

Research note

## *Erechtites hieraciifolius* (Asteraceae) and Its Variety, *E. hieraciifolius* var. *cacalioides*, in Taiwan

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### 【 Summary 】

Two Asteraceae plants naturalized in Taiwan, *Erechtites hieraciifolius* (L.) Raf. ex DC. (Asteraceae), and its variety, *E. hieraciifolius* (L.) Raf. ex DC. var. *cacalioides* (Fisch. Ex Spreng.) Griseb., are described in this research note. *Erechtites hieraciifolius* is naturalized in the lowlands of central and eastern Taiwan, while *E. hieraciifolius* var. *cacalioides* is naturalized in the lowlands and low elevations of southern Taiwan and Lanyu (Orchid Island). Color photos and a distribution map of *E. hieraciifolius* and *E. hieraciifolius* var. *cacalioides* are offered.

**Key words:** Asteraceae, *Erechtites hieraciifolius*, *Erechtites hieraciifolius* var. *cacalioides*, naturalization, Taiwan.

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## 研究簡報

## 台灣的饑荒草(*Erechtites hieraciifolius*) (Asteraceae) 及其變種粗毛饑荒草(*E. hieraciifolius* var. *cacalioides*)

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### 摘要

本文描述台灣的歸化菊科植物：饑荒草(*Erechtites hieraciifolius* (L.) Raf. ex DC.)及其變種：粗毛饑荒草(*E. hieraciifolius* (L.) Raf. ex DC. var. *cacalioides* (Fisch. Ex Spreng.) Griseb.)；饑荒草歸化於台灣中部及東部平地，粗毛饑荒草歸化於台灣南部及蘭嶼平地至低海拔山區；本文並提供饑荒草及粗毛饑荒草的彩色照片及分布圖。

關鍵詞：菊科、饑荒草、粗毛饑荒草、歸化、台灣。

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The genus *Erechtites* Raf. (Senecioneae, Asteraceae) contains about 5–15 species, native to tropical and subtropical of North and South America and Australia (Belcher 1956, 1989, Hatusima 1971, Osada 1972, Walker 1976, McVaugh 1984, Koyama 1995, Pruski 1997, Peng and Chung 1998b, Barkley 2006). *Erechtites hieraciifolius* (L.) Raf. ex DC. and *E. valerianifolius* (Link ex Spreng.) DC. were naturalized on fallow farms and roadsides in the tropical and subtropical Old World (Belcher 1956, 1989, Hatusima 1971, Osada 1972, Walker 1976, McVaugh 1984, Koyama 1995, Pruski 1997, Peng and Chung 1998b, Barkley 2006). Three varieties of *E. hieraciifolius* were suggested by Belcher (1956) and was adopted by Osada (1972), Walker (1976), McVaugh (1984), Koyama (1995), Pruski (1997), and Barkley (2006). Two varieties of *E. hieraciifolius* are naturalized in the Far East: *E. hieraciifolius* (L.) Raf. ex DC. var. *hieraciifolius* and *E. hieraciifolius* (L.) Raf. ex DC. var. *cacalioides* (Fisch. ex Spreng.) Griseb. (Belcher 1956, Hatusima 1971, Osada

1972, Walker 1976, Koyama 1995). Belcher (1956) suggested that length and vesture of the bracteoles are diagnostic characters distinguishing between these 2 varieties of *E. hieraciifolius*. The vesture and blade margin were used as key characters between these 2 varieties by Hatusima (1971) and Osada (1972).

*Erechtites hieraciifolius* was illustrated in the 2nd edition of the *Flora of Taiwan* (Peng and Chung 1998b), in which marginal hairs of bracteoles are dominant on this plant in plate 445. The first author examined 4 of the 5 vouchers cited by Peng and Chung (1998b) in the 2nd edition of the *Flora of Taiwan*. Two vouchers, *Y. Shimada s. n.* and *Huang 5214*, belonged to *E. hieraciifolius* var. *hieraciifolius*. The voucher, *Peng 6589*, should be annotated as *E. hieraciifolius* var. *cacalioides*. We examined the last voucher cited by Peng and Chung (1998b), *Huang 9122*, which should be annotated as *Crassocephalum crepidioides*. In addition, lots of specimens, which were misidentified as *E. hieraciifolius*

*lius*, should be annotated as other Asteraceae species, i.e., *C. crepidioides* or *E. valerianifolius* (see below). In our botanical surveys, *E. hieraciifolius* var. *hieraciifolius* was collected in lowlands of central Taiwan, and *E. hieraciifolius* var. *cacalioides* was collected in lowlands of southern Taiwan and Lanyu (Orchid Island). The exact distribution areas of these 2 varieties of *E. hieraciifolius* may be wider than we mentioned previously because relevant collecting records of weeds are relatively rare in Taiwan. *Erechtites hieraciifolius* and its 2 varieties are described and illustrated herein with color photos. According to the collecting sites of the vouchers we examined, we tentatively offer a distribution map of this weed (Fig. 1). A key to the members of genus *Erechtites* in Taiwan is also given. In addition the plant in plate 445 of the 2nd edition of the *Flora of Taiwan* (Peng and Chung 1998b) should be annotated as *E. hieraciifolius* var. *cacalioides*.

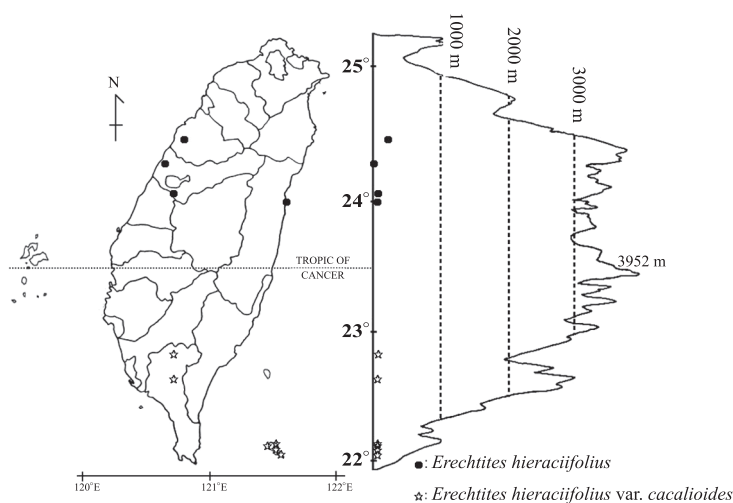
**Key to *Erechtites* species in Taiwan**

1. Width of capitulum about 1/3 its length, corolla of florets pink; leaves usually peti-

- olate, blade usually parted, occasionally simple. .... *E. valerianifolius*
- 1. Width of capitulum about 1/2 its length, corolla of florets whitish or pale-yellow; leaves usually sessile and amplexicaul, occasionally petiolate; blade usually simple, occasionally parted. .... 2
- 2. Stems and leaves usually glabrous, occasionally pilose, pale-greenish; inner involucre bracts and bracteoles of capitulum glabrous or coated with unicellular hairs. .... *E. hieraciifolius* var. *hieraciifolius*
- 2. Stems and leaves densely pubescent, dark-greenish tinged by purple; inner involucre bracts glabrous to sparsely pubescent, margin of bracteoles ciliate, coated with multicellular hairs. .... *E. hieraciifolius* var. *cacalioides*

**Taxonomic treatments**

- 1. *Erechtites hieraciifolius* (L.) Raf. ex DC., Prodr. 1837; 6:294. Belcher, Ann Missouri Bot Gard 1956; 43:12. Osada. Ill. Jpn Alien Plant 1972: 22, pl. 45. Barkley, Flora North Am. 2006; 19:603. — *Senecio hieraciifolius* L., Spec Pllants 866. 1753.



**Fig. 1.** Distribution map of *Erechtites hieraciifolius* var. *hieraciifolius* (●) and *E. hieraciifolius* var. *cacalioides* (☆).

1a. var. *hieraciifolius*. .... 饑荒草 Figs. 1, 2A-C

Annual herb, erect, 50~100 cm tall, fleshy, glabrous or occasionally pilose; leaves alternate or nearly so, simple or lobed, lower leaves elliptical to spatulate, occasionally oblanceolate, upper leaves lanceolate to oblong, blade apex acute, margins incised, serrate to doubly serrate, blade bases of lower leaves sessile to petiolate, petiole winged, blade bases of upper leaves sessile, truncate or auricled, both blade surfaces glabrous to sparsely pilose, lobes lanceolate. Heads erect, composed of a paniculate corymb, apical or axillary, yellowish to pale-greenish, 10~15 mm long, 5~7 mm wide. Involucre cylindri-

cal, swollen at base, involucre bracts linear, glabrous, outer involucre bracts (bracteoles) 3~4 mm long, inner involucre bracts 10~12 mm long; florets whitish to pale-yellowish, corolla very slender, tubular, 10~13 mm long, marginal florets pistillate, fertile, 2 or 3 series, central floret perfect. Anther apex obtuse, with a short appendage. Pappus white, ca. 14 mm long.

Specimens examined: Taiwan. Hualien Co., Meilunbi, 26 May 1993, *S.-F. Huang, K.-C. Yangs, and J.-M. Hu* 5214 (HAST, TAI); Miaoli Co., Sanyi, Aug 1940, *Y. Simada s. n.* (TAI); Taichung Co., Chenggong, 31 Mar 2009, *M.-J. Jung* 3847 (TAIF), Ch-

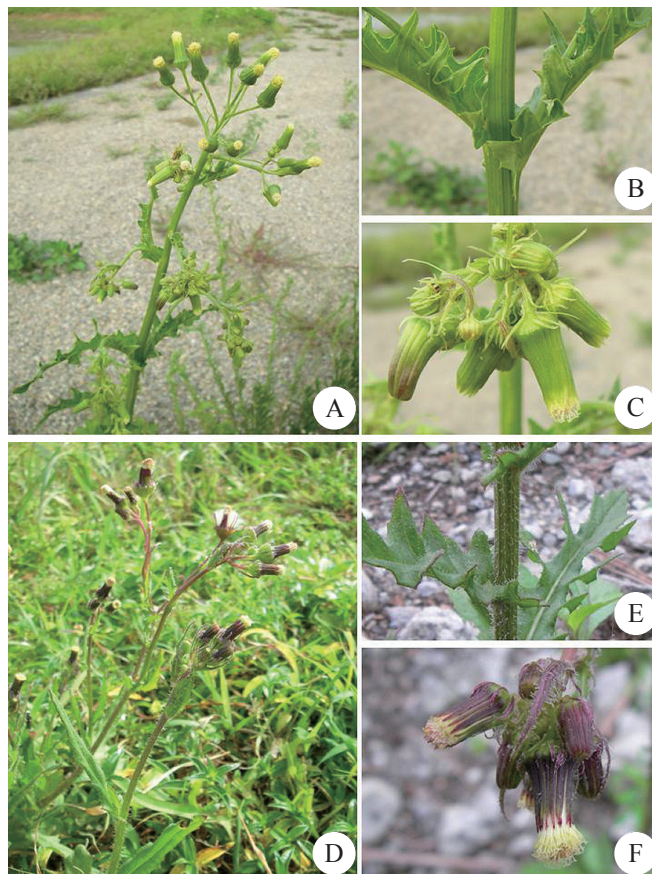


Fig. 2. *Erechtites hieraciifolius* var. *hieraciifolius* (A-C) and *E. hieraciifolius* var. *cacalioides* (D-F). A and D, habit; B and E, stems and leaf bases; C and F, capitula; showing the vestiture of the bracteoles and involucre.

ingshui, 1 Apr 2009, *M.-J. Jung* 3860 (TAIF).

Habitat: Several individuals of *E. hieraciifolius* (L.) Raf. ex DC. were collected along roadsides and in abandoned paddies by the first author in lowlands of central Taiwan.

Distribution: *Erechtites hieraciifolius* (L.) Raf. ex DC. var. *hieraciifolius* is native to North America and northern South America (Belcher 1956, Hatusima 1971, Osada 1972, McVaugh 1984, Koyama 1995, Barkley 2006) and had been naturalized in Europe (Belcher 1956, McVaugh 1984, Pruski 1997), Japan (Hatusima 1971, Osada 1972, Koyama 1995) including the Ryukyus (Koyama 1995), Southeast Asia (Belcher 1956), Australia, and the Pacific islands (Belcher 1956, Barkley 2006).

Note: The specimen deposited in herbarium TAI, *Huang 9122*, was determined by the collector to be *E. valerianifolia* (Wolf ex Rchb.) DC. This specimen was cited and annotated as *E. hieraciifolia* by Peng and Chung (1998b) in the 2nd edition of the *Flora of Taiwan*. However, reddish corollas, elliptic leaf blades, and winged petioles of the upper leaves were found on the specimen, and these characters fit the characters of *C. crepidioides* (Benth.) S. Moore (Peng and Chung 1998a). In addition, the first author examined specimens identified as *E. hieraciifolia* by collectors including: *Chih-Hui Chen* 2073, 2932, 4571, *Ming-Yea Shen*, 3512, *Tsai-Wen Hsu* 8691, 9696, *Yen-Hsieh Tseng* 1061, deposited in herbarium of Endemic Species Research Institute, Nantou Co., Taiwan (TAIE). Reddish corollas, elliptic leaf blades, and winged petioles of the upper leaves were found on all 7 of these specimens. According to the corolla color, blade shape, and blade base of the upper leaves, all these specimens mentioned in this paragraph should be annotated as *C. crepidioides*.

1b. var. *cacalioides* (Fisch. ex Spreng.) Griseb, *Flora Br West Indies* 381, 1861; Belcher,

*Ann Missouri Bot Gard* 43:19, 1956; Hatusima, *Flora of the Ryukyu* 605, 1971; Osada, *Ill. Jpn Alien Plants* 22, pl. 45, 1972; Walker, *Flora Okinawa S Ryukyu* I. 1045, 1976; McVaugh, In: Anderson, *Flora Novo-Galiciana* 325-328, 1984; Koyama, In: Iwatsuki et al. *Flora Jpn* III b, 44-45, 1995. — *E. cacalioides* Less., *Syn Compos* 395, 1832.....粗毛饑荒草 Figs. 1, 2D-F

*Erechtites hieraciifolius* sensu lato Peng and Chung. In: Huang et al. (eds.). *Flora of Taiwan*, 2nd ed. 1998; 4:944, pl. 445.

Annual herb, erect to ascending, 25~100 cm tall, stems soft, striated, pilose; leaves alternate, sessile, lanceolate, oblong to spatulate, simple to lobed, apex acute, margins coarsely serrate to doubly serrate, ciliate to pilose, base truncate or auricled, both blade surfaces dark-greenish tinged purple or brown, sparsely pilose. Heads erect or nodded, composed of a paniculate corymb, apical or axillary, yellow to brownish-green, 10~15 mm long, 5~8 mm wide. Involucre cylindrical, swollen at base, involucre bracts linear, outer involucre bracts (bracteoles) 3~4 mm long, margin ciliate, coated with multicellular hairs, inner involucre bracts 10~12 mm long, sparsely pubescent; florets whitish to pale-yellowish, corolla very slender, tubular, 10~13 mm long, marginal florets pistillate, fertile, 2 or 3 series, central floret perfect. Anther apex obtuse, with a short appendage. Pappus white, ca. 13 mm long.

Specimens examined: Taiwan. Pingtung Co., Sandimen Township, Haishenkung, 8 May 2005, *M.-J. Jung* 1092 (x050804) (NCKU), Taiwu Township, Wan'an, 25 Feb 2001, *S.-M. Ku* 1206 (TAIF); Taitung Co., Lanyu Township, Chingching grassland, 25 Mar 2008, *M.-J. Jung* 2546 (TAIF), same locality, 19 May 2009, *M.-J. Jung* 4011, 4012 (TAIF), en route from Yehyu Bridge to the hill peak on the Yehyu River, 27 Feb 1993,

*H.-L. Ho 1094* (HAST), Hungtoushan, 20 May 2009, *M.-J. Jung 4028, 4029* (TAIF), Mantoushan, 21 May 2009, *M.-J. Jung 4045, 4046* (TAIF), Red-head rock to Tank rock, 7 May 1984, *C.-I Peng 6589* (HAST), Yehyu, 27 Mar 2008, *M.-J. Jung 2620* (TAIF).

Habitat: *E. hieraciifolius* (L.) Raf. ex DC. var. *cacalioides* (Fisch. ex Spreng.) Griseb. was collected along the roadside and on abandoned farms in the lowlands of southern Taiwan. *Erechtites hieraciifolius* var. *cacalioides* is more common on Lanyu than in Taiwan. This plant is easily found in coastal regions, along roadsides, in grasslands, disturbed lands, and paddy taro fields on Lanyu.

Distribution: *E. hieraciifolius* var. *cacalioides* is native to tropical America (Belcher 1956, Hatusima 1971, McVaugh 1984, Koyama 1995) and was introduced and naturalized in the Ryukyus (Hatusima 1971, Osada 1972, Walker 1976, Koyama 1995), Australia, Malesia (Belcher 1956, 1989), and Taiwan. In Taiwan, *E. hieraciifolius* var. *cacalioides* is more common than *E. hieraciifolius* var. *hieraciifolius*.

Notes: *E. hieraciifolius* var. *cacalioides* might be confused or misidentified as *C. crepidioides* (Benth.) S. Moore. Blades of the former are lanceolate, oblong, or spatulate and sessile at the base, but blades of the latter are elliptical to ovate and petiolate at the base (Peng and Chung 1998a). Bracteole margins are ciliate in *E. hieraciifolius* var. *cacalioides*, but glabrous in *C. crepidioides* (Peng and Chung 1998a). Floret corollas are red or orange in *C. crepidioides* (Peng and Chung 1998a), but they are whitish or pale-yellow in *E. hieraciifolius* var. *cacalioides*.

## LITERATURE CITED

- Barkley TM. 2006.** *Erechtites*. In: Baillargeon G et al., editors. Flora of North America. New York: Editorial Committee, Oxford Univ Press. 19:602-4.
- Belcher RO. 1956.** A revision of the genus *Erechtites* (Compositae), with inquiries into *Sececio* and *Arrhenechthites*. Ann Missouri Bot Gard 43:1-85.
- Belcher RO. 1989.** *Gynura* (Compositae) in Australia and Malesia, emended. Kew Bull 44(3):533-42.
- Hatusima S. 1971.** Flora of the Ryukyus (including Amami Islands, Okinawa Islands, and Sakishima Archipelago). Naha, Japan: Seibutsu-kyoiku Kenkyukai. p 605.
- Koyama T. 1995.** Compositae. In: Iwatsuki K, et al., editors. Flora of Japan. Tokyo, Japan: Kodansha. III b:44-5.
- McVaugh R. 1984.** Compositae. In: Anderson WR, editor. Flora Novo-Galiciana, a descriptive account of the vascular plants of western Mexico. Ann Arbor, MI: The Univ of Michigan. p 325-8.
- Osada T. 1972.** Illustrated Japanese alien plants. Tokyo, Japan: Hokuryu-Kan Publishing. p 22.
- Peng CI, Chung SW. 1998a.** *Crassocephalum* Moench. In: Huang TC, et al., editors. Flora of Taiwan, 2<sup>nd</sup> ed. Taipei, Taiwan: Editorial Committee, Department of Botany, National Taiwan Univ. 4:920-2.
- Peng CI, Chung SW. 1998b.** *Erechtites* Raf. In: Huang TC, et al., editors. Flora of Taiwan, 2<sup>nd</sup> ed. Taipei, Taiwan: Editorial Committee, Department of Botany, National Taiwan Univ. 4:944-6
- Pruski JF. 1997.** Asteraceae. In: Berry PE, et al., editors. Flora of the Venezuelan Guayana. St. Louis, MO: Missouri Botanical Garden. 3:271-3.
- Walker EH. 1976.** Flora of Okinawa and the southern Ryukyu Islands. Washington, DC: Smithsonian Institution Press. 1045 p.