 8–25 cm wide, medially pinnatilobate with 3–8-jugae, provided with sharp spines 5–10 mm long along margin, pubescent with brownish multicellular hairs along veins on both sides, shortly petiolate to subsessile. Flowers in October. Capitula numerous in a panicle, erect to oblique; peduncles 0.5–1.5 cm long, arachnoid; subtending leaves (1–) 3–5, narrowly lanceolate to linear, 0.5–4 cm long, provided with sharp spines 2–5 mm long. Involucrel campanulate to bowl-shaped, glutinous, 18–21 mm long, 15–20 mm (*in vivo*) and 20–34 mm (*in sicco*) in diameter, arachnoid. Phyllaries 8–9-seriate, subcoriaceous, terminated with sharp spines ca. 2 mm long; glandular bodies narrowly lanceolate, on the abaxial side of inner and middle phyllaries; inner phyllaries narrowly ovate, 15–17 cm long, erect; outer ones ovate with acuminate tips, 3–7



Fig. 1. Type specimen of *Cirsium nipponense* Kadota (JAPAN: Miyazaki Pref., Higashi-usuki-gun, Kitaura-chô, Nomi, Y. Kadota 034915, TNS). Left: Upper part. Right: Middle part.

mm long, recurved. Corollae pale violet, 19–20 mm long; lobes 4–5 mm long; throats 6 mm long; tubes 8 mm long, longer than the throats. Achenes light brown, 4 mm long, smooth; pappi sordid, 15–17 mm long. Chromosome number  $2n=68$ .

Japanese name: Nippô-azami (nov.).

Distribution: S. Ôita and N. Miyazaki, Kyushu (endemic to Japan; Fig. 4, disc). In herbal stands of maritime mountains: the sea level to 120 m in elevation.

Specimens examined: JAPAN; Kyushu, Miyazaki Pref., Higashi-usuki-gun, Kitaura-chô, Nomi, alt. 10 m, 29 Oct. 2003, Y. Kadota 034911–034914, 034916–034917 (TNS); Kitaura-chô, Miyanoura, alt. 2 m, 29 Oct. 2003, Y. Kadota 034918 (TNS). Ôita Pref., Minami-amabe-gun, Kamae-chô, Hatotsu-ura, alt. 120 m, 29 Oct. 2003, Y. Kadota 034901–034910 (TNS).

*Cirsium umezawanum* Kadota from Is. Rishiri, Hokkaido, northern Japan (Kadota, 1998) is similar to *C. nipponense* in having well-branched stem, erect to oblique capitula and 8–9-seriate involucre phyllaries. However, *C. umezawanum* is discriminated from *C. nipponense* by elliptic and usually coarsely dentate cauline leaves, several capitula arranged in a loose corymb, the absence or the sole incolucre subtending leaf and the absence of glandular bodies. The range of *C. umezawanum* is apart from that of *C. nipponense* by more than 1500 km in a beeline.

As mentioned in the description the well-branched stem with numerous divaricate branches is one of characteristics of *C. nipponense*. However, the branches do not extend on rare occasions by unknown factor(s) [e. g., Kadota 034909–034910, Ôita Pref., Kamae-chiô, Hatotsu-ura]. Such a phenomenon is sometimes ob-



Fig. 2. Habit of *Cirsium nippoense* Kadota (JAPAN: Miyazaki Pref., Higashi-usuki-gun, Kitaura-chô, Nomi, alt. 10 m, 29 Oct. 2003). Left corner inset: Close-up of ahead. Arrows show glandular bodies.



Fig. 3. Type specimen of *Cirsium tanegashimense* Kitam. ex Kadota (JAPAN: Kagoshima Pref., Is. Tanegashima, Z. Tashiro s. n., KYO). Left corner inset: Close-up of a head.

served in the other species of the genus *Cirsium* in Japan (e. g., *C. nipponicum* (Maxim.) Matsum., *C. fauriei* Nakai and *C. senjoense* Kitam.).

Ethymology: The specific epithet “*nippoense*” and the Japanese name “Nippô-azami” are derived from the locality name which covers both Miyazaki and Ôita Prefectures.

***Cirsium tanegashimense* Kitam., sp. nov.**

[Fig. 3]

*Cirsium tanegashimense* Kitam. in M. Hotta *et al.*, Kagoshima Red Data Book 335, fig. 135 (2003), nom. nud., ut “*Cirsium* sp.”

Haec species *Cirsio nipponense* affinis est, sed a *Cirsio nipponense* phyllariis 6-seriatis et involucriis vittis carentibus itaque eglutinosi distinguitur.

**TYPE:** JAPAN; Kyushu, Kagoshima Pref., Kumage-gun, Is. Tanegashima, Nishino-omote, 25 Oct. 1921, Z. Tashiro (holotype-KYO!; iso-

type-KYO!).

Stem at least 50 cm long, erect, robust, arachnoid, striate, branched; branches divaricate. Upper cauline leaves narrowly ovate, 11 cm long, 4 cm wide, medially pinnately lobed, sessile and amplexicaul; lobes 2–3-jugate; spines strong, up to 2 cm long. Capitula erect, 3–4 cm in diameter *in sicco*. Involucre campanulate, 18–24 mm in diameter *in sicco*; phyllaries 6-seriate, strongly recurved, terminated with strong spines ca. 2 mm long; glandular bodies absent; subtending leaves ca. 5. Corollae 20 mm long; lobes 5 mm long; throats 6 mm long; tubes 9 mm long, clearly longer than the throats. Achenes brownish, 4.5 mm long, smooth; pappi sordid, 11–13 mm long.

Japanese name: Tanegashima-azami (Kitamura).

Distribution: Is. Tanegashima, Kyushu (endemic to Japan; Fig. 4, star).

Specimen examined: JAPAN; Kyushu,

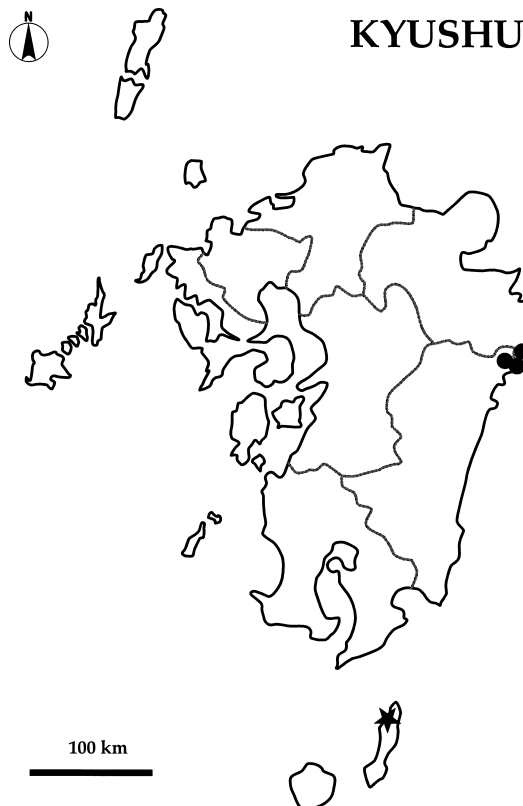


Fig. 4. Distribution of *Cirsium nipponense* Kadota (disk) and *C. tanegashimense* Kitam. ex Kadota (star).

Kagoshima Pref., Is. Tanega-shima, Onigasawa, north of Nishino-omote, 'by mountain path at edge of forest', 26 Dec. 1958, K. Iwatsuki 4011 (KYO).

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