

## Identity of *Burmannia nana* Fukuy. & T. Suzuki, A Species of Burmanniaceae Endemic to Taiwan

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**ABSTRACT:** *Burmannia nana* Fukuy. & T. Suzuki was described in 1936 on the basis of one individual collection in Lanyu Island of the southeastern coast of Taiwan. The species was transferred to *Gymnosiphon* in 1940 as *G. nanus* (Fukuy. & T. Suzuki) Tuyama, but this name was not adopted in the first edition of Flora of Taiwan. Careful examination of the flowers of this species makes it clear that the species is referable to *Gymnosiphon aphyllus* Blume which was described from western Java. The species is newly recorded in Taiwan. The type of *B. nana* Fukuy. & T. Suzuki doesn't exist in Taiwan and Japan, hence the neotype is designated, *i. e.*, *T. H. Hsieh 2014* in TAI.

**KEY WORDS:** Burmanniaceae, *Burmannia nana*, *Gymnosiphon aphyllus*, Neotype, Taiwan.

### INTRODUCTION

During our study on Burmanniaceae for the second edition of Flora of Taiwan vol. 5 (eds. T. C. Huang *et al.* in prep.), we have been much interested in the identity of *Burmannia nana* Fukuy. & T. Suzuki. The holotype was recorded as kept in TAI in the original publication, but it is not exist in the herbarium (Huang, pers. com.). Moreover, no specimens of the species are found in major herbaria in Taiwan and Japan: KYO, TAI, TI, TNS and TUS. The type seems to be lost during unexpectedly confused times after World War II. Rediscovery of this species has, therefore, been much awaited. Fortunately, the second author found two plants referable to *Burmannia nana* in Tasenshan, Lanyu Island, on 30 August 1998, where is the same locality of the original plant collected 65 years ago.

In this paper, based on morphological examination of our new material, we newly try to identify the species and to compare the species with related ones known in neighboring areas, because *Burmannia nana* has never been compared with other species in all previous studies (Fukuyama and Suzuki, 1936; Tuyama, 1940; Liu and Su, 1978; Wu and Chen, 1981).

### Taxonomic History of *Burmannia nana*

*Burmannia nana* Fukuy. & T. Suzuki was described by Fukuyama and Suzuki (1936) based only on one individual collection by Fukuyama in a tropical rain forest in a mountain, west of Mt. Omori-yama, in southern Lanyu Island (Botel Tobago) in 1935. This species was tentatively placed in the genus *Burmannia* in the original publication (Fukuyama and Suzuki, 1936).

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In the explanatory note written in Japanese in the original publication of *Burmannia nana*, Fukuyama and Suzuki (1936) pointed out that this plant lacks wings or ribs on the tubular perianth-tube and has the apically lamellate inner segments which indistinguishable from the outer segments. Their Latin description runs as follows: "*perigonii tubus cylindraceus, ..., glaber, toto facie exalatus, segmentis 3 perbrevis*". Due to these features they doubted the plant to classify into *Burmannia* and suggested to create a new genus to accommodate it. Tuyama (1940) interpreted that *Burmannia nana* was not complete but a plant losing the upper parts of perianth. He regarded the perianth-segments of the plant described by Fukuyama and Suzuki as a basal part of a remainder of perianth-segment. He considered that this species belongs to *Gymnosiphon*. The inflorescences of *Gymnosiphon* are cincinnus, the limb of perianth is caducous after anthesis, the perianth-tube has no wings, anthers whether or not inserted near the top of the tube and ovary is 1-celled and placentae parietal, while *Burmannia* has solitary flowers or several-flowered fascicle, persistent perianth after anthesis, the tube is winged or not, anthers inserted near the top of the tube and ovary is 3-celled and placentae axile. Tuyama (1940) did not compare the inflorescences of *Burmannia nana* with *Gymnosiphon*, but noted that *B. nana* doesn't have a broad connective in the stamen (connective is broad in *Burmannia*) and has a seemingly 1-celled ovary. He recognized, accordingly, the species as *Gymnosiphon nanus* (Fukuy and T. Suzuki) Tuyama, although this name was not cited in Flora of Taiwan (Liu and Su, 1978; Huang, 1979). Tuyama (1940) distinguished *G. nanus* from other species of the genus in having a stout stem. *Burmannia nana* was recorded by Liu and Su (1978) in the first edition of Flora of Taiwan (Li *et al.*, 1978), but the description was a translation from the original one. On the other hand, *Gymnosiphon nanus* was adopted in Flora Reipublicae Popularis Sinicae (Wu and Chen, 1981) as a species endemic to Taiwan without examining any specimens.

#### Identification of our new material

Our new material contains two plants in flowering stage. They are quite similar to *Burmannia nana* illustrated by Fukuyama and Suzuki (1936) (Figs. 1 and 2). The original plant bears densely 4 flowers at the apex of stem of which one is flowers and 3 are flower-buds, but ours 4 or 6 flowers with 1-2 flower-buds, respectively. Flowers of our material match those described in the original description: they are about 4 mm long, the perianth-tube is cylindrical, pale yellowish, ca. 3 mm long and not winged on outer surface, the outer perianth-segments are 3, white and about 1 mm long, and the inner ones are minute, about 0.2 mm long. Stamens of new material match the original description. The ovary is 1-celled with parietal placentae, the style and stigma fit well with the original description. Accordingly, we refer our new material to *Burmannia nana*.

One of the most important differences between *Burmannia* and *Gymnosiphon* is in the ovary, but this character was neither mentioned nor illustrated in the original publication of *B. nana*. Tuyama (1940) supposed that the ovary seems to be 1-celled, but did not show any evidence of his interpretation. Our new material shows definitely that *B. nana* has 1-celled ovary and parietal placentae. Therefore, the treatment by Tuyama (1940) is supported in our study, that is, *B. nana* is belonging to *Gymnosiphon*.

#### Identity of *Gymnosiphon nanus*

Generally, flora of vascular plants of Taiwan is closely related to that of the Ryukyus of Japan, south and east China and the Philippines, although a number of disjunct distribution is known in Burmanniaceae at specific or generic level. According to Hsieh *et al.* (1994), the

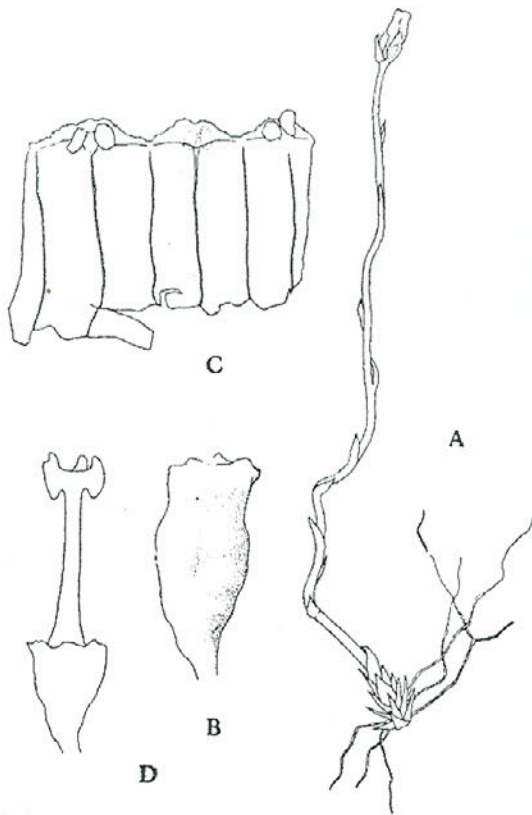


Fig. 1. *Burmannia nana* Fukuyama & T. Suzuki in the original publication. A: habit; B: flower; C: perianth dissected (view from inside) and anthers; D: style. Reproduced from Journal of Japanese Botany (1936) with permission of Tsumura Laboratory.

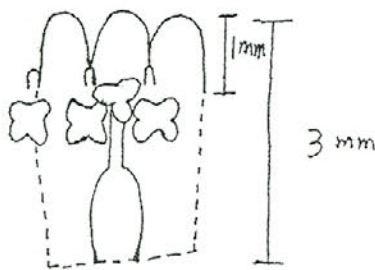


Fig. 2. *Gymnosiphon aphyllus* Blume (Lanyu Isl.: Tasenshan, ca. 280 m alt., 30 Aug 1998, T. H. Hsieh 2014).

flora of Lanyu is close to that of Malesian Region, especially that of the Philippines. We have tried to identify *Gymnosiphon nanus* in comparing with known species of the genus occurring in these regions. There are no species of *Gymnosiphon* in Japan (Satake, 1982), 1 species in China, i. e., *G. nanus* from Taiwan (Wu and Chen, 1981), and 7 species in Malesia (Jonker, 1948) in which only *G. aphyllus* Blume is found in the Philippines, although Merrill (1924) excluded a record of this species from the Philippines in his "Enumeration".

Among the species known in Malesia, *G. aphyllus* is most similar to *G. nanus*. *G. aphyllus* was found in shady habitat in Mount Megamendung in western Java (Blume, 1827) and occurs throughout Malesia and South Thailand (Jonker, 1948). According to a key to the Malesian species of *Gymnosiphon* prepared by Jonker (1948), *G. aphyllus* is distinguished from other species in the following characters: anthers inserted above the middle of the perianth, and flowers pedicellate and in loose, many-flowered cincinni or bifid cincinni. *G. nanus* agrees with *G. aphyllus* except for the inflorescence, i. e., flowers are in dense cyme in *G. nanus*. The difference between *G. nanus* and *G. aphyllus* is considered to be within a continuous range of variation. We think the cyme in *G. nanus* is a poorly developed state of cincinnus. Smaller habit, fewer flowers and shorter pedicel in *G. nanus* than those in *G. aphyllus* also show poorly developed state of *G. nanus*. We consider that *G. nanus* is a poorly developed individuals of *G. aphyllus*.

### TAXONOMIC TREATMENT

***Gymnosiphon aphyllus*** Blume, Enum. Pl. Javae 1: 29. 1827, as aphyllum [Type. Crescit in umbrasis montis Megamendung Javae occidentalis. Blume (probably in L., n.v.)]; Jonker, Monogr. Burmann.: 30. 1938; Jonker, Fl. Males. ser. I, 4: 20. 1948. Figs. 3-4

*Burmattia nana* Fukuy. & T. Suzuki in J. Japan. Bot.12: 415, Figs. 5 & 6. 1936; T. S. Liu & H. J. Su in Fl.Taiwan 5: 145. 1978, syn. nov.

*Gymnosiphon nanus* (Fukuy. & T. Suzuki) Tuyama, Icon. Pl. Asia. Orient. 3 (3): 239. 1940, as *nana*; T. L. Wu & S. J. Chen in Fl. Reip. Popul. Sin.16(2): 175. 1981, as *nana*, syn. nov.

Saprophyte, annual, white to pale yellowish, without chlorophyll. Stems simple, terete, very slender, glabrous, 7-8 cm long. Leaves scale-like, ovate, 1-nerved, 1.5-2 mm long, internodes 6-7 mm long in upper part. Inflorescences terminal cyme, densely 5-8-flowered, sometimes uppermost leaf embracing a rudimentary flower-bud; bracts ovate, ca. 2 mm long, apex obtuse. Pedicel 2-3 mm long. Flowers ca. 3 mm long, white; perianth-tube cylindrical, glabrous, not winged, ca. 3 mm long; perianth-segments 6: outer 3 ovate, ca. 1 mm long, deciduous after flowering; inner 3 minute, ca. 0.2 mm long. Anthers 3, adnate near the top of perianth-tube, sessile. Ovary 1-celled, ca. 2 mm long; style erect, nearly the half of perianth-tube, divided into 3 stigmas.

Distr. Malesia, Micronesia (Baberudaob Island in Palau Islands) [see Ohashi in this journal] and Taiwan (Lanyu Island).

Taiwan. Taitung: Lanyu Island (Botel Tobago), in *pluviisilvis monte* Omoriyama, ca. 300 m. alt. *N. Fukuyama* 3616. 3 July 1935 (TAI, holotype, not seen); Tasenshan, ca. 280 m alt. 30 Aug. 1998. *T. H. Hsieh* 2014 (TAI, neotype; photo. in TAI, TUS). The holotype of *Burmattia nana* is lost, hence we designate the neotype as cited above.

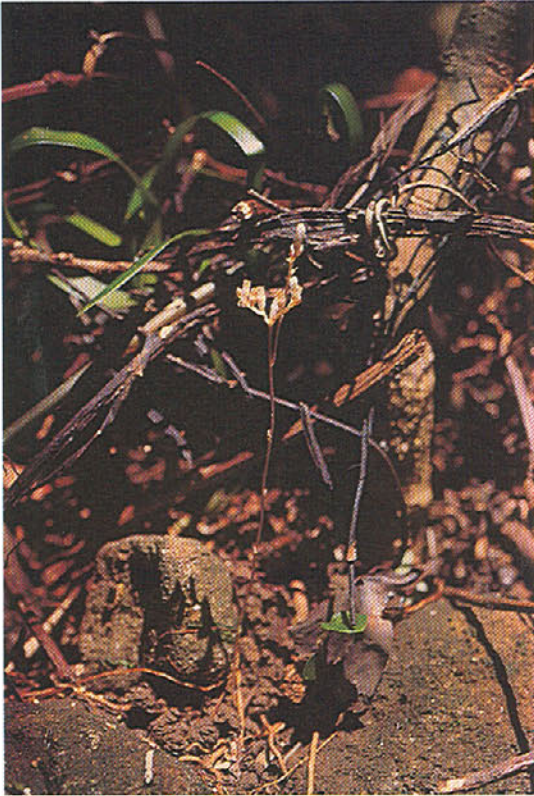


Fig. 3. Habitat of *Gymnosiphon aphyllus* Blume. (Photographed by T.-H. Hsieh).

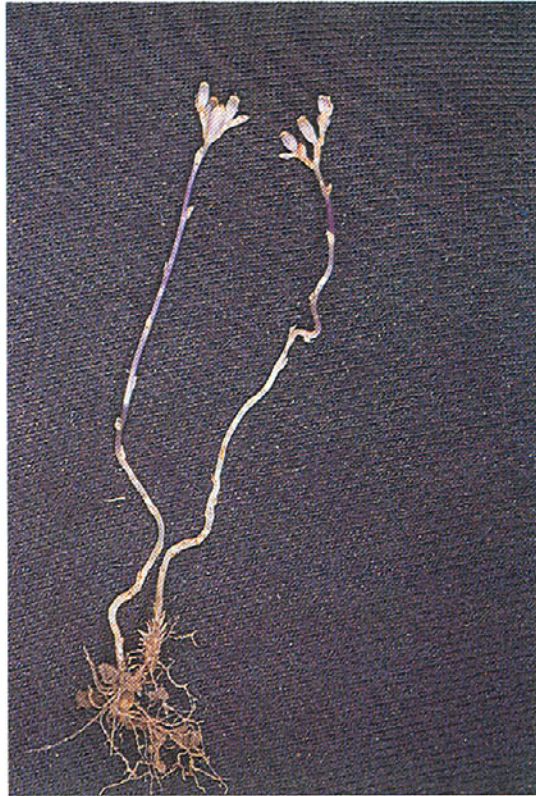


Fig. 4. Neotype of *Gymnosiphon aphyllus* Blume. (T.-H. Hsieh 2014, TAI).

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### LITERATURE CITED

- Blume, C. L. 1827. Enumeratio Plantarum Javae. Fascicles 1: 28. J. W. van Leeuwen, Leiden.
- Fukuyama, N. and T. Suzuki. 1936. Three new saprophytic species of plants from the Island of Kotosyo, Taiwan. *J. Japan. Bot.* **12**: 410-416.
- Hsieh, C.-F., C.-F. Shen and K.-C. Yang. 1994. Introduction to the flora of Taiwan, 3: floristics, phytogeography, and vegetation. In: Huang, T.-C. *et al.* (eds.), *Flora of Taiwan*, 2nd edition: 7-18. Editorial Committee of the Flora. of Taiwan, Second Edition, Taipei.
- Huang, T.-C. 1979. A checklist of the vascular plants of Taiwan. 2. Spermatophyta. In: Li, H.-L. *et al.* (eds.), *Flora of Taiwan* 6: 22-188. Epoch Pub. Co. Ltd. Taipei.
- Jonker F. P. 1948. Burmanniaceae. In: van Steen (eds.), *Flora Malesiana ser. I.* **4**: 13-26.
- Li, H.-L., T.-S. Liu, T.-C. Huang, T. Koyama and C. E. DeVol (eds.). 1978. *Flora of Taiwan* vol. 5. Epoch Publishing Co., Ltd. Taipei.
- Liu, T.-S. and H.-J. Su. 1978. Burmanniaceae. In: Li, H.-L. *et al.* (eds.), *Flora of Taiwan* **5**: 144-145.
- Merrill, E. D. 1924. Burmanniaceae. In: *An Enumeration of Philippine Flowering Plants* **1**: 251. Manila.
- Satake, Y. 1982. Burmanniaceae. In: Satake, Y. *et al.* (eds.), *Wild Flowers of Japan, Herbaceous Plants (including Dwarf Subshrubs)* **1**: 63-64, pls. 58-59. Heibonsha Ltd., Publishers. Tokyo. (in Japanese).
- Tuyama, T. 1940. Tabula 87. Gymnosiphon Okamoto Tuyama. In: Nakai, T. (ed.), *Iconographia Plantarum Asiae Orientalis* **3**: 237-240.
- Wu, T.-L. and S.-J. Chen. 1981. Burmanniaceae. In: *Flora Reipublicae Popularis Sinicae* **16**: 169-175. Science Press, Beijing.

## 台灣特有種植物—小水玉簪（水玉簪科）之辨正

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## 摘 要

小水玉簪(*Burmannia nana*)是福山伯明和鈴木時夫於1936年根據採自蘭嶼島上的一株植物標本所發表的新種植物。Tuyama於1940年將其轉移至*Gymnosiphon*之下成為*G. nanus*，但此學名在台灣植物誌第一版中並未被採用。第二作者於蘭嶼大森山重新採獲此種植物，經仔細比對確認與福山伯明的原採集植物相同，且本種與產自西爪哇的*Gymnosiphon aphyllus* Blume非常相似，因此將*B. nana*當作*G. aphyllus*的異名。因為*B. nana*的模式標本已經遺失，本文重新選定新模式標本 T. H. Hsieh 2014 存放於台大植物系標本館(TAI)。

關鍵詞：水玉簪科，小水玉簪，新模式標本，台灣。

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