

## Trigonocarpace Violets of Taiwan

By

Tamotsu HASHIMOTO\*

橋本 保\*: 台湾産タチツボスミレ類

Although the Trigonocarpace violets (gen. *Viola* L.-subgen. *Viola*-sect. *Trigonocarpace* Godron, emendated by F. Maekawa & Hashimoto, 1963=*Caninae* & *Sylvestres* of Nakai, 1922, for the greater part=Sekt. *Nomimium* Ging.-*Rostratae* Kupffer, emendated by W. Becker, 1925) are widespread in the Northern Hemisphere, they have not been properly recorded from Taiwan. They can be recognized within the genus by having following characters: rhizome at or just beneath the surface of ground somewhat woody with approximate nodes, often branching; aerial stem or stolon usually elongate in or after flowering; leaves with a distinct petiole; stipules incised to fimbriate-pectinate; flowers purple to white with an apparent spur; style rather slender, not laterally deplanate at the stigmatic area, cylindric, slightly clavate or hooked with a rostellate or nearly upward stigma.

Three taxa of the section *Trigonocarpace* are recognized among the collection of Mr. Koji Nagami, who travelled Taiwan several times in recent years and kindly presented to the author a number of specimens.

***Viola nagamiana*** Hashimoto, sp. nov.

Differt a *V. sacchalinensis* rhizomate saepe elongato; foliis sparsim pilosis, plerumque cordiformibus et abrupte acutis; stipulis fimbriato-laciniatis; petalo infimo brevissimo; capsulis globosis.

Plant usually caespitose. Rhizome dark brown, often elongate and creeping rather deep, less branching except near the surface of ground, bearing white adventitious roots. Stems usually abbreviated, rarely ascending to 7 cm long as in the specimen from Yushih. Leaves congested; blade deep green and with sparse hairs on the upper surface, glaucous and often purplish and with no hair on the lower surface, cordiform or reniform, 20 to 40 mm long, 18 to 28 mm wide, commonly short-acuminate, rarely subacute or obtuse at the apex, cordate at the base, depressed crenate-serrate at the margins; petiole 1.5 to 2.3 times longer than the blade in basal ones, as long as in upper ones, glabrous; stipules narrowly ovate in outline, deeply fimbriate-lacinate at the margins, about 10 mm long. Peduncles slender, upright, 3 to 5 cm long with opposite or subopposite bracts

\* Tsukuba Botanical Garden, National Science Museum, Ibaraki 305. 国立科学博物館 筑波実験植物園.

near the summit. Bracts linear-triangular with a few basal dentations at the margins. Pedicels 7 to 10 mm long. Flowers 9 to 15 mm in diameter, almost white to pinkish with dark violet veins at the lower petal, yellowish green at the base of every petal. Sepals purplish with scarious margins, narrowly lanceolate, 5 to 6 mm long, acute, glabrous, sparsely pubescent in the specimen from Meifeng; appendages 1 to 2 mm long, dentate, glabrous. Upper petals obovate, 7 to 9 mm long, 3 to 6 mm wide; laterals similar to the uppers, sometimes retuse at the apex, with dense clavate papilla at the mouth; lower shorter and smaller than the others, obtuse or bluntly apiculate, 4 to 5 mm long, about 2.5 mm wide, with a cylindrical, obtuse and 2 to 2.5 cm long spur. Ovary green, glabrous. Style rostrate, minutely papillose at the rear half of stigmatic area. Cleistogamous flowers short-stalked, i.e. with a 5 to 10 mm long peduncle and a 1.5 to 2.5 mm long pedicel. Plant fructiferous by both chasmogamous and cleistogamous flowers. Capsule globose, 3 to 6 mm in diameter, with minute purple spots; peduncle prostrate when maturing; pedicel slightly upcurved. Seeds light brown or brown; aril conspicuous.

#### SPECIMENS EXAMINED

TAICHUNG: Wu-Ling, alt. ca. 1850 m, cult. in Hino, Tokyo, Apr. 11, 1985, K. Nagami, TNS 9504019-type; Ibid., Aug. 3, 1984, K. Nagami, plant with cleistogamous flowers, TNS 9504018.

NANTOU: Meifeng, Mar. 31, 1986, K. Nagami, rhizome abbreviated, TNS 9504020; Ibid., rhizome elongate, flowers not fully opened, TNS 9504021; Yushih, alt. ca. 1700 m, Apr. 2, 1986, K. Nagami, aerial stem ascending, TNS 9504022.

#### LIVING COLLECTIONS

TBG acc. nos. 54857 & 74580, plants from the type locality.

This new species apparently belongs to the sect. *Trigonocarpace*-subsect. *Campylostylae*-ser. *Campylostylae* (emendated by F. Maekawa & Hashimoto, 1963) since it has papillae inside the lateral petals and at the rear half of the stigmatic area. As the author provides the diagnosis, it differs from *V. sacchalinensis* H. de Boissieu of northeastern



Fig. 1. *Viola nagamiana* Hashimoto, sp. nov. at Meifeng, Mar. 31, 1986. Photograph by K. Nagami.

Asia in many morphological features. '*V. okinawensis* Nakajima & Hama' from Isl. Okinawa, which was illustrated by Hama (1975) without nomenclatural standing, is probably the most closely related violet with this new species, but the former has glabrous leaf-blades with overlapped basal lobes and flowers with a larger lower petal.

***Viola obtusa*** (Makino) Makino var. ***tsuifengensis*** Hashimoto, var. nov.

A typo differt caulibus elongatis floriferis; appendicibus sepalorum conspicuis et dentatis; petalis angustioribus; marginibus petalorum undatis; calcari brevior.

Plant puberulent or rarely glabrescent. Rhizome rather stout with dried brown scales, 0.5 to 2 cm long, erect or subhorizontal, bearing a considerable number of hard lateral roots. Stems erect or ascending, 2 to 12 cm long in flowering, usually bearing 1 to 2 stipule-like scale(s) between the base and the first cauline leaf. Basal leaves few or evanescent in flowering; blade cordate-ovate or rarely cordate-reniform, acute or rarely obtuse at the apex, with depressed crenate margins, 17 to 30 mm long, 16 to 24 mm wide; petiole 17 to 60 mm long; stipules brownish, ovate, fimbriate-laciniate, 8 to 10 mm long. Cauline leaves usually tufted above 1/3 of the plant; blades longer than wide, mostly triangular ovate, acute or rarely obtuse at the apex, cordate at the base, with depressed crenate margins, 10 to 30 mm long, 8 to 24 mm wide; petiole usually shorter than the blade, 5 to 23 mm long; stipules greenish, ovate-lanceolate to lanceolate with fimbriate-laciniate margins, 8 to 11 mm long. Peduncles slender, usually arising from the axes of the cauline leaves, 20 to 80 mm long, with opposite or subopposite bracts near the summit; bracts linear-triangular with a few glandular processes at the basal parts of the margins; pedicels 5 to 7 mm long. Flowers pale purple with darker veins at the mouth and with a yellowish green spur. Sepals green with purple tints and scarious margins, lanceolate, 5 to 7 mm long, 1 to 1.5 mm wide, acuminate at the



Fig. 2. *Viola obtusa* (Makino) Makino var. *tsuifengensis* Hashimoto, var. nov. at Tsuifeng, Mar. 31, 1986. Photograph by K. Nagami.

apex; appendages of the laterals obtriangular, about 1.5 mm long, irregularly dentate. Petals obovate, up to 12 mm long, about 5 mm wide, with undulate margins, not bearded; lower not recurved, thus appears longer than the others; spur 2.5 to 3 mm long. Style rostrate, glabrous. Ovary glabrous.

SPECIMENS EXAMINED

NANTOU: Tsuifeng, Mar. 31, 1986, K. Nagami, plant puberulent with acute leaves, TNS 9504028-type; Ibid., plant glabrescent with obtuse leaves, TNS 9504030.

*Viola obtusa*, as a specific category, is newly recorded to Taiwan, but the Taiwanese plant differs from the Japanese typical variety in its caulescent habit in flowering, more triangular and acute leaves, light-coloured flowers with conspicuous sepaline appendages, narrower and undulate margins of the petal and shorter spur. The sciophylous tolerance and a more elongate rhizome than in var. *obtusa* seem to be additional features of this new variety.

Although *Viola acuminata* was reported from five localities of the Central Mountains of Taiwan, including Tsuifeng, by Kao & Chiu (1978), it was doubtful. According to their descriptions, their '*V. acuminata*' had erect or ascending stems with adventitious roots at the nodes and a 0.5 to 0.6 cm long spur of the lower petal. As far as the author knows, these characters do not agree with those of *V. acuminata*. *V. acuminata* has erect stems without any adventitious root in nature and a less than 4 mm (usually 2 to 3 mm) long spur. They did not mention about the hairiness at the inside of lateral petals and the rear half of stigmatic area which is one of the evidence of *V. acuminata*. As they did not notice its significance, the author suspects that the laterals and style of their flowers are glabrous. Their illustration on page 120 shows that the plant has no adventitious root on the aerial stem unlike their description, and has roots from the subterranean stem as in many other *Trigonocarpaceae* violets. The illustrated plant seems to be identical with the present new variety in its all aspects. The material was probably collected from Tsuifeng, because K. Nagami could find the variety only at Tsuifeng, even he carefully sought for it in various places of Taiwan. The author can not identify other cited plants by Kao & Chiu with proper species but they are presumably members of the *Trigonocarpaceae*.

***Viola grypoceras*** A. Gray in Narr. Perry's Exped. 2, Append. 308, 1856.

SPECIMENS EXAMINED

TAICHUNG: Wu-Ling, at forest-edge, alt. ca. 1850 m, Aug. 3, 1984, K. Nagami, plant with fruits, TNS 9504008; Ibid., without date, K. Nagami, TNS 9504009; Ibid., Mar. 19, 1987, K. Nagami, TNS 9504010 & 9504011.

TAIPEI: Tatung-shan, at the foot of the mountain, Apr. 9, 1983, K. Nagami, TNS 9504007.

LIVING COLLECTION

TBG acc. no. 74578, plant from Wu-Ling, alt. ca. 1850 m.

This one of the most common and variable violets in Japan is newly recorded from Taiwan. Taiwanese specimens are somewhat smaller, viz. stems rather slender; leaf-



Fig. 3. *Viola grypoceras* A. Gray at Wu-Ling, Mar. 19, 1987.  
Photograph by K. Nagami.

blades  $9 \times 9$  to  $19 \times 20$  mm in floriferous and  $12 \times 11$  to  $23 \times 23$  mm in fructiferous periods with more lustrous surfaces. These evidences recall several montane populations of *V. grypoceras* var. *exilis* in Kyushu, Japan. However, their stipules are fimbriate-laciniate as observed in var. *grypoceras* but are not linear lanceolate with few basal laciniae as in var. *exilis*. According to Mr. Nagami's communication and by the result of cultivation at the Tsukuba Botanical Garden (a plant from Wu-Ling), the spur of lower petal are 3 to 6 mm in plants from north of Kyushu, but coincident with the plant of Ryukyus (cf. Walker 1976, as *V. grypoceras* var. *lutchuensis*). The plant from Tatung-shan is somewhat pilose on both surfaces of the leaves, pedicels and basal 1/3 of the sepals, though the plant from Wu-Ling is glabrous. The variation of pilosity is also found in Japanese plants. By above reasons, the author does not adopt any infraspecific taxon of *V. grypoceras* to Taiwanese plants.

#### Excluded species

'*Viola acuminata* Ledebour' Kao & Chiu in Quart. J. Chinese Forest. 11: 119, 1978, misspelled the author name as 'Ledebour'.

See the note under *V. obtusa* var. *tsuifengensis*.

#### Key to the Trigonocarpace violets of Taiwan

1. Style laterally deplanate or bilobed at the stigmatic area .....  
..... All the species of *Viola* described in Flora of Taiwan by Hsieh (1977).
1. Style not laterally deplanate nor bilobed at the stigmatic area, cylindric or slightly clavate with a rostellate stigma.
  2. Plant usually caespitose. Lateral petals bearded. Stigmatic area papillose.  
Lower petal shorter than the others ..... *V. nagamiana*

2. Plant usually caulescent. Petals and style glabrous. Lower petal as long as or longer than the others.
3. Leaf-blades usually as long as or shorter than wide, cordiform .....  
..... *V. grypoceras*
3. Leaf-blades usually longer than wide, triangular ovate with cordate base....  
..... *V. obtusa* var. *tsuifengensis*

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### Summary

The section *Trigonocarpace* (*Viola*) is properly recorded from Taiwan. Two new taxa, viz. *Viola nagamiana* Hashimoto and *V. obtusa* (Makino) Makino var. *tsuifengensis* Hashimoto are proposed. *Viola grypoceras* A. Gray is newly added, but *V. acuminata* Ledeb. by Kao & Chiu (1978) is excluded from the flora of Taiwan. An emendated key to the genus *Viola* of Taiwan is provided.

### 摘 要

台湾のスマレ属は今世紀に入ってから本格的に調査され始め、植物誌、植物目録、専門誌上の論文などによって自生する種類はほとんど明らかにされていると思っていた。しかし永見宏二氏の採集品を見せていただき、これまで知られていなかったタチツボスマレ節が分布しており、しかも3種もあることを確め得た。それらのうち *Viola nagamiana* はアイヌタチツボスマレの仲間であるが地上茎はほとんど発達せず、果実は球形になる新種である。種としての近似種との相違点は本文に記した通りである。

ニオイタチツボスマレは北海道南端から九州屋久島まで分布するとされていた種である。台湾産のものは日本産の果実期に植物体が似ているが、本文に記したような違いが見られるので新変種 *V. obtusa* var. *tsuifengensis* とした。

タチツボスマレ *V. grypoceras* は日本および朝鮮半島南部に分布し、形態の変異に富む種として知られていた。著者は既に京都大学と東京大学に所蔵されている標本の中に台湾産タチツボスマレと思われるのを見たことがあったが断定できないでいた。この度いただいた標本および生品によってこの問題の一つの区切りがついた。

1978年に台湾新産として報告されたエゾノタチツボスマレ *V. acuminata* は実は別種であり、記載文および図から推察すると *V. obtusa* var. *tsuifengensis* が含まれていると思う。

以上の種類を加えて、Flora of Taiwan (1977)にあるスマレ属各種類への検索表を修正する試

みを行なった。

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