

A New Hybrid, *Crepidiastrum* × *semiauriculatum* (*Asteraceae: Lactuceae*), from Okayama Prefecture, Western Japan

Nobuko YAMAMOTO^a, Okihito YANO^b and Hiroshi IKEDA^b

^aDepartment of Mathematical and Environmental System Science,
Graduate School of Informatics, Okayama University of Science,
1–1, Ridai-cho, Okayama, 700–0005 JAPAN;

^bDepartment of Botany, University Museum, University of Tokyo,
7–3–1, Hongo, Bunkyo-ku, Tokyo, 113–0033 JAPAN
E-mail: h_ikeda@um.u-tokyo.ac.jp

(Received on February 12, 2009)

A putative hybrid between *Crepidiastrum denticulatum* (Houtt.) J. H. Pak & Kawano and *C. yoshinoi* (Makino) J. H. Pak & Kawano, *Crepidiastrum* × *semiauriculatum* N. Yamam. & H. Ikeda (*Asteraceae: Lactuceae*), is described from a limestone area in Okayama Prefecture, western Japan. This plant differs from the presumed parents by the semi-auriculate base of the inflorescence bracts (deeply auriculate in *C. denticulatum* and attenuate in *C. yoshinoi*), and intermediate state of several characters of the flowers and fruits: florets 6–8 per capitulum (11–15 in *C. denticulatum* and 5 in *C. yoshinoi*), ligules 8.5–9.0 mm long (7.8–8.3 mm in *C. denticulatum* and 9.0–9.3 mm in *C. yoshinoi*), and achenes 3.8–4.3 mm long (3.2–3.8 mm in *C. denticulatum* and 4.5–5.0 mm in *C. yoshinoi*).

Key words: *Asteraceae*, Atetsu region, *Crepidiastrum* × *semiauriculatum*, hybrid, Japan.

During the course of floristic studies of Okayama Prefecture, western Japan, we have found a putative hybrid between *Crepidiastrum denticulatum* (Houtt.) J. H. Pak & Kawano and *C. yoshinoi* (Makino) J. H. Pak & Kawano (*Asteraceae: Lactuceae*) in a limestone area of western Okayama Prefecture. It is here described for the first time.

Crepidiastrum × *semiauriculatum*

N. Yamam. & H. Ikeda, hybr. nov.

[Figs. 1–3]

Crepidiastrum denticulatum (Houtt.) J. H. Pak & Kawano × *C. yoshinoi* (Makino) J. H. Pak & Kawano

Type: JAPAN. Western Honshu. Okayama

Prefecture. Kawakami-gun, Nariwa-cho, Kinomura, 300 m, 17 Oct. 2004, H. Ikeda 04101703 (TI–holo; KYO, MAK, OKAY, TNS–iso).

Hybrida naturalis inter *Crepidiastro denticulato* (Houtt.) J. H. Pak & Kawano et *C. yoshinoi* (Makino) J. H. Pak & Kawano putata; inflorescentiae bracteis basi semiauriculatis neque fere auriculatis ut in *C. denticulato* neque attenuatis ut in *C. yoshinoi*, capitulis ex floribus 6–8 (non 5 neque 11–15 in parentibus) constantibus bene distinguibilis.

Annual herb. Stems 40–100 cm tall, glabrous, loosely branched above. Leaves oblong to narrowly obovate, gradually reduced upward, 4.0–14.5 cm long, 1.0–5.0 cm wide, glabrous on both surfaces, lower

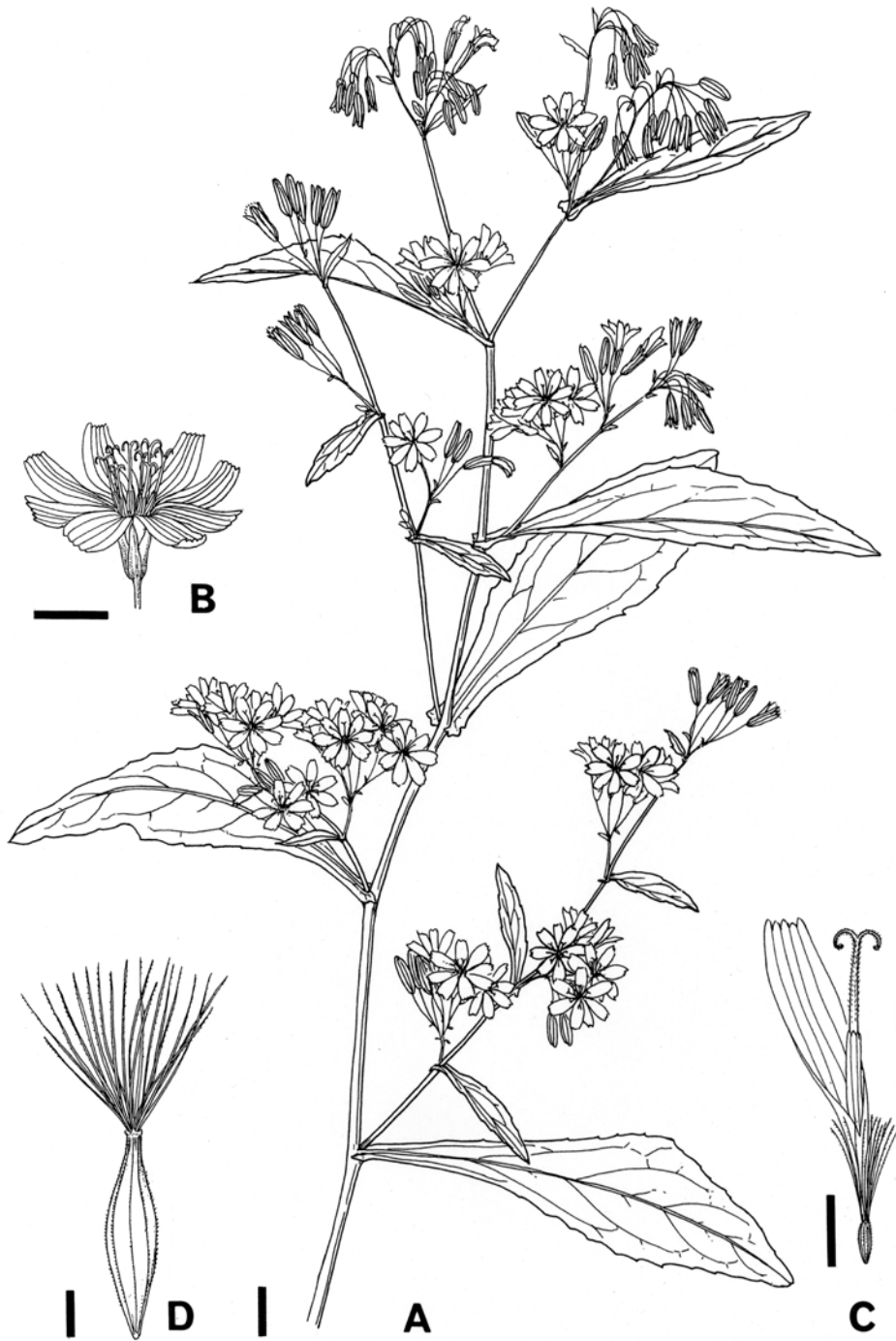


Fig. 1. *Crepidiastrum x semiauriculatum*. A. Habit. B. Capitulum. C. Floret. D. Achene. Bar = 1 cm for A; 5 mm for B; 2 mm for C; 1 mm for D.

leaves petiolate, base attenuate, upper leaves sessile, base semi-auriculate, margins sparsely denticulate, upper surface light green, lower surface glaucous. Flowering October to November. Inflorescence terminal or from axils in the upper cauline leaves; bracts leafy, sessile, base semi-auriculate. Peduncles slender, glabrous, 5–14 mm long. Capitula many, 1.3–1.7 cm across, in loose corymb. Outer involucre bracts 5–8, ovate, 0.7–0.8 mm long, ca. 0.5 mm wide, tip acute to obtuse;

inner involucre bracts 5–8, oblong-lanceolate, 6.7–7.3 mm long, 1.0–1.1 mm wide, tip obtuse. Florets 6–8 per capitulum, ligulate. Pappus white, 3.8–4.0 mm long, caducous. Ligule yellow, oblong-oblongate, 10–13 mm long, 1.7–2.0 mm wide, tip shallowly 5-toothed. Filaments white, filiform, ca. 1 mm long; anthers brown, 3.2–3.5 mm long. Ovary creamy white, compressed, narrow obovoid, 0.8–1.0 mm long, 0.3–0.5 mm wide; style 6.0–7.0 mm long; stigma deeply 2-lobed, linear,

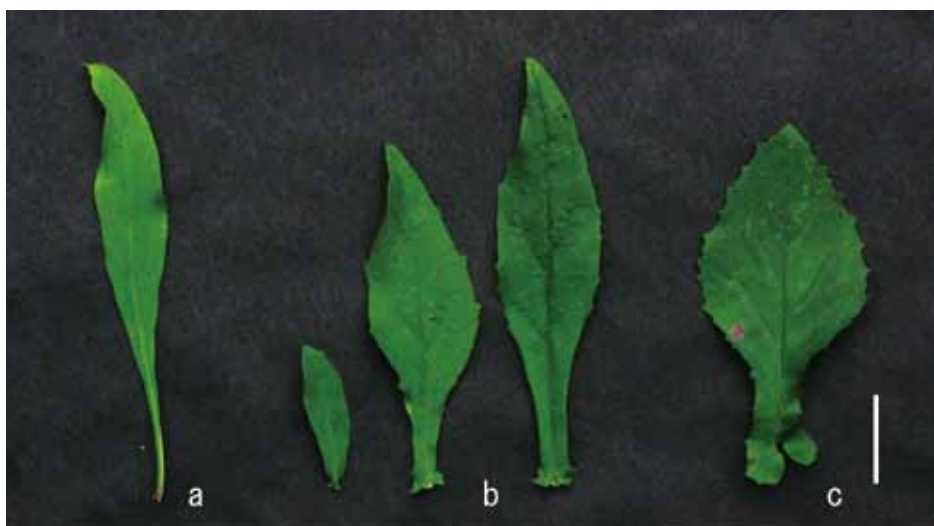


Fig. 2. Bracts of *Crepidiastrum yoshinoi* (a), *C. xsemiauriculatum* (b) and *C. denticulatum* (c). Bar = 2 cm.

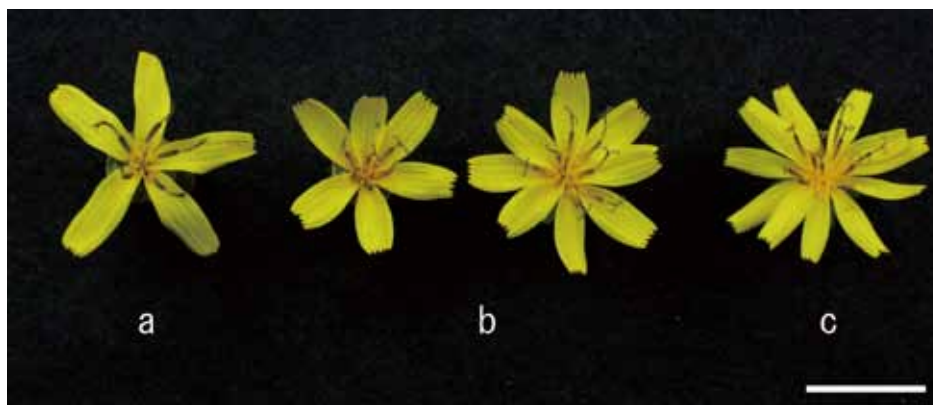


Fig. 3. Capitula of *Crepidiastrum yoshinoi* (a), *C. xsemiauriculatum* (b) and *C. denticulatum* (c). Bar = 1 cm.

1.2–1.4 mm long, reflexed. Achenes brownish, compressed, narrow fusiform, 10–14 ribbed, with a short beak, 3.8–4.3 mm long, 0.7–0.8 mm wide.

Japanese name: Atetsu-yakushisô.

新和名：アテツヤクシソウ

Distribution: Japan. Western Honshu (Atetsu region, western Okayama Prefecture). Endemic.

Other specimens examined: JAPAN. Western Honshu. Okayama Prefecture. Takahashi-shi, Bitchu-cho, Youze, 100 m, 16 Oct. 2005, N. Yamamoto 05101601 (TI, E). Ibid. 18 Oct. 2005, H. Ikeda & al. 05101803 (TI, A). Bichu-cho, Nagaya, 260 m, 18 Oct. 2005, H. Ikeda & al. 05101804 (TI).

Crepidiastrum \times *semiauriculatum* is intermediate in several vegetative, floral and fruit characters between its putative parents *C. denticulatum* and *C. yoshinoi* (see Table 1). *Crepidiastrum yoshinoi* is a calciphilous plants, restricted to calcareous areas in Okayama Prefecture (Koyama 1995) and also in Hiroshima Prefecture (Miyajima Natural Botanical Garden of Hiroshima University and the Hiba Society of Natural History 1997). Maekawa (1974) recognized the calcareous areas of western Okayama and eastern Hiroshima Prefectures as a distinct floristic region: the Atetsu region. The Atetsu region is characterized by narrow endemic species or species related to those found on the Korean Peninsula and NE China. *Crepidiastrum*

yoshinoi is one of these unusual plants that are restricted to the Atetsu region. Conversely, *C. denticulatum* is much more widely distributed and occurs throughout Japan, Korea, China, and Vietnam (Kitamura 1981). The putative hybrid, *C. \times semiauriculatum*, was collected beside limestone rocks with the two presumed parent species growing nearby. It is thought that *C. denticulatum* and *C. yoshinoi* are usually isolated from each other by their different geological preferences, but hybridization between the two species might have occurred spontaneously here where they grow parapatrically.

Crepidiastrum \times *semiauriculatum* bears fertile seeds, and reproduces by achene dispersal. This suggests that *C. denticulatum* and *C. yoshinoi* are genetically closely related. The chromosome number of $2n = 10$ for *C. \times semiauriculatum* was counted using root tips and the squash method with 2% lacto-propionic orcein stain (see Ikeda et al. 2008). This chromosome number is the same as that of *C. denticulatum* and *C. yoshinoi* (Pak and Kawano 1990). Further cytological and molecular characteristics of *C. \times semiauriculatum* will be published in a forthcoming paper.

We thank Mrs. Mariko Nishimoto for the drawing of *C. \times semiauriculatum*. We are grateful to Professor Emeritus Hideaki

Table 1. Morphological comparison of *Crepidiastrum denticulatum*, *C. \times semiauriculatum* and *C. yoshinoi*

	<i>C. denticulatum</i>	<i>C. \timessemiauriculatum</i>	<i>C. yoshinoi</i>
Base of inflorescence bracts	deeply auriculate	semi-auriculate	attenuate
Number of florets per capitulum	11–15	6–8	5
Length of ligule (mm)	7.8–8.3	8.5–9.0	9.0–9.3
Length of achene (mm)	3.2–3.8	3.8–4.3	4.5–5.0

Ohba, University of Tokyo, and to Dr. Mark F. Watson, Royal Botanic Garden Edinburgh, for their critical reading and for the English and Latin description of the manuscript. This study was partly supported by the Yakumo Foundation for Environmental Science in 2007 (to N. Y.).

References

- Ikeda H., Kurosawa T. and Ohba H. 2008. Chromosome numbers and karyomorphology of three species of the genus *Euphorbia* L. (*Euphorbiaceae*) in the Sikkim Himalaya. *J. Jpn. Bot.* **83**: 295–300.
- Kitamura S. 1981. Compositae (Asteraceae). *In*: Satake Y., Ohwi J., Kitamura S., Watari S. and Tominari T. (eds.), *Wild Flowers of Japan, Herbaceous Plants (including Dwarf Subshrubs)* **3**: 156–235. Heibonsha, Tokyo (in Japanese).
- Koyama H. 1995. *Paraixeris* Nakai. *In*: Iwatsuki K., Yamazaki T., Boufford D. E. and Ohba H. (eds.), *Flora of Japan* **IIIb**: 20–21. Kodansha, Tokyo.
- Maekawa F. 1974. Origin and characteristics of Japan's flora. *In*: Numata M. (ed.), *The Flora and Vegetation of Japan*. pp. 33–86. Kodansha, Tokyo and Elsevier Scientific Publ. Co., Amsterdam.
- Miyajima Natural Botanical Garden of Hiroshima University and the Hiba Society of Natural History (eds.) 1997. *Flora of Hiroshima Prefecture, Japan*. The Chugoku Shimbun, Hiroshima (in Japanese).
- Pak J.-H. and Kawano S. 1990. Biosystematic studies on the genus *Ixeris* and allied genera (*Compositae-Lactuceae*) III. Fruit wall anatomy and karyology of *Crepidiastrum* and *Paraixeris*, and their taxonomic implications. *Acta Phytotax. Geobot.* **41**: 109–128.

山本伸子^a, 矢野興一^b, 池田 博^b: 岡山県で見出された新雑種アテツヤクシソウ(キク科タンポポ連)

岡山県西部の石灰岩地域(阿哲地域)から、キク科タンポポ連のヤクシソウ(*Crepidiastrum denticulatum* (Houtt.) J. H. Pak & Kawano)とナガバヤクシソウ(*C. yoshinoi* (Makino) J. H. Pak & Kawano)の推定雑種を記載した。推定新雑種アテツヤクシソウ(*C. ×semiauriculatum* N. Yamam. & H. Ikeda)は、推定両親種から 1) 花序の苞の基部はやや茎を抱く(ヤクシソウは深く茎を抱き、ナガバヤクシソウは漸先形となる)、2) 頭花は 6 個から 8 個の小花からなる(ヤ

クシソウは 11 個から 15 個、ナガバヤクシソウは 5 個)、3) 舌状花の花冠は長さ 8.5–9.0 mm (ヤクシソウは 7.8–8.3 mm、ナガバヤクシソウは 9.0–9.3 mm)、4) 瘦果は長さ 3.8–4.3 mm (ヤクシソウは 3.2–3.8 mm、ナガバヤクシソウは 4.5–5.0 mm) などにより区別される。

アテツヤクシソウの染色体数は $2n = 10$ である。アテツヤクシソウは、ヤクシソウとナガバヤクシソウが近接して生育する石灰岩地域で、交雑により生じたと推定される。

(^a岡山理科大学大学院総合情報研究科,
^b東京大学総合研究博物館植物部門)