

## Revision of *Ranunculus cantoniensis* DC. and Allied Species (Ranunculaceae) in Taiwan

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(Manuscript received 18 April, 2005; accepted 24 May, 2005)

**ABSTRACT:** Based on an extensive morphological study of *Ranunculus cantoniensis* and its allied species in Taiwan four species are recognized: *R. cantoniensis* DC., *R. chinensis* Bunge, *R. sieboldii* Miq., and *R. silerifolius* Lév. (previously lumped into *R. sieboldii* Miq.). *Ranunculus chinensis* Bunge is a new record for the flora of Taiwan. A key to species, taxonomic characters, illustration, and geographical distribution are provided here.

**KEY WORDS:** Ranunculaceae, *Ranunculus*, *Ranunculus cantoniensis*, *Ranunculus chinensis*, *Ranunculus sieboldii*, *Ranunculus silerifolius*, Systematics, Taiwan.

### INTRODUCTION

*Ranunculus* L. comprises about 550 species widely distributed on all continents except Antarctica (Wang and Gilbert, 2001). *Ranunculus cantoniensis* DC. is a weed widely spread in tropical and subtropical Asia. Taxonomically, the species has ever been ambiguous and often confused with *R. chinensis*, *R. silerifolius*, *R. sieboldii*, especially with the former two. It is possibly due to that *R. cantoniensis* originated from hybridization between *R. chinensis* and *R. silerifolius* with the subsequent polyploidization (Okada, 1984; 1989). Of this group in Taiwan, only one species *R. cantoniensis* was recorded in the early plant lists (e.g. Masamune, 1954). A later revision by Tsai (1972) lumped *R. cantoniensis* into *R. sieboldii* and also recognized one species only. Tsai's treatment was adopted by the Flora of Taiwan (Liu and Hsieh, 1976). In the 2nd edition of the Flora of Taiwan, Yang and Huang (1996b) followed their early critical revision (Yang and Huang, 1996a) and separated *R. cantoniensis* from *R. sieboldii*. Recently, Wang and Gilbert (2001) reported *R. silerifolius* in Taiwan, however, without documentation. This paper presents a taxonomic revision of *R. cantoniensis* group based on an extensive study of comparative morphology. As a result, four species, including one new record, are recognized.

### MATERIALS AND METHODS

Materials used in the present study were collected from the field throughout Taiwan. Living materials for studies were cultivated in the green house of Department of Life Science, National Taiwan Normal University. In addition, specimens preserved in HAST, NTUF, PPI, TAI, TAIF, TESRI, TNM, TNU were examined.

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## TAXONOMIC CHARACTERS

Yang and Huang (1996a) has revised the genus of *Ranunculus* in Taiwan and mentioned that leaf morphology and inflorescences are different between *R. cantoniensis* and *R. sieboldii*. Based on our detailed observation, the characters shown to be useful for the taxonomical treatment in Taiwan are concisely discussed as follows.

### Habit

*Ranunculus cantoniensis* and its allied species in Taiwan are erect or ascending perennial herbs. *Ranunculus sieboldii* bears creeping stems with adventitious roots on each node. However, other three species lack creeping stem. Basal stems of *R. silerifolius* are sometimes purplish, while other three species are green.

### Leaves

Leaves of this group are ternate, with 3-parted to 3-lobed, petiolulate central leaflet. Morphology of central leaflets displays somewhat interspecific difference and could be helpful for identification especially when the plant lacks reproductive structure. The central leaflets of *R. cantoniensis* and *R. chinensis* are 3-parted, deeply incised nearly to the base (Figs. 1A & B); those of *R. sieboldii* and *R. silerifolius* are 3-lobed, incised to the middle at most (Figs. 1C & D). The central leaflet of *R. chinensis* is rhombic while other three species are broadly ovate or rhombic ovate. It is noteworthy that *R. sieboldii* has shorter petiolule (<5 mm) than other three species (often > 1 cm or near so) (Fig. 1).

### Vesture

Most taxa of *Ranunculus* cover with hairs on stem, petiole and leaf, only few are glabrous. Tsai (1972) and Liu and Hsieh (1976) considered the patterns of vesture are important characters to distinguish taxa. Based on our observation, though it is indeed useful in separating some taxa, the character often varies according to the environment. It is inappropriate to over-emphasize the application of this character. In our study, vesture of *R. cantoniensis* and its allied species can be divided into two kinds. Plants of *R. silerifolius* are sparsely pubescent to subglabrous, occasionally hirsute on the base of stem in some populations. The other three species, *R. cantoniensis*, *R. chinensis* and *R. sieboldii*, are usually hirsute throughout.

### Inflorescence

The main inflorescence type of Ranunculaceae is cyme (Tamura, 1963). The inflorescences of *Ranunculus* are either a solitary flower or a monochasium (Wang and Gilbert, 2001). By our observation, inflorescences of *R. cantoniensis* and its allied species in Taiwan can be divided into two types. The first type is terminal compound monochasium, including *R. cantoniensis*, *R. chinensis* and *R. silerifolius*. The second type is leaf-opposite, a modification of monochasium, only found in *R. sieboldii*.

### Aggregate fruit

Fruit of *Ranunculus* is achene, aggregate on receptacle. Two forms of aggregate fruit, cylindrical and globose, are recognized in Taiwanese *R. cantoniensis* and its allied species. The cylindrical form, only found in the new record *R. chinensis* (Fig. 2B), can be easily distinguished from the globose to subglobose form found in other three taxa (Figs. 2A, C, D).

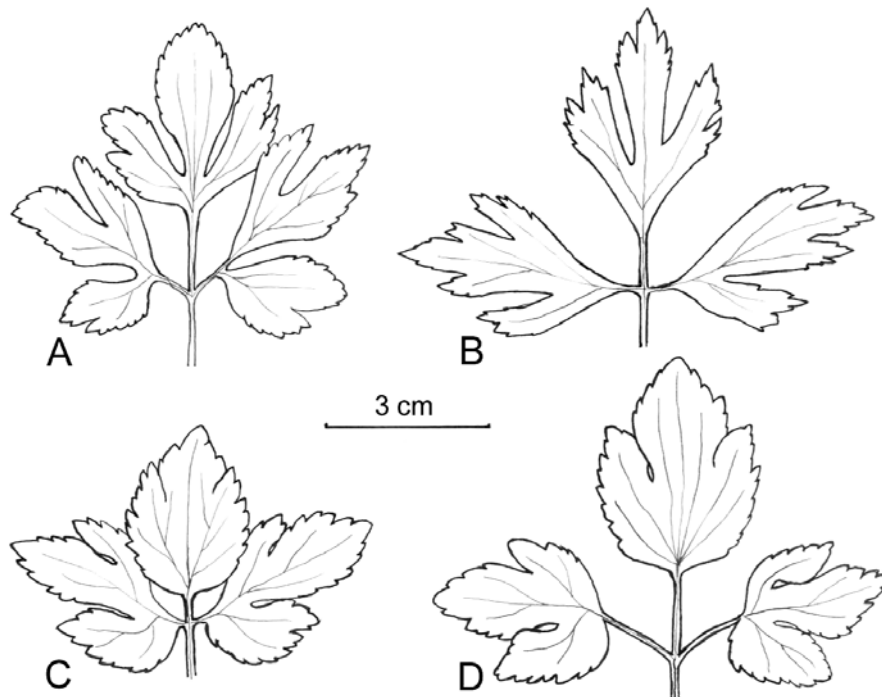


Fig. 1. Leaves of *Ranunculus cantoniensis* and allied species. A: *R. cantoniensis*. B: *R. chinensis*. C: *R. sieboldii*. D: *R. silerifolius*. Bar = 3 cm.

**Achene**

Achene morphology has been considered to be very important in the classification of *Ranunculus* (Liu, 1980; Yang and Huang, 1996a). Achenes of *R. cantoniensis* and its allied species look alike with the naked eye; all of them are obliquely obovate and bilaterally compressed. However, they can be distinguished by persistent stigma under stereomicroscope (Figs. 2E-H). Persistent stigma of *R. silerifolius* is abaxially hooked at apex, and those of *R. cantoniensis*, *R. chinensis*, *R. sieboldii* is straight to uncinata, spot like, and curved, respectively.

**TAXONOMIC TREATMENT**

Key to *Ranunculus cantoniensis* and its allied species in Taiwan

- 1. Gynoecium or aggregate fruit ovoid-cylindric to cylindric ..... 2. *R. chinensis*
- 1. Gynoecium or aggregate fruit globose to subglobose
  - 2. Plants repent, creeping stem present; flowers leaf-opposite ..... 3. *R. sieboldii*
  - 2. Plants erect or ascending, creeping stem wanting; flowers terminal
    - 3. Plants glabrous or sparsely pubescent, persistent stigma hooked at apex ..... 4. *R. silerifolius*
    - 3. Plants hirsute, persistent stigma straight or uncinata at apex ..... 1. *R. cantoniensis*

1. ***Ranunculus cantoniensis*** DC., Prod. Syst. Nat. 1: 43. 1824; Masamune, List Vasc. Pl. Taiwan 53. 1954; Liu, Fl. Reip. Pop. Sin. 28: 321. 1980; Yang & Huang, Taiwania 41: 131. 1996; et Fl. Taiwan 2nd ed. 2: 550. 1996; Wang & Gilbert, Fl. China 6: 429. 2001.

禹毛葎 Fig. 3

*Ranunculus sieboldii* auct. non Miq.: Liu & Hsieh, Fl. Taiwan 2: 506. 1976. *pro parte*.

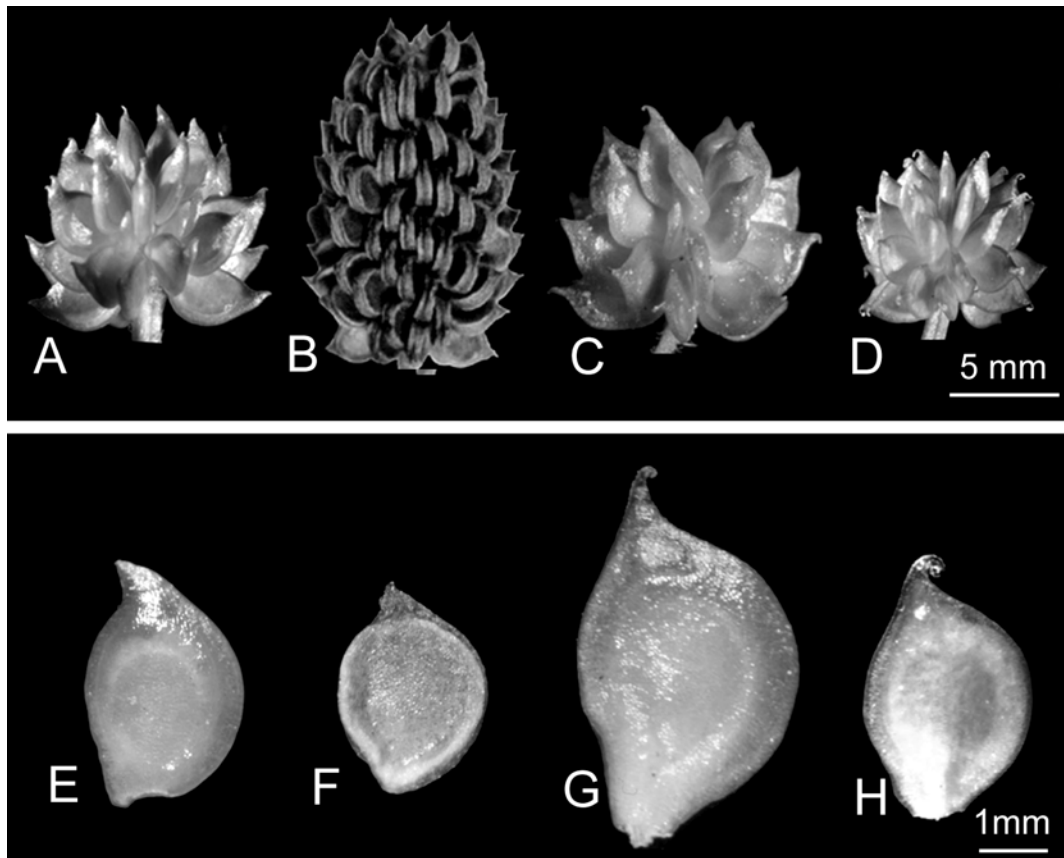


Fig. 2. Aggregate fruits (A-D) and achenes (E-H) of *Ranunculus cantoniensis* and allied species. A, E: *R. cantoniensis*. B, F: *R. chinensis*. C, G: *R. sieboldii*. D, H: *R. silerifolius*. A-D, bar = 5 mm; E-H, bar = 1 mm.

Annual pubescent herbs. Roots fibrous. Stems ascending or erect, 25-50(-85) cm tall, hirsute. Radical and lower cauline leaves with petiole 5-10(-30) cm, hirsute; blade ternate, 3.5-5.5(-11) cm long, 3-6.5(-16.5) cm wide, margin serrulate, sparsely pubescent on adaxial surface, pubescent on abaxial surface; central leaflet 3-partite, rhombic-ovate or broadly ovate, 3.5-7.5 cm long, 4-7 cm wide, petiolules 1.5-3 cm; lateral leaflets obliquely broadly ovate, unequally 2-partite. Upper cauline leaves smaller, shortly petiolate. Inflorescence compound monochasium, terminal. Pedicels 1.2-12(-18) cm long, pubescent. Flowers 1-1.5 cm in diam. Receptacle hirtellous. Sepals 5, reflexed, narrowly ovate, 4.5-5 mm long, 2-2.5 mm wide, abaxially strigose. Petals 5, yellow, narrowly elliptic or obovate, 7 mm long, 3-4 mm wide; nectary pit covered by a scale, scale obtuse at apex. Stamens numerous; anthers oblong. Carpels numerous, glabrous. Aggregate fruit subglobose, 8-10 mm in diam. Achenes bilaterally compressed, obliquely obovate, 4.5-5 mm long, 2-2.5 mm wide; persistent stigma triangular, ca. 1 mm long, straight or uncinat at apex. Chromosome number  $n = 16$ .

Flowering (December-) January to September (-October); fruiting February to November (-February).

Widely distributed around India, SW, S and SE China, Vietnam, Hong Kong, Korea and Japan. In Taiwan, *R. cantoniensis* is the most widespread of these four taxa, ranging from sea level up to medium elevations about 2,500 m throughout the island (Fig. 4A). It commonly grows in open area, roadside, and forest edge.

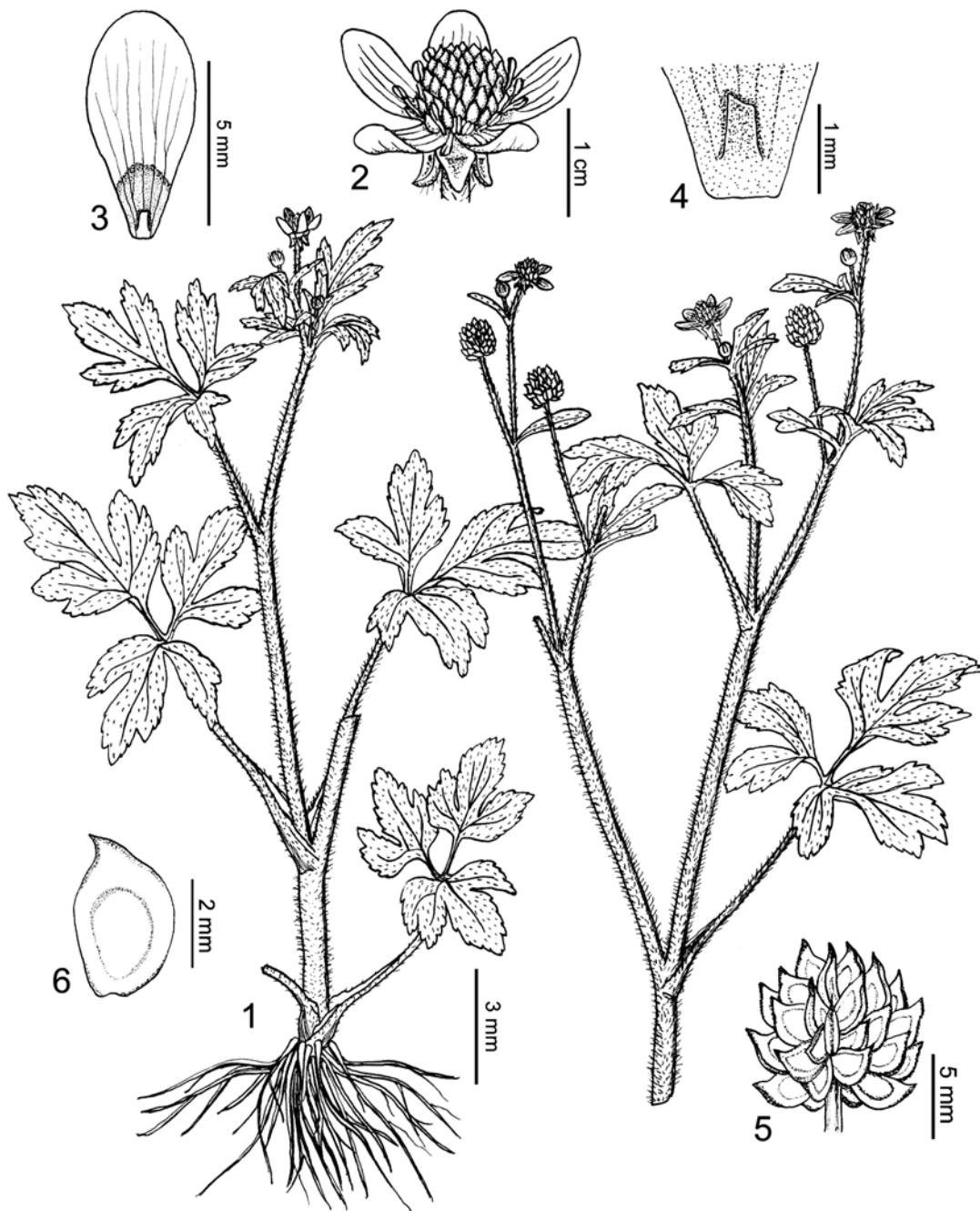


Fig. 3. *Ranunculus cantoniensis* DC. 1: Habit. 2: Flower. 3: Petal. 4: Nectary. 5: Aggregate fruit. 6: Achene. (*S. M. Kuo 590*).

Specimens examined: Keelung: Keelung, Apr. 1910, *T. Kawakami & Sasaki s. n.* (TAI). Taipei City: Taipei, Apr. 1947, *S. T. Lin s. n.* (TAI); same loc., Mar. 1915, *E. Matuda s. n.* (TAI); same loc., Oct. 8, 1931, *Y. Yamamoto s. n.* (TAI); same loc., Dec. 24, 1932, *S. Suzuki s. n.* (TAI); Nankang, Apr. 3, 1974, *Y. C. Lu s. n.* (TNU); same loc., 300 m, Apr. 1973, *W. C. Ya s. n.* (TNU); Chienkou, 100-200 m, *T. Tanaka & Shimada s. n.* (TAI); Neihu, 200 m, *T. T. Chen 9960* (TAIF); National Taiwan Univ. campus, Apr. 4, 1962, *S. H. Lee s. n.* (TAI); Hsiaotukeng to Mt. Chihshingshan, 800-1000 m, *S. M. Kuo 167* (TNU); Mientianshan, *C. M. Kuo 5455* (TAI); Chishanyen, Apr. 1933, *T. Nosaka & Mori s. n.* (TAI), Mt. Tatunshan, *T. Suzuki 6807* (TAI), Yangmingshan, *H. Shimizu 658* (TAI); Branch Campus of National Taiwan Normal Univ., 0-50 m, *S. M. Kuo 590* (TNU); Mt. Chengchushan, *H. Shimizu 647* (TAI); same loc., May 1930, *Y. Yamamoto s. n.* (TAI). Taipei:

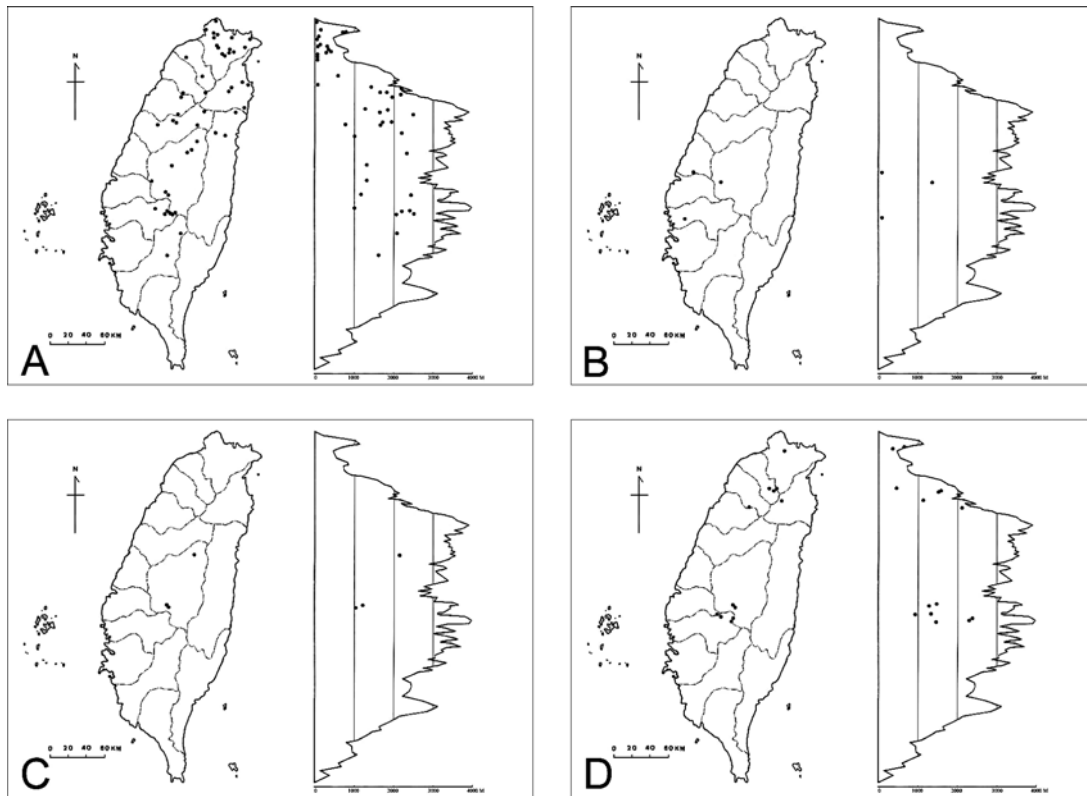


Fig. 4. Distribution of *Ranunculus cantoniensis* and allied species in Taiwan. A: *R. cantoniensis*. B: *R. chinensis*. C: *R. sieboldii*. D: *R. silerifolius*.

Chungho, 100-150 m, W. F. Ho 522 (TAIF); Huangtieten, 300 m, T. T. Chen 8218 (TAIF); Yinghotung, 200-450 m, W. F. Ho 1144 (TAIF); Kungliao, Auti, 0-50 m, S. M. Kuo 188 (TNU); Pinglin, C. T. Wang 907 (TAI); Shihmen: 10 m, J. C. Wang 3343 (TAI); same loc., W. F. Ho 792 (TAIF); Shihting, Provincial Rd. #9 25-30K, 500 m, S. C. Liu & C. H. Chen 328 (TAIF, TNU); Hsiaokotou, 300-500 m, S. F. Huang k297 (TAI); Tanshui, Peihsinchuang, S. M. Kuo 217 (TNU); Shuanghsi, Pool Hupaotan, 200-300 m, S. M. Kuo 133 (TNU); Wulai, Hsiaoyi, 300 m, S. C. Liu 259 (TNU); Wulai Bird-watch pathway, 200-300 m, S. M. Kuo 596 (TNU); Tunghou, 400 m, C. C. Liao et al. 423 (HAST). Taoyuan: Fuhsing, Province Rd. #7 30-31K, 500-600 m, S. M. Kuo 197 (TNU); Yangmei, Yangmei Dairy station, C. I Peng 3101 (TAI). Hsinchu: Chienshih, Lake Yuenyanghu, 1600-2400 m, C. M. Kuo 14503 (TAI); same loc., 1670-1850 m, H. Y. Shen et al. 624 (HAST). Wufeng, Kuanwu, 2000-2100 m, S. M. Kuo 647 (TNU). Miaoli: Taian, Mt. Anmashan, T. C. Huang 8609 (TAI); Talu logging tract, 1940 m, C. M. Wang 2864 (TNM). Taichung: Hoping, 710 logging tract, 1900-2000 m, J. C. Wang 8092 (TNU); Ssuyuan, 1900 m, H. L. Chiang 1490 (TAIF); Lishan, 1700 m, J. C. Wang 3054 (TAI); Hsuehshan, Wuling to Chika, 1700-2600 m, J. C. Wang 4376 (TAI); Anmashan, 35K, C. M. Kuo 7493 (TAI); Tahsueshan 200 forest track, 1998 m, G. P. Hsieh 91 (TNM); Tungshih, 400 m, May 6, 1994, W. C. Hsieh s. n. (TAIF). Nantou: Chushan, Chingshuikou, T. C. Huang et al. 828 (TAI); same loc., T. Y. A. Yang 1314 (TAIF, TNM); Hsinyi, Tzuchung to Tatachia, 2150-2250 m, C. H. Chen 1222 (TAIF, TNU); Jenai, Sungkang, 2000-2100 m, S. M. Kuo 192 (TNU); Nanshan stream, 700-800 m, S. M. Kuo 210 (TNU); Meifeng, Juiyen stream, 2000-2100 m, S. M. Kuo 253 (TNU); Meifeng Farm, 2000-2200 m, S. M. Kuo 242 (TNU); Wushe, 1000 m, T. Y. A. Yang 3836 (TNM); Meifeng, 2100 m, W. P. Lue & Yen 454 (HAST, TNM); Luku, Hsitou, Kao & Ou 9128 (TAI); same loc., T. Y. A. Yang 2979 (TNM); Shanlinhsea, S. H. Lin 1 (TAI); Hsitou to Hsiti, Sasaki 691 (TI); same loc., 1150 m, C. I Peng 15008 (HAST); to Sunlinhsi, 1100-1600 m, C. I Peng 5352 (HAST); Yuchih, Sun Moon Lake, C. M. Kuo 8305 (TAI). Chiayi: Alishan, Erhwanping, 2000-2100 m, S. M. Kuo 135 (TNU); Sister Pool, 2300-2500 m, S. M. Kuo 313 (TNU); Chaoping station, 2300-2500 m, S. M. Kuo 548 (TNU); Alishan to Chushan, 2300 m, S. F. Huang 2576 (TAI); Temple Shouchunkung, 2150 m, T. Y. A. Yang et al. 6518 (TAIF, TNM); Tatachia to Alishan, 2400 m, M. Tamura et al. 22225 (TAI); Alishan to Tungpu, 2350-2500 m, C. C. Hsu 7292 (TAI); same loc., Nov. 1932, Y. Yamamoto & Mori s. n. (TAI); same loc., 2300 m, T. Shimizu 10718 (TAI); to Chushan, T. Nakamura 4089 (TAI); same loc., 2200-2400 m, J. Murata & Huang 17595 (TAI, TI); Tataka-anbu, 2600-2800 m, T. Y. A. Yang et al. 5301 (HAST, TNM); Chuchi, Fenchihu, 1000 m, T.

*C. Huang 13991* (TAI). Tainan: Chiayi Farm, 250 m, *T. C. Huang 14177* (TAI). Kaohsiung: Fengkang log road, 1600 m, *H. L. Chiang 1436* (TAIF); Taoyuan, 1600 m, *T. Y. A. Yang 6465* (TAIF, TNM); Tengchih, 1500 m, *T. C. Huang 14384* (TAI); Shihshan Forest road, 2050 m, *C. I. Huang 311* (TNM). Hualien: Hsiulin, Hoping logging tract 27K, 1500-1800 m, *S. M. Kuo 653* (TNU); Tzuen, 2000-2100 m, *S. M. Kuo 458* (TNU); Yenhai-lindao, 1000 m, *T. Y. A. Yang 5448* (TNM). Ilan: Lotung, Aug. 25, 1933, *Y. Yamamoto s. n.* (TAD); Nanao, Tsuifeng logging tract, 2100-2200 m, *S. M. Kuo 145* (TNU); Shenmihu Natural Preserve Area, 1000-1150 m, *C. C. Liao et al. 1774* (TAIF); Lake Shenmihu, 1000-1300 m, *S. M. Kuo 312* (TNU); Lake Tsuifenghu, around Tsuifengshanchuang, 1790 m, *Y. R. Lin et al. 76* (HAST); Mt. Taipingshan, 1950 m, *C. I. Peng 7842* (HAST); same loc., Jun. 25, 1927, *S. Suzuki s. n.* (TAI); Mt. Tayuanshan, 1400 m, *M. T. Kao 3144* (TAI); Tatung, Litaishenmuyuan, *K. Y. Wang 1069* (HAST, TNM).

Notes: This taxon was often lumped into *R. sieboldii* by early botanists until Liu (1980) distinguished them clearly. Liu's treatment was adopted by later taxonomists (e.g., Yang and Huang, 1996; Wang and Gilbert, 2001). This taxon can be distinguished from *R. sieboldii* in having erect stems, from *R. chinensis* in having ovoid-cylindric aggregate fruit, and from *R. silerifolius* in having triangular and uncinately persistent stigma.

## 2. *Ranunculus chinensis* Bunge, Enum. Pl. China Bor. 3. 1833.

茵茵蒜 Fig. 5

Annual pubescent herbs. Roots fibrous. Stems 10-50 cm tall, densely hirsute. Radical and lower cauline leaves with petiole 4-25 cm, hirsute; blade ternate, 4-8 cm long, 4-16 cm wide, papery, margin serrulate, sparsely pubescent on adaxial surface, pubescent on abaxial surface; central leaflet 3-partite, rhombic or broadly rhombic, 3-7.5 cm long, 3.7-5.5 cm wide, petiolule 1.7-4 cm; lateral leaflets smaller, shortly petiolulate, obliquely flabellate, unequally 2-partite. Upper cauline leaves smaller, shortly petiolate, 3-partite. Inflorescence compound monochasium, terminal. Pedicels 1.8-7 cm long, pubescent. Flowers 7-12 mm in diam. Receptacle hirtellous. Sepals 5, reflexed, elliptic-ovate, 3-5 mm long, abaxially strigose. Petals 5, yellow, obovate or ovate, 5-6 mm long, 2.8-3 mm wide; nectary pit covered by a scale, apex round. Stamens numerous; anthers oblong. Carpels numerous, glabrous. Aggregate fruit ovoid-cylindric or ovoid, 6-15 mm long, 5-10 mm wide. Achenes bilaterally compressed, obliquely obovate, 3.5-4 mm long, 2-2.5 mm wide; persistent stigma triangular, ca. 0.5 mm long.

Flowering and fruiting in March.

Widely distributed around Bhutan, N India, N Pakistan, China, Thailand, Russia (Siberia), Mongolia, Kazakhstan, Korea, Japan. Taiwan, on semi-wet places, stream sides, and forest margins below 1000 m, only few populations are recorded in the central part (Fig. 4B).

Specimens examined: Chuanghua: Hsichou, Shuiwei Farm, *T. Y. A. Yang 7921* (TAIF, TNM). Nantou: Luku, Chingshuiko, *T. Y. A. Yang 1314* (TNM). Chiayi: Oct. 1912, *T. Kawakami s. n.* (TI).

Notes: *Ranunculus chinensis* is a new record for the flora of Taiwan, although the first collection of this species in Taiwan can be traced as early as 1912 from Chiayi (*T. Kawakami s. n.*, Oct. 1912, TI). Hayata named '*R. kagiensis*' on the label, but he never published it formally. The species was re-collected by the second author from central Taiwan after 73 years. This species differs from *R. cantoniensis* by its ellipsoidal aggregate fruit (length/width 2:1), shorter persistent style (0.5 mm), and narrower and deep-incised leaflets.

## 2. *Ranunculus sieboldii* Miq., Ann. Mus. Bot. Lugd. Bat. 3: 5. 1876; Hayata, Icon. Pl. Form. 3: 9. 1913; Handel-Mazzetti, Symb. Sin. 7: 302. 1931; Liu & Hsieh, Fl. Taiwan 2: 506. 1976. *pro parte*; Liu, Fl. Reip. Pop. Sin. 28: 321. 1980; Yang & Huang, Taiwania 41: 144. 1996; et Fl. Taiwan 2nd ed. 2: 560. 1996; Wang & Gilbert, Fl. China 6: 429. 2001.

揚子毛茛 Fig. 6

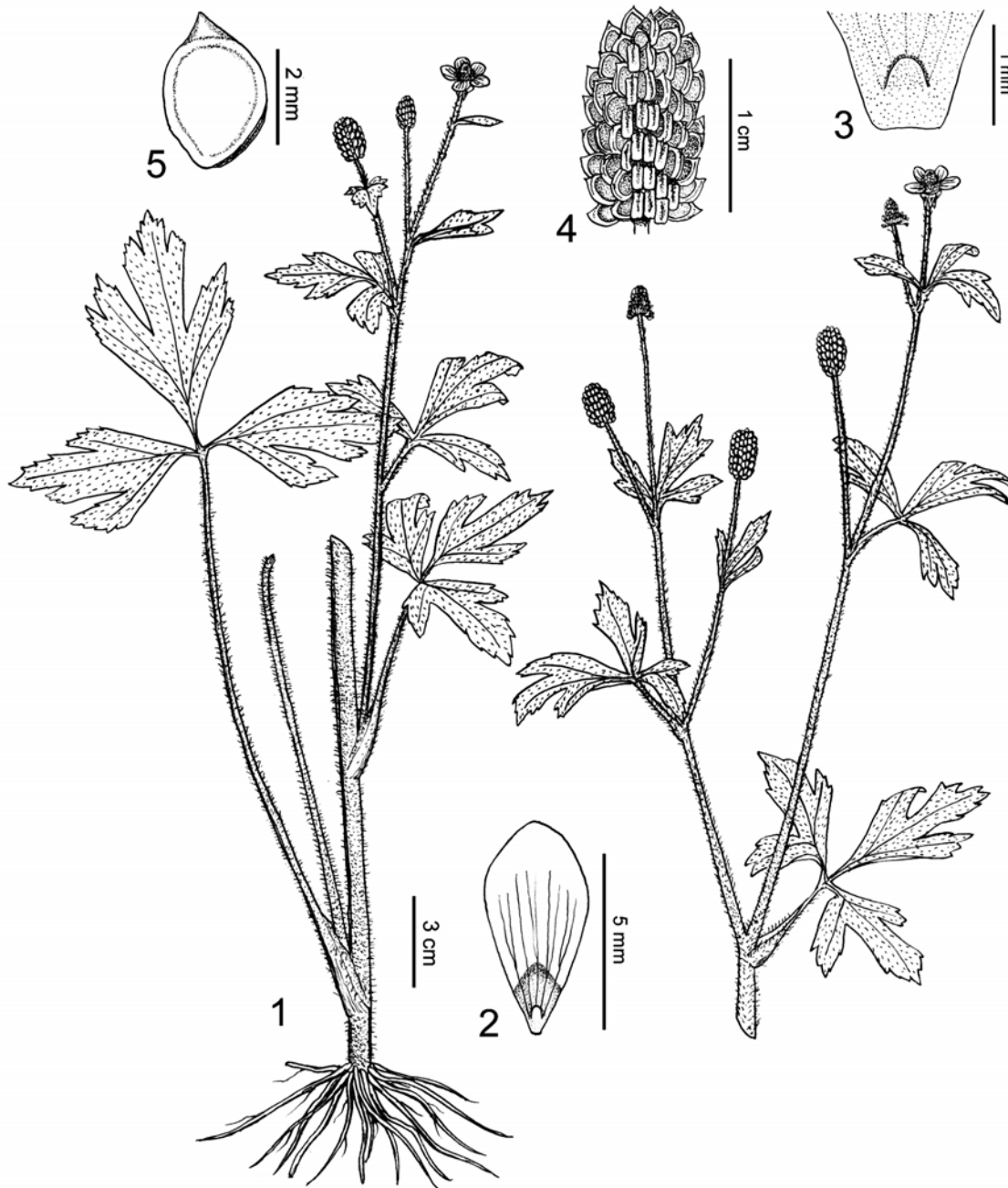


Fig. 5. *Ranunculus chinensis* Bunge. 1: Habit. 2: Petal. 3: Nectary. 4: Aggregate fruit. 5: Achene. (T. Y. A. Yang 7921).

Annual pubescent herbs. Roots fibrous, sometimes with adventitious root. Stems ascending or repent, 16-35 cm, hirsute, branched, rarely simple, rooting at lower nodes. Radical leaves with petiole 8-16 cm, hirsute; blade ternate, 3-3.5 cm long, 5-7.1 cm wide, papery, margin serrulate, sparsely pubescent on adaxial surface, pubescent on abaxial surface; central leaflet broadly rhombic or broadly rhombic-ovate, margin 3-cleft to middle, 2.3-4 cm long, 2.1-3.5 cm, apex acute, base obtuse, petiolule 3-5 mm; lateral leaflets petiolulate, obliquely broadly obovate, unequally 2-lobed or 2-partite. Cauline leaves similar to basal ones, with shorter petioles. Inflorescence leaf-opposite. Pedicels 1.8-3.5 cm long, densely strigose.



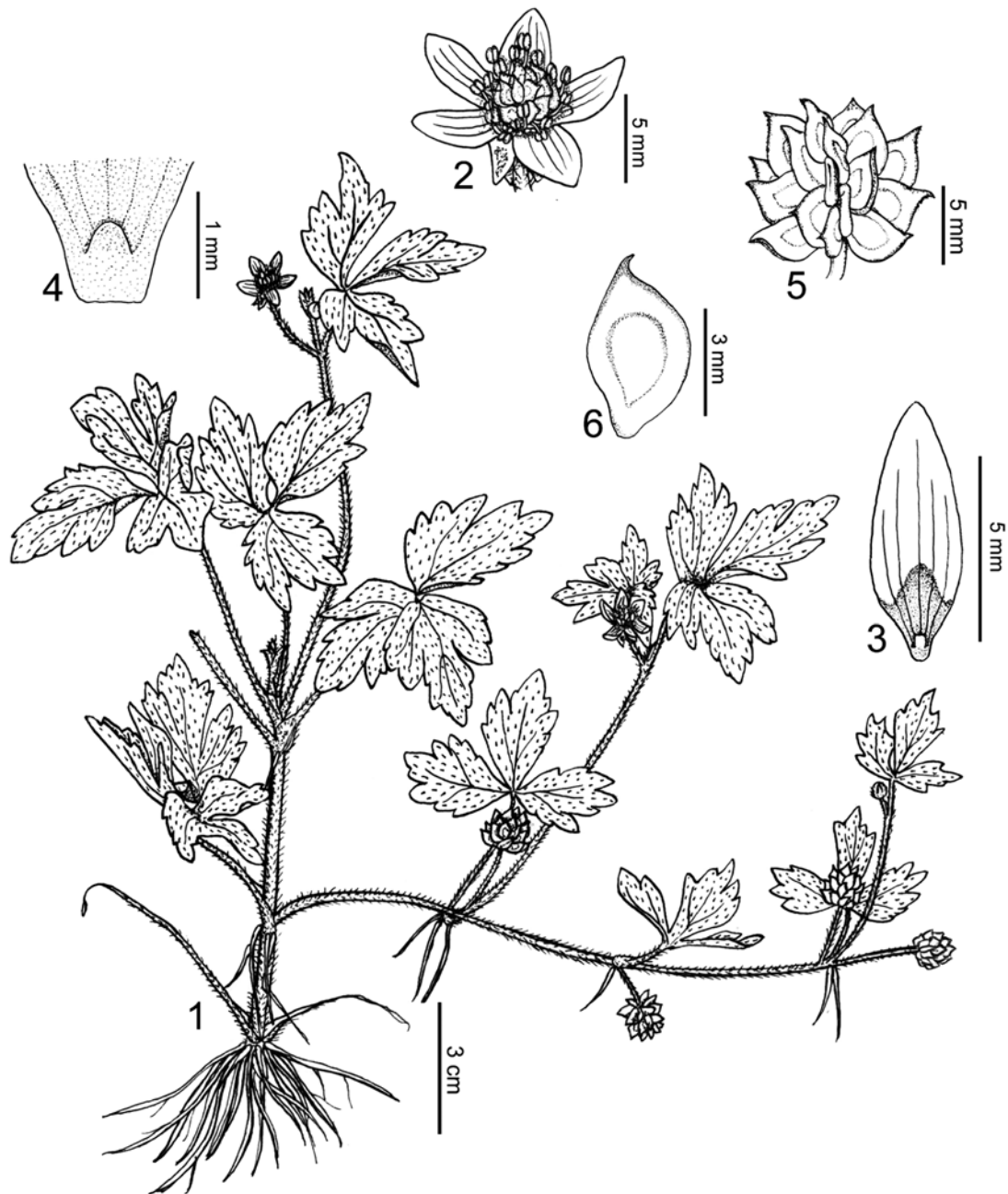


Fig. 6. *Ranunculus sieboldii* Miq. 1: Habit. 2: Flower. 3: Petal. 4: Nectary. 5: Aggregate fruit. 6: Achene. (S. M. Kuo 632).

Flowers 9-13 mm in diam. Receptacle puberulent. Sepals 5, reflexed, narrowly ovate, 4-5 mm long; abaxially strigose. Petals 5-6, yellow, narrowly obovate or long elliptic, 6.5-7 mm long, 2-2.5 mm wide; nectary pit covered by a scale, apex obtuse. Stamens numerous; anthers oblong. Carpels numerous, glabrous. Aggregate fruit subglobose, 9-12 mm in diam.; Achene laterally compressed, obliquely obovate, 4.5-5 mm long, 3-3.5 mm wide, broadly marginate; persistent stigma triangular, ca. 1 mm, slightly curved abaxially at apex. Chromosome number  $n = 16$ .

Flowering February to April; Fruiting March to June.

Distributed in southern China and Japan. Taiwan, restricted in semi-wet places and forest margins between 1,500 and 2,000 m in the central part (Fig. 4C).

Specimens examined: Nantou: Luku, Hsitou, 1200-1300 m, *S. M. Kuo* 552 (TNU); same loc., *C. C. Hsu* 10973 (TAI); same loc., *H. N. Yang* 1638 (TAI); same loc., *H. C. Li* 10104 (TAI); same loc., *T. C. Huang* 3337 (TAI); same loc., 1320 m, *S. Y. Lu* 15289 (TAIF); Hsitou to God Tree, 1000 m, *C. C. Hsu* 6116 (TAI); same loc., 1000 m, *S. F. Huang* 13457 (TAI); Chiti, 1600 m, *C. C. Hsu* 5087 (TAI); Jenai, Meifeng Farm, 2000-2200 m, *S. M. Kuo* 128 (TNU); same loc., *S. M. Kuo* 241 (TNU).

Notes: The species was often confused with *R. cantoniensis*, but can be distinguished from the latter in having creeping stems, wider achene (>3 mm) with 0.5-1 mm wide fringe on the dorsal ridge, straight or slightly curved persistent stigma.

4. *Ranunculus silerifolius* Lév., Report. Spec. Nov. Regni Veg. 7: 257. 1909; Wang & Gilbert, Fl. China 6: 429. 2001. 鉤柱毛茛 Fig. 7

*Ranunculus silerifolius* Lév. var. *glaber* (H. Boissieu) M. Tamura, Acta Phytotax. Geobot. 39: 93, 1988; Shimabuku, Check List Vas. Fl. Ryukyu Is. Rev. ed. 185. 1997.

Sparsely pubescent or subglabrous perennial herbs. Roots fibrous, sometimes with adventitious root. Stems ascending or erect, 26-40 cm, branched, base part sometimes purplish, rooting at lower nodes. Radical leaves with petiole 10-18 cm; blade ternate, 4.5-5.3 cm long, 6.4-7.6 cm wide, papery, margin serrulate, sparsely pubescent on both surfaces; central leaflet broadly rhombic or broadly ovate, 3-lobed, 3.4-4 cm long, 2.7-3.9 cm, apex acute, base cordate, petiolule 7-16 mm; lateral leaflets petiolulate, obliquely broadly ovate, unequally 2-lobed or 2-partite. Cauline leaves similar to basal ones, with shorter petioles. Inflorescence compound monochasium, terminal. Pedicels 1-5.9 cm long. Flowers 10-12 mm in diam. Receptacle hirtellous. Sepals 5, reflexed, narrowly obovate, 3-4 mm long 1.5-2 mm wide; abaxially strigose. Petals 5-7, yellow, narrowly obovate or long elliptic, 4.5-5 mm long, 2-2.8 mm wide; nectary pit covered by a scale, apex round. Stamens numerous; anthers oblong. Carpels numerous, glabrous. Aggregate fruit subglobose, 8-9 mm in diam. Achenes laterally compressed, obliquely obovate, 3.5-4 mm long, 2 mm wide, narrowly marginate; persistent stigma triangular, ca. 1.2 mm, abaxially hooked at apex. Chromosome number  $n = 8$ .

Flowering February to May; Fruiting March to July (-September).

Distributed in southern China and Japan. Taiwan, distributed in semi-wet places and forest margins between 1,500-2,200 m in north part (Fig. 4D), often coexisted with *R. cantoniensis* and *R. sieboldii* in some area.

Specimens examined: Taipei City: Yangmingshan National Park, Chingtienkang, 700-800 m, *S. M. Kuo* 420 (TNU); Palaka, 400-600 m, *H. L. Chiang* 1877 (TAIF). Taoyuan: Fuhsing, *S. H. Lin* 755 (TAI); Lofu to Paling, 300-600 m, *J. C. Wang* 10779 (TNU); Mt. Takuanshan Forest Recreation Area, 1600-1700 m, *S. M. Kuo* 230 (TNU); Shangpalin, Lalashan, 1400-2100 m, *T. Y. A. Yang* 6286 (TNM). Hsinchu: Wufeng, Kuanwu, 2000-2100 m, *S. M. Kuo* 633 (TNU); same loc., *T. W. Hsu* 8578 (TESRI). Nantou: Luku, Hsitou, 1200-1300 m, *S. M. Kuo* 223 (TNU); same loc., *Y. S. Tseng* 653 (TESRI); Hsitou to Shenmu, *T. Y. A. Yang* 153 (TAI). Yunlin: Kukeng, 1380 m, *C. H. Chen* 1519 (TESRI). Chiayi: Alishan, 2400 m, *M. Tamura* 22225 (TAI); Alishan to Hoshe, 1500 m, Aug. 20, 1963, *M. Tamura s. n.* (TAI); Sisters' Pond, 2200-2500 m, *T. Y. A. Yang et al.* 5315 (TNM); Mt. Tatashan, 2300-2500 m, *S. M. Kuo* 123 (TNU); Meishan, 900 m, *C. H. Chen* 2882 (TESRI). Ilan: Tatung, Mingchiu to Paling, 1100-1200 m, *H. T. Hung* 104 (TNU).

Notes: This species was omitted by "Flora of Taiwan", although it has been collected very early in 1963. All the herbarium specimens belonging to this taxon were misidentified



Fig. 7. *Ranunculus silerifolius* Lévl. 1: Habit. 2: Flower. 3: Petal. 4: Nectary. 5: Aggregate fruit. 6: Achene. (*S. M. Kuo* 553).

as *R. sieboldii*, mainly due to they share the similar morphology and common habitat. However, this taxon can be distinguished from the latter in having glabrous (or near so) plant, purplish stem base, and abaxially hooked persistent stigma. Its occurrence in Taiwan was first reported by Shimabuku (1997) using the name *R. silerifolius* var. *glaber*. This variety is different from the typical phase by the almost glabrous plants and purplish basal stem (Tamura, 1988). However, our observation in field is not congruent with Tamura

(1988). The hairiness and stem color are not very stable even in the same population. An intensive population study is necessary to resolve this problem. Here the treatment of Wang and Gilbert (2001) was adopted.

### ACKNOWLEDGEMENTS

We thank Mr. Ho-Ming Chang, National Taiwan Normal University, and Mr. Tsai-Wen Hsu, Taiwan Endemic Species Research Institute, for providing collection information. This study was supported by research grant (NSC 91-2311-B-003-007) from the National Science Council, ROC.

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## 台灣產禺毛茛及其相近種植物(毛茛科)之訂正

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(收稿日期：2005 年 4 月 18 日；接受日期：2005 年 5 月 24 日)

### 摘 要

本文依據詳細的外部形態研究結果，將台灣產毛茛屬之禺毛茛及其相近種植物處理為四種：禺毛茛 (*R. cantoniensis* DC.)、苗苗蒜 (*R. chinensis* Bunge)、揚子毛茛 (*R. sieboldii* Miq.) 及鈎柱毛茛 (*R. silerifolius* Lév.)。其中苗苗蒜為台灣新紀錄種。本文並提供檢索表、分類特徵、手繪圖以及地理分布。

關鍵詞：毛茛科、毛茛屬、禺毛茛、苗苗蒜、揚子毛茛、鈎柱毛茛、分類、台灣。

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