

PARNASSIA (PARNASSIACEAE) IN NORTH SUMATRA

H. TURNER & J.F. VELDKAMP¹

Nationaal Herbarium Nederland, University Leiden branch,
P.O. Box 9514, 2300 RA Leiden, The Netherlands

SUMMARY

The *Parnassia* (Parnassiaceae) from Mt Leuser in N Sumatra, provisionally known as *Parnassia* aff. *wightiana*, is described as *Parnassia procul*.

Key words: *Parnassia*, *Parnassia crassifolia*, *Parnassia procul*, *Parnassia wightiana*, Celastraceae, Parnassiaceae, Saxifragaceae, Malesia, Sumatra, Leuser.

INTRODUCTION

Parnassia L. (Parnassiaceae, formerly in Saxifragaceae; recently inclusion in Celastraceae has been suggested by Simmons et al. (2001)) is a North temperate and Arctic genus of c. 70 species, with 61 in China (Ku, 1987, 1995; Gu & Hultgard, in press).

The genus was first discovered in Malesia by W.J. Scheepens in 1936, in the Mt Leuser area of Aceh, N Sumatra, c. 1700 km S of the Chiang Mai Province, the closest locality where the genus occurs. It is represented there by two, not three species:

- *Parnassia siamensis* T. Shimizu. *Garrett 702* (L) was formerly misidentified as *P. mysorensis* B. Heyne ex Wight & Arn. by Kerr (1934) which was repeated by Shimizu (1969, 1981) and Smitinand & Shimizu (1970).
- *Parnassia wightiana* Wall. ex Wight & Arn. (Shimizu, 1981).

Van Steenis collected *Parnassia* again during the Leuser Expedition of 1937 and regarded it as “very much related, possibly identical with *Parnassia wightiana* from the Himalaya” (Van Steenis, 1938). In 1939 Ripley and Ulmer found it too, during the George Vanderbilt Sumatran Expedition and Merrill also identified it with *P. wightiana*, saying (1940) “On the basis of the single specimen ... I can see no reason for attempting to distinguish this ... from ... [*P. wightiana*]”. Actually, both were quite wrong and this misidentification could easily have been prevented, had they read the keys by e.g. Drude (1875), Franchet (1897), Nekrassova (1927), and Engler (1930) better. These state that *P. wightiana* has 5-fid staminodes, while in Sumatra they are 3-fid, as Van Steenis himself already had observed, an important difference. Had they compared the specimens with material a bit more closely they would have noticed that *P. wightiana* has numerous minute purplish dots and lines (made up of tanniferous cells), at

1) Corresponding author; e-mail: veldkamp@nhn.leidenuniv.nl

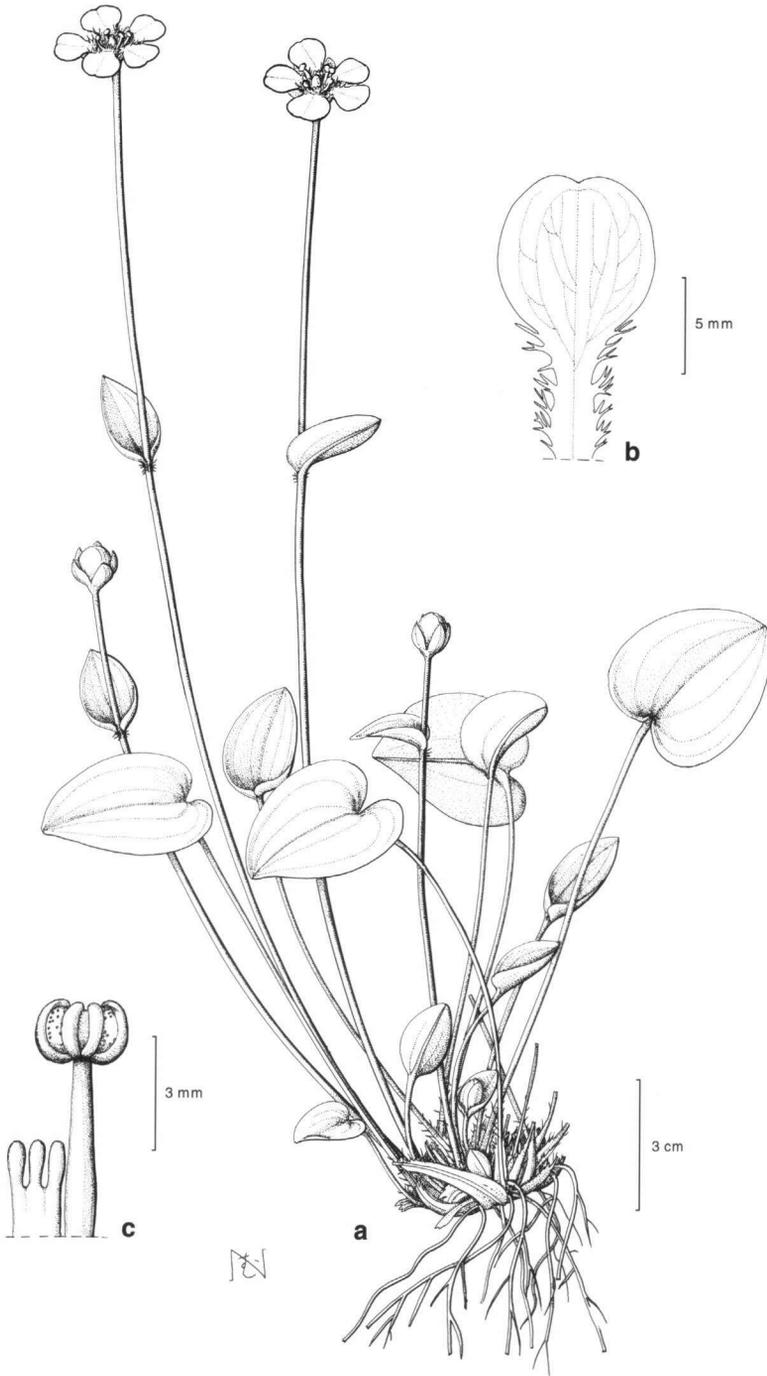


Fig. 1. *Parnassia procul* H. Turner & Veldk. a. Habit; b. petal; c. staminode and stamen (Van Steenis 8612, L).

least on the leaves, and usually also on the sepals, petals, staminodes, ovary, and fruit, while the Sumatran material is nearly to completely devoid of them, and, when present, the dots are of a different appearance.

During their Leuser Expedition of 1975 De Wilde & Duyfjes collected it twice and provisionally accepted Van Steenis's and Merrill's identification (De Wilde & Duyfjes, 1994: 259, 260, 281).

However, Van Steenis remained uncertain about the exact identity of the Leuser plants and therefore in 1976 asked us to take another look at them.

This analysis based on the material present in the Nationaal Herbarium Nederland, University Leiden branch (L), especially the undistributed collections by De Wilde & Duyfjes, immediately showed that the plants from Sumatra could not belong to *P. wightiana*. Instead, the keys invariably led to *P. crassifolia* Franch. (see also Anonymous, 1972, t. 2026, 2027). No representative of this species was available in L, and not much other Chinese material either, so no definite solution could be reached at the time. Since then treatments of *Parnassia* in China have been published (Ku, 1987, 1995), but in Chinese. Thus a good comparison remained impossible. Recently a manuscript with the translation of the 1995 treatment prepared for the Flora of China Project by Gu & Hultgard became available, while representatives of several Chinese species had been donated to L by the Laboratoire de Phanérogamie, Muséum National d'Histoire Naturelle, Paris (P), including an isotype (*Delavay*, 20 Aug. 1889) of *P. crassifolia*.

From these data the latter turned out to differ significantly from the Sumatra specimens by the presence (again) of numerous minute dots and lines all over, rosettes with only a few leaves and 1 or 2 scapes, more (ob)ovate sepals (the isotype without basal appendages), petals with 3–5 nerves, and larger staminodes (4–5 by 3 mm) with branches 2–3 mm long, apically with rounded lobes.

This new species is another example of the unique nature of the Leuser Mountains, where many taxa either of clearly SE Asian or of Chinese origin occur together with species from E Malesia, but somehow have been unable to spread further south down the central cordillera (Bukit Barisan) of Sumatra. Van Steenis (1938: 765) already pointed out this curious mixture, but the processes by which it is formed remains an enigma until this day. Obviously, long-distance dispersal is not the answer.

***Parnassia procul* H. Turner & Veldk., *spec. nov.* — Fig. 1**

Plantae haud vel paene punctatae (i.s.), glandulae ubi adsunt protrudentes nec immersae nigrae punctiformes, rosettae folia 4–20(–numerosa), laminis cordatis coreaceis 1.5–3.5 cm longis 1.5–3.5 cm latis, scapi 1–4, bracteola 1 supra medio scapi inserta, sepala elliptica ad oblonga marginibus basi sparse fimbriatis, petala 11.5–14 mm longa 4–7.5 mm lata nervis 7–9 marginibus fimbriatis in parte dimidia inferiore basi eglandulosa, staminodia 2–3.5 mm longa ad medio vel ultra subaequaliter 3-ramosa, ramuli 1–2 mm longi distaliter capitellati, antherae connectivum inappendiculatum. — Typus: *Van Steenis 8612* (holo L; A n.v., BO n.v.), N Sumatra, Gunung Leuser Nature Reserve, below W summit of Mt Leuser, c. 3200 m alt., 4 Feb. 1937.

Parnassia aff. *wightiana* Wight & Arn.: Van Steenis (1938) 765, t. 13; De Wilde & Duyfjes (1994) 259, 260, 281, photo 4.

Parnassia wightiana auct. non Wall. ex Wight & Arn.: Merrill (1940) 2.

Plants usually epunctate or nearly so, the minute glands, when present, not immersed, but protruding, black, dot-like. Rosette with 4–20 (–numerous) leaves and 1–4 scapes. Stipules apically fimbriate. Petioles 5–8 cm long. Blade elliptic-cordate, 1.5–3.5 by 1.5–3.5 cm, coriaceous, margin entire, white (in vivo) reduced to a verruculose rim (in sicco), apex acute, nerves 7–9. Scapes 1-flowered, 13–30 cm tall. Bracteole solitary, inserted above the middle, as the blades but smaller, base fimbriate. Flower 1.5–2.5 cm diam. Sepals elliptic to oblong, 4.5–7 by 2–3.5 mm, base with some fimbriae, margin flat, entire, apex obtuse. Petals white, spatulate, 11.5–14 by 4–7.5 mm, claw 2–3.5 by 1–2 mm, blade suborbicular to elliptic, 6.5–9 mm long, 7–9-nerved, margins in the lower half eglandular, fimbriate, fimbriae eglandular, in the upper half entire to undulate, apex obtuse to truncate. Stamens 5–8 mm long, anthers 1.75–2 mm long, connective not excurrent. Staminodes flat, 2–3.5 by 1–2 mm, subequally 3-branched to the middle or below, branches 1–2 mm long, apically obtuse, capitellate. Ovary superior, 2.5–4 by 2–3 mm diam.; style 0–1.5 mm long; stigma 3-lobed. Fruit 3-valved, valves c. 8 by 7 mm. Seeds unknown.

Distribution — N Sumatra, Aceh, W summit area of Mt Leuser.

Habitat — Wet blang with *Sphagnum* on peat with running ground water, along streams in thickets, 3150–3200 m altitude. Very local, then gregarious, known from 2 or 3 localities only. Flowering in at least February and April.

Collector's notes — Leaves leathery. Flowers white with yellow centres. Sepals (pale) green. Petals white. Anthers (orange-)yellow.

Notes — Photographs of living specimens by Van Steenis (1938: t. 13) and De Wilde & Duyfjes (1994: photo 4; many colour slides, ined.) show the margins of the leaves and sepals to be conspicuously white, a feature which disappears in drying, only a verruculose rim remaining. The plates usually also show the presence of *Potentilla borneensis* (Stapf) Kalkman (*Potentilla sumatrana* Soják). Among *De Wilde & De Wilde-Duyfjes 16222* is a very well-developed specimen with 5 elongated c. 10 cm long branches, densely covered by the remnants of numerous leaves. These elongations were surely caused by the plant keeping pace with the growth of the *Sphagnum* cushion in which it was found and suggests a quite considerable age for it. Van Steenis observed that during anthesis a single anther matures each day (so the flowering would take 5 days), which would explain the difference in length of the filaments. In dried material, however, several anthers with exerted pollen were present simultaneously.

Name — 'Procul' (Lat., adverb) means 'far away' in reference to the nearest occurrence (c. 1700 km in N Thailand) of a congener.

Specimens seen: *De Wilde & De Wilde-Duyfjes 16222, 16331; Van Steenis 8612*. — Not seen: *Ripley & Ulmer 86 (PH); Scheepens s.n. (BO)*.

ACKNOWLEDGEMENTS

This project was started during a course in Angiosperm Taxonomy at the Rijksherbarium, now Nationaal Herbarium Nederland, Universiteit Leiden branch (L), by the first author under the guidance of the second one who wrote the final draft. Thanks are due to the facilities offered at L, to the Director of the Laboratoire de Phanérogamie, Paris (P), for the donation of some crucial material, to Dr. Ding Hou (L) for his help with Chinese texts, Mr. J.F. Maxwell, Chiang Mai, for providing much-needed literature, Ms. M. Nakajima, Kanagawa, for the beautiful drawing, to Dr. E. A. Widjaja for information on the holdings of the Herbarium Bogoriense (BO), and to

Ms. E. Wood, Harvard Herbaria, for those in GH. Dr. B.E.E. Duyfjes, Dr. W.J.J.O. de Wilde, and the late Dr. C.G.G.J. van Steenis (L) offered vigorous advice on taxonomic, ecological, and distributional points.

REFERENCES

- Anonymous. 1972. *Iconographia cormophytorum sinicorum* 2: 147–151, t. 2023–2031. Science Press, Beijing.
- De Wilde, W.J.J.O. & B.E.E. Duyfjes. 1994. Brief history of the botanical exploration in the Gunung Leuser Natural Park and vicinity, North Sumatra – with itineraries and reports of the exploration tours by Van Steenis (1937) and De Wilde & Duyfjes (1972–1991). *Fl. Males.* Bull. 11: 253–291.
- Drude, O. 1875. Über die Blüthengestaltung und die Verwandtschaftsverhältnisse des Genus *Parnassia*, nebst einer systematischen Revision seiner Arten. *Linnaea* 39: 239–324.
- Engler, A. 1930. *Parnassia*. In: A. Engler (ed.), *Die natürlichen Pflanzenfamilien*, ed. 2, 18a: 178–182. W. Engelmann, Leipzig.
- Franchet, M.A. 1897. Les *Parnassia* de l'Asie orientale. *Bull. Soc. Bot. France* 44: 244–263.
- Gu, C.-Z. & U.-M. Hultgard. In press. *Parnassia*. *Flora of China*. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis.
- Kerr, A.F.G. 1934. The genus *Parnassia* in Siam. *J. Siam Soc. Nat. Hist., Suppl.* 9: 327–328, fig.
- Ku, T.-C. 1987. A revision of the genus *Parnassia* (Saxifragaceae) in China. *Bull. Bot. Res. (Harbin)* 7: 1–61.
- Ku, T.-C. 1995. *Parnassia*. In: L. Li & S. Hwang, *Flora Reipublicae Popularis Sinicae* 35, 1: 1–66. Science Press, Beijing.
- Merrill, E.D. 1940. Botanical results of the George Vanderbilt Sumatran Expedition, 1939. *Plants from Mt. Lōsir*. *Notul. Nat. Acad. Nat. Sci. Philadelphia* 47: 2.
- Nekrassova, V. 1927. Les *Parnassia* de la section *Nectarotrilobus*. *Bull. Soc. Bot. France* 74: 635–655.
- Shimizu, T. 1969. Some new species from Thailand. *Acta Phytotax. Geobot.* 24: 41, t. 9.
- Shimizu, T. 1981. In: T. Shimizu, H. Toyokuni, H. Koyama, T. Santisuk & T. Smitinand (eds.), *Contributions to the flora of Southeast Asia VI. Taxonomy and phytogeography of some temperate species in Thailand (2)*. *Acta Phytotax. Geobot.* 32: 44, t. 2.
- Simmons, M.P., V. Savolainen, C.C. Clevinger, R.H. Archer & J.I. Davis. 2001. Phylogeny of the Celastraceae, inferred from 26S nuclear ribosomal DNA, phytochrome B, *rbcL*, *atpB*, and morphology. *Molec. Phylogen. Evol.* 19: 353–366.
- Smitinand, T. & T. Shimizu. 1970. In: T. Shimizu, H. Koyama & N. Fukuoka (eds.), *Contributions to the flora of Southeast Asia I. Taxonomy and phytogeography of some temperate species in Thailand*. *S. Asian Studies (Tonan Ajia Kenkyu)* 8, 2: 181–182.
- Van Steenis, C.G.G.J. 1938. Exploraties in de Gajo-Landen. *Algemeene resultaten der Losir expeditie 1937*. *Tijdschr. Kon. Ned. Aardrijksk. Genootsch.* II, 55: 728–801.