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A SYNOPSIS OF THE GENUS SWERTIA (GENT.) IN MALESIA

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In August 1972, Dr. W. J. J. O. de Wilde and his wife, Mrs. B. E. E. de Wilde-Duyfjes, collected on Mt. Bandahara in North Sumatra besides the already known *Swertia piloglandulosa* another, yet unknown *Swertia* which gave rise to this preliminary revision. This plant occurs together with *S. piloglandulosa* but inhabits a moister place in the mountain heath, viz. along a small streamlet, and it appeared to represent a miniature form of *S. piloglandulosa*. Besides, it had a further reduced number of ovules.

It may be worthwhile to point out first the difference between dwarf forms and miniature forms.

Dwarf forms are well known in *S. javanica* and in many other *Gentianaceae*. They show strong reduction of the vegetative parts, but the flower parts are always equal in size with those of the 'well-grown' form. The dwarf form and the 'well-grown' form are considered to be genetically identical, the dwarf form being an edaphic modification. Miniature forms have also the flower parts smaller and are considered to be genetically different from the big-flowered form.

From 3 of the 6 Malesian species miniature forms could be distinguished, sometimes occurring on the same mountains as the big-flowered forms, sometimes occurring on different mountains or islands.

Besides differences in flower measurements, different types of indument were found in *S. javanica*, varying from glabrous to a short hirsute indument on all vegetative parts and on the calyx, combined with ciliolate leaves, bracts, and calyx or not. All these characters mentioned are not considered to be of high taxonomic importance and the forms which could only be distinguished on these characters are delimited on infra-specific levels.

I am very thankful to Dr. H. O. Sleumer and Drs. J. F. Veldkamp, who corrected the latin diagnoses.

Cited specimens are located in L, unless otherwise indicated.

KEY TO THE MALESIAN SPECIES AND SUBSPECIES

1. One nectary per corolla-lobe.
   2. Nectary with a tuft of hairs at its apical side.
      3. Flower 5-merous; plant shortly hirsute, most distinct on the pedicel; main nerves of calyx externally bent in the connate part of the calyx, giving it a slightly inflated appearance . . . . . **1. S. oxyphylla**
         4. Corolla 9—13 mm long; calyx 5—7 mm long. *Java* . **1.1. var. oxyphylla**
         4. Corolla 7—8 mm long; calyx 4—5 mm long. *Java, Lesser Sunda Isl.* **1.2. var. parvula**
      3. Flower 4-merous; plant glabrous; main nerves of calyx not externally bent. *Philippines* . . . . . **2. S. decurrens**

2. Nectary glabrous . . . . . **3. S. javanica**
5. Calyx distinctly shorter than the corolla in most flowers of the inflorescence.
6. All vegetative parts shortly hirsute. *Java* . . . . . **3.2.** ssp. **coerulescens**
6. Vegetative parts glabrous or only leaf-bases and bases of bracts ciliolate.
7. Leaf bases and bases of bracts ciliolate.
8. Apex of corolla lobes acute to acuminate. At least the terminal branch not ending in an inflorescence. Base of plant woody when old. *N. Sumatra*. . . . . **3.3.** ssp. **steenisii**
8. Apex of corolla lobes acute and apiculate. All branches ending in an inflorescence. Base of plant herbaceous. *Java*. . . . **3.4.** ssp. **confusa**
7. Vegetative parts glabrous.
9. Corolla lobes 4—6 by 2.5—3 mm. *Timor* . . . . . **3.5.** ssp. **nana**
9. Corolla lobes (8—)10—17 by (3—)5—8 mm. *Java, Celebes.* **3.1.** ssp. **javanica**
5. Calyx slightly shorter to distinctly longer than the corolla.
10. Leaf-bases, bracts, and the sutures of the calyx ciliolate; calyx always longer than the corolla. *W. Coast of Sumatra*. . . . . **3.6.** ssp. **sumatrensis**
10. Vegetative parts and calyx not ciliolate; glabrous; calyx slightly shorter to longer than the corolla. *Java*. . . . . **3.1.** ssp. **javanica**

1. Nectaries 2 per corolla-lobe.
11. Nectaries at base of corolla-lobes, fringed with hairs; ovules 2—4.
12. Flower 5-merous*). All branches terminating in an inflorescence; basal leaves decayed at anthesis. Ovules 4; seeds 4. *E. New Guinea*. . . . **4. S. papuana**
12. Flower 4-merous. Creeping vegetative branches mostly present; leaves crowded at base of flowering branches. Ovules 2—4; seeds 1—3. *N. Sumatra.* **5. S. piloglandulosa**
13. Corolla 4—7 mm long; ovules 4; seeds 1—3. **5.1.** ssp. **piloglandulosa**
13. Corolla 3—4 mm long; ovules 2; seeds 2 . . . . . **5.2.** ssp. **biovulata**
11. Nectaries about halfway corolla lobes, glabrous; ovules > 20. **6. S. bimaculata**

1. **Swertia oxyphylla** (Miq.) Gilg

Ophelia oxyphylla Miq., Fl. Ind. Bat. 2 (1865) 562. — *S. oxyphylla* Gilg in E. & P., Nat. Pfl. Fam. 4,2 (1895) 88; Back. & Bakh. *f.*, Fl. Java 2 (1965) 440; Steen., Mount. Fl. Java (1972) t. 20-5. — Type: *Horsfield s.n.*, E. Java, Mt. Merapi (K).

1.1. var. **oxyphylla**

JAVA. Central and East. 1500—3000 m, locally.

1.2. var. **parvula** Geesink, *var. nov.*

Differt a var. *oxyphylla* habitu gracili floreque minore. Calycis lobi 4—5 mm. longi et 1,3—1,7 mm. lati. Corollae lobi 7—8 mm. longi et 2,5—3 mm. lati. Filamenta 5—5,5 mm. longa. Antherae 1,2 mm. longae, 0,6—0,7 mm. latae. — Type: *Elbert 1158* (L).

JAVA. *Junghuhn.*
LESSER SUNDA ISL. Bali. Mt. Agoeng, 3100 m, *de Voogd 1935*. — Lombok. Mt. Ridjani 2000—2700 m, *Elbert 1158* (type), *2245*. — Timor. Mt. Moetis, *de Voogd 2295*.

*) In the original description, Diels mentioned also the occurrence of 4-merous flowers, but in the material, present in L, I did not observe any.

2. Swertia decurrens C. B. Robinson

S. decurrens C. B. Robinson, Philip. J. Sci. 3 (1908) 214; Merr., En. Philip. 3 (1923) 319. — Type: *R. S. Williams 1529* (NY).

PHILIPPINES. Luzon. Bontoc & Benguet, 1200—2300 m.

3. Swertia javanica Bl.

S. javanica Bl., Bijdr. (1826) 848; Back. & Bakh. *f.*, Fl. Java 2 (1965) 440; Steen., Mount. Fl. Java (1972) t. 20-3. — *Ophelia javanica* Hassk., Cat. Hort. Bog. (1844) 127. — Type: *Blume*, W. Java, Mt. Gedé (L).
S. javanica forma *variegata* Hochr., Pl. Hochr. 2 (1925) 197. — Type: *Hochreutiner 887*, W. Java, Mt. Panggerango (iso L). Other synonyms are mentioned under the subspecies.

3.1. ssp. javanica

JAVA. West to East. 2300—3000 m.
CELEBES. Near Mt. Rantemario, 2600—3400 m.

The specimens from Celebes have slightly smaller flowers than the Javanese specimens (corolla 8—10 mm, resp. 10—14 mm), but it seems not worthwhile to base a new infraspecific taxon upon them.

3.2. ssp. coerulescens (Zoll. & Mor.) Geesink, *stat. nov.*

Ophelia coerulescens Zoll. & Mor., Nat. Geneesk. Arch. Neêrl. Ind. 2 (1845) 569. — *S. coerulescens* (Zoll. & Mor.) Gilg in E. & P., Nat. Pfl. Fam. 4, 2 (1895) 88; Back. & Bakh. *f.*, Fl. Java 2 (1965) 441 *pro parte* (excl. glabrous form); Steen., Mount. Fl. Java (1972) t. 20-4 *pro parte* (excl. fig.). — Type: *Zollinger*, E. Java, Mt. Welirang (BO, iso L).

JAVA. East. 2200—3100 m.

3.3. ssp. steenisii (Geesink) Geesink, *stat. nov.*

S. steenisii Geesink, Blumea 20 (1972) 132. — Type: *Van Steenis 8555*, N. Sumatra, Mt. Losir (L).

N. SUMATRA. Mt. Kemiri, 2900—3300 m. Mt. Losir, 3100 m.

3.4. ssp. confusa Geesink, *ssp. nov.*

S. coerulescens (Zoll. & Mor.) Gilg, *pro parte*; Back. & Bakh. *f.*, Fl. Java 2 (1965) 441, in adnot.; Steen. Mount. Fl. Java (1972) t. 20-4 (incl. fig.).

Herba subglabra. Ramuli vegetativi accrescentes nulli. Folia 1(—3)-nervia, basi ciliolata. Bracteae, alae pedicellorum calicisque lobi ciliolati. Corollae lobi calicem plerumque superantes. Calycis lobi 5—10 mm. longi, 2—3 mm. lati. Corollae lobi 8,5—13 mm. longi, 3,5—5 mm. lati. — Type: *Van Steenis 4219* (L).

JAVA. West. Mt. Papandajan, 2100—2500 m, *Van Steenis 12222, 4219* (type), *Holstvoogd 366 b.*

3.5. ssp. nana Geesink, *ssp. nov.*

Herba glabra. Ramuli vegetativi accrescentes nulli. Folia 1-nervia. Corollae lobi calicem superantes. Calycis lobi 3,3—5 mm. longi, c. 1,5 mm. lati. Corollae lobi 4—6 mm. longi, 2,5—3 mm. lati. — Type: *Van Steenis 18414* (L).

LESSER SUNDA ISL. Timor. Mt. Fatamailau, 2700 m. Only known from the type.

3.6. ssp. **sumatrensis** Geesink, *ssp. nov.*

Herba subglabra. Ramuli vegetativi accrescentes nulli. Folia 3-nervia, ciliolata. Bracteae ciliolatae. Calycis pars connatis extus ad quamque medianam lobos indicantes ciliolatus. Calycis lobi corollam semper superantes, ciliolati, 10—20 mm. longi, 3,5—5 mm. lati. Corollae lobi 9,5—14 mm. longi, 5—7 mm. lati. — Type: *Bünnemeyer 10441* (L).

SUMATRA. West Coast. Mt. Kerintji, 2200—2400 m, *Bünnemeyer 9669, 9796, 10441* (type).

4. **Swertia papuana** Diels

S. papuana Diels, Bot. Jahrb. 62 (1929) 488. — Type: *Keysser* (B, †), East New Guinea, Mt. Saruwagad, 2400—3000 m.

NEW GUINEA. East. Western to Southern Highlands, Mt. Hagen, Mt. Giluwe. Mt. Albert Edward, Mt. Saruwagad.

5. **Swertia piloglandulosa** Geesink

S. piloglandulosa Geesink, Blumea 20 (1972) 132. — Type: *Van Steenis 8486*, N. Sumatra, Mt. Losir (L).

5.1. ssp. **piloglandulosa**

N. SUMATRA. Mt. Losir, 2700—3450 m; Mt. Kemiri, 2900—3300 m; Goh Lembuh, 3000 m; Putjuk Angasan, 2700 m; Mt. Bandahara, 2600—2700 m.

5.2. ssp. **biovulata** Geesink, *ssp. nov.*

Herba procumbens, glabra. Rami curvato-erecti, ad nodos prostratos radicantes basibus foliorum persistentibus praediti. Folia aggregata, c. 20 mm. longa et 3 mm. lata. Bracteae c. 9 mm. longae et 2,5 mm. latae. Calycis lobi c. 3 mm. longi, c. 0,9 mm. lati. Corollae lobi pallide lutei, c. 3,2 mm. longi et 1,3 mm. lati. Flores pro parte staminibus reductis praediti, filamentis usque ad 0,7 mm. longa, antheris c. 0,3 mm. in diam., pollinis granis c. 30 μm in diam., impressis (sterilibus?). Stamina bene evoluta filamentis usque ad 2,3 mm. longis, antheris hastato-ovoideis, c. 0,75 mm. diam.; pollinis grana globosis, c. 35 μm diam. Ovula 2. Semina 2, globosa, c. 0,8 mm diam. —Type: *De Wilde & De Wilde-Duyfjes 13282* (L).

N. SUMATRA. Gaju and Alas lands. Mt. Bandahara, 2600—2700 m. Only known from the type.

This subspecies occurs together with the former in mountain heaths, but lives near streamlets, whereas ssp. *piloglandulosa* occurs on drier places.

6. **Swertia bimaculata** (Sieb. & Zucc.) C. B. Clarke

Ophelia bimaculata Sieb. & Zucc., Abh. K. Bayer. Ak. Wiss. M.-Ph. Kl. Münch. 4, 3 (1846) 159. — *S. bimaculata* Hook. *f.* & Th. *ex* C. B. Clarke, J. Linn. Soc. Bot. 14 (1875) 449; in Hook. *f.*, Fl. Br. Ind. 4 (1883) 123. — Type: *von Siebold*, Japan, Sitzigama (L).

INDIA. Eastern Himalaya.
JAPAN. Hokkaido, Honshiu, Shikoku, and Kiushu.
SUMATRA. Atjeh. Laut Pupandji, 1900 m, *Van Steenis 6402*.

DOUBTFUL SPECIES

Swertia moetis Malm, Fedde Rep. 42 (1937) 14. — Type: G. *Stein 906*, Lesser Sunda Isl., Timor, Mt. Moetis. (B†).

The original description is too vague to ascertain its identity. From Mt. Moetis only a specimen belonging to *S. oxyphylla* var. *parvula* is known to me, to which it could belong. However, it could as well belong to *S. javanica* ssp. *javanica*.