

## A TAXONOMIC REVISION OF THE GENUS *SABIA* (SABIACEAE)

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### SUMMARY

In the present revision of *Sabia* the number of species has been reduced from 55 to 19, including two that are described as new. Below the specific level, a new subspecies and a new variety are described, whereas some new infraspecific combinations have been made. Most of the reduced species have been included in the synonymy of *S. campanulata*, which consequently represents the most complex and most variable species of the genus.

Next to a general key, some regional keys are given as on the one hand some widespread species are locally far less variable than taken over their whole area, on the other hand well-delimited species from different regions may be very uniform in some points.

### INTRODUCTION

After the revision of *Meliosma* by C. F. van Beusekom, *Blumea* 19 (1971) 355–529, the present study on *Sabia* completes the revision of the *Sabiaceae* of the Old World. Some authors, however, have expressed their doubts about the naturalness of this family and proposed a monogeneric family *Sabiaceae*, including only *Sabia*, placing *Meliosma* and *Ophiocaryon* (syn. *Phoxanthus*), the third genus of the *Sabiaceae s. l.*, into a separate family *Meliosmaceae* (see Airy Shaw in Willis, *Dict. Flow. Pl. & Ferns*, 8th ed. (1973) 711, 990). Concerning possible relationships of the *Sabiaceae s. l.* with other families no consensus of opinion exists. For a historical survey of the systematic position of the family, and especially of *Sabia*, the reader is referred to Chen, *Sargentia* 3 (1943) 8.

The genus *Sabia* has already been monographed in 1943 by Chen, l.c., who

recognized fifty-three species, of which no less than twenty-four were described as new. Later, in 1952, when Gagnepain, *Not. Syst.* 14, p. 271, described two new species from northern Vietnam, the total number then distinguished came to fifty-five. In the present study, however, no more than nineteen species are distinguished, two of which are new. In a key to the Chinese and Japanese species of *Sabia*, published in Japanese by an anonymous author in *Acta Phytotax. Geobot.*, Kyoto 5 (1936) 76–78 (see also note on p. 27), the species were arranged into three groups, viz. *Eusabia*, *Dolichostylae* ('*Dolicostylae*') and *Leptandreae*, mainly based on the shape of the flowers and the length of the style in the mature fruit. In the first revision of *Sabia*, Chen distinguished two sections, viz. *Pachydiscus* and *Odontodiscus*, which were based on disk-characters. Although the above-mentioned characters can be useful for identification, a subdivision of the genus based on these characters is artificial; besides, the whole section *Pachydiscus* in the sense of Chen has been reduced in this paper to one single species, viz. *S. campanulata*. In my opinion, a distinct subdivision of the genus into well-delimited sections, reflecting more or less natural affinities, is not well possible.

Although the reduction to synonymy of many former species is clear and needs no further explanation, the delimitation of some species deserves some more discussion, which will be given under the species concerned.

#### DISTRIBUTION

The distribution of *Sabia*, which is mainly confined to SE. Asia and the Malesian region, has been mapped in fig. 1. Looking at the number of species, it must be noticed that the highest numbers occur in a rather wide zone (hatched area), ranging from Assam in India to Fukien in SE. China, with a maximum of eight species in Upper Burma<sup>1</sup>). As shown, the area of distribution of *Sabia* runs north-west as well as south-east into a rather narrow zone. The south-eastern extension of the area is due to a single species, *S. pauciflora*, and extends as far as the Solomon Islands (Guadalcanal). The north-western extension, on the contrary, which more or less corresponds with the lower mountainous regions of the Himalayas, is initially formed by four species, viz. *S. campanulata*, *S. paniculata*, *S. parviflora*, and *S. purpurea*. Of these species the latter three reach as far as Nepal or Kumaon (India) only, whereas *S. campanulata* reaches as far westwards as Kashmir. The distribution of *Sabia* also shows a disjunction which is due to the occurrence of one species, *S. limoniacea*, in southern India. Furthermore, when looking at the area of distribution of each species separately it can be stated that the migration of the Malesian species must have taken place by way of Indo-China. Finally, it must be noticed that the distribution pattern of *Sabia* agrees very well with that of *Meliosma* sect. *Meliosma* (cf. C. F. van Beusekom, *Blumea* 19, 1971: 374, fig. 6).

<sup>1</sup>) In this context it must be noted that relatively very few specimens from Burma were available to me. Nevertheless, these few collections still represent no less than eight different species, one of which is new; besides, in some species, e.g. *S. lanceolata*, the Burmese collections are more or less different from the typical form, which occurs in adjacent regions. Therefore, it will be clear that that part of the area of distribution has my special interest. More material from Burma, and in particular Upper Burma, would be highly desirable.

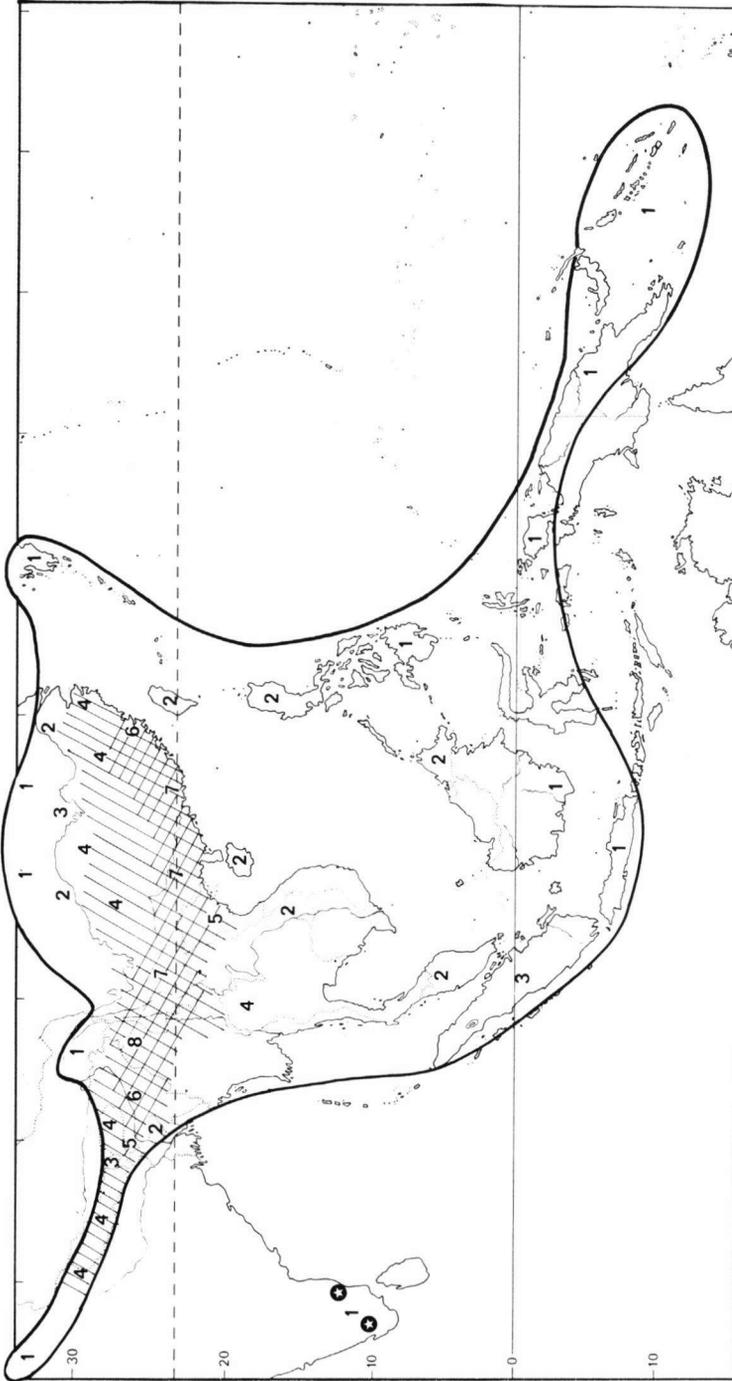


Fig. 1. The area of distribution of *Sabia*. Hatched is the zone with 4 or 5 species, cross-hatched the one with 7 or 8 species. The numbers refer to the number of species in that area.

## ACKNOWLEDGEMENTS

The present revision of *Sabia* would not have been possible without the loan of many specimens from the following herbaria: A, BM, BO, E, GH, K, L, P, SING, and U. My sincere thanks are due to the directors of these institutes. Special thanks are due to the directors of BM and K for their hospitality, and to the Rijke Hamaker Fund of the Leiden University for enabling me to visit these institutes. I am also very thankful to Miss R. van Crevel for making the excellent drawings in this paper. Furthermore, I am very indebted to Dr. P. W. Leenhouts, who supervised my work. I am very grateful to him for the discussions we had, the way in which he coached me, and his critical way of correcting the manuscript. Finally, I like to thank the staff of the Rijksherbarium, Leiden, and especially Prof. Dr. C. Kalkman for his critical remarks after having read the manuscript. Thanks are also due to all other persons who helped me in various ways with this study.

## SABIA

*Sabia* Colebrooke, Trans. Linn. Soc. Lond. 12 (1818) 355, t. 14; Wallich in Roxb., Fl. Ind. 2 (1824) 308; G. Don, Gen. Hist. 2 (1832) 69; Endlicher, Gen. Pl. (1840) 1135; Blume, Mus. Bot. Lugd.-Bat. 1 (1851) 368; Hooker f. & Thoms., Fl. Ind. 1 (1855) 206–209; Bentham & Hooker, Gen. Pl. 1 (1862) 414; Baillon, Hist. Pl. 5 (1874) 345, fig. 342 & 343, 393; Warburg in Engl. & Prantl, Nat. Pflanzenfam. 3, 5 (1895) 367–371, fig. 183A & 184A–H; Chen, Sargentia 3 (1943) 1–75 (revision). — T y p e : *Sabia lanceolata* Colebrooke.

*Meniscosta* Blume, Bijdr. (1825) 28; Dietrich, Syn. Pl. 2 (1840) 923 ('*Menicosta*'). — T y p e : *Meniscosta javanica* Bl. (= *S. javanica*).

*Enantia* Falconer, Hook. J. Bot. 4 (1841) 75.

*Celastrinea* Wallich, Cat. (1849) 9015, *nom. nud.*

*Androglossum* Champion ex Bentham, Hooker's J. Bot. Kew Gard. Misc. 4 (1852) 42. — *Androglossa* Bentham & Hooker, Gen. Pl. 1 (1862) 414. — T y p e : *Androglossum reticulatum* B. & H. (= *S. limoniacea*).

Evergreen or deciduous, woody climbers or more or less scandent shrubs (rarely recorded as small trees). *Twigs* terete, striate (see note), with  $\pm$  prominent leaf-cushions, unarmed (except *S. japonica*, see note), glabrous to pubescent and glabrescent; flowering twigs as twigs, unarmed, mainly in deciduous species with some cataphyls at their base, glabrous to densely pubescent. *Buds* (see note) either  $\pm$  globular and obtuse to rounded, or ovoid and acute; scales glabrous to pubescent, ciliolate or not, persistent at the base of the twigs. *Leaves* alternate, simple, ovate or elliptic to lanceolate, 2–25  $\times$  c. 1–10 cm, herbaceous to coriaceous, above and beneath glabrous to pubescent, when pubescent often only on midrib and nerves, beneath slightly to conspicuously paler than above; base acute to rounded or sometimes truncate or subcordate, attenuate or not; apex acute or sometimes obtuse, mostly acuminate, mucronate; margin entire or sometimes irregularly and minutely incised (as sometimes in *S. campanulata*), more or less cartilagineous in older leaves, revolute or not, above sometimes conspicuously paler than leaf-blade; midrib above  $\pm$  impressed to flat or slightly prominent at the apex, beneath distinctly prominent and in older leaves striate; nerves 3–12 pairs, ascending to patent, curved to straight (see note), above slightly impressed to some what prominent or obscure, beneath usually  $\pm$  prominent; venation coarsely to finely reticulate; veins above as the nerves, but often obscure or invisible, beneath flat to prominent; petiole canaliculate, smooth to wrinkled or sometimes somewhat bullate, glabrous or at least above pubescent. *Flowers* bisexual, 5-merous, actinomorphic, up to about 15 mm  $\varnothing$ , green to white, yellow, or purple, axillary, either solitary, or arranged in a few to many-flowered cyme, appearing before or with the new leaves. Cymes axillary, either solitary, or, when the subtending leaves are shed

or are bract-like, arranged in a racemose to thyrsoid or sometimes corymbose (as in *S. fasciculata*) inflorescence (see note), glabrous to pubescent; pedicel  $\pm$  thickened upwards in fruit; bracts ovate to lanceolate, up to 6 mm, glabrous to pubescent, ciliolate or not; bracteoles as bracts but usually smaller, or sepal-like, or minute and then often situated near calyx. *Sepals* 5 (–7, see bracteoles), equal to very unequal mutually, mostly  $\pm$  confluent at the base, variable in size and shape but often suborbicular or broad-ovate to ovate, glabrous to pubescent, ciliolate or not, persistent. *Petals* 5, rarely 6 or 7, episepalous, imbricate, suborbicular, elliptic, ovate, or obovate to lanceolate or ovate-lanceolate, glabrous, sometimes (sub-)ciliolate, persistent or not; nerves  $\pm$  parallel, branching or not, sometimes conspicuous when dark-coloured. *Stamens* (see note) 5, epipetalous,  $\pm$  equal, persistent or not; filaments more or less flattened, adherent to the base of the subtending petals; anthers globular, ovoid, ellipsoid, or oblong-ellipsoid, introrse, upright or inflexed. *Disk* in most species  $\pm$  crown-shaped (see note), sometimes short-cylindrical (*S. sumatrana*), truncated conical (sometimes in *S. campanulata* 'yunnanensis'), or  $\pm$  cushion-shaped (*S. campanulata*); lobes and ribs, if present, alternating with the stamens. *Pistil* (see note): style conical to cylindrical, rarely absent (see note under *S. parviflora* subsp. *philippinensis*), glabrous or with some hairs especially near the base, persistent (see note); ovary superior, 2-celled, (sub-)globose to subreniform, usually laterally somewhat compressed, glabrous to densely pubescent; ovules 2 per cell, more or less superimposed, attached to the septum, hemi-anatropous. 'Drupelets' (see note) one-seeded or very rarely with two seeds, (sub-)globose, obovoid, oblong-obovoid (or pyriform), or subreniform, laterally  $\pm$  compressed, glabrous or with scattered hairs, green or white to red or deep blue when fresh; mesocarp rather thin, pulpy, sometimes with many dark 'granules' (see note); endocarp crustaceous, very often with  $\pm$  prominent ribs forming a fine to coarse reticulate pattern, which is visible on the outside of a dried drupelet, margin sometimes distinctly keeled (*S. discolor*). *Seed* conform to the drupelet; testa usually conspicuously dark-dotted (see note), inside often lined with a very thin layer of endosperm. *Embryo* with two flat, smooth, somewhat undulated, or sometimes strongly folded cotyledons and a cylindrical rootlet curving to the hilum.

#### NOTES ON MORPHOLOGY

**T w i g s :** In all species the twigs, vegetative as well as flowering, are characterized by a longitudinal striation, formed by fine ribs and grooves, probably corresponding with groups of axial elements (fibres and vessels) and alternating relatively broad rays. This conspicuous character, possibly only present in dried specimens, has also been discussed by Lecomte. Bull. Soc. Bot. Fr. 54 (1907) 672–673, and by Le Renard, J. Bot., Paris 21, 1 (1908) 295–296. In cross sections the alternation of rays with groups of axial elements is clearly visible.

**B u d s :** According to Lecomte, l.c., p. 673, two different types of buds can be distinguished, viz. 1) floral buds, situated in the axils of the leaves and without any protection (naked buds), and 2) vegetative buds, inserted above the former and protected by bud scales. The distinction of two different types of buds, the one inserted above the other, agrees very well with the following observations: firstly, no bud scales are found at the bases of the cymes (naked floral buds), whereas they are always present at the bases of the twigs (protected vegetative buds), and, secondly,

very often small protected buds can be found axillary to the cymes, especially in fruiting specimens (vegetative buds placed above the floral buds). I disagree, however, with Lecomte's statement that the vegetative buds will produce an inflorescence with small leaves when the floral buds do not develop. An inflorescence with small leaves, as described by Lecomte, must be considered as a (reduced) flowering twig, developed from a normal vegetative bud, and in which the

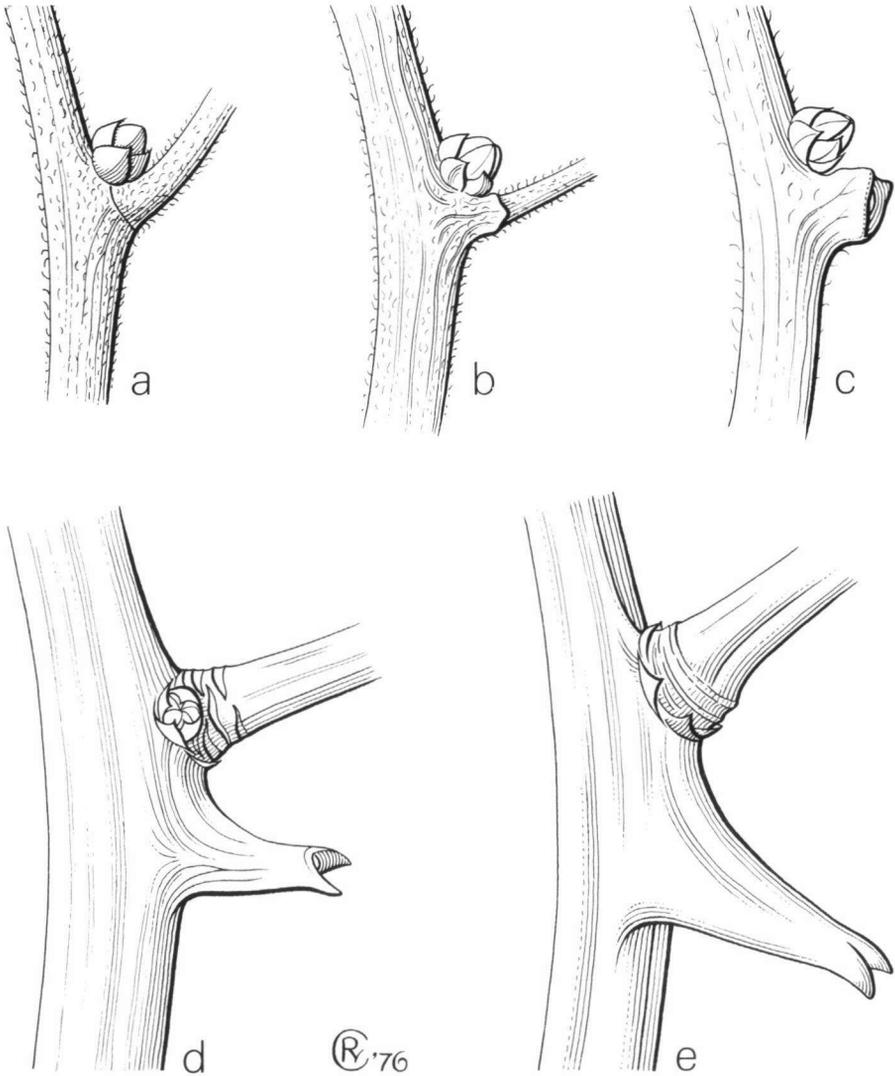


Fig. 2. *Sabia japonica*. Development of spines. Explanation in text. a. from *Cheo & Wilson 12833*; b. from *Y. L. Keng 622*; c. & d. from *W. T. Tsang 23657*; e. from *Y. K. Hsiung 5481*. All  $\times 6$ .

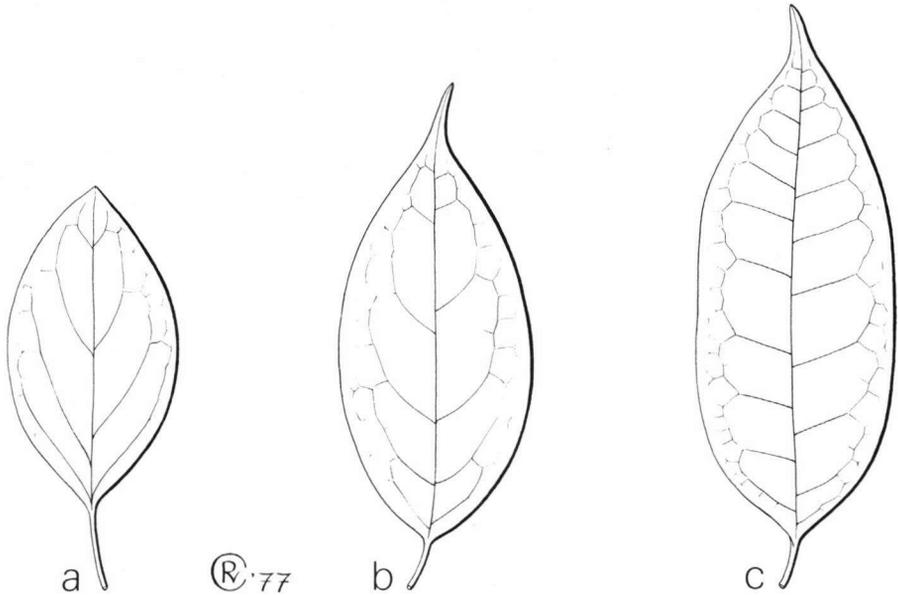


Fig. 3. Different types of nervation. Explanation in text. a. *Sabia discolor*, from *Dunn Hongkong Herb.* 2537. — b. *Sabia purpurea* subsp. *dumicola*, from *G. Forrest* 7850. — c. *Sabia parviflora* subsp. *parviflora*, from *W. N. Koelz* 25384. All  $\times 2/3$ .

cymes, subtended by the small leaves, are produced by normal floral buds (see note 'inflorescence').

**S p i n e s :** *S. japonica* is the only species of the genus which is armed with short spines. As the spines develop from the more or less prominent leaf-cushions after the leaves have fallen, they can only be found on the older twigs. The development of the spines is pictured in fig. 2 a – e, and can be briefly described as follows: (a) young twigs with leaves and without spines; the leaves on somewhat prominent leaf-cushions, as in all species of *Sabia*; after the leaves are shed (c), or sometimes even sooner (b), the leaf-cushions become somewhat more prominent and pointed at the lateral margins; later, the leaf-cushions elongate (d); notice the characteristic, shallowly but distinctly bifurcated apices of the spines, formed by the pointed outgrowths of the lateral margins of the leaf-cushions; when full-grown the spines, which can reach 6 mm in length, show no longer their origin as shown in (e). The development of the spines seems, however, to be rather unequal as in several specimens well-developed spines are found on rather young twigs, whereas in other collections the spines on older twigs are still in an earlier stage of development.

**L e a v e s :** The two types of nervation that can be distinguished in *Sabia*, and which have been briefly described as: 'nerves ascending, somewhat curved', and 'nerves patent, straight', are pictured in fig. 3a and c respectively. Although each of these types is characteristic of some species, and both types seem to be clearly distinct from each other, the nervation in other species makes clear that these two different types represent merely the extremes of a continuous range of variation. In those

species the nervation can be considered as more or less intermediate, as shown in fig. 3b, and can be described as: 'nerves  $\pm$  patent, curved', although the more apical nerves are often straight; transitions to one or both of the above-mentioned types frequently occur, sometimes when within the same specimen.

Foot nerves are usually absent or obscure, but in some species, e.g. *S. japonica*, they are occasionally distinctly developed in some of the leaves.

**I n f l o r e s c e n c e s :** In most species the inflorescence is an axillary few- to many-flowered cyme. The cymes are either solitary or arranged in a compound inflorescence. In a few other species solitary flowers occur. The relation between the different types of inflorescence and their interpretation can very easily be understood when starting from a flowering twig (always with persistent budscales at the base) with solitary cymes, subtended by normal leaves (cymes without budscales at their bases; see note 'buds'), as occurring in most of the species (fig. 4a). Often the cymes near or at the base of a flowering twig are subtended by somewhat smaller leaves or sometimes by bracts or budscales. When the twig remains shorter than usual and the subtending leaves are shed or are very small (and then often still herbaceous), as occurs frequently in several species, e.g. *S. paniculata*, the flowering twig with the cymes resembles a thyrsoïd or sometimes corymbose (*S. fasciculata*) inflorescence (fig. 4b), or as stated in the description of the species concerned: 'cymes arranged in a thyrsoïd or corymbose inflorescence when the subtending leaves are shed or are very small'. In some species, on the other hand, the cymes are subtended by real bracts, and then the usually short flowering twig with the cymes has been considered a true thyrsoïd inflorescence (fig. 4c). Very often, however, transitions between a true thyrsoïd inflorescence and a flowering twig, in which the cymes are subtended by normal leaves, can be found in several species, e.g. *S. limoniacea* and *S. pauciflora*. Since the number of flowers per cyme varies considerably between the different species as well as within the same species (e.g. *S. campanulata* in which the transition from more-flowered cymes to solitary flowers is clearly demonstrated) it will be clear that the solitary flowers in several species (*S. sumatrana* excepted) must be considered as 'one-flowered cymes' (fig. 4d); besides, it must be noticed that no budscales are present at the bases of the pedicels (see below). Sometimes, when the subtending leaves are fallen or are replaced by bracts, the short flowering twig with the solitary flowers resembles a simple raceme (fig. 4e). In several collections of *S. sumatrana* solitary flowers, or sometimes two or even three flowers together, are found in the axils of normal leaves. Contrary to the solitary flowers in other species, as *S. campanulata* and *S. japonica*, persistent budscales are present at the bases of their pedicels (fig. 4f). Therefore, the solitary flowers in *S. sumatrana* can not be considered as 'one-flowered cymes', but are homologous with the flowering twigs in other species. The occurrence of two or three seemingly collateral flowers in the axil of a single leaf is not peculiar at all, as in other species regularly two flowering twigs (or compound inflorescences) can be found in the axil of a leaf.

**B r a c t s a n d b r a c t e o l e s :** In the description of the genus the bracts are described as: 'ovate to lanceolate, up to 6 mm'. In several species, e.g. *S. limoniacea* and *S. pauciflora*, the bracts are often leaf-like, corresponding with the transition from a true thyrsoïd inflorescence, in which the cymes are subtended by real bracts, to a normal flowering twig with the cymes subtended by normal leaves (see previous note). In some species the bracteoles are usually situated near the calyx and then often minute or sepal-like. In the latter case the calyx seems to be 6- or 7-merous.

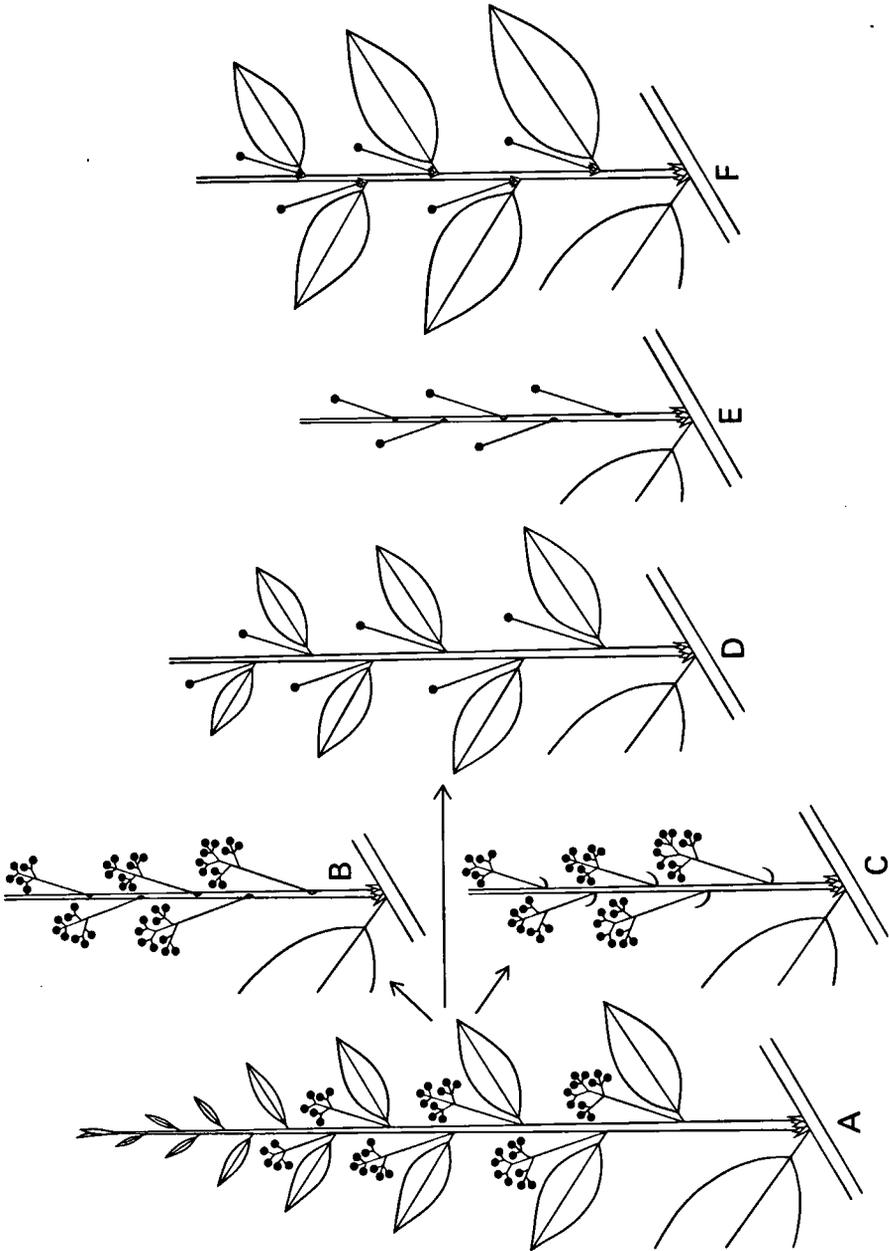


Fig. 4. Inflorescences. Explanation in text.

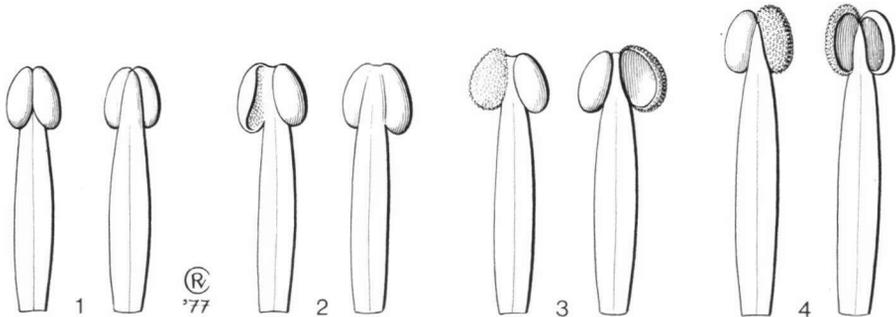


Fig. 5. *Sabia fasciculata*. Development of the stamen. Explanation in text. All from G. Forrest 17799;  $\times 12$ .

**Flower:** The flower of *Sabia* consists of 5 imbricate sepals to which are sometimes added 1 or 2 sepal-like bracteoles; 5 imbricate petals (exceptionally up to 7) in front of the sepals; 5 stamens before the petals and at the base adherent to these; disk often with 5 lobes and/or 5 prominent ribs, alternating with the stamens; 1 ovary with 2 cells, each with 2 ovules. The most conspicuous character of the *Sabia* flower is the opposition of the floral elements: *sepals, petals and stamens are on the same radius!*

**Stamens:** Each stamen consists of a filament with at the apex two anther cells separated by a fairly thick connective. The filament is more or less flattened (perpendicular to the radius) and at the base adherent to the base of the opposite petal; often a thin midnerve is visible. The anther cells are ovoid to (oblong-) ellipsoid and unilocular. They open (in all species!) along the connection with the connective at the adaxial side, so introrsely (fig. 5-1)! When axially separated from the connective the cells turn the inside out, so that the pollengrains come outside (fig. 5-2 and 3). After dispersal of the pollen it looks as if the cells have opened extrorsely (fig. 5-4), as described for some species by former authors, although it was already noticed correctly for *S. parviflora* by Wallich in Roxb., Fl. Ind. 2 (1824) 310: 'Anthers oblong, erect; the dehiscence takes place towards their back, in consequence of which they appear as if they were posterior', and later by Griffith, Notulae ad Plantas Asiaticas 4 (1854) 423 – 426, who wrote: 'The anthers are curious, they open internally along the furrow separating the loculi, by separation of the edge of the valve from the connective hence no inner valve exists, as in almost all other cases. Moisture causes the valve to return to its original direction, dryness causes its reflection'. In several species the connective with the two anther cells is more or less inflexed ('nodding').

**Pollen:** A detailed study of the pollenmorphology of *Sabia* will be done by Dr. Ferguson at Kew.

**Disk:** In nearly all species the disk has been briefly described as 'crown-shaped'. A more detailed description of a 'crown-shaped' disk is as follows: 'disk hypogynous, cupular, the upper part more or less enclosing the base of the ovary; margin usually with 5 lobes, corresponding with the  $\pm$  prominent ribs of the disk; lobes with or without distinctly glandular apices'. Very often, however, the disk shows a high degree of variation, the lobes being less distinct, short or even absent, the ribs faint

or even absent, too. Contrary to Chen, l.c. p. 7, who concluded: 'The disk characters, as a matter of fact, impress me as being more dependable and significant than the long or short styles, or whether the species be deciduous or evergreen.....', I believe that the disk in some species provides no more than some (additional) characters for identification.

**Pistil:** The pistil is formed by two carpels, which are adaxially more or less adherent to each other. Usually a thin but distinct, longitudinal furrow is still visible. Although the pistil has been considered as being single, consisting of a two-celled ovary and a short to long style, it must be noticed that each carpel has highly kept its own individuality: each cell or locule of the ovary can develop into a drupelet, while the style can very easily be split longitudinally from the base upwards along the furrow, as often occurs during development of the fruit. Sometimes,

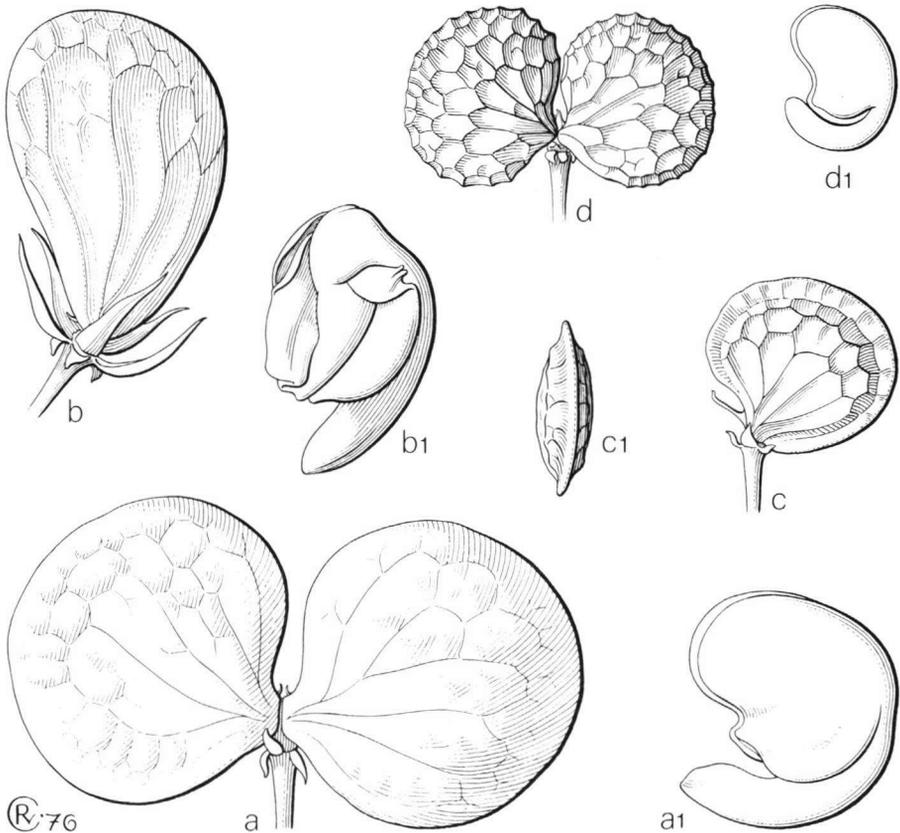


Fig. 6. Fruits and embryo's of different species of *Sabia*. a. & a1. *Sabia limoniacea*; a. fruit, from Poilane 24769; a1. embryo, from Poilane 18918. — b. & b1. *Sabia lanceolata*; b. fruit; b1. embryo; both from T. R. Chand 6740. — c. & c1. *Sabia discolor*, fruit in lateral and marginal view; from H. H. Hu 946. — d. & d1. *Sabia dielsii*; d. fruit, from Cavalerie 4332; d1. embryo, from Esquirol 474. All  $\times 3$ .

the upper parts of the carpels are not differentiated into a style (see note under *S. parviflora* subsp. *philippinensis*).

**Fruit:** The fruit is a one-seeded or exceptionally two-seeded drupelet with a rather thin pulpy mesocarp and a crustaceous endocarp. As each locule of the ovary can develop into a drupelet, regularly two drupelets per flower are produced, which are, however, at the base connected with each other ('paired'). The persistent style, longitudinally split or not, is situated between the drupelets. Often, however, one of the two locules does not develop, and when only one drupelet is produced, the persistent style is situated at its base. The length of the style in proportion to the size of the drupelet(s) provides a useful character for identification. In some species the mesocarp contains many dark 'granules' (see next note). The endocarp is in nearly all species characterized by a reticulate pattern formed by more or less prominent ribs. The reticulation of the endocarp, which is usually distinctly visible on the outside of a dried drupelet, is often limited to the margin of the fruit. In some species the reticulation of the endocarp is faint or even absent. The shape and size of the drupelets as well as the reticulation of the endocarp together with the length of the persistent style provide important characters for identification of the species, as shown in fig. 6.

**'Granules' and 'dark dots':** In the descriptions of, or notes to, several species and of the genus the terms 'granules' or 'dark dots' (dark-dotted) have been used to describe briefly the occurrence of cells or groups of cells with dark deposits (probably tannin). These cells can occur in many different parts of the plant, e.g. leaves, all floral parts, and drupelets. In some parts, e.g. pedicels and petals, the cells with the dark contents are often arranged in longitudinal rows, whereas they are more scattered or closely packed in other parts. In all species the seeds are characterized by a conspicuously dark-dotted testa, whereas the presence and number of these cell-deposits in other parts of the plant vary considerably between the different species. It has only been described or noted under the species, when the occurrence of these dark-coloured cell-contents in one or more parts of the plant is more or less constant and conspicuous.

**Anatomy:** For this revision no observations have been made on the anatomy of *Sabia*. For a concise survey of some anatomical characters I refer to Metcalfe and Chalk, *Anatomy of the Dicotyledons 1* (1950) p. 448 – 452 and Le Renard, *J. Bot.*, Paris 21, 1 (1908) 290 – 300.

**Chromosome count.** According to S. B. Malla et al, *Taxon* 26 (1977) 561:  $n = 24$  (*S. purpurea* subsp. *purpurea*).

#### GENERAL KEY TO ALL SPECIES OF SABIA

- |   |   |
|---|---|
| 1a. Plants deciduous*; flowering twigs with bud scales and, especially when young, with some cataphyls at their bases . . . . . | 2 |
| b. Plants evergreen; flowering twigs only with bud scales at their bases . . . . .  | 7 |
| 2a. Flowers solitary, appearing before the leaves . . . . .   | 3 |
| b. Flowers in 2 – 12-flowered cymes, appearing about the same time as leaves . . . . .  | 4 |

\* in case of doubt use alternative lead.

- 3a. At least older twigs with short spines (see fig. 2); vegetative buds small,  $\pm$  globular, up to 1.5 mm, acute-obtuse to rounded; leaves somewhat ovate, elliptic to oblong, up to 8.5 cm long, acute, (short-)acuminate

**8. Sabia japonica**

- b. Twigs unarmed; leaf-cushions more or less prominent but never spine-like; vegetative buds usually ovoid, acute, sometimes globular and rounded, up to 3.5 mm; leaves oblong-ovate, oblong to lanceolate, up to 15 cm long, acute, acuminate to cuspidate . . . . . **2. Sabia campanulata**

- 4a. Style in flower 2 mm long or more, conspicuous in fruit and then at least half as long as the adjacent side(s) of the drupelet(s) . . . . . 5

- b. Style in flower 1.5 mm long or less, rather inconspicuous in fruit and much shorter than the adjacent side(s) of the drupelet(s) . . . . . 6

- 5a. Twigs glabrous; vegetative buds  $\pm$  globular, up to 1.5 mm, obtuse to rounded; leaves ovate to elliptic(-oblong), up to 7.5 cm long, acute to obtuse, sometimes short-acuminate, usually conspicuously glaucous beneath when older; petals elliptic to elliptic-oblong, 3.25–4.25  $\times$  1.5–2(–2.5) mm; style in flower 2–2.75 mm long; endocarp distinctly keeled . . . . . **5. Sabia discolor**

- b. Twigs glabrous to pubescent; vegetative buds usually ovoid, acute, sometimes globular and rounded, up to 3.5 mm; leaves oblong-ovate, oblong to lanceolate, up to 15 cm long, acute, acuminate to cuspidate, usually beneath paler than above, but not glaucous; petals (broad-)elliptic to (broad-)obovate, or more or less rectangular-oblong, 4–9(–11)  $\times$  2–7(–8) mm; style in flower (2–)3–5.5 mm long; endocarp not keeled . . . . . **2. Sabia campanulata**

- 6a. Cymes 3–6-flowered; petals ovate, elliptic to oblong-ovate or oblong, 3–4.5  $\times$  1.25–2.25 mm; style in flower 0.7–1 mm; drupelets (broad-)obovoid to subreniform, 5–7  $\times$  5.5–7.5 mm; reticulate pattern of endocarp somewhat prominent, often limited to the margin. (*Nepal, India, Burma, Thailand*)

**15. Sabia purpurea** subsp. **purpurea**

- b. Cymes 5–12-flowered; petals ovate to elliptic, 2.5–4  $\times$  1.5–2 mm; style in flower 0.4–0.7 mm; drupelets (broad-)obovoid to subreniform, 5–6  $\times$  5.5–6 mm; reticulate pattern of endocarp somewhat prominent and often limited to the margin, or absent. (*China: Yunnan*)

**15. Sabia purpurea** subsp. **dumicola**

- c. Cymes (2)3–5-flowered; petals elliptic to elliptic-oblong, 2–3  $\times$  1.25–1.75 mm; style in flower 1–1.25 mm; drupelets more or less subreniform, 5.5–7  $\times$  6.5–8 mm; reticulate pattern of endocarp distinctly prominent. (*China: Yunnan, Kweichow, Kwangsi; Vietnam*) . . . . . **4. Sabia dielsii**

- 7a. Flowers either solitary or sometimes 2 or 3 together, or rarely arranged in a racemose to thyrsoid inflorescence . . . . . 8

- b. Flowers in cymes (br rarely in simple racemes); cymes either solitary, subtended by normal leaves, or arranged in a compound inflorescence . . . . . 9

- 8a. Flowers either solitary, sometimes 2 or 3 together, and with some bud scales at the base of their pedicels, or sometimes arranged in a racemose to thyrsoid inflorescence; petals oblong, oblong-ovate to (ovate-)lanceolate, c. 6–10  $\times$  1.5–2.5 mm, acute to narrow-obtuse; drupelets  $\pm$  obovoid, 11–13  $\times$  8–9 mm. . . . . **17. Sabia sumatrana**

- b. Flowers solitary, always without bud scales at the base of the pedicels; petals (broad-)elliptic, elliptic-oblong to (broad-)obovate, oblong-obovate, or more or less rectangular-oblong, 3.75–9(–11)  $\times$  (1.75–)2–7(–8) mm, obtuse to

- rounded; drupelets globular to (broad-)obovoid or subreniform, 5–7(–8) × 5–8(–9) mm . . . . . 3
- 9a. Cymes solitary, or arranged in a corymbose or sometimes thyrsoid inflorescence, up to 6(–10)-flowered; ovary glabrous to pubescent; style in flower 2 mm long or more, conspicuous in fruit and then at least half as long as the adjacent side(s) of the drupelet(s) . . . . . 10
- b. Cymes solitary, or arranged in a racemose to thyrsoid inflorescence (flowers rarely in simple racemes), 2–30(–35)-flowered; ovary glabrous; style in flower 1.5 mm long or less, rather inconspicuous in fruit and much shorter than the adjacent side(s) of the drupelet(s) . . . . . 11
- c. Cymes solitary, up to 30(–40)-flowered; ovary densely pubescent; style in flower 2.25–2.5 mm long; drupelets not known . . . . . **6. *Sabia erratica***
- 10a. Leaves oblong to sublanceolate, up to 12 cm long, acute, acuminate; nerves (5)6–8 pairs, patent, straight; cymes very often arranged in a more or less corymbose or sometimes thyrsoid inflorescence; petals oblong to oblong-ovate, 4.5–6.5(–7.5) × 2–2.5(–3) mm, acute to narrow-obtuse; endocarp often short-keeled . . . . . **7. *Sabia fasciculata***
- b. Leaves ovate to elliptic-oblong, up to 7.5 cm long, acute to obtuse, sometimes short-acuminate; nerves 3–5 pairs, ascending to somewhat patent, more or less curved, often the apical nerves more patent and ± straight; cymes solitary; petals elliptic to elliptic-oblong, 3.25–4.25 × 1.5–2(–2.5) mm, obtuse to narrow-obtuse; endocarp distinctly keeled . . . . . **5. *Sabia discolor***
- c. Leaves oblong-ovate to lanceolate, up to 15 cm long, acute, acuminate to cuspidate; nerves 4–6 pairs, patent to ascending, more or less curved, sometimes straight; cymes solitary; petals (broad-)elliptic to (broad-)obovate, or more or less rectangular-oblong, 4–9(–11) × 2–7(–8) mm, obtuse to rounded; endocarp not keeled . . . . . **2. *Sabia campanulata***
- 11a. Cymes (8–)10–30(–35)-flowered . . . . . 12
- b. Cymes (1)2–6(–8)-flowered . . . . . 14
- 12a. Cymes 8–18-flowered; petals suborbicular to elliptic or somewhat broad-obovate, 3.25–4.5 × (2.25–)2.5–3.25 mm, obtuse to rounded; drupelets not known . . . . . **1. *Sabia burmanica***
- b. Cymes (10–)15–30(–35)-flowered; petals oblong to oblong-ovate, (2.5–)3–5.5(–6) × (c. 1–)1.5–2(–2.25) mm, acute to narrow-obtuse; drupelets distinctly obovoid to oblong-obovoid or pyriform, 10–15(–16) × 7–10 mm; embryo with strongly folded cotyledons **10. *Sabia lanceolata***
- c. Cymes up to 12-flowered; petals ovate to elliptic, 2.5–4 × c. 1.5–2 mm, acute to obtuse; drupelets (broad-)obovoid to subreniform, 5–6 × 5.5–6 mm; embryo without folded cotyledons **15. *Sabia purpurea* subsp. *dumicola***
- d. Cymes 8–30(–35)-flowered; petals (elliptic-)oblong to lanceolate, sometimes somewhat oblong-ovate, 2–4(–4.5) × 0.7–1.5 mm, acute to obtuse; drupelets globular to ± obovoid, 7–11 × 6–10 mm; embryo with not or only slightly folded cotyledons . . . . . 13
- 13a. Leaves oblong to (sub-)lanceolate, 3–12(–15) × 1–5 cm; nerves (5)6–9(10) pairs, patent, straight or sometimes ± curved; cymes solitary, up to 8(–10) cm long, (4–)7–25(–35)-flowered; style (0.75–)1–1.5(–1.75) mm long, or sometimes absent; drupelets 7–9 × 6–8 mm; reticulate pattern of endocarp rather fine, often inconspicuous or obscure . . . . . **13. *Sabia parviflora***
- b. Leaves oblong, oblong-ovate to sublanceolate, (6–)8–22 × c. 2.5–8 cm;

- nerves 5–7 pairs,  $\pm$  patent, sometimes ascending, curved but often at least the more apical ones  $\pm$  straight; cymes solitary or arranged in a thyrsoid inflorescence, up to 5 cm long, (10–)15–30-flowered; style 0.75–1.25 mm long; drupelets 9–11  $\times$  8–10 mm; reticulate pattern of endocarp rather fine, limited to the margin. . . . . **12. Sabia paniculata**
- c. Leaves elliptic-oblong to oblong, sometimes oblong-(ob-)ovate, or lanceolate, 6–19  $\times$  2–8(–10) cm; nerves 4–7(8) pairs, patent, curved to  $\pm$  straight; cymes arranged in a thyrsoid inflorescence, up to 2(–3) cm long, up to 12-flowered; style 0.2–0.5 mm long; drupelets 9–11  $\times$  c. 9–10 mm; reticulate pattern of endocarp often rather coarse and limited to the margin
- 9. Sabia javanica**
- 14a. Cymes solitary, subtended by normal leaves . . . . . 15
- b. Cymes arranged in a racemose to thyrsoid inflorescence, subtended or not by bracts or very small leaves . . . . . 20
- 15a. Leaves beneath all over more or less pubescent; petals ovate-lanceolate to lanceolate, (3.5–)4–6  $\times$  0.75–c. 1.5 mm, acute, gradually narrower to apex, or upper part distinctly narrowed or caudate . . . . . 16
- b. Leaves beneath glabrous or with some hairs especially on midrib; petals suborbicular to oblong or ovate, 1.75–4.5  $\times$  1.25–2.25 mm, or (elliptic-)oblong to lanceolate, 2–4(–4.5)  $\times$  0.7–1.5 mm, acute to rounded . . . . . 17
- 16a. Cymes up to 3 cm long, 2–6-flowered, sparsely to laxly pubescent or tomentose; sepals ovate to oblong-ovate, 0.7–1.4  $\times$  0.5–1 mm; petals ovate-lanceolate to lanceolate, acute, gradually narrower to apex; style 0.75–1 mm
- 18. Sabia swinhoei**
- b. Cymes up to c. 1 cm long, 3-flowered,  $\pm$  densely long-pubescent; sepals oblong-triangular, 1.25–1.75  $\times$  0.3–0.5 mm; petals lanceolate, acute, the upper part distinctly narrowed or caudate; style 0.3–0.6 mm
- 19. Sabia uropetala**
- 17a. Petals suborbicular to elliptic, 1.75–2.5  $\times$  1.25–2 mm, obtuse to rounded; stamens nearly as long as the petals; anthers inflexed; drupelets globular to obovoid, 11–14  $\times$  10–13 mm, distinctly compressed
- 11. Sabia limoniacea**
- b. Petals elliptic or ovate to oblong or oblong-ovate, 2–4  $\times$  1.25–2 mm, acute to obtuse; stamens shorter than petals; anthers  $\pm$  upright; drupelets (broad-)obovoid to subreniform, 4–7  $\times$  5–8 mm,  $\pm$  compressed . . . . . 18
- c. Petals (elliptic-)oblong to lanceolate, 2–4(–4.5)  $\times$  0.7–1.5 mm, acute to obtuse; stamens shorter than petals; anthers  $\pm$  inflexed; drupelets globular to obovoid, 7–11  $\times$  6–10(–11) mm,  $\pm$  compressed or not. . . . . 19
- 18a. Leaves oblong, up to 7.5 cm long,  $\pm$  coriaceous when older; cymes 3–8-flowered; petals ovate to oblong, 3–3.5  $\times$  1.5–2 mm; style in flower 0.75–c. 1 mm, or when petals and stamens are fallen even up to 1.75 mm; drupelets 4–4.5  $\times$  5–5.5 mm; reticulate pattern of endocarp more or less prominent, limited to the margin . . . . . **3. Sabia coriacea**
- b. Leaves oblong or oblong-ovate to sublanceolate, up to 12 cm long, herbaceous to pergamentaceous when older; cymes 3–12-flowered; petals ovate to oblong, 2.5–4.5  $\times$  1.25–2.25 mm; style in flower 0.4–1 mm; drupelets (broad-)obovoid to subreniform, 5–7  $\times$  5.5–7.5 mm; reticulate pattern of endocarp somewhat prominent, often limited to the margin, or absent
- 15. Sabia purpurea**

- c. Leaves elliptic-oblong or oblong-ovate to lanceolate, up to 12(-15) cm long, herbaceous to herbaceous-pergamentaceous; cymes (2) 3-5-flowered; petals elliptic to elliptic-oblong, 2-3 × 1.25-1.75 mm; style in flower 1-1.25 mm; drupelets more or less subreniform, 5.5-7 × 6.5-8 mm; reticulate pattern of endocarp distinctly prominent . . . . . **4. *Sabia dielsii***
- 19a. Leaves oblong to (sub-)lanceolate, 3-12(-15) × 1-5 cm, beneath usually distinctly paler than above; nerves (5)6-9(10) pairs, patent, straight; cymes (4-)7-25-flowered; style either absent or obscure, or style conical, (0.75-)1-1.5(-1.75) mm; drupelets 7-9 × 6-8 mm **13. *Sabia parviflora***
- b. Leaves elliptic-oblong to oblong, sometimes sublanceolate, 6-19 × 2-8(-10) cm, usually beneath somewhat paler than above but not conspicuously so; nerves 4-7(8) pairs, patent, straight to curved; cymes 3-10(-12)-flowered; style short-conical, 0.2-0.5 mm; drupelets 9-11 × c. 9-10 mm . . . . . **9. *Sabia javanica***
- c. Leaves oblong to sublanceolate, 5-14(-18) × 2-6(-8) cm, usually beneath somewhat paler than above but not conspicuously so; nerves (5)6-8(9) pairs, patent, ± straight; cymes 1-4-flowered; style conical, 0.6-1 mm; drupelets 7.5-11 × c. 8-10(-11) mm . . . . . **14. *Sabia pauciflora***
- 20a. Young twigs distinctly pubescent; leaves ovate or elliptic to sublanceolate, 2-12 × c. 1-5.5 cm, beneath all over sparsely pubescent; petals ovate-lanceolate to lanceolate, (3.5-)4-6 × 0.75-c. 1.5 mm, acute, gradually narrower to the apex, or upper part distinctly narrowed or caudate; drupelets ± obovoid, 7-8 × 6-8 mm. . . . . 16
- b. Young twigs glabrous or still with some hairs; leaves oblong to slightly oblong-obovate, 6-25 × 2-10 cm, beneath glabrous or with some hairs especially on midrib; petals oblong-ovate to ovate-lanceolate, (3.5-)4.5-6.5 × (1.25-)1.5-2.5 mm, acute, somewhat acuminate or not; drupelets incompletely known . . . . . **16. *Sabia racemosa* subsp. *racemosa***
- c. Young twigs glabrous or still somewhat pubescent; leaves elliptic-oblong to lanceolate, 4-25 × 1.5-10 cm, beneath glabrous or with some hairs especially on midrib; petals either suborbicular to elliptic, 1.75-2.5 × 1.25-2 mm, obtuse to rounded, or petals elliptic-oblong to oblong, 2.5-5 × c. 1-2.5 mm, obtuse; drupelets globular to obovoid, 7.5-14 × (7-)8-13 mm . . . . . 21
- 21a. Petals suborbicular to elliptic, 1.75-2.5 × 1.25-2 mm, obtuse to rounded; stamens nearly as long as petals; drupelets globular to obovoid, 11-14 × 10-13 mm, very compressed . . . . . **11. *Sabia limoniacea***
- b. Petals elliptic-oblong to oblong, 2.5-5 × c. 1-2.5 mm, obtuse; stamens distinctly shorter than petals; drupelets globular to obovoid, 7.5-12 × (7-)8-10(-11) mm, ± compressed . . . . . 22
- 22a. Leaves oblong to slightly oblong-obovate, 6-25 × 2-10 cm; nerves 4-8(9) pairs, patent to somewhat ascending, straight to curved; cymes up to 1 cm long, 1-4(-7)-flowered; petals elliptic-oblong to oblong, 3.5-5 × 1.5-2.5 mm; style 0.6-0.9 mm; drupelets obovoid, sometimes ± globular, c. 10-12 × (7-)8-10 mm . . . . . **16. *Sabia racemosa* subsp. *kinabaluensis***
- b. Leaves oblong to sublanceolate, sometimes oblong-ovate or oblong-obovate, 5-14(-18) × 2-6(-8) cm; nerves (5)6-8(9) pairs, patent, ± straight; cymes up to 2(-3.5) cm long, 1-4-flowered; petals oblong, 2.5-4(-4.5) × c. 1-1.3(-1.5) mm; style 0.6-1 mm; drupelets ± globular, sometimes somewhat obovoid, 7.5-11 × c. 8-10(-11) mm . . . . . **14. *Sabia pauciflora***

- c. Leaves elliptic-oblong to oblong, sometimes oblong-ovate, oblong-obovate, or sublanceolate, 6–19 × 2–8(–10) cm; nerves 4–7(8) pairs, patent, straight to somewhat curved; cymes up to 2(–3) cm long, 3–10(–12)-flowered; petals oblong, 2.5–3.5(–4) × 1–1.5 mm; style 0.2–0.5 mm; drupelets obovoid, sometimes ± globular, 9–11 × c. 9–10 mm . . . . . **9. *Sabia javanica***

**N o t e s :** Since it is often not well possible to distinguish well-delimited groups of species, based on characters which are constant in all species of the group(s) concerned, the necessity to use characters which are more or less variable in some species has complicated the construction of the key. The first character used in the key, viz. species deciduous or evergreen, will usually give no problems when young flowering material is available, but it probably will do in older, e.g. fruiting, specimens. For that reason all deciduous species have also been included in the alternative lead. Other characters used, like number of flowers per cyme, and cymes solitary or arranged in a compound inflorescence, are usually distinct and easily perceptible. However, the variability of several characters as well as the fact that often relatively many characters have to be used, have complicated the construction of the key and therefore probably made its use less simple. Although I believe that the key as presented here is as complete as possible and will certainly give no insuperable problems, nevertheless I have decided to construct several regional keys to make possible a quicker and maybe easier identification of the species.

In 1936 a key to the Chinese and Japanese species of *Sabia* was published in Japanese by an anonymous author in *Acta Phytotax. Geobot.*, Kyoto 5, p. 76–78. Since the key has been published in Japanese and after Januari 1st, 1935, all new binomials in that paper are *nomina invalida*. Later, in 1943, several of these binomials were validated by Chen. Furthermore, it must be noticed that the Japanese key represents undoubtedly a (free) translation of a provisional key to the Chinese and Japanese species of *Sabia*, prepared by Dr. O. Stapf at Kew. A more detailed discussion about this subject has been given by Chen l.c., p. 2. Besides the provisional key to the Chinese and Japanese species of *Sabia* Stapf prepared also a provisional key to the Indian species, but that key has never been published (both keys in K; fotocopies in L).

REGIONAL KEYS

KEY TO THE SPECIES OF CHINA, JAPAN, AND TAIWAN

- 1a. Plants deciduous\* . . . . . 2
- b. Plants evergreen . . . . . 7
- 2a. Flowers solitary . . . . . 3
- b. Flowers in cymes . . . . . 4
- 3a. At least older twigs with short spines (see fig. 2); vegetative buds small, ± globular, up to 1.5 mm, acute-obtuse to rounded; leaves somewhat ovate, elliptic to oblong, up to 8.5 cm long, acute, (short-)acuminate  
**8. *Sabia japonica***
- b. Twigs unarmed (leaf-cushions more or less prominent but never spine-like);

\* in case of doubt use alternative lead.

- vegetative buds usually ovoid, acute, sometimes globular and rounded, up to 3.5 mm; leaves oblong-ovate or oblong to lanceolate, up to 15 cm long, acute, acuminate to cuspidate . . . . . **2. *Sabia campanulata***
- 4a. Style in flower 2 mm long or more, conspicuous in fruit and then at least half as long as the adjacent side(s) of the drupelet(s) . . . . . 5
- b. Style in flower 1.5 mm long or less, rather inconspicuous in fruit and much shorter than the adjacent side(s) of the drupelet(s) . . . . . 6
- 5a. Twigs glabrous; vegetative buds  $\pm$  globular, up to 1.5 mm, obtuse to rounded; leaves ovate to elliptic(-oblong), up to 7.5 cm long, acute to obtuse, sometimes short-acuminate, usually conspicuously glaucous beneath when older; petals elliptic to elliptic-oblong,  $3.25 - 4.25 \times 1.5 - 2(-2.5)$  mm; style in flower  $2 - 2.75$  mm long; endocarp distinctly keeled . . . . . **5. *Sabia discolor***
- b. Twigs glabrous to pubescent; vegetative buds usually ovoid and acute, sometimes globular and rounded, up to 3.5 mm; leaves oblong-ovate or oblong to lanceolate, up to 15 cm long, acute, acuminate to cuspidate, usually beneath paler than above but not glaucous; petals (broad-)elliptic to (broad-)obovate or  $\pm$  rectangular-oblong,  $4 - 6.5 \times 2 - 5(-6)$  mm; style in flower  $(2 - )3 - 5.5$  mm long; endocarp not keeled. . . . . **2. *Sabia campanulata***
- 6a. Cymes 5–12-flowered; petals ovate to elliptic,  $2.5 - 4 \times 1.5 - 2$  mm; style  $0.4 - 0.7$  mm long; drupelets (broad-)obovoid to more or less subreniform,  $5 - 6 \times 5.5 - 6$  mm, with or without persistent petals and stamens at the base; reticulate pattern of endocarp somewhat prominent and often limited to the margin, or absent . . . . . **15. *Sabia pupurea* subsp. *dumicola***
- b. Cymes (2)3–5-flowered; petals elliptic to elliptic-oblong,  $2 - 3 \times 1.25 - 1.75$  mm; style  $1 - 1.25$  mm long; drupelets more or less subreniform,  $5.5 - 7 \times 6.5 - 8$  mm, without persistent petals and stamens at the base; reticulate pattern of endocarp distinctly prominent . . . . . **4. *Sabia dielsii***
- 7a. Flowers solitary . . . . . 3
- b. Flowers in cymes; cymes solitary or arranged in a compound inflorescence . . . . . 8
- 8a. Style in flower 2 mm long or more, conspicuous in fruit and then at least half as long as the adjacent side(s) of the drupelet(s) . . . . . 9
- b. Style in flower 1.5 mm long or less, rather inconspicuous in fruit and then much shorter than the adjacent side(s) of the drupelet(s) . . . . . 10
- 9a. Leaves oblong to sublanceolate, up to 12 cm long, acute, acuminate; nerves (5)6–8 pairs, patent, straight; cymes very often arranged in a more or less corymbose or sometimes thyrsoid inflorescence; petals oblong to oblong-ovate,  $4.5 - 6.5(-7.5) \times 2 - 2.5(-3)$  mm, acute to narrow-obtuse; endocarp often short-keeled . . . . . **7. *Sabia fasciculata***
- b. Leaves ovate to elliptic-oblong, up to 7.5 cm long, acute to obtuse, sometimes short-acuminate; nerves 3–5 pairs, ascending to somewhat patent,  $\pm$  curved, often the apical nerves more patent and  $\pm$  straight; cymes solitary; petals elliptic to elliptic-oblong,  $3.25 - 4.25 \times 1.5 - 2(-2.5)$  mm, obtuse to narrow-obtuse; endocarp distinctly keeled . . . . . **5. *Sabia discolor***
- c. Leaves oblong-ovate to lanceolate, up to 15 cm long, acute, acuminate to cuspidate; nerves 4–6 pairs, patent to ascending,  $\pm$  curved to sometimes straight; cymes solitary; petals (broad-)elliptic to (broad-)obovate or  $\pm$  rectangular-oblong,  $4 - 6.5 \times 2 - 5(-6)$  mm, obtuse to rounded; endocarp not keeled . . . . . **2. *Sabia campanulata***

- 10a. Leaves beneath all over  $\pm$  pubescent; cymes 2–6-flowered; petals ovate-lanceolate to lanceolate, (3.5–)4–6  $\times$  c. 1–1.4 mm, tapering to the apex, acute to narrow–obtuse, at the apex incurved or not . **18. Sabia swinhoei**
- b. Leaves beneath glabrous or with some hairs especially on the midrib; cymes either up to 12-flowered and then petals suborbicular or ovate to oblong, 1.75–4.5  $\times$  1.25–2.25 mm, or cymes (4–)7–25-flowered and then petals oblong to lanceolate, 2.25–4(–4.5)  $\times$  0.7–1.25 mm, acute to obtuse, rounded, not incurved at the apex . . . . . 11
- 11a. Cymes usually arranged in a racemose to thyrsoid inflorescence, sometimes solitary when subtended by small, often still herbaceous leaves; petals suborbicular to elliptic, 1.75–2.5  $\times$  1.25–2 mm, obtuse to rounded; drupelets 11–14  $\times$  10–13 mm, distinctly compressed . . . . . **11. Sabia limoniacea**
- b. Cymes solitary, subtended by normal leaves; petals either elliptic or ovate to oblong or oblong-ovate, 2–4  $\times$  1.25–2 mm, acute to obtuse, or petals oblong to lanceolate, 2.25–4(–4.5)  $\times$  0.7–1.25 mm, acute to obtuse; drupelets 4–9  $\times$  5–8 mm,  $\pm$  compressed. . . . . 12
- 12a. Leaves oblong to (sub-)lanceolate; nerves (5)6–9(10) pairs, patent, straight, sometimes  $\pm$  curved; cymes (4–)7–25-flowered; petals oblong to lanceolate, 2.25–4(–4.5)  $\times$  0.7–1.25 mm; drupelets 7–9  $\times$  6–8 mm  

**13. Sabia parviflora**

  - b. Leaves (elliptic-)oblong to lanceolate; nerves 4–6 pairs, patent to somewhat ascending, curved to  $\pm$  straight; cymes (2)3–12-flowered; petals elliptic or ovate to oblong or oblong-ovate, 2–4  $\times$  1.25–2 mm; drupelets 4–7  $\times$  5–8 mm. . . . . 13
- 13a. Leaves oblong, up to 7.5 cm long,  $\pm$  coriaceous when older; cymes 3–8-flowered; petals ovate to elliptic-oblong, 3–3.5  $\times$  1.5–2 mm; style in flower 0.75–c. 1 mm, or when petals and stamens are fallen even up to 1.75 mm; drupelets 4–4.5  $\times$  5–5.5 mm; reticulate pattern of endocarp more or less prominent, limited to the margin . . . . . **3. Sabia coriacea**
- b. Leaves oblong, up to 10 cm long, herbaceous to pergamentaceous when older; cymes 5–12-flowered; petals ovate to elliptic, 2.5–4  $\times$  c. 1.5–2 mm; style in flower 0.4–0.7 mm; drupelets 5–6  $\times$  5.5–6 mm; reticulate pattern of endocarp somewhat prominent and often limited to the margin, or absent  

**15. Sabia purpurea** subsp. **dumicola**

  - c. Leaves oblong-ovate to lanceolate, up to 15 cm long, herbaceous to herbaceous-pergamentaceous; cymes (2)3–5-flowered; petals elliptic to elliptic-oblong, 2–3  $\times$  1.25–1.75 mm; style in flower 1–1.25 mm; drupelets 5.5–7  $\times$  6.5–8 mm; reticulate pattern of endocarp distinctly prominent  

**4. Sabia dielsii**

KEY TO THE SPECIES OF INDIA (INCL. NEPAL, SIKKIM, AND BHUTAN)  
AND BANGLADESH

- 1a. Plants deciduous\* . . . . . 2
- b. Plants evergreen . . . . . 3

\* In case of doubt use alternative lead.

- 2a. Flowers solitary, axillary; pedicel up to 3 cm; petals (broad-)elliptic to (broad-)obovate, or more or less rectangular-oblong, 4-9(-11) × 2-7(-8) mm, obtuse to rounded; style in flower 3-5.5 mm long, in fruit nearly as long as to somewhat longer than the adjacent side(s) of the drupelet(s)

**2. *Sabia campanulata***

- b. Flowers in cymes; cymes solitary, axillary, up to 3(-4.5) cm, 3-6-flowered; petals ovate to oblong, 3-4.5 × 1.25-2.25 mm, acute to obtuse; style in flower 0.7-1 mm long, in fruit much shorter than the adjacent side(s) of the drupelet(s) . . . . . **15. *Sabia purpurea* subsp. *purpurea***
- 3a. Flowers solitary, axillary; petals (broad-)elliptic to (broad-)obovate, or more or less rectangular-oblong, 4-9(-11) × 2-7(-8) mm; style in flower 3-5.5 mm long, in fruit nearly as long as to somewhat longer than the adjacent side(s) of the drupelet(s) . . . . . **2. *Sabia campanulata***
- b. Flowers in few- to many-flowered cymes; cymes solitary or arranged in a racemose to thyrsoid inflorescence; petals either suborbicular to elliptic, 1.75-2.5 × 1.25-2 mm, or ovate to lanceolate, 2.25-5.5(-6) × 0.7-2.25 mm; style in flower up to 1.5 mm long, in fruit much shorter than the adjacent side(s) of the drupelet(s) . . . . . 4
- 4a. Cymes up to 6-flowered, solitary or arranged in a poorly flowered racemose to thyrsoid inflorescence. . . . . 5
- b. Cymes (7-)10-30(-35)-flowered, solitary or arranged in an abundantly flowered thyrsoid inflorescence . . . . . 6
- 5a. Leaves 4-18 × 1.5-6.5(-8) cm, ± pergamentaceous-coriaceous; nerves 5-9 pairs; cymes often arranged in a racemose to thyrsoid inflorescence, sometimes solitary when subtended by small, often still herbaceous, leaves, up to 2 cm; petals suborbicular to elliptic, 1.75-2.5 × 1.25-2 mm; drupelets globular to obovoid, 11-14 × 10-13 mm. . . . . **11. *Sabia limoniacea***
- b. Leaves 3-12 × c. 1.5-4.5 cm, herbaceous to pergamentaceous; nerves 4-6 pairs; cymes solitary, axillary, up to 3(-4.5) cm; petals ovate to oblong, 3-4.5 × 1.25-2.25 mm; drupelets (broad-)obovoid to subreniform, 5-7 × 5.5-7.5 mm. . . . . **15. *Sabia purpurea* subsp. *purpurea***
- 6a. Leaves oblong to lanceolate, 5-18 × 1.5-6(-8) cm; nerves 7-12 pairs, patent, straight to somewhat curved; petals oblong-ovate to oblong, (3.5-)4-5.5(-6) × c. 1.5-2(-2.25) mm; drupelets obovoid to oblong-obovoid or pyriform, (11-)12-15(-16) × 7-10 mm . . . . . **10. *Sabia lanceolata* var. *lanceolata***
- b. Petals oblong to lanceolate, 2.25-4(-4.5) × 0.7-1.25(-1.5) mm; drupelets globular to obovoid, 7-11 × 6-10 mm . . . . . 7
- 7a. Leaves oblong to (sub-)lanceolate, 3-12(-15) × 1-5 cm; nerves (5)6-9(10) pairs, patent, straight or sometimes more or less curved; cymes solitary, axillary, up to 8(-10) cm, 7-25-flowered, glabrous to sparsely pubescent; drupelets 7-9 × 6-8 mm; reticulate pattern rather fine, but often inconspicuous or obscure . . . . . **13. *Sabia parviflora* subsp. *parviflora***
- b. Leaves oblong or oblong-ovate to sublanceolate, (6-)8-22 × c. 2.5-8 cm; nerves 5-7 pairs, ± patent, sometimes ascending, curved, often the more apical nerves ± straight; cymes either solitary, axillary, or often arranged in a thyrsoid inflorescence, up to 5 cm, (10-)15-30-flowered, variably pubescent or tomentose; drupelets 9-11 × 8-10 mm; reticulate pattern rather fine, limited to the margin . . . . . **12. *Sabia paniculata***

KEY TO THE SPECIES OF BURMA

- 1a. Plants deciduous\* . . . . . 2
- b. Plants evergreen . . . . . 3
- 2a. Flowers solitary, axillary; pedicel up to 3 cm; petals (broad-)elliptic to (broad-)obovate or somewhat rectangular-oblong, 4–9(–11) × 2–7(–8) mm, obtuse to rounded; style in flower 3–5.5 mm long, in fruit nearly as long as to somewhat longer than the adjacent side(s) of the drupelet(s).
  - 2. **Sabia campanulata**
  - b. Flowers in cymes; cymes solitary, axillary, up to 3(–4.5) cm, 3–6-flowered; petals ovate to oblong, 3–4.5 × 1.25–2.25 mm, acute to obtuse; style in flower 0.7–1 mm long, in fruit much shorter than the adjacent side(s) of the drupelet(s) . . . . . 15. **Sabia purpurea** subsp. **purpurea**
  - 3a. Style in flower 2.75–5.5 mm long, in fruit nearly as long as to somewhat longer than the adjacent side(s) of the drupelet(s). . . . . 4
  - b. Style in flower up to 1.5 mm long, in fruit much shorter than the adjacent side(s) of the drupelet(s). . . . . 5
  - 4a. Leaves herbaceous to pergamentaceous; nerves 4–6 pairs, patent to ascending, ± curved or sometimes straight; flowers solitary, axillary; pedicel up to 3 cm; petals (broad-)elliptic to (broad-)obovate or somewhat rectangular-oblong, 4–9(–11) × 2–7(–8) mm, obtuse to rounded
    - 2. **Sabia campanulata**
    - b. Leaves ± pergamentaceous-coriaceous; nerves (5)6–8 pairs, patent, straight; flowers in cymes; cymes usually arranged in a ± corymbose or sometimes thyrsoid inflorescence, sometimes subtended by small herbaceous leaves, up to 4 cm, (2)3–6-flowered; petals oblong to oblong-ovate, 4.5–6.5(–7.5) × 2–2.5(–3) mm, acute to narrow-obtuse . . . . . 7. **Sabia fasciculata**
    - 5a. Cymes up to 6-flowered, solitary, axillary, or arranged in a poorly flowered racemose to thyrsoid inflorescence . . . . . 6
    - b. Cymes (7–)10–30(–35)-flowered, solitary, axillary, or arranged in an abundantly flowered thyrsoid inflorescence . . . . . 7
    - 6a. Leaves 3–12 × *c.* 1.5–4.5 cm, herbaceous to pergamentaceous; nerves 4–6 pairs; cymes solitary, axillary, up to 3(–4.5) cm; petals ovate to oblong, 3–4.5 × 1.25–2.25 mm; drupelets (broad-)obovoid to subreniform, 5–7 × 5.5–7.5 mm. . . . . 15. **Sabia purpurea** subsp. **purpurea**
    - b. Leaves 4–18 × 1.5–6.5(–8) cm, ± pergamentaceous-coriaceous; nerves 5–9 pairs; cymes often arranged in a racemose to thyrsoid inflorescence, sometimes solitary when subtended by small, often still herbaceous, leaves, up to 2 cm; petals suborbicular to elliptic, 1.75–2.5 × 1.25–2 mm; drupelets globular to obovoid, 11–14 × 10–13 mm. . . . . 11. **Sabia limoniacea**
    - 7a. Petals suborbicular to elliptic or slightly broad-obovate, 3.75–4.5 × (2.25–)2.75–3.25 mm, obtuse to rounded; drupelets not known
      - 1. **Sabia burmanica**
      - b. Petals oblong-ovate to oblong, (2.5–)3.5–5.5(–6) × (*c.*1–)1.5–2(–2.25) mm, acute to narrow-obtuse; drupelets obovoid to oblong-obovoid or pyriform, 10–15(–16) × 7–10 mm; embryo with strongly folded cotyledons

\* In case of doubt use alternative lead.

- c. Petals oblong to lanceolate,  $2.25-4(-4.5) \times 0.7-1.25(-1.5)$  mm, acute to obtuse; drupelets globular to obovoid,  $7-11 \times 6-10$  mm; embryo with smooth to somewhat wrinkled or undulated cotyledons . . . . . 8
- 8a. Leaves oblong to (sub-)lanceolate,  $3-12(-15) \times 1-5$  cm, nerves (5)6–9(10) pairs, patent, straight, sometimes  $\pm$  curved; cymes solitary, axillary, up to 8(–10) cm, 7–25-flowered, glabrous to sparsely pubescent; drupelets  $7-9 \times 6-8$  mm; reticulate pattern rather fine, often inconspicuous or obscure
- 13. *Sabia parviflora* subsp. *parviflora***
- b. Leaves oblong or oblong-ovate to sublanceolate,  $(6- )8-22 \times c. 2.5-8$  cm; nerves 5–7 pairs,  $\pm$  patent or sometimes ascending, curved, often the more apical nerves  $\pm$  straight; cymes solitary, axillary, but often arranged in a thyrsoid inflorescence, up to 5 cm, (10–)15–30-flowered, variably pubescent or tomentose; drupelets  $9-11 \times 8-10$  mm; reticulate pattern rather fine, limited to the margin . . . . . **12. *Sabia paniculata***

## KEY TO THE SPECIES OF THAILAND

- 1a. Plants deciduous\* . . . . . **15. *Sabia purpurea* subsp. *purpurea***
- b. Plants evergreen . . . . . 2
- 2a. Petals ovate to oblong,  $2.5-4.5 \times 1.25-2.25$  mm. . . . . 3
- b. Petals either suborbicular to elliptic,  $1.75-2.5 \times 1.25-2$  mm, or oblong to lanceolate,  $2.25-4(-4.5) \times 0.7-1.25$  mm. . . . . 4
- 3a. Leaves oblong,  $7-22 \times c. 3-10$  cm, herbaceous, beneath pubescent especially on midrib; cymes 10- or more-flowered
- 10. *Sabia lanceolata* var. *siamensis***
- b. Leaves oblong or oblong-ovate to sublanceolate,  $3-12 \times c. 1.5-4.5$  cm, herbaceous to pergamentaceous, beneath (sub-)glabrous; cymes 3–6-flowered, glabrous. . . . . **15. *Sabia purpurea* subsp. *purpurea***
- 4a. Leaves oblong to lanceolate,  $3-12(-15) \times 1-5$  cm; nerves patent, straight or sometimes  $\pm$  curved; cymes 7–25-flowered; petals oblong to lanceolate,  $2.25-4(-4.5) \times 0.7-1.25$  mm; drupelets  $\pm$  compressed,  $7-9 \times 6-8$  mm
- 13. *Sabia parviflora* subsp. *parviflora***
- b. Leaves oblong-ovate to lanceolate,  $4-18 \times 1.5-6.5(-8)$  cm; nerves  $\pm$  patent, sometimes somewhat ascending, curved to straight; cymes 1–4(–6)-flowered; petals suborbicular to elliptic,  $1.75-2.5 \times 1.25-2$  mm; drupelets very compressed,  $11-14 \times 10-13$  mm . . . . . **11. *Sabia limoniacea***

## KEY TO THE SPECIES OF CAMBODIA, LAOS, AND VIETNAM

- 1a. Leaves beneath all over  $\pm$  pubescent; cymes arranged in a racemose to thyrsoid inflorescence, whether or not subtended by very small leaves, up to 1 cm, 3-flowered, densely pubescent; petals lanceolate,  $4.5-5.5(-6) \times 0.75-1.1$  mm, acute, the upper part distinctly narrowed or caudate; style in flower 0.3–0.6 mm . . . . . **19. *Sabia uropetala***

\* In herbarium material this character is only easily perceptible when young flowering material is available; in case of doubt use the alternative lead.

- b. Leaves beneath glabrous; cymes arranged in a corymbose to thyrsoid inflorescence, sometimes subtended by small leaves, up to 4 cm, (2)3–6-flowered, glabrous to sparsely tomentellous; petals oblong to oblong-ovate, 4.5–6.5(–7.5) × 2–2.5(–3) mm; acute to narrow-obtuse; style in flower 2.75–4.5 mm, in fruit about as long as the adjacent side(s) of the drupelet(s)

**7. Sabia fasciculata**

- c. Leaves beneath glabrous to, mainly on midrib, lax-pubescent; cymes either arranged in a racemose to thyrsoid inflorescence, up to 2 cm, 1–4(–6)-flowered, or solitary, axillary, few- to many-(up to 25)-flowered, glabrous to lax-pubescent or tomentellous; petals suborbicular to lanceolate, 1.75–4(–4.5) × 0.7–2 mm, acute to rounded; style in flower up to 1.5(–1.75) mm, in fruit much shorter than the adjacent side(s) of the drupelet(s) . . . . . 2
- 2a. Leaves ± pergamentaceous; nerves (5)6–9(10) pairs, patent, straight, sometimes curved; cymes solitary, axillary, 2–8(–10) cm, 7–25-flowered; petals oblong to lanceolate, 2.25–4(–4.5) × 0.7–1.25 mm; drupelets globular to somewhat obovoid, ± compressed, 7–9 × 6–8 mm; reticulate pattern rather fine, often inconspicuous or obscure . . . . . **13. Sabia parviflora**
- b. Leaves herbaceous to herbaceous-pergamentaceous; nerves 4–6 pairs, ascending to ± patent, slightly to distinctly curved, or the more apical nerves ± straight; cymes solitary, axillary, up to 4(–5) cm, (2)3–5-flowered; petals elliptic to elliptic-oblong, 2–3 × 1.25–1.75 mm; drupelets transverse-ellipsoid or subreniform, ± compressed, 5.5–7 × 6.5–8 mm; reticulate pattern coarse, usually finer to the margin, conspicuous . . . . . **4. Sabia dielsii**
- c. Leaves ± pergamentaceous-coriaceous; nerves 5–9 pairs, ± patent, curved to straight; cymes either arranged in a racemose to thyrsoid inflorescence, or solitary, axillary, when subtended by small leaves, up to 2 cm, 1–4(–6)-flowered; petals suborbicular to elliptic, 1.75–2.5 × 1.25–2 mm; drupelets globular to obovoid, very compressed, 11–14 × 10–13 mm; reticulate pattern faint or absent, sometimes somewhat prominent at the margin

**11. Sabia limoniacea**

KEY TO THE SPECIES OF MALESIA

- 1a. Flowers solitary, sometimes 2 or 3 together, or arranged in a thyrus; ovary glabrous; style in flower 3–6 mm long, conspicuous in fruit and about half as long as the adjacent side(s) of the drupelet(s). (*Malay Peninsula, Sumatra*) . . . . . **17. Sabia sumatrana**
- b. Flowers in cymes, these solitary, axillary, up to 30(–40)-flowered; ovary densely pubescent; style in flower 2.25–2.5 mm long; drupelets not known (*Malay Peninsula*) . . . . . **6. Sabia erratica**
- c. Flowers in few- to many-flowered cymes; cymes either solitary, axillary, or arranged in an, up to 15 cm long, racemose to thyrsoid inflorescence, (1)2–25-flowered; ovary glabrous; style in flower up to 1.5(–1.75) mm long, inconspicuous in fruit and much shorter than the adjacent side(s) of the drupelet(s) . . . . . 2
- 2a. Leaves oblong to lanceolate, 3–12(–15) × 1–5 cm, beneath usually distinctly paler than above; nerves (5)6–9(10) pairs, patent, straight; cymes

- solitary, axillary, (4–)7–25-flowered; style either absent or obscurely (see fig. 9) or normally developed, (0.75–)1–1.5(–1.75) mm long. (*Borneo, Philippines*). . . . . **13. *Sabia parviflora***
- b. Leaves elliptic-oblong to sublanceolate, 5–25 × 2–10 cm, beneath usually somewhat paler than above but not conspicuously so; nerves 4–8(9) pairs, ± patent, straight to curved; cymes often arranged in an up to 15 cm long racemose to thyrsoid inflorescence, (1)2–10(–12)-flowered, sometimes solitary, axillary, up to 4(–6)-flowered; style normal-developed, 0.2–1 mm long . . . . . 3
- 3a. Cymes up to 2 cm, 1–4(–6)-flowered; petals suborbicular to elliptic, 1.75–2.5 × 1.25–2 mm, obtuse to rounded; stamens nearly as long as petals; drupelets globular to obovoid, very compressed, 11–14 × 10–13 mm; reticulate pattern usually faint or absent. (*Malay Peninsula, Sumatra, Borneo*)
- 11. *Sabia limoniacea***
- b. Cymes up to 1 cm, 1–4(–7)-flowered; petals either oblong-ovate to ovate-lanceolate, acute, acuminate or not, or elliptic-oblong to oblong, obtuse, 3.5–6.5 × (1.25–)1.5–2.5 mm; stamens distinctly shorter than petals; drupelets obovoid, ± compressed, c. 10–12 × (7–)8–10 mm; reticulate pattern rather faint but usually visible, often limited to the margin. (*Borneo*)
- 16. *Sabia racemosa***
- c. Cymes up to 2(–3.5) cm, (1)2–10(–12)-flowered; petals oblong, 2.5–4(–4.5) × c. 1–1.5 mm, obtuse; stamens distinctly shorter than petals; drupelets obovoid or ± globular, ± compressed, 7.5–11 × c. 8–10(–11) mm; reticulate pattern usually clearly visible, sometimes obscure, limited to the margin or not . . . . . 4
- 4a. Leaves oblong to sublanceolate, 5–14(–18) × 2–6(–8) cm; nerves (5)6–8(9) pairs; cymes either arranged in a racemose to thyrsoid inflorescence, or solitary, axillary, 1–4-flowered; style 0.6–1 mm; drupelets ± globular, sometimes somewhat obovoid, compressed, 7.5–11 × c. 8–10(–11) mm. (*Philippines, Moluccas, New Guinea, Solomon Islands*)
- 14. *Sabia pauciflora***
- b. Leaves elliptic-oblong to oblong, sometimes sublanceolate, 6–19 × 2–8(–10) cm; nerves 4–7(8) pairs; cymes usually arranged in a thyrsoid inflorescence, sometimes subtended by small leaves, 3–10(–12)-flowered; style 0.2–0.5 mm; drupelets obovoid, sometimes globular, somewhat compressed, 9–11 × c. 9–10 mm. (*Java, Sumatra*). . . . . **9. *Sabia javanica***

**1. *Sabia burmanica* v. d. Water, *sp. nov.***

Arbor parva sempervirens. *Ramuli* steriles glabri; ramuli floriferi subglabri vel sparse breve pubescenti, usque ad 3 mm diam. *Gemmae* ovoideae acutae; squamae plus minusve glabrae, ciliolatae. *Folia* anguste oblonga, 15–18 cm longa, 5–7 cm lata, pergamentacea, supra glabra vel in costa sparse puberula, subtus praesertim in costa nervisque perbreve pubescentes; basis acuta ad rotundata, interdum subattenuata; apex acutus, acuminatus; nervi 7- vel 8-jugati, patentes, curvi; petiolus usque ad 1.5 cm longus, levis vel minute rugosus, glaber vel sparse puberulus. *Inflorescentiae* axillares, thyrsoidae, usque ad 13 cm longae, sparse pubescentes; cymae usque ad 4 cm longae, sparse ramosae, 8–18 flores gerentes, subglabrae; pedicelli usque ad 8 mm longi; bracteolae sublanceolatae, usque ad 1.5 mm longae, paulum pubescentes, ciliolatae. *Sepala* late ovata ad ovata, 1–1.5 mm longa, 0.75–1.5 mm lata, acuta usque ad obtusa, glabra sed interdum subciliolata. *Petala* suborbicularia usque ad elliptica vel late subobovata, 3.25–4.5 mm longa, (2.25–)2.5–3.25 mm lata, obtusa usque ad rotundata; nervi usque ad 7 vel 8, tenues vel indistincti. *Stamina* 2–2.5(–3) mm longa; filamentum applanatum, 1.5–2(–2.5) mm

longum, 0,3–0,5 mm latum; anthera oblongo-ellipsoidea, 0,5–0,6 mm longa, erecta. *Discus* coronae similis, lobis brevibus angustis, costis plus minusve prominentibus. *Pistillum* 2–2,5 mm altum; stylum conicum, 1,2–1,6 mm longum; ovarium transverse ellipsoideum, 0,5–0,8 mm altum, 0,8–1 mm latum, glabrum. *Drupae* ignotae.

*T y p u s*: Burma, Kachin State, between Ning W'Krok and Kanang, alt. 1500 m, -3-1962, *J. Keenan, U Thun Aung & U Tha Hla* 3946 (E).

An evergreen, small tree (?). *Twigs* glabrous; flowering twigs subglabrous to sparsely short-pubescent, up to 3 mm Ø. *Buds* ovoid, acute; scales (sub-)glabrous, ciliolate. *Leaves* oblong to sublanceolate, 15–18 × 5–7 cm, ratio 2.5–3.5, pergamentaceous, above glabrous or with some very short hairs on midrib, beneath especially on midrib and nerves pubescent with very short hairs; base acute to rounded, not or slightly attenuate; apex acute, acuminate; nerves 7–8 pairs, patent, ± curved; petiole up to c. 1.5 cm, rather smooth to fine-wrinkled, glabrous or with some very short hairs. *Inflorescences* axillary thyrsoid, up to 13 cm long, very sparsely pubescent, cymes up to 4 cm, rather laxly 8–18-flowered, (sub-)glabrous; pedicels up to 8 mm; bracteoles sublanceolate, up to 1.5 mm, somewhat pubescent, ciliolate. *Sepals* broad-ovate to ovate, 1–1.5 × 0.75–1.5 mm, acute to obtuse, glabrous, subciliolate or not. *Petals* suborbicular to elliptic or slightly broad-ovate, 3.25–4.5 × (2.25–)2.5–3.25 mm, obtuse to rounded, nerves up to 7(8), thin or obscure. *Stamens* 2–2.5(–3) mm; filament flattened, 1.5–2(–2.5) mm long, 0.3–0.5 mm wide; anther oblong-ellipsoid, 0.5–0.6 mm, upright. *Disk* crown-shaped; lobes short and narrow; ribs more or less prominent. *Pistil* 2–2.5 mm; style conical, 1.2–1.6 mm, probably much shorter than the adjacent side(s) of the drupelet(s); ovary subreniform 0.5–0.8 × 0.8–1 mm, glabrous. *Drupelets* not present.

*D i s t r i b u t i o n*. Burma; only known from the type.

*N o t e s*. This species can very easily be distinguished from all other species of the genus by its flowers, arranged in 8–18-flowered cymes and characterized by the shape and size of the petals together with the relatively short style.

Although the only available specimen of *S. burmanica* has been recorded as 'a small tree', I believe that *S. burmanica* will usually be a climber or a more or less scandent shrub like the other species of *Sabia*. Occasionally, several other species, e.g. *S. pauciflora*, have been recorded as 'small trees' or 'treelets', too.

## 2. *Sabia campanulata* Wall.

*S. campanulata* Wall. in Roxb., Fl. Ind. 2 (1824) 311; G. Don, Gen. Hist. 2 (1832) 69; Walp. Repert. 1 (1842) 557; Hook. f. & Thoms., Fl. Ind. 1 (1855) 209; Walp. Ann. 4 (1857) 138.; Brandis, For. Fl. (1874) 116, 574; Hook. f., Fl. Brit. Ind. 2 (1876) 1; Gamble, Man. Ind. Timb. (1881) 102; Collett, Fl. Simlensis (1902) 101; Brandis, Ind. Trees (1906) 193; Kanjilal, For. Fl. Siwalik & Jaunsar (1911) 121; Parker, For. Fl. Punjab (1924) 108; Osmaston, For. Fl. Kumaon (1927) 131; Chen, Sargentia 3 (1943) 37; Banerji, Rec. Bot. Surv. India 19 (1965) 36; Biswas, Pl. Darj. Sikkim Himal. 1 (1966) 260; Hara, Fl. East. Himal. 1 (1966) 194; 2 (1971) 74; Abdul Ghafoor in Nasir & Ali, Fl. W. Pakistan 91 (1975) 2, fig. 1 c–d; Hara & Williams, Enum. Flow. Pl. Nepal 2 (1979) 100. — *T y p e*: *Wallich* 1002, Nepal, Sheopore (K-W).

*S. leptandra* Hook. f. & Thoms., Fl. Ind. 1 (1855) 209; Walp. Ann. 4 (1857) 138; Hook. f., Fl. Brit. Ind. 2 (1876) 2; Gamble, Man. Ind. Timb. (1881) 102; Brandis, Ind. Trees (1906) 193; Chen, Sargentia 3 (1943) 39; Biswas, Pl. Darj. Sikkim Himal. 1 (1966) 261; Hara, Fl. East. Himal. 1 (1966) 194; 2 (1971) 74; Sen Gupta, Bull. Bot. Soc. Bengal 22, 2 (1968) 196; Rec. Bot. Surv. India 20 (1973) 65. — *T y p e*: *J. D. Hooker s.n.*, Sikkim, alt. 1500–2100 m, fl. (K; iso in BM), fr. (K; iso in BM, E, L, P, and W).

- S. yunnanensis* Franch., Bull. Soc. Bot. Fr. 33 (1886) 465; Pl. Delavayanae (1889) 147; Handel-Mazzetti, Symb. Sin. 7 (1933) 644; Chen, Sargentia 3 (1943) 23. — Synonyms: *Delavay 149*, China, Yunnan, Mao-kou-tchang, near Tapin-tze, 23-4-1883, fl. (P); 793, China, Yunnan, Pee-cha-ho, near Mo-so-yn, alt. 2200 m, 23-4-1884, fl. (P); 2031, China, Yunnan, Ta-long-tan, near Tapin-tze, alt. 1800 m, 28-4-1886, fl. (P; iso in K).
- S. schumanniana* Diels, Bot. Jahrb. 29 (1900) 451; Rehder & Wilson in Sargent, Pl. Wilson. 2 (1914) 196; Handel-Mazzetti, Symb. Sin. 7 (1933) 643; Chen, Sargentia 3 (1943) 29. — Synonyms: *C. Bock & A. von Rosthorn 1935, 2026, 2028*, China, Szechuan, Nan ch'uan, defl., fr. (B? n.v.).
- S. emarginata* Lecomte, Bull. Soc. Bot. Fr. 54 (1907) 673; Rehder & Wilson in Sargent, Pl. Wilson. 2 (1914) 196; Handel-Mazzetti, Symb. Sin. 7 (1933) 644; Chen, Sargentia 3 (1943) 20. — Type: *A. Henry 5314*, China, Hupeh, fl. (K; iso in GH, P).
- Celastrus mairei* Léveillé, Feddes Repert. 13 (1914) 264; Loesener, Ber. Dt. Bot. Ges. 32 (1914) 543; Rehder & Wilson in Sargent, Pl. Wilson. 2 (1915) 358; Rehder, J. Arnold Arbor. 15 (1934) 9; Chen, Sargentia 3 (1943) 24; Lauener, Notes R. Bot. Gdn. Edinb. 27 (1967) 274. — *S. yunnanensis* Franch. var. *mairei* Chen, Sargentia 3 (1943) 24. — Synonyms: *E. E. Maire s.n.*, China, Yunnan, Tong-tch'ouan, alt. 2600 m, -4/5-1911, fl. (E); *s.n.*, China, Yunnan, Lou-Ké-suin, alt. 3000 m, -4-1911, fl. (E).
- S. latifolia* Rehder & Wilson in Sargent, Pl. Wilson. 2 (1914) 195; Stapf, Curtis's Bot. Mag. 146 (1920) tab. 8859; Rehder & Wilson, J. Arnold Arbor. 8 (1927) 164; Handel-Mazzetti, Symb. Sin. 7 (1933) 644; Chen, Sargentia 3 (1943) 25; Anon., Icon. Corm. Sin. 2 (1972) 727, fig. 3184. — Type: *E. H. Wilson 818*, China, W. Szechuan, Wa-shan, alt. 1500–1800 m, fl., fr., -6/8-1908 (K; iso in A, E, GH, W).
- S. puberula* Rehder & Wilson in Sargent, Pl. Wilson. 2 (1914) 197; Chen, Sargentia 3 (1943) 22. — Type: *E. H. Wilson 2534 A*, China, W. Hupeh, Hsing-shan-Hsien, alt. 600–1200 m, -5/9-1907, fl (K; iso in A).
- S. schumanniana* Diels var. *longipes* Rehder & Wilson in Sargent, Pl. Wilson. 2 (1914) 197; Chen, Sargentia 3 (1943) 30. — Type: *E. H. Wilson 2529*, China, W. Szechuan, Chin-ting-shan, alt. 1200 m, 22-5-1908, fl. (K; iso in A, BM, E).
- S. schumanniana* Diels var. *pluriflora* Rehder & Wilson in Sargent, Pl. Wilson. 2 (1914) 197; Chen, Sargentia 3 (1943) 30. — Type: *E. H. Wilson 2534*, China, W. Hupeh, Hsing-shan Hsien, alt. 600–1300 m, -5-1907, fl. (K; iso in A, BM, E, W).
- S. ritchieae* Rehder & Wilson in Sargent, Pl. Wilson. 2 (1914) 195; J. Arnold Arbor. 9 (1928) 91; Merrill, Brittonia 4 (1941) 112; Chen, Sargentia 3 (1943) 21. — Type: *E. H. Wilson 2533*, China, W. Hupeh, Hsing-shan-Hsien, alt. 900–1200 m, -5-1907, fl., -8-1907, fr. (K; iso in A, BM, E, W).
- S. transarisanensis* Hayata, Icon. Pl. Formos. 5 (1915) 31, pl. 5; Chen, Sargentia 3 (1943) 19; Liu, Ill. Lign. Pl. Taiwan 2 (1962) 928, t. 765; Li, Woody Fl. Taiwan (1963) 505; Fl. Taiwan 3 (1977) 598. — Type *B. Hayata & Takeo Ito s.n.*, Taiwan, Mt. Arisan Tozan, -4-1914 (TI, n.v.).
- S. acutisepala* Stapf ex [Anon., Acta Phytotax. Geobot., Kyoto 5 (1936) 77, *nom. inval.*] Chen, Sargentia 3 (1943) 67. — Type: *A. Henry 5265*, China, Hupeh, Changyang, fl. (K).
- S. rotundata* Stapf ex [Anon., Acta Phytotax. Geobot., Kyoto 5 (1936) 77, *nom. inval.*] Chen, Sargentia 3 (1943) 68. — Synonyms: *E. H. Wilson 329*, China, Hupeh, Patung, Changyang, alt. 1500 m, 7-4-1900, fl. (K); 3141, W. China, -5-1904, fl. (K; iso in A, BM, P).
- S. angustifolia* Chen, Sargentia 3 (1943) 31. — Type: *G. Forrest 21472*, China, Yunnan, Chien-chuan-Mekong Divide, 26°36'N, 99°40'E, alt. 3000 m, -7-1922, fr. (A; iso in E).
- S. bicolor* Chen, Sargentia 3 (1943) 32. — Type: *H. Wang 41415*, China, Yunnan, Lao-ho-shan, Chen kiang, alt. 2280 m (?), 8-7-1939, defl. (A).
- S. callosa* Chen, Sargentia 3 (1943) 33. — Type: *H. T. Tsai 57328*, China, Yunnan, -1934, fr. (A).
- S. croizatiana* Chen, Sargentia 3 (1943) 28. — Type: *E. E. Maire 326*, China, Yunnan, Tchê-Ky, alt. 2990 m, fl. (A).
- S. gaultherifolia* Stapf ex [Anon., Acta Phytotax. Geobot., Kyoto 5 (1936) 78, *nom. inval.*] Chen, Sargentia 3 (1943) 26. — Type: *A. Henry 6227*, China, Hupeh, Chang-yang, -1885/88, fr. (GH; iso in BM, K, P).
- S. glandulosa* Chen, Sargentia 3 (1943) 30. — Type: *K. M. Feng 1834*, China, Yunnan, S. Chungtien, Kung-shiang-shu, Snow Mt., on the way to Kai-lou-wei, on banks of Yangtze, alt. 2900 m, 25-7-1939, defl. (A).
- S. heterosepala* Chen, Sargentia 3 (1943) 41. — Type: *Wang-Te-Hui 87*, China, Hunan, Yun-schan near Wukang, alt. 400–1420 m, -4-1919, fl. (A; iso in W).
- S. metcalifiana* Chen, Sargentia 3 (1943) 27. — Type: *H. T. Tsai 55007*, China, Yunnan, Lung-ling Hsien, alt. 2200 m, 7-1-1934, defl. (A; iso in BO).
- S. omeiensis* Stapf ex [Anon., Acta Phytotax. Geobot., Kyoto 5 (1936) 77, *nom. inval.*] Chen, Sargentia 3 (1943) 29. — Type: *E. H. Wilson 4713*, China, Szechuan, Mt. Omei, -6-1904, fl. (K; iso in A).
- S. pallida* Stapf ex [Anon., Acta Phytotax. Geobot., Kyoto 5 (1936) 78, *nom. inval.*] Chen, Sargentia 3 (1943) 33. — Type: *A. Henry 10529*, China, Yunnan, Mengtze, alt. 1800 m, fl. (A; iso in E, K).

- S. pentadenia* Chen, Sargentia 3 (1943) 27. — Type: *H. T. Tsai 62875*, China, Yunnan, -1934, fr. (A).  
*S. pubescens* Chen, Sargentia 3 (1943) 20. — Type: *T. T. Yü 5231*, China, Yunnan, -1938, fl. (A).  
*S. rockii* Chen, Sargentia 3 (1943) 21. — Type: *J. F. Rock 8334*, China, Yunnan, E. slopes Likiang Snow Ra., Yangtze watershed, -1923/24, fl. (A).  
*S. shensiensis* Chen, Sargentia 3 (1943) 31. — Type: *W. Purdom 894*, China, Shensi, Tai-pei-shan, -1910, fr. (A; iso in K).  
*S. yuii* Chen, Sargentia 3 (1943) 25. — Type: *T. T. Yü 15975*, China, Yunnan, Shunning, Snow Ra., alt. 3000 m, 26-5-1938, fl. (A).  
*S. puberula* Rehder & Wilson var. *hupehensis* Chen, Sargentia 3 (1943) 23. — Type: *A. Henry 6290*, China, Hupeh, -1885/88 (NY, *n.v.*; iso in K).

A woody climber or scandent shrub, up to 6 m, usually deciduous, but sometimes with persistent leaves ('*leptandra*'). Twigs glabrous or sometimes to laxly pubescent; flowering twigs up to 2(-3) mm  $\varnothing$ , glabrous to pubescent or tomentose. *Buds* ovoid, acute, or sometimes globular, obtuse-rounded, up to 3.5 mm; scales glabrous or sometimes short-pubescent, ciliolate. *Leaves* oblong or oblong-ovate to lanceolate, 3-15  $\times$  1-5(-8) cm, ratio *c.* 2-4(-5), herbaceous to pergamentaceous, above glabrous to puberulous, beneath glabrous to pubescent, when pubescent often only on midrib and nerves, hairs sometimes on broadened bases; base acute to rounded or sometimes truncate or subcordate, attenuate or not; apex acute, acuminate to cuspidate; margin sometimes irregularly and minutely incised; nerves 4-6 pairs, patent to ascending,  $\pm$  curved or sometimes straight; petiole up to 1.5 cm, rather smooth, glabrous to, mainly above, pubescent. *Flowers* green to purple, either solitary, axillary, appearing shortly before or with the new leaves, or in cymes, appearing with the new leaves; cymes solitary, axillary, up to 6(-10) cm long, 2-5(-10)-flowered, glabrous to laxly pubescent or tomentellous; pedicel up to 1(-1.5) cm, but when flowers solitary up to 3 cm or in fruit even up to 4.5 cm; bracteoles elliptic to lanceolate, up to 1.5 mm, glabrous, ciliolate or not. *Sepals* often more or less unequal, suborbicular, broad-ovate to ovate, or sometimes very short and much wider than long, 0.25-1.25(-3.5)  $\times$  0.6-1.75 mm, acute to rounded or irregular, glabrous, ciliolate or not. *Petals* broad-elliptic or elliptic to broad-obovate, obovate, or somewhat rectangular-oblong, 4-9(-11)  $\times$  2-7(-8) mm, rarely up to 14 mm long when long persistent ('*campanulata*'), obtuse to rounded or sometimes broad-acute, nerves up to 10, branching towards the apex, often obscure. *Stamens* (3-)3.5-6.5 mm long, when full-grown slightly exerted or not; filament flattened, (2-)2.5-*c.* 6 mm long, 0.4-*c.* 1 mm wide at the base, tapering to the apex; anther oblong-ellipsoid, 0.6-1 mm, upright. *Disk* very variable in shape and size, either somewhat crown-shaped with short lobes and with or without faint ribs ('*leptandra*'), or large and somewhat irregularly shaped, usually wider than high and much larger than the ovary, the margin irregularly lobed, often somewhat enclosing the base of the ovary ('*campanulata*'), or  $\pm$  cushion-shaped, or sometimes even truncate-conical with the margin not lobed and not enclosing the base of the ovary ('*yunnanensis*'). *Pistil* (2.5-)3.5-6 mm, finally slightly exerted or not; style cylindrical to conical, (2-)3-5.5 mm, in fruit half as long as to somewhat longer than the adjacent side(s) of the drupelet(s), sometimes with some hairs near the base; ovary (broad-)ovoid to subreniform or sometimes not clearly distinguishable from the style, somewhat compressed, 0.5-1  $\times$  0.6-1.2(-1.5) mm, glabrous to densely short-pubescent. *Drupelets* globular, (broad-)obovoid or subreniform, somewhat compressed, 5-7(-8)  $\times$  6-8(-9) mm, green to red or deep blue when fresh, sometimes with scattered hairs, sometimes with long persistent petals and stamens ('*campanulata*'); reticulate pattern coarse, limited to

the margin or not; margin rounded or sometimes distinctly angular. Embryo with smooth cotyledons.

**Distribution:** India (Jammu & Kashmir, Himachal Pradesh, Punjab, Uttar Pradesh, W. Bengal, Assam), Nepal, Sikkim, Bhutan, Burma, China (SE. Tibet, Yunnan, Kweichow, Szechuan, Kansu, Shensi, Honan (?), Hupeh, Hunan, Kwangtung (?), Kiangsi, Fukien, Chekiang), and Taiwan.

**INDIA.** J a m m u & K a s h m i r : *E. Nasir & R. R. Stewart 23739*, Poonch Dist., Dhuli, Poonch, alt. 1800 m (W); *25503*, Poonch Dist., Serimarg, alt. 1800–2100 m (W). — H i m a c h a l P r a d e s h : 11 collections from Chamba and Simla. — P u n j a b : *R. R. Stewart 2026*, Dharmsala, alt. 1500 m (K); *2258*, Kanjeer to Chamba, alt. 1500 m (K). — U t t a r P r a d e s h : *Bisram 2328*, Kumaon, W. Almora Div. (E); *Duthie 19844*, Garhwal, near Deola, alt. 2100–2400 m (L); *Kanjilal 997*, Jaunsar, Mundali, alt. 2550 m (K); *R. Strachey & J. Winterbottom 1*, Kumaon, alt. 1950 m (BM), alt. 2300 m (K); 3, Kumaon, alt. 2400 m (K). — W. B e n g a l : 10 collections, mainly from Darjeeling. — A s s a m : *C. B. Clarke 41762C & F*, Kohima, alt. 1650 m (BM, K); *Herb. G. Watt 6463*, Manipur, alt. 2400 m (K); *F. K. Ward 7768*, Naga Hills, Kohima, alt. 1500 m (K).

**NEPAL.** 15 collections from West to East Nepal.

**SIKKIM.** 12 collections.

**BHUTAN.** 9 collections.

**BURMA.** 6 collections.

**CHINA.** S E. T i b e t : *G. Forrest 379*, Mekong Valley, betw. Yeh Chih and Bati, alt. 1800 m (E); *F. Ludlow & G. Sherriff 12256*, Tsakchugong, Po Tsangpo Valley, Pome, alt. 1950 m (BM). — Y u n n a n : 96 collections. — K w e i c h o w : 47 collections. — K a n s u : *J. F. Rock 12074*, betw. Kaichow and Minchow, along riverbank of Wutu ho (A. E. K. P). — S h e n s i : *Herb. J. Hers 2956*, Tsing Ling, S. of Sianfu, alt. 1000–1500 m (A); *W. Purdom 894*, Tai-pei-shan (A, K). — H o n a n : *J. Hers 1249*, Sunghsien, Shih-tzu-miao, alt. 1200 m (A). — H u p e h : 26 collections, most from Changyang, Ichang, and Patung. — H u n a n : *Handel-Mazzetti (coll. Wang-Te-Hui) 87*, near Wukang, alt. 400–1420 m (A, W). — K w a n g t u n g : *C. L. Tso 20689*, Lokchong (BO, W). — K i a n g s i : *H. H. Chung & S. C. Sun 627, 735*, Lushan Mts., alt. 700–800 m. — F u k i e n : *H. H. Chung 3409*, Buong Kang, Yenping, alt. 500 m (A, E). — C h e k i a n g : *R. C. Ching 2391*, alt. 1080 m (A).

**TAIWAN.** *Suzuki 18161*, alt. 1550 m (A); *E. H. Wilson 10035*, from Nanto to Noko via Musha, Prov. Nanto, alt. 2300–3000 m; *10936*, Arisan to Mt. Morrison, Prov. Kagi, alt. 2833–3333 m (A).

**Note.** *S. campanulata* in the broad sense as accepted in the present revision is one of the most complex species of the genus. This is clearly demonstrated by the list of no less than 29 heterotypic synonyms, including the whole section *Pachydiscus* in the sense of Chen. The complexity of this species is due to its wide distribution, ranging from Kashmir in NW. India to Fukien and Chekiang in SE. China and to Taiwan, and to the variability of several characters, in consequence of which many local 'species' were distinguished. Within *S. campanulata* as presently accepted three groups can be distinguished, viz. a *campanulata*-, a *leptandra*-, and a *yunnanensis*-group, although even between these groups transitions occur. Probably, *S. campanulata* must be seen as being in a process of differentiation which may ultimately result in the forming of well-delimited taxa, whether varieties, subspecies, or even species (see also under *S. japonica*). At this moment, however, a subdivision of the species is in my opinion not yet possible.

In the following discussion the binomials used are in the sense of Chen (1943), whereas the names between inverted comma's indicate the groups as distinguished in the present paper.

The distribution as given under each group has merely been based on those collections which undoubtedly represent the groups concerned.

Finally, it must be emphasized that the distinction of these groups within *S. campanulata* does not mean a complete subdivision of the species. These groups merely represent the most characteristic forms within the variability of the species,

and their distinction facilitates the discussion about, and hence our insight in, this variability, which has led to the lumping of so many 'local species'.

### 'campanulata'

This group, which includes only *S. campanulata*, is mainly characterized by its solitary campanulate flowers in which the disk is relatively large and more or less irregularly shaped. It occurs from the western Himalayas eastwards as far as Bhutan. Within 'campanulata' there is, however, a distinct variation in the size of the flowers, which seems to be correlated with the distribution of the group. The typical form of 'campanulata', characterized by its relatively very large flowers, which can reach 15 mm  $\varnothing$ , and of which the petals are sometimes long persistent in fruit, is restricted to the eastern Himalayas (Nepal to Bhutan), whereas all collections from the more western regions of the Himalayas (W. Nepal to Kashmir) have distinctly smaller flowers. The small- and the large-flowered form of 'campanulata' agree, however, very well with each other in all other essential characters.

The relations of 'campanulata' with the two other groups will be discussed under those groups.

**Distribution and ecology:** Large-flowered or typical form: Nepal, Sikkim, Bhutan, and India (W. Bengal). Fl. March – June, fr. June – August; alt. mainly 2100 – 3000 m. Small-flowered form: W. Nepal, India (Jammu & Kashmir, Himachal Pradesh, Punjab, and Uttar Pradesh). Fl. March – May, fr. May – June; alt. mainly 1500 – 2700 m.

**Vernacular names:** *Bakalpata* (Kumaon), *Lohari* (Ranikhet Div.).

### 'leptandra'

The group 'leptandra', which encompasses *S. leptandra* and *S. metcalfiana*, differs from the two other groups mainly in its floral characters. In short, 'leptandra' is characterized by its long- and slender-pedicelled solitary flowers with the petals more or less rectangular-oblong, 4–5(–5.5) × 2–2.5(–3) mm, and stamens and style long and slender, often exerted when full-grown, disk crown-shaped with short lobes and with or without faint ribs. In some collections of 'leptandra' the older leaves, usually fallen when new flowering shoots develop, are still persistent ('evergreen'). Comparison of 'leptandra' with the large-flowered or typical form of 'campanulata', of which the area of distribution agrees with the western part of the area of 'leptandra', makes one believe that both groups represent different species. Besides the more slenderly pedicelled flowers of 'leptandra' with the long and slender stamens and style, the following morphological and ecological differences between the typical forms of the two groups can be noted:

### morphological differences

#### 'leptandra'

petals  $\pm$  rectangular-oblong, 4–5(–5.5) × 2–2.5(–3) mm.  
disk crown-shaped, small; lobes short, ribs faint or absent.

#### 'campanulata'

petals (broad-jelliptic to (broad-) obovate, 6–9(–11) × 4–7(–8) mm.  
disk large and somewhat irregularly shaped, usually wider than high and much larger than ovary; the margin irregularly lobed, often somewhat enclosing the base of the ovary.

drupelets with angular margin.

drupelets with rounded margin.

**ecological differences:**

*'leptandra'*

altitude (1200–)1500–2200 m.  
fl. October–December(–April)  
fr. December, March–July

*'campanulata'*

altitude mainly 2100–3000 m.  
fl. March–June  
fr. June–August

In this connection it must be remarked that it is very well possible that some of the above-mentioned characters, in which the two groups differ, may be correlated with each other, e.g. sizes of flowers and disks, or altitude and flowering time.

Notwithstanding the differences between the typical forms of *'leptandra'* and *'campanulata'*, I believe that both groups represent the same species and that even a subdivision into infraspecific taxa is not well possible. The most important support to that view is the occurrence of transitional or intermediate specimens. The transition from the typical form of *'leptandra'* to that of *campanulata'* is rather clearly demonstrated by the following collections: *J. H. Lace 2457* (E), *Cave s.n.* (E), *F. K. Ward 9226* (BM), *Ludlow & Sherriff 18707* (BM, E), *12256* (BM), *R. N. Parker s.n.* (K), *Bowes Lyon 55* (BM), *Ludlow & Sherriff 16066* and *16174* (E).

The occurrence of *'leptandra'* at lower altitudes and its different flowering time suggest that this group represents an ecological form of *S. campanulata*. This suggestion is strengthened by the comparison of several specimens, collected from the same region but at different altitudes, compare e.g. *F. K. Ward 9226*, Burma, Adung Valley, 1800 m alt. (*aff. 'leptandra'*) with *F. K. Ward 9411*, ditto, 2400 m alt. (= *'campanulata'* or *'yunnanensis'*).

The view that *'leptandra'* and *'campanulata'* represent the same complex species is also strengthened indirectly by the relation of each to *'yunnanensis'*, the third group within *S. campanulata* as accepted in this paper. This will be discussed under that group.

**Distribution and ecology:** Sikkim, Bhutan, India (W. Bengal, Assam), Burma, and China (Yunnan). Fl. October–December(–April), fr. December, March–July; alt. (1200–)1500–2200 m.

**Vernacular names:** *Simali* (Nepal), *Payongrik* (Lepcha), *Kali lahara* (Bhutan).

***'yunnanensis'***

The third group, *'yunnanensis'*, is undoubtedly the most complex and variable one within *S. campanulata* as accepted in this paper, or even within the whole genus. It encompasses all heterotypic synonyms as cited under the species with the exception of *S. campanulata*, *S. leptandra*, and *S. metcalfiana*. The recognition of many 'local species' is mainly due to the relatively wide variation in vegetative characters as size and shape (length/width ratio) of the leaves and pubescence, as well as in floral characters as number of flowers per cyme, size of the flowers, and shape of the disk. The typical form of *'yunnanensis'* is mainly characterized by its flowers, arranged in 2–5(–10)-flowered cymes, the petals (broad-)elliptic to (broad-)obovate, (4–)4.5–6.5 × (2.75–)3–5(–6) mm, obtuse to rounded, the

disk  $\pm$  cushion-shaped, without a lobed margin and not enclosing the base of the ovary. Since 'yunnanensis' agrees very well with 'campanulata' in floral and fruit characters, comparison of the typical form of 'yunnanensis' with 'campanulata' shows only the following differences:

## 'yunnanensis'

Flowers in cymes.

Disk  $\pm$  cushion-shaped, the margin straight, not enclosing the base of the ovary.

## 'campanulata'

Flowers solitary

Disk large and somewhat irregularly shaped, usually wider than high and much larger than the ovary, the margin irregularly lobed, often somewhat enclosing the base of the ovary.

The differences between the two groups become, however, very obscure as within 'yunnanensis' *s.l.* solitary flowers may occur. The transition from more-flowered cymes to solitary flowers is clearly demonstrated by the following collections: *G. Forrest* 6974 (E), 7254 (E), 5574 (E), 2096 (E), 379 (E), 15711 (E, K), *E. H. Wilson* 329 (K), *J. F. Rock* 12074 (E, P) and *Farges s.n.* (P). Comparison of these collections with 'campanulata' shows very clearly that the two at first sight clearly different groups are very closely related to each other, and that they undoubtedly belong to the same species.

Although the affinity between 'yunnanensis' and 'leptandra' is less pronounced than between 'yunnanensis' and 'campanulata', the following facts are still convincing: comparison of the following collections, viz. *Herb. O. Kuntze s.n.* (E), *G. H. Cave s.n.*, 20-3-1914 & 18-12-1912 (E), *Griffith* 8 (K), *R. E. Cooper* 1278 (E), *A. Henry* 6114, 6022 (GH), ranging from typical 'leptandra' to 'yunnanensis', shows a distinct resemblance in vegetative as well as fruit characters between the two groups. (In this respect it is undoubtedly also useful to compare the type-collections of several species as distinguished by former authors: e.g. *S. leptandra*, *S. gaultieriifolia*, *S. latifolia*, *S. puberula*, and *S. ritchieae*, which are clearly similar.) Nevertheless, the following (floral) differences between the two groups can be noted:

## 'yunnanensis'

flowers in 2–5(–10)-flowered cymes.  
petals (broad-)jelliptic to (broad-) obovate, (4–)4.5–6.5  $\times$  (2.75–) 3–5(–6) mm.  
disk  $\pm$  cushion-shaped, the margin straight, not enclosing the base of the ovary.

## 'leptandra'

flowers solitary.  
petals  $\pm$  rectangular-oblong, 4–5(–5.5)  $\times$  2–2.5(–3) mm.  
disk crown-shaped, small; lobes short, ribs faint or absent.

The above-mentioned differences in floral characters between typical 'yunnanensis' and 'leptandra' become, however, less distinct if the full variability of these characters within the groups concerned is included. The long and slenderly pedicelled, solitary flowers which are characteristic for the typical form of 'leptandra', have also been found in 'yunnanensis', but then often arranged in cymes. In this respect it seems interesting that in the only flowering collection from Taiwan available to me, viz. *Suzuki* 18161, the flowers are arranged in few-flowered cymes (a

'*yunnanensis*' character), whereas they clearly resemble '*leptandra*' in all other essential characters. Besides I may refer to the transition of the '*leptandra*'-flower to the '*campanulata*'-flower as discussed under '*leptandra*', as '*yunnanensis*' agrees very well with '*campanulata*' in its floral characters. Although more or less different between the typical forms of the groups, the variability of the disk especially within '*yunnanensis*' makes that part of the flower less useful for identification and delimitation.

**Distribution and ecology:** N. Burma, China (Yunnan, Tibet, Szechuan, Kansu, Hupeh, Kweichow, Hunan, and Shensi), but probably also in the other provinces of China as listed under the species. Fl. mainly March – June (– August), fr. May – August; alt. mainly 1800 – 3300 m, but at lower altitudes towards E. China.

**Vernacular name:** *tsing she tiao* (Chinese).

### 3. *Sabia coriacea* Rehder & Wilson

*S. coriacea* Rehder & Wilson in Sargent, Pl. Wilson, 2 (1914) 198; Chun, Sunyatsenia 1 (1934) 266; Chen, Sargentia 3 (1943) 46, fig. 5 — Type: *Dunn (Hongkong Herb. 2534)*, China, Fukien, Liu Kai Kan, alt. 330 m, -4/6-1905, fl. (HK, n.v.; iso in A, K).

An evergreen scandent shrub, up to 5 m. Twigs glabrous; flowering twigs glabrous, up to 1.5 mm Ø. Buds ovoid, up to 1.5 mm, acute; scales glabrous, (sub-) ciliolate. Leaves oblong, 3 – 7.5 × 1.5 – 2.5 cm, ratio 2 – 3, more or less coriaceous when older, above and beneath glabrous; base acute, (short-)attenuate; apex acute, acuminate or not; nerves 4 – 6 pairs, ± patent, straight to curved; petiole up to 1.5 cm, smooth to fine-wrinkled, glabrous. Cymes solitary, axillary, up to 3.5 cm, 3 – 8-flowered, glabrous; pedicels up to 5 mm. Flowers pale green. Sepals (broad-)ovate, 0.9 – 1.2 × 0.9 – 1.3 mm, acute to obtuse, glabrous, ciliolate. Petals ovate to elliptic-oblong, 3 – 3.5 × 1.5 – 2 mm, acute to narrow-obtuse; nerves up to 7, thin but distinctly visible. Stamens (1.5 – )2.5 – 2.75 mm; filament flattened, (1.2 – )2 – 2.25 mm long, 0.3 – 0.4 mm wide; anther oblong-ellipsoid, 0.4 – 0.5 mm, ± upright. Disk crown-shaped, relatively wide; lobes very short or absent; ribs more or less prominent. Pistil 1.25 – 1.5 mm; style conical, 0.75 – c. 1 mm or when petals and stamens are fallen even up to 1.75 mm; ovary subreniform, 0.5 – 0.7 × 0.7 – c. 1 mm, glabrous. Drupelets subreniform, 4 – 4.5 × 5 – 5.5 mm, somewhat compressed, white to reddish-purple when fresh, without persistent petals and stamens at the base; reticulate pattern only at the margin; persistent style shorter than the adjacent side(s) of drupelet(s).

**Distribution.** China (Fukien, Kwangtung).

CHINA. F u k i e n : *Dunn (Hongkong Herb. 2534)*, Liu Kai Kan, alt. 330 m (A, K); *J. L. Gressitt 1718*, Gang Keu, alt. 635 m (BM, E). — K w a n g t u n g : *W. T. Tsang 21362*, Yam Na Shan, Mei Dist. (BO, P).

**Ecology.** Fl. April, fr. July – August; altitude 300 – 650 m.

**Note.** No description of the embryo could be given as the two fruiting collections available to me bear only young drupelets with immature seeds.

**4. *Sabia dielsii* Léveillé — Fig. 6d.**

- S. dielsii* Léveillé in Feddes Repert. 9 (1911) 456; Fl. Kouy-Tchéou (1915) 379; Rehder, J. Arnold Arbor. 15 (1934) 9, excl. syn. *S. puberula* (= *S. campanulata*); Chen, Sargentia 3 (1943) 51. — **L e c t o t y p e** : *J. Esquirol 474*, China, Kweichow, -6-1905, fr. (E; iso in K).
- S. olacifolia* Stapf ex [Anon., Acta Phytotax. Geobot., Kyoto 5 (1936) 78, *nom. inval.*] Chen, Sargentia 3 (1943) 52; Gagnepain & Vidal, Fl. Cambodge, Laos, Vietnam 1 (1960) 15. — **T y p e** : *A. Henry 10250*, China, Yunnan, Mengtze, alt. 1500 m, fr. (A; iso in K).
- S. brevipetiolata* Chen, Sargentia 3 (1943) 50. — **T y p e** : *A. N. Steward & H. C. Cheo 171*, China, Kwangsi, Loh Hoh Tsuen, Ling Yün Hsien, alt. 1150 m, 12-4-1933, fl. (A; iso in BM, BO, SING, W).
- S. wangii* Chen, Sargentia 3 (1943) 51. — **T y p e** : *C. Wang 40857*, China, Kwangsi, Nam Tayuen, alt. 750 m, 22-6-1937, defl., fr. (A).

Shrub, up to 2 m, probably deciduous. *Twigs* glabrous; flowering twigs up to 2.5 mm  $\emptyset$ , glabrous. *Buds* ovoid, up to 3.5 mm, acute; scales glabrous, ciliate or not. *Leaves* elliptic-oblong or somewhat oblong-ovate to lanceolate, 4–12(–15)  $\times$  1.5–5(–7) cm, ratio 2–4, herbaceous to herbaceous-pergamentaceous, above and beneath glabrous; base acute to rounded or sometimes subcordate, attenuate or not; apex acute acuminate to cuspidate tapering; nerves 4–6 pairs, ascending to  $\pm$  patent,  $\pm$  curved but often the more apical nerves  $\pm$  straight; petiole up to 1.5(–2) cm, smooth, glabrous. *Cymes* solitary, axillary, up to 5 cm, (2)3–5-flowered, glabrous; pedicels up to 1 cm; bracteoles oblong to lanceolate or even linear, up to 2.5 mm long, glabrous, subciliate or not. *Flowers* green or greenish-yellow to white. *Sepals*  $\pm$  ovate, 0.6–1(–1.25)  $\times$  0.5–c. 1 mm, acute to obtuse, glabrous, not ciliate. *Petals* elliptic to elliptic-oblong, 2–3  $\times$  1.25–1.75 mm, acute to obtuse, nerves up to 7, inconspicuous. *Stamens* 1.25–2 mm; filament flattened, 0.75–1.5 mm long,  $\pm$  0.3 mm wide; anther ellipsoid,  $\pm$  0.4 mm, upright. *Disk* crown-shaped; lobes sometimes short or even absent; ribs  $\pm$  prominent. *Pistil* 1.5–1.75 mm; style  $\pm$  conical, 1–1.25 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary subreniform, 0.5–0.6  $\times$  0.6–0.9 mm, glabrous. *Drupelets* subreniform, somewhat compressed, 5.5–7  $\times$  6.5–8 mm, green when fresh (immature?), without persistent petals and stamens at the base; reticulate pattern coarse but usually becoming finer to the margin, conspicuous. Embryo with smooth to somewhat wrinkled cotyledons.

**D i s t r i b u t i o n**. China (Yunnan, Kweichow, and Kwangsi) and Vietnam.

**C H I N A**. **Y u n n a n** : 8 collections. — **K w e i c h o w** : 6 collections. — **K w a n g s i** : *A. N. Steward & H. C. Cheo 171, 712*, Loh Hoh Tsuen, Ling Yün Hsien, alt. 1150 m, 12-4-1933 (A, BM, BO, SING, W), 10-7-1933 (P); *C. Wang 40857*, Nam Tayuen, alt. 750 m (A).

**V I E T N A M**. *A. Pételot 2183*, Tonkin, prov. Laokay, Chapa, alt. 1600 m, (P); *3069 A*, Tonkin, Chapa, alt. 1500 m (K); *E. Poilane 12792*, Tonkin, route de Ta Phinh, near Chapa, alt. 1500 m (P); *Herb. Ch. d'Alleizette s.n.*, Annam, -6-1907 (P).

**E c o l o g y**. In woods and along roadsides, mainly at 1100–1900 m altitude. Fl. April–May, fr. mainly June–August.

**N o t e**. In some specimens the drupelets are distinctly dark-spotted, which is caused by groups of many closely packed 'granules' in the mesocarp. The 'granules' can also occur in the mesocarp along the ribs formed by the endocarp.

This species, especially the few flowering collections available to me, distinctly resembles *S. purpurea* subsp. *dumicola* from Yunnan, and distinction from that subspecies is somewhat difficult. Nevertheless, I prefer to consider *S. dielsii* as a separate species until more flowering material becomes available, which may make a better judgement about the naturalness of the species possible.

### 5. *Sabia discolor* Dunn — Fig. 3a, 6c.

*S. discolor* Dunn, J. Linn. Soc. Bot. 38 (1908) 358; Merrill & Chun, Sunyatsenia 1, 1 (1930) 68; Chen, Sargentia 3 (1943) 45; Anon., Icon. Corm. Sin. 2 (1972) 726, fig. 3182. — Lectotype: Dunn (*Hongkong Herb.* 2537), China, Fukien, Yenping, alt. 690 m, -4/6-1905, fr. (HK, n.v.; iso in A, K).

A woody climber, up to 3.5 m, deciduous. *Twigs* glabrous; flowering twigs up to c. 2 mm Ø, glabrous. *Buds* small, ± globular, up to c. 1.5 mm, obtuse to rounded; scales glabrous, ciliolate. *Leaves* ovate to elliptic, 2.5–7.5 × 1.5–4 cm, ratio c. 1.5–2(–2.5), herbaceous to pergamentaceous, above and beneath glabrous; base acute to rounded or sometimes truncate, (short-)attenuate or not; apex acute to obtuse, sometimes short-acuminate; nerves 3–5 pairs, ascending to somewhat patent, ± curved, but often the apical nerves more patent and nearly straight; petiole up to 1.5 cm, rather smooth to fine-wrinkled or striate, glabrous. *Cymes* solitary, axillary, up to 4 cm, 2–5-flowered, glabrous; pedicel up to 8 mm. *Flowers* green to yellow. *Sepals* triangular-ovate to ovate, 0.5–1(–1.25) × 0.5–1.1 mm, acute to obtuse, glabrous, ciliolate. *Petals* elliptic or somewhat oblong-elliptic, 3.25–4.25 × 1.5–2(–2.5) mm, (narrow-)obtuse, short-ciliolate, nerves 4–7, inconspicuous. *Stamens* 2.75–3.5 mm; filament flattened, 2.25–3 mm long, 0.3–0.4 mm wide; anther ellipsoid, 0.5–0.6 mm, upright. *Disk* crown-shaped, rather thin; lobes very short or absent; ribs ± faint or absent. *Pistil* 2.5–3.25 mm; style conical to somewhat cylindrical, 2–2.75 mm, half to nearly as long as the adjacent side(s) of the drupelet(s); ovary ± globular to subreniform, 0.5–0.6 × 0.6–1 mm, glabrous. *Drupelets* globular to obovoid or subreniform, compressed, 5–6.5(–7) × 5.5–7 mm, red when fresh, without persistent petals and stamens at the base; reticulate pattern only at the margin, indistinct; margin usually distinctly keeled. Embryo with smooth cotyledons.

**Distribution.** China (Chekiang, Fukien, Kiangsi, Hunan, Kwangtung, Kwangsi, and ? Yunnan).

**CHINA.** Chekiang: R. C. Ching 1722, Sze-tou (A). — Fukien: H. H. Chung 3276, Buong Kang, Yenping, alt. 800 m (A, E, SING, W); Dunn (*Hongkong Herb.* 2537), Yenping, alt. 690 m (A, K). — Kiangsi: H. H. Hu 946, Chung Yih, alt. 750 m (A). — Hunan: according to Anon. l.c. — Kwangtung: 8 collections. — Kwangsi: T. S. Tsoong (= Z. S. Chung) 82097, Chuen Yuen (A); C. Wang 39198 (A). — Yunnan: doubtful; see Notes.

**Ecology.** In thickets, c. 700–850 m altitude. Fl. April, fr. May–July.

**Notes.** *S. discolor* is also characterized by the colour of its older leaves, e.g. in fruiting specimens, which is (very) dark above, but conspicuously paler, more or less glaucous, beneath.

The small drupelets in this species are distinctly keeled, as shown in fig. 6c.

In *S. discolor* especially the sepals and the mesocarp contain many 'granules'.

According to Chen, l.c., *S. discolor* was erroneously recorded from Yunnan by H. H. Chung, Mem. Sci. Soc. China 1 (1924) 152. The record was based on two collections, viz. *Henry 10496* and *10529*, which, indeed, represent a totally different species, *S. campanulata*. The present species was also recorded from Yunnan by Merrill & Chun, l.c., and recently by Anon., l.c., but in both records no collections were cited. Therefore, it is very well possible that these records were copied from Chung.

**6. *Sabia erratica* v. d. Water, *sp. nov.***

Planta lignea sempervirens. *Ramuli* steriles glabri vel subpuberuli; ramuli florigeri usque ad 2.5 mm diam., plus minusve sparse pubescenti. *Gemmae* ovoideae acutae; squamae plus minusve pubescentes, ciliolatae. *Folia* oblonga, 5–8 cm longa, 2.5–3 cm lata, pergamentacea, supra glabra vel praesertim basem costaque, subtus praesertim costa nervisque sparse pubescentia; basis acuta, interdum attenuata; apex acutus, interdum breve attenuatus; nervi utrinque 6 vel 7 patentes, recti vel paulum curvati; petiolus usque ad 1.5 cm longus, minute rugosus, glaber vel pubescens. *Cymae* solitariae, axillares, usque ad 4.5 cm longae, ad 40-floribus, plus minusve sparse pubescentes; pedicelli usque ad 4 mm longi; bracteolae oblongae vel oblongo-ovatae, usque ad 0.8 mm longae, pubescentes, ciliolatae. *Sepala* ovata vel subelliptica, 0.8–1 mm longa, 0.5–0.75 mm lata, obtusa vel acuta, plus minusve pubescentia, ciliolata. *Petala* oblonga vel oblongo-ovata usque ad sublanceolata vel ovato-lanceolata, 3.75–4 mm longa, 1–1.5 mm lata, acuta usque ad anguste obtusa, subciliolata, nervis 6 vel minus obscuris. *Stamina* 2.3–3 mm longa; filamentum applanatum 1.8–2.6 mm longum, 0.25–0.4 mm latum; anthera ellipsoidea vel oblongo-ellipsoidea, ca. 0.4–0.6 mm longum, erectum. *Discus* coronae similis, lobis perbrevibus vel absentibus, costis plus minusve prominentibus. *Pistillum* 2.75–3 mm altum; stylum angusto-conicum usque ad teres, 2.25–2.5 mm longum, ad basem sparse pubescens; ovarium subglobosum usque ad transverse ellipsoideum, 0.5–0.6 mm altum, 0.6–0.8 mm latum, dense pubescens. *Drupae* ignotae.

**T y p u s :** Malay Peninsula, Singapore, Bukit Timah Res., low alt., 22-5-1940, *Ngadiwan KEP 36149* (K).

An evergreen woody plant. *Twigs* glabrous to still somewhat pubescent; flowering twigs up to 2.5 mm Ø, ± lax-pubescent. *Buds* ovoid, acute; scales ± pubescent, ciliolate. *Leaves* oblong, 5–8 × 2.5–3 cm, ratio 2–2.7, pergamentaceous, above glabrous or still sparsely pubescent especially at the base and on midrib, beneath laxly pubescent especially on midrib and nerves; base acute, attenuate or not; apex acute, short-acuminate or not; nerves 6–7 pairs, patent, ± straight to somewhat curved; petiole up to 1.5 cm, somewhat fine-wrinkled, glabrous to pubescent. *Cymes* solitary, axillary, up to 4.5 cm, up to 40-flowered, ± lax-pubescent; pedicels up to 4 mm; bracteoles oblong to oblong-ovate, up to 0.8 mm, pubescent, ciliolate. *Sepals* ovate to somewhat elliptic, 0.8–1 × 0.5–0.75 mm, obtuse to acute, ± pubescent, ciliolate. *Petals* oblong or oblong-ovate to sublanceolate or ovate-lanceolate, 3.75–4 × 1–1.5 mm, acute to narrow-obtuse, subciliolate, nerves up to 6, dark-coloured. *Stamens* 2.3–3 mm; filament flattened, 1.8–2.6 mm long, 0.25–0.4 mm wide; anther ellipsoid to oblong-ellipsoid, c. 0.4–0.6 mm, upright. *Disk* crown-shaped; lobes very short or absent; ribs ± prominent. *Pistil* 2.75–3 mm; style narrow-conical to cylindrical, 2.25–2.5 mm, with some hairs at the base; ovary somewhat globular to subreniform, 0.5–0.6 × 0.6–0.8 mm, densely pubescent. *Drupelets* not available.

**D i s t r i b u t i o n .** Only known from the type.

**N o t e s .** In general appearance this species resembles somewhat *S. parviflora*, but it can very easily be distinguished especially by its floral characters.

I have seen only one specimen of *S. erratica*, which was recorded as 'tree, 100 ft tall'. Although a cursory anatomical examination of the twigs by Dr. P. Baas at Leiden does not exclude a tree-like nature of the specimen, and though several other species of the genus have occasionally been recorded as 'small trees' or 'treelets', too, I still believe that the record must be put down to a wrong annotation or field-observation. Besides, it is also possible that a wrong label has been added to the collection, as was already suggested by someone else, who wrote 'wrong label?!' on it. Therefore, as it is not certain where the (type-)collection of *S. erratica* has been collected from, the epithet '*erratica*', which means 'wandering, without a homeland', has been chosen.

## 7. *Sabia fasciculata* Chen — Fig. 5, 7.

*S. fasciculata* Lecomte ex [Anon., Acta Phytotax. Geobot., Kyoto 5 (1936) 77, *nom. inval.*; Merrill, Brittonia 4 (1941) 111 *p.p.*, excl. *F. K. Ward 9018*] Chen, Sargentia 3 (1943) 42, fig. 4; Gagnepain & Vidal, Fl. Cambodge, Laos, Vietnam 1 (1960) 17. — *T y p e*: *A. Henry 10487*, China, Yunnan, SE. of Mengtze, alt. 1500 m, fl. (A; iso in K).

*S. kontumensis* Gagnepain, Not. Syst. 14 (1952) 271; Gagnepain & Vidal, Fl. Cambodge, Laos, Vietnam 1 (1960) 18, fig. 1. — *L e c t o t y p e*: *E. Poilane 35823*, Vietnam, Annam, massif du Ngok Pan, prov. Kontum, alt. 2400 m, 13-12-1946, fl., fr. (P), chosen by Vidal l.c.

An evergreen climber or scandent shrub, up to 12 m. *Twigs* glabrous to sparsely puberulous or tomentellous; flowering twigs up to 2.5 mm  $\varnothing$ , glabrous to tomentellous. *Buds* ovoid to globular, up to 1.5 mm, acute to rounded; scales (sub-) glabrous, ciliolate. *Leaves* oblong to sub lanceolate, 4–12  $\times$  1.5–4 cm, ratio 2–3.5(–4),  $\pm$  pergamentaceous-coriaceous, above glabrous or with short hairs on midrib, beneath glabrous; base acute to rounded, short-attenuate or not; apex acute, acuminate; nerves (5)6–8 pairs, patent, straight; petiole up to 2.5 cm, smooth to fine-wrinkled, glabrous to somewhat puberulous above. *Cymes* sometimes solitary, axillary, up to 4 cm, (2)3–6-flowered, but often arranged in a short, more or less corymbose inflorescence, glabrous to sparsely tomentellous; pedicels up to 1 cm. *Flowers* green to white. *Sepals* ovate to elliptic, 1.25–2  $\times$  1–1.5 mm, acute to obtuse, sometimes slightly irregular at the apex, glabrous, ciliolate or not. *Petals* oblong to oblong-ovate, 4.5–6.5(–7.5)  $\times$  2–2.5(–3) mm, acute to narrow-obtuse, nerves usually 5–7, slightly branching to the apex. *Stamens* 2.75–5(–5.5) mm; filament flattened, 2.25–4.5(–5) mm long, 0.4–0.6 mm wide; anther ellipsoid to oblong-ellipsoid, 0.5–0.9 mm, upright. *Disk* crown-shaped; lobes usually very short; ribs more or less prominent, sometimes obscure. *Pistil* c. 3.5–5 mm; style conical, c. 2.75–4.5 mm, about as long as the adjacent side(s) of the drupelet(s); ovary  $\pm$  subreniform, 0.6–0.8  $\times$  0.7–c. 1 mm, glabrous. *Drupelets* broad-obovoid or subreniform,  $\pm$  compressed, 6.5–7.5  $\times$  7–8.5 mm, red when fresh, without persistent petals and stamens at the base; reticulate pattern rather coarse, only at the margin; margin often somewhat short-keeled. Embryo with smooth cotyledons.

**D i s t r i b u t i o n**: China (Yunnan, Kwangsi, and Kwangtung), Burma, and Vietnam.

**C H I N A**. **Y u n n a n**: 13 collections. — **K w a n g s i**: *R. C. Ching 5792*, Chu Feng Shan, SW. Shan Fang, N. Luchen, alt. 540 m (W); *S. K. Lau 28443*, Ling Wan Dist. (A); *C. Wang 39425*, Yao Shan, Tseungyuen (A); *40326*, Yao Shan, alt. 1500 m (A). — **K w a n g t u n**: according to Chen l.c.

**B U R M A**. *G. Forrest 24894*, Upper Burma, Htawgaw, lat. 26° 10' N, long. 98° 25' E, alt. 2400 m (E, K); *Maung 4975*, Bhamo Dist., alt. 1620 m (K).

**V I E T N A M**. *A. Pételot 4531*, Tonkin, Chapa, alt. 1400 m (P); *7859*, Tonkin, Chapa, alt. 1500 m (P); *E. Poilane 35795, 35823*, Annam, massif du Ngok Pan, prov. Kontum, alt. 2300–2400 m (P).

**E c o l o g y**. Often in forests, but sometimes also in thickets. Alt. usually 1300–2400 m. Fl. mainly December–February, sometimes till August, fr. June–December.

**N o t e s**. *Inflorescence*: In a very early stage of development the young cymes are closely packed, together forming a glomerule (fascicle, hence '*fasciculata*') of flowerbuds, which is more or less covered by small, relatively broad, and ciliolate, still somewhat budscale-like leaves (see fig. 7b). In a later stage the cymes subtended by small normal leaves can be recognized separately. In some collections, e.g. *Feng*

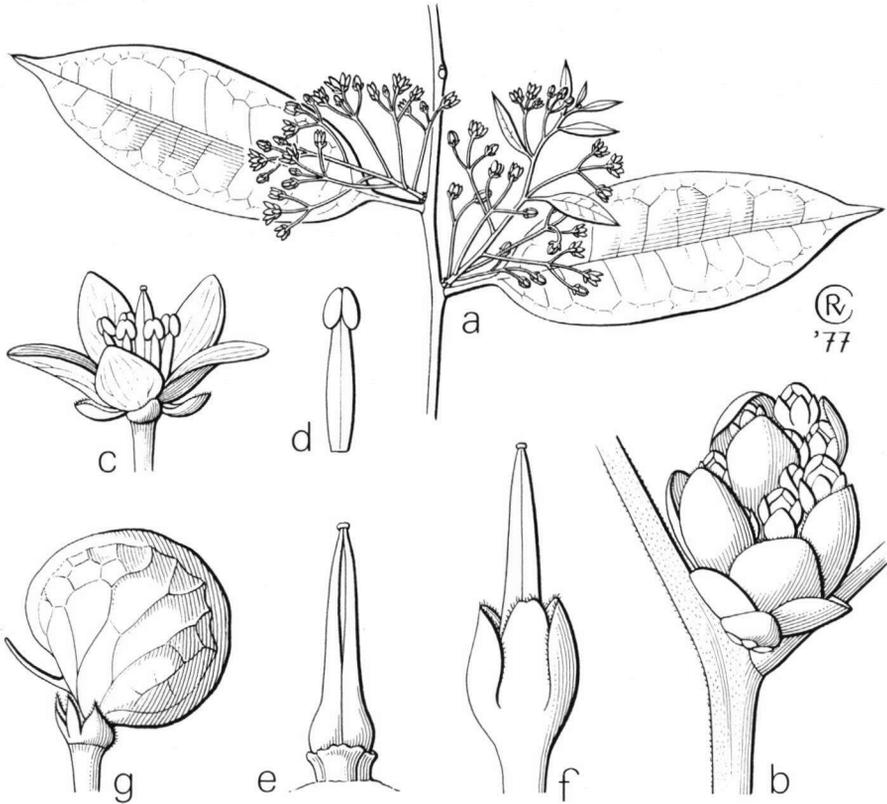


Fig. 7. *Sabia fasciculata* — a. habit,  $\times 2/3$ ; b. bud,  $\times 4$ ; c. open flower,  $\times 4$ ; d. stamen from inside,  $\times 8$ ; e. disk and pistil,  $\times 8$ ; f. pistil enclosed by the calyx,  $\times 8$ ; g. fruit,  $\times 3$ . — a, c & d. from *G. Forrest 17799*; b. from *K. Feng 13821*; e & f. from *G. Forrest 17711*; g. from *K. Feng 11144*.

*11144* and *Forrest 17799*, the more or less full-grown cymes are still solitary and subtended by often small leaves and are shorter than the flowering twig as usual. In many other collections the young leaves are caducous, and the cymes at the base of the flowering twig (= main axis) are somewhat shorter to even longer than the short main axis, forming together a lax to rather dense, more or less corymbose inflorescence. In other species with a (seemingly) compound inflorescence the main axis is much longer than a cyme; the whole has then been called thyrsoid.

The sepals in *S. fasciculata* are characterized by a distinctly paler margin. The dark colour of the central part is caused by many 'granules', which are, however, absent at the margin.

### 8. *Sabia japonica* Maximowicz — Fig. 2.

*S. japonica* Maxim., Bull. Acad. Sci. St. Pétersb. 11 (1867) 430; Mém. Biol. Acad. Sci. St. Pétersb. 6 (1867) 202, 8 (1872) 420; Forbes & Hemsley, J. Linn. Soc. Bot. 23 (1886) 143; Dunn & Tutcher, Kew Bull. Add. Ser. 10 (1912) 68; Chen, Sargentia 3 (1943) 34, fig. 1; Makino, Ill. Fl. Japan (1954) 349, fig. 1045;

- Ohwi, Fl. Japan (1965) 612; Anon., Icon. Corm. Sin. 2 (1972) 726, fig. 3181. — T y p e : *Maximowicz s.n.*, Japan, Nagasaki, -1863, veg. (L.E. n.v.: iso in BM. K. L).
- S. bullockii* Hance, J. Bot. Lond. 16 (1878) 9, 21 (1883) 297; Chen, Sargentia 3 (1943) 34. — T y p e : *T. L. Bullock* (*Herb. H. F. Hance 19964*), China, Kwangtung (prov. Cantonensis), North River, -3-1877, defl. (BM).
- S. japonica* Maxim. var. *spinosa* Lecomte, Bull. Soc. Bot. Fr. 54 (1907) 673. — [*S. spinosa* Stapf ex Anon., Acta Phytotax. Géobot., Kyoto 5 (1936) 78, nom. inval.; c. f. Chen, Sargentia 3 (1943) 35]. — T y p e : *Oldham 568* (Lecomte err. 368), Japan, Nagasaki, -4-1862 (K).
- Sabia* sp. Rehder & Wilson, J. Arnold Arbor. 8 (1927) 164.
- [*S. sinensis* Stapf ex Anon., Acta Phytotax. Géobot., Kyoto 5 (1936) 78, nom. inval.]. — *S. japonica* Maxim. var. *sinensis* Chen, Sargentia 3 (1943) 36. — T y p e : *Tutcher 10862 A*, China, Kwangtung, North River, Kai Tau, -4-1914 (K).

A deciduous woody climber or scandent shrub, up to 3 m. *Twigs* when older armed with short, up to 4(–6) mm long, terete to dorso-ventrally somewhat compressed, at the apex shallowly bifurcated spines, glabrous to short-pubescent or tomentellous; flowering twigs still unarmed, up to 2 mm Ø, glabrous to ± densely short-pubescent or tomentellous especially when very young. *Buds* ± globular to somewhat ovoid, up to 1.5 mm, obtuse to rounded; scales glabrous, ciliolate. *Leaves* somewhat ovate or elliptic to oblong, 2.5–8.5 × c. 1.5–5 cm, ratio c. 1.5–2.5(–c. 3), herbaceous to pergamentaceous, when very young densely adpressed-pubescent, but very soon glabrescent and when older above glabrous or still with some hairs on midrib, beneath glabrous to ± sparsely pubescent especially on midrib and nerves; base acute, cuneate, rounded, or sometimes truncate, (short-) attenuate or not; apex acute, (short-) acuminate; nerves 3–5 pairs, ascending to more or less patent, curved, the more apical ones becoming more patent and straight, foot-nerves sometimes distinctly developed; petiole up to 1.5 cm, glabrous to ± lax-pubescent, smooth to fine-wrinkled. *Flowers* green to yellow, solitary, axillary; pedicel up to c. 1 cm, but in fruit up to 4.5 cm, glabrous to short-pubescent or tomentellous. *Sepals* ± suborbicular, 0.3–0.7 × 0.5–1 mm, rounded or apex irregular, glabrous to somewhat pubescent, (sub-)ciliolate or not. *Petals* elliptic or elliptic-oblong to somewhat obovate or oblong-obovate, 3.75–5.5(–6) × (1.75–)2–3(–3.5) mm, obtuse to rounded, nerves up to 6, thin and branching or obscure, often distinctly joined near or at the base of the petal. *Stamens* (2–)2.75–3.75 mm; filament flattened, (1.5–)2.25–3.25 mm long, 0.25–0.5(–0.75) mm wide at the base; anther oblong-ellipsoid, 0.5–0.7 mm, upright. *Disk* crown-shaped; lobes very short or absent; ribs ± prominent. *Pistil* 2.5–3.5(–4) mm; style cylindrical to conical, 2–2.75(–3.25) mm, glabrous or with some hairs at the base, half as long as to as long as the adjacent side(s) of the drupelet(s); ovary about globular to subreniform, 0.5–0.7 × 0.6–0.9 mm, glabrous to pubescent. *Drupelets* globular to broad-obovoid or subreniform, compressed, 5–6 × 5–7 mm, green to red, blue, or black when fresh, with scattered hairs when ovary was pubescent, without persistent petals and stamens at the base; reticulate pattern somewhat coarse, limited to the margin or not. Embryo with smooth cotyledons.

**D i s t r i b u t i o n .** Japan (Kyushu, Shikoku), China (Kiangsu, Anhwei, Hupeh, Chekiang, Fukien, Kiangsi, Hunan, Kwangtung, Kwangsi).

JAPAN. K y u s h u : 10 collections. — S h i k o k u : according to Ohwi l.c.

CHINA. K i a n g s u : *Ching & Tso 496*, Hai Wei, S. of I-shing, Lungge (A); *K. Ling* (*Herb. Univ. Nanking 12400*), I-hsing (GH); *E. D. Merrill 11438*, Bau Hwa Shan (A). — A n h w e i : *K. Ling 1283*

(*Herb. Univ. Nanking 7825*), Kimen (*n.v.*, see notes). — H u p e h : *E. H. Wilson 35*, Nanto (K, W). — C h e k i a n g : 7 collections. — F u k i e n : *H. H. Chung 8023, 8043*, Ku-Dien, (A); *Dunn (Hongkong Herb. 2535)* (A); *J. de La Touche 25* (E). — K i a n g s i : *Y. K. Hsiung 5481*, Hsiao-shui (A); *5109*, Wuning (A); *H. H. Hu 869*, Sui-Chuen, alt. 600 m (A); *S. K. Lau 4152*, Sai Hang Cheung, near Tung Lei Village, Kiennan Dist. (A, BM); *4464*, Oo Chi Shan, near Lam Uk Tung Village, Lungnan Dist. (A, BM). — H u n a n : *C. S. Fan & Y. Y. Li 82*, I-Chia-Ao, Changning Hsien, alt. 240 m (A, BM, BO, L, P, W); *W. T. Tsang 23657*, P'ing T'ou Shan, Tang Wan Village, Yi Chang Dist. (A, BM, W). — K w a n g t u n g : 7 collections. — K w a n g s i : *W. T. Tsang 28146*, Ta-chiang-yuan, Chin-kang-shan, Kwei-lin Dist. (A); *T. S. Tsoong (= Z. S. Chung) 81700*, Hang-On-Yuen (A).

**E c o l o g y**. In thickets at c. 250–600 m altitude; fl. March–April, fr. mainly May–August.

**V e r n a c u l a r n a m e s**: *Aokadsura*, *Aokatsura* or *Aokazura* (Japanese).

**N o t e s**. *S. japonica* is the only species of the genus which is armed with spines. The development of these characteristic spines, which are only present in older twigs, has been described and pictured under the 'Notes on Morphology'. Apart from these spines, *S. japonica* is doubtless closely related to *S. campanulata*; several Chinese collections of both species are difficult to place.

The record of a *Sabia spec.* by Rehder & Wilson, *J. Arnold Arbor*, 8 (1927) 164, based on *K. Ling 1283 (Herb. Univ. Nanking 7825)* from Anhwei, was placed by Chen in the synonymy of *S. japonica*. Although I have not seen that collection, the short description given by Rehder, as well as the identification by Chen made me accept this record.

Furthermore, *S. japonica* was recorded from Shensi in Anon., l.c., but no collections were cited. Finally, Lèveillé, *Cat. Pl. Yunnan* (1917) 250, recorded the present species from Yunnan, but according to Chen this was probably based upon a wrong identification.

## 9. *Sabia javanica* (Blume) Chen

- S. javanica* (Blume) Backer ex Chen, *Sargentia* 3 (1943) 59; Backer & Bakhuizen van den Brink *f.*, *Fl. Java* 2 (1965) 144. — *Meniscosta javanica* Blume, *Bijdr.* (1825) 29. — *Meniscosta scandens* Blume ex Sprengel, *Syst. Veg.* 4, 2 (1827) 114, *nom. illeg.* (ICBN art. 63); Dietrich, *Syn. Pl.* 2 (1840) 923 ('*Meniscosta*'). — *S. meniscosta* Blume, *Mus. Bot. Lugd.-Bat.* 1 (1851) 369, fig. 44, *nom. illeg.* (ICBN art. 63); Miquel, *Fl. Ind. Bat.* 1, 2 (1859) 618 ('*meniscosta*'); *Fl. Arch. Ind.* (1870) 71, (1871) pl. 31 ('*meniscosta*'); Hook. *f.*, *Fl. Brit. Ind.* 2 (1876) 3 ('*meniscorta*'); Backer, *Schoolfl. Java* (1911) 273; Koorders, *Exkursionsfl. Java* 2 (1912) 544 ('*meniscosta*'). — **L e c t o t y p e**: *Blume (?) 892*, Java, G. Seribu, fl. (L 908.205–267).
- S. meniscosta* Blume var. *firma* Blume, *Mus. Bot. Lugd.-Bat.* 1 (1851) 370. — **T y p e**: *N.N.*, Sumatra, veg. (L 908.205–273).
- S. meniscosta* Blume var. *latifolia* Blume, *Mus. Bot. Lugd.-Bat.* 1 (1851) 370. — **S y n t y p e s**: *Korthals s.n.*, Sumatra, fl. (L 908.204–452); *Praetorius s.n.*, Sumatra, veg. (L 908.204–471).
- S. meniscosta* Blume var. *glabriuscula* Blume, *Mus. Bot. Lugd. Bat.* 1 (1851) 370. — *S. javanica* Chen var. *glabriuscula* Chen, *Sargentia* 3 (1943) 61. — **S y n t y p e s**: *Korthals s.n.*, Sumatra, veg. (L 908.205–261); *N.N.*, Java, fl. (L 908.205–271, 274, 275, 731).
- S. elliptica* Miquel, *Fl. Ind. Bat. Suppl.* (1860) 203, 521. — *S. meniscosta* Blume var. *elliptica* Miquel, *Fl. Arch. Ind.* (1870) 71 ('*meniscosta*'). — **T y p e**: *Teysmann 462 H. B.*, Sumatra, Prov. Riau, fr. (U; iso in L).

An evergreen woody climber or scandent shrub, up to 10 m. *Twigs* glabrous; flowering twigs up to 5 mm Ø, glabrous or still somewhat pubescent. *Buds* ovoid, up to 2 mm, acute; scales glabrous or with few hairs, ± ciliolate. *Leaves* elliptic-oblong to oblong or sometimes oblong-ovate or oblong-obovate or sublanceolate, 6–19 × 2–8(–10) cm, ratio c. 2–3(–4), pergamentaceous to pergamentaceous-coriaceous, above and beneath glabrous or with some hairs on midrib; base acute to

rounded, short-attenuate or not; apex acute, acuminate; nerves 4–7(8) pairs, patent, curved to straight; petiole up to 2.5 cm, glabrous to sparsely pubescent, ± (fine-)wrinkled. *Cymes* arranged in an axillary, up to 12 cm long, glabrous to pubescent, thyrsoid inflorescence, subtended by bracts or sometimes by small leaves and then inflorescence up to 17 cm long; cymes up to 3 cm, forming a lax to dense cluster of 3–10(–12) flowers, subglabrous to pubescent; bracts ovate to sublanceolate, up to 5 mm, subglabrous to more or less pubescent, ± ciliate; bracteoles as bracts but smaller, or bracteoles minute or sepal-like and then situated near calyx; pedicel up to 4 mm. *Flowers* green to yellow or white. *Sepals* sometimes 6 (see bracteoles), ± ovate or broad-ovate,  $0.75-1(-1.25) \times 0.5-0.8(-1)$  mm, acute to obtuse, ± pubescent, ciliate. *Petals* oblong,  $2.5-3.5(-4) \times 1-1.5$  mm, obtuse, nerves up to 5, often dark-coloured and than conspicuous. *Stamens* (1–)1.25–1.5 mm; filament ± flattened, (0.75–)1–1.25 mm long, 0.25–0.5 mm wide; anther globular to ellipsoid, 0.2–0.3 mm, inflexed. *Disk* crown-shaped; ribs sometimes faint or absent. *Pistil* 0.8–1.2 mm; style ± conical, 0.2–0.5 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary globular to subreniform,  $0.5-0.6 \times 0.5-0.7$  mm, glabrous. *Drupelets* obovoid or sometimes globular, somewhat compressed,  $9-11 \times c. 9-10$  mm, without persistent petals and stamens at the base; reticulate pattern often coarse and limited to the margin. Embryo with somewhat undulated or faintly folded cotyledons.

#### Distribution: Sumatra and Java.

SUMATRA. East Coast: *Lesger 363*, Langkat, alt. c. 80 m (BO); *Lörzing 16707*, Medan, alt. c. 20 m (BO); *Rahmat si Toroes 3703*, Laboehan Batoe Subdiv., Kota Pinang Dist., Saboengan (L); *Yates 1200*, Simeloengoen, Siantan, alt. 390 m (BM, BO), 1926, ditto (BO). — Indragiri: *Teysmann 462 HB* (L, U). — Lampung Dist.: *Forbes 1495*, hills NE. of G. Trang, alt. 180 m (BM, SING).

JAVA. About 25 numbered collections and several without collector and number. As far as annotated all from West and mainly from the southern part.

Ecology. Fl. and fr. probably throughout the year. In forests, at (20–)200–1500 m alt.

Vernacular names: According to Blume l.c. (2): *Aroy katjapi*, and *Aroy kahawatang* (Sundanese). The first name was also written as *Areuj katjapi* and *Areuj ketjapi* by Backer, and as *Aroi katjapi* by Miquel, who wrote the second vernacular name as *A. hahawatang*. On the labels of some collections the following names were written: *Katyapi aray* (Blume (?) 206), *Arey kakawatang* (Blume (?) 591), and *Areuj bebenjojan* (Winckel 1680 B).

Notes. *S. javanica* strongly resembles *S. pauciflora* from the Philippines, the Moluccas, New Guinea, and the Solomon Islands. It can be distinguished from that species by its often more-flowered cymes, its shorter style, and some other slight differences. Since both species are geographically separated, it was also possible to combine them into one species and give them the rank of subspecies. Although the differences are rather small, I believe that *S. javanica* and *S. pauciflora* represent two different, well-delimited, but very closely related species, however. Moreover, a reduction of both species to a single one would increase the variability of several taxonomic important characters, in consequence of which the delimitation with some other related species, like *S. paniculata*, *parviflora*, *racemosa*, and possibly also *limoniacea*, would become less distinct. Finally, this might result into a far-going lumping and a reduction of all these species to, say, subspecies. Contrary to *S.*

*campanulata*, however, in this case I believe that the differences between these taxa have reached a higher level already, resulting in the distinction of mutually closely related but  $\pm$  well-delimited species, each with its own specific combination of characters.

In vegetative characters and in drupelets *S. javanica* resembles *S. racemosa* from Borneo. It can, however, easily be distinguished from that species by its more-flowered inflorescences and its floral characters, especially its petals.

### 10. *Sabia lanceolata* Colebrooke — Fig. 6b.

- S. lanceolata* Colebrooke, Trans. Linn. Soc. Lond. 12 (1818) 355, t. 14; Wallich in Roxb., Fl. Ind. 2 (1824) 309; Sprengel, Syst. Veg. 1 (1824) 779; G. Don, Gen. Hist. 2 (1832) 69; Dietrich, Synop. Pl. 1 (1839) 804; Walp. Repert. 1 (1842) 557; Blume, Mus. Bot. Lugd.-Bat. 1 (1851) 368; Hook. f. & Thoms., Fl. Ind. 1 (1855) 210; Walp. Ann. 4 (1857) 138; Drury, Handb. Ind. Fl. 1 (1864) 650; Hook. f., Fl. Brit. Ind. 2 (1876) 2; Warburg in Engl. & Prantl, Nat. Pflanzenfam. 3, 5 (1895) 368, 370, fig. 183A, 184A—H; Brandis, Ind. Trees (1906) 194; Kanjilal *et al.*, Fl. Assam 1, 2 (1936) 325; Chen, Sargentia 3 (1943) 53; Sen Gupta, Bull. Bot. Soc. Bengal 22, 2 (1968) 196; Rec. Bot. Surv. India 20, 2 (1973) 64. — Type: *Colebrooke*, Silhet (K, n.v.).
- S. tomentosa* Hook. f., Fl. Brit. Ind. 2 (1876) 3; Brandis, Ind. Trees (1906) 194; Chen, Sargentia 3 (1943) 52. — Type: *Griffith s.n.*, Upper Burma (?), alt. 1050 m, defl., fr. (K).
- S. wardii* W. W. Smith, Notes R. Bot. Gdn. Edinb. 10 (1917) 64; Chen, Sargentia 3 (1943) 53. — Type: *F. K. Ward 1955*, Burma, Putao Ridge, alt. 360 m, -11-1914, fl. (E).
- S. kachinica* Chen, Sargentia 3 (1943) 63, fig. 8. — *S. fasciculata auct. non* Chen: Merrill, Brittonia 4 (1941) 111, *pro Ward 9018*. — Type: *F. K. Ward 9018*, Burma, Kachin Hills, alt. 600–900 m, 3-12-1930, fl. (A; iso in BM).

An evergreen woody climber or scandent shrub. *Twigs* glabrous to pubescent; flowering twigs up to 3 mm  $\varnothing$ , glabrous to pubescent. *Buds* ovoid, up to 1.5 mm, acute; scales glabrous to pubescent, ciliolate or not. *Leaves* (elliptic-)oblong to lanceolate, 5–22  $\times$  1.5–8(–10) cm, ratio (c. 2–)2.5–4.5(–5), herbaceous to pergamentaceous or sometimes coriaceous, above glabrous or subglabrous, sometimes sparsely pubescent, beneath glabrous or with very few hairs on midrib, sometimes laxly pubescent (distinctly visible on midrib); base acute to obtuse or rounded, attenuate or not; apex acute, acuminate; nerves (5–)7–12 pairs, patent, straight or sometimes  $\pm$  curved; petiole up to 2.5 cm, glabrous to pubescent, rather smooth to fine-wrinkled or bullate. *Cymes* solitary, axillary, or (seemingly) arranged in an axillary thyrsoid inflorescence when the subtending leaves are fallen, 1.5–5.5(–7) cm, (10–)15–30(–35)-flowered, glabrous to pubescent; pedicel up to 13 mm; bracteoles ovate to oblong-ovate, up to 1.2 mm, often near calyx, glabrous to pubescent, ciliolate or not. *Flowers* green to white. *Sepals* broad-ovate to ovate, sometimes oblong-ovate, 0.75–1.25(–2)  $\times$  c. 0.7–1(–1.5) mm, acute to obtuse, glabrous to pubescent, ciliolate or not. *Petals* oblong-ovate to oblong, (3.5–)4–5.5(–6)  $\times$  c. 1.5–2(–2.25) mm, acute or narrow-obtuse, nerves up to 6, but often obscure by many ‘granules’ forming dotted lines. *Stamens* c. 1.5–2(–2.25) mm; filament flattened, 1.2–1.75(–2) mm long, 0.3–0.5 (rarely up to 0.8) mm wide; anther globular to ellipsoid, 0.2–0.3 mm, inflexed. *Disk* crown-shaped; lobes short, but often with distinctly disciform apices; ribs often faint or absent. *Pistil* 1.25–1.75 mm; style cylindrical to slightly conical, 0.6–1 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary broadly transverse-ellipsoid, 0.6–0.75  $\times$  0.7–1 mm, glabrous. *Drupelets* distinctly obovoid to oblong-obovoid or pyriform, somewhat compressed, (11–)12–15(–16)  $\times$  7–10 mm, probably blue when fresh, with or without persistent petals and stamens at the base;

reticulate pattern faint or absent. Embryo with very plicate cotyledons, which fit into each other.

#### KEY TO THE VARIETIES

- 1a. Leaves beneath glabrous or with very few hairs on midrib. var. *lanceolata*  
 b. Leaves beneath sparsely to laxly pubescent, especially visible on midrib 2  
 2a. Leaves pergamentaceous-coriaceous; base obtuse to rounded; nerves patent, straight. . . . . var. *tomentosa*  
 b. Leaves herbaceous; base acute or cuneate; nerves patent,  $\pm$  curved  
 var. *siamensis*

**a. var. *lanceolata*** — *S. lanceolata* Colebrooke — *S. kachinica* Chen — *S. fasciculata* auct. non Chen.

Flowering twigs glabrous to variably short-pubescent. *Leaves* oblong to lanceolate, 5–18 × 1.5–6(–8) cm, ratio (2–)2.5–4.5(–5), beneath glabrous or with very few hairs on midrib; nerves 7–12 pairs, patent, straight to somewhat curved. *Cymes* (sub-)glabrous. *Sepals* broad-ovate to ovate, 0.75–1.25 × 0.7–1(–1.25) mm. *Petals* (3.5–)4–5.5(–6) × c. 1.5–2(–2.25) mm. *Drupelets* obovoid to oblong-obovoid or pyriform, (11–)12–15(–16) × 7–10 mm.

**Distribution.** Bhutan, India (Assam), Bangladesh (Silhet), and N. Burma.

BHUTAN. *R. Lister* 16, alt. 230 m (E)

INDIA. Assam: 24 collections.

BANGLADESH. Silhet: *Wallich* 999 p.p. (K-W).

BURMA. *F. K. Ward* 1989, Putao to Myitkyina, alt. 900–1200 m: (E); 9018, Kachin Hills, alt. 600–900 m (A, BM).

**Ecology.** Fl. mainly October–January, fr. mainly January–April; at 200–1500 m altitude.

**Uses.** According to Kanjilal et al. l.c.: ‘The leaves are used by the Garos for fomenting in cases of swellings and pain on the ankle or wrist’. (see also *S. pauciflora*).

**Vernacular names:** According to Colebrooke l.c.: *Sabjā-lat* (Beng., at Sylhet); according to Wallich l.c.: *Soobja* (Beng.); according to Kanjilal et al. l.c.: *Miri*, and *Mandri* (both names Garo), and *Samtameh* (Khasi).

**Notes.** The three collections from Upper Burma, viz. *Toppin s.n.* (K), *F. K. Ward* 1989 and 9018, the latter being the type of *S. kachinica* Chen, differ from the other collections only in their shiny and more stiff leaves, in consequence of which the nerves and veins beneath are more prominent and conspicuous than usual. Comparison of these Burmese collections with collections of the ‘typical’ form, e.g. *F. K. Ward* 1989 (E) with *Hook. f. & Thoms. s.n.* from Khasia (L), and *F. K. Ward* 9018 (A) with *Panigrahi* 22370 from Garo Hills, Assam (L), makes clear that these all doubtless represent the same species and even the same variety, and that the above-mentioned differences, probably due to different environmental conditions, are of no taxonomic value.

In Kew ‘Ceylon’ was written on the sheet of a specimen collected by *Walker (s.n.)*. Although the specimen represents *S. lanceolata* var. *lanceolata*, I have not

inserted Ceylon in the distribution of the species, because I doubt whether this specimen has really been collected from Ceylon.

**b. var. tomentosa** (Hook. f.) van de Water, *stat. nov.* — *S. tomentosa* Hook. f. — *S. wardii* W. W. Smith.

Flowering twigs  $\pm$  pubescent. Leaves elliptic-oblong to oblong,  $5-17 \times c. 2-10$  cm, ratio  $(1.7-2-2.5)$ , pergamentaceous-coriaceous, beneath sparsely to laxly pubescent especially on midrib and nerves; base obtuse to rounded; nerves  $5-9$  pairs, patent, straight. *Cymes* glabrous to pubescent. *Sepals* ovate to oblong-ovate,  $(1-1.25-2 \times 0.75-1.25(-1.5))$  mm. *Petals*  $(2.5-3.5-4.5 \times (c. 1-1.5)-2)$  mm. *Drupelets* distinctly obovoid,  $10-11 \times 8-9$  mm.

**Distribution.** Burma.

BURMA. *Griffith s.n.*, Upper Burma (?), alt. 1050 m (K); *C. E. Parkinson 322*, Myitkyina Dist. (K); *F. K. Ward 1955*, Putao Ridge, alt. 360 m (E).

**Ecology.** In forests, at 350–1050 m altitude. Fl. in November.

**Notes.** Although there is no locality given on the label of the type-collection of *S. tomentosa*, I believe that it must have been collected in Upper Burma and not in Assam as suggested by Hooker l.c.; it agrees very well with the other Burmese collections of the variety.

At first sight var. *tomentosa* looks totally different from var. *lanceolata* in its vegetative characters. It differs from that variety in its pubescence and its broader and more solid leaves, of which the (fewer) nerves and veins beneath are more prominent and accordingly more conspicuous than they usually are in the typical variety. Although the flowers and fruits in var. *tomentosa* are somewhat smaller, they agree very well with var. *lanceolata* in all essential characters. The above-mentioned differences in leaf-characters, which mainly determine the difference in appearance between the two varieties, are, however, less distinct if only Burmese collections are compared. The distinct resemblance in leaf-characters between e.g. *C. E. Parkinson 322 (tomentosa)* and *F. K. Ward 1989 (lanceolata)* makes clear that the two varieties are closely related.

**c. var. siamensis** v. d. Water, *var. nov.*

Ramuli florigeri plus minusve pubescentes. *Folia* oblonga, 7–22 cm longa, ca. 3–10 cm lata, herbacea, subtus praesertim costa nervisque laxe pubescentia; basis acuta vel cuneata; nervi utrinque 5–7, plus minusve patentes, curvi vel praesertim in foliis minoribus recti. *Cymae* pubescentes. *Sepala* ovata, 0.8–1.2 mm longa, 0.6–1 mm lata. *Petala* ovata vel oblongo-ovata, 2.5–3.5 mm longa, 1.4–1.8 mm lata. *Drupeae* ignotae.

**Typus:** *A. F. G. Kerr 10809*, Thailand, Kao Luang, Prachuap, alt. c. 700 m. 4-7-1926. fl. (L: iso in BM, K).

Flowering twigs  $\pm$  pubescent. *Leaves* oblong,  $7-22 \times c. 3-10$  cm, ratio  $c. 2-3$ , herbaceous, beneath sparsely to laxly pubescent especially on midrib and nerves; base acute to cuneate; nerves  $5-7$  pairs,  $\pm$  patent, curved to, mainly in smaller leaves, straight. *Cymes* pubescent. *Sepals* ovate,  $0.8-1.2 \times 0.6-1$  mm. *Petals* ovate to oblong-ovate,  $2.5-3.5 \times 1.4-1.8$  mm. *Drupelets* not available.

**Distribution.** Thailand.

THAILAND. *A. F. G. Kerr 10809*, Kao Luang, Prachuap, alt. c. 700 m (BM, K, L); *12183*, Pato, Langsuan, alt. c. 200 m (BM).

**E c o l o g y .** Collected at 200–700 m altitude; fl. in July.

**N o t e s .** This variety differs from var. *lanceolata* in its pubescence, its large but still herbaceous leaves, which have curved (versus straight) and fewer nerves, and its smaller flowers. Although the two collections from Thailand agree with var. *tomentosa* in pubescence and flowers, the differences in leaf-characters make me prefer to place them into a new variety. Var. *siamensis* differs from var. *tomentosa* mainly in its large herbaceous (versus pergamentaceous-coriaceous) leaves, in which the nerves and veins beneath are less prominent and conspicuous than in var. *tomentosa*, and of which the bases are acute to cuneate (versus obtuse to rounded). Finally, it must be noticed that the only flowering collection of var. *siamensis*, viz. *A. F. G. Kerr 10809*, has been collected in July, whereas the two other varieties flower October–January.

### 11. *Sabia limoniacea* Hook. f. & Thoms. — Fig. 6a, 8.

*S. limoniacea* Wall. [Cat. (1829) 1000, *nom. nud.*] ex Hook. f. & Thoms., Fl. Ind. 1 (1855) 210; Walp. Ann. 4 (1857) 139; Bentham, Fl. Hongkong. (1861) 70; Drury, Handb. Ind. Fl. 1 (1864) 650; Hook. f., Fl. Brit. Ind. 2 (1876) 3; Kurz, J. Asiat. Soc. Bengal 45, 2 (1876) 204, excl. syn. *Sabia* sp. Griffith (= *S. parviflora* subsp. *parviflora*); For. Fl. Brit. Burma 1 (1877) 300 ('*limonacea*'); Forbes & Hemsley, J. Linn. Soc. Bot. 23 (1886) 144; King, J. Asiat. Soc. Bengal 65, 2 (1896) 454 ('*limonacea*'), excl. syn. *Sabia* sp. Griffith (= *S. parviflora* subsp. *parviflora*); Prain, Beng. Pl. 1 (1903) 246; Brandis, Ind. Trees (1906) 194; Dunn & Tutcher, Kew Bull., Add. Ser. 10 (1912) 68; Ridley, Fl. Mal. Pen. 1 (1922) 513; Merrill, Lingnan Sci. J. 5 (1927) 119 ('*limonacea*'); Kanjilal et al. Fl. Assam 1, 2 (1936) 326; Chen, Sargentia 3 (1943) 56, fig. 7; Biswas, Pl. Darj. Sikkim Himal. 1 (1966) 261. — T y p e : *Wallich 1000*, Silhet (K-W). *Androglossum reticulatum* Champ. ex Benth., Hooker's J. Bot. Kew Gard. Misc. 4 (1852) 42; Bentham, Fl. Hongkong. (1861) 70; Chen, Sargentia 3 (1943) 58; non *Sabia reticulata* Elmer (1909) (= *S. pauciflora*). — *S. paniculata* auct. non Hook. f. & Thoms.: Seem., Bot. Voy. 'Herald' (1857) 362.

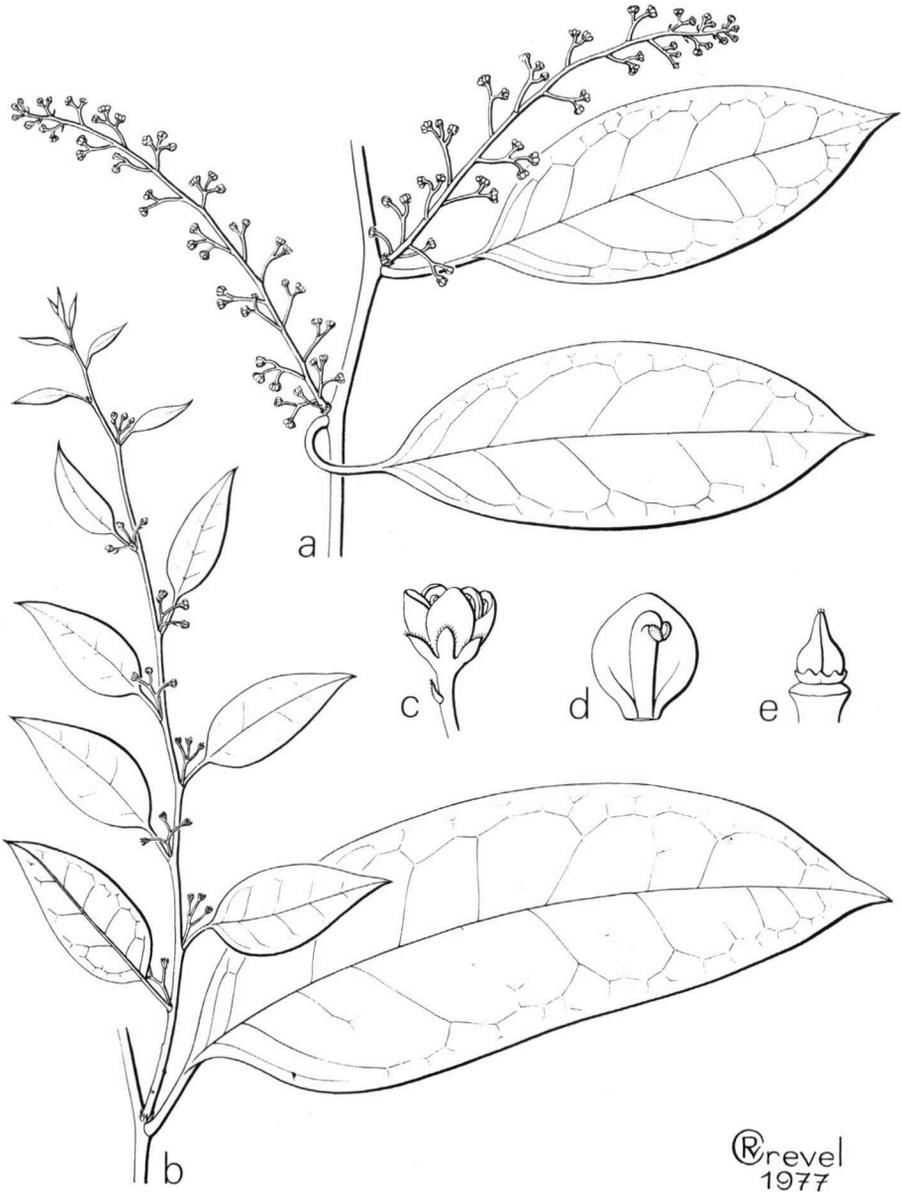
T y p e : *Champion 317*, Hongkong, fl. (K).

[*Celastrinea* sp. *Wallich*, Cat. (1849) 9015, *nom. nud.* — *S. celastrinea* Muell., Walp. Ann. 6 (1865) 1269, *nom. nud.* T y p e : *Wallich 9015*, Silhet (K-W).]

*S. malabarica* Bedd., Icon. Pl. Ind. Orient. 1 (1874) 39, t. 177; Hook. f., Fl. Brit. Ind. 2 (1876) 2; Brandis, Ind. Trees (1906) 194; Gamble, Fl. Presid. Madras 1 (1918) 254; Chen, Sargentia 3 (1943) 48. — T y p e : *Beddome s.n.*, India, Anamallay forests, alt. 900–1200 m, fl. (K; iso in BM).

*S. limoniacea* Hook. f. & Thoms. var. *ardisioides* Chen, Sargentia 3 (1943) 58; Anon., Fl. Hainan. 3 (1974) 93, fig. 590. — T y p e : *W. T. Tsang 24415*, China, Kwangsi, Shap Man Taai Shan, SE. of Shang-sze, Kwantung border, 1/16-10-1934, fl. (A).

An evergreen woody climber, up to 10 m. *Twigs* glabrous or sometimes sparsely pubescent; flowering twigs up to 5 mm Ø, glabrous to lax-pubescent. *Buds* broad-ovoid to ovoid, up to 2.5 mm, acute; scales (sub-)glabrous, often ciliolate. *Leaves* oblong-ovate or oblong to lanceolate, 4–18 × 1.5–6.5(–8) cm, ratio *c.* 2–4(–4.5), ± pergamentaceous-coriaceous, above and beneath glabrous or with some hairs especially on midrib; base acute to rounded, attenuate or not; apex acute, sometimes obtuse, acuminate or not; nerves 5–9 pairs, ± patent, sometimes somewhat ascending, curved to straight; petiole up to 2.5 cm, ± wrinkled, glabrous to lax-pubescent. *Cymes* either solitary, axillary, subtended by small and often still herbaceous leaves, or when either the leaves are fallen or the cymes are subtended by bracts arranged in an up to 15 cm long, glabrous to ± lax-pubescent or tomentellous, racemose to thyrsoid inflorescence, cymes up to 2 cm, 1–4(–6)-flowered; pedicels up to 7 mm; bracts oblong, up to 4 mm, glabrous to pubescent,



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Fig. 8. *Sabia limoniacea* — a. habit,  $\times 2/3$ ; b. ditto, with axillary cymes,  $\times 2/3$ ; c. open flower,  $\times 4$ ; d. petal and the opposed stamen,  $\times 8$ ; e. disk and pistil,  $\times 8$ . — a. & c. — e. from C. W. Wang 79409; b. from N. Wallich 1000.

ciliolate; bracteoles ovate to oblong, up to 1.75 mm, glabrous to pubescent, ciliolate, often situated near calyx. *Flowers* green to yellow or white. *Sepals* sometimes 6 or 7 (see bracteoles), broad-ovate to elliptic, 0.7–1.2(–1.5) × 0.6–1 mm, acute to rounded, glabrous to somewhat pubescent, ciliolate. *Petals* suborbicular to elliptic or somewhat obovate, 1.75–2.5 × 1.25–2 mm, obtuse to rounded, sometimes broad-acute, nerves 5, usually obscure. *Stamens* 1.5–2 mm; filament somewhat flattened, 1.25–1.75 mm long, 0.3–0.4 mm wide; anther ellipsoid, 0.25–0.35 mm, inflexed. *Disk* crown-shaped, thin; ribs often faint or even absent. *Pistil* 0.7–1.2 mm; style conical to cylindrical, 0.2–0.6 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary globular to subreniform, 0.5–0.6 × 0.5–0.8 mm, glabrous. *Drupelets* globular to obovoid, strongly compressed, 11–14 × 10–13 mm, red to blue or black when fresh, without persistent petals and stamens at the base; reticulate pattern usually faint or absent, sometimes more prominent at the margin. Embryo with somewhat undulated cotyledons.

**Distribution:** China (Yunnan, Kwangsi, Hainan, Kwangtung, Fukien), Hongkong, Vietnam, Laos, Thailand, Burma, Bhutan, Sikkim, India (W. Bengal, Assam, Kerala & Madras), Bangladesh (Chittagong, Silhet), Malay Peninsula, Sumatra, and Borneo (Sarawak).

CHINA. Yunnan: *C. W. Wang* 78127, 79409, 79501, 81027, Che-li Hsien, alt. 800–1200 m (A); 80118, Jenn-yeh Hsien, alt. 980 m (A). — Kwangsi: 8 collections. — Hainan: 7 collections. — Kwangtung: 7 collections. — Hongkong: *Champion* 317 (K); *N. K. Chun* 40137 (E, P); *C. Ford* 490 (K); *C. Wilford* 365, Victoria Peak (K). — Fukien: *Dunn, Hongkong Herb.* 2538, Yuen Fu valley (A).

VIETNAM. Annam: *Poilane* 18918, Lung Van, Prov. Thanh Hoa, alt. 1000 m (P); 24769, Braïan, near Djiring, Prov. Haut Donnai, alt. 1000–1200 m (P); 25351, Prov. Quang Tri, alt. 400–600 m (P). Laos. *Poilane* 15614, Prov. Bassac, alt. 1200 m (P).

THAILAND. *Haniff & Nur* 3843, Khan Pok Hill, alt. 450 m (K, SING); *A. F. G. Kerr* 6429, Chieng Mai, alt. 800 m (K, L); 9490, Bau Rai, alt. 600 m (K); 9846, Bukanum, Korat, alt. 400 m (K, L).

BURMA. *Brandis s.n.*, without locality (E), *p.p.* (partly *S. lanceolata*).

BHUTAN. According to Hook. f. l.c.

SIKKIM. *Hooker s.n.*, without locality (K).

INDIA. W. Bengal: *Herb. H. H. Haines* 506, Lower Tondou, Jalpaiguri Dist. (E, K). — Assam: *T. R. Chand* 8361, Umrán, Khasi Hills, alt. 600 m (W); *Anderson (Herb. Pierre)* 4104 (P). — Kerala & Madras: *R. H. Beddome s.n.*, Anamallay, alt. 900–1200 m (BM, K); *Bélanger s.n.*, Pondicherry (P).

BANGLADESH. Silhet: *Anderson (Herb. Pierre)* 4100 (P); *Wallich* 1000, 9015 (K-W). — Chittagong: *Hook. f. & Thoms. s.n.*, without locality (K).

MALAY PENINSULA. Perak: *Scortechini* 628 (SING). — Penang: *C. Curtis* 1221, alt. 300 m (K, SING); 2158, alt. 750 m (SING).

SUMATRA. East Coast: *J. A. Lörzing* 4521, Sibolangit, alt. c. 500 m. — West Coast: *H. A. B. Bunnemeyer* 4926, G. Merapi, alt. 1150 m (BO, L).

BORNEO. Sarawak: *H. P. Nooteboom & P. Chai* 01849, Kalabit Highlands, Mt. Murud E., Belapan R. — Dapo R., alt. 1100 m (L); 02235, Kalabit Highlands, Ulu Limbang, 115° 28' E, 3° 49' N, alt. 1600 m (L).

**Ecology.** In thickets and woods, mainly at 300–1200 m alt. Fl. September–January, fr. December–April.

**Vernacular name:** Chinese (Cantonese): *Ngau Li Ma*.

**Notes.** The only two available specimens of *S. malabarica* consist of flowering material. The drupelets of that species were described by Beddome l.c. as: 'flat reniform scrobiculate'. Although these differ somewhat from *S. limoniacea* ('scrobiculate' versus 'reticulate pattern faint or absent'), the flowering specimens of the type-collection represent undoubtedly *S. limoniacea*.

Under the synonymy of *S. limoniacea* var. *ardisioides* Chen placed *Myrsine? ardisioides* Hook. & Arnott (Bot. Capt. Beechey's Voy., 1837: 197). Since *M.? ardisioides* is a later homonym (*non M. ardisioides* H. B. K., 1819), the name must be rejected (ICBN art. 64), and has, therefore, no priority over *S. limoniacea*. Moreover, I believe that *M.? ardisioides* does not belong to *S. limoniacea* nor to any other species of the genus *Sabia*, as the very short description given by Hooker and Arnott differs in two essential characters. These are: 'the ovules hang from the top of the cavity (1), which is almost divided into two cells (2)'. In *Sabia* the ovules are always axillary, and the ovary is always completely two-celled. According to Chen the type-specimen of *M.? ardisioides* is probably no longer extant. Contrary to Chen, I prefer, considering the two important differences, to strike off *M.? ardisioides* from the list of synonyms of *S. limoniacea*.

## 12. *Sabia paniculata* Hook. f. & Thoms.

*S. paniculata* Edgew. ex Hook. f. & Thoms., Fl. Ind. 1 (1855) 211; Walp. Ann. 4 (1857) 139; Brandis, For. Fl. (1874) 117, 574; Hook. f., Fl. Brit. Ind. 2 (1876) 3; Gamble, Man. Ind. Timb. (1881) 102; Duthie, Fl. Upper Gang. Plain 1 (1903) 183; Brandis, Ind. Trees (1906) 194; Burkill, Rec. Bot. Surv. India 4 (1910) 103; Kanjilal, For. Fl. Siwalik and Jaunsar (1911) 122; Haines, Bot. Bihar & Orissa 2 (1921) 218; Osmaston, For. Fl. Kumaon (1927) 132; Kanjilal *et al.*, Fl. Assam 1, 2 (1936) 326; Chen, Sargentia 3 (1943) 54, fig. 6; Hara & Williams, Enum. Flow. Pl. Nepal 2 (1979) 100. — Type: *M. P. Edgeworth 388*, N.W. India, Dehra Dun, -1844, fl. (K).

An evergreen woody climber or scandent shrub, up to 4 m. Twigs glabrous to pubescent; flowering twigs up to 4 mm Ø, subglabrous to rather densely pubescent or tomentose. Buds ovoid, up to 2.5 mm, acute; scales glabrous to variably short-pubescent, ciliolate. Leaves oblong or oblong-ovate to sublanceolate, (6–)8–22 × c. 2.5–8 cm, ratio 2–3.5, ± pergamentaceous-coriaceous, above glabrous, beneath glabrous to sparsely pubescent on midrib, sometimes all over short-pubescent; base acute to rounded, sometimes short-attenuate; apex acute, acuminate; nerves 5–7 pairs, ± patent, sometimes ascending, curved but often the more apical ones, or sometimes all, ± straight; petiole up to 2.5(–3.5) cm, glabrous to lax-pubescent, fine-wrinkled. Cymes solitary, axillary, but often arranged in a thyrsoid inflorescence when the subtending leaves are fallen, up to 5 cm, laxly to somewhat densely (10–)15–30-flowered, variably pubescent or tomentose; pedicels up to 8 mm; bracts oblong to lanceolate, up to 2.5 mm, pubescent, ciliolate; bracteoles as bracts. Flowers yellow to yellowish-green. Sepals ovate, (0.7–)1–1.3 × (0.5–)0.7–1 mm, rarely up to 2 mm long, acute to obtuse, ± densely pubescent, ciliolate. Petals oblong, sometimes oblong-ovate, 2.25–3.5(–4.5) × 0.75–1.25(–1.5) mm, obtuse, sometimes acute, nerves up to 7, often dark-coloured and than conspicuous. Stamens (1.25–)1.5–2.25 mm; filament flattened, (0.75–)1–1.75 mm long, 0.25–0.5 mm wide; anther ellipsoid, 0.4–0.5 mm, ± upright. Disk crown-shaped; lobes very short or absent. Pistil 1.5–1.75(–2) mm; style cylindrical to narrowly conical, 0.75–1.25 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary globular to subreniform, 0.6–0.75(–1) × 0.75–1.2 mm, glabrous. Drupelets globular to obovoid, compressed, 9–11 × 8–10 mm, without persistent petals and stamens at the base; reticulate pattern rather fine, limited to the margin. Embryo with smooth to somewhat undulated cotyledons.

**Distribution:** Nepal, India (Uttar Pradesh, Bihar, W. Bengal, Assam), and Burma.

NEPAL. *J. F. Dohremez* 2437, Babai Khola, 28° 20' N, 81° 47' E, alt. 350 m (BM); *T. B. Shrestha* 3936, Churia area, alt. 600 m (BM); *J. D. A. Stainton* 6120, Babai Khola, N. of Nepalganj, 28° 22' N, 81° 38' E, alt. 300 m (BM); 6761, Soktim, Mai Khola, 26° 48' N, 87° 55' E, alt. 450 m (BM); *J. D. A. Stainton, W. R. Sykes, L. H. J. Williams* 263, Bhim Khola, E. of Kutharpekot, alt. 1650 m (BM, E).

INDIA. Uttar Pradesh: *c.* 15 collections. — Bihar: *Herb. H. H. Haines* 5560, Ramnagar Hills (K). — W. Bengal: *J. S. Gamble* 358 A, 28039, Darjeeling (K); *Herb. H. H. Haines* 502, Jalpaiguri (E, K); 1065, alt. 240 m (K); *J. H. Lace* 2667, Jalpaiguri Dist. (E). — Assam: *N. Bor* 2851, Naga Hills, alt. 600 m (K); *N. N.* 6474, Manipur, alt. 2100 m (K).

BURMA. *E. M. Buchanan* 74, Myitkyina Dist., Wabaio Hill, alt. 600–900 m (E); *H. H. Haines* H8, Katha Dist. (K); *J. H. Lace* 5132, Katha Dist., Mohuyin Res., alt. 270 m (E, K); *Shaik Mokim* 60, Kachin Hills (BO).

**E c o l o g y.** In shady and swampy localities, mainly between 250 and 1400 m alt. Fl. January–April, fr. March–August.

**V e r n a c u l a r n a m e s:** Acc. to Brandis (1874) 574, *Bakal pata* (Kumaon); the same (1906): *Kywè-hin-byin*; acc. to Hundley & U Chit Ko Ko, List of trees etc. from Burma (1961) 59, 361: *Kywe-hin* (Burmese).

### 13. *Sabia parviflora* Wallich — Fig. 3c, 9.

*S. parviflora* Wall. in Roxb., Fl. Ind. 2 (1824) 310; G. Don, Gen. Hist. 2 (1832) 69; Walp. Repert. 1 (1842) 557; Hook. f. & Thoms., Fl. Ind. 1 (1855) 210; Walp. Ann. 4 (1857) 139; Hook. f., Fl. Brit. Ind. 2 (1876) 2; Stapf, Trans. Linn. Soc. London 4, 2 (1894) 142; Brandis, Ind. Trees (1906) 194; Lecomte, Fl. Gén. Indo-Chine 2 (1908) 2; Kanjilal *et al.*, Fl. Assam 1, 2 (1936) 325; Chun, Sunyatsenia 4 (1940) 242; Merrill, Brittonia 4 (1941) 112; Chen, Sargentia 3 (1943) 64; Gagnepain & Vidal, Fl. Cambodge, Laos, Vietnam 1 (1960) 16; Vidal, Dansk Bot. Ark. 23 (1963) 35; Biswas, Pl. Darj. Sikkim Himal. 1 (1966) 261; Sen Gupta, Bull. Bot. Soc. Bengal 22, 2 (1968) 196; Hara, Fl. East. Himal. 2 (1971) 74; Sen Gupta, Rec. Bot. Surv. India 20, 2 (1973) 65; Hara & Williams, Enum. Flow. Pl. Nepal 2 (1979) 100. — **T y p e:** *Wallich* 1001 *p.p.*, Nepal, fl. (K-W).

*Sabia* sp. Griffith, Not. Pl. Asiat. 4 (1854) 423; Icon. Pl. Asiat. 4 (1854) pl. 568, 2.

*S. harmandiana* Pierre, Fl. For. Cochinch. 5 (1897) pl. 360 B; Craib, Fl. Siam. Enum. 1 (1926) 340. — *S. parviflora* Wall. var. *harmandiana* Lecomte, Bull. Soc. Bot. Fr. 54 (1907) 674; Fl. Gén. Indo-Chine 2 (1908) 3; Chen, Sargentia 3 (1943) 66; Gagnepain & Vidal, Fl. Cambodge, Laos, Vietnam 1 (1960) 17. — **T y p e:** *Harmand* 1158, Laos, plateau d'Attopeu, alt. 1000 m, -3-1877, fl. (P).

*S. philippinensis* Robinson, Bull. Torrey Bot. Club 35 (1908) 70; Merrill, Enum. Philipp. Flow. Pl. 2 (1923) 516; Chen, Sargentia 3 (1943) 67. — **T y p e:** *R. S. Williams* 1445, Philippines, Luzon, Prov. Benguet, near Baguio, 8-11-1904, fl., fr. (PNH?, *n.v.*).

*Celastrus discolor* Léveillé, Bull. Gèogr. Bot. 24 (1914) 142. — **T y p e:** *J. Cavalerie* 3919, China, Kweichow, route de Mou-you-se à Kouan-lin, 25-7-1912, fl., defl. (E; iso in A, K).

*Celastrus esquirolii* Léveillé, Feddes Repert. 13 (1914) 262; Loesener, Ber. Dt. Bot. Ges. 32 (1914) 541. — *S. parviflora* Wall. var. *nitidissima* Léveillé, Fl. Kouy-Tchéou (1915) 379; Chen, Sargentia 3 (1943) 65. — **T y p e:** *J. Esquirol s.n.*, China, Kweichow, 8-8-1905, fl. (E; iso in A).

*S. polyantha* Hand.-Mazz., Sinensia 3 (1933) 190. — **T y p e:** *R. C. Ching* 6720, China, Kwangsi, Bian Chen, E. Lin Yen, alt. 900 m, 5-8-1928, fl. (W; iso in A).

An evergreen climber or scandent shrub, up to 6 m. *Twigs* glabrous to laxly pubescent; flowering twigs up to 4 mm Ø, glabrous to pubescent. *Buds* broad-ovoid to ovoid, up to 2 mm, acute; scales glabrous to short-pubescent, ciliolate. *Leaves* oblong or sometimes oblong-ovate to (sub-)lanceolate, 3–12(–15) × 1–5 cm, ratio *c.* 2–4(–4.5), ± pergamentaceous, above glabrous to subglabrous or sometimes sparsely pubescent especially when young, beneath glabrous to lax-pubescent especially on midrib; base acute to rounded, attenuate or not; apex acute, acuminate; nerves (5)6–9(10) pairs, patent, straight or sometimes ± curved; petiole up to 1.5 cm, glabrous to mainly above lax-pubescent, smooth to fine-wrinkled. *Cymes* solitary, axillary, *c.* 1.5–8(–10) cm long, 4–25-flowered, sometimes widely spreading, lax, and with up to 35 or more flowers, glabrous to

sparsely pubescent; pedicels up to 1 cm; bracts ovate to lanceolate, up to 2 mm or, when subtending a cyme up to 6 mm, subglabrous to pubescent, ciliolate; bracteoles as bracts. *Flowers* green to yellow or white. *Sepals* broad-ovate to ovate, 0.7–1.5 × 0.5–1 mm, acute to rounded, glabrous to pubescent, ciliolate. *Petals* elliptic-oblong to lanceolate or sometimes oblong-ovate, 2–4(–4.5) × 0.7–1.3 mm, acute to obtuse; nerves up to 7, dark-coloured or sometimes obscure. *Stamens* 1.2–2.25(–2.5) mm; filament flattened, 0.9–2(–2.25) mm long, 0.25–0.5 mm wide; anther ellipsoid to ovoid, 0.25–0.4 mm, often ± inflexed. *Disk* crown-shaped, usually thin; lobes often distinct, relatively long and narrow, sometimes short or margin of disk irregular; ribs often faint or absent. *Pistil* c. 1–2(–2.5) mm; style either absent or obscure, or conical, (0.75–)1–1.5(–1.75) mm, much shorter than the adjacent side(s) of the drupelet(s); ovary globular to subreniform, 0.4–0.7 × 0.5–0.75 mm, glabrous. *Drupelets* globular to somewhat obovoid, ± compressed, 7–9 × 6–8 mm, green to red or blue when fresh, without persistent petals and stamens at the base; reticulate pattern rather fine, but often inconspicuous or obscure. Embryo with faintly wrinkled cotyledons.

## KEY TO THE SUBSPECIES

- 1a. Style normally developed, distinctly conical, (0.75–)1–1.5(–1.75) mm long  
 subsp. **parviflora**  
 b. Style usually absent or obscure, the upper part of the pistil still carpel-like,  
 sometimes normally developed and than up to 0.75 mm (*Philippines*)  
 subsp. **philippinensis**

**a. subsp. parviflora.** — *S. parviflora* Wall. — *Sabia* sp. Griffith — *S. harmandiana* Pierre — *Celastrus discolor* Léveillé — *Celastrus esquirolii* Léveillé — *S. polyantha* Hand.-Mazz.

*Leaves* oblong, sometimes oblong-ovate to (sub-)lanceolate, 3–12(–15) × 1–5 cm. *Cymes* c. 2–8(–10) cm long, 7–25-flowered, sometimes widely spreading, lax, and with up to more than 35 flowers. *Petals* oblong to lanceolate, sometimes oblong-ovate, 2.25–4(–4.5) × 0.7–1.25 mm. *Style* distinctly conical, (0.75–)1–1.5(–1.75) mm long.

**Distribution.** Nepal, Sikkim, India (Uttar Pradesh, W. Bengal, Assam), Bhutan, Burma, China (Yunnan, Kweichow, Kwangsi), Vietnam, Laos, Thailand, and Borneo (Sabah).

**NEPAL.** *Wallich 1001 p.p.* (K-W).

**SIKKIM.** *C. B. Clarke 27634 A-D*, Nampok, alt. 900 m (BM, K, P); *G. King 979*, alt. 750 m (P); *Herb. Pierre 4103 (coll. Anderson)* (P).

**INDIA.** **Uttar Pradesh:** According to Hook. f. & Thoms., l.c., Kumaon. — **W. Bengal** *G. H. Cave s.n.*, Tista, alt. 300 m, 1-4-1912, 1-5-1918, 19-4-1920 (E). — **Assam:** 10 collections.

**BHUTAN.** According to Sen Gupta l.c., and Griffith l.c. (*Sabia* sp. collected from Pannukka Bootan); *H. Haines 2008*, alt. 1500 m (K).

**BURMA.** *A. E. English 32*, Maymyo Plateau, alt. 960 m (K); *J. H. Lace 6350*, Maymyo Plateau, alt. 1050 m (E); *J. F. Rock 2202*, betw. Ban Yang Kha and Pang Hoi Hpi Bang, Meh Len Valley (W).

**CHINA.** **Yunnan:** 27 collections. — **Kweichow:** *J. Cavalerie 3415*, Lo-fou (A, E, K); 3919, route de Mou-you-se à Kouan-lin (A, E, K); *S. W. Teng 90865*, Dowan, Chenfeng (A); 91041, Gen-Kai, Chenfeng (A). — **Kwangsi:** 6 collections.

**VIETNAM.** *A. Pételot 4433*, Tonkin, Chapa, alt. 1300 m (P); 5443, Tonkin, Chapa, alt. 1450 m (BO, P); *E. Poilane 24625, 24629, 24641*, Annam, Braïan, near Djiring, Prov. Haut Donai, alt. 1000–1200 m (P).

LAOS. *Harmand 1158*, plateau d'Attopeu, alt. 1000 m (P); *A. F. G. Kerr 20998*, Muang Cha, alt. 1100 m (K); *E. Poilane 25972*, Phong Saly, alt. 1500 m (P).

THAILAND. *H. B. G. Garrett 1171*, Doi Chiengdao, alt. 1580 m (BM, E, K, L, P); *A. F. G. Kerr 5043*, Doi-Tiu (Nan), alt. 1000 m (BM, E, K); *Th. Sørensen et al. 1549*, Pah Hom Pok, alt. 1200 m (BKF, K).

BORNEO. *S a b a h*: 9 collections.

**E c o l o g y**. On road sides, in thickets, and in forests, mainly 600–2000 m alt. Fl. and fr. probably throughout the year.

**N o t e**. In May 1914 Lévillé described as well *Celastrus esquirolii* as *Celastrus discolor*. A few months later, August 1914, Loesener l.c. wrote: '*Celastrus esquirolii* Lév., l.c. p. 262 ist *Sabia parviflora* Wall. vel aff., wie ich durch vergleich im Kgl. Herbar zusammen mit R. Schlechter, der in dieser Pflanze sofort eine *Sabia* erkannte, feststellen konnte'. In 1915 Lévillé reduced *Celastrus esquirolii* to a variety of *S. parviflora*: *S. parviflora* Wall. var. *nitidissima* Lév. At the same time he cited *J. Cavalerie 3415* and *3919*, the latter the type of *Celastrus discolor*, under var. *parviflora*. In other words, probably unwittingly Lévillé reduced *C. discolor* to *S. parviflora*. Chen, probably not knowing about *Celastrus discolor*, cited *J. Cavalerie 3919* under var. *nitidissima*, contrary to Lévillé. In my opinion the differences between these two varieties are too slight for recognition.

**b. subsp. philippinensis** (Robinson) van de Water, *stat. nov.* — *S. philippinensis* Robinson.

*Leaves* oblong or oblong-ovate to lanceolate, 3–11 × 1–3.5 cm. *Cymes* c. 1.5–4.5 cm, 4–20-flowered. *Petals* elliptic-oblong to sub lanceolate, 2–3.5 × 1–1.25 mm. *Style* absent or obscure and often still carpel-like, sometimes normal-developed and then up to 0.75 mm.

**D i s t r i b u t i o n**. Philippines (Luzon).

PHILIPPINES. *L u z o n*: 11 collections.

**E c o l o g y**. Fl. mainly Febr. – April, but fl. and fr. probably throughout the year.

**V e r n a c u l a r n a m e s**: According to Merrill l.c.: *Baybayok*, *kopdas*, *uakal*, and *udok* (all Igorot-language).

**N o t e s**. Subsp. *philippinensis* can be distinguished rather easily from subsp. *parviflora* by the absence of a normally developed style. In all the specimens I have seen, except *Merrill 7708*, the upper parts of the two carpels of each flower are not connate with each other and differentiated into a style as usual, but remain free and carpel-like, although the tip of each carpel is sometimes slightly stigmatic. Moreover, the margins of the upper part of a carpel are not fused, so that the upper half of each carpel is still open (see fig. 9). Although this phenomenon is unique within the genus, I have reduced *S. philippinensis* to a subspecies of *S. parviflora* because it agrees very well with that species in all other main characters.

Of subsp. *philippinensis* I have not seen fruiting specimens.

Like in all *Sabia* spp. the leaves are dark above, paler beneath, but in the present one the contrast is especially conspicuous. In subsp. *philippinensis* the pale margins and undersides of the leaves provide a useful character to distinguish vegetative specimens from those of *S. pauciflora*, another species from the Philippines.

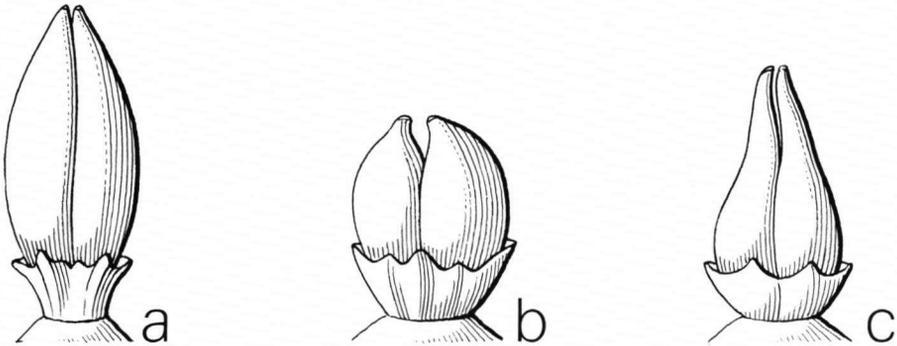


Fig. 9. *Sabia parviflora* subsp. *philippinensis*; disk and pistil, showing the absence of a style (a. & b.) or a feebly developed one (c.); all  $\times 24$ . — a. from *M. Ramos 26973*; b. from *Jacobs 7402*; c. from *E. D. Merrill 7708*.

#### 14. *Sabia pauciflora* Blume

*S. pauciflora* Blume, Mus. Bot. Lugd.-Bat. 1 (1851) 370; Miquel, Fl. Ind. Bat. 1,2 (1859) 619; Fl. Arch Ind. (1870) 72, (1871) pl. 32; Chen, Sargentia 3 (1943) 61. — **T y p e**: *Blume (?) s.n.*, Moluccas, fl (L908.204–493).

*S. papuana* Warburg in Schumann & Lauterbach, Fl. Deutsch. Schutzgeb. Südsee (1900) 425. — **T y p e**: *Herb. C. Lauterbach 2394*, New Guinea, Ramu R., alt. 250 m, 20-6-1896, fr. (WRSL; iso in K).

*S. reticulata* Elmer, Leaf. Philipp. Bot. 2 (1909) 579; Merrill, Enum. Philipp. Flow. Pl. 2 (1923) 516; Chen, Sargentia 3 (1943) 62. — **T y p e**: *A. D. E. Elmer 10027*, Philippines, Negros, Dumaguete, Cuernos Mts., -6-1908, fl., fr. (PNH, *n.v.*; iso in GH, P).

An evergreen woody climber or scandent shrub, up to 20 m. *Twigs* glabrous; flowering twigs up to 5 mm  $\varnothing$ , glabrous or still sparsely pubescent. *Buds* ovoid, up to 2.5 mm, acute; scales glabrous to pubescent, (sub-)ciliolate. *Leaves* oblong to sublanceolate, sometimes oblong-ovate or oblong-obovate, 5–14(–18)  $\times$  2–6(–8) cm, ratio (2–)2.5–3.5(–4), above and beneath glabrous or with very few hairs on midrib, pergamentaceous to pergamentaceous-coriaceous; base acute to rounded, short-attenuate or not; apex acute, acuminate; nerves (5)6–8(9) pairs, patent, straight to curved; petiole up to 2 cm, glabrous to sparsely pubescent, rather smooth to  $\pm$  (fine-)wrinkled. *Cymes* either arranged in an axillary, up to 12 cm long, glabrous to sparsely pubescent, racemose to thyrsoid inflorescence, subtended by bracts, or solitary, axillary, often subtended by small leaves, up to 3.5 cm, 1–4-flowered, glabrous to sparsely pubescent; bracts oblong to lanceolate, up to 3.5 mm, subglabrous to somewhat pubescent, (sub-)ciliolate; bracteoles as bracts but smaller, or minute, or sepal-like and then often situated near calyx; pedicels up to c. 1 cm. *Flowers* green to yellow or white. *Sepals* sometimes 6 (see bracteoles), ovate to broad-ovate, 0.75–1.25  $\times$  0.7–1 mm, acute to obtuse, glabrous to somewhat pubescent, (sub-)ciliolate. *Petals* oblong, sometimes somewhat oblong-ovate, 2.5–4(–4.5)  $\times$  (0.75–)c. 1–1.3(–1.5) mm, (narrow-) obtuse, sometimes subciliolate, nerves up to 5, sometimes dark-coloured and then conspicuous. *Stamens* (1–)1.25–1.75(–2) mm; filament flattened, (0.75–)1–1.5(–1.75) mm long, 0.25–0.5 mm wide; anther globular to ellipsoid, 0.2–0.3 mm, inflexed. *Disk* crown-shaped; lobes often short or irregular; ribs sometimes faint or absent. *Pistil*

1.3–1.7 mm; style conical, 0.6–1 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary globular to subreniform, 0.5–0.7 × 0.5–0.8 mm, glabrous. *Drupelets* ± globular, sometimes somewhat obovoid, compressed, 7.5–11 × c. 8–10(–11) mm, white to red or dark-blue when fresh, without persistent petals and stamens at the base; reticulate pattern fine to rather coarse, sometimes indistinct, limited to the margin or not. Embryo with somewhat undulated or faintly folded cotyledons.

**Distribution.** Philippines, Moluccas, New Guinea, and Solomon Islands.

**PHILIPPINES.** Luzon: *A. D. E. Elmer 15562*, Prov. Sorsogon, Irosin, Mt. Bulusan (A, BM, BO, K, L, P, U, W); *M. Ramos 23593*, Prov. Sorsogon (A, BM, BO, GH, K, L, P, SING). — Negros: *G. E. Edaño 6734*, Tanjay, Balinsasayao Lake (SING); *A. D. E. Elmer 10027, 10448*, Dumaguete, Cuernos Mts. (GH, P, U), (A, BM, BO, E, K, L, W). — Mindanao: *M. S. Clemens 714*, Camp Keithley, Lanao Lake (A, K); *A. D. E. Elmer 11655*, Todaya, Mt. Apo, Davao Dist. (BM, BO, E, L).

**MOLUCCAS.** Halmahera: *E. de Vogel 3311*, Mt. Sahu, alt. 500 m (L). — Batjan Is.: *E. de Vogel 3649*, Mt. Sibela, alt. 1000 m (L).

**NEW GUINEA.** About 60 collections from different districts, viz. Vogelkop, Jayapura, Madang, Morobe, Western Highlands, Eastern Highlands, Southern Highlands, Central, Northern, and Milne Bay Dist.

**SOLOMON ISLANDS.** Bougainville: *S. F. Kajewski 1670*, Kupei Gold Field, alt. 950 m (BO, P); *2028*, Koniguru, Buin, alt. 850 m (BM, BO, P); *J. H. L. Waterhouse 184, 184-B*, Suivai or Siwai (K), (L); *516, 516-B*, Maisua, alt. 540 m (K), (L). — Guadalcanal: *T. C. Whitmore BSIP 636*, Gold Ridge, alt. 750 m (K, L, SING).

**Ecology.** In forests, from sea-level to 2300 m altitude. Fl. and fr. probably throughout the year.

**Uses.** Fresh leaves eaten against wound fever (New Guinea).

**Vernacular names:** According to Merrill l.c.: *Bungoi* and *dadabu*, both Bagobo language. Other vernacular names are from New Guinea, West. Highlands Dist.: *Hambui* (Poio: Enga language), *Kubiakan* (Yoowi dialect, Hagen-Chimbu language), and *Mongolya Ka*; Northern Dist.: *Pehkuma* (Orokaiva language, Mumuni); East. Highlands Dist.: *Pipi*; South. Highlands Dist.: *Pukhabu*, and from the Solomon Is. Bougainville: *Pojaitohe* or *Tojaipohe*.

**Notes.** This species is closely related to *S. javanica* from Java and Sumatra, but can be distinguished from that species by its always few-flowered cymes, its longer style, and its often ± globular drupelets (*S. javanica* often obovoid) (see note under *S. javanica*).

### 15. *Sabia purpurea* Hook. f. & Thoms. — Fig. 3b.

*S. purpurea* Hook. f. & Thoms., Fl. Ind. 1 (1855) 209; Walp. Ann. 4 (1857) 138; Drury, Handb. Ind. Fl. 1 (1864) 650; Hook. f., Fl. Brit. Ind. 2 (1876) 2; Brandis, Ind. Trees (1906) 193; Osmaston, For. Fl. Kumaon (1927) 132; Kanjilal *et al.*, Fl. Assam 1, 2 (1936) 124; Chen, Sargentia 3 (1943) 47; N. N., Bull. Dep. Med. Pl. 2 (1969) 22; Hara & Williams, Enum. Flow. Pl. Nepal 2 — (1979) 100. — Type: *Hooker f. & Thomson s.n.*, Khasia, alt. 1200–1800 m, fr. (K; iso in BM, E, L, P, U, W).

*S. parviflora* auct. non Wall.: Wall. Cat. (1829) 1001 *p.p.*

*S. dumicola* W. W. Smith, Notes R. Bot. Gdn. Edinb. 10 (1917) 63; Chen, Sargentia 3 (1943) 40, fig. 3. — Lectotype: *G. Forrest 9717*, China, Yunnan, hills E. of Tengyueh, lat. 25°N, alt. 2100 m, -3-1913, fl. (E; iso in A, K).

*S. acuminata* Chen, Sargentia 3 (1943) 49. — Type: *T. T. Yü 16171*, China, Yunnan, Shunning, Huilungsu, alt. 2050 m, 7-6-1938, fr. (A; iso in E).

*S. falcata* Chen, Sargentia 3 (1943) 48. — Type: *F. G. Dickason 7480*, Burma, Haka, alt. 1950 m, 18-4-1938, fr. (A; iso in E, L).

*S. parvifolia* Chen, *Sargentia* 3 (1943) 49. — Type: T. T. Yü 17082, China, Yunnan, Chenkang, Snow Ra., Pangca, alt. 2300 m, 29-7-1938, fr. (A; iso in E).

Shrub or climber, up to 4.5 m, usually deciduous. *Twigs* glabrous; flowering twigs up to 2 mm  $\varnothing$ , glabrous. *Buds* ovoid, up to 3 mm, acute; scales glabrous, ciliolate. *Leaves* oblong or oblong-ovate to sublanceolate, 3–12  $\times$  (1–)1.5–4.5 cm, ratio 2–3.5, herbaceous to pergamentaceous, above and beneath glabrous or with some hairs on midrib; base acute to rounded or truncate, sometimes distinctly attenuate; apex acute, acuminate to caudate; nerves 4–6 pairs,  $\pm$  patent, curved to somewhat straight; petiole up to 1 cm, rather smooth, glabrous to mainly above puberulous. *Cymes* solitary, axillary, up to 3(–4.5) cm, 3–12-flowered, glabrous; pedicels up to 6 mm; bracteoles oblong to lanceolate, up to 1.75 mm, glabrous, ciliolate or not. *Flowers* green to purple. *Sepals* subequal to very unequal, very variable in shape and size, often distinctly connate at the base, suborbicular or ovate to oblong, sometimes petal-like, 0.5–3  $\times$  0.5–1.5 mm, glabrous, ciliolate or not; apex acute to obtuse or irregular. *Petals* ovate or elliptic to oblong, 2.5–4.5  $\times$  1.25–2.25 mm, acute to obtuse, nerves up to 6, often obscure. *Stamens* (0.75–)1–1.75 mm; filament flattened, (0.5–)0.75–1.3 mm long, 0.25–0.5 mm wide; anther ellipsoid, 0.3–0.6 mm, upright. *Disk* crown-shaped; lobes short, often apices conspicuous; ribs sometimes indistinct. *Pistil* c. 1–1.7 mm; style (narrow-)conical, 0.4–1 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary  $\pm$  globular to subreniform, 0.5–0.75  $\times$  0.5–1 mm, glabrous. *Drupelets* (broad-)obovoid to subreniform, compressed, 5–7  $\times$  5.5–7.5 mm, green to blue when fresh, with or without persistent petals and stamens at the base; reticulate pattern rather coarse, often limited to the margin, sometimes absent. Embryo with smooth cotyledons.

#### KEY TO THE SUBSPECIES

- 1a. Cymes 3–6-flowered; style 0.7–1 mm . . . . . subsp. **purpurea**  
 b. Cymes 5–12-flowered; style 0.4–0.7 mm . . . . . subsp. **dumicola**

**a.** subsp. **purpurea**. — *S. purpurea* Hook. f. & Thoms. — *S. parviflora* Wall. p.p. — *S. falcata* Chen.

Climber or shrub, up to 4.5 m. *Leaves* oblong, oblong-ovate to sublanceolate, 3–12  $\times$  c. 1.5–4.5 cm, ratio (2–)2.5–3.5. Cymes up to 4.5 cm, 3–6-flowered. *Sepals* subequal to unequal or sometimes very unequal in size and shape, suborbicular to ovate, often rather small, but sometimes up to 1.5 mm. *Petals* ovate or elliptic to oblong-ovate or oblong, 3–4.5  $\times$  1.25–2.25 mm, acute to obtuse. *Stamens* c. 1.5–1.75 mm; filament 1–1.3 mm long; anther 0.4–0.6 mm. *Pistil* 1.3–1.7 mm; style narrow-conical to conical, 0.7–1 mm; ovary 0.5–0.75  $\times$  c. 0.7–1 mm. *Drupelets* 5–7  $\times$  5.5–7.5 mm.

**Distribution.** Nepal, India (Uttar Pradesh, Assam, W. Bengal), Burma, and Thailand.

**NEPAL.** *J. D. A. Stainton* 5202, Nepal Valley, Phulchoki, 27°35' N, 85°20' E, alt. 1800 m (BM); 6207, Khurpa, N. of Jajarkot, 28°50' N, 82°10' E, alt. 1650 m (BM); *J. D. A. Stainton, W. R. Sykes & L. H. J. Williams* 2816, Pakhapani, alt. 2100 m (BM, E); 5043, Bakhri Kharka, N. of Pokhara, alt. 1650 m (BM, E); *Wallich* 1001 p.p. (K-W).

INDIA. Uttar Pradesh: R. Strachey & J. E. Winterbottom 3, Kumaon, alt. 900 m (K); according to Osmaston l.c. — Assam: 8 collections. — W. Bengal: J. S. Gamble 1281 A, Kalimpong, alt. 1350 m (K).

BURMA. F. G. Dickason 7480, Haka, alt. 1950 m (A, E, L).

THAILAND. B. Hansen & T. Smitinand 12784, Doi Khun Huai Pong, 18° 58' N, 98° 10' E, alt. 1850 m (BKF, E, K, L, P).

Ecology. In thickets and forests, 1200–2100 m alt. Fl. Febr. – April, fr. April – June.

Vernacular names: According to Kanjilal *et al.* l.c.: *Jermineirang-chhai*, *Dieng-jermei* (Khasi).

**b. subsp. *dumicola*** (W. W. Smith) van de Water, *stat. nov.* — *S. dumicola* W. W. Smith — *S. acuminata* Chen — *S. parvifolia* Chen.

Shrub, up to 3 m, erect to scandent. *Leaves* oblong, 3–10 × 1–4 cm, ratio 2–3. *Cymes* up to 3 cm, with a rather lax to dense cluster of 5–12 flowers. *Sepals* either small, subequal to unequal, ± suborbicular to ovate, or large, very unequal in size, often petal-like, and up to 3 mm. *Petals* ovate to elliptic, 2.5–4 × c. 1.5–2 mm. *Stamens* (0.75–)1–1.5 mm; filament (0.5–)0.75–1.25 mm long; anther 0.3–0.4 mm. *Pistil* c. 1–1.25 mm; style conical, 0.4–0.7 mm; ovary 0.4–0.6 × 0.5–0.75 mm. *Drupelets* 5–6 × 5.5–6 mm.

Distribution. China (Yunnan).

CHINA. Yunnan: 12 collections.

Ecology. In thickets, 1700–2400 m alt. Fl. Febr. – March, fr. May – July.

Notes. In general, subsp. *dumicola* can be distinguished from subsp. *purpurea* by its more-flowered cymes, its somewhat shorter style, and the often petal-like sepals. The sepals are, however, very variable in shape and size, and even in one of the syntypes (*G. Forrest 9569*) they are very small. As the differences between the two subspecies are sometimes very weak, I would not be surprised when subsp. *dumicola* could be reduced when more material from Burma and Yunnan becomes available.

One of the characters used by Chen to distinguish *S. acuminata* is that 'the carpels are non-scrubulate or at most very obscurely so'. This character must probably be considered as a deviation, as it occurs (but rarely) in some other species, too. Although *S. acuminata* is also very similar to subsp. *purpurea*, I have reduced it to subsp. *dumicola* because of its short style and of the type locality. This indicates, as already said before, that the differences between the two subspecies are sometimes very obscure.

*S. purpurea* was also recorded from Ichang (China, Hupeh) by Diels, Bot. Jahrb. 29 (1900) 451, but I believe that this record was based on a misidentification.

## 16. *Sabia racemosa* Chen

*S. racemosa* Chen, Sargentia 3 (1943) 36, fig. 2. — Type: *H. Winkler 2948*, Borneo, SE. Kalimantan, betw. Kumam (?) and Salinahu, 13-7-1908, fl. (BO; iso in BM, K, L).

An evergreen woody climber or scandent shrub, up to 6 m. *Twigs* glabrous; flowering twigs up to 4 mm Ø, glabrous or still somewhat short-pubescent. *Buds*

ovoid, up to 1.5 mm acute; scales (sub-)glabrous, (sub-)ciliolate or not. *Leaves* oblong or somewhat oblong-obovate, 6–25 × 2–10 cm, ratio 2–3(3.5), pergamentaceous to pergamentaceous-coriaceous, above and beneath glabrous or with some hairs on midrib, rarely beneath all over sparsely short-pubescent; base acute to rounded, short-attenuate or not; apex acute, acuminate; nerves 4–8(9) pairs, ± patent, curved to straight; petiole up to 2.5 cm, glabrous or with some very short hairs, ± wrinkled. *Cymes* arranged in an axillary, up to 8 cm long, glabrous to puberulous or short-tomentellous, racemose to thyrsoid inflorescence, subtended by bracts but often bracts fallen or sometimes leaf-like, cymes up to 1 cm, 1–4(–7)-flowered, glabrous to somewhat puberulous or short-tomentellous; bracts ovate to oblong, up to 3 mm, glabrous to somewhat pubescent, (sub-)ciliolate; bracteoles as bracts but usually smaller, or minute and then often situated near calyx; pedicels up to 4 mm. *Flowers* (pale-)green to yellow. *Sepals* ± ovate to broad-ovate, 0.6–1.3 × 0.5–1 mm, acute to obtuse, glabrous to somewhat pubescent, (sub-)ciliolate. *Petals* elliptic-oblong to oblong, or oblong-ovate to ovate-lanceolate, 3.5–6.5 × (1.25–)1.5–2.5 mm, acute to obtuse, somewhat acuminate or not, or gradually narrower to the apex, nerves up to 7, thin but distinct. *Stamens* 1.2–2.2 mm; filament flattened, c. 1–2 mm long, 0.2–0.5 mm wide; anther globular to ellipsoid, 0.2–0.3 mm, inflexed. *Disk* crown-shaped; lobes sometimes very short or indistinct; ribs sometimes faint or absent. *Pistil* 1–1.5 mm; style ± conical, 0.5–0.9 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary globular to subreniform, 0.5–0.6 × 0.5–0.7 mm, glabrous. *Drupelets* obovoid, ± compressed, c. 10–12 × (7–)8–10 mm, white to pink or red when fresh, without persistent petals and stamens at the base; reticulate pattern faint to rather coarse, often limited to the margin. Embryo with somewhat to very wrinkled or folded cotyledons.

## KEY TO THE SUBSPECIES

- 1a. Petals oblong-ovate to ovate-lanceolate, acute, somewhat acuminate or tapering to the apex . . . . . subsp. **racemosa**  
 b. Petals elliptic-oblong to oblong, acute to obtuse . . . . . subsp. **kinabaluensis**

**a. subsp. racemosa.** — *S. racemosa* Chen

*Sepals* 0.6–1.1 × 0.5–1 mm. *Petals* oblong-ovate to ovate-lanceolate, (3.5–)4.5–6.5 × (1.25–)1.5–2.5 mm, acute, somewhat acuminate or tapering to the apex. *Pistil* 1–1.2 mm; style 0.5–0.7 mm long.

**Distribution:** Borneo (Kalimantan).

**BORNEO.** K a l i m a n t a n : 7 collections.

**Ecology:** Collected at low altitudes, up to 100 m. Fl. and fr. probably throughout the year.

**b. subsp. kinabaluensis** van de Water, *subsp. nov.* — **T y p e :** *W. L. Chew & E. J. H. Corner* *RSNB 4238*, Borneo, Mt. Kinabalu, Mesilau R., alt. 1500 m, 5-2-1964 (L; iso in K, SING)

*Sepala* 0.9–1.3 mm longa, 0.6–1 mm lata. *Petala* elliptico-oblonga vel oblonga, 3.5–5 mm longa, 1.5–2.5 mm lata, acuta vel obtusa. *Pistillum* 1.2–1.5 mm longum; stylus 0.6–0.9 mm longus.

*Sepals* 0.9–1.3 × 0.6–1 mm. *Petals* elliptic-oblong to oblong, 3.5–5 × 1.5–2.5 mm, acute to obtuse. *Pistil* 1.2–1.5 mm high; style 0.6–0.9 mm long.

**Distribution:** Borneo (Sabah).

BORNEO. S a b a h : C. E. Carr 26719, Mt. Kinabalu, Menetendok R., alt. 840 m (SING); 26851, Mt. Kinabalu, Kinataki R., alt. 1050 m (SING); W. L. Chew & E. J. H. Corner RSNB 4238, Mt. Kinabalu, Mesilau R., alt. 1500 m (K, L, SING); J. & M. S. Clemens 26192, Dallas, alt. 900–1200 m (BM, BO, K, L); 29100 (BM), 30373 (K, L), 30374 (BO, K), 30375 (BO), Tenompok, alt. 1500 m; 30631 (BM, BO, K, L), 32102 (BM, BO), 40432 (BM, K), 40991A (BM), Penibukan, alt. 1200 m; H. P. Nooteboom & Aban 1547, Penibukan (Bahandoi), Sgei Tahubang, alt. 1000 m (L); G. H. S. Wood SAN A4645, Kinabatangan Dist., NE. of Gomantong Caves Hill, on path to Suan Lamba R., alt. 18 m (L).

**Ecology.** In forests, mainly at 800–1500 m alt. Fl. and fr. probably throughout the year.

**Notes.** In vegetative characters and somewhat in fruit this species resembles *S. javanica*. It differs, however, from that species in its inflorescence (few-flowered cymes) and in its floral characters, especially the petals.

Since the fruiting collections of subsp. *racemosa* bear only immature or damaged fruit, the description of the drupelets has mainly been based on the fruit of subsp. *kinabaluensis*.

The two subspecies can very easily be distinguished from each other by the difference in the shape of their petals. Regarding, however, the slight variation in the shape of the petals in *Wood SAN A4645*, collected at low altitude (18 m) in N. Borneo (Sabah), and also in *Kostermans 12719* from W. Kutei (Kalimantan) it is, in my opinion, very well possible that the differences in the petals become less distinct when flowering material from interjacent regions becomes available.

Since the two subspecies can only be distinguished from each other when flowers are available, the identification of most of the vegetative and fruiting specimens has mainly been based on the locality from where they have been collected.

## 17. *Sabia sumatrana* Blume

*S. sumatrana* Blume, Mus. Bot. Lugd.-Bat. 1 (1851) 370; Miquel, Fl. Ind. Bat. 1, 2 (1859) 619; Fl. Arch. Ind. (1870) 72, (1871) pl. 33; King, J. Asiat. Soc. Beng. 65, 2 (1896) 454; Ridley, Fl. Mal. Pen. 1 (1922) 513; Chen, Sargentia 3 (1943) 39. — **L e c t o t y p e** (here proposed): *Praetorius s. n.*, Sumatra, fl., fr. (L 908.204–492).

An evergreen woody climber, up to *c.* 3.5 m. *Twigs* glabrous; flowering twigs up to 4 mm Ø, glabrous. *Leaves* elliptic to oblong, sometimes (sub-)lanceolate, (5–)7–15(–18) × (1.5–)2.5–7(–10) cm, ratio *c.* 2–3(–4), herbaceous-pergamentaceous to pergamentaceous, above and beneath glabrous; base acute, (short-)attenuate; apex acute, acuminate to subcuspidate; nerves 5–7 pairs, patent, curved to straight; petiole up to 2 cm, rugged or somewhat fine-wrinkled, glabrous. *Flowers* yellowish-green to white, either solitary, sometimes 2 or 3 together, axillary, or arranged in a thyrsoid, axillary, up to 6.5 cm long, glabrous inflorescence; pedicels up to 2.5 cm, glabrous, with few small bud scales at the base when flowers solitary (see note 'inflorescences' under the genus); bracts ± oblong-ovate, up to 1.5 mm long, glabrous, ciliolate; bracteoles as bracts. *Sepals* broad-ovate to ovate, 1.25–1.75(–2) × (0.75–)1–1.75 mm, acute to obtuse, glabrous, (sub-)ciliolate or not. *Petals* oblong or oblong-ovate to lanceolate or ovate-lanceolate, *c.* 6–10 × 1.5–2.5 mm, sometimes the upper part somewhat channeled, tapering to the

apex, acute to narrow-obtuse, nerves obscure. *Stamens* 3.5–7.5 mm; filament  $\pm$  flattened, 3–7 mm long, 0.4–0.75 mm wide; anther ellipsoid, 0.5–0.7 mm, upright. *Disk* short-cylindrical, small, the upper part not enclosing the base of the ovary and without lobes; ribs  $\pm$  prominent. *Pistil* 3.5–c. 7 mm; style narrow-conical, 3–6 mm, about half as long as the adjacent side(s) of the drupelet(s); ovary somewhat globular to subreniform, 0.5–0.8  $\times$  0.7–1 mm, glabrous. *Drupelets* obovoid, somewhat compressed, 11–13  $\times$  8–9 mm, white to blue when fresh, without persistent petals and stamens at the base; reticulate pattern absent, often more or less rugged on the outside.

**Distribution.** Malay Peninsula, Sumatra.

MALAY PENINSULA. **P e r a k :** *King's coll.* 2117, Larut, alt. 540 m (P, SING); 2217, ditto (K, P); 5053, Larut, alt. 90–150 m (BM, K); 8205, Gopeng Dist., alt. 60–90 m (L, P).

SUMATRA. **West Coast :** *H. A. B. Bunnemeijer* 595, G. Talakmau, alt. 980 m (BO); *Maradjo* 433, alt. 900–1200 m (L). — **P a l e m b a n g :** *A. Kostermans* 77, Tjaban For. Res., near Muaraenim (BO, L).

**E c o l o g y .** At 60–1000 m altitude, fl. May–August, fr. July–September, but also in Februari (throughout the year?).

**N o t e .** Of this species only a few collections are available. For that reason no buds and embryo's could be described, whereas the description of the flowers has partly been based on rather young ones.

## 18. *Sabia swinhoei* Hemsley

*S. swinhoei* Hemsley in Forbes & Hemsley, J. Linn. Soc. Bot. 23 (1886) 144; Hayata, Icon. Pl. Formos. 1 (1911) 160; Dunn & Tutchet, Kew Bull. Add. Ser. 10 (1912) 68; Handel-Mazzetti, Symb. Sin. 7 (1933) 643; Chen, Sargentia 3 (1943) 44; Liu, Ill. Lign. Pl. Taiwan 2 (1962) 927; Li, Woody Fl. Taiwan (1963) 505, fig. 195; Fl. Taiwan 3 (1977) 597–598, pl. 743. — **T y p e :** *Swinhoe s.n.*, Formosa, fl. (K).

*S. gracilis* Hemsley, Hooker's Icon. Pl. IV, 9 (1907) tab. 2831; Feddes Repert. 5 (1908) 339; Rehder & Wilson in Sargent, Pl. Wilson. 2 (1914) 198; Rehder, J. Arnold Arbor. 15 (1934) 9; Chen, Sargentia 3 (1943) 43. — **T y p e :** *E. H. Wilson* 4806, China, Szechuan, Mt. Ormei, -6-1904, fl. (K; iso in A).

*S. dunii* Lévillé, Feddes Repert. 9 (1911) 457. — **T y p e :** *J. Cavalerie* 21 bis, China, Kweichow, Pin-fa, 4-4-1902, fl. (E).

[*S. subcorymbosa* Stapf ex Anon., Acta Phytotax. Géobot. Kyoto 5 (1936) 77, *nom. inval.*]. — *S. swinhoei* Hemsley var. *subcorymbosa* Chen, Sargentia 3 (1943) 45. — **T y p e :** *E. H. Wilson* 184, China, Hupeh, Nanto, -4-1900, fl. (K; iso in W.).

*S. swinhoei* Hemsley var. *hainanensis* Chen, Sargentia 3 (1943) 45; Anon., Fl. Hainan. 3 (1974) 93. — **T y p e :** *S. K. Lau* 25751, China, Hainan, Bak Sa, 18-3-1936, defl. (A).

An evergreen woody climber or scandent shrub, up to 6 m. *Twigs*  $\pm$  pubescent; flowering twigs up to 2 mm  $\varnothing$ , pubescent or tomentose. *Buds* ovoid, up to 2 mm, acute; scales pubescent, ciliolate. *Leaves* ovate or elliptic to sublanceolate, 2–12  $\times$  c. 1–5 cm, ratio 1.5–3.5, pergamentaceous, above glabrous but on midrib  $\pm$  pubescent, beneath all over sparsely pubescent; base acute or cuneate to rounded, (short-)attenuate or not; apex acute, acuminate; nerves 4–6(7) pairs,  $\pm$  patent, straight to curved, sometimes with distinctly developed foot-nerves; petiole relatively short, up to 1 cm, slightly wrinkled or not, pubescent. *Cymes* solitary, axillary, or sometimes arranged in a thyrsoid inflorescence when the subtending leaves are very small or fallen, up to 3 cm, 2–6-flowered, sparsely pubescent or tomentose; pedicels up to 6 mm; bracteoles, if present,  $\pm$  oblong, up to c. 1.5 mm, glabrous to pubescent, ciliolate or not. *Flowers* white to yellow or yellowish-green.

*Sepals* ovate to oblong-ovate, 0.7–1.4 × 0.5–1 mm, acute, glabrous to pubescent, ciliate or not. *Petals* ovate-lanceolate to lanceolate, (3.5–)4–6 × 1–1.4 mm, tapering to the apex, acute to narrow-obtuse, incurved or not at the apex, nerves up to 5. *Stamens* 1–1.6 mm; filament somewhat flattened, 0.75–1.25 mm long, 0.4–0.5 mm wide but often narrower at the base; anther ellipsoid, 0.3–0.5 mm, often inflexed. *Disk* crown-shaped, thin and small; lobes short; ribs often faintly prominent. *Pistil* 1.25–1.5 mm; style conical to cylindrical, 0.75–1 mm, much shorter than the adjacent side(s) of the drupelet(s); ovary somewhat globular to subreniform, 0.5–0.6 × 0.5–0.8(–1) mm, glabrous. *Drupelets* ± obovoid, compressed, 7–8 × 6–8 mm, blue or dark-blue when fresh, without persistent petals and stamens at the base; reticulate pattern fine, faintly prominent and therefore rather obscure, usually only at the margin. Embryo with smooth to somewhat wrinkled cotyledons.

**Distribution.** Taiwan, China (Kiangsu, Chekiang, Kiangsi, Fukien, Hunan, Kwangtung, Kwangsi, Hainan, Kweichow, Szechuan, and Hupeh).

TAIWAN. *Swinhoe s.n.* (K).

CHINA. Kiangsu: according to Chen l.c. — Chekiang: *S. Chen 970* (A); *R. C. Ching 2006*, S. of Ping Yung, alt. 60 m (A, BM, E, K, P, W); *F. N. Meyer 1539*, near Chang-hua, alt. 240 m (A). — Kiangsi: *Handel-Mazzetti (Wang-Te-Hui) 130*, Pinghsiang, alt. 600 m (A, W); *Y. K. Hsiung 6324, 6446*, Yi-feng (A). — Fukien: *H. H. Chung 3191*, Inghok (E, SING, W); *6653*, Kuliang (A); *Dunn, Hongkong Herb. 2533* (A, K). — Hunan: *W. T. Tsang 23416*, Ping T'ou Shan, Pai Mu Village, Yi Chang Dist. (A, BM, P, W). — Kwangtung: *W. T. Tsang 20203*, Naam Kwan Shan, Tsengshing Dist. (A, K); *26232*, Man Chi Shan, Shek Pik Ha Village, Jen-hwa Dist. (A). — Kwangsi: *Y. W. Taam 54*, Pai-shou (A); *A. N. Steward & H. C. Cheo 889*, Ta Tseh Tsuen, Yung Hsien, alt. 540 m (A, P); *W. T. Tsang 22698*, Shap Man Taai Shan, near Hoh Lung Village, SE. of Shang-sze (A). — Hainan: *S. K. Lau 25751*, Bak Sa (A). — Kweichow: *J. Cavalerie 21 bis*, Pin-fa (E, K); *309*, Pin-fa (K p.p., P p.p.); *Y. Tsiang 5072*, Tungtze, alt. 450 m (A, BM, E, P, W); *5306*, Kying-ten-shan, Tsunyi, alt. 400 m (K). — Szechuan: 8 collections. — Hupeh: *A. Henry 1299* (K), *2762* (K, P), *3460* (E, GH, K, P), *3460A* (BM, E, GH, K), *4181* (A, BM, E, K), Ichang; *E. H. Wilson 184*, Nanto (K, W).

**Ecology.** Often on shady places in thickets and woods, mainly at 200–1200 m altitude. Fl. April–June, fr. July–October.

**Note.** In some specimens the drupelets are characterized by small to large dark spots, which are caused by many very small 'granules' in the exocarp.

## 19. *Sabia uropetala* Gagnepain

*S. uropetala* Gagnepain, Not. Syst. 14 (1952) 271; Gagnepain & Vidal, Fl. Cambodge. Laos, Vietnam 1 (1960) 13, fig. 1. — Type: *A. Pételot 6675*, Vietnam, Tonkin, Prov. Bac Giang, betw. Lang Met and Thanh Mai, 9-12-1940, fl. (P).

An evergreen woody plant. *Flowering twigs* up to c. 4 mm Ø, densely pubescent. *Buds* somewhat ovoid, up to 2.5 mm, acute; scales pubescent, ciliate. *Leaves* elliptic-oblong to oblong, 5–10.5 × 2–5.5 cm, ratio c. 2–2.5(–c. 3), pergamentaceous, above (sub-)glabrous or pubescent on midrib, beneath all over ± lax-pubescent; base acute, not or very shortly attenuate; apex acute, acuminate or not; nerves 5–7 pairs, patent, curved to straight; petiole up to 1 cm, densely pubescent. *Cymes* arranged in an axillary, up to 13 cm long, thyrsoïd inflorescence, subtended by very small leaves, cymes up to c. 1 cm, 3-flowered, ± densely long-pubescent; pedicels up to 2 mm. *Sepals* oblong-triangular, 1.25–1.75 × 0.3–0.5 mm, acute, pubescent, ciliate. *Petals* lanceolate, 4.5–5.5(–6) × 0.75–1.1 mm, the upper part distinctly

narrowed or caudate, acute, nerves up to 5, obscure. *Stamens* 1.1–1.5 mm; filament flattened, 0.8–1.2 mm long, 0.2–0.3 mm wide; anther globular-ellipsoid, 0.25 mm, somewhat inflexed. *Disk* crown-shaped, thin; lobes indistinct; ribs prominent or not. *Pistil* 0.9–1.1 mm; style short-cylindrical, 0.3–0.6 mm, probably much shorter than the adjacent side(s) of the drupelet(s); ovary globular to subreniform, 0.4–0.6 × 0.5–0.6 mm, glabrous. *Drupelets* not available.

**Distribution.** N. Vietnam. Only known from the type.

**Note.** This species is closely related to *S. swinhoei* from China and Taiwan. It differs, however, from that species in its pubescence (longer hairs) and several floral characters, e.g. sepals, petals, and style length.

#### ADDENDUM

After my manuscript was completed, Dr. P. W. Leenhouts drew my attention to a paper by Y. W. Law & Y. F. Wu, *Acta Phytotax. Sin.* 17 (1979) 42–44, in which two new species were described, viz. *Sabia obovatifolia* Law & Y. F. Wu and *Sabia nervosa* Chun ex Y. F. Wu. The description and the figures of the former species do assume a close relationship with *Sabia campanulata* Wall. Indirectly, this was also stated by the authors themselves, who suggested an affinity with *Sabia latifolia* (in my opinion a synonym of *campanulata*). I have seen one of the collections cited, viz. *Tsai 51045*, and identified this as resembling *S. campanulata*. So I believe that *Sabia obovatifolia* Law & Y. F. Wu can be reduced to *Sabia campanulata* Wall.

Of the second species, *Sabia nervosa*, no collections were available to me. Although the authors suggested an affinity to *Sabia coriacea* Rehder & Wilson, the description and figures rather suggest a relationship with *Sabia campanulata* too. However, since some differences between *S. nervosa* and *S. campanulata* seem to exist and since I have not seen any material, for the time being I prefer to consider *Sabia nervosa* Y. F. Wu as 'doubtful'.

My thanks are due to Dr. Ding Hou of the Rijksherbarium, Leiden, for the translation of the Chinese descriptions and discussions.

#### EXCLUDED SPECIES

*Sabia cavalieriei* L veill , Feddes Repert. 9 (1911) 456 = *Orixa japonica* Thunb. (*Rutaceae*); Rehder, J. Arnold Arbor. 14 (1933) 225.

*Sabia densiflora* Miq., Fl. Ind. Bat. Suppl. (1860) 203, 520 = *Meliosma angulata* Blume; Koorders & Valetton, Bijdr. 9 (1903) 131 = *Meliosma simplicifolia* (Roxb.) Walp. subsp. *simplicifolia* (*Sabiaceae*); van Beusekom, Blumea 19 (1971) 476.

*Sabia edulis* L veill , Fl. Kouy-Tch ou (1915) 379 *pro parte, quoad Cavalerie* 2033, 3904 = *Iodes ovalis* Blume; Rehder, J. Arnold Arbor. 15 (1934) 2 = *Iodes ovalis* Bl. var. *vitiginea* (Hance) Gagnepain; Lauener, Notes R. Bot. Gdn, Edinb. 27 (1967) 271 = *Iodes vitiginea* (Hance) Hemsl. var. *vitiginea* (*Icacinaceae*); Sleumer, Blumea 17 (1969) 223. — *pro parte, quoad Cavalerie* 3932 (L veill  *err.* 2932) = *Iodes seguini* (L vl.) Rehder, J. Arnold Arbor. 15 (1934) 3; Lauener, Notes R. Bot. Gdn. Edinb. 27 (1967) 271 = *Iodes vitiginea* (Hance) Hemsl. var. *levitesticus* Hand.-Mazz.; Sleumer, Blumea 17 (1969) 223.

- Sabia esquirolii* Léveillé, Feddes Repert. 9 (1911) 457 = **Gardneria multiflora** Makino (*Loganiaceae*); Rehder, J. Arnold Arbor. 15 (1934) 309; Leenhouts, Bull. Jard. bot. Etat Brux. 32 (1962) 433.
- Sabia feddei* Léveillé, Feddes Repert. 9 (1911) 456 = **Orixa japonica** Thunb. (*Rutaceae*); Rehder, J. Arnold Arbor. 14 (1933) 224.
- Sabia ? floribunda* Miq., Fl. Ind. Bat. Suppl. (1860) 203, 521 = *Meliosma angulata* Blume; Koorders & Valetton, Bijdr. 9 (1903) 131 = **Meliosma simplicifolia** (Roxb.) Walp. subsp. **simplicifolia** (*Sabiaceae* s.l.); van Beusekom, Blumea 19 (1971) 476.
- Sabia viridissima* Kurz, J. Asiat. Soc. Bengal 41, 2 (1872) 304 = *p.p.* **Erythralum scandens** Blume (*Olacaceae*); King, J. Asiat. Soc. Bengal 65, 2 (1896) 455; Balakrishnan, Bull. Bot. Surv. India 8 (1966) 68. — *p.p.* = *Blachia viridissima* (Kurz) King, J. Asiat. Soc. Bengal 65, 2 (1896) 455 = *Kurziodendron viridissimum* (Kurz) Balakrishnan, Bull. Bot. Surv. India 8 (1966) 68–71, pl. I, figs. 1–7 (*gen. nov.*) = **Trigonostemon viridissimus** (Kurz) Airy Shaw, Kew Bulletin 25 (1971) 545, 546 (*Euphorbiaceae*).

#### SABIA IN THE WALLICH HERBARIUM AT KEW

According to Wallich, Cat. (1829) the following collections in his herbarium represent species of the genus *Sabia* Colebr.:

- 999: *Sabia lanceolata* Colebr.  
 1000: *Sabia limoniacea* Wall.  
 1001: *Sabia parviflora* Wall.  
 1002: *Sabia campanulata* Wall.

These collections, each consisting of several sheets, are, however, mixed, as already stated by Hook. *f.* & Thoms., Fl. Ind. 1 (1855) 209–210. Moreover, these authors stated that the collection 9015, representing *Celastrinea* according to Wall., l.c. must be placed under *S. limoniacea*. During my visit to the Kew Herbarium I could study these collections and made the following identifications:

- 999: *Sabia lanceolata* Colebr., except one sheet which is mixed: partly *S. lanceolata* Colebr., partly *S. limoniacea* Wall. *ex* Hook. *f.* & Thoms.  
 1000: *Sabia limoniacea* Wall. *ex* Hook. *f.* & Thoms., except one sheet with number 1000B, representing no *Sabia* at all, but according to Hook. *f.* & Thoms., l.c.: *Photinia* *sp.*  
 1001: Of this collection two sheets are mixed: one sheet, partly *S. campanulata* Wall., partly *S. purpurea* Hook. *f.* & Thoms.; one sheet, partly *S. parviflora* Wall., partly *S. purpurea* Hook. *f.* & Thoms. All other sheets under this number represent *S. purpurea*. Hence, there is reason to believe that the description of *S. parviflora* by Wallich has partly been based on specimens of *S. purpurea*. This suggestion becomes very likely when reading Wallich's description of *S. parviflora*, in which he described the flowers as purple and arranged in 5–7-flowered cymes. This agrees very well with *S. purpurea*, whereas the flowers of *S. parviflora* are green to yellow or white, and arranged in 7–25-flowered cymes.  
 1002: *Sabia campanulata* Wall., except one sheet with number 1002B which represents *S. purpurea* Hook. *f.* & Thoms.  
 9015: *Sabia limoniacea* Wall. *ex* Hook. *f.* & Thoms.

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