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Senecio kuanshanensis (Asteraceae), a new species from southern Taiwan

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Abstract. A new species of Asteraceae from Taiwan, *Senecio kuanshanensis* C.-I Peng & S.W. Chung, a distinct member of sect. *Crociseris* (Reichenb.) Hall. & Wohlf. ser. *Nemorenses* Gagnidze, is described and illustrated. *Senecio kuanshanensis* is apparently rare, presently known only from mountain ridges of Kuanshan, at (2,500-)3,000-3,300 m elevation in the southern part of the Central Mountain Range of Taiwan. In habit the new species somewhat resembles *S. morrisonensis* Hayata, an endemic congener from Taiwan, but it is clearly distinct in having longer peduncles (3-7 cm vs. 0.5-2[-3] cm), longer involucres (8-10 mm vs. 4.5-6 mm), longer corolla tube in the disc florets (4-5 mm vs. 3-3.5 mm), longer rays (9-14 mm vs. 5.5-7.2 mm) in the ray florets, and median cauline leaves that are deeply bipinnatipartite to tripinnatipartite (vs. serrate to coarsely dentate or deeply pinnately lobed).

Keywords: Asteraceae; Compositae; New species; Rare species; *Senecio kuanshanensis*; Senecioneae; Taiwan; Taxonomy.

Senecio is a cosmopolitan genus of ca. 1,250-3,000 species, depending on circumscription (Diggs et al., 1999). New information and new taxonomic concepts indicate that the genus should be divided into various segregates (Barkley et al., 1996). Based on the generic concepts adopted in recent taxonomic studies on the tribe *Senecioneae* of eastern Asia (Jeffrey and Chen, 1984; Chen, 1999), seven species and one additional variety of *Senecio* were recognized in the recently revised Flora of Taiwan (Peng and Chung, 1998). With the exception of *S. vulgaris* L., which is naturalized around villages at 2,000-2,500 m in Taiwan, all members of the genus are indigenous and five are endemic.

Subsequent to our recent description of a new species of *Senecio* from eastern Taiwan, *S. tarokoensis* C.-I Peng (Peng and Leu, 1999), another unique species was discovered on Kuanshan at ca. 3,000-3,300 m in the southern part of the Central Mountain Range. It is not referable to any species heretofore known in eastern Asia (Koyama, 1968, 1969; Jeffrey and Chen, 1984; Iwatsuki et al., 1995; Peng et al., 1998; Peng and Leu, 1999; Chen, 1999) and is here described as new.

Senecio kuanshanensis C.-I Peng & S.W. Chung, sp. nov.—TYPE: TAIWAN. Kaohsiung Hsien, Taoyuan Hsiang, Yushan National Park, from '3026 Lodge' to Kuanshan, 120° 54' 22" E, 23° 14' 45" N, elev. ca. 3,300 m, in *Abies* forest on mountain ridges, frequent on forest floor, at peak anthesis, 20 Aug 1998, *Kuo-Fang Chung 1022*, accompanied by Yoko Kita, Chien-Chih Chen, and S. J. Moore (holotype: HAST; isotypes: E, GH, K, KUN, MO, NCUF, PE, TAIF, TNM).

關山千里光 Figures 1-3

Haec species *Senecioni morrisonensi* Hayata subsimilis, sed ab eo foliis caulinis medianis profunde bipinnatipartitis usque tripinnatipartitis (vs. irregulariter pinnatifidis vel -partitis), pedunculo 3-7 (vs. 0.5-2[-3]) cm longo, involucro 8-10 (vs. 4.5-6) mm longo atque partibus floralibus majoribus inter eas flosculorum radii limbo 9-14 (vs. 5.5-7.2) mm longo, eorum disci tubo angusto 4-5 (vs. 3-3.5) mm longo manifeste distinguitur.

Erect, perennial rhizomatous herb. Stem 32-44 cm tall, usually simple basally, branched above, glabrous. Basal and lower cauline leaves withered at anthesis; middle and upper cauline leaves many, base attenuate into petiole, 1-2 cm long, glabrous on both surfaces, ovate, 11-13 cm long, 3-5.5 cm wide, deeply bipinnatipartite to tripinnatipartite, irregularly incised, segments spreading, lanceolate to narrowly oblong or linear, papery; upper cauline leaves gradually smaller, linear-lanceolate to linear, remotely dentate, subsessile. Heads radiate, many terminal on branches, forming a corymb; peduncles 3-7 cm long, slender, nearly glabrous to sparingly puberulous, with 1-3 linear bracteoles; bracteoles 2-3 mm long, subglabrous or sparsely pubescent. Involucre subcylindric, ca. 8-10 mm long, 4-6 mm across, calyculate; bracts 2-seriate, ca. 13, herbaceous, linear, 0.5 -1 mm wide, with narrow scarious margins, apex acute to subobtuse, puberulous, otherwise

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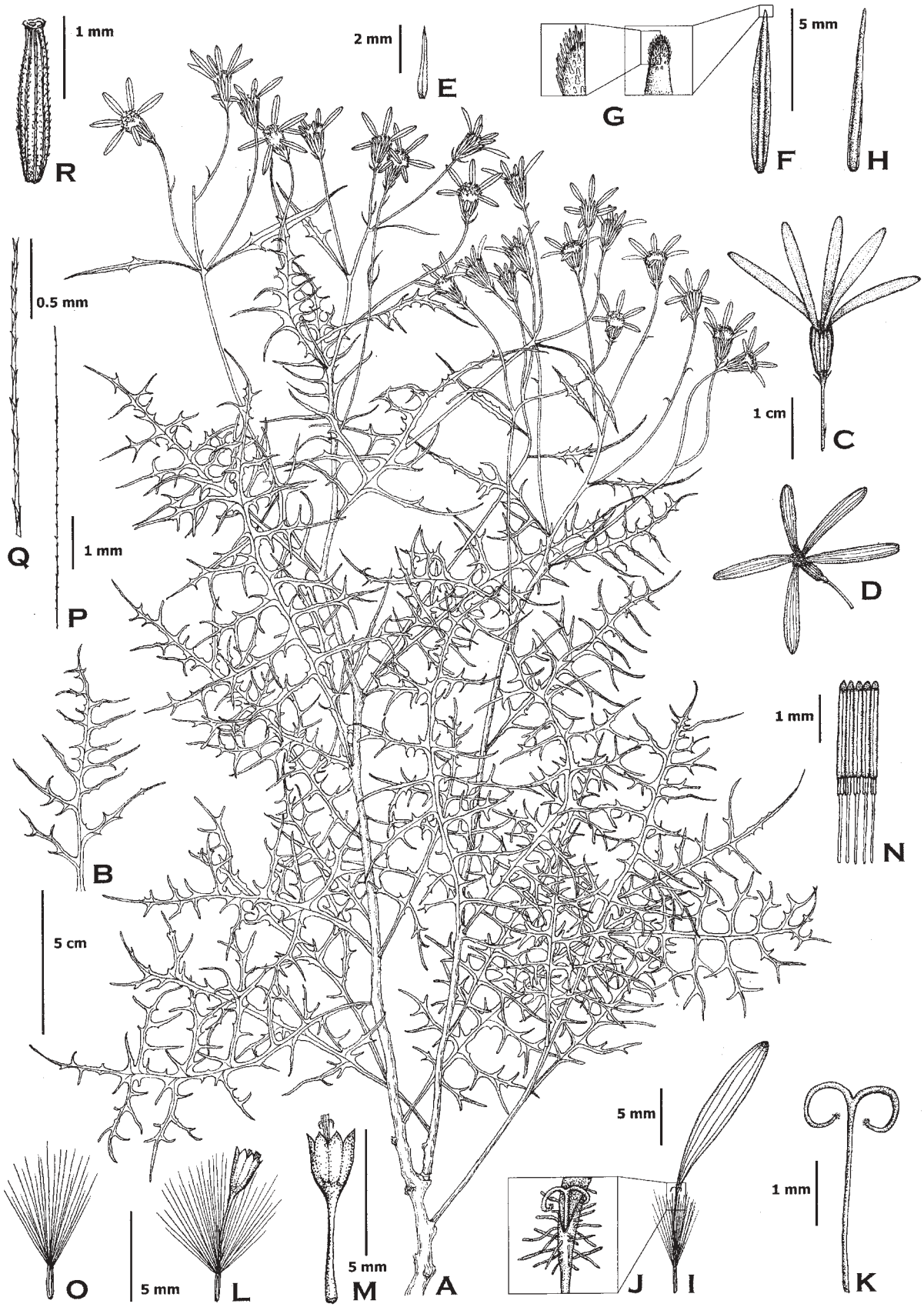

Figure 1. *Senecio kuanshanensis* C.-I Peng & S.W. Chung. A, Habit; B, Apical portion of a leaf; C, D. Capitulum; E, Bracteole; F, Involucral bract, abaxial surface; G, Apex of involucral bract, much magnified; H, Involucral bract, adaxial surface; I, Ray floret; J, Portion of ray floret; K, Style branches; L, Disc floret; M, Disc floret, achene and pappus removed; N, Stamens, expanded; O, Achene; P, Q. Pappus; R, Achene, pappus removed. (All from *S. W. Chung 101*, HAST)

Figure 2. *Senecio kuanshanensis*, showing habit and habitat.

Figure 3. *Senecio kuanshanensis*, upper part of a plant, showing leaves and capitula.

glabrous. Ray florets 5 (-6), tube yellow, ca. 8.5 mm long, rays yellow, 9-14 mm long, ca. 3.5 mm broad, 3-denticulate at apex, 4-veined; disc florets ca. 14-15, corolla yellow, 7-8 mm long, tube 4-5 mm long, limb infundibuliform, lobes oblong-lanceolate, 1-1.5 mm long, acute, papillose at apex. Anthers ca. 2.5 mm long, shortly obtusely auriculate at the base, apical appendages ovate-lanceolate. Achenes cylindrical, 2-3 mm long, sparsely hirtellous on ribs. Flowering Aug-Oct.

Additional specimens examined. **TAIWAN.** Kaohsiung Hsien, Taoyuan Hsiang, path side from Southern Cross-island Hwy to Kuanshan, ca. 3,000-3,200 m, 23°13'15" N, 120°54'07" E, associated with *Tsuga chinensis*, *Chamaecyparis formosensis*, *Trochodendron aralioides*, *Parasenecio monantha*, *Stranvaesia niitakayamensis*, *Rubus hayata-koidzumii*, *Viburnum taitoense*, *Yushania niitakayamensis*, *Erigeron morrisonensis*, 2 Oct 1994, *S. W. Chung s. n* (HAST, NCUF, TAIF); 3026 cottage to Kuanshan, 2 Oct 1994, *S. W. Chung 101* (TAIF); Oct 1997, *M. J. Wu & S. F. Huang 5417* (TAI); 23°13'15" N, 120°54'07" E, on mountain ridge, numerous, in alpine bamboo grassland, roadside/pathside, middle humidity, slightly shaded, 11 Oct 1996, *C. K. Liou et al. 367* (TAIF).

Distribution and notes. Endemic and apparently rare in Taiwan; presently known only along semishaded trails in *Tsuga-Abies* forests and in *Yushania* bamboo grasslands near the mountain ridge of Kuanshan, at (2,500-)3,000-3,300 m elevation (Figure 4). Mt. Kuanshan and its neighboring area are noted for harboring a number of endemic and/or rare species of Asteraceae, e.g. *Senecio taitungensis* S. S. Ying (endemic; Ying, 1990), *Saussurea kanzanensis* Kitam. (endemic and vulnerable; Peng, 2000), *Parasenecio monantha* (Diels) C.-I Peng & S.W. Chung (rare and vulnerable; Peng, 2000) and *Parasenecio nokoensis* (Masam. & Suzuki) C.-I Peng & S.W. Chung (endemic and rare; Peng and Chung, 1998). Other plants such as *Sarcococca saligna* (D. Don) Muell.-Arg. [Buxaceae; endangered; Lu, 1996], *Listera kuanshanensis* H.J. Su [Orchidaceae; endemic and rare; Su, 1999], *Ponerochis tominagai* (Hayata) H.J. Su & J.C. Chen [Orchidaceae; endemic; Su and Chen, 2000], *Woodsia okamotoi* Tagawa [Athyriaceae; endemic and critically endangered; Moore, 1999], *Polystichum xiphophyllum* (Baker) Diels [Dryopteridaceae; critically endangered; Moore, 2000], *Epilobium nankotaizanese* Yamam. [Onagraceae; rare, alpine endemic; Hsu and Lu, 1984] are found also on Mt. Kuanshan.

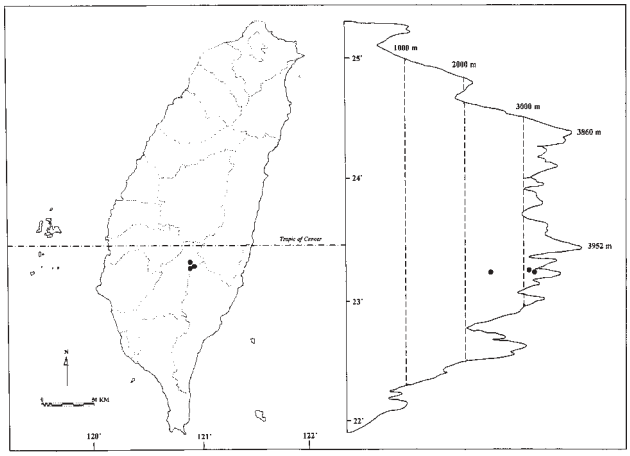

Figure 4. Distribution map of *Senecio kuanshanensis* in Taiwan.

Senecio kuanshanensis is a distinct member of sect. *Crociseris* (Reichenb.) Hall. et Wohlf. ser. *Nemorenses* Gagnidze (cf. Chen, 1999). Although in habit it is somewhat similar to *S. morrisonensis* Hayata, it is clearly distinct in having the middle cauline leaves deeply bipinnatipartite to tripinnatipartite (vs. serrate to coarsely dentate or deeply pinnately lobed), longer peduncles (3-7 cm vs. 0.5-2[-3] cm), longer involucres (8-10 mm vs. 4.5-6 mm), and larger floral parts, such as the narrow tube of the disc florets 4-5 mm long (vs. 3-3.5 mm long), and the rays of the ray florets 9-14 mm long (vs. 5.5-7.2 mm long).

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Literature Cited

Barkley, T.M., B.L. Clark, and A.M. Funston. 1996. The segregate genera of *Senecio* sensu lato and *Cacalia* sensu lato (Asteraceae: *Senecioneae*) in Mexico and Central America. *In* D. J. N. Hind and H. J. Beentje (eds.), Compositae: Systematics. Proceedings of the International Compositae Conference, Kew, 1994. Vol. 1. Royal Botanic Gardens, Kew, pp. 613-620.

Chen, Y.L. 1999. Compositae (5): *Senecioneae, Calenduleae*. Fl. Reipubl. Popularis Sin. **77(1):** 1-369.

Diggs, G.M. Jr., B.L. Lipscomb, and R.J. O'Kennon. 1999. Shinners & Mahler's Illustrated Flora of North Central Texas. Austin College, Sherman and Botanical Research Institute of Texas, Forth Worth, 1626 pp.

Hsu, K.S. and S.Y. Lu. 1984. Taiwan Rare Plants. Vacation Press, Taipei, 191 pp.

Iwatsuki, K., T. Yamazaki, D.E. Boufford, and H. Ohba. 1995. Flora of Japan, vol. IIIb. Angiospermae, Dicotyledoneae, Sympetalae (b). Kodansha Ltd., Tokyo.

Jeffrey, C. and Y.L. Chen. 1984. Taxonomic studies on the tribe *Senecioneae* (Compositae) of Eastern Asia. Kew Bull. **39:** 205-446.

Kitamura, S. 1939. Expositiones plantarum novarum orientali-Asiaticarum 4. Acta Phytotax. Geobot. **8:** 75-90.

Koyama, H. 1968. Taxonomic studies on the tribe *Senecioneae* of Eastern Asia II. Enumeration of the species of eastern Asia. Mem. Fac. Sci. Kyoto Univ., Ser. Biol. **2(1):** 19-60.

Koyama, H. 1969. Taxonomic studies on the tribe *Senecioneae* of Eastern Asia II. Enumeration of the species of eastern Asia. Mem. Fac. Sci. Kyoto Univ., Ser. Biol. **2(2):** 137-183.

Lu, S.Y. 1996. Rare and Endangered Plants of Taiwan, vol. 1. Council of Agriculture, Taipei, 163 pp.

Moore, S.J. 1999. Pteridophytes. *In* S.Y. Lu and S.J. Moore, Rare and Endangered Plants of Taiwan, vol. 4. Council of Agriculture, Taipei, 161 pp.

Moore, S.J. 2000. Pteridophytes. *In* S.Y. Lu, S.J. Moore, C.-I Peng and T.H. Hsieh, Rare and Endangered Plants of Taiwan, vol. 5. Council of Agriculture, Taipei, 161 pp.

Peng, C.-I and S.W. Chung. 1998. *Senecio*. *In* C.-I Peng, K.F. Chung and H.L. Li (eds.), Compositae. Flora of Taiwan, 2nd edn., vol. 4. Editorial Committee of the Flora of Taiwan, Second Edition, Taipei, pp. 1051-1062.

Peng, C.-I and W.P. Leu. 1999. Novelties in Asteraceae of Taiwan: *Blumea linearis* and *Senecio tarokoensis*. Bot. Bull. Acad. Sin. **40:** 53-60.

Peng, C.-I. 2000. Compositae. *In* S.Y. Lu, S.J. Moore, C.-I Peng and T.H. Hsieh, Rare and Endangered Plants of Taiwan, vol. 5. Council of Agriculture, Taipei, 161 pp.

Su, H.J. 1999. Contribution to the revised orchid flora of Taiwan (III). J. Exp. Forest Natl. Taiwan Univ. **13(3):** 203-209.

Su, H.J. and J.J. Chen. 2000. *Ponerorchis*. *In* H. J. Su (ed.), Orchidaceae. Flora of Taiwan, 2nd edn., vol. 5. Editorial Committee of the Flora of Taiwan, Second Edition, Taipei, pp. 807-1101.

Ying, S.S. 1990. Miscellaneous notes on the flora of Taiwan (XIII). Mem. Coll. Agric. Natl. Taiwan Univ. **30(2):** 53-72.

台灣特產之菊科新種植物：關山千里光

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本文發表一種特產台灣之菊科新種植物：關山千里光（*Senecio kuanshanensis* C.-I Peng & S. W. Chung, sp. nov.），並提供植物繪圖、照片及分布圖以資辨識。關山千里光為台灣稀有植物，目前僅知分布於關山海拔 (2,500-)3,000-3,300 公尺之鐵杉、冷杉林或玉山箭竹叢的半遮蔭山徑上。關山千里光為千里光屬番紅菊組 (Sect. *Crociseris*) 林蔭系（Ser. *Nemorenses*）植物，習性略似台灣特產之玉山黃菀（*S. morrisonensis*），但莖生葉二回至三回羽狀深裂，並裂至中肋及側脈處（非鋸齒或粗齒緣，或羽狀分裂）；總花梗可達 3-7 公分（非 0.5-2-[-3] 公分）；總苞較長，8-10 公厘（非僅 4.5-6 公厘）；管狀花之管部較長，達 4-5 公厘（非僅 3-3.5 公厘）；舌狀花花瓣長 9-14 公厘（非僅 5.5-7.2 公厘）等特徵，明顯可與玉山黃菀區別。

關鍵詞：菊科；新種；稀有植物；關山千里光；台灣；分類。