

The Genus *Rhynchocheum* Blume (Gesneriaceae) in Taiwan

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ABSTRACT: The genus *Rhynchocheum* (Gesneriaceae) in Taiwan is revised based on a critical morphological study. Three species and one form are recognized. A new species, *Rhynchocheum brevipedunculatum* J. C. Wang *sp. nov.*, is here described from Taiwan. After comparing with *R. discolor* in detail, *R. discolor* var. *incisum* (Ohwi) Walker can be distinguished from the former only in having incised leaves. Therefore, the taxon is reduced to the rank of form and a new combination, *R. discolor* forma *incisum* (Ohwi) Hatusima ex J. C. Wang *comb. nov.*, is proposed here. Calyx-segments shape and inflorescence patterns are shown to be the most useful characters for the classification of Taiwan species. In addition, seed coat micromorphology under scanning electron microscope displays more or less interspecific variation. The meiotic chromosome numbers of all Taiwanese taxa are counted in this paper. All taxa, of which three are determined for the first time, have the same chromosome number ($n=10$). A key to the taxa of this genus in Taiwan along with description, taxonomic notes, and a line drawing are provided.

KEY WORDS: Chromosome number, Revision, *Rhynchocheum brevipedunculatum*, Gesneriaceae, Taiwan.

INTRODUCTION

In the first edition of the Flora of Taiwan, Kao and DeVol (1978) recorded two species of the genus *Rhynchocheum* (Gesneriaceae), i.e. *R. discolor* (Maxim.) Burt and *R. formosanum* Hatusima. Later, Ying (1987, 1989) described a new taxon *R. ellipticum* var. *saurauifolium* (S. S. Ying) S. S. Ying. However, Li and Hsieh (1997) reduced the new taxon to the synonym of *R. formosanum* Hatusima in a more recent revision. In addition, they (Li and Hsieh, 1997) reported a new record, *R. discolor* var. *incisum* (Ohwi) Walker, from southern Taiwan. Consequently, a total of two species and one variety were recorded in the Flora of Taiwan, 2nd edition (Li and Hsieh, 1998). Based on an intensive morphological revision, three species and one form, including one new species, *Rhynchocheum brevipedunculatum* J. C. Wang and one new combination, *R. discolor* forma *incisum* (Ohwi) Hatusima ex J. C. Wang, are here recognized from Taiwan. A taxonomic revision of the genus *Rhynchocheum* in Taiwan follows.

MATERIALS AND METHODS

Materials used in the present studies were collected from the field throughout Taiwan. Voucher specimens for seed coat observation and chromosome counts were deposited in the Herbarium, Department of Biology, National Taiwan Normal University (TNU). Living material for studies was cultivated in the shade house of Department of Biology, National Taiwan Normal University. In addition, specimens preserved in HAST, NTUF, TAI, TAIF, TI, TNU were examined.

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Seeds for scanning electron microscopic (SEM) study were collected from fresh mature fruits. After being dried in a desiccator for at least 24 hours, the material was coated with gold, and examined under scanning electron microscope.

Flower buds for chromosome counts were cut from living plants. The material was fixed in a mixture of absolute alcohol and glacial acetic acid (3:1/v:v), then stained with acetocarmine, squashed, and observed under a Leitz Aristoplan microscope.

TAXONOMIC CHARACTERS

Leaves

Leaves of the genus are simple, often pubescent especially on the lower surface. In Taiwan, *R. formosanum* is quite distinct with the remaining three taxa in many aspects, such as leaf arrangement (opposite in the former against alternate in the latter), leaf shape (elliptic-oblong against oblong-oblongeolate), and the angle of lateral veins attached to the midrib (60-75° against 45°). On the other hand, the last three taxa are very much alike one another in leaf morphology. Ohwi (1938) described *R. discolor* var. *incisum* characterized by the sole distinguishable character: incised leaves in comparison with *R. discolor* var. *discolor*. Through a very detailed comparison, we are unable to find other characters yet to distinguish them (see below). We consider *R. discolor* var. *incisum* just a sporadic variation in the leaves' shape and, therefore, reduce it to the rank of form.

Inflorescence

The inflorescence of the genus is typically cymose. Two recognizable patterns of inflorescence are found in the Taiwanese species. The first type, found in *R. brevipedunculatum*, is a simple cyme with one to three flowers forming a compact glomerule borne on a very short peduncle (often less than 2 mm). The second type, found in the remaining taxa, is branched two or three times with more than five flowers loosely arranged on a slender (> 1.5 cm) peduncle.

Calyx

In this study, we found that the morphology of calyx could be an important good character in distinguishing species of *Rhynchoechum*. Every species in Taiwan has its unique pattern of calyx-segments. The narrowly triangular or triangular lanceolate (Fig. 1D) calyx-segments, found in *R. formosanum*, are apparently different from the linear type found in other taxa. Among the last three taxa with the linear type, *R. brevipedunculatum* has much larger calyx (10 - 12 × 1.5 - 2 mm, Fig. 1A), usually twice as large as those of *R. discolor* (5 - 8 × 0.5 mm). The calyx-segments of the two infraspecific taxa of *R. discolor* are completely identical (Figs. 1B, C), although the plants are quite different in leaf shape.

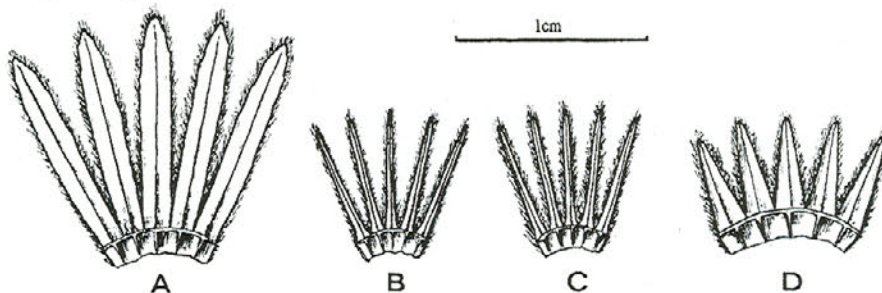


Fig. 1. Calyx of *Rhynchoechum* in Taiwan (inside view). A: *R. brevipedunculatum*; B: *R. discolor* forma *discolor*; C: *R. discolor* forma *incisum*; D: *R. formosanum*. Bar = 1 cm.

Fruits and Seeds

Fruits of *Rhyncholechum* are typically baccate with white fleshy exocarp. In Taiwanese species, the shapes of fruits are more or less different and can be used in separating species. Li and Hsieh (1998) used these characters to distinguish *R. discolor* (ovoid) from *R. formosanum* (subglobose) in their key. These two species (including their infraspecific taxa) share the typical exocarpic form (white fleshy) of this genus. However, the new species *R. brevipedunculatum* bears ellipsoid fruit with a more or less thinner and drier exocarp, a quite distinct type.

Seeds of this genus are numerous and so minute as to hardly differ from one another under magnifying glass or stereomicroscope. In general, seeds of the Taiwanese species under stereomicroscope are ovoid to ellipsoid in shape, reddish to blackish brown in color, and $0.25\text{--}0.3 \times 0.1\text{--}0.2$ mm in size. Recently, using scanning electron microscope, seed coat micromorphology has been widely used for taxonomic purpose in a variety of plant groups. In this study, we observed the seed coat micromorphology of all four taxa in Taiwan under scanning electron microscope. The result reveals a little interspecific variation in seed size and seed coat ornamentation. Using scanning electron microscope, seed coat shows longitudinally rib-like ornamentation (striation) all over the surface (Fig. 2). The ribs construct irregular cells with numerous tubercles along the inner-margin. Of the Taiwanese taxa, *R. brevipedunculatum* (Figs. 2A, B) has larger seeds with striations somewhat more dense than the others. On the contrary, *R. formosanum* has small seeds (Fig. 2G). Our knowledge of the inter- and intraspecific variation of seed coat ornamentation, however, is still incomplete. A more comprehensive study would be necessary before we can draw any conclusion.

Chromosome numbers

Among the Taiwanese taxa, only *R. discolor* has been cytologically examined by the previous studies in which the chromosome numbers of $2n = 20$ was reported (Shimabuku, 1997). We counted the chromosome number of all the Taiwanese taxa (Table 1) by observing meiosis. As a result, all examined species have $n = 10$ chromosomes (Fig. 3) and show no interspecific variation. The chromosome numbers of *R. brevipedunculatum*, *R. discolor* forma *incisum*, and *R. formosanum* are determined for the first time.

TAXONOMIC TREATMENT

Rhyncholechum Blume, Bijdr. 775. 1826; Benth. and Hook. f., Gen. Pl. 2: 1016. 1876; Clarke in A. DC., Monogr. Phan. 4: 194. 1883; Burtt, Notes Bot. Gard. Edinburgh 24: 36. 1962. 同蕊草(線柱苣苔)屬

Terrestrial subshrubs, perennials, often pubescent; stems erect, simple or few-branched at base. Leaves opposite or alternate. Cymes axillary, simple or branched; bracts 2, opposite. Calyx 5-parted, divided to base, persistent; corolla white or occasionally tinged purple, broadly tubular, deeply 5-lobed; stamens 4, inserted near corolla base, included; filaments short; anthers subglobose; thecae parallel, dehiscing longitudinally, confluent at apex; staminodes 1 or absent; ovary ovoid, 1-loculed; style as long as ovary; stigma 1, depressed globose. Fruit baccate, ovoid to subglobose. Seeds numerous, minute, ellipsoid, without appendage.

About 14 species. Distributed mainly in E. and S. Asia, from Sri Lanka, S. India, E. Himalayas to S. China, and the Philippines, southeastwards to New Guinea (Li and Hsieh, 1997). Three species and one form in Taiwan.

Table 1. Chromosome numbers of *Rhyncholechum* in Taiwan with voucher information.

Taxa	Chromosome number (n)	Locality	Voucher
<i>R. brevipedunculata</i>	10	Taipei: Wu-lai-shan	C. C. Wang 71
<i>R. discolor</i> forma <i>discolor</i>	10	Taipei: Ping-hsi	C. C. Wang 25
	10	Taipei: Shih-ting	C. C. Wang 35
<i>R. discolor</i> forma <i>incisum</i>	10	Ping-tung: Nan-jen-shan	C. C. Wang & S. C. Liu 49
<i>R. formosanum</i>	10	Taipei: Ping-hsi	C. C. Wang 74

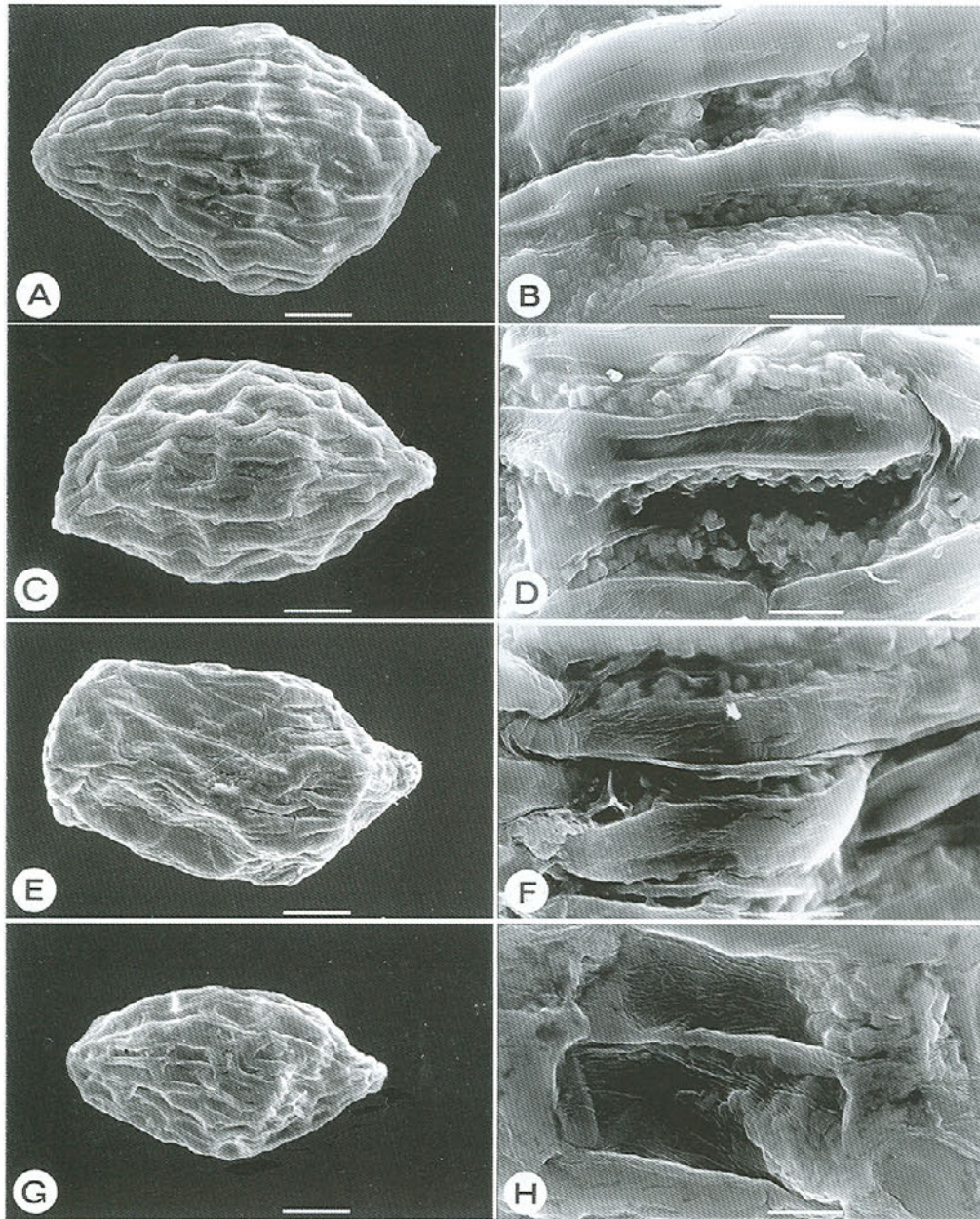


Fig. 2. SEM photographs of seeds of *Rhyncholechum* in Taiwan. A and B: *R. brevipedunculatum* (from C. C. Wang 32); C and D: *R. discolor* forma *discolor* (from C. C. Wang 68); E and F: *R. discolor* forma *incisum* (from Chang s. n. 1968); G and H: *R. formosanum* (from C. C. Wang 38). Bars = 50 μ m in left column, 10 μ m in right column.

Key to taxa in Taiwan

- 1. Leaves opposite, leaf blade elliptic or oblong, lateral veins attached to the midrib with an angle of 60°-75°; calyx-segments narrowly triangular to triangular lanceolate 3. *R. formosanum*
- 1. Leaves alternate, leaf blade oblong-oblancoelate, lateral veins at an angle of ca. 45°; calyx-segments linear.
 - 2. Inflorescence in compact simple cyme; peduncle very short, less than 2mm; calyx-segments 1-1.2 cm long, 1.5-2 mm wide 1. *R. brevipedunculatum*
 - 2. Inflorescence in loose compound cyme; peduncle longer than 1.8 cm; calyx-segments 5-8 mm long, ca. 0.5 mm wide
 - 3. Leaf-blades serrate 2a. *R. discolor* forma *discolor*
 - 3. Leaf-blades middle-lobed to shallow lobed, or coarsely few-toothed 2b. *R. discolor* forma *incisum*

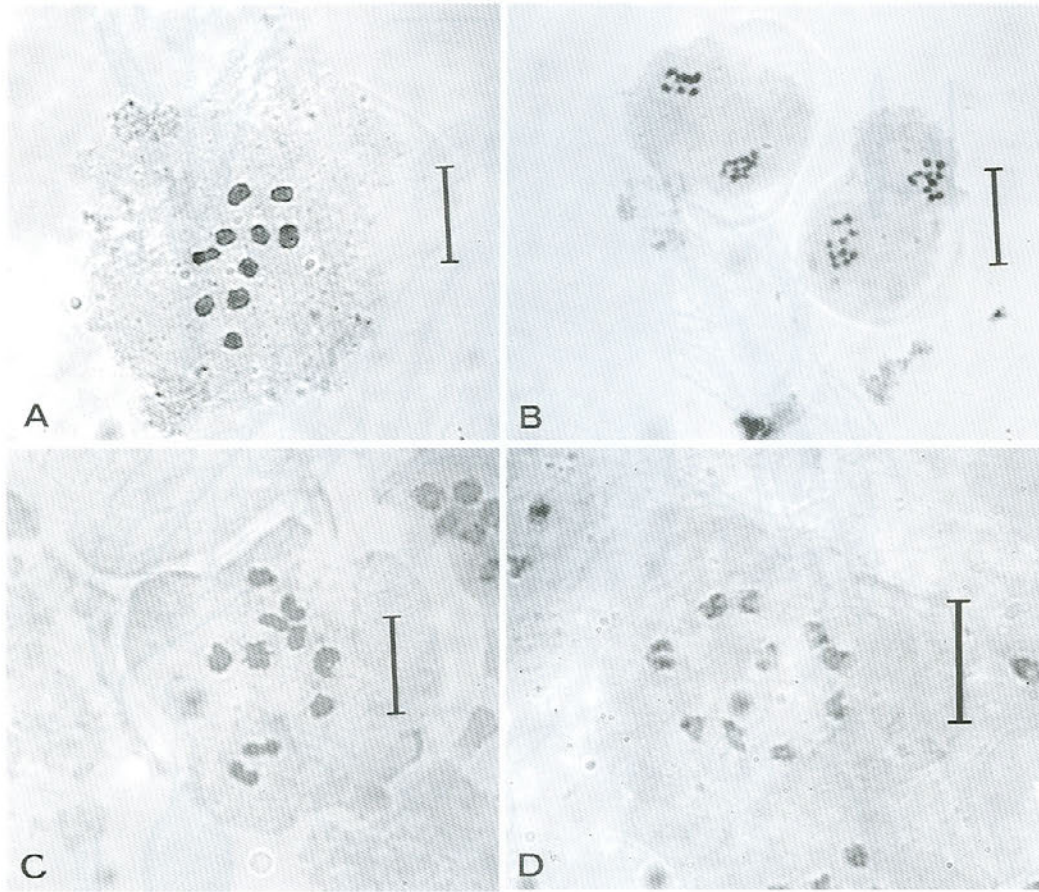


Fig. 3. Meiotic chromosomes of Taiwanese *Rhyncholechum*. All $n = 10$ A: *R. brevipedunculatum* (from C. C. Wang 71); B: *R. discolor* forma *discolor* (from C. C. Wang 25); C: *R. discolor* forma *incisum* (from C. C. Wang & S. C. Liu 49); D: *R. formosanum* (from C. C. Wang 74). Bars = 10 μ m.

1. ***Rhyncholechum brevipedunculatum*** J. C. Wang *sp. nov.*--TYPE: Taiwan, Taipei Hsien, Urai, elev. ca. 300 m, 30 Oct. 1992, J. C. Wang 7905 (holotype: TNU; isotype: HAST, TAI, TAIF, TNU) 短梗同蕊草(短梗線柱苣苔) Fig. 4

Species R. discolori (Maxim.) Burt affinis, sed planta parva, inflorescentia simplex floribus 1-3, breviter pedunculata, calycis segmenta magna differt.

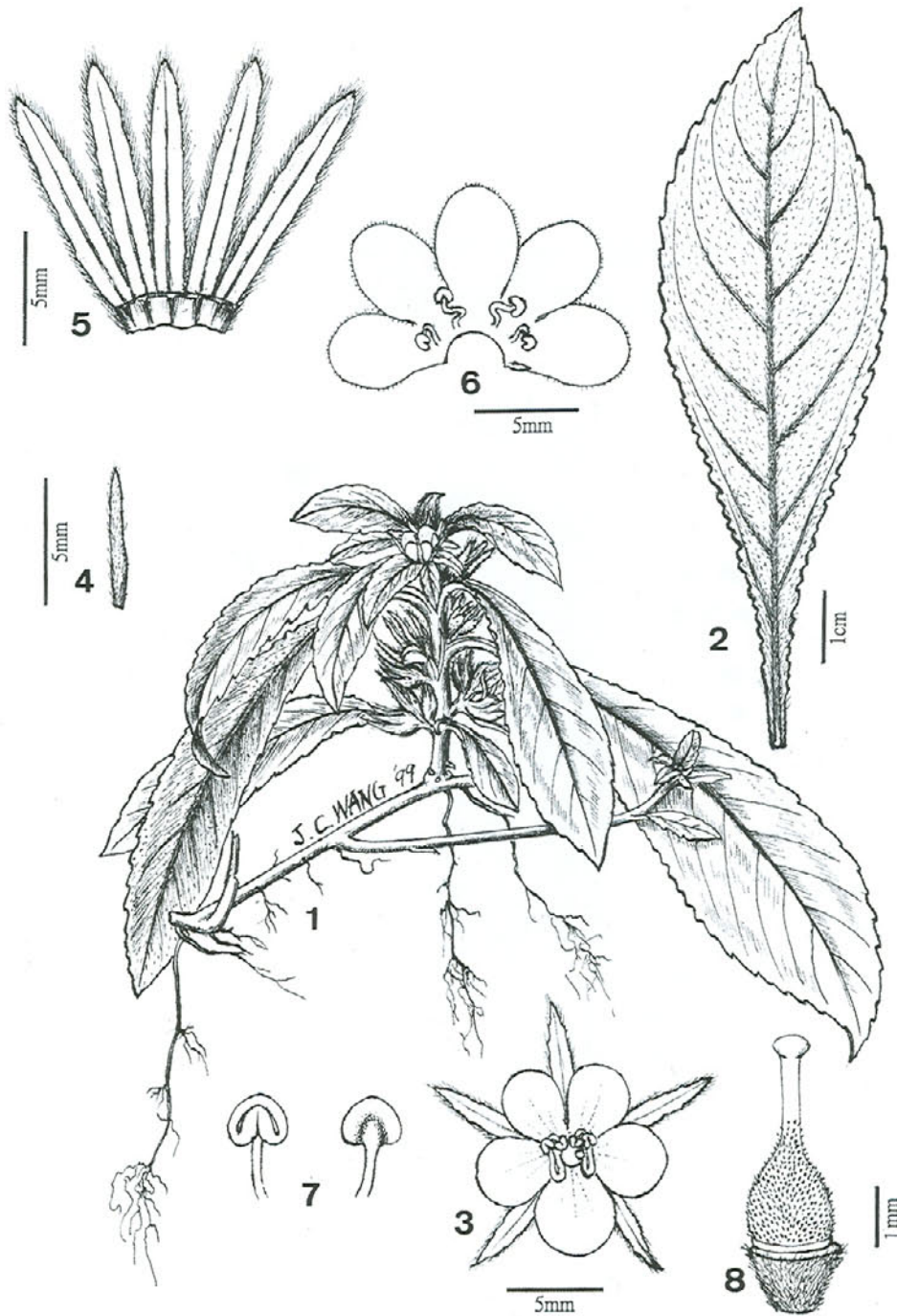


Fig. 4. *Rhynchotechum brevipedunculatum* J. C. Wang. 1: Habit; 2: Leaf, abaxial view; 3: Flower, front view; 4: Bract; 5: Calyx, inside view; 6: Corolla; 7: Stamens; 8: Pistil. (from J. C. Wang 7905)

Subshrubs. 2 - 15 cm, appressed brown pubescent. Leaves alternate, petiole 0.5-2 cm long; leaf blade oblong-oblongate, 2.5~12(~16)×1~2.5 cm, papery or herbaceous, abaxially puberulous, adaxially appressed brown pubescent, persistent on the veins, margin irregularly denticulate, apex slightly acute; lateral veins 5 - 9 pairs. Cyme 1, simple dichasium, axillary; peduncle less than 2 mm, puberulous; bracts lanceolate, 0.8 - 1 cm long, densely appressed brown pubescent. Pedicel less than 1 mm, puberulous. Calyx segments linear, 1 - 1.2 cm long,

1.5 - 2 mm wide, densely appressed pubescent outside, glabrous inside. Corolla white, 7 - 9 mm long, tube *ca.* 2 mm long, upper lip *ca.* 5 mm long, lower lip 6 - 7 mm long. Stamens 4, adnate near corolla base, filaments *ca.* 2.5 mm long; anthers 1 mm long; staminodes 1, *ca.* 0.5 mm long. Gynoecium *ca.* 6.5 mm; ovary *ca.* 3 mm long, puberulous. Berry, ovoid, puberulous. Seeds ovoid to ellipsoid, 0.25-0.3 × 0.1-0.2 mm. Chromosome number $n = 10$.

So far known from Taiwan, confined at low elevations of northern and southern parts.

Additional specimens examined: TAIWAN. TAIPEI HSIEN: Wulai, en route from Wulai to Wulaishan, *J. C. Wang* 9603 (TNU); en route to the Wu-lai-shan, *C. C. Wang* 69 (TNU), 71 (TNU), 78 (TNU); same loc., *C. C. Wang et al.* 33 (TNU); Fu-shan Botanical Garden, *M. J. Lin* 53 (TNU); Sanhsia: Yun-Sen Waterfall, *J. C. Wang et al.* 8231 (TNU); Huangtitten, *S. C. Wu* 1245 (TAIF); Huang-ti-tien-shan, *J. C. Wang* 9948 (TNU); Kan-kou, *M. T. Kao* 7903 (TAI); Hsin-tien, *C. C. Wang* 36 (TNU); Yin-ho-tung, *J. C. Wang* 8194 (TNU). PINGTUNG HSIEN: Lanjenchi, *S. C. Wu et al.* 1309 (TAIF, TNU); Lanjenchi-Luliaoshi, *J. C. Wang & Y. C. Lu* 5550 (TNU); Hengchun, Peitsushan, *T. C. Huang & S. F. Huang* 13549 (TAI); Nanjenshan, *T. H. Hsieh s. n.* Oct. 20, 1989 (TAI); same loc., *C. I. Peng* 7800 (HAST); Luliaoshi, *C. C. Wang et al.* 32 (TNU).

The new species *Rhyncholechum brevipedunculatum* is very similar to *R. discolor*, especially in the shape of the leaves, so that it is frequently misidentified in the herbarium. However, based on our critical comparison, the new species can be distinguished easily from *R. discolor* not only by its extremely short peduncle, but also by many other features, such as dwarf stem, simple-cymose inflorescence, larger flower, much longer and larger calyx-segments, and seed coat micromorphology (Table 2). Besides, we never found any morphologically intermediate plant between them after examining the specimens of this genus in Taiwan herbaria. The two taxa are closely related but readily distinguishable. It is reasonable to treat them as distinct species. Based on its distribution in Taiwan, the new species may be expected to occur also in the Ryukyus.

Table 2. A comparison between *Rhyncholechum brevipedunculatum* and *R. discolor*.

	<i>R. brevipedunculatum</i>	<i>R. discolor</i>
Stem height	Dwarf, < 15 cm	25 - 45 cm
Inflorescence	Simple dichasia, 1 - 3-flowered	Compound dichasia, 6 - 25-flowered
Peduncle	Very short, < 0.2 cm long	Slender, > 1.8 cm long
Calyx segment	10 - 12 × 1.5 - 2 mm	5-8 × <i>ca.</i> 0.5 mm
Corolla tube	<i>ca.</i> 2 mm long	<i>ca.</i> 1 mm long
lip	Upper and lower lip <i>ca.</i> 5 mm and 6 - 7 mm long respectively	Upper lip <i>ca.</i> 3 mm long, lower lip nearly as long as upper
Fruit	Ellipsoid	Ovoid

2. *Rhyncholechum discolor* (Maxim.) Burt, Notes Bot. Gard. Edinburgh **24**: 37. 1962.

2a. *Rhyncholechum discolor* (Maxim.) Burt forma *discolor*, Burt in Notes Bot. Gard. Edinburgh **24**: 37. 1962; Kao and DeVol, *Taiwania* **17**: 163. 1972; Kao and DeVol in Li *et al.* *Fl. Taiwan* **4**: 681, *pl.* 1156. 1978; Li and Hsieh, *Taiwania* **42(2)**: 92. 1997; Li and Hsieh in T. C. Huang *et al.* *Fl. Taiwan*, 2nd ed. **4**: 706, *pl.* 324, *Photo* 362. 1998

同蕊草(異色線柱莖苔)

Isanthera discolor Maxim., Bull. Acad. Sci. St. Petersburg. **19**: 538. 1874.--TYPE: Taipei, Tamsui, 1864, *R. Oldham* 380 (holotype: K, n.v.; isotype: P, n.v.).

Isanthera discolor var. *austrukiushiuensis* Ohwi, Acta Phytotax. Geobot. **7** : 29. 1938.--TYPE: Kiushiu, Pref. Kagoshima: near Haruo, Isl. Yakushima, 7 Sept. 1933, *M. Tagawa* 1867 (holotype: KYO).

Rhyncholechum discolor var. *austrukiushiuensis* (Ohwi) Ohwi, Fl. Jap. Engl. ed. 813. 1965.

Isanthera austrukiushiuensis Ohwi, Acta Phytotax. Geobot. **7** : 29. 1938. *pro syn., nom. inval.*

Subshrubs. 25 - 45 cm, apically densely appressed brown pubescent; with rhizomes. Leaves alternate, appressed brown pubescent; petiole 0.7 - 2.5 cm long; leaf blade oblong-oblancheolate, 6.5 - 19 × 2.5 - 5 cm, papery or herbaceous, abaxially puberulous, adaxially less appressed pubescent, persistent on the veins, margin irregularly denticulate, apex slightly acute; lateral veins 7-12 pairs, attached to the midrib with an angle of 45°. Cyme 1, axillary, branched 2 or 3 times, 6 - 25-flowered; peduncle 1.8 - 5 cm long, puberulous; bracts lanceolate, 5 - 8 mm long, densely appressed brown pubescent. Pedicel 1 - 7 mm long, puberulous. Calyx segments linear, 5-8 mm long, *ca.* 0.5 mm wide, densely appressed pubescent outside, glabrous inside. Corolla white, *ca.* 4 mm long, tube *ca.* 1 mm long, upper lip *ca.* 3 mm long, lower lip nearly as long as upper. Stamens 4, adnate near corolla base, filaments *ca.* 1 mm long; anthers 0.5 mm long; staminodes 1, *ca.* 0.5 mm long. Gynoecium *ca.* 3.5 mm; ovary *ca.* 2.2 mm long, puberulous. Berry white, ovoid, *ca.* 5 mm long, puberulous. Seeds ovoid to ellipsoid, 0.25 - 0.3 × 0.1 - 0.2 mm. Chromosome number $n = 10$.

Distributed in southern Japan, northern Philippines and China, also reported from New Guinea (Burt, 1962). In Taiwan, commonly found at shady places along valleys throughout the island, below 1900 m in elevation.

Additional specimens examined: TAIWAN. TAIPEI HSIEN: Chungho, *W. F. Ho 514* (TNU); Pinghsi, *H. W. Lin 54* (TNU); same loc., *C. C. Wang 25* (TNU), *68* (TNU); Yunsen Waterfall, *K. C. Yang & W. F. Ho 4991* (TNU); Man-Yuei-Yuan, *S. Y. Liu 24* (TAI); Hsintien: Wenshan Experimental Forest, *K. Y. Wang et al. 99* (TNU); Hsiao-ko-tou, *H. T. Huang et al. 99* (TNU); Shih-ting, *C. C. Wang 35* (TNU); Mt. Huang-ti-tien, *J. C. Wang 9739* (TNU). ILAN HSIEN: Northern cross highway, *K. C. Yang & W. L. Chiou 5139* (TNU); Fushan Botanical Garden, *K. C. Yang 4797* (TNU); same loc., *C. C. Wang 52* (TNU). MIAOLI HSIEN: Taian hot-spring, *J. C. Wang 7718* (TNU). NANTOU HSIEN: Hsinmuhchung, *H. F. Yen 1171* (TAI). CHIAYI HSIEN: Fenchihu to Dadonshan, *F. W. Lin et al. 113* (TNU); Furshan, *J. C. Wang et al. 6272* (TNU); same loc., *J. C. Wang et al. 9482* (TNU). KAOHSIUNG HSIEN: Tengchih, *J. C. Wang et al. 10373* (TNU); same loc., *T. C. Huang & S. F. Huang 13810* (TAI); Shan-ping, *J. C. Wang 9685* (TNU). PINGTUNG HSIEN: Laiyi to Laiyi Farm, *J. C. Wang & H. T. Hung 8434* (TNU); Forest trail from Ali to Hsiaokueihu, *C. C. Liao et al. 691* (TNU); Nanjenshan, *C. C. Wang 551* (TNU); Tahan Forest Road, *S. C. Hsiao et al. 1043* (TNU); Lanjenshi-Luliaoshi, *J. C. Wang 5551* (TNU). TAITUNG HSIEN: Tai-ma-li working station, *J. C. Wang et al. 8761* (TNU). HUALIEN HSIEN: Yuli, *S. C. Wu & K. C. Yang 1022* (TNU); Yushan National Park, en route from Walami through Totukun, *T. P. Chiang et al. 17* (TNU); Hoping logging tract, *J. C. Wang et al. 8681* (TNU); Taroko National Park: Chingshuishan, *C. C. Liao et al. 487* (TNU); Logging route beside Paipaoshi, from Pinho to Yuanlaonaoshan, *W. P. Leu et al. 1457* (TNU). For further specimens see Li and Hsieh (1997).

Ohwi (1938) first described *Rhynchotechum discolor* var. *austrokiushiuensis* and separated it from the typical phase by having short pedicel and short-pedunculate glomerate inflorescence. His treatment was adopted by most taxonomists except Walker (1976) who considered that the short subcapitate inflorescences seem to be immature unexpanded and reduced it to the synonymy of *R. discolor*. A clear photograph of type specimen (in KYO Herbarium) was seen by us. Its long-pedunculate inflorescence with quite a few flowers growing in cluster is just like those immature plants of *R. discolor* we observed in the field. Furthermore, its linear calyx-segments, as can be clearly observed in the photograph, are identical with those of *R. discolor*. Walker's treatment was very possibly right, and therefore adopted here.

2b. *Rhynchotechum discolor* forma *incisum* (Ohwi) Hatusima ex J. C. Wang, *comb. nov.*

羽裂同蕊草(羽裂線柱苣苔)

Isanthera discolor var. *incisa* Ohwi, Acta Phytotax. Geobot. 7: 29. 1938.--TYPE: Okinawa, Kunigami, Nagodake, 8 Aug. 1937, T. Kanashiro 9, (holotype: KYO; isotype: TAI).
Rhynchotechum discolor forma *incisum* (Ohwi) Hatusima, Fl. Ryukyus 557. 1971, *invalid comb.*;
 Hatusima in Hatusima & Amano, Fl. Ryukyus 2nd ed. 203. 1994. *invalid comb.*
Rhynchotechum discolor var. *incisum* (Ohwi) Walker, J. Jap. Bot. 46: 69. 1971; Li & Hsieh, Taiwania 42(2): 93. 1997; Li & Hsieh in T. C. Huang *et al.*, Fl. Taiwan, 2nd ed. 4: 708. 1998

The form can be distinguished from the species primarily by its incised leaves. Chromosome number $n=10$.

Distributed in Okinawa Islands and southern Taiwan. In Taiwan, found in shady wet places at low altitude of southern part.

Additional specimens examined: TAIWAN. PINGTUNG HSIEN: Nanzenshan, T. Y. Yang 1091 (TAI); same loc., C. C. Wang & S. C. Liu 49 (TNU).

Based on our observation, this taxon is almost identical with *R. discolor* forma *discolor* in gross morphology, including inflorescence, calyx, corolla, fruit, and seed (see above "taxonomic characters"). Incised-leaf is the sole character that can be used to distinguish them, as Ohwi (1938) had pointed out "A typo foliis incisus obsolete serratis differt." in his original description. In our opinion, it is nothing but a sporadic variation. Its reduction to the rank of form by Hatusima (1971) was an improvement and is adopted here. However, Hatusima failed to validate his new combination in 1971 and subsequent treatments in 1975 and 1994. He cited the basionym and its author but without reference to its place of valid publication. The combination, *R. discolor* forma *incisum*, is validated here by giving the full reference to its basionym.

3. ***Rhynchotechum formosanum*** Hatusima, J. Jap. Bot. 15: 132, Fig. 1. 1939; Kao and DeVol, Taiwania 17: 163-164. 1972, in Li *et al.* Fl. Taiwan 4: 684. 1978; Li and Hsieh, Taiwania 42: 93. 1997, Li and Hsieh in T. C. Huang *et al.*, Fl. Taiwan, 2nd ed. 4: 708, Photo 363. 1998.--TYPE: Taipei, Kankou, 30 Oct. 1932, S. Hatusima s. n. (holotype: FU, n. v.)
 蓬萊同蕊草 (台灣線柱苣苔)

Lysimachia saurauifolia S. S. Ying, Quart. J. Chinese Forest. 20: 123, pl. 1. 1987.--TYPE: Taipei, Hsintien, Kungpingshan, 320 m alt., 2 Aug. 1986, S. S. Ying s. n. (holotype: NTUF).
Rhynchotechum ellipticum var. *saurauifolium* (S. S. Ying) S. S. Ying, Mem. Coll. Agr. Taiwan Univ. 29(2): 46, pl. 1-2. 1989.
Rhynchotechum saurauifolia (S. S. Ying) S. S. Ying, Mem. Coll. Agr. Taiwan Univ. 29: 46. 1989. *pro syn., nom. inval.*

Subshrubs. 15 - 70 cm, apically densely appressed brown pubescent. Leaves opposite, appressed brown pubescent; petiole 0.5 - 2.5 cm long; leaf blade elliptic-oblong, (6.5-)13-26 × (2.5-)6.5-12 cm, papery, abaxially puberulous, adaxially few appressed pubescent, persistent on the veins, margin denticulate, base cuneate, apex short acuminate or acute; lateral veins 9 - 14 pairs, 60° - 75° with midrib. Cymes often in pair, axillary, opposite, branched 2 or 3 times, purple; peduncle 1.5 - 5.0 cm long, puberulous, bracts lanceolate, 5 - 8 mm long, densely appressed brown pubescent. Pedicel 0.8 - 1.6 cm long, puberulous. Calyx segments narrowly triangular to triangular lanceolate, 4 - 5 mm long, 1.5 - 2 mm wide at base, densely appressed pubescent outside, glabrous inside. Corolla white, occasionally tinged purple, ca. 4 mm long, tube ca. 2 mm long, upper lip ca. 4 mm long, lower lip ca. 3 mm long. Stamens 4, adnate to corolla base, filaments ca. 1 mm long; anthers 1 mm long; staminodes 1, ca. 0.2 mm long. Gynoecium ca. 4 mm; ovary ca. 3.5 mm long, puberulous. Berry white, subglobose, 6 - 8 mm long, puberulous. Seeds ovoid to ellipsoid, 0.25 - 0.3 × 0.1 - 0.2 mm. Chromosome number $n = 10$.

Distributed in southern and southwestern China (Guangdong, Hainan, Guangxi, and Yunnan) (Li and Hsieh, 1998) and northern Taiwan. In Taiwan, found in wet places along shady stream valley, from 100 to 400 m in elevation.

Additional specimens examined: TAIWAN. TAIPEI HSIEN: Shihing District: Leikungpo, Hsiaokotou, C. I. Peng & L. A. Hu 12294 (HAST); Hsiaokotou, S. F. Huang K185 (TAI); Lei-kung-po, T. S. Hsieh & K. C. Yang 691 (TAI); Pinglin Hsiang: Chihsi Village, C. I. Peng et al. 15198 (HAST); Bunzangun, Sasaki s. n. Aug. 12, 1930 (TAI); Pinghsi, C. C. Wang 38 (TNU), 74 (TNU); Hsintien, S. S. Ying s. n. Aug. 2, 1986 (NTUF).

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台灣產苦苣苔科同蕊草(線柱苣苔)屬植物之訂正

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摘 要

本文依據詳細之外部形態研究結果將台灣產同蕊草屬植物(*Rhyncholechum* Blume)處理為三種一型：短梗同蕊草(*R. brevipedunculatum*)，同蕊草(*R. discolor* forma *discolor*)，羽裂同蕊草(*R. discolor* forma *incisum*)以及蓬萊同蕊草(*R. formosanum*)，其中短梗同蕊草為新種。根據詳細之形態研究，發現羽裂同蕊草與同蕊草除葉形外並無其他差異，故將之處理為同蕊草之一型(*R. discolor* forma *incisum* (Ohwi) Hatusima ex J. C. Wang comb. nov.)。台灣產本屬植物在外部形態方面，以葉序、葉片形態、花序類型、萼片形態等為分類的重要特徵。以掃描式電子顯微鏡觀察台灣產本屬植物種皮細部形態，發現各分類群大致相同，但仍有種間差異存在。本研究並檢視減數分裂之染色體數目，發現台灣產本屬植物均為 $n=10$ ，其中短梗同蕊草，羽裂同蕊草以及蓬萊同蕊草之染色體數目為首次報導。

關鍵詞：染色體數目，分類訂正，短梗同蕊草，苦苣苔科，台灣。

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