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REVISION OF THE GENUS
DUNBARIA WIGHT & ARN.

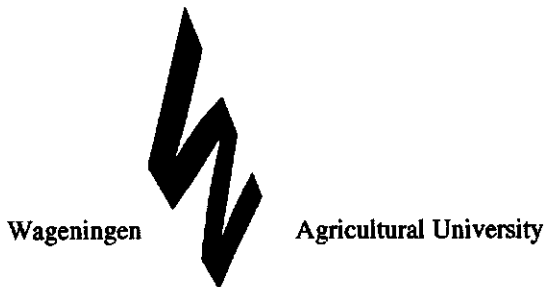
(LEGUMINOSAE-PAPILIONOIDEAE)

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CONTENTS

| | |
|---|-----|
| Summary | 4 |
| Resumé | 4 |
| 1 INTRODUCTION..... | 5 |
| 2 HISTORY OF THE GENUS <i>DUNBARIA</i> Wight & Arn..... | 6 |
| 3 RELATIONSHIPS OF <i>DUNBARIA</i> IN THE SUBTRIBE CAJANINAE..... | 8 |
| 4 GEOGRAPHICAL DISTRIBUTION AND ECOLOGY..... | 10 |
| 5 DESCRIPTION OF THE GENUS <i>DUNBARIA</i> | 12 |
| 6 SECTIONAL ARRANGEMENT..... | 13 |
| 7 KEYS TO THE SPECIES OF <i>DUNBARIA</i> | 14 |
| 8 ALPHABETICAL TREATMENT OF THE SPECIES..... | 17 |
| 8.1 <i>Dunbaria bella</i> Prain..... | 17 |
| 8.2 <i>Dunbaria circinalis</i> (Benth.) Baker..... | 22 |
| 8.3 <i>Dunbaria crinita</i> (Dunn) Maesen..... | 26 |
| 8.4 <i>Dunbaria cumingiana</i> Benth..... | 30 |
| 8.5 <i>Dunbaria debilis</i> Baker..... | 35 |
| 8.6 <i>Dunbaria ferruginea</i> Wight & Arn..... | 40 |
| 8.7 <i>Dunbaria floresiana</i> Maesen..... | 44 |
| 8.8 <i>Dunbaria fusca</i> (Wall.) Kurz..... | 48 |
| 8.9 <i>Dunbaria glabra</i> Thuan..... | 51 |
| 8.10 <i>Dunbaria glandulosa</i> (Dalzell & A. Gibson) Prain..... | 53 |
| 8.11 <i>Dunbaria gracilipes</i> Lace..... | 58 |
| 8.12 <i>Dunbaria incana</i> (Zoll. & Moritzi) Maesen..... | 61 |
| 8.13 <i>Dunbaria lecomtei</i> Gagnep..... | 65 |
| 8.14 <i>Dunbaria longicarpa</i> (Thuan) Maesen..... | 69 |
| 8.15 <i>Dunbaria podocarpa</i> Kurz..... | 71 |
| 8.16 <i>Dunbaria punctata</i> (Wight & Arn.) Benth..... | 76 |
| 8.17 <i>Dunbaria rubella</i> Span. ex Miquel..... | 83 |
| 8.18 <i>Dunbaria trichodon</i> (Dunn) Maesen..... | 87 |
| 8.19 <i>Dunbaria truncata</i> (Miquel) Maesen..... | 89 |
| 8.20 <i>Dunbaria villosa</i> (Thunb. ex Murray) Makino..... | 93 |
| 9 EXCLUDED SPECIES AND REJECTED NAMES..... | 100 |
| 10 ACKNOWLEDGEMENTS..... | 102 |
| References | 105 |
| Index to plant names | 107 |

SUMMARY

One of the genera of the Phaseoleae subtribe Cajaninae (Leguminosae-Papilionoideae), *Dunbaria*, has long been incompletely known. In the present revision twenty species are recognized. One species, *Dunbaria floresiana*, was newly described, and six species had to be provided with a new combination. Several names had to be sunk into synonymy, including some well-known ones, like *Dunbaria longerracemosa*, which is synonymous to the earlier and poorly known *D. bella*. Most *Dunbaria* species have an Asian distribution, some species are found in Australia and on New Guinea. The area extends from 72 to 143 degrees Eastern longitude, and from 38 degrees North to 13 degrees South of the equator. All species are climbers and grow in semi-deciduous forests, scrub or grassland vegetations of the semi-arid or moist tropical habitats. One species, *D. villosa*, occurs in East Asia including Japan. Most species occur between 0 and 1200 m a.s.l., some reach 2000 m, rarely species are restricted to high elevations. *Dunbaria* species may be useful for breeding programmes of pigeonpea, *Cajanus cajan* (L.) Millsp., as the genera are related.

RESUMÉ

Un des genres de la sous-tribu des Cajaninées, tribu des Phaseolées (Légumineuses-Papilionoïdées), *Dunbaria*, était généralement malconnu. La présente révision reconnaît vingt espèces. Une espèce, *Dunbaria floresiana*, a été nouvellement décrite, et six espèces ont reçu une nouvelle combinaison. Plusieurs noms devraient être réduits à la synonymie, y inclus *Dunbaria longerracemosa*, espèce bien connue, laquelle était décrite plus tard que la malconnu *D. bella* qui a la priorité. La plupart des espèces de *Dunbaria* sont distribuées en Asie, quelques-uns on trouve en Australie et au Nouvelle Guinée. L'aire s'étend de 72 à 143 degrés Est, et de 38 degrés Nord à 13 degrés Sud de l'équateur. Toutes les espèces sont des grimpeurs et poussent dans les forêts semi-caducifoliées, les broussailles ou les savanes des tropiques semi-arides ou humides. Une espèce, *D. villosa* est distribuée en Asie de l'Est y inclus le Japon. La plupart des espèces se trouvent entre 0 et 1200 m de altitude, parfois jusqu'au 2000 m, rarement une espèce se trouve uniquement à grande altitude. La relation (morphologique) avec le pois d'Angole, *Cajanus cajan* (L.) Millsp. indique qu'une utilisation de *Dunbaria* comme géniteur serait possible, bien que des hybrides interspécifiques ne sont pas encore réussites.

1 INTRODUCTION

During a revision of the genus *Cajanus* DC. sensu lato (incl. *Atylosia* Wight & Arn.) (van der Maesen, 1986), attention was drawn to *Dunbaria*. *Dunbaria* does not include cultivated species, but the morphological similarities to *Cajanus*, hence the possibility to place the genus in a secondary or tertiary genepool of the cultivated pigeonpea, *Cajanus cajan* (L.) Millsp., expresses the close relationship to *Cajanus*. At least some species have the facies of climbing *Cajanus*. Also some species of *Rhynchosia* have undoubtedly a strong relationship to *Cajanus*. Fairly recently the genus *Dunbaria* Wight & Arnott (Leguminosae - Phaseoleae - Cajaninae) has been reviewed for the Flore du Cambodge, du Laos et du Viet-nam (Thuan, 1979). Species distributed outside Indo-China were not treated. Thothathri and Satyanarayana (1983) worked with the genus while reviewing the subtribe Cajaninae for the Flora of India, and published some new names. In a thesis Satyanarayana (1994) presented all Cajaninae occurring in India. Even though Indo-China is probably the area of greatest diversity, a review of all species has not been available and an integrated treatment appeared necessary. The study is based on a morphological study of herbarium material and a few living plants. The work was carried out at the Herbarium Vadense (WAG), where the loans of the materials were placed, and during study visits to Kew, Paris, St. Louis, Kunming, Beijing and New York. The typification and synonymy were verified, distribution and phenology data complete the detailed morphological descriptions. Illustrations and distribution maps show habitus and repartition of the species.

Those specimens that I have been able to collect in the Indian subcontinent are lodged at the ICRISAT Reference Herbarium in the Genetic Resources Unit, and duplicates are available at WAG, K and/or CAL. The genetic resources scientists of the Centro Internacional de Agricultura Tropical, Cali, Colombia, sent specimens for identification, and samples of *Dunbaria villosa* and *D. incana* produced plants that could be studied in vivo.

2 HISTORY OF THE GENUS *DUNBARIA* Wight & Arn.

The history of the genus *Dunbaria* is relatively uncomplicated. In 1834 Wight and Arnott described the genus in their Prodrum for the Flora of peninsular India, to accommodate those "Euphaseoleae" with large flowers, flat pods, without conspicuous external delineations of the pod valves between the (more than 2-3) seeds. They commemorated George Dunbar (Coddington, Berwickshire, Scotland 1784 - Edinburgh 1851), who became Professor of Greek Philology in 1806 at Edinburgh, Scotland. In his youth he was a gardener, but a fall from a tree incapacitated him for physical labour, so he studied Greek instead (Backer 1936). Apparently he was a long-standing friend and colleague.

Originally the genus comprised of 3 species, the last (*Dunbaria latifolia*) supposedly scarcely different from the second (*D. ferruginea*), and later put into synonymy with it by Baker (1876). Important additions were made by Bentham (1852, 3 species), Miquel (1855, 6 species), Baker (1876, 2 species), and Gagnepain (1912, 3 species). Several authors added one or a few species for Indo-China, Malesia and Japan. Some specific epithets were later reduced to the synonymy of others. Thuan (1979) included 10 species in his treatment for the Flora of Laos, Cambodia and Vietnam. Thuan (1979) and Verdcourt (1979) estimated that about 15 species could be recognized in *Dunbaria*. Up to 1988 the Index Kewensis listed 37 species and 7 synonyms in *Dunbaria*. The present treatment considers that 16 out of the 37 remaining validly published binomials can be maintained. The number of recognized species is 20, of which 1 is described as new. In his Commentationes de Leguminosarum Generibus Bentham (1837, and again in 1865) listed "? *Dunbaria*" under subtribe "Euphaseoleae" (now Phaseoleae), the presence of vesicular glands had not been introduced as subtribal characteristic for "Cajaneae", nor were they described by Wight and Arnott (1834) for any of their "Euphaseoleae". In 1852 Bentham outlined the close relationship of *Cajanus*, *Dunbaria*, *Fagelia* and *Atylosia*, and mentioned the resinous glands. The presence of these glands still constitutes the main differentiating (signal) character for the subtribe Cajaninae.

As with several other phaseoloid legume genera, some species have been insufficiently collected, which does not necessarily mean that they are rare. To the general collectors they usually are "one of the many yellow-flowering bean-like vines", and tend to be under-

collected. Being legumes, animals probably feed on them for protein-rich fodder, probably with reasonable or even good palatability.

3 RELATIONSHIPS OF *DUNBARIA* IN THE SUBTRIBE CAJANINAE

The circumscription of the subtribe Cajaninae as a natural group within the Phaseoleae tribe of the Leguminosae-Papilionoideae has been outlined in detail (Lackey 1977, 1982), and the case for merging *Atylosia* with *Cajanus* has been explained earlier (van der Maesen 1986, p. 16-36). In relation to the other genera *Dunbaria* is a member of Baudet's (1978) group of Cajanastrae, with a multi-ovuled ovary and mainly Asian distribution. Notable characters are the glandular-dotted foliage and calyces, bulbous-based hairs, stipels small or lacking, absence of bracteoles, flowers yellow with or without red or purplish streaks or flush, inflorescence nodes not swollen, seeds often strophiolate, consisting of two parallel flaps, style often swollen in the middle (Lackey 1977). The flat pods stand most of the species apart from e.g. *Cajanus*. Some *Dunbaria* have slight impressions between the seeds. *Dunbaria* spp. are sturdy or weak climbers or trailers, no shrubby species are extant.

Some intergeneric pollination attempts with *Cajanus* spp. have been made, in particular with *Dunbaria ferruginea*, at ICRISAT, Patancheru near Hyderabad, Andhra Pradesh, India. So far no hybrids were obtained; the only negative evidence to indicate the presence of a strong intergeneric cross-incompatibility.

It appears no *Dunbaria* species have been cytologically investigated, as Lackey (1977) did not locate data, nor could I locate published records. Thuan (1975) did not have *Dunbaria* seeds at his disposal. It would be surprising if chromosome numbers in *Dunbaria* would turn out to be anything else but $2n = 22$. From seeds obtained from CIAT (courtesy Dr. Schultze-Kraft), seedlings were grown and root tips were examined cytologically to check this hypothesis, but no proper metaphases could be obtained.

The pollen morphology of 14 *Dunbaria* species (actually 12, two species are *Cajanus* spp.) has been investigated by Thuan (1973). The pollen grains are suboblate to spherical (P/E 0.78–0.94), subtriangular in polar view, tricolporate, of medium size (diameter 30 – 45 μ) with a 1.5 – 2.5 μ thick exine layer. The sculpture of the ectexine is reticulate. The two species since relegated to *Cajanus* (*C. heynei* (Wight & Arn.) Maesen (as *D. heynei* Wight & Arn.), and *C. grandiflorus* (Benth. ex Bak.) Maesen (as *D. pulchra* Benth. ex Bak.) fit well in the range, and point once more to the natural alliance of the Cajaninae. Thuan (1973) also forwarded the theory that *Dunbaria*

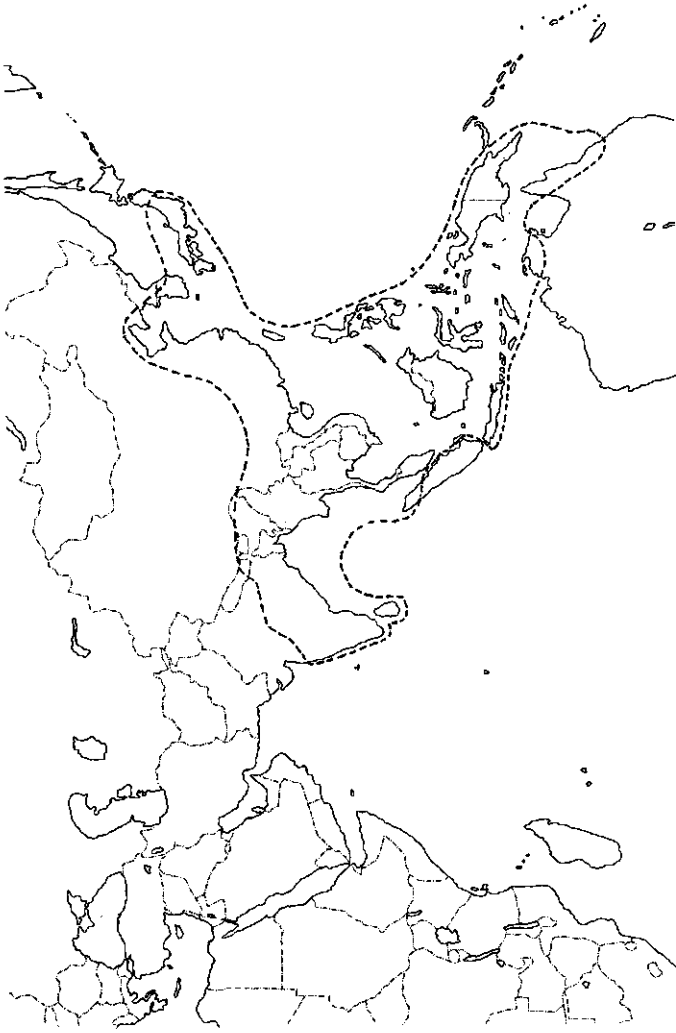
originated in Indonesia, and spread west to India and north to Indo-China where more species developed out of the more primitive woody (tree!) forms with large and thick leaflets, large flowers, sturdy "spiny" pods, pollen with coarsely reticulate tectum and long ectoaperture. More herbaceous species were the result, having fine twining branches, small flowers and small glabrescent pods, and pollen with more finely reticulate tectum and residual ectoaperture. I remark that the morphology of *D. glandulosa* (Dalzell & A. Gibson) Prain belies this general trend (sturdy climbers with large showy flowers), and also in Indonesia slender twiners are present.

4 GEOGRAPHICAL DISTRIBUTION AND ECOLOGY

Dunbaria species are bean-like climbers of semi-deciduous forests, grassland or scrub habitats mainly in the tropics and semi-arid tropics. Particularly open spaces and forest edges are preferred, just as most sun-loving climbing legumes. Some occur in wet habitats of more moist forests. Road and river sides, and forest fringes are places where *Dunbaria* spp. are most likely to be found. The species are distributed in Asia and Australia. Endemism is found in *D. floresiana* of Flores, Indonesia, *D. glabra* from Vietnam, *D. gracilipes* from Burma, while several species are of restricted regional occurrence, such as in Yunnan and Thailand, or Indo-China. Disjunct distribution is found in *D. debilis*, that occurs in Assam and Yunnan as well as in the Northern Territory of Australia and Papua New Guinea, where this species had subsequently been described as *D. singuliflora*. *D. glandulosa* is disjunct in its distribution too: the Western and Eastern Ghats of India, E. Nepal and E. Bangladesh/Burma/Thailand. It is likely that the areas in between have become unsuitable for these species in the distant or more recent past, respectively. Indications for long-distance dispersal are unknown.

D. villosa is the most northerly distributed species, it reaches 38° N in Japan, hence it is adapted to temperate as well as to tropical conditions e.g. in N. Sumatra. Southern limits are approximately 13° S, and the species can be found between 72° and 143° E. No indications are found that some species have enlarged their area in recent times, as is the case with recent herbarium records of e.g. *Cajanus scarabaeoides* (L.) Thouars.

Adding up, the largest diversity of *Dunbaria* species is found in Indo-China and China, in Vietnam 11 species are found, followed by Thailand and (mainly southern) China with 10 species. Indonesia harbours 9 species, India and Laos both 7. Keen collectors are bound to discover more locations for species of this genus. Map 1 gives a generalized outline of the distribution of the genus.



Map 1. Generalised distribution of the genus *Dunbaria* in Asia. So far *Dunbaria* species have not been found in S Sumatra and Kalimantan/Borneo.

5 DESCRIPTION OF THE GENUS *DUNBARIA*

Dunbaria Wight & Arnott, Prodr. 258 (1834); Bentham & Hooker f., Gen. Pl. 1: 541 (1865); Baker, in Hook.f. Fl. Brit. Ind. 2: 217 (1876); Taubert, in Engl. & Prantl, Nat. Pflz.fam. 3-3: 372 (1894); Gagnepain in Lecomte, Fl. Ind. Gén. Indo-Chine 2: 282 (1916); Hutchinson, Gen. Fl. Pl. Dicots 1: 422 (1964); Thuan, Fl. Camb., Laos, Viet-nam 17: 115 (1979); Lee Shukang, Fl. Reip. Pop. Sin. 41: 307-314 (1995).

Type species: *Dunbaria ferruginea* Wight & Arnott (redesignated; see Satyanarayana 1993:165). The type species indicated by Hutchinson (1964): *D. heynei* Wight & Arn. has been placed in *Cajanus* (van der Maesen, 1986), so the only remaining species in the original genus description is the proper candidate for the type.

Robust or tender perennial climbers or trailing legumes, usually with short indumentum. Vesicular glands greenish yellow to orange or red, blackish in sicco. *Stems* and *branches* 0.5–8 (–20) m. *Stipules* triangular to narrow-elliptic, often caducous. *Leaves* pinnately trifoliolate, leaflets elliptic, ovate or rhomboid, glabrous or hairy, pubescence below denser than on upper surface, venation consisting of a midrib, 2 opposite lateral veins at the base, and 4-8 lateral veins of which the lowest pair above the leaf base is (sub)opposite; stipellae present, sometimes absent. *Flowers* in axillary pedunculate or almost sessile pseudoracemes, up to 35 cm long, entirely yellow, or yellow with flag dorsally red or purple, veined or not. Bracts small, always caducous, bracteoles absent. Calyx teeth acute to elongate, two upper ones more or less connate. Corolla persistent in some species, vexillum 0.8-3 cm long, obovate-orbicular, reflexed, clawed and auriculate at the base, with or without two callosities near the base. Wings elongate-obovate, auriculate, keel curved, in some species circinnato-rostrate. Ovary sessile or stalked, ovules (3–)4–10, style thickened above the middle or not, upcurved, lower part hairy, upper part glabrous, not bearded near the stigma. Stamens 9 fused, vexillar stamen free, anthers uniform. *Fruit* a pod, linear-oblong, flat-compressed, 3–9 cm long, 0.4–1.5 cm wide, ± depressed between the seeds but without sharp transverse lines, more or less septate between the seeds, valves curling when ripe. *Seeds* flattened-orbicular, sometimes squarish, longest axis 3–7 mm, brown to black, variegated or not, strophiole vestigial, in some species conspicuous.

The characteristics of the species are clearly more uniform than those in *Cajanus*.

6 SECTIONAL ARRANGEMENT

Bentham (1852) divided the genus into two sections: Sect. 1. *Eudunbaria* with marcescent petals, and Sect. 2. *Rhynholobium* with petals deciduous before maturation of the pods. Only *D. ferruginea* remains in the first section, of which the name should be corrected to Sect. *Dunbaria*. Bentham placed *D. cumingiana*, *D. conspersa* and *D. punctata* in his second section. Baker (1876) maintained these taxa as subgenera *Eudunbaria* and *Rhyncolobium* (not *Rhynholobium*), adding a few species. No subsequent authors, except for Satyanarayana (1993), used the subdivision. If so required, the species could be assigned to the sections, that I consider rather artificial. No other species than *D. ferruginea* has marcescent corollas, leaving sect. *Dunbaria* (= *Eudunbaria*) monotypic. The flower size, as Baker added, is no good character either to distinguish subgeneric taxa.

7 KEYS TO THE SPECIES OF *DUNBARIA*

Analytical key

- 1a. Corolla of mature flower bud almost straight, persisting with developing pod, keel not circinnato-rostrate... **6. *D. ferruginea***
- 1b. Corolla of mature flower bud falcate, only staminal tube remaining with ripening pod, keel usually circinnato-rostrate..... 2
- 2a. Ovary and pod stipitate, stipe 2–20 mm3
- 2b. Ovary and pod (sub) sessile, stipe 0–1 mm 7
- 3a. Leaflets more or less trilobed, quite often broader than long, pods with stipe 2–6 (–10) mm, trailing or climbing herb.....
.....**20. *D. villosa***
- 3b. Leaflets not trilobed, or base truncate if so, usually longer than broad, pods short- or long-stipitate, 4–20 mm.....4
- 4a. Stipe 10–20 mm, pods 5–9 cm long, 8–11-seeded, pods without long bulbous-based hairs5
- 4b. Stipe 4–12 mm, pods at most 6.5 cm long, 5–9-seeded, pods with long caducous long bulbous-based hairs6
- 5a. Stipe 10–20 mm, pods glabrous, straw-coloured (light brown), 8–11-seeded, inflorescence semi-sessile, 0.5–1.5 cm, 2–4-flowered, upper and lateral calyx lobes about as long as tube.....
.....**15. *D. podocarpa***
- 5b. Stipe 5–14 mm, pods thinly short- and grey-hairy, dark brown, inflorescence lax, clearly pedunculate, 4–12 cm, 3–5-flowered, calyx lobes longer than the tube**13. *D. lecomtei***
- 6a. Stipe 5–10 (–12) mm, ripe pods dark brown or black, 4.5–6.5 x 0.7–1.0 cm, seeds (5–)6–9(–10), terminal leaflets truncate or cuneate-truncate at the base.....**19. *D. truncata***
- 6b. Stipe 4–6 mm, pods straw-coloured, 3–5 x 0.5–0.6 cm, seeds 4–6, terminal leaflets cuneate at the base.....**2. *D. circinalis***
- 7a. Trailing herbs, flowers solitary or few in sessile racemes, branches filiform, 0.5 mm diameter, leaflets 1–3 (–4.5) cm long
.....8
- 7b. More robust climbers, flowers in extended pseudoracemes, branches thicker than filiform, > 1mm diameter, leaflets 4–16 cm long.....9
- 8a. Leaflets small, elliptic, much narrower than long, 1–3 x 0.3–1 cm, coriaceous, peduncle 0.5–2 mm, 1-flowered, pedicel 2–7 mm
.....**5. *D. debilis***
- 8b. Leaflets quite rhomboid, 1–3(–4.5) X 1–3(–3.5) cm, membranous, peduncle 1–2(–5) mm, 1–3 flowered.....**16. *D. punctata***

- 9a. Pedicels slender, 8-17 mm, vexillum dark purplish red, terminal leaflet 4-6 X 3.5-5 cm, apex long-acuminate, inflorescence very slender, 5-16 cm, flowering at the end, 6-15 flowers.....**11. D. gracilipes**
- 9b. Pedicels robust, shorter, 1-7 mm, at maturity sturdy, vexillum yellow with or without red, inflorescence more sturdy.....10
- 10a. Calyx with long bulbous-based hairs.....11
- 10b. Calyx without long bulbous-based hairs.....18
- 11a. Leaflets coriaceous, shining and glabrous above, ovary short-hairy.....**9. D. glabra**
- 11b. Leaflets membranous, dull green, (short-, thin-) pubescent above, ovary long-hairy.....12
- 12a. Inflorescence long, 16-35 cm, lateral branches c. 10 cm.....13
- 12b. Inflorescence shorter, 1-13 (rarely up to 20) cm.....15
- 13a. Inflorescence long-hairy with golden hairs, pods large, 8-10 x 1.5 cm, c. 10 seeds.....**14. D. longicarpa**
- 13b. Inflorescence glabrous or short-hairy, pods narrower, 0.8-1.2 cm, 5-10 seeds.....14
- 14a. Leaflets large, top leaflets ovate, 6-16 X 3.5-8.5 cm, thin-membranous, vexillum 1.2-2 cm long and wide, inflorescence thinly hairy, long-pedunculate, pods with c. 5 seeds... **17. D. rubella**
- 14b. Leaflets 4-9.5 cm long and wide, broad-ovate to rounded, sub-coriaceous, vexillum 3-4 cm long and wide, inflorescence almost glabrous, pods with c. 10 seeds.....**10. D. glandulosa**
- 15a. Leaflets densely villous, inflorescences 1-7 cm, vexillum 15-18 mm long, dorsally red, pods 4-5 x 0.6-0.7 cm, c. 6-8 seeds**3. D. crinita**
- 15b. Leaflets laxly short-pubescent, inflorescences 4-20 cm, vexillum 12-22 mm long, dorsally red or yellow, pods 4-6 x 0.6-0.9 cm, c. 7-12 seeds.....16
- 16a. Leaflets broad-ovate, 5-7 cm long, tip long-acuminate, base truncate.....**7. D. floresiana**
- 16b. Leaflets ovate, 5-13 cm, tip acuminate, base cuneate.....17
- 17a. Leaflets 6-13 cm long, pods with short grey and long yellow bulbous-based hairs.....**8. D. fusca**
- 17b. Leaflets 5-8 cm long, pods with only short grey hairs**18. D. trichodon**
- 18a. Leaflets coriaceous, elliptic, apex obtuse, vexillum green to purple red or maroon black, veined, wings yellow to orange, keel green to greenish yellow, inflorescence to 35 cm**1. D. bella**

- 18b. Leaflets membranous, cordate to ovate, apex acuminate, whitish pubescent below, vexillum yellow to maroon, veined or not, wings yellowish, keel yellow or greenish white.....19
- 19a. Terminal leaflet rhomboid-ovate, base cuneate, green and sparsely grey-pubescent above, whitish-pubescent below, calyx without short bulbous-based hairs, vexillum dorsally uniformly maroon-coloured, ventrally yellowish.....12. **D. incana**
- 19b. Terminal leaflet broad-ovate, base rounded to truncate, dark green, shiny and puberulous to sparsely pubescent above, sparsely to densely short and grey-pubescent below, calyx sometimes with some short bulbous-based hairs, vexillum with conspicuous purplish veins on both sides.....4. **D. cumingiana**

Short synoptic key

Ovate leaflets: 3, 4, 6, 7, 8, 9, 10, 14, 15, 17, 18, 19.

Elliptic leaflets: 1, 5.

Rhomboid leaflets: 2, (3), (6), (10), 11, 12, 13, 16, 20.

Very large flowers, vexillum 18-30 mm long: 4, 6, 7, 10, 13, 14, (17).

Bulbous-based hairs on calyx: 3, 7, 8, 9, 10, 14, 17, 18.

No bulbous-based hairs on calyx: 1, 2, 4, 5, 6, 11, 12, 13, 15, 19, 20.

Bulbous-based hairs on pods: 2, 3, 4, 7?, 8, 10, 17, 19.

No bulbous-based hairs on pods: 1, 5, 6, 9, 11, 12, 13, 14, 15, 16, 18, 20.

8 ALPHABETICAL TREATMENT OF THE SPECIES

1. *Dunbaria bella* Prain

Fig. 1, p. 18, Map 2, p. 19

J. Asiatic Soc. Bengal 66-2: 434-435 (1897).

Type: Burma, Lwekaw or Laikaw, S Shan States, *Abdul Khalil (King's collector) s.n.* (K, lecto; isolecto: CAL, here designated).

Paratype: Burma, Tenasserim, *Gallatly s.n.* (CAL, not seen).

Heterotypic synonyms: *Dunbaria longeracemosa* Craib, Kew Bull. 1910: 277; Craib, Kew Bull. 1911-1: 41; Craib, Contrib. Fl. Siam., Univ. Aberdeen Stud. 57: 67 (1912); Hosseus, Beih. Bot. Centrbl. 28 Abt. 2: 397 (1911); Thuan, Pollen et Spores 15-3/4: 374-376 (1973). Type: Thailand, deciduous jungle, Doi Sootep, 300-900 m, *Kerr 917* (lecto: K; iso: BM, K, TCD). Paratype: Thailand, Kan Phra Dang, *Hosseus 148* (BM, E, K, L, M).

Phaseolus fuscus Hosseus non Wall. Beih. Bot. Centrbl. 27 Abt.2: 495 (1910).

Perennial climber, vigorous, *branches* up to 6 mm diameter, striate, growing from a woody rootstock, 2 cm diameter. *Branches* and petioles glabrescent, *Indumentum* sparse, short, grey, sometimes brown red, vesicular glands orange to brown. *Stipules* triangular, deciduous. *Leaf petiole* 1.2-4 cm long, glabrescent, rachis 1-1.8 cm, sometimes longer than or similar to the petiole, grooved above, petiolules 2-4 mm. *Leaflets* coriaceous, puckered and dark green above, dull light green below, turning dirty yellow with age; veins short-pubescent above and below, raised below; top leaflet elliptic with obtuse or short-acuminate apex to narrowly elliptic with acute apex, base rounded to broad-cuneate, 6-19 cm long, 2-8 cm wide, side leaflets obliquely so, 5-16.5 cm long, 2-7.5 cm wide, 2 basal opposite lateral veins, c. 10 other secondary veins alternate, stipellae minute setae, 1 mm, or absent. *Pseudoracemes* unbranched, 9-35 cm or more, with many flowers. *Bracts* caducous, triangular, pubescent, c. 4 mm long, 2 mm wide. *Pedicels* slender, 2-3 mm in flower, recurved and sturdy in fruit, up to 8 mm long. *Flowers* pretty, mature flower buds falcate. *Corolla* multi-coloured. *Calyx* velvety, green to red and dark red, orange glands visible, interior glabrous, margin hairy, tube c. 4 mm, teeth obtuse, c. 2 mm, the upper ones fused, the lowest one acute, c. 11 mm. *Vexillum* reniform, folded outside plane, dorsally pale green to purple red or very dark maroon-black, ventrally purple-striped, base violet-brown, c. 13 mm

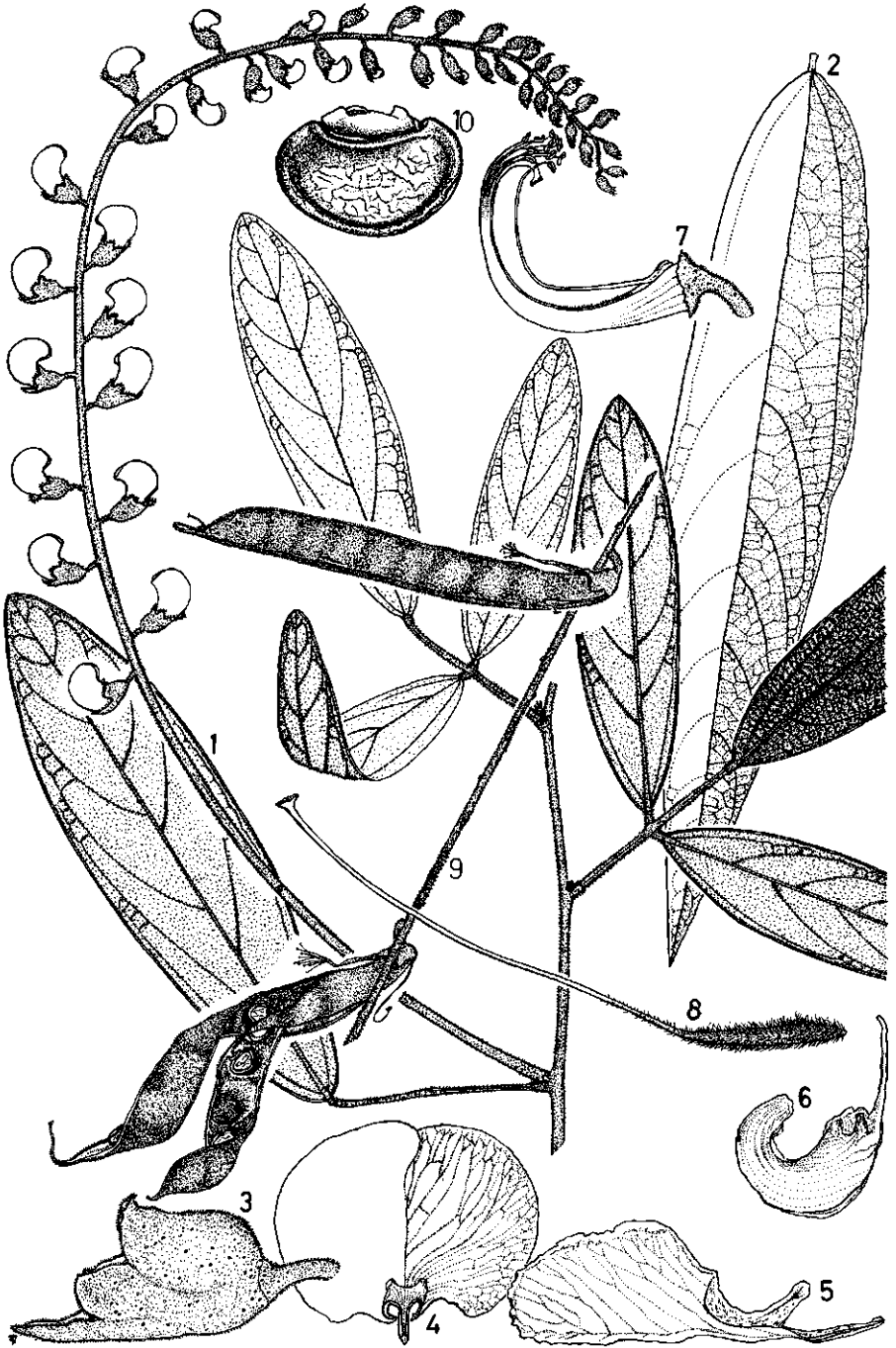
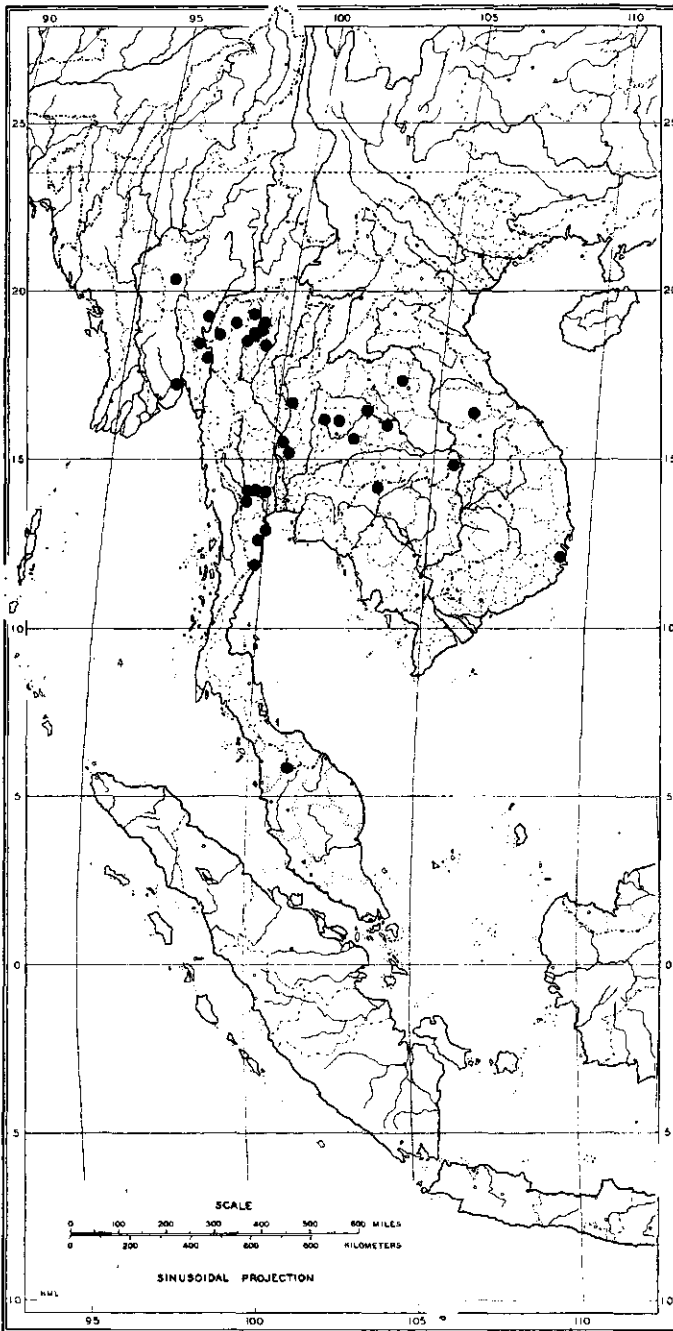


Fig. 1. *Dunbaria bella*: 1. habit, 0.66 X; 2. leaflet, 0.66 X; 3. calyx, 4 X; 4. flag, 2 X; 5. wing, 4 X; 6. keel, 2 X; 7. staminal tube, 2 X; 8. pistil, 4 X; 9. pods, 0.66 X; 10. seed, 4 X. - 1, 9 & 10: *Poilane 14387*, 2: *Micholi s.n.*, 3-8: *BR no. E 37 (Khon Kaen)*. Drawn by Mrs. Y.F. Tan.



Map 2. Distribution of *Dunbaria bella*

long, 16 mm wide, base clawed, reinforced, biauriculate, two callosities near the base; *alae* obovate, yellow to orange, c. 13 mm long, 5 mm wide, long auricle at the ventral side, dorsally a short auricle, and two bulges on the margin; *keel* strongly curved, circinnato-rostrate, green to greenish yellow, longest dimension c. 13 mm. *Ovary* hairy, linear, hairy, densely yellow-glandular, c. 6 mm long, 1 mm wide, style curved, c. 18 mm, basal part hairy, stigma stamp-shaped. *Stamens* c. 23 mm, tube bent, terminal 6–8 mm free, 4 filaments slightly shorter, free stamen geniculate near the base, anthers basidorsifix, yellow, pollen dirty white. *Pods* linear to somewhat falcate, cm long, cm wide, short-velvety, sutures marked, valves curling when ripe. *Seeds* 8–12, reniform, red brown to brown, c. 6 mm long, 4 mm wide, 2 mm thick, strophiole narrow, vestigial.

Distribution: Burma, Cambodia, Laos, Thailand, Vietnam.

Ecology: straggling in scattered shrubs, dry deciduous jungle, moist savanna, also clearings in *Pinus-Dipterocarpus* forest, open forests, on clay and sandy soils, limestone, common or not. Altitude: 0–800 m.

Flowering: Aug. (Hongkong); Sept.-Dec.(-Feb.).

Fruiting: (Oct.-)Nov.-Dec.(Jan.).

Vernacular names: Thailand: Dank kung, Dok klang (Chieng-mai); Nguang chang (Petchaburi); Khang kang (Lampun). Laos: Khang luay, Ta Gyed lin (Laotian name cf. Hosseus 148).

Specimens examined:

BURMA: Laikaw or Lwekaw, S Shan State, *Abdul Khalil, King's collector* dd. 1893 (Lecto: CAL, iso: K); Pegu Yomay & Tenasserim, *Beddome* 2289 (BM); Kyaukhet Taung, Thaungyin distr., *Maung Ba Pe* 12983 (DD, K); Salween valley, Karenni Ywathit, *Micholi* 22-12-1912 (K).

CAMBODIA: betw. Thmor Pouk and Benteai Chhma, foot of Dangrek nr border of Battambang and Siem Reap prov., *Poilane* 14387 (P).

LAOS: Bassin d'Attopeu, *Harmand* 995 (P); *Massie s.n.* (P); km 120 Savannakhet to Quang Tri, *Poilane* 11579 (P); betw. Savannakhet and Paksé, *Poilane* 28302 (P); Bassac to Hbau, *Thorel s.n.* (E, P); Paksé, prov. Sédone, *Vidal* 1909 (P).

THAILAND: E side of Doi Sutep, *L.B. & E.C. Abbe & Smitinand* 9255 (A, NY); Doi Sutep to Pui along rd to Konthathan, waterfall, *Anderson* 3952 (MO); Doi Chieng dao, N Chiengmai, *Banchuoy* 77 (L); W flank of Doi Inthanond, Mae Pau, *van Beusekom & Phenklai* 2307 (AAU, E, L); Tunkamang, Chaiyaphun distr., *Van Beusekom, Phenklai, Geesink & Wongwan* 4294A (C, L); Si Sawat, Kanchanaburi distr., *Van Beusekom, Phenklai, Geesink & Wongwan* 3439 (BKF, C, MO, P); Loei: Phu Rua Nat. Park, summit road, Sam Tong, *Chantaranothai, Parnell & Simpson* 90/494 (TCD); Nam Ring Ubon Rat, Dam rd, Khon Kaen, *BR Khon Kaen E37* (AAU); Doi Sutep, *B. Hayata s.n.* (TI); Doi Saket - Me Wow, *B. Hayata s.n.* (TI); Payap, 3 km N Mae La Noi, *Hennipman* 3497 (L); Kan Phra Dang,

Hosseus 148 (paratype of *D. longeracemosa* Craib, BM, E, K, L); Doi Sutep, 1800 ft, *Kerr* 3-12-1911 (BM); Doi Sutep 1200 ft, *Kerr s.n.* BM); Doi Sutep, *Kerr* 917 (lecto: K; isolecto: BM, K); Nakauwn Panom (Nakhon Phanom) - Udawn, *Kerr* 8938 (BM, K); Sisawat, Kanburi, *Kerr* 10217 (BM, K); Hua Hin, Prachuap, *Kerr* 13437 (BM, K); Koh Bak, Erawan Nat. Park, Kanchanaburi prov., *Hiroshiga Koyama et al.* T 30370 (L); Doi Sutep, Na Lampoon 16 (L); Ban Kao, Larsen 8174 (C); Sai Yok, Larsen 8793 (C); Tapoh, Larsen 9140 (C); Ban Takhli, Marcan 1099 (C, BM); Hua Hin, Marcan 2226 (BM, C, K); Bo Fai, Petchaburi, Marcan 2737 (BM); E Doi Sutep, Wang Buah Bahn area, Maxwell 87-1215 (Chiang Mai, L); E Doi Sutep, Pah Laht area, Maxwell 87-1507 (BKF, Chiang Mai); Mae Klang waterfall to Sop Aep, Chiang Mai prov., Murata et al. T15442 (AAU); Sai Yok, Kanchanaburi, Phengkklai 345 (K, L, P); Surin, Phengkklai et al. 3637 (BKF); Pong Kae, N Phitsanulok, Phengnaren s.n. (L); Bangtapan, Put 1339 (AAU, BM, K); Ban Takhli, Nakhon Sawan, Put 2104 (BM, C, K, L); Doi Saket, Chiangmai, Put 3267 (AAU, BM, K, J); Bua Yai, Korat, Put 4281 (AAU, BM, K); Doi Sutep, camp Hoi Chan Kiang, Rock 126 or 129 (US); 303 (US); summit of Doi Dom Cheng, Doi Sutep range, Rock 295 (US); 398 (US); Loei, Phu Kradung, Sandik 593 (BKF); SW Prov. Kanchanaburi, Rintin Forest, Thong Pha Phum distr., Shimizu et al. T21910 (BKF); Wang Kwang waterfall via Penpob Mai waterfall to Tam Yar waterfall, Phu Kradung Nat. Park, NE prov. Lori, Shimuzu et al. T23202 (L); 50 km N of Chiangmai, Sørensen, Larsen & Hansen 1336 (C); Doi Sutep, Sørensen, Larsen & Hansen 5358 (C); 5413 (C, E); 5678 (C); 5726 (C); Ban Si Than, foothill of Pu Kradung, Sørensen, Larsen & Hansen 6133 (C); Mae Hoi, T. Tuyama OCUBI 228-36 (TI); betw. Ok Louang and Bo Louang, prov. Chiang Mai, Vidal 4644 (P); Lampun, Mê Li Pê forest, Winit 1546 (K).
 VIETNAM: Rôngol, Dournes Nov. 1967 (P); Cü Mökia, Dournes s.n. (P); Mu xoai, Pierre s.n. (K, P); Nha Trang & vicinity, Robinson 1259 (P).

Notes: A very distinct species, relatively well collected. Regrettably the wellknown name *Dunbaria longeracemosa* is antedated by *D. bella*. The length of the flower stalk and the shape of the coriaceous leaflets were taken by Craib as distinction from *D. bella*. However, indumentum, flowers and fruits are identical. The length of the inflorescence is variable, and not a good character to separate the species, e.g. Sørensen et al. 5413 has very long pseudoracemes. Even in the same specimen both elliptic and narrow-elliptic leaflets exist with apex obtuse, rounded to acute, sometimes acuminate (e.g. *Kerr s.n.* from Doi Sutep, 3-12-1911, BM). The length of the entire climber is rarely reported: 1 m to 3.3 m, but it seems likely that this sturdy plant may grow much taller. The protologues do not give an indication either.

Uses: Mention is made once of the use of flowers as a vegetable (apparently like those of *Sesbania grandiflora*) in Thailand, *Anam ka Lampoon 16* (L). In Laos the plant is medicinal (*Vidal 1090*).

2. *Dunbaria circinalis* (Benth.) Baker

Fig. 2, p. 23, Map 3, p. 24

in J.D. Hooker, Fl. Brit. India 2: 219 (1876); Kurz, J. Asiatic Soc. Bengal 45-2: 255-256 (1876); Backer, Voorl. Schoolfl. Java 92 (1908); Koorders, Exk.fl. Java 404 (1912); Boldingh, Zakfl. Landbouwstr. Java 120 (1916); Y.C. Wu, Engl. Bot. Jahrb. 71: 184 (1940); Wang & Tang, Ill. treatm. princip. pl. China. Legumin. 688 (1955); Verdcourt, Manual New Guinea Legumes 544 (1979); Khoi & Yakovlev, Bot. Zh. (Leningr.) 67: 1541 (1982); Lee Shukang, Fl. Reip. Pop. Sin. 41: 312-313 (1995). Most of the publications outside the Indian subcontinent refer to *Dunbaria truncata*.

Basionym: *Atylosia circinnalis* Benth. in Miq., Pl. Jungh. 244 (1852), based on *Phaseolus circinnalis* Ham. ex Wall., Cat. 5594 (1831).

Type: India, Assam, Goalpara, *Hamilton in Herb. Wallich 5594 ex parte* (holo: K; iso: K).

Homotypic synonym: *Phaseolus circinnalis* Ham. ex Wall. nom. nud., *Wall. Cat. 5594* (1831).

Heterotypic synonym: *Dunbaria thorelii* Gagnep., Lecomte Not. Syst. 3: 194 (1916); id. Fl. Gén. Indoch. 2: 284 (1916); Thuan, Pollen et Spores 15-3/4: 370-372; Thuan, Fl. Cambodge, Laos, Vietnam 17: 120 (1979). Type: Laos, Bassac, Mekong area, *Thorel s.n.* (holo: P; iso: P).

Perennial climber. Branches slender, length not reported, to 2 mm diameter. *Indumentum* sparsely grey-hairy, more densely on calyx and leaf veins. *Stipules* triangular or narrowly so, to linear, hairy, 1–2 mm long. *Leaf petiole* slender, striate, 1–3 cm, rachis 0.5–1.5 cm. *Leaflets*: top leaflet rhomboid to rounded, acuminate, 2–4.5 cm long, 2–4 (–4.5) cm wide, apex blunted-acute, tipped with a small mucro, base broadly to narrowly cuneate, dark green above, olive-green below, side leaflets obliquely so, 1.2–3 cm long, 1.2–2.5 cm wide, both sides with many yellow to orange glands, petiolules 1–2 mm, stipellae minute, c. 0.5 mm, sometimes falling. *Pseudoracemes* (5–)8–12(–20) cm long, peduncle unbranched or with a second slender peduncle branched off from a trifoliolate bract, buds crowded at the curled end, *bracts* narrowly elliptic, dorsally hairy, early caducous, 3–7 mm long. *Flowers* c. 12–20. *Corolla* yellow, quite persistent. *Calyx* densely orange-glandular, pubescent, interior sparsely pubescent, tube 2.5–4.5 mm, teeth very narrow-

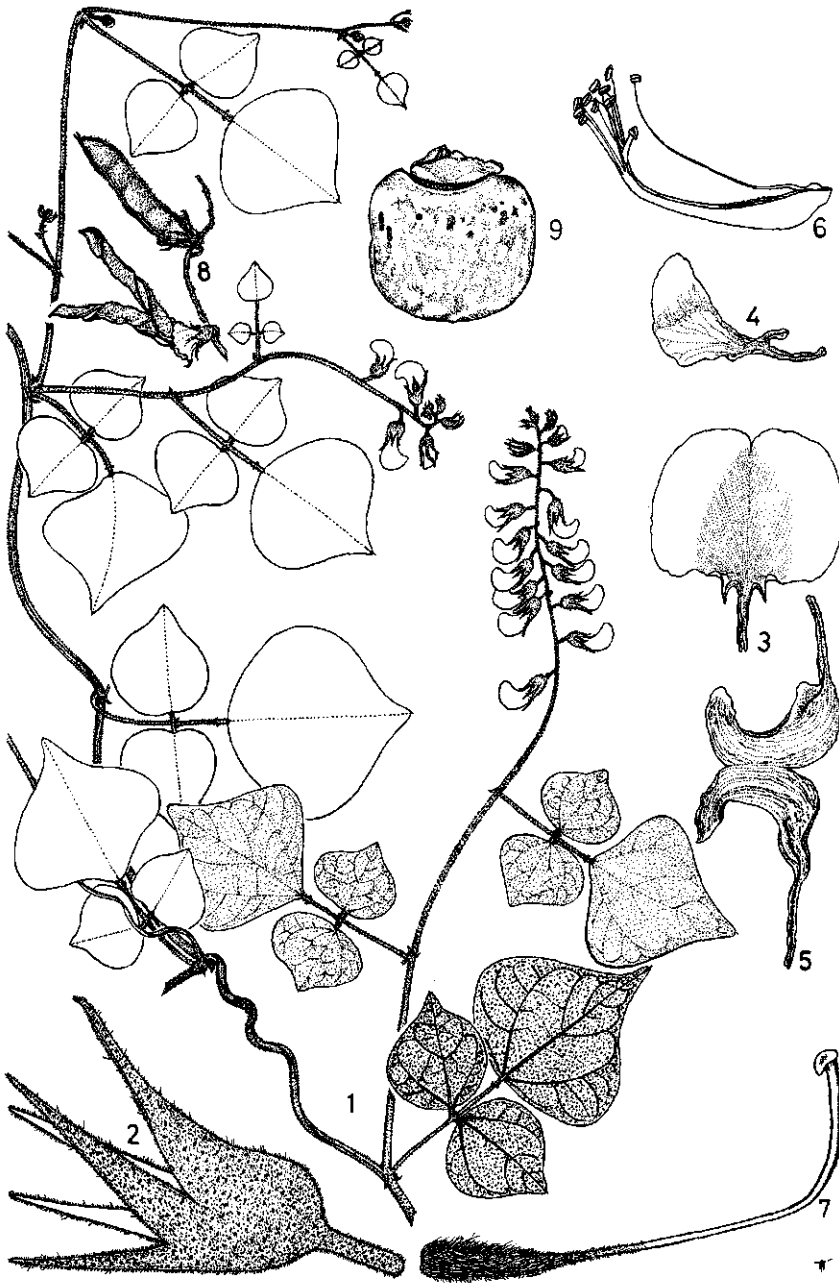
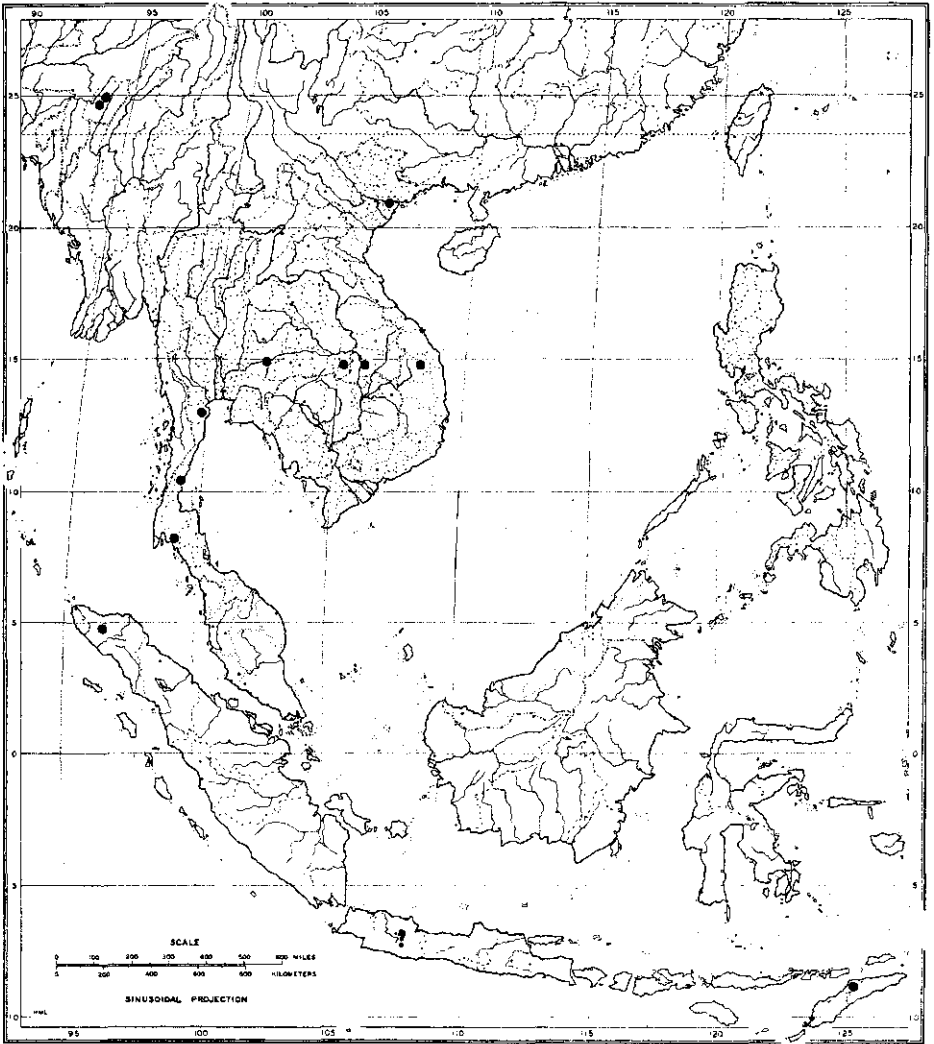


Fig. 2. *Dunbaria circinalis*: 1. habit, 0.66 X; 2. calyx, 4 X; 3. flag, 2 X; 4. wing, 2 X; 5. keel, 2 X; 6. staminal tube, 2 X; 7. pistil, 4 X; 8. pods, 0.66 X; 9. seed, 6 X. - 1, 8 & 9: *Marcan 541*, 2-8: *Kerr 8101*. Drawn by Mrs. Y.F. Tan.



Map 3. Distribution of *Dunbaria circinalis* in S and SE Asia

elliptic, acuminate, upper teeth 6–7 mm, connate for a third to a half of their length, lateral teeth c. 5 mm long, lower tooth c. 6–7 mm. *Vexillum* rounded, 10–14 mm long, c. 9–11 mm wide, base clawed, biauriculate, auricles not reinforced, no crest or callosities, apex folded, emarginate, *alae* obovate, 9–13 mm long, c. 4.5 mm wide, base bent, c. 2–4 mm, ventral side 1 long auricle, dorsal side 1 short auricle, *keel* circinnato-rostrate, longest dimension 10–15 mm, ventral sutures adnate, base narrow, c. 3–6 mm. *Ovary* linear, c. 5–6 mm, silvery hairy, with yellow glands, about 6 ovules, stalk 1 mm, style to 16 mm, stigma terminal, oblique. *Stamens* c. 13–19 mm long, tube curved upwards, upper 7 mm of filaments free, anthers basidorsifix, enclosed in the rostrum of the keel. *Pods* 3–5 cm long, 0.5–0.6 cm wide, straw-coloured, stipitate, stalk 4–6 mm, 1–3 mm of style remaining at the apex. *Seeds* (4–)5–6, black or brown with black mosaic, squarish-rounded, to c. 4 mm long and wide, 2.5 mm thick, strophiole divided.

Distribution: NE India, Thailand, Laos, Indonesia (Timor).

Ecology: a climber in scrub jungle, along roadsides. Altitude: 50–200 m (India, Timor), 50–1200 m (Thailand).

Flowering: Oct.–Dec., May (mainland Asia), April (Timor).

Fruiting: Aug., Jan. (mainland Asia), April (Timor).

Vernacular names: –

Specimens examined:

INDIA: Herb. Hamilton, Wallich 5594 (K-Wall.); Assam: Kistopore, Cachar, Clarke 7009 (BM); Lakhipur on the Barak river, Gage *s.n.* (G); Assam sine loc., Jenkins *s.n.* (DD, G, L, P); Sikkim: Terai, Sukna, Clarke 36641 A (K), 36641 D (G); West Bengal: Nilpara, W Duars, Haines 511 (K).

INDONESIA: Timor, de Castro *s.n.* (BO); NW Timor, Lalian, Kooy 98 (L); Lalian, Kooy 102 (L); Sumatra, Aceh, Balek, Jeswiet 623=1832 (sterile, WAG).

LAOS: Bassac, Mekong, Thorel *s.n.* (Type of *D. thorelii*: P).

THAILAND: Chumphon, CIAT 17329 (CIAT, WAG); Qak tong Chai, Korat, Kerr 8101 (BM, K); Sakeo, Krabin, Kerr 9792 (K, TCD); E Prov., Ubon Ratchabani, Det Udom distr., Koyama *et al.* T30777 (L); Petchaburi, Marcan 541 (BM, K).

VIETNAM: Sept Pagodas, Tonkin, Sergeant Mouret 47 (P); Dac Dao, Miang Giang, Gialai - Kontum, Tran Ngoc Ninh 175 (LE).

Sine loc.: Kurz *s.n.* (BO).

Notes: The complex around *Dunbaria circinalis* was difficult to comprehend. Study of live material would be ideal to unravel the populations. The material has not earlier been studied for the entire range of habitats.

Baker (1876) correctly placed "*Atylosia circinnalis*" Benth. in

Dunbaria, the pods do not have linear depressions, but the pod valves show bulges where the seeds develop. Baker considered specimens of what I think to be *Dunbaria truncata* as part of *D. circinalis* due to inadequate material (Craib, 1923). A manuscript name shows that Bentham (or Baker?) at one time thought those specimens, *Helper 1709* and *Griffith s.n.* from Burma, to be distinct, but he included them in the species as treated for the Flora of British India. I restrict *D. circinalis* to the Indian-Indochinese and Timorese populations with narrow straw-coloured, c. 6-seeded pods with yellow-brown long bulbous-based straggly hairs on short-grey-pubescent pod valves. Also, Baker did not see *D. podocarpa*, he could only quote Kurz's description; the holotype arrived in Kew from Calcutta in June 1878, two years after the second volume of the Flora of British India was published. Prain did not discuss *Dunbaria podocarpa* nor *D. circinalis*. Gagnepain and Thuan only treated *D. podocarpa* and *D. thorelii* Gagnep., the latter is conspecific with *D. circinalis*. *Dunbaria circinalis* seems to secrete more sticky matter from glands and glandular hairs on inflorescences and pods than *D. truncata*, seen the several fragments sticking to those parts, and the shiny material on the pod valves.

The species has not been collected in India in recent times (Satyanarayana, 1993), but from Thailand, Vietnam and Indonesia samples were collected in the last decennia. *D. circinalis* remains a poorly collected species.

3. *Dunbaria crinita* (Dunn) Maesen comb. nov.

Fig. 3, p. 27, Map 4, p. 28

Basionym: *Atylosia crinita* Dunn, J. Bot. 47: 198 (1909).

Lectotype: China, Lienchow River, *Ford 13-8-1887* (lecto: BM, here designated). Paratype: China, Hainan prov., *Ford 366*, Aug. 1893 (HK, not seen, NY).

Heterotypic synonym: *Dunbaria flavescens* Nguyen Van Thuan, Adansonia, sér. 2, 16-4: 512 (1977); id., Fl. Cambodge, Laos, Viet-nam 17: 124 (1979). Type: Vietnam, Lam Dong, Dalat Region, 1000 m, *Lichy 3* (P, holo; iso: P). Paratypes: Vietnam, Lam Dong, road on Mont de l'Elephant, Kampot, along Prenn stream, *Evrard 1226* (P); Vietnam, N of Dalat, prov. Haut-Donai, *Poilane 30398* (AAU, BKF, K, P); Vietnam, Lang Anh, prov. Haut Donai, *Poilane 21044* (P).

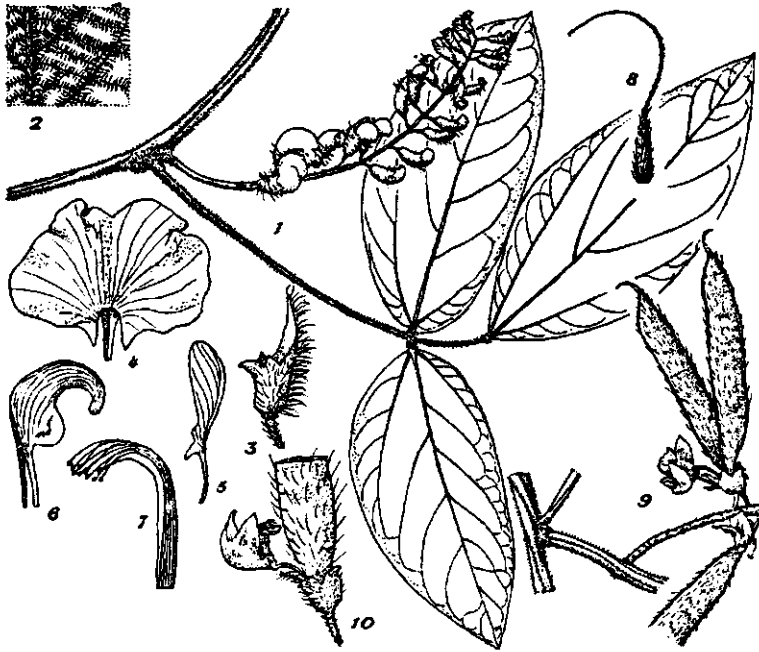
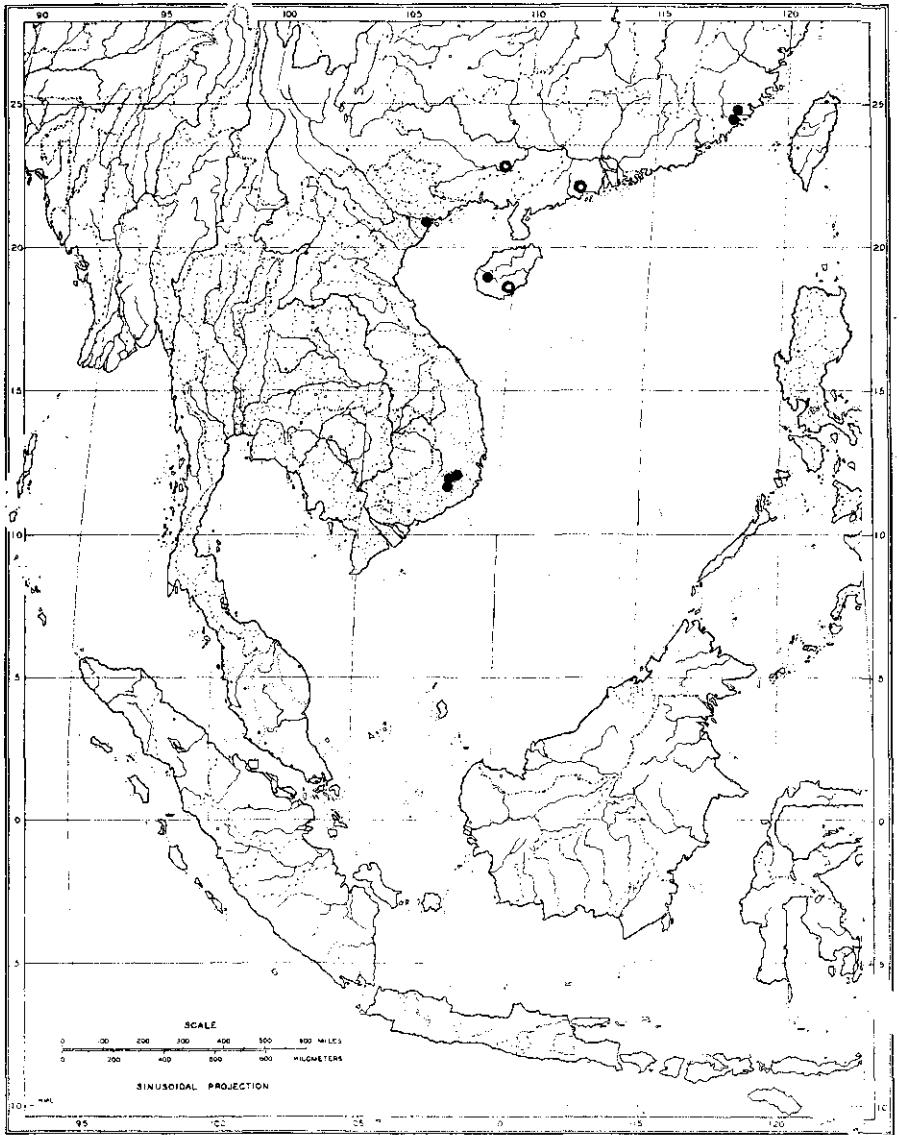


Fig. 3. *Dunbaria crinita*: 1. leaf and inflorescence, 0.66 X; 2. detail of lower leaflet surface, 2 X; 3. calyx, 1.5 X; 4. flag, 1.5 X; 5. wing, 1.5 X; 6. keel, 1.5 X; 7. staminal tube, 1.5 X; 8. pistil, 4 X; 9. pods, 0.66 X; 10. detail of base of pod, 1 X. – 1-10: *Lichy* 3. Source: Fl. Cambodge, Laos, Viet-nam 17: 127 (1979). Drawn by Mrs. H. Lamourdedieu. Reproduced by permission from Mus. Nat. Hist. Natur., Paris.

Perennial climber, branches striate, to 3 m. Indumentum densely velvety, grey, with short hairs on upper surface of leaves, branch ribs long retrorsely hairy, short-hairy between ribs. *Stipules* caducous, triangular, 1–3 mm long. *Leaf petiole* striate, 3–4.5 cm, rachis 0.8–1.5 cm. *Leaflets* dark green above, grey-green below, both sides with many reddish vesicular glands; top leaflet ovate to ovate-elliptic, 5–8 cm long, 3–4 cm wide, apex acute, base rounded, side leaflets obliquely so, 4–6 cm long, 2.5–3.5 cm wide, petiolules 2–3 mm, stipellae hairy, setaceous, caducous or invisible between indumentum. *Pseudoracemes* not branched, to 7 cm. *Bracts* early caducous, 2–4 mm, glandular, setaceous. *Flowers* 10–20 or more, singly or in pairs. *Corolla* yellow, vexillum dorsally red or purple. *Calyx* glandular, tube c. 4 mm, teeth triangular, upper teeth connate but free at the tip, lateral teeth acute to rounded, 2–3 mm, lower tooth longest, 4–5 mm, margin hairy, bulbous-based golden hairs conspicuous esp. at bud stage. *Vexillum* rounded, 15–18 mm long, c.



Map 4. Distribution of *Dunbaria crinita* in China and Vietnam (●), probable locations (○)

15 mm wide, base clawed, biauriculate, apex rounded, emarginate; *alae* obovate, to 15–17 mm long, 5 mm wide, base narrow, c. 6 mm, dorsal side 1 short auricle, ventral side 1 long auricle; *keel* circinnato-rostrate, pouched, longest dimension c. 15–17 mm, ventral sutures adnate, base clawed, c. 5 mm. *Ovary* linear, 6–7 mm, grey silken-hairy, glandular, c. 6–8 ovules, stalk 1 mm, style 17–20 mm, stigma oblique, terminal. *Stamens* c. 22–25 mm, upper half of filaments curved, upper 10 mm free, anthers basidorsifix, enclosed in the rostrum of the keel. *Pods* sessile, linear, tapering at the ends, 4–5 cm long, 0.6–0.7 cm wide, with short hairs and bulbous-based long caducous hairs. *Seeds* 6–8, red brown to brown with black mosaic, orbicular, c. 4 mm long, 4 mm wide, 2 mm thick, strophiole conspicuous, divided.

Distribution: China: Guangdong, Guangxi and Hongkong, Vietnam.

Ecology: weedy places in pine forest, in thickets or fields, e.g. on red soils. **Altitude:** 0–1500 m.

Flowering: Aug. - Sept.

Fruiting: Oct.

Vernacular names: China: Ye tau fa (Poon Yuen).

Specimens examined:

CHINA: Guanxi/Kwangsi prov.: Tung Loo, E Tang Lan, *R.C. Ching* 6526 (A, W). Guangdong/Kwangtung prov.: Lienchow river, *Ford* 59, 13-8-1887, fr. cult. in Bot. Gdn Hongkong (lecto BM; isolecto K); Cult. in Hongkong Bot. Gdn, grown from seeds from Hainan (probably *Ford* 59?), *Ford* 613 (K); Poon Yuen distr., *Levine et al.* 2180, coll. Ah To (A); Hainan prov.: Shun Cheong, *Ford* 358, Chinese collector (K); Yaichow, H.Y. Liang 62648 (A, NY). Hongkong: New Territories, Wah Shan Kuek, *Shiu Ying Hu* 10901 (K); Kamtin, Un-Loong, *Y. W. Taam* 1615 (A, G, NY, US); Shek Kong catchment area, *J.P.W. Woo* 369 (P). VIETNAM: Type and paratypes of *D. flavescens* (see above).

Notes: Before I studied *Dunbaria* in its entirety, I considered *Atylosia crinita* as a synonym of *Dunbaria fusca* (van der Maesen 1986). The Flora of China (Lee Sukiang, 1995) lists *D. crinita* as synonym of *D. fusca*. Since the type material of *A. crinita* is conspecific with the *D. fusca* segregate *D. flavescens* Thuan, a new combination is necessary as the epithet *crinita* has priority. Judging from the rather limited material, I concur with Thuan, that the taxon merits specific status. The place of the species is open to discussion, as depressions on the pod valves between the seeds are present, but not sharp: *Dunbaria* or *Cajanus*? However, the very rostrate-

circinnate keel points more to *Dunbaria*. The relationship to *Dunbaria fusca* is obviously close. In addition to the dense indumentum and ovate-elliptic leaflets with an acute tip, *D. crinita* differs from *D. fusca* by the flower colour: its standard petal is (dorsally) red, in *D. fusca* all petals are yellow, only *Evrard 2424* has yellow-purplish flowers, but is otherwise *D. fusca*. The flowers of *Taam 1615* are reported to be yellow, but have dried up quite dark. The upper sepal of *D. crinita* (= *flavescens*) is not always divided, so this character to key out the species from *D. fusca* (with 4 sepals) is not unambiguous.

In 1973 Thuan described the pollen of *D. flavescens*, of which the protologue was issued in 1977 only.

4. *Dunbaria cumingiana* Benth. Fig. 4, p. 31, Map 5, p. 32

in Miquel, Pl. Jungh. 242 (1852); Miquel, Fl. Ind. Bat. 1: 177 (1855); Merrill, Enum. Philipp. Legumes, Philipp. J. Sci. 5: 127 (1910); Merrill, Enum. Philipp. Pl. 2: 314 (1923); Verdcourt, Manual New Guinea Legumes 544 (1979).

Type: Philippines, Luzon, Prov. Tayabas, *Cuming 819* (K, holo; iso: BM, K, MEL, P, W).

Heterotypic synonyms: *Dunbaria discolor* Harms & K. Schum., Fl. Deutsch. Schutzgeb. Südsee 369-370 (1901). Lectotype: Papua New Guinea, betw. Finschhafen & Gibuni, in Bumi valley, *Lauterbach 457* (B, lecto; designated here). Paratypes: woods nr Finschhafen, *Lauterbach 418* (B, para); Stephansort, *Lewandowski 22* (B, para); Schumann river bank, 300 m, *Lauterbach 2419* leg. *Kersting* (not seen).

D. merrillii Elmer, Leaflets Philipp. Bot. 1: 225 (1907) as *Dunbaria*; Merrill, Enum. Philipp. Legumes, Philipp. J. Sci. 5: 127 (1910); Merrill, Enum. Philipp. Fl. Pl. 2: 315 (1923). Type: Philippines, Luzon, Baguio in Benguet prov., *Elmer 8502* (K, lecto; iso: BO, E, G, L, LY, NY, US, W).

Perennial climber, robust. *Stems* to several m long, to 4 mm in diameter, branched. *Indumentum* short-cinereous, from sparse to dense. *Stipules* very narrow-elliptic, caducous, 2–4 mm long. *Leaf petiole* slender, ribbed, pubescent, 3–6 cm, rachis 1.2–2 cm long. *Leaflets* dark green and puberulous-shiny to sparsely pubescent above with few glandular dots, grey-green below with sparse to

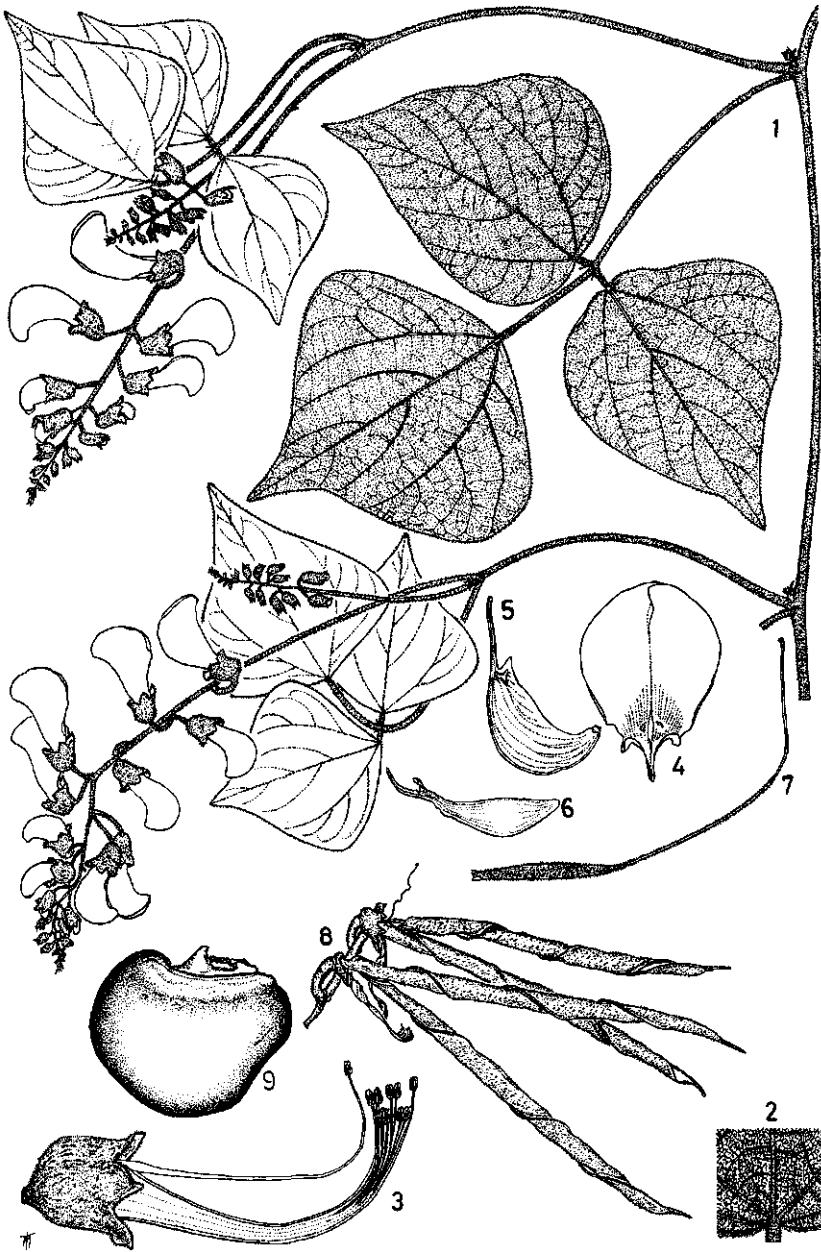
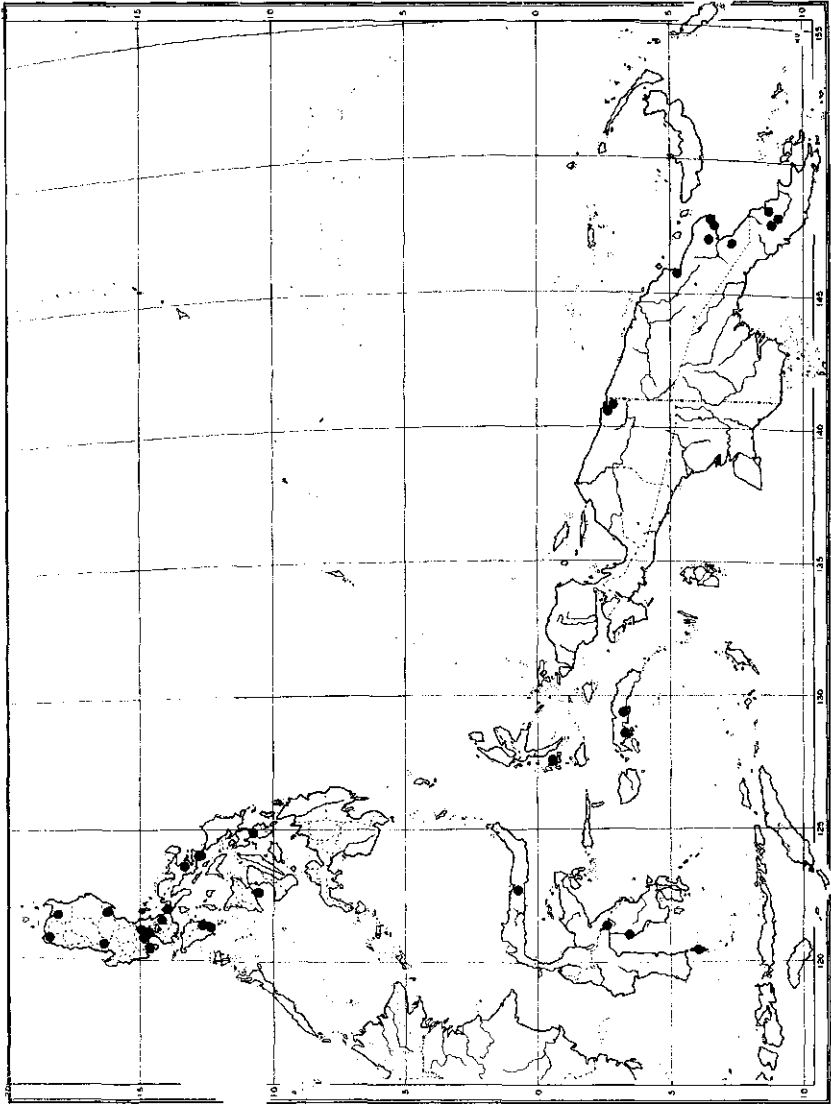


Fig. 4. *Dunbaria cumingiana*: 1. habit, 0.66 X; 2. detail of leaflet, 2 X; 3. calyx and staminal tube, 2 X; 4. flag, 1 X; 5. wing, 1 X; 6. keel, 1 X; 7. pistil, 2 X; 8. pods, 0.66 X; 9. seed, 4 X. - 1 & 2: Fox 9205, 3-7: Ramos 27432, 8 & 9: Sulit 11765. Drawn by Mrs. Y.F. Tan.



Map 5. Distribution of *Dunbaria cumingiana* in SE Asia and Papua New Guinea

dense pubescence, giving a whitish appearance, densely gland-dotted; 2 major lateral veins from the base, c. 6 alternate alternate veins; top leaflet broadly ovate, 3–7 cm long and wide, apex acuminate or acute, base rounded to truncate; side leaflets obliquely so, 2–6 cm long, 2–5 cm wide; petiolules 2–5 mm long, hairy; stipellae hairy, narrow-elliptic, minute to 2 mm long. *Pseudoracemes* lax, simple or with a few branches, (5–)10–20 cm long, up to c. 20 flowers. *Bracts* very narrow-elliptic to setaceous, hairy, soon dropping, c. 1 mm; pedicels thin at first, to 6–7 mm, in fruit sturdy and 8–12 mm long. *Mature flower buds* falcate. *Corolla* yellow to yellowish orange, vexillum veined purple and dorsally flushed purple or green. *Calyx* pubescent, inside too, tube to 6 mm long, teeth broad-triangular, upper teeth connate, c. 2 mm long, incised at the tip, lateral teeth 2 mm, lower tooth 3 mm. *Vexillum* obovate, falcate until widely opened, 18–25 mm long, 14–20 mm wide, clawed, strongly auricled at the base, two callosities not very conspicuous; *alae* yellow, narrow-obovate, 18–23 mm long, to 6 mm wide, one dorsal auricle of c. 3 mm long; *keel* yellow, curved, clawed, longest dimension 18 mm, 9 mm wide. *Ovary* linear, c. 8 mm, densely pubescent with or without bristly hairs developing, glandular dots dense, yellow, c. 9 ovules, style up to 23 mm, upper 10 mm curved upwards, after anthesis stylar canal plainly visible, stigma an oblique knob, terminal. *Stamens* with filament tube to 25 mm, free part upcurved, filaments unequal, 7–10 mm, anthers basidorsifix. *Pods* slightly falcate, brown to dark brown, 6–8 cm long, c. 1 cm wide, densely puberulous and sparsely to densely covered with yellowish bristly hairs and glandular dots, bristles caducous or sometimes lacking, stipe c. 1–2 mm, base of style persistent. Valves strongly curling and glabrous when ripe. *Seeds* 7–9, roundish compressed, brown, up to c. 7 mm long, 5.5 mm wide and 2–3 mm thick, hilum with narrow papery vestigial strophiole.

Distribution: Indonesia, Papua New Guinea, Philippines.

Ecology: climber in forests along lake or in river valleys, also in disturbed open areas, forming tangled masses over shrubs and trees. Altitude: 0–600? m.

Flowering and fruiting: almost throughout the year.

Vernacular names: Indonesia: Kacang meraya; Philippines: Mang; Ayemik; Igorot: Kalat; Ilocano: Bangbangnau, Marapatam.

Specimens examined:

INDONESIA: Saleyer Isl., *Docters van Leeuwen 1692* (U); Irian Jaya, Bivak Hollandia (now Jayapura), *Gjellerup 165b* (BO, K, L, U); Lamala, Kalibambang, E Sulawesi, *Kaudern 370* (AAU, L, NY, S); N Sulawesi, Dumoga-Bone National Park, by Tumpah River, *Jon Martin 4635* (BM); Amasing, Batjan, Moluccas, *Nedi 149* (BO, L); Cyclope Mts, Hollandia (Jayapura) - Sentani rd, Lake Sentani, Irian Jaya, *van Royen & Sleumer 5803* (BO, L); Seran (Seram) nr Maneo, *Rutten 309* (BO); S. Sulawesi, Soroako, S shore of Lake Matano, *de Vogel 5771* (L, NSW); Seram, *de Vriese s.n.* (L).

PAPUA NEW GUINEA: Garabinumu, *Carr 12960* (K, NY); Kokoda sea front, 400 m, *Carr 16289* (B, BM, L); NE of Manumu village, *Isles & Vinas NGF 33892* (A, L); Gewam, subprov. Lae, prov. Morobe, *Kerenga et al. LAE 73807* (A, BRI, E, K, L); Finschhafen, *Lauterbach 418* (B, paratype of *D. discolor*); Bumi valley between Finschhafen & Gibumi, *Lauterbach 457* (B, lectotype of *D. discolor*); Stephansort beach, *Lewandowski 22* (B, paratype of *D. discolor*); Fife Bay, *Lister Turner 52* (BM, BRI); *113A, 113B* (BRI); Popondetta, bed of Amboga river, *Womersley 4747* (BRI, K, L).

PHILIPPINES: Guimaras island: Buenavista - Bo Savacion, *Sulit 11765* (K, L). Leyte: Dagami, *Ramos 15304* (E). Luzon: Manila, prov. Tayabas, *Cuming 819* (K, holo; iso: BM, K, MEL, P, W); Mt. Darna, prov. Ilocos Norte, *Edaño 3885* (A, K, L); Lucban, prov. Tayabas, *Elmer 7799* (BO, E, K, L, LE, Z); Baguio, prov. Benguet, *Elmer 8502* (type of *D. merrillii* Elmer, iso: E, G, K, L, LE, LY, W, Z); Irosin, Mt Bulasan, prov. Sorsogon, *Elmer 15579* (A, BM, BO, C, G, K, L, MO, NY, P, S, U, US, W, Z); Sablang, prov. Benguet, *Fenix 12575* (C); Montalban, prov. Rizal, *Loher 2282* (K); *ibid.*, Rio Macharing, *Loher 2283* (K, M, P, US); San Francisco del Monte, *Loher 2284* (K); nr Dupax, prov. Nueva Vizcaya, *McGregor 11326* (BM, BO, L, LY); Montalban, prov. Rizal, *Merrill 5077* (BRI, K, L, LY, P, US); Lamao, prov. Bataan, *Merrill 7589* (L, P); Mayon volcano, prov. Albay, *Mendoza 18414* (K); Cagayan prov., *Ramos 7411* (LY, US); Cagayan prov., *Ramos 7872* (LE); Bangui, prov. Ilocos Norte, *Ramos 27432* (P, US); San Mariano, prov. Isabela, *Ramos & Edaño s.n.* (B); Siargao Island, *Ramos & Pascasio 34867* (P); Casiguran, prov. Tayabas *Ramos & Edaño 45505* (LE). Mindoro: Randan Mt. Bulalacao, *Ebalo 244* (A); Mt. Yagaw E slope, Mansalay, *Sulit & Conklin 16882* (L). Polillo island: NE forest, Karlagan, *Fox 327* (A).

Notes: Merrill (1910) already mentioned the possible conspecificity of *D. cumingiana* and *D. merrillii*. Only the more dense and whitish pubescence of the lower surface of the leaflets separated the latter from the first. The structure of the hairs on the leaflets is similar, the colour is silvery, so increasing density makes the surface from pale green to white, in several gradations. Habit, flower and pod characters do not differ, although in specimens with sparsely or densely haired leaflets the (caducous) yellow bristly hairs on the pods are obviously more sparse when mature or are indeed entirely lacking. Even *Cuming 819*, the type of *Dunbaria cumingiana*, has the occasional bristle. Elmer did not have mature pods in the type material of *D. merrillii*. The specimens issued as *D. merrillii* by Elmer (no 15579) hardly have denser indumentum than the common

specimens of *D. cumingiana*. A study of possible seasonal fluctuations in leaf background colour in different accessions may serve to remove further reservations against the merger of the species, such as the existence of different vernaculars e.g. in Ilocano. *Elmer 8502* appears not to be present in PNH or US, therefore the duplicate at K was selected as lectotype for *D. merrillii*.

In some specimens (*Nedi 149*) the vesicular glands are almost invisible on the lower side of leaflets, black remnants perhaps indicate a fungus infection. The calyx shows reddish glands, however.

5. *Dunbaria debilis* Baker Fig. 5, p. 36, Map 6a, 6b, p. 37, 38

in J.D. Hooker, Fl. Brit. Ind. 2: 218 (1876); Clarke, J. Linn. Soc. 25-1: 17 (1889).

Lectotype: India, Meghalaya, Khasi Mts, Nunklow, alt. 4–5000 ft, *Hooker f. & Thomson 1930* (K, *lectotypus novus*). Paratype: *ibid.*, Ponerang, *Hooker f. & Thomson s.n.* (K); Ponerang, *Lobb s.n.* (K).

Heterotypic synonyms: *Dunbaria singuliflora* F. Muell., J. Roy. Soc. N.S. Wales 24: 74 (1890-91); Lazarides et al. Checklist Fl. Kakadu NT, Austral.: 14 (1988); Verdcourt, Manual N. Guinea Legumes 545 (1979). Lectotype: Australia NT, Port Darwin, Arnhem's Land, *Holtze N1043* (fl. 1890) (MEL, lecto; isolecto: K). Paratype: *ibid.*, *Holtze s.n.* 1890 (fr.) (MEL).

Dunbaria parvifolia X.X. Chen, Acta Bot. Yunnan. 3-4: 435 (1981); Lee Shukang, Fl. Reip. Pop. Sin. 41: 310 (1995). Type: China, Guangxi, Yongning Xian, *Q. Li et al. 2-0008* (Herb. Inst. Med. Pharm. Sci. Guangxi Chuang Auton. Reg. Nanning, holo, not seen).

Perennial climber, woody rootstock with filiform stems, indumentum dense, short. Vesicular glands yellow to brown. *Branches* to 0.7 m long, striate, up to 2 mm thick. *Stipules* setaceous, 1–5 mm long. *Leaf petiole* grooved above, narrowly winged, 3–16 mm, rachis 1–3 mm, with wings somewhat spoon-shaped. *Leaflets* coriaceous, grey-green above, whitish grey-green below, top leaflet elliptic to narrow-elliptic, 1–3 cm long, 0.3–1 cm wide, apex rounded-emarginate to acute-cuspidate, base slightly cordate, prominently veined, 2 laterals at the base, c. 4-5 alternate lateral

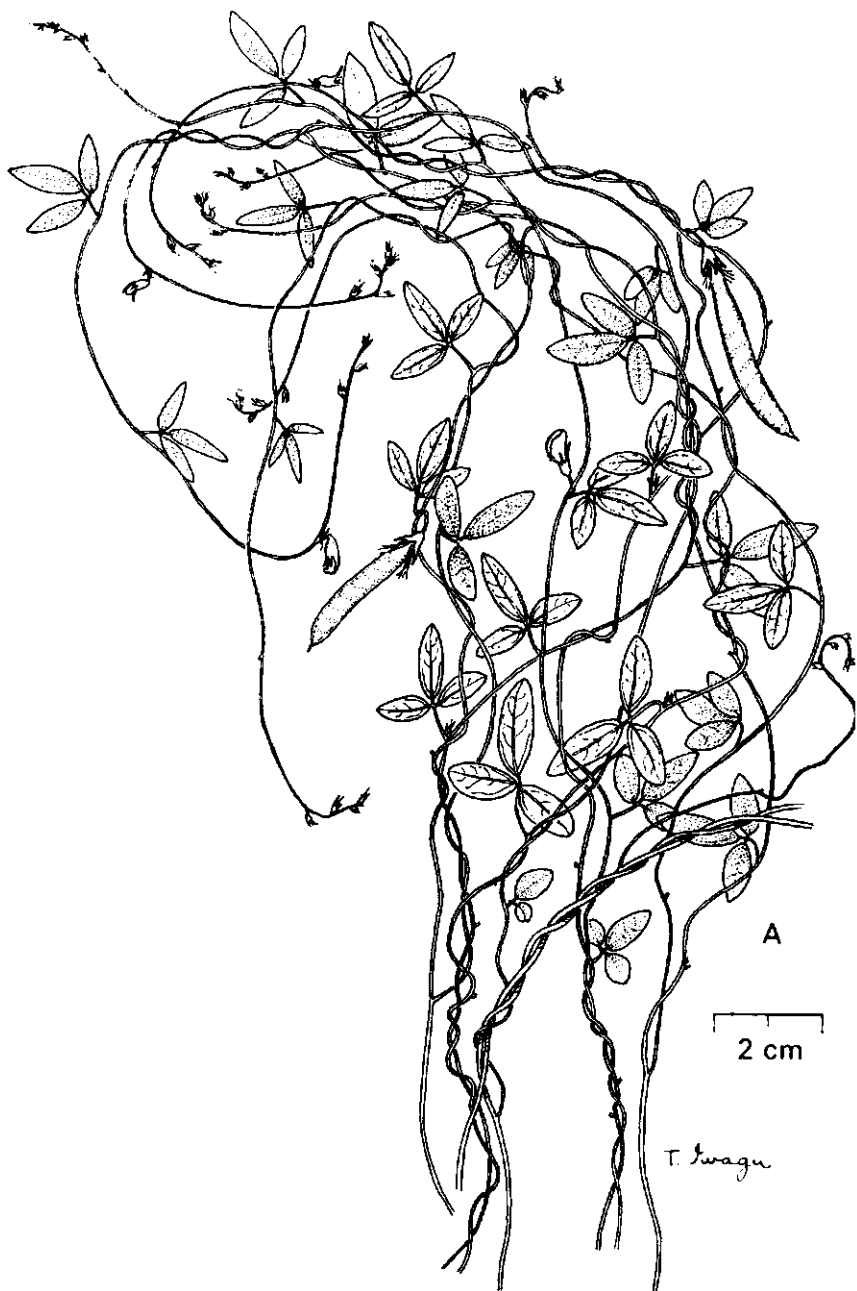
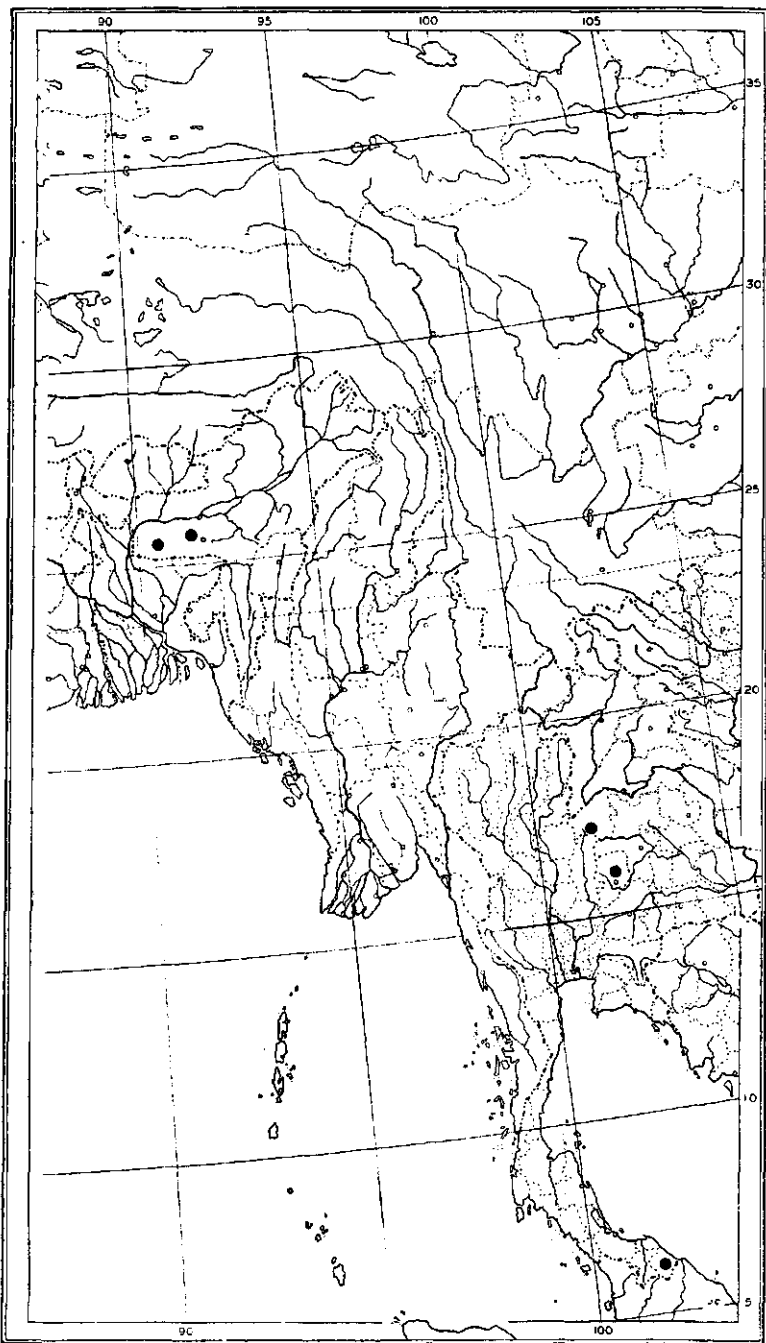
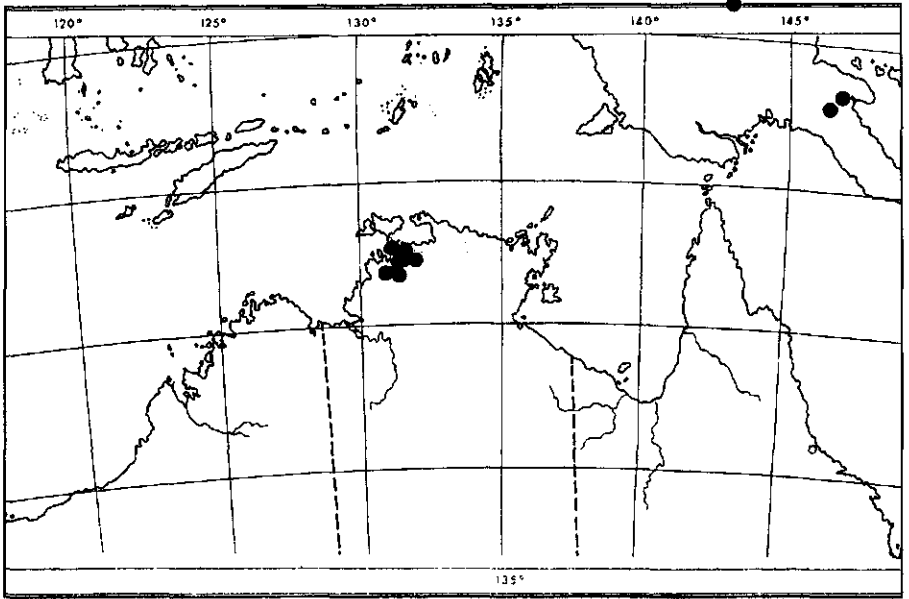


Fig. 5. *Dunbaria debilis*: 1. habit. Source: B. Verdcourt, *A Manual of New Guinea Legumes* p. 546 (1979), drawn by Mr. T. Iwagu. Reproduced by permission from the Papua New Guinea Forest Research Institute.



Map 6a. Distribution of *Dunbaria debilis* in Asia

AUSTRALIA



Map 6b. Distribution of *Dunbaria debilis* in Australia

veins; side leaflets obliquely so, 0.7–2.3 cm long, 0.2–0.9 cm wide; petiolules hairy, c. 1 mm; stipellae none. *Pseudoracemes* axillary, single-flowered. *Bracts* setaceous, caducous, c. 1 mm. Peduncles 0.5–2 mm, pedicels slender, 4–7 mm. *Corolla* yellowish. *Calyx* tube c. 2 mm, upper teeth connate except at the very tip, c. 3 mm, lateral teeth triangular, c. 2 mm, lower tooth narrow-elliptic, c. 4 mm. *Vexillum* rounded, c. 8–10 mm long and wide, apex emarginate, base clawed, reinforced with two auricles, no callosities; *alae* long-obovate, 2 mm wide, 8 mm long; *keel* strongly curved, longest dimension 8–10 mm, basal suture adnate. *Ovary* elliptic, densely short grey-pubescent, glandular, c. 5 mm, style c. 8 mm, base pubescent, upper part curved and flattened, stigma terminal. *Stamens* c. 12 mm, upper 5 mm of filaments curved upward and free, anthers basifix. *Pods* sessile, flat, linear, (3–)4–5 cm long, 4.5–7.5 mm wide, base of style persisting, sutures sturdy, valves curling when ripe. *Seeds* (6–)7–10, roundish, laterally compressed, brown to black, minutely pitted, c. 3 X 3 X 2 mm, strophiole narrow, divided.

Distribution: China: Guangxi; NE India: Meghalaya, Sikkim and West Bengal; Australia: N. Territories; Papua New Guinea.

Ecology: creeping or climbing in grassland (in Australia with *Themeda*), *Eucalyptus tetrodonta* etc. woodland, rare to locally common, on red earth, gravelly or sandy laterites. In India the Terai has black vertisols, no details about soils are given. Altitude: 0–1300 m, perhaps 2000 m.

Flowering: Sept. (India); Oct., Jan., Feb. (Australia); June & Dec. (New Guinea).

Fruiting: Oct.-Dec. (India); Jan.-March (Austr.); June & Dec. (PNG).

Vernacular names: -

Specimens examined:

AUSTRALIA: Northern Territory: Bachelor Farm nr Darwin, *Allen 4* (K); 4.3 m NW Pine Creek, *Chippendale 7598* (BRI); Alligator Creek, 12 40 S, 132 10 E, *Dunlop & Taylor 6094* (DNA); Port Darwin, *Holtze N1043* (fl.) (MEL, lecto *D. singuliflora*); *ibid.*, *Holtze s.n.* (fr) (K, MEL, LE, paratypes *D. singuliflora*); 33 km N Adelaide River, 13 08 S, 131 06 E, *Maconochie 2343* (K, L, MO); Port Darwin (Palmerston), *F. von Mueller 133* (G); J. Meany, Bachelor, *Muspratt 550101* (DNA); Noonamah, *Nuspratt 550254* (DNA); Strauss Airstrip, 28 m S Darwin, *Must 950* (DNA); Coonalie Creek, 13 02 S, 131 07 E, *Parker 361* (DNA); Marrokai rd, 2 m from Loy (?) (DNA); Port Darwin, *Schomburgk 54* (K).

INDIA: Meghalaya: Nurtiung, *Clarke 14575A* (K); Mythi Phuni, Muneypoor, *Clarke 41990E* (K); Nunklow, Khasi Mts, *Hooker & Thomson 1930* (K, lecto); Ponerang, *Hooker & Thomson s.n.* (K, paratype); Khasi Mts, *Hooker & Thomson s.n.* (K, paratype); Khasi Mts, *Lobb s.n.* (K, paratype); Sikkim Terai, Dulkajhar 500 ft, *Clarke 37036* (BM, G, K); Borpani, *Clarke 40655* (LE).

PAPUA NEW GUINEA: Morobe district: Markham Point, 6 45 S, 147 00 E, *Henty NGF 11674* (A, K); *ibid.*, 7 00 S, 146 58 E, *Streimann 47798* (BRI, K, L); Sepik district: Kungingini rd, Maprik subdistr., in hayfield, *Womersley & Simmonds 6869* (BRI); Kaiser Wilhelmsland, location not deciphered, *Schlechter 18405* (K).

THAILAND: E Prov.: Chaiyaphum, Tunkamang, *Geesink et al. 7074* (BKF, K, L, P); E Prov.: Thung Kra Mang, *Larsen et al. 31628* (BKF, K); Peninsular: Yala Prov., *Sangkha Chand et al. 1523* (BKF 72881).

Notes: Von Mueller (1891) described his *D. singuliflora* as nearest allied to *D. debilis*. Protologues and material seen leave no reason to keep *D. debilis* and *D. singuliflora* separate. The disjunct distribution and probable ecological differences between the regions are very peculiar indeed, for plants so strikingly similar in morphology.

In NE India the species occurs both at low and high altitudes.

In his protologue Von Mueller did not indicate a type specimen for *Dunbaria singuliflora* from Port Darwin, Arnhem's Land, but his

handwriting with the flowering specimen *Holtze N1043* in the type cover at MEL leaves no doubt. The other, fruiting, syntype specimens are designated herewith as paratypes.

Verdcourt (1979) wondered if the Papuan material, that has narrower fruits than the *D. singuliflora* type from Port Darwin, is distinct at varietal level. The pods are within the range of variation, and look more like those of Indian specimens. I do not distinguish a variety.

The protologue and illustration of *D. parvifolia* X.X. Chen does not offer characteristics to distinguish this species from *D. debilis*.

Non-fruiting plants of *Dunbaria debilis* sometimes cause confusion with *Cajanus scarabaeoides*. It has clearer green or black glandular dots, smaller and narrower leaflets (but some *C. scarabaeoides* material is very similar) and very short fine hairs. The branches are more filiform.

6. *Dunbaria ferruginea* Wight & Arn.

Fig. 6, p. 41; Map 7, p. 42

Wight & Arnott, Prodr. Fl. Pen. Ind. Or. 258 (1834); Bentham, Pl. Jungh. 1: 242 (1855); Miquel, Fl. Ind. Bat. 1-1: 179 (1855); Baker, Fl. Brit. Ind. 2: 217 (1876); Trimen, Handb. Fl. Ceylon 2: 80 (1894); Bourne, List pl. S India: 10 (1897); Thuan, Pollen et Spores 15-3/4: 372-375 (1973); Khoi & Yakovlev, Bot. Zh. 67-11: 154 (1982) (see note); Matthews, Fl. Tamilnadu Carnatic 3-1: 403 (1983); Matthews, Illustrations Fl. Tamilnadu Carnatic 198 (198x).

Type: Peninsular India, *Wight herb. prop.* 878 p.p. (lecto: K; isolecto: G). Paratypes: *Cylista? ferruginea* nom. nud., *Herb. Madras* (CAL?, MH? not seen); "*Collaea venosa*" Graham, *Wallich 5573* (BM, K); Nilgiris, *Heyne s.n.* (BM).

Perennial climber, indumentum short-tomentose, ferruginous when young, paler to grey when old. Vesicular glands yellow, sometimes orange when old. *Branches* to c. 8 m long, 2-5 mm diameter, hardly striate. *Stipules* triangular, quite caducous, c. 2-3 mm long, 1 mm wide, hairy. *Leaf petiole* striate, grooved above, 2-5 cm, rachis 0.7-2 cm long, petiolules 2-4(-5) mm. *Leaflets* dark green, sparsely short-pubescent above, sparsely to densely rusty brown tomentose below, especially on the veins, midrib and 2 major

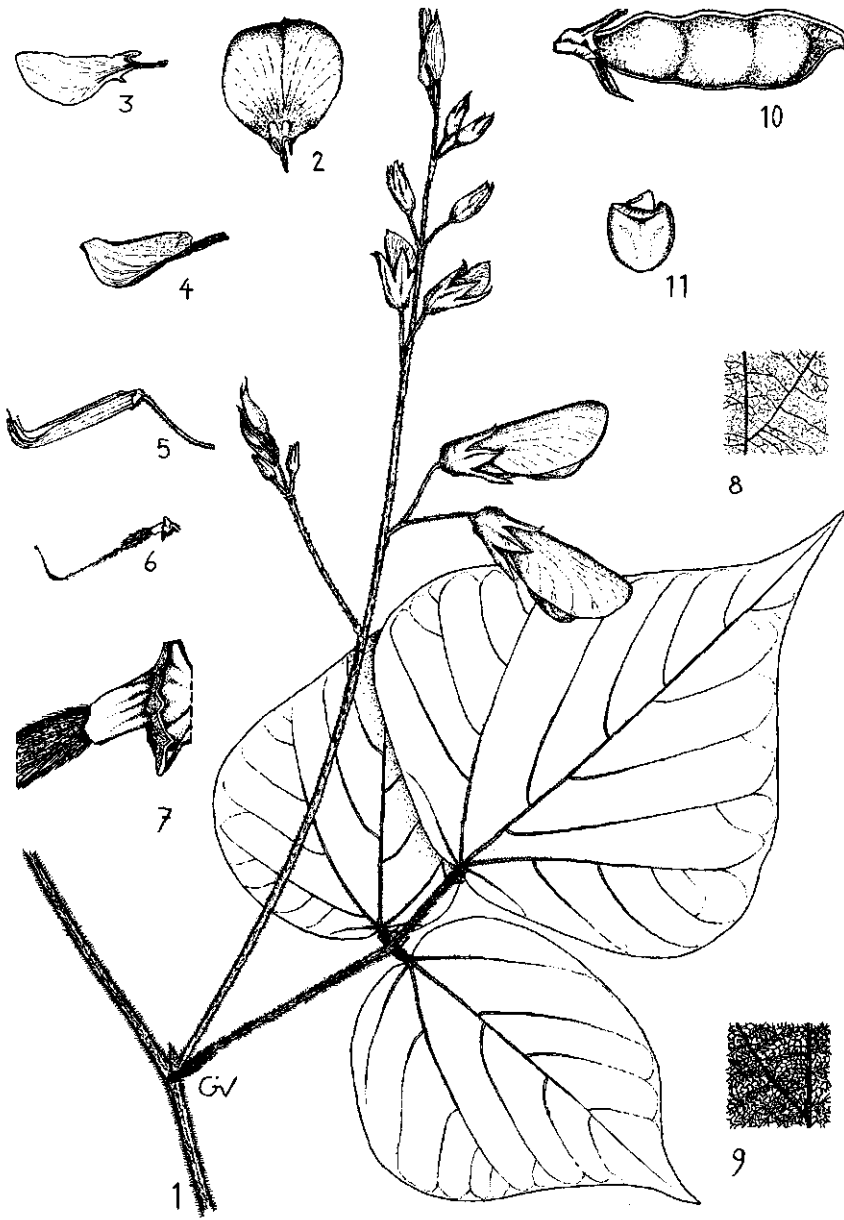
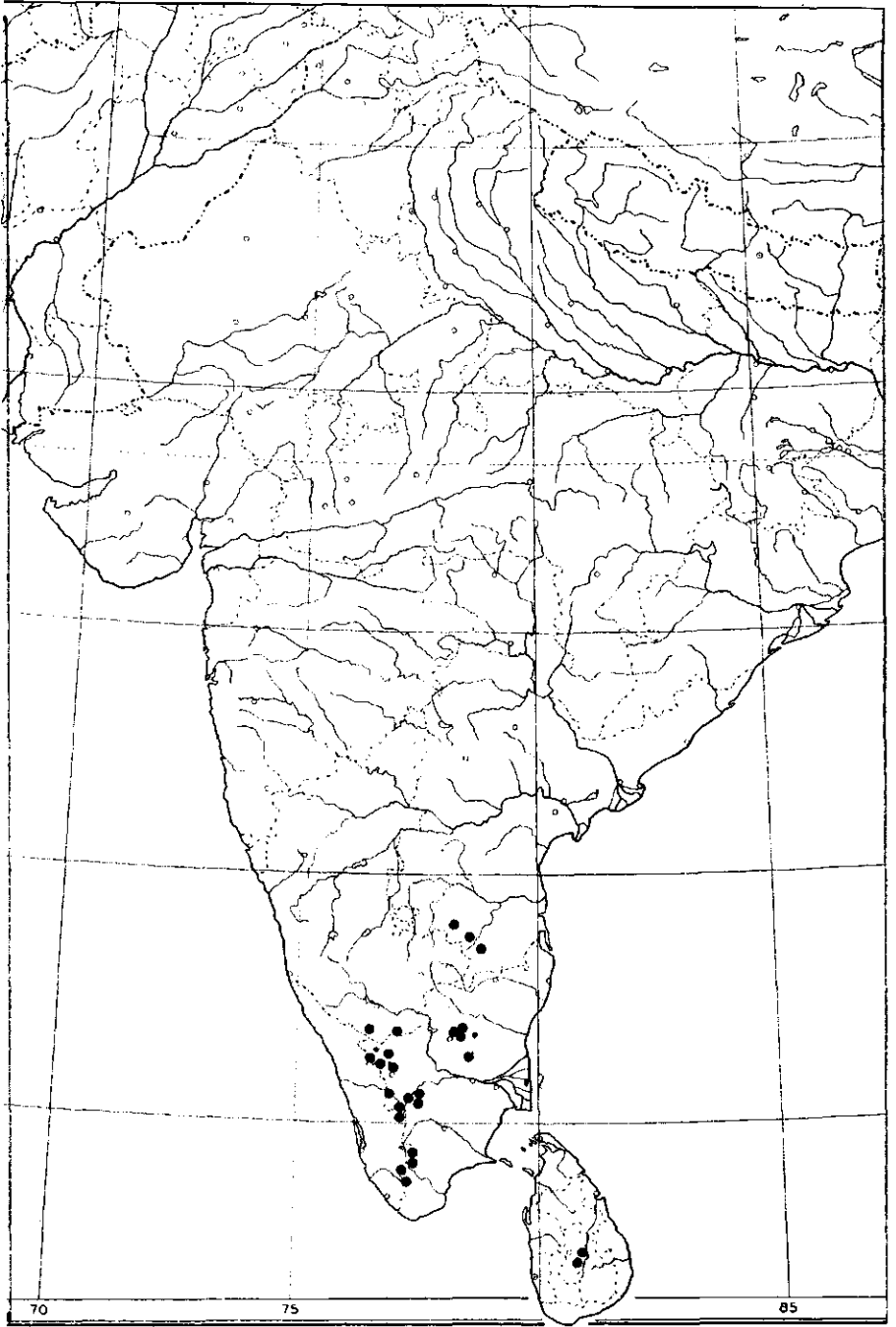


Fig. 6. *Dunbaria ferruginea*: 1. flowering branch, 0.66 X; 2. flag, 0.66 X; 3. wing, 0.66 X; 4. keel, 0.66 X; 5. staminal tube, 0.66 X; 6. pistil, 0.66 X; 7. base of pistil, showing disk, 4 X; 8. detail of upper leaflet surface, 1.32 X; 9. detail of lower leaflet surface, 1.32 X; 10. pod without marcescent corolla, 1 X; 11. seed, 2 X. - 1-9: van der Maesen 4812, 10 & 11: van der Maesen 3561. Drawn by Mr. G. Vonk.



Map 7. Distribution of *Dunbaria ferruginea* in S India and Sri Lanka

laterals from the base, c. 5–7 major secondary veins, alternate or subopposite, stipellae linear to narrow-triangular, 1–3 mm long, caducous. Top leaflet ovate to rounded-ovate, 4–10 cm long, 2.5–6 cm wide, apex acuminate-cuspidate, base rounded to truncate; side leaflets obliquely so, 3–7.5 cm long, 2.5–6 cm wide; hairy-setaceous, 2–3 mm. *Pseudoracemes* simple or with one branch, peduncles 6–20 cm long, many-flowered, pedicels 8–20 mm, thin at first, flowers often attached in pairs. *Bracts* narrow-elliptic to linear, up to 10 mm long, 4 mm wide, very caducous. *Calyx* pubescent, inside glabrous, tube 4–7 mm, teeth acute to narrow-elliptic, 6–8 mm, subequal, the upper ones connate except at the tip. *Vexillum* yellow, dorsally red, obovate, c. 25–28 mm long, 22 mm wide, apex rounded, base clawed, reinforced, biauriculate, two callosities; *alae* yellow, elongate-obovate, c. 25 mm long, 8 mm wide, clawed, with an auricle each side, near the largest auricle a bump; *keel* curved, largest dimension c. 26 mm. Ovary densely hairy, covered with pale yellow glands, c. 8 mm, 5–6 ovules, style c. 20 mm, basal 14 mm hairy, upper 6 mm curved upward and flattened at the bend, stigma terminal. *Stamens* 25–28 mm, free part c. 3–5 mm, anthers uniform, dorsifix. *Pods* oblong, 2.5–4.3 cm long, 0.8–1.2 mm wide, petals marcescent, sutures prominent, tipped with remnant of style, ripe seeds visible by faint bulges, valves pubescent, glabrous with age except the sutures, glands conspicuous, valves curling when mature, inside vaguely septate, 3–5 seeds. *Seeds* roundish-compressed, brown with black mosaic to black, c. 5 mm long, 4 mm wide and 3 mm thick, hilum with a narrow papery vestigial strophiole.

Distribution: S India, Sri Lanka.

Ecology: along forest edges, in the hills, climbing in shrubs and trees. Quite a common climber in the semi-deciduous forests of south Peninsular India, flowering and seeding prolificously. Altitude: 800–2000 m.

Flowering: (Aug.–) Nov.–March (–May).

Fruiting: (Dec.–) Jan.–March (–Apr).

Vernacular names: Masukkodi (Tamil); Goradiye (Sri Lanka).

Specimens examined:

INDIA: (Western) Ghats, sine loc., *Anon.* 48875 (LIV); Metz dd. 1854 (P); "*Collaea gibba*", E.I.C., *Wallich* 5572C (LE, M, S, TCD); *Wight* 769 p.p. (S), *Wight* s.n. (Z). Andhra Pradesh: Horseley hills, Chittoor distr., *van der Maesen* 2791 (ICRISAT, WAG). Karnataka: Malaikadu, Biligirirangan hills, *Barnes* 614 (A); Maysore (state), *Heyne* WB 878a (W?); 2 km S of Bandipur, Mysore distr., *van der Maesen* 2650 (ICRISAT, WAG). Kerala: 42 km N of Munnar, *van der*

Maesen 3471 (ICRISAT, K, WAG); Santhanpara, Travancore, *Meebold 13239* (BSI Cooke, S). Tamil Nadu: Thirthagiri Reserve Forest, Attur taluk, Chinnakalrayans, Salem distr., Amalraj RHT10831 (K); Machur, Madurai distr, Palni Hills, *Anglade 728* (G); Tinevelly Ghats, *Beddome 2290* (BM); Anaimalai hills, *Beddome 2291* (BM); Machsea? lower Palni (Pulney) hills, *Bourne 1092a* (K); Shevaroy hills, Salem distr., *Bourne 2572* (K); Coonoor, Nilgiri hills, *Clarke 10788A* (BM); Nilgiri hills, *Cooke s.n.* (BSI Cooke); Coonoor Ghat, *Gamble 11969* (K); below Coonoor, *Gardner s.n.* (BM, K, OXF); nr Iuduru, Nilgiri hills, *Hohenacker 1593* (BM, G, K, LE, P, W, Z); Nilgiri hills, *Hooker & Thomson 13* (K, P); Coonoor to Sivas, Nilgiri distr., 25 km to Kundah, *van der Maesen 2312* (ICRISAT, K, WAG); *ibid.*, 3 km to Kundah, *van der Maesen 2314* (ICRISAT, K, WAG); 13 km SW of Yercaud, Shevaroy hills, *van der Maesen 3561* (ICRISAT, K, WAG); Perumalmalai to Palni, 50 km to Palni, *van der Maesen 4769* (ICRISAT, WAG); 5 km E of Bodimettu, 50 km E of Munnar, *van der Maesen 4812* (ICRISAT, WAG); Sengattupatty top, Pacchamalai hills, Tiruchchirapalli distr., *Matthew et al. RHT 19430* (L); Coonoor, *Prain s.n.* (A, U); Salem - Yercaud rd, 12.5 km from Salem, *Remanandan 4863* (ICRISAT, WAG); Tiger Shola, Kodaikanal, *Saulières 7* (A); *id.* 8 (BM, W); Kodaikanal station, *Saulières 110* (B); 485 (K); 536 (K); lower Tiger Shola, *Sebastine 4763* (L); Nilgiris, *Wight s.n.* (M); Kuttalam (Courtallum), *Wight 242* (E, K); Pulney Mountains, Maratimalai (Murroothu Malay), *Wight 770* Sept.1836 (A, C, K, L, LE, M, MEL, S, W); see also type materials.

SRI LANKA: Urugala above village, *Douglas Simpson 9218* (BM); nr Urugala, *Douglas Simpson 9423* (BM); 1 km W of Urugala, Kandy distr., *van der Maesen 4025* (ICRISAT, WAG); Ceylon sine loc., *Walker 306* (K, U).

Notes: *Dunbaria latifolia* Wight & Arn. (1834) was put into synonymy with *D. ferruginea* by Baker (1876), despite the peculiar number of 1-2 seeds per pod. That taxon does not belong in *Dunbaria* but in *Rhynchosia* (see van der Maesen 1995): *R. courtallensis* Maesen. At first glance the similarity is striking, and Wight & Arnott noted that their *D. ferruginea* material was not perfect.

The occurrence of *D. ferruginea* in Vietnam was reported by Nguyen Dang Khoi and Yakovlev (1982) from Gialai-Kontum, Dac Choong, 18-3-1978, *L.K. Bien 488* (HN, HM, LE). The specimen in LE with flowers and bracts but without fruit turned out to be *Cajanus crassus* (Prain ex King) Maesen.

7. *Dunbaria floresiana* Maesen spec. nov.

Fig. 7, p. 45, Map 8, p. 46

Herba scandens ramis aliquantum fortibus. Indumentum sparse cinereo-pubescent foliolus subtus densius. Calyx pilis multis flavidis basi incrassatis. Stipulae deciduae. Foliae rhachis carinatus pilosus.

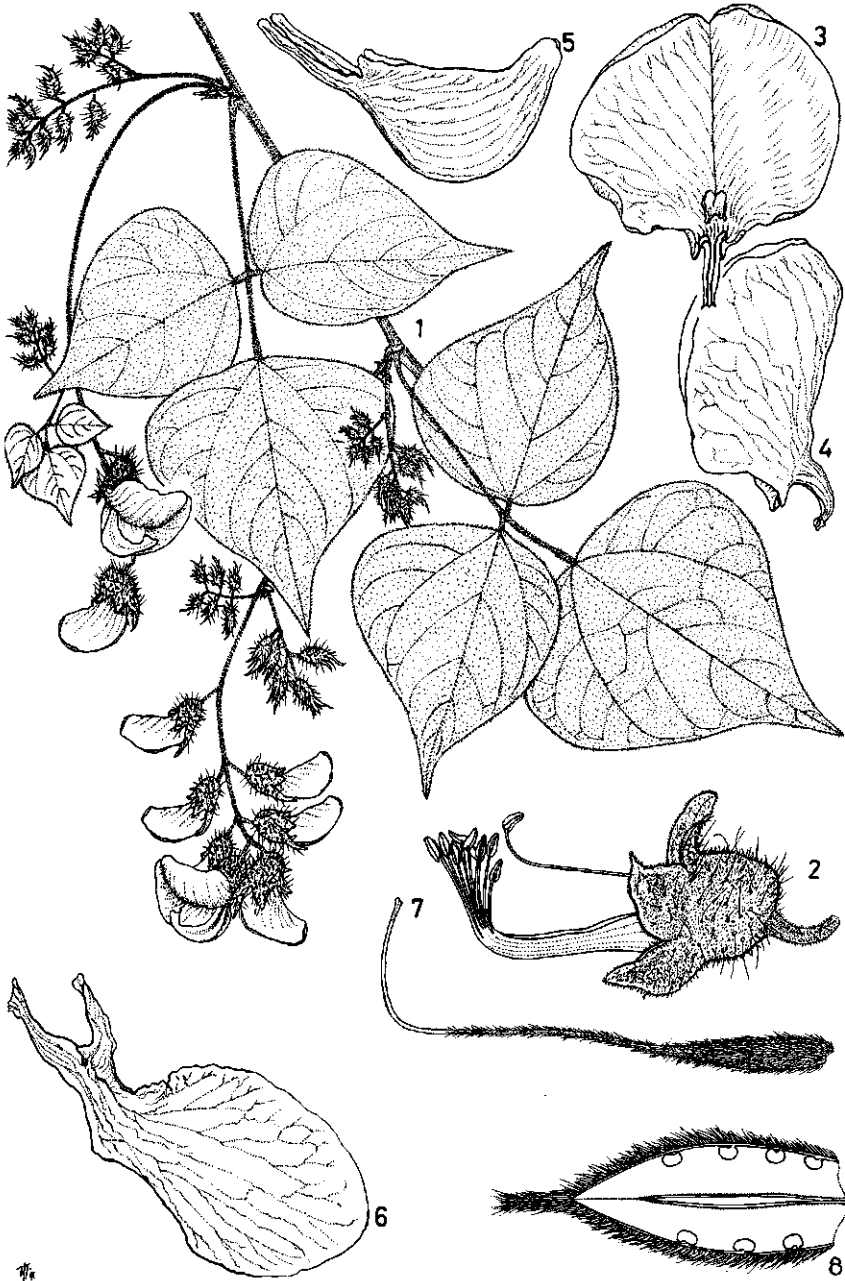
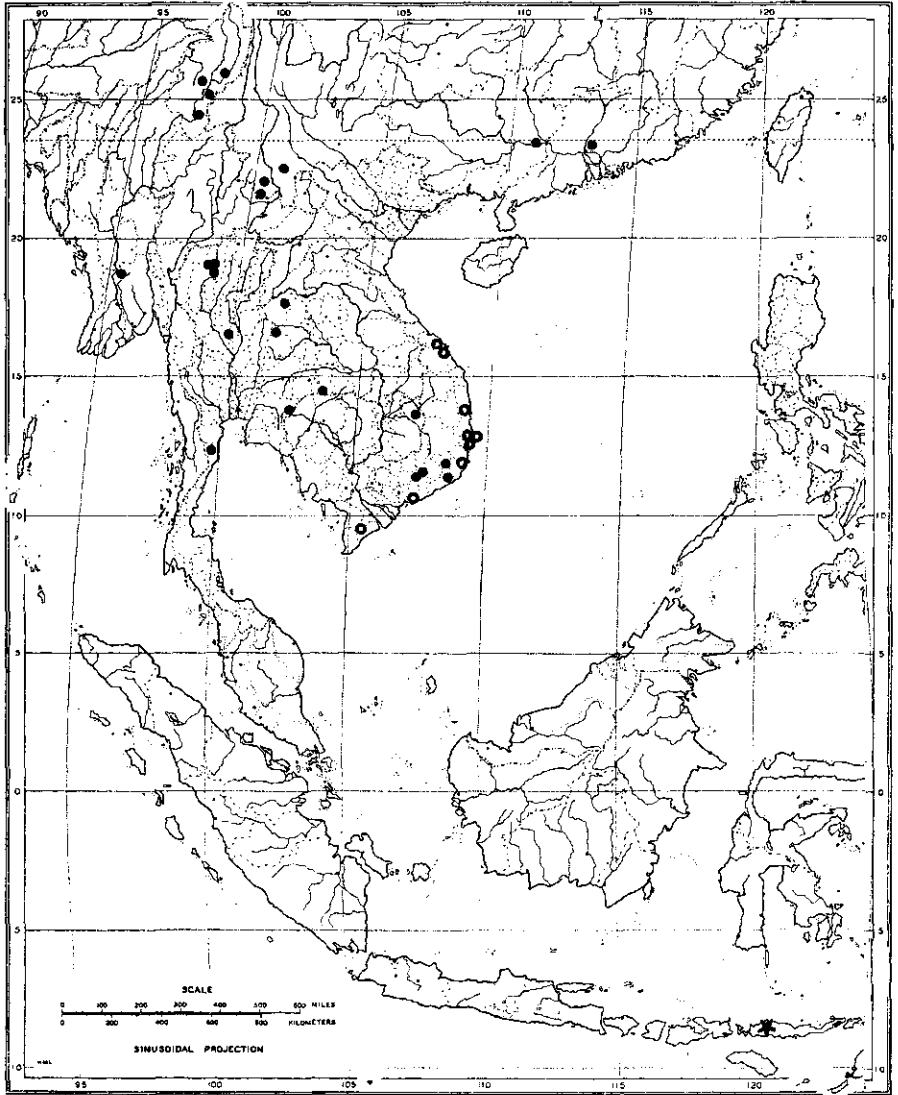


Fig. 7. *Dunbaria floresiana*. 1. flowering branch, 0.66 X; 2. calyx and staminal tube, 2 X; 3. flag, abaxial view, 2 X; 4. flag, lateral view, 2 X; 5. keel, 4 X; 6. wing, 4 X; 7. pistil, 4 X; 8. detail of ovary, interior, 6 X. – 1-8: Verheyen 388. Drawn by Mrs. Y.F. Tan.



Map 8. Distribution of *Dunbaria floresiana* (★), *D. fusca* (●) and *D. glabra* (○)

Foliolae virides super, glaucae subtus. Bracteeae ovatae acuminatae, extus pilosae, intus glabrae. Calyx tubulosus dentibus triangularibus, pilis longis basi bulbosis. Corolla lutea vexillo venis rubris, apice emarginato. Alae anguste obovatae. Affine D. cumingiana.

Type: Indonesia, Flores, distr. Manggarai, Ruteng e.a., Verheyen 388 (L, holo).

Perennial climber. Branches rather vigorous. *Indumentum* sparsely grey-pubescent, more dense on lower side of leaflets, calyx with many bulbous-based yellowish hairs. *Stipules* caducous, leaving a hairy scar. *Leaf petiole* grooved, hairy, c. 4 cm, rachis c. 1.5 cm. *Leaflets* green above, grey-green below, orange-red glandular dotted both sides, top leaflet broadly ovate, 5–7 cm long, 5–6 cm wide, apex long-acuminate, small mucro, base rounded, almost cordate; side leaflets obliquely so, 5–6 cm long, 3.5–4 cm wide; petiolules long, c. 4 mm, hairy; stipellae not seen. *Pseudoracemes* 4–10 cm, branched, 4–6 flowers per branch. *Bracts* ovate, acuminate, glabrous inside, hairy outside, 5 mm long, 2.5 mm wide. *Flowers* 1 or 2 per node. *Corolla* yellow with red-veined vexillum. *Calyx* short grey-hairy with many long yellowish bulbous-based hairs, tube c. 6 mm, teeth short-triangular, in bud overlapping, upper ones connate except at the tip, c. 4 mm long, lateral teeth c. 4 mm, lower tooth c. 6 mm. *Vexillum* broadly rotundate, incl. claw c. 22 mm long, c. 20 mm wide, top emarginate, base clawed, biauriculate, with a protruding single notched crest near the base; *alae* narrowly obovate, c. 18 mm long and 7 mm wide, base clawed, ventrally long-auriculate; *keel* falcate, longest dimensions c. 21 mm, 7 mm wide, long-clawed. *Ovary* with a short stalk, linear, c. 7 mm long, 2 mm wide, long yellowish hairy, densely covered with yellow glands, with c. 7 ovules, style c. 14 mm, curved upward, sparsely hairy all along, stigma terminal, oblique. *Stamens* c. 23 mm, last 5 mm upcurved and free, anthers basidorsifix. *Pods* not known in ripe stage. *Seeds* 6–7.

Distribution: Indonesia: Flores.

Ecology: ? Altitude: 1000-1200 m.

Flowering: May.

Fruiting: ?

Vernacular names: Wasé lintjor?

Specimens examined: INDONESIA: known only from the type.

Note: *Dunbaria floresiana* is closely allied to *Dunbaria cumingiana* by the habit, leaves and inflorescence. It could also be a new *Cajanus*, as no ripe pods are available. Both species differ as follows:

- Indumentum sparse or dense, very short, hairs not bulbous-based...
.....**D. cumingiana**
- Indumentum on calyx of short densely placed hairs mixed with long stiff to straggly bulbous-based hairs.....**D. floresiana**

8. *Dunbaria fusca* (Wall.) Kurz Fig. 8, p. 49, Map 8, p. 46

J. Asiatic Soc. Bengal 43-2: 186 (1874); Baker, in Hooker, Fl. Brit. India 2: 204 (1876); Kurz, J. Asiatic Soc. Bengal 45-2: 255 (1876); Prain, J. Asiatic Soc. Bengal 66-2: 434 (1897); Hosseus, Beih. Bot. Centrbl. 28: 397 (1911); Craib, Kew Bull. 1911-1: 41 (1911); Craib, Contrib. Fl. Siam 67 (1912); Dunn & Tutcher, Fl. Kwangtung, Hongkong 85 (1912); Thuan, Pollen et Spores 15-3/4: 368-370; Thuan, Fl. Cambodge, Laos, Viet-nam 17: 124 (1979); Wu, C.Y. Index Fl. Yunnan. 1: 598 (1984); Lee Shukang, Fl. Reip. Pop. Sin. 41: 308-310 (1995).

Basionym: *Phaseolus fuscus* Wall., Pl. As. rar. 1-6, t. 6 (1830). Type: Burma, Prome Hills, *Wallich 5613 A* (holo: K-Wall.; iso: BM, K).

Perennial climber, branches 3 m, indumentum short bristly, grey, inconspicuous on branches and leaves, visible on veins of lower leaf surface, few long golden-brown bulbous-based hairs on calyx and pods, branch ribs hairy, almost glabrous in between. *Stipules* caducous, triangular, 2-3 mm. *Leaf petiole* striate, 3-5(-8) cm, rachis 1-1.5(-2) cm. *Leaflets*: top leaflet ovate, 6-9(-13) cm long, 3-5(-9)cm wide, base truncate to rounded, tip long-acuminate, mucronate, side leaflets obliquely so, 5-7(-11) cm long, (2-)2.5-4(-7) cm wide, petiolules 2-3 mm, hairy, stipellae setaceous hairy, 2 mm. *Pseudoracemes* not branched, peduncle striate, 4-13 cm, 10-15 flowers singly or in pairs; *Bracts* early-caducous, very narrow-elliptic, 1-4 mm long. *Corolla* yellow and red to purple. *Calyx* glandular, tube c. 4 mm, teeth triangular, upper teeth connate, apex rounded, not or hardly notched, 2-3 mm, lateral teeth with acute to rounded apex, 2-3 mm, lower tooth longest, 5-6 mm, margins yellow short-hairy, long golden hairs conspicuous especially

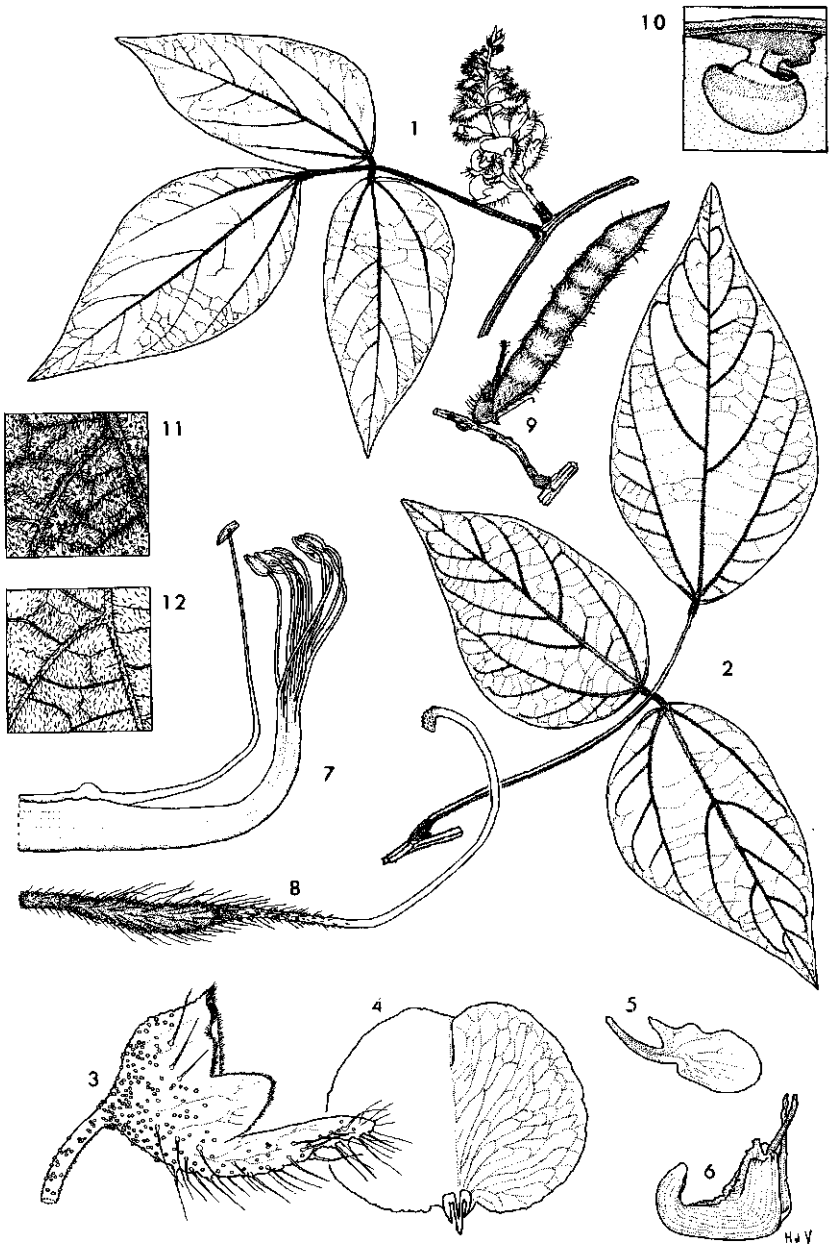


Fig. 8. *Dunbaria fusca* 1. flowering branch, 0.66 X; 2. leaflet from below, 0.66 X; 3. calyx, 4 X; 4. flag, 2 X; 5. wing, 2 X; 6. keel, 2 X; 7. staminal tube, 4 X; 8. pistil, 4 X; 9. pod, 0.66 X; 10. developing seed in pod, 4 X; 11. detail of lower leaflet side, 4 X; 12. detail of upper leaflet side, 4 X. – 1&2, 11 & 12: Sørensen et al. 5325, 3-8: Maxwell 71-743, 9 & 10: Put 1918. Drawn by Mr. H. de Vries.

in bud stage, calyx inside adpressely short-hairy. *Vexillum* rounded, 12 X 10 mm, base clawed, biauriculate, 2 callosities, apex rounded, twisted, dorsally purple or red to brown, ventrally yellow; *alae* obovate, to c. 10 X 3 mm, base clawed, dorsal side 2 auricles, ventral side 1 auricle, yellow; *keel* circinnato-rostrate, pouched, longest dimension c. 9 mm. *Ovary* linear, c. 6 mm long, yellow silken hairy, glandular, style c. 15 mm, stigma terminal, hooked-papillate. *Stamens* c. 20 mm, last 10 mm upcurved, upper 5–8 mm free, staminal tube folded within keel and finally protruding, anthers basidorsifix. *Pods* flat-linear, base and apex tapering, 5–6 cm long, 0.6–0.8 cm wide, glands red, hairs ± caducous. *Seeds* c. 7, squarish ovoid, up to 4 X 4 X 2 mm, strophiole rather conspicuous, 2 mm long, 1 mm wide.

Distribution: Burma, China: Anhui, Guangdong, Guangxi, Hongkong, Yunnan; Laos, Thailand, Vietnam.

Ecology: climbing in thickets, over low herbage, in evergreen jungle and deciduous forest, on red or clayey soils, on sand along streams. Altitude: 0–1500 m

Flowering: July–Aug. to Nov.

Fruiting: Aug. –Feb.

Vernacular names: Laos: Thoua he khua (Thuan 1979).

Specimens examined:

BURMA: Myitkina region. Camp Landis area, *Belcher* 690 (K); Shwegu, Bhamo distr., *Lace* 4470 (E, K); Kachin Hills, *Shaik Mokim s.n.*, 11-1897 (BM, G, K, L, LE, P, U, US, W, Z); Meitkina, Kachin Hills, *Shaik Mokim* 166, 8-1899 (A); Prome, *Wallich* 5613 A (holo: K; iso: BM, K); grown at HBC, Hort. Bot. Calcutta, *Wallich* 5613 B (BM, K).

CHINA: Anhui/Anhui Prov.: Wang Shan, W Chemen (Qimen), *R.C. Ching* 8810 (US). Guangdong: Guangzhou, *S.Q. Chen* 6734 (KUN). Guangxi Prov.: Cangwu, *S.H. Chun* 9926 (KUN). Yunnan: N Szemao Mts, *Henry* 12377 (A, K, MO); Che-li Hsien (=Jinghong), Xishuangbanna, *C.W. Wang* 78826 (KUN); Che-li, Damenglong, Xishuangbanna, *C.W. Wang* 77836 (KUN).

LAOS: sine loc., *Massie s.n.* (P).

THAILAND: Chiang Mai, Northern Botanic Garden, *Chantaranothai et al.* 90/662 (TCD); Doi Sootep, Chiangmai, *Kerr* 813 (BM, K, L, P, TCD); Doi Sootep, *Kerr* 2289 (BM, K); Doi Sootep, *Kerr* 2686 (E, K, TCD); Thung Kra Mang, *Larsen et al.* 31628 (L); Tung Luang, Petchaburi, *Marcan* 2760 (BM, K); Sukothai, *Maxwell* 71-743 (AAU); Doi Sutep E, below Temple, *Maxwell* 87-927, 88-1096 (BKF, L); Doi Sutep E, Pah Laht falls, *Maxwell* 87-1095 (Chiangmai, BKF, L); E: Surin Prov. nr Cambodian border c. 50 km SW of Sangkha, *Murata et al.* T37671 (L); Watana, *Put* 1918 (BM, K); Amphoe Phu Kradung, Loei, *Sangkachand* 995 (L); NE of Loei, Wangsapong, *Smitinand* 3045 (L); Doi Sutep, *Sørensen, Larsen & Hansen* 4623 (C); 5325 (BKF, C, K).

VIETNAM: 1200 m sign E of Cana, *Evrard* 2424 (AAU, P); Nieng Pa Paw - Tha

Kaw, *Hayata & Lagrange s.n.* (TI); km 152 from Saigon on rd no. 20, Haut Donai, *Poilane 23357* (P); Agric. Station of Blao, Haut Donai, *Poilane 23554* (P); N of Pn. Sapoum, nr Agric. Station of Blao, *Poilane 23866bis* (P); nr Ban-me-thuot, *Schmid s.n.* (P); Xieng Mai, Dalat region, *Schmid 1324* (P); Me-kong, *Thorel 2764* (P).

Notes: *Sangkachand 995* reportedly has milky juice, a character not otherwise stated in *Dunbaria*. Ripe *D. fusca* pods have slight depressions, not sharp as in *Cajanus* species.

9. *Dunbaria glabra* Thuan

Fig. 9, p. 52, Map 8, p. 46

Nguyen Van Thuan, Fl. Cambodge, Laos, Viet-nam 17: 122 (1979); Lock & Heald, Legumes Indo-China 105 (1994).

Type: Vietnam: Plain of Nuoc Ngot, Binh Tri Thien prov., *Eberhardt 3185* (holo: P; iso: P). Paratypes: Vietnam: Lang-co, Binh Tri Thien prov., *Eberhardt 1624* (P); Tourane, J. & J.M. Clemens 3190 (G, K, P, US, Z); Tourane, J. & J.M. Clemens 3424 (G, K, P, US, Z); Phu Khanh prov., Réserve Forestiere de Suoi-Cat, *Fleury in Chevalier 39015* (P); Tré Island nr Nha Trang, *Poilane 2883* (P); Tré Island nr Nha Trang, *Poilane 3010* (AAU, P); Mt Han Heo, *Poilane 4768* (P); Nui Han Heo peninsula, *Poilane 6174* (P); 6871 (P); Ba Ran, *Poilane 9822* (P); 9825 (P).

Perennial climber. Branches 3 to 20 m long, striate. Indumentum very short, sparse, greyish, appearance glabrous, on calyx a few long bulbous-based yellow hairs. *Stipules* very caducous, triangular-linear. *Leaves* glabrous, coriaceous, *leaf petiole* grooved above, 1–3 cm, rachis 0.5–1 cm, vesicular glands on lower surface of leaf only, bright red to yellowish. *Leaflets*: top leaflet ovate, 3–6 cm long, 2–5 cm wide, base cordate to truncate, tip acute to rounded-acute, shining green above, olive green below, side leaflets obliquely so, 2–4 cm long, 1.2–3.3 cm wide; petiolules 2–3 mm; stipellae setaceous, c. 1 mm. *Pseudoracemes* 7–13 cm, flowers singly or in pairs, many, pedicels slender, 3–9 mm. *Bracts* ovate to narrow-elliptic, small, caducous. *Calyx* glandular, glabrous inside, tube 3–4 mm, lobes triangular, 1–2 mm, lowest one narrow-elliptic, c. 5 mm, short-hairy margins. *Corolla* yellow with dull red, purple or brown on dorsal side of vexillum. *Vexillum* rounded, up to 17 X 15 mm, apex emarginate, bent, base clawed, biauriculate, two callosities; *alae* obovate, c. 15 X 5 mm, long-clawed, with two auricles on the ventral

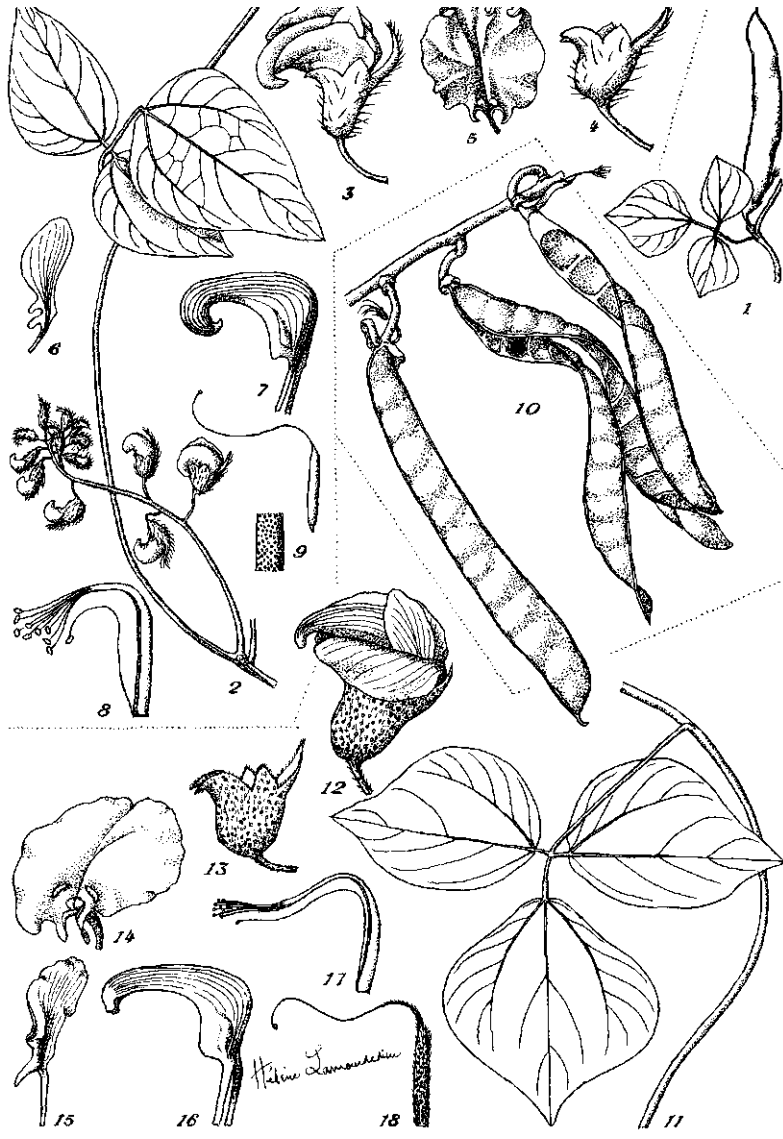


Fig. 9. *Dunbaria punctata* 1. leaf and fruit, 0.66 X; *Dunbaria glabra* 2. flowering branch, 0.66 X; 3. flower, 1.5 X; 4. calyx, 1.5 X; 5. flag, 1.5 X; 6. wing, 1.5 X; 7. keel, 1.5 X; 8. staminal tube, 1.5 X; 9. pistil and style. – *Dunbaria longicarpa* 10: pods (see also fig. 13). – *Dunbaria incana* 11. branch and leaf, 0.66 X; 12: flower, 1.5 X; 13. calyx, 1.5 X; 14. flag, 1.5 X; 15. wing, 1.5 X; 16. keel, 1.5 X; 17. staminal tube, 1.5 X; 18. pistil, 1.5 X. – 1: *Levêfre 265*, 2-9: *Clemens 3424*, 10: *Poilane 18403*, 11-18. *S.K. Lau 3644*. Source: *Fl. Cambodge, Laos, Viet-nam* 17: 123 (1979). Drawn by Mrs. H. Lamourdedieu. Reproduced by permission from Mus. Nat. Hist. Natur., Paris.

side; *keel* strongly curved (90°), c. 17 mm long, claw 5 mm. *Ovary* linear, c. 6 mm long, 1 mm wide, hairy, densely yellow-glandular, style perpendicularly upcurved, c. 19 mm, stigma terminal, oblique. *Stamens* c. 25 mm, tube bent, terminal 8 mm free, anthers dorsifix. *Pods* linear, 6–8 cm long, c. 1 cm wide, glandular and very short-pubescent, almost glabrous, sutures thickened. *Seeds* c. 7, ovoid, brown, 4 X 2 mm (teste Thuan).

Distribution: Vietnam.

Ecology: in dune thickets, forests, on clayey and rocky soils, along coast and on small coastal islands. Altitude: low.

Flowering: March, April, July.

Fruiting: July.

Vernacular names: (Day) chim bim (Phu Khanh), Day dau ma, Cay dau hoang (Binh Tri Thien, Vietnamese), Re dao, Re mo, Re ma (Phu Khanh, Moio or proto-indochinois).

Specimens examined:

VIETNAM; type and paratypes cited above. Cape Baudoin, *Anon.* dd. 1868 (P); Phu Khanh: Nha-Trang, Hon Tre, *Averyanov & Kudryavtzeva* 260 (LE); Phu Khanh: Nha-Trang & vicinity, *Robinson* 1259 (P).

Notes: the paratype *Poilane* 2510 from Gia Ray, prov. Dong Nai, "ntir nar", cannot be accepted as such, since it is a specimen of *Pueraria phaseoloides* (Roxb.) Benth. var. *phaseoloides*. Thuan (1979) qualifies the occurrence as frequent. The ovary is short-hairy (*Eberhardt* 1624, P), not glabrous as described by Thuan. The pollen was described by Thuan already in 1973, but the proper protologue was first published in 1979.

10. *Dunbaria glandulosa* (Dalzell & A. Gibson) Prain

Fig. 10, p. 54, Map 9, p. 55

J. Asiatic Soc. Bengal 66: 433-434 (1897); Talbot, Forest Fl. Bombay Pres. Sind: 414 (1909, repr. 1976); Cooke, Fl. Pres. Bombay 1: 385 (1903, repr. 1958, 1967); Craib, Contrib. Fl. Siam., Univ. Aberdeen Studies 57, 2: 67 (1912); Craib, Fl. Siam. Enum. 1-3: 462 (1928); Thuan, Pollen et Spores 15-3/4: 373, 378-379 (1973).

Basionym: *Cajanus glandulosus* Dalzell & A. Gibson, Bombay Fl. 73 (1861). Type: India, Bombay (Presidency), Malwan and Wagotun, S Concan, *Stocks & Dalzell s.n.* (holo: BLAT? CAL? not

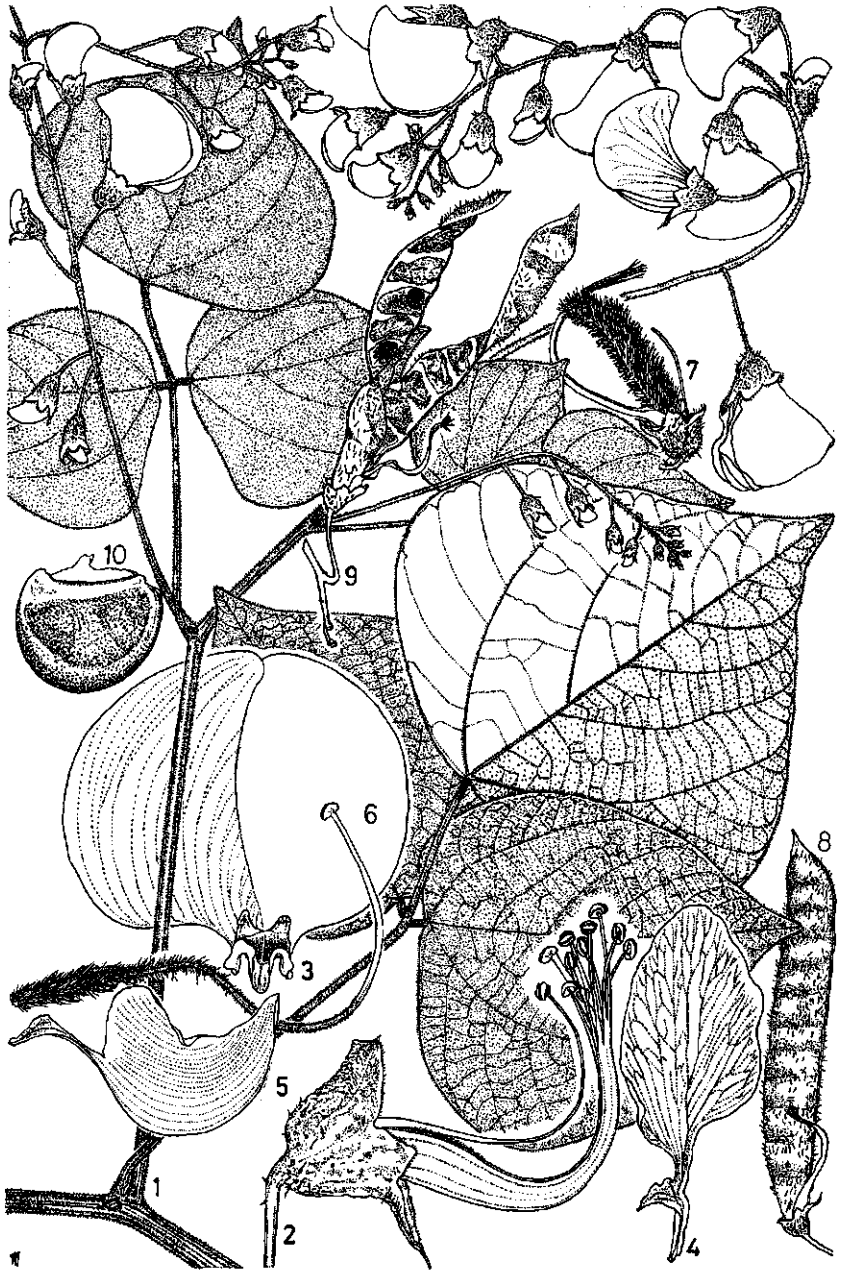
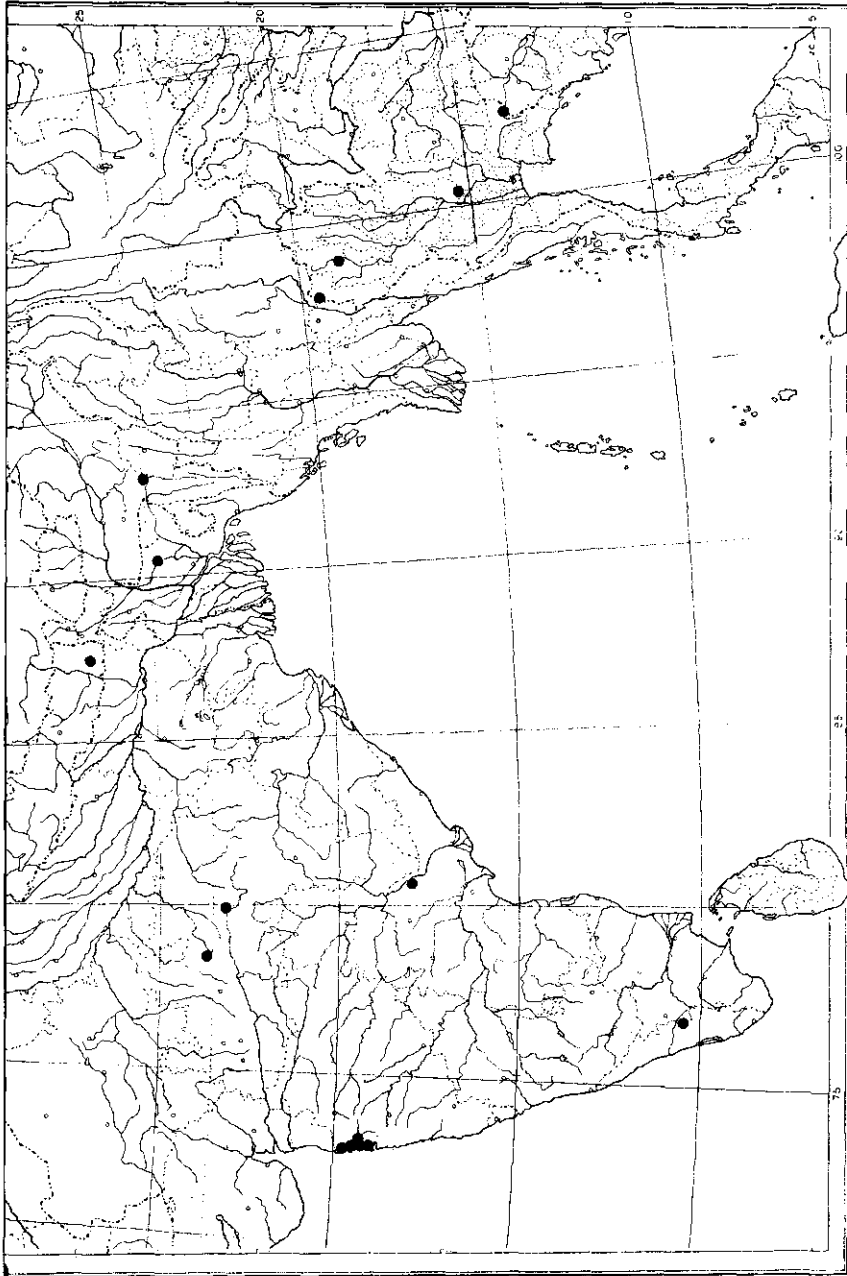


Fig. 10. *Dunbaria glandulosa* 1. habit, 0.66 X; 2. calyx and stamens, 2 X; 3. flag, 1.6 X; 4. wing, 1.2 X; 5. keel, 1.2 X; 6. pistil, 4 X; 7. developing ovary, 1 X; 8-9. pods, 0.66 X; 10. seed, 4 X. - 1-6: Williams & Stainton 8369, 7: Kerr 1398, 8-10: Stocks 15. Drawn by Mrs. Y.F. Tan.



Map 9. Distribution of *Dunbaria glandulosa* in the Indian subcontinent and Thailand

annotated). See notes.

Homotypic synonym: *Atylosia glandulosa* (Dalzell & A. Gibson) Dalzell, J. Linn. Soc. 13:185 (1873).

Heterotypic synonym: *Atylosia rostrata* Baker, Fl. Brit. Ind. 2: 216 (1876); Prain, J. Asiatic Soc. Bengal 66: 433 (1897); Talbot, Trees Bombay Pres. 134 (1894); Nairne, Fl. Plants W India 90 (1894). Type: India, Concan, *Stocks s.n.*, most likely the fruiting material issued as "*Dunbaria rostrata* Benth.", Malabar Concan etc. Regio trop., Coll. Stocks, Law etc. Herb. Ind. Or. Hook. fil. & Thomson (holo: K, not seen; iso: A, BM, C, G, L, P, TCD, W).

Perennial tall woody climber. *Indumentum* sparse, on upper surface of leaflets on veins, on undersurface also scattered. Vesicular glands brown red, sometimes shrivelled to opaque-yellow and hardly visible in old specimens. *Branches* up to at least 5 mm diameter, striate, downy at first. *Stipules* caducous, triangular, up to 4 mm long, 2 mm wide. *Leaf petiole* grooved above, 3–8 cm, rachis (1–)1.5–2.7 cm. *Leaflets* green above, pale green below, subcoriaceous; top leaflet broad-ovate to roundish, acuminate, apex rounded-cuspidate, base cordate to truncate, (2.5–)4–9.5 cm long, 4–9.5 cm wide; side leaflets obliquely so, 2.5–8 cm long, 3–7.5 cm wide; petiolules 2–4 mm, grey pubescent; stipellae absent. *Pseudoracemes* usually not branched, (10–)16–30 cm long, lax, branches c. 10 cm if present, almost glabrous. *Bracts* ovate-rostrate, small, 4 X 1.5 mm, early caducous. Pedicels thin, more sturdy in fruit, 1–1.8 cm long, inserted alone or in pairs. *Calyx* red-glandular, with a few bulbous-based hairs, concentrated near the base, inside glabrous, tube c. 5 mm, lateral and upper connate teeth broad-obtuse, c. 2 mm, lower one rostrate, up to c. 5 mm. *Corolla* yellow. *Vexillum* rounded, when fully expanded 2–3 cm long, 3–4 cm wide, apex emarginate, base clawed, reinforced, with 2 narrow auricles, no callosities; *alae* obovate, clawed, with one narrow auricle, up to 2 cm long, 1.2 cm wide; *keel* curved, adnate, largest dimension c. 2 cm. *Ovary* sessile, densely yellow-hairy, with yellow glands, c. 10–15 mm, style c. 27 mm, slender, basal 8 mm pubescent, stigma terminal, globose. *Stamens* c. 28 mm, terminal 8 mm free, quite persistent, anthers dorsifix. *Pods* linear, 7–8.5 cm long, 0.8–1.2 cm wide, depressed but not lineate between seeds, sparsely covered with bulbous-based hairs of 2 mm, glands few. *Seeds* 8–10, roundish-compressed, dark brown to black, pitted, c. 4 X 4 X 2 mm, strophiole narrow.

Distribution: Bangladesh, Burma, India, Nepal, Thailand.

Ecology: climber in scrub jungle. Altitude: 0–800 m.

Flowering and fruiting: (Aug.–) Sept.–Nov.

Vernacular names: Ran warwa, Rata warwa, Ghansod (W India).

Specimens examined:

INDIA: sine loc., Asia, *Hügel* 2306 (W). Maharashtra: Thana distr., Pawai Lake, *Ackland* 354 (BLAT); Jungar, Inam forest, Bassein, *Ryan* 1324 (BSI); Ghanosi, *Ryan* 1360 (BSI); Virar, Bassein, *Ryan* 1413 (BSI); Nawghar, Bassein, *Ryan* 1504 (BSI); Tamil Nadu: Jubbulpore (Jabalpur, not Madhya Pradesh), Anaimalai Hills, *Beddome* 2295 (BM).

NEPAL: Dhankuta, Nepal Valley, 26 59 N, 87 23 E, *Williams & Stainton* 8369 (BM, K). THAILAND: Den Jaya, *Franck* 489 (C); Chiangmai scrub jungle, *Kerr* 1398 (BM, C, K, L, P, TCD); Maehongsong, *Larsen* 34277 (AAU, BKF, K, P); Ban Taklee, *Marcan* 1087 (BM, C); Aran(ya) Pratet, *Put* 2042 (BM, C, K, L, E, TCD).

Specimens quoted by Prain, not seen (CAL?) and partly annotated in BLAT: BANGLADESH: Mymensingh, *Clarke* 7800.

BURMA: S Shan States, Lwekaw, *King's collectors s.n.*

INDIA: Andhra Pradesh: Godavari jungles, *Beddome s.n.* Madhya Pradesh: Sagor, *Jerdon*. Maharashtra: Borivli National Park, Aarey Milk Colony, Goregaon, Tungar Hill, Andheri to Vinayalaya, Nr Andheri Makal Caves, Salsette, Sakinaka to Pawai Lake, Vehar Lake along Pawai S banks, Jogeshwari (BLAT).

Notes: Quite a rare climber with conspicuous large bright yellow flowers, with a peculiar wide but disjunct distribution. Baker indeed mentioned that "the flowers [are] much the most showy in the genus [*Atylosia*]". Dalzell claimed the presence of stipellae, Baker and Talbot described the leaflets exstipellate, I have not seen stipellae either.

It is entirely possible that the type of *Atylosia rostrata* is also the type of *Dunbaria glandulosa*, but the indication Malwan & Wagotun, S Concan (the location of the type), I have not seen on any of Stocks's specimens from the Concan area.

Uses: In W India the juice of the pressed leaves or the roots is taken against diarrhoea.

11. *Dunbaria gracilipes* Lace Fig. 11, p. 59, Map 10, p. 60

Lace, Kew Bull. 1914: 152-153 (1914).

Type: Burma, Ani Sakan nr Maymyo, 900 m, *Lace 5494* (E: holo; iso: CAL, E, K).

Homotypic synonym: *Dunbaria maymyoensis* P. Satyanarayana & Thothathri syn. nov., Bull. Bot. Surv. India 27-1/4: 152-153 (1985, publ. 1987) (CAL: holo; iso: E, K).

Perennial climber. Branches slender, finely ribbed, up to 3 mm diameter *Indumentum* short, grey, dense on stem ribs, lower leaf surface and calyx, vesicular glands orange-red. *Stipules* narrow-elliptic, 2-3 mm long, c. 1 mm wide. *Leaf petiole* striate, canaliculate above, 3-4.5 cm, rachis part 1-1.5 cm. *Leaflets* rhomboid, thinly pubescent and hardly glandular above, densely pubescent with longer hairs and many glands below; top leaflet rhomboid, 4-6 cm long, 3.5-5 cm wide, apex long-acuminate, cuspidate, rarely blunt, base cuneate; side leaflets obliquely so, 3.5-5 cm long, 2-3 cm wide; petiolules 2-3 mm; stipellae c. 1 mm, often caducous. *Pseudoracemes* slender, 5-16 cm long, with 6-15 flowers, sometimes a few on a weak lateral, pedicels slender, 0.8-1.7 cm. *Bracts* ovate to very narrow-elliptic, hairy, 3-5 mm long, 1-2 mm wide, very caducous. *Flowers* with dark red-purple *corolla*. *Calyx* green or green and purple, tube c. 4-5 mm, teeth narrow-elliptic, upper teeth c. 2-4 mm, quite free, lateral ones 3 mm, lowest tooth 4-5 mm. *Vexillum* rounded, curved, c. 1.2-1.4 cm long, 1.1-1.2 cm wide, apex emarginate, base clawed, biauriculate, no callosities; *alae* obovate-falcate, auriculate, c. 1.2 cm; *keel* falcate, c. 1.1 cm. *Ovary* linear, grey-pubescent and gland-dotted, c. 10 mm long, style c. 8-15 mm, hairy at the base, swollen at the distal 5 mm, stigma terminal, swollen. *Stamens* c. 15 mm, upper 5 mm free and curved upward, anthers basidorsifix. *Pods* linear, c. 5 cm long, 0.8 cm wide (not fully ripe), sessile, 8-10-seeded. *Seeds* not available in ripe stage.

Distribution: Upper Burma.

Ecology: along streams and watercourses in a limestone region, scrambling on bushes in thin forest and open places. Altitude: 400-1160 m.

Flowering: Sept.-Oct.

Fruiting: Oct.-Nov.

Vernacular names: -

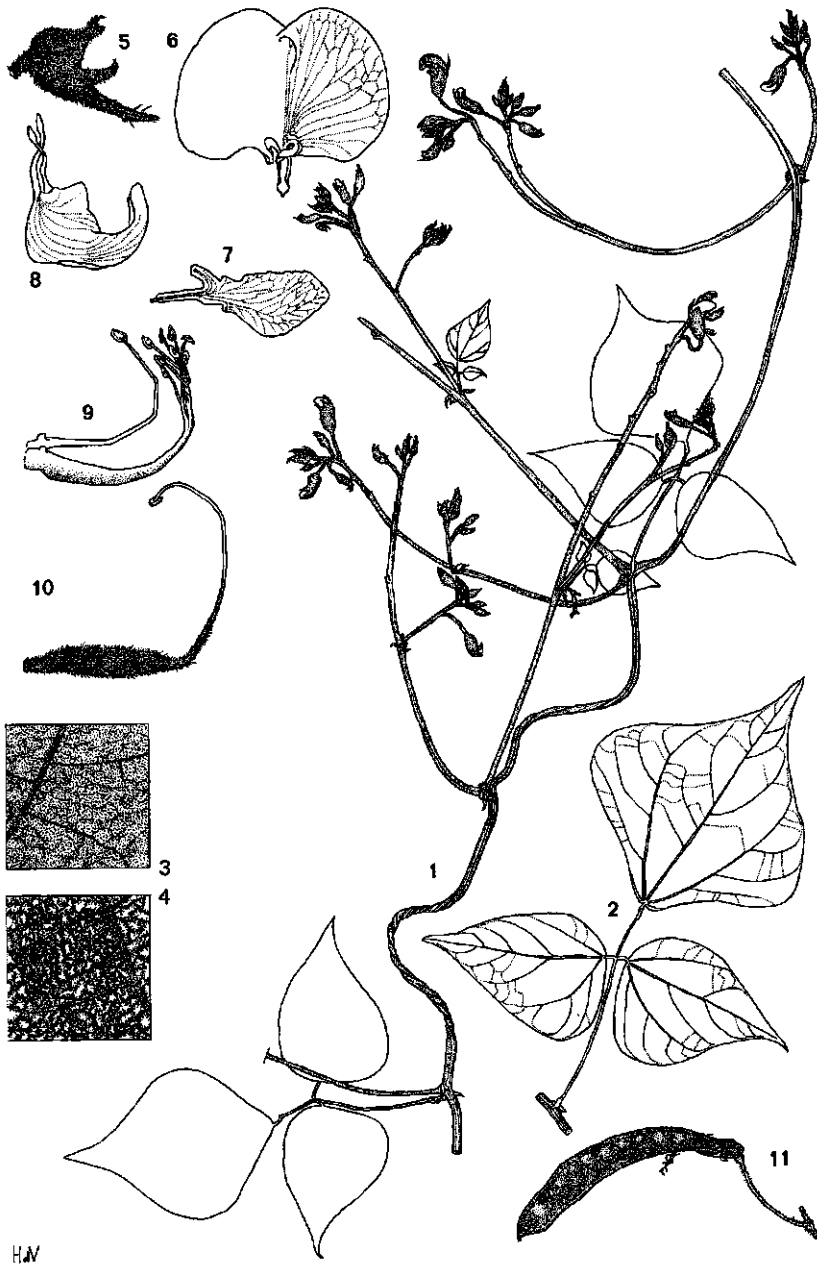
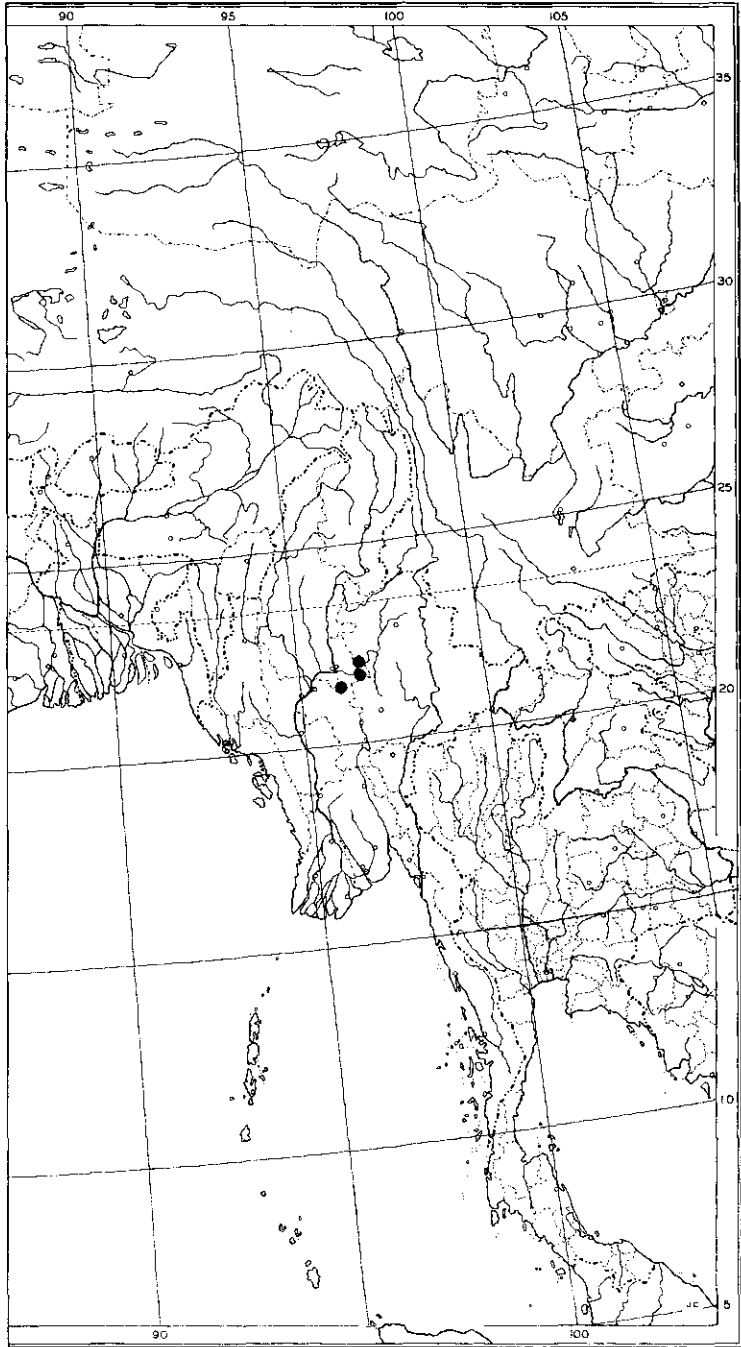


Fig. 11. *Dunbaria gracilipes* 1. habit, 0.66 X; 2. leaf, 0.66 X; 3. detail of upper leaflet surface, 4 X; 4. detail of lower leaflet surface, 4 X; 5. calyx, 4 X; 6. flag, 2 X; 7. wing, 2 X; 8. keel, 2 X; 9. staminal tube, 2 X; 10. pistil, 2 X; 11. pod, 0.66 X. - 1-4: *Kingdon-Ward 22691*, 5-10: *Smith 108*, 11: *Lace 5495*. Drawn by Mr. H. de Vries.



Map 10. Distribution of *Dunbaria gracilipes* in Myanmar/Burma

Specimens examined:

BURMA: Ani Sakan, nr Maymyo, 3000 ft, *Lace 5494* (E, holo; iso: CAL, E, K); Burma (same loc.?) *Lace 5495* (K); Kyauktu, *Kingdon-Ward 22691* (BM); Maymyo, 1200 ft, *Jesse F. Smith 108* (GH).

Note: a rare species (only known from the protologues).

12. *Dunbaria incana* (Zoll. & Moritz) Maesen comb. nov.

Fig. 9, p. 52, Map 11, p. 62

Basionym: *Phaseolus incanus* Zoll. & Moritz, Syst. Verz. Zoll. 4 (1846). Type: Indonesia, Java, Cikoya, *Zollinger 303* (holo: P; iso: G, L, P, U).

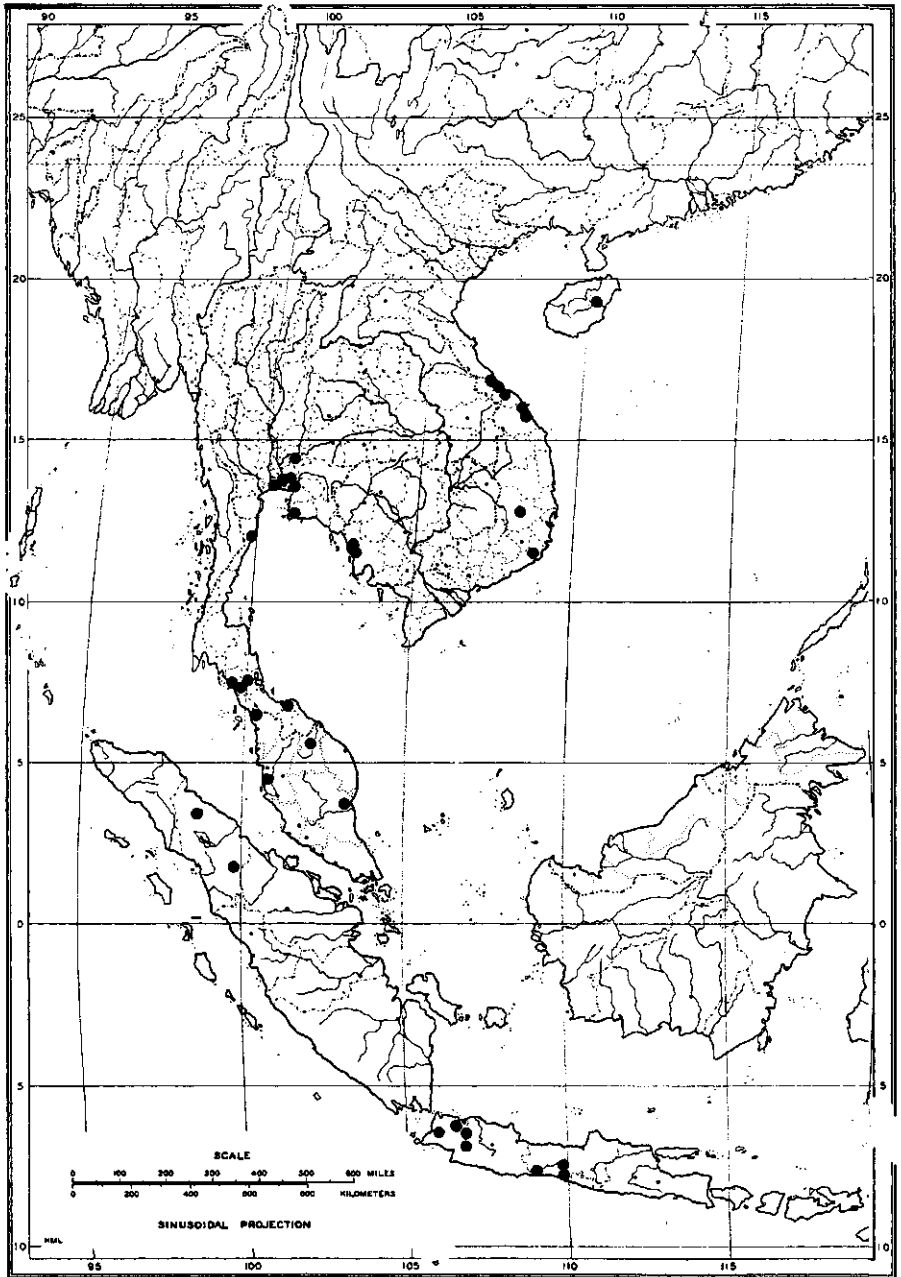
Homotypic synonym: *Dunbaria nivea* Miquel *syn. nov.*, Fl. Ind. Bat. 1: 177 (1855); Backer & Bakhuizen-van den Brink, Fl. Java 1: 635 (1963); Thuan, Pollen et Spores 15-3/4: 366-368; Thuan, Fl. Cambodge, Laos, Viet-nam 17: 126 (1979); Lee Shukang, Fl. Reip. Pop. Sin. 41: 310 (1995). Type: *Zollinger 303* (lecto: P, here designated; iso: G, L, U).

Pseudarthria timoriensis Zoll. & Moritz, Nat. & Geneesk. Arch. Neerl. Indië 3: 63 (1846), *nomen nudum*, erroneously taking for its basionym *Desmodium timoriense* DC. (as "*Armosiense*") from Timor, Java ad rupes prope Waringin, Pr. Besoeki. Reference specimen Java, *Zollinger 2771* (P).

Heterotypic synonyms: *Dunbaria scortechinii* Prain, J. As. Soc. Beng. 66-2: 44; 435 (1897); Burkill, Gdn Bull. Strait Settl. 1-9: 312 (1910); Craib, Fl. Siam. Enum. 1-3: 463 (1928); Burkill & Haniff, Gdn Bull. Strait Settl. 6: 190 (1930); Merrill & Chun, Sunyatsenia 2: 250 (1935); Wu, Y.C. Engl. Bot. Jahrb. 71: 184 (1940). Type: Malaysia, Perak, Dijong, *Scortechini 1841* (lecto: BM, here designated). Paratypes: Malaysia, Perak, *Kunstler 908* (BM); *ibid.*, Ulu Bubong, *Kunstler = King's Collector 10852* (K).

D. harmandii Gagnep., Not. Syst. 3: 192 (1915); *id.*, Fl. Gén. Indoch. 2: 288 (1916); Pham Hoang Ho, Ill. Fl. S. Vietnam ed.2, 1: 877, fig. 2205 (1970). Type: Vietnam, Tourane, *Harmand s.n.* (lecto: P). Paratype: Indo-China, without location, *Pierre s.n.* (E, P).

Perennial climber. Branches to 8 m long, up to 0.5 cm diameter, ridged when young. *Indumentum* of young branches, undersurface of leaflets and calyces densely light grey, short-velvety. Vesicular glands reddish, initially yellow on calyx and pods. *Stipules*



Map 11. Distribution of *Dunbaria incana* in SE Asia

caducous. *Leaf petiole* grooved above, 2–8.5 cm, rachis 0.8–1.5 cm. *Leaflets* green, thinly glabrescent above, grey-velvety hairy below, top leaflet rhomboid-ovate, 4–12 cm long, 3–9 cm wide, apex cuspidate-acuminate, base broad to narrowly cuneate, with 3 major veins from the base and 5–7 secondary veins; side leaflets obliquely so, 3.5–6 cm long, 3–9 cm wide; petiolules 1–3 mm, stipellae minute, obscure, hairy-setaceous. *Pseudoracemes* (6–)14–25(–30) cm, unbranched, sturdy, peduncle white-hairy. *Bracts* ovate to narrow elliptic, glandular and hairy outside, thinly hairy inside, 3–9 mm long, 1–3 mm wide, early caducous. *Flowers* c. (10–)15–20, mainly distally, crowded at first, lax when developed, 1–2 per node, pedicel 1–4 mm. *Corolla* with vexillum dorsally brown red, purple or crimson, ventrally yellowish with purple veins; *alae* pale yellowish green; *keel* greenish or white. *Calyx* yellowish green to reddish, orange-glandular, short-pubescent inside and outside, tube c. 5 mm long, upper teeth triangular, c. 2 mm, connate except 1 mm at apex, lateral teeth triangular, c. 2 mm, lower tooth narrow-elliptic, c. 4 mm. *Vexillum* rotundate, twisted, c. 12–17 mm long, 14–18 mm wide, apex emarginate, base clawed, reinforced, biauriculate, with a narrow rim-callosity near the base; *alae* obovate, with claw c. 12–13 mm long, 5 mm wide, biauriculate, ventral side with long auricle; *keel* circinnato-rostrate, c. 10 mm in diameter, length of curvature c. 28 mm, ventral sutures adnate, claw c. 7 mm, with a lateral pouch. *Ovary* linear, c. 6 mm long, 1.5 mm wide, white-hairy and yellow-glandular, style c. 19 mm, curved, stigma oblique, terminal. *Stamens* with curved tube, fused part c. 18 mm, 5–7 mm free part, free stamen geniculate at the base, c. 20 mm long, anthers basidorsifix. *Pods* linear to slightly falcate, (4–)5.5–6.5 cm long, 7–8 mm wide, tipped with 5 mm style, dark brown, short grey hairs, orange glands. *Seeds* 7–8(–10), reniform, brown to black, c. 4 mm long, 5 mm wide, 3 mm thick, strophiole narrow, divided.

Distribution: China (Hainan), Indonesia (Java and Sumatra), Malaysia, Papua New Guinea, Thailand, Vietnam.

Ecology: twining on bamboo clumps and thickets, in forests, along rivers, tidal areas, limestone hills, on waste grounds. Altitude: 0–400 (–1000) m.

Flowering: (Jan.–) March–May (Hainan), June, Sept.–Dec. (Indonesia), Feb.–March, July, Sept. (Malaysia), Aug. (Papua New Guinea), Oct.–Dec, Febr., June, Aug. (Thailand), Feb.–March, June, Sept. (Vietnam).

Fruiting: as for flowering, up to a month or two later.

Vernacular names: Tampong urat, Patong urat (Malaysia).
Khaw fang, Tan wa pla, Yan tua raet (Thai), Pep pa (Lao), (Dây) bu,
(Dây) dâu hoang, (Dây) móc (Binh Tri Thiên, Vietnamese), Re ma
nai (Thuận Hai, Proto-indochinese).

Specimens examined:

CHINA: Hainan prov.: Nor Tai Lee, *Fords Chinese Collector* 366 (K) & 370 (NY);
Yaichow, *F.C. How* 70515 (NY); Manning, *F.C. How* 71459 (A); Chin Fung
Ling nr Sam Mo Watt village, Kan-en distr., *S.K. Lau* 3644 (A, P, S); sine loc.,
H.Y. Liang 64641 (A, K, NY); *C. Wang* 34102 (A, NY).

INDONESIA: Java: sine loc., *Anon.* 145 (L, U) ("typus fragment"); Sadjira, SW
of Rangkas Bitung, *Anon.* 1770 (L); Nusa Kambangan, Banyumas Res., *C.A.
Backer* 4620 (BOG, K, L); Gunung Pamis nr Jasinga, *C.A. Backer* 10277 (BOG,
L); Ciseureuh W of Wanayasa, Jakarta area, *C.A. Backer* 14340 (BOG, K, L);
Kedu, Sempor nr Gombong, *Brinkman* 836 (A, BOG, L); *ibid.*, *Brinkman* 860a
(L, U); Sadjira SW of Rangkas Bitung, *Reinwardt?* dd. 1770? (L); nr Cikoya,
Zollinger 303 (type of *Phaseolus incanus* Zoll. & Moritzi, and of *Dunbaria nivea*
Miquel (G, L, P)); nr Waringin, nr Besuki, *Zollinger* 2771 (P; reference for
Pseudarthria timoriensis Zoll. & Moritzi nom. nud.). Sumatra: S Sumatra, *CIAT*
19825, 19826 (CIAT, WAG); Wai Lima, Lampong Estate, *Iboet* 461 (BOG, K, L);
Medan, *Lörzing* 17150 (BOG, L); E Coast, Bila, in vicinity Rantau Parapat,
Rahmat si Toroos 2054 (NY); Gunung Suasah nr Rantau Parapat, Bila, *Rahmat si
Toroos* 2345 (US). MALAYSIA: Perlis, *MARDI* 402/*CIAT* 17333 (CIAT, WAG);
Pahang, *CIAT* 19334 (CIAT, WAG); Kelantan, *CIAT* 17335 (CIAT, WAG);
Pekan Pahang, *Evans s.n.* (K); Biscrat in Jalor, *Gwynne-Vaughan* 608 (K);
Kelantan, Kuala Kerai, *Hamilton* 10083 (K); Perlis, Kangar, Bukil Lage,
Henderson 22383 (BM, BO); Perak, *King's Collector = Kunstler* 908 (BM, K);
ibid., *Ulu Bobong* 10852 (K); Ara Kuda, Baukes Wunga Krai, *Ridley* 7015 (BM);
Malaya, Dijong, *Scortechini* 1841 (type of *D. scortechinii* Prain) (K).

PAPUA NEW GUINEA: Garabinumu Forest, *Carr* 12960 (BM, K, L); check! as
cumingiana.

THAILAND: Peninsula: Trang, Khao Chawng, *Charan Boonnab* 196 (BKF);
Phattalung, *CIAT* 17330 (CIAT, WAG); Nathariwat, *CIAT* 17331 (CIAT, WAG);
Trang, *CIAT* 17332 (CIAT, WAG); Sriracha, *Collins* 1303 (K, US); Sriracha,
Collins 1485 (K, TCD); Sriracha, *Collins* 1737 (K, US); Bangkok, tidal area, *Kerr*
3700 (BM, K); Bangkok, *Kerr* 3955 (BM, K); Bangkok, *Kerr* 6755 (BM, K);
Tepa, Songlala, *Kerr* 14730 (BM); Lü Site, Ban Kao, *K. Larsen* 8216 (C, K);
Bangkok, *Marcan* 14 (BM); Bangkok, *Marcan* 641 (BM); Ban Pak Tawan, Pran,
Marcan 2714 (BM); Sattahip: Taong Brong, *Maxwell s.n.* (AAU); *Maxwell* 71
(AAU); Songkla, distr. Nuang, Suan Dtoon (Dteen) Falls, *Maxwell* 86-3 (BKF);
Saraburi: Sahn Lahn, *Maxwell* 73-492 (AAU); *ibid.*, *Maxwell* 74-1047 (AAU, L);
Nong Khai, 63 km SE of Bung Kan to Nakhon Phanom, *Schultze-Kraft et al.*
CIAT 22088 (CIAT, WAG); Bangkok, *Eryl Smith* 370 (BM).

VIETNAM: Massif de Lang-Biang, between Dabang & Dran, *Chevalier* 30619 (P);
Hau Bon (Cheo Reo), Dac Lac, *Dournes* 320? (P); Tourane, *Harmand s.n.* (type *D.
harmandii*, P); Cochinchina, *Pierre s.n.* (paratype *D. harmandii*, E, P); Quang Tri,
Binh Tri Thien, *Pirey* 57 (P); Quang Tri, Bu ou Mác, *Pirey* 58 (P); Mai Lanh nr
Quang Tri, *Poilane* 1204 (AAU, K, P); Lien Chieu nr Tourane, *Poilane* 7797
(AAU, P); Ka Rom, Prov. Phan Ray, *Poilane* 9971 (AAU, P); Lang Vieng Ap nr

Quang Tri, *Poilane 10921* (P); Cahn Trap, *Spire 1111* (P); Me-Kong, Khôn, *Thorel 2263* (P); Hué, prov. Thua Thien, *Vidal 869A* (P).

Notes: The designation by Thuan of the type of *Dunbaria nivea* has to be rejected, as *Zollinger 2771* (a rather poor specimen) does not bear the locality Cikoya, and originates from Besuki, E Java (Moritzi 1846). Pasted over the name *Pseudarthria timorensis* Zoll. & Moritzi, of which nomen nudum it is a reference sheet, is a label *Dunbaria nivea* Miquel, attestedly in Miquel's handwriting. *Zollinger 303*, the type of *Phaseolus incanus*, is the proper choice, as it was collected from Cikoya, the type locality. Miquel did not state a collection number in his protologue, nor did he quote the epithets of Zollinger and Moritzi. The holotype of *D. incana* is the lectotype of *D. nivea*. It is the specimen with flowers and fruit and the most complete label written by Moritzi, who distributed the Zollinger collections. Miquel studied the fragments of *Zollinger 303*, and has seen Zollinger's private set (marked HZ) for the Flora Ind. Bat., donated via de Franqueville to the Paris Herbarium. I have not seen Zollinger 303 specimens marked HZ, hence my choice of the Paris *Zollinger 303* sheet as lectotype for *D. nivea*.

Few of the at least 20 flowers per peduncle set fruit, so usually not more than 4-5 pods can be seen on an inflorescence. Plants grown from seed (CIAT ex Thailand) in a greenhouse did not flower in 1990, nor in the first half of 1991, despite reasonable vegetative development. It flowered during the spring of 1993, but produced no seeds.

Uses: In Malaysia the pounded leaves are used as poultice to cure fever, itches and cuts ("Tampong urat") (Burkill & Hanefff 1930).

13. *Dunbaria lecomtei* Gagnep. Fig. 12, p. 66, Map 12, p. 67

in Lecomte, Not. Syst. 3: 193 (1916); Gagnepain, Fl. Gén. Indo-Chine 2: 286-288 (1916); Thuan, Pollen et Spores 15-3/4: 378, 380-381 (1973); Thuan, Fl. Laos, Cambodge, Viet-nam 17: 119-120 (1979). Type: Vietnam, Phan-Rang to Dran, *Lecomte & Finet 1481* (holo: P).

Heterotypic synonym: *Dunbaria villosa* var. *peduncularis* Handel-Mazetti *syn. nov.*, Symb. Sinic. 7-3: 582 (1933); Wu, C.Y., Index Fl. Yunnan. 1: 598 (1984). Type: China, Yunnan, Tshuhsiung to Gwangdong, *Handel-Mazetti 4858* (holo: W; iso: E).

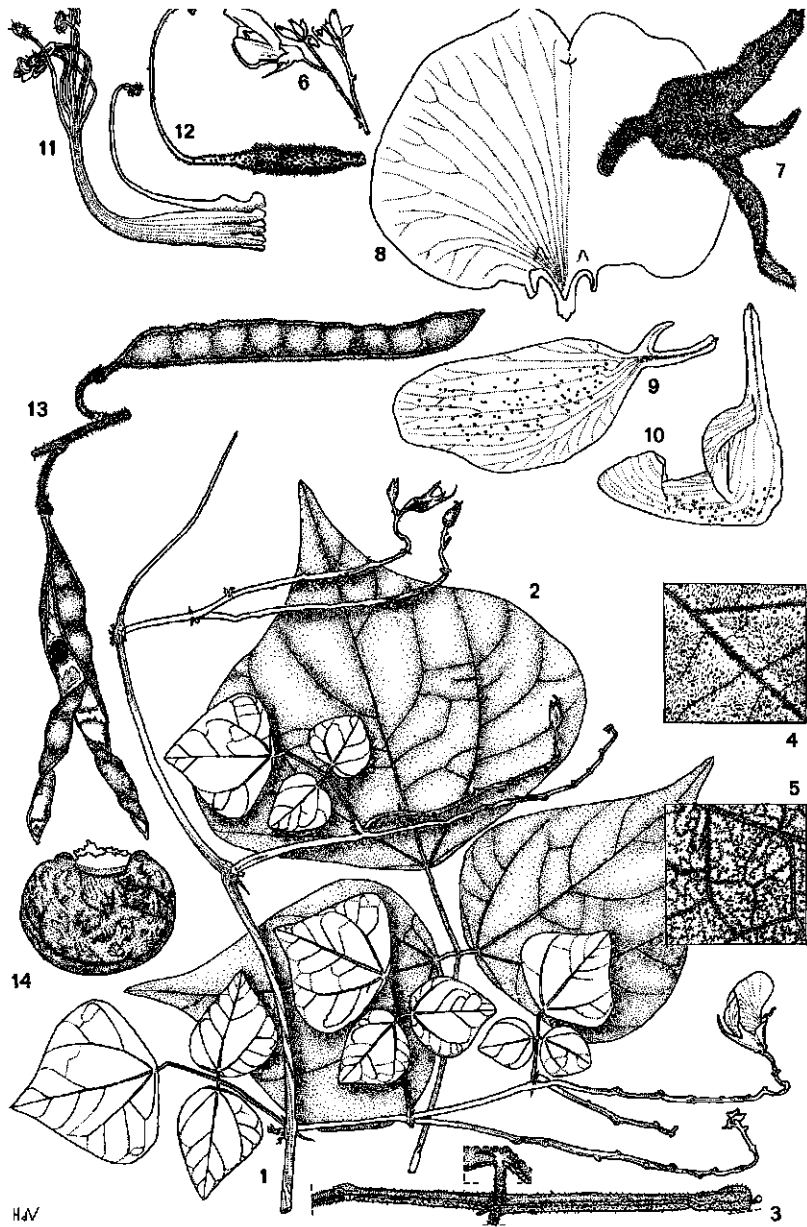
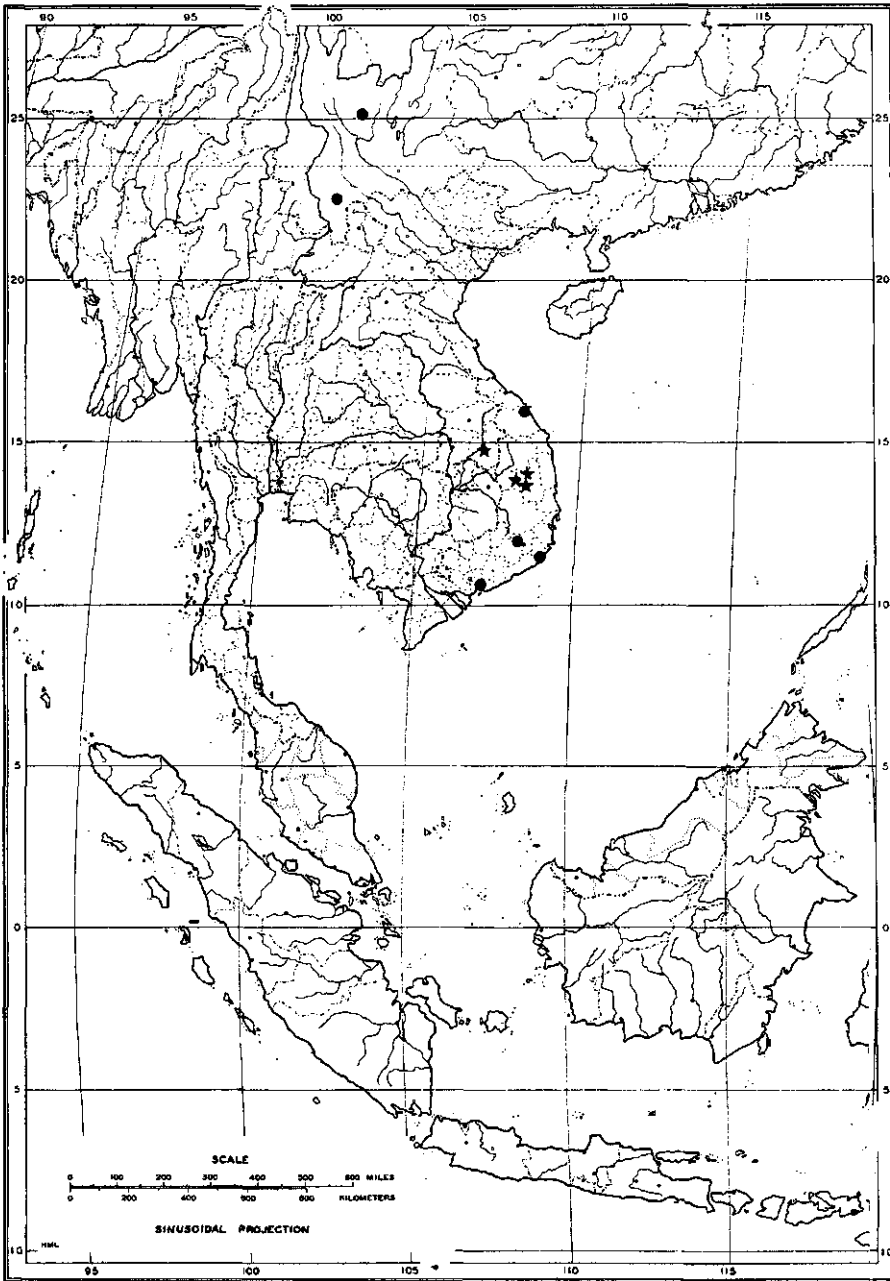


Fig. 12. *Dunbaria lecontei* 1. habit, 0.66 X; 2. leaf, 0.66 X; 3. petiole, 2 X; 4. detail of upper leaflet surface, 4 X; 5. detail of lower leaflet surface, 4 X; 6. part of inflorescence, 0.66 X; 7. calyx, 2 X; 8. flag, 2 X; 9. wing, 2 X; 10. keel, 2 X; 11. staminal tube, 2 X; 12. pistil, 3 X; 13. pods, 0.66 X; 14. seed, 4 X. — 1 & 3: *Evvard 131*, 2: *Henry 12384*, 4-12: *Handel-Mazetti 4858*, 13 & 14: *Vu Van Chong 1162*. Drawn by Mr. H. de Vries.



Map 12. Distribution of *Dunbaria lecomtei* (●) and *D. longicarpa* (★) in China and Indo-China

Perennial climber, several m. *Branches* to at least 1.5 mm thick, grooved, glabrescent. *Indumentum* short, grey, rather thin, shorter on upper side of leaflets, glands orange red. *Stipules* ovate-acuminate, 3–5 mm long, 1–2 mm wide, striate, persistent. *Leaf petiole* grooved, 2–5 cm long, rachis 1–1.5 cm long. *Leaflets* green and thinly glandular above, dull to grey-green below and densely glandular; top leaflet ovate-rhomboid, 4.5–9 cm long, 3.5–8.5 cm wide, apex acute, hardly mucronate; side leaflets obliquely so, 3–7 cm long, 2–5.5 cm wide; petiolules 1–2 mm, hairy; stipellae setaceous, 1 mm, caducous. *Pseudoracemes* slender, lax, 4–12 cm. *Bracts* ovate, 7 mm long, grey-hairy, early caducous. *Flowers* 3–5(–6) rather close together at top of raceme. *Corolla* yellow, petals sparsely covered with caducous vesicular glands. *Calyx* short grey-pubescent, with somewhat longer bulbous-based hairs, yellow to brown glands, tube c. 6 mm, upper teeth 9–10 mm, narrow-elliptic, connate except 0.5 mm at the tip, lateral teeth acuminate, c. 6 mm, lower tooth curved, narrow-elliptic, c. 9 mm. *Vexillum* rotundate or folded, up to 22 mm long and wide, base clawed, 3 mm, bi-auriculate, crests thin, transparent; *alae* oblique-ovate, 2.4 cm long, 7 mm wide, one prominent auricle of 2 mm; *keel* circinnato-rostrate, c. 2 cm long, 5 mm wide, rostrum folded, keel petals joined at the base, claw 7 mm. *Ovary* pedicellate, c. 6–9 mm long, 9–10 ovules, grey-pubescent, yellow and orange glands very prominent, style 12 mm, basal 3 mm pubescent, upper half not flattened, curved upward, stigma oblique. *Stamens* c. 25 mm long, free part 6–9 mm, upper 15 mm upcurved, free stamen geniculate, anthers basifix. *Pods* linear, slightly falcate, brown, 8–9 cm long, thinly short grey-pubescent, stipe 0.5–1.4 cm, c. 9 seeds. *Seeds* roundish-compressed, c. 5 mm long, 4 mm wide, 2.5 mm thick, strophiole narrow, divided.

Distribution: China, Vietnam.

Ecology: climber on trees, open forests. Altitude: 50?–1500 m.

Flowering: Sept.–Nov.

Fruiting: Nov.

Vernacular names: (Dai) Trung Chau (Lam Dong, Vietnam)

Specimens examined:

CHINA, Yunnan: between Tsuyung and Guangdong, *Handel-Mazzetti* 4858 (type of *D. villosa* (Thunb. ex Murray) Makino var. *peduncularis* Hand.-Maz.) (holo: W); Szemao S Mts, *Henry* 12384 (K) & 12384A (E, K).

VIETNAM: Annam, nr Tourane, *d'Alleizette* juin 1090 (L); Lam Dong, Lang Hanh forest, *Vu Van Chong* 1162 (P); mangrove at 10 km from the Cape, Saigon road,

Evrard 131 (AAU, BKF, K, P); Phan-rang to Dran, *Lecomte & Finet 1481* (holo: P).

Notes: Mentioned as *D. circinalis* in Index Florae Yunnanensis (C.Y. Wu, 1984). Young specimens are similar to the more robust specimens of *D. villosa*, but have longer pseudo-racemes. Full-grown specimens have the facies of *D. podocarpa*, but again the inflorescences are much longer. The petals and staminal tube may be marcescent, just as in *D. podocarpa*. It is not unlikely that this species may be found in Thailand and Laos.

14. *Dunbaria longicarpa* (Thuan) Maesen stat. nov.

Fig. 9 & 13, p. 52 & 70, Map 12, p. 67

Basionym: *Dunbaria fusca* (Wall.) Kurz var. *longicarpa* Thuan, Fl. Cambodge, Laos, Viet-nam 17: 125 (1979). Type: Vietnam, Gia Lai to Cong Tum: Dak Ha to Dak To, 1600 m, 1-10-1930, *Poilane 18403* (holo: P; iso: P). Paratypes: Laos, Attopeu: Muong Mai to Phu Da Phuk, 700 m, *Poilane 15974* (P); type location betw. Dak Ha and Dah To, 900 m, 3-10-1930, *Poilane 18468* (P).

Perennial climber. Branches 3-4 m long. Indumentum bristly, grey, particularly on veins of lower leaflet surface, inflorescence, calyx and bracts velvety with long golden bulbous-based hairs. *Stipules* caducous, base c. 3 mm wide. *Leaf petiole* canaliculate, striae inconspicuous, petiole 2.5-6 cm, rachis 1.5-2.5 cm. *Leaflets* top leaflet narrow-ovate to ovate, 8-12(-14) cm long, 5-7.5 cm wide, side leaflets obliquely so, 7-11 cm long, 5-7.5 cm wide, petiolules 3-4 mm, grey-hairy, stipellae setaceous, c. 2-3 mm. *Pseudoracemes* not branched, 20-35 cm, flowers c. 20, very fragrant, peduncle golden-hairy at the flowering part. *Bracts* velvety, ovate-acuminate, 7-15 mm long, glandular, densely grey-hairy. *Corolla* yellow, *Calyx* glandular, tube 5-6 mm, teeth narrow-elliptic, upper teeth fused except at the tip, c. 3 mm, lateral teeth c. 7 mm, lower tooth c. 9 mm. *Corolla* yellow, *Vexillum* broad-ovate, c. 20 mm long and wide, twisted, base clawed, 2 auricles, 2 protruding callosities nr the base, apex deeply emarginate; *alae* long-obovate, c. 15 mm long, 5 mm wide, base clawed, dorsal side 2 auricles, one of 3 mm, ventral side one small auricle; *keel* hooked, frontally adnate, longest dimension c. 15 mm, base clawed. *Ovary* linear, c. 7 mm, glandular, densely hairy, style 22 mm, lower 7 mm hairy, stigma

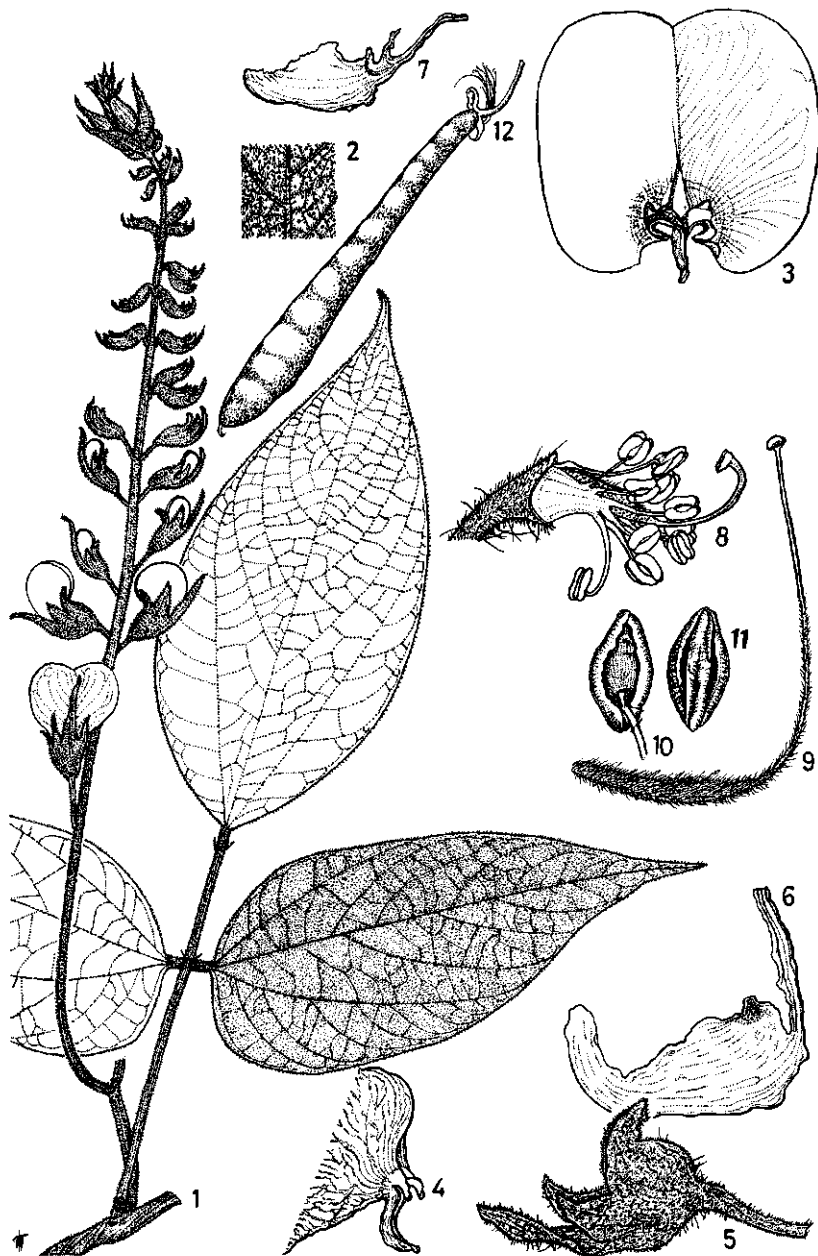


Fig. 13. *Dunbaria longicarpa* 1. flowering branch, 0.66 X; 2. detail of lower leaflet surface, 2 X; 3 & 4, flag, 2 X; 5. calyx, 2 X; 6. keel, 2 X; 7. wing, 2 X; 8. staminal tube of young flower, 6 X; 9. pistil, 4 X; 10 & 11, anthers, 20 X; 12. pod, 0.66 X; 10. seed, 4 X. — 1, 8-11: *Poilane 18399*, 3-7: *Poilane 15974*, 12: after Fl. Cambodge, Laos, Viet-nam 17:123. Drawn by Mrs. Y.F. Tan.

oblique-terminal. *Stamens* c. 26 mm, upper 13 mm free, marcescent, anthers (basi)dorsifix. *Pods* linear, 8 cm long, 1.5 cm wide. *Seeds* 8–10, strophiolate, c. 6 mm long and wide, c. 2 mm thick.

Distribution: Laos, Vietnam.

Ecology: young forests, acid clay soils. Altitude: 600–1600 m.

Flowering: Sept.

Fruiting: Oct.

Vernacular name: –

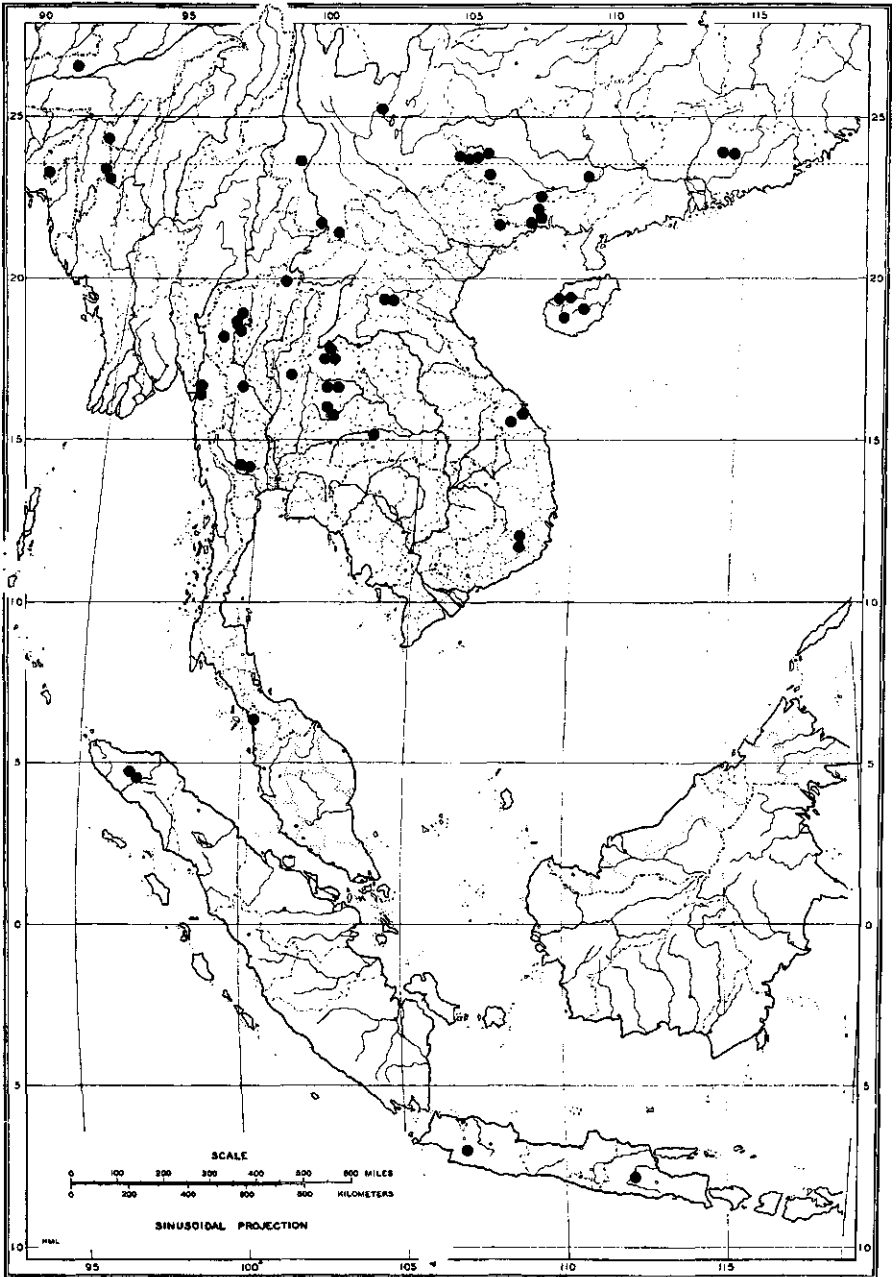
Specimens examined: type and paratype material quoted above.

Notes: If *Dunbaria crinita* (= *D. flavescens*) is considered not to be conspecific with *D. fusca*, to which it is very close, *D. fusca* var. *longicarpa* Thuan ought to be recognized as a species too. The differences with typical *D. fusca* are more numerous than Thuan mentioned: not only the pod is longer, wider and thicker with 10 seeds compared to 5 or 6, but the inflorescence is much larger, and the indumentum is velvety on the peduncle and calyx in addition to the presence of long yellow hairs. The *longicarpa* bracts are much larger and do not shed as soon. The three mentioned species are obviously quite closely related, and *D. glabra* also forms part of this species aggregate or series.

As a coincidence, all specimens belonging to this species have been collected exclusively by Poilane.

15. *Dunbaria podocarpa* Kurz Fig. 17, p. 94, Map 13, p. 72

J. As. Soc. Beng. 43-2: 185 (1874); Kurz, J. As. Soc. Beng. 45-2: 455 (1876); Baker in Hooker, Fl. Brit. India 2: 218 (1876); Craib, Kew Bull. 1911-1: 41; Craib, Contrib. Fl. Siam, Univ. Aberdeen Studies 57: 67 (1912); Dunn & Tutcher, Fl. Kwangtung, Hongkong 85 (1912); Gagnepain, Fl. Gén. Indoch. 2: 284 (1916); Craib, Fl. Siam. Enum. 1-3: 463 (1928); Wu, Y.C., Engl. Bot. Jahrb. 71: 184 (1940); Wang & Tang, Ill. treatm. princip. pl. China. Legumin. 688-689 (1955); Pham Hoang Ho, Ill. Fl. S. Viet-nam ed. 2-1: 876 (1970); Thuan, Pollen et Spores 15-3/4: 380-381 (1973); Thuan, Fl. Cambodge, Laos, Viet-nam 17: 124 (1979); Wu, C.Y., Index Fl. Yunnan. 1: 598 (1984); Lee Shukang, Fl. Reip. Pop. Sin. 41: 309, 312 (1995). Type: Burma, Tenasserim, Moulmein, *Kurz-Holiczk s.n.*



Map 13. Distribution of *Dunbaria podocarpa* in S and SE Asia

(holo: K)

Synonym: *Vigna retusa* Williams non Walp., nom. nud., Bull. Herb. Boiss. 2nd series 5: 21 (1905); Hosseus, Beih. Bot. Centr.bl. 28: 397 (1911). Based on *E. Candler*, Tavoy to Bangkok, dd. 1898 (K).

Perennial climber, branches to c. 3 m, to c. 3 mm diam. *Indumentum* tomentose to velvety in various densities, densest on lower surface of leaves. *Stipules* narrow-triangular, 3-5 mm long, 1 mm wide, caducous. *Leaf petiole* striate, 1-3.5 cm, suprajugal part 0.4-1 cm, top leaflet broad-ovate, acuminate, 3.5-8 cm long, 2.5-7 cm wide, base almost truncate to rounded or broad-cuneate, apex quite acute, sometimes obtuse, usually (short) mucronate, dark green-tomentose above, grey-green and more hairy below, both sides with many reddish vesicular glands; side leaflets obliquely so, 2.5-5 cm long, 1.8-4 cm wide, petiolules 1-2 mm; stipellae hairy, inconspicuous between hairs, c. 0.5 mm, caducous. *Pseudoracemes* short, peduncle not branched, 0.5-1.5 cm, with 2-4 flowers. *Bracts* early caducous, ovate narrow-elliptic, c. 1 mm, pedicels 4-6 mm. *Corolla* creamy or pale yellow to yellow, marcescent. *Calyx* glandular, silvery pubescent, interior adpressed short-hairy, tube c. 4-6 mm long, upper teeth triangular, connate or almost connate, c. 3-6 mm long, lateral teeth triangular-acuminate, 3-7 mm, lower tooth narrow-elliptic, 6-10 mm long. *Vexillum* rounded, 15-18 mm long, c. 15 mm wide, base clawed, reinforced-biauriculate, 2 sickle-shaped callosities, apex rounded, folded, emarginate; *alae* obovate, incl. base 15-18 mm long, 5-6 mm wide, base narrow, c. 6 mm, dorsal side with 1 short auricle, ventral side with 1 long auricle; *keel* circinnato-rostrate, longest dimension c. 17 mm, ventral sutures adnate, base narrow, c. 6 mm. *Ovary* linear, c. 6-7 mm, stalked, grey silken hairy, glandular, about 9 ovules, style 17-20 mm, stigma oblique, terminal. *Stamens* c. 22-25 mm, upper half of filaments curved, upper 10 mm free, anthers basidorsifix, enclosed in the rostrum of the keel. *Pods* brown, short grey-pubescent, falcate, conspicuously long-stipitate, stalk (0.8-)1-2 cm, pod 5-8 cm long, 0.9-1 cm wide, style -10 mm remaining or breaking off. *Seeds* 8-11, black or dark brown, orbicular, c. 3.5 mm long, 4 mm wide and 2.5 mm thick, strophiole narrow, divided.

Distribution: Burma, Cambodia, China: Guangxi, Guangdong, Hainan, Hongkong; Laos; Malaysia; India: Meghalaya, Assam, W

Bengal; Indonesia: Sumatra, Java; Thailand; Vietnam.

Ecology: edges of *Pinus*, *Lithocarpus*, *Dipterocarpus* forests, in thickets, grasslands, also fire-affected ones, near marshes, along rivers, in evergreen and mixed jungle. Peat and sandstone soils. Altitude: 0-1700 m.

Flowering: over long periods. China: April–Sept., India: Aug., Nov., March, Indo-China: Feb.–July, Sept.–Nov., Indonesia: July, Aug.

Fruiting: China: June–Sept., Dec., Feb., India: Nov., April, Indo-China: Oct. - Jan., March, and quite probably some of the other months.

Vernacular names: Shaan lok tan (cantonese), Mahé Kwang (Lao, Chiangmai), Dau ma (Vietnam), Re (sa) mian (Lam dong, proto-indochinois).

Specimens examined:

BURMA: Tenasserim, Moulmein, *Kurz-Holiczk s.n.* (holo: K); Tamu, Upper Chindwin, *Meebold 6903* (K); Moulmein, *Meebold 16757* (S); Phuum da Than, *Müller 694* (P).

CHINA: Guangdong / Kwangtung prov.: Lofoushan, *N.K. Chun 40590* (BM); 41660 (BM); Luofu Shan Mts, *Ford 388* (P); Shek Tok Shaan, Hau Pui Shaan, Ch'un Shek Wa, *Fung Hom 539 or 19719* (A, NY); Luo-fu Shan, *K'tung 78 or 6107* (L); Hsing Leung Shaan, *McClure 336 or 6681* (A, NY); Pakhoi, *Playfair 99* (Hance 1316) (K); Lin Fa Shan, Sam Hang Shek T'au village, Hwei-yang distr., *W.T. Tsang 25843* (A); Luofu Shan Mts, *Tsiang Ying 1737* (A, BM, E); Suny distr., *Tsiang Ying 2741* (K, P, W), Haifenxian, Huangqiang, *Z.F. Wei 121416* (KUN). Guangxi / Kwangsi Prov.: Bose (Poseh), *Anon. 1042* (KUN); Hengxian, Nanxiang, *Z.Z. Chen 50659* (KUN); Tang lan, *R.C. Ching 6543* (NY, US); Bako Shan, W Bose (Poseh), *R.C. Ching 7561* (NY, US); Longjing, Daqingshan, *S.H. Chun 12949* (KUN); Nor Yut, Tai Ching Shan, *S. Ko 55391* (A); On Tak, *S. Ko 55707* (A); Du-an, *I.K. Li P01633* (KUN); Shap Man Taai Shan nr Ping Hoh village, Shang-sze distr. SE of Shang-sze, Guangdong border, *W.T. Tsang 22045* (A, BM, P, S); Na Leung and vicinity, Fang Ch'eng distr. (formerly in Kwangtung), *W.T. Tsang. 26586* (A, C, E, K, P); Kung Ping Shan and vicinity, T'aan Faan, Fang Ch'eng distr., *W.T. Tsang 26716* (A, C, E, K, P); Sie-Lung, Lotong, *Tsiang Ying 1147* (A, E); Rongxian, Licun, Liuzhen, *J.Y. Wei 40026* (KUN). Hainan prov.: Qiongzong, *S.H. Chun 10461* (KUN); Loktung, *S.K. Lau 26716* (A); S of Fan Ta, *McClure 2611 or CCC9169* (A); Momingxian, Dapo, *L. Tang 1887, 2114* (KUN). Hongkong: Ngong Ping - Tung Chun, *K.Y. Chan 132* (P); Mainland opp. Hongkong, *Ford's collector 172* (K); Lantau isl., Tungchung & vicinity, Shantao, *Y.W. Taam 1734* (G, GH, NY, US); Shek Kong, *J.P.W. Woo & T.K. Woo 390* (P). Yunnan prov.: Peng-beng, *Anon. 4539* (KUN); Wu-ting, *Exped. 60-130, 1960* (KUN); Fu-nin(g), *H.T. Hsui 8955* (KUN); Mong-hai, Xishuangbanna, *Y.H. Li 01912* (KUN); Suan-jiang, *G.S. Sin 751* (KUN); Shean-meng-yeang, Che-li, *C.W. Wang 75754* (KUN); Foo-Oning-Jar-gei (Funing?), *C.W. Wang 89232* (KUN); Yi-Wu, *W.T. Wang 10424* (KUN); Shuangjiangxian, *J.S. Xin 751* (KUN).

INDIA: Assam: Lakhipur on the Barak river, Cachar, *Gage s.n.* (G); Assam sine

loc., *Col. Jenkins s.n.* (G); Manas Reserve, *Remanandan 4732* (ICRISAT, WAG). Bengal: sine loc., *Capt. Jenkins s.n.* (AAU). Manipur: S Lushai Hills nr Fort Lungleh, *Gage 192* (BM, G, K, L, P);

INDONESIA: Sumatra, Aceh, Payajorok, *Jeswiet 487 or 1695* (WAG); *Jeswiet 491 or 1699* (WAG); Isak, *van Steenis 6252* (BOG, L). Java: Sukabumi to Nyalindug, *Backer 14543* (BO); Foothills of Mt. Klotok, near Kediri, *F. Kramer 16* (BO).

LAOS: Xieng Khouang (Tran-ninh), *Miéville s.n.* (P); Phok Lou nr Xieng Khouang, *Poillane 16902* (P).

MALAYSIA: Wellesly Prov., banks of Sungai Krai, Ara Kuda, *Ridley 7015* (BM).

THAILAND: E Prov., Chaiyaphum distr., Tunkamang, *van Beusekom et al. 4314* (BKF, L); Tavoy to Bangkok, *Candler s.n.* (K) (*Vigna retusa* Williams non Walp.); NE, Loei, Phu Fradung, summit plateau, trail from Buddha image to Than Sawan, *Chantaranothai et al. 90/127* (TCD); NE, Phu Kradung, S of Loi, *Charoenpol et al. 4750* (AAU, K); Doi Sutep, *Deignan 1561* (A); Chiang Mai, Hui Da Han, *Garrett 1090* (AAU, B, K, L, TCD); Doi S(u)tep, *B. Hayata s.n.* (KI); Nakantai: Nakhon Thai, Petchamlak = Phitsanulok Prov., *Hosseus 717* (BM, K, M, P); Doi Sutep, Chiangmai, *Kerr 870* (BM, K, L, P, TCD); *Kerr 1483* (BM); *Kerr 1597* (BM); *Kerr 2277* (AAU, BM, E, K, P); Kao Krading, *Kerr 8748* (AAU, BM, C, E, K); 15 km NE of Chaiyaphum, *Larsen et al. 31844* (AAU, K); N, Doi Intanon, *Larsen 34475* (AAU, C, K, L, P); Doi Sutep E, Ru-See Cave area, *Maxwell 87-1213* (Chiangmai, L); Doi Sutep, Kohntatahn Falls, *Maxwell 87-1362* (BKF, L); Doi Sutep, above village, road to St. Louis Church, *Maxwell 88-1245* (L); Doi Sutep, *Ogawa & Yoda 212-25* (KI); Buriram, *Phengkklai et al. 3354* (BKF); between Ban Du and Ban Meh Ki, Chieng Rai to Chieng Sen, Chiangmai Prov., *Rock 1861* (A); SW Prov. Kanchanaburi, Khao Kam Paeng, Tham Tam Lod Nat. Park, Bo Phloi distr., *Shimizu et al. T22067* (L); *T22122* (L); NE Loei prov.: Phu Kradung Nat. Park, *Shimizu et al. T22679* (L); N, Tak, Lansang Nat. Park, *Shiwiat & Nimawong 36* (AAU); Chiangmai, Doi Suthep, *Soradet Singhastit 93* (BKF); N Chiangmai, Doi Chieng Dao, Ploenchit Suvanakoseo 964 (BKF 22590); NE, Loei, Phu Gaching, *Smitinand 1886* (L); Phu Kradung, *Sørensen et al. 2382* (C); Doi Sutep, *Sørensen et al. 5427* (BKF 57248); Doi Sutep, stand 16, *Sørensen et al. 5961*, (BKF, C).

VIETNAM: Tonkin, Ouong Bi, *Balansa 1185* (P); Yen Mai, *Bon 542* (P); Suoi vang - Dalat, *LX-VN 962* (LE); Kontum, Dacuy, Prov. Gia Lai, *LX-VN 2171* (LE); Dalat, *Evrard 1100* (P); Lang Son to Quon Ho, *Lecomte & Finet 9bis, 16, 23* (P); Lang Son to Nuoc Binh, *Lecomte & Finet 376* (P); Fimnon, reg. Dalat, *Lichy 4* (P); Da Chang or Do Chong, Prov. Santay, *Petelot 6203* (A, NY, WA, US); Pagoda of Soc Son, Prov. Phuc Yen, Tonkin, *Petelot 6406* (A, BOG, NY, P, US); Annam, betw. Giang Lo and Dak To, prov. Kontum, *Poillane 18278* (P); Mahou de Langaud, Annam, prov. Haut Donai, *Poillane 21097* (P); Annam, km 123 route no. 12, prov. Haut Donai, *Poillane 21141* (P); Blao, prov. Haut Donai, *Poillane 21879* (P); Tourane, *Poillane 28889* (AAU, P); Dak Gley, Prov. Kontum, *Poillane 32796* (P); Dalat to Tönnnum, *Schmid s.n.* (P); Conbi, *Schmid s.n.*, 21-1-1954 (P); Ban Tring, Darlac N, Phu Khanh prov., *Schmid 719* (P); Long-Tchéou, *Simond 296 bis* (P); Col de Bellevue, *Tixier 3-2-1957* (P); Datria, *Tixier 20-11-1960* (P).

Notes: see also notes under *Dunbaria circinalis*. Thuan (1979) described the *D. podocarpa* inflorescences as 10-12 cm, while these are only 0.5-1.5 cm, apparently a printing error perpetuated in his key. The *Helper* specimens no 82 issued in 1937 by the National

Museum of Prague, determined by K. Biswas as *Dunbaria podocarpa*, and reported from the Calcutta area, are *Dunbaria truncata*. These are possibly from the same population as *Helper 1709* from Tenasserim, and not from Calcutta.

16. *Dunbaria punctata* (Wight & Arn.) Benth.

Fig. 9, p. 52, Map 14a, 14b, 14c, p. 77, 78, 79

in Pl. Jungh. 242 (1852); Merrill, Fl. Manila 254 (1912). Based on: *Dolichos? punctatus* Wight & Arn., Prodr. Fl. Pen. Ind. Or. 1: 247 (1834). Type: *Wight 996* (holo)

Homotypic synonym: *Atylosia punctata* (Wight & Arn.) Dalzell, J. Linn. Soc. Bot. 1: 186 (1873).

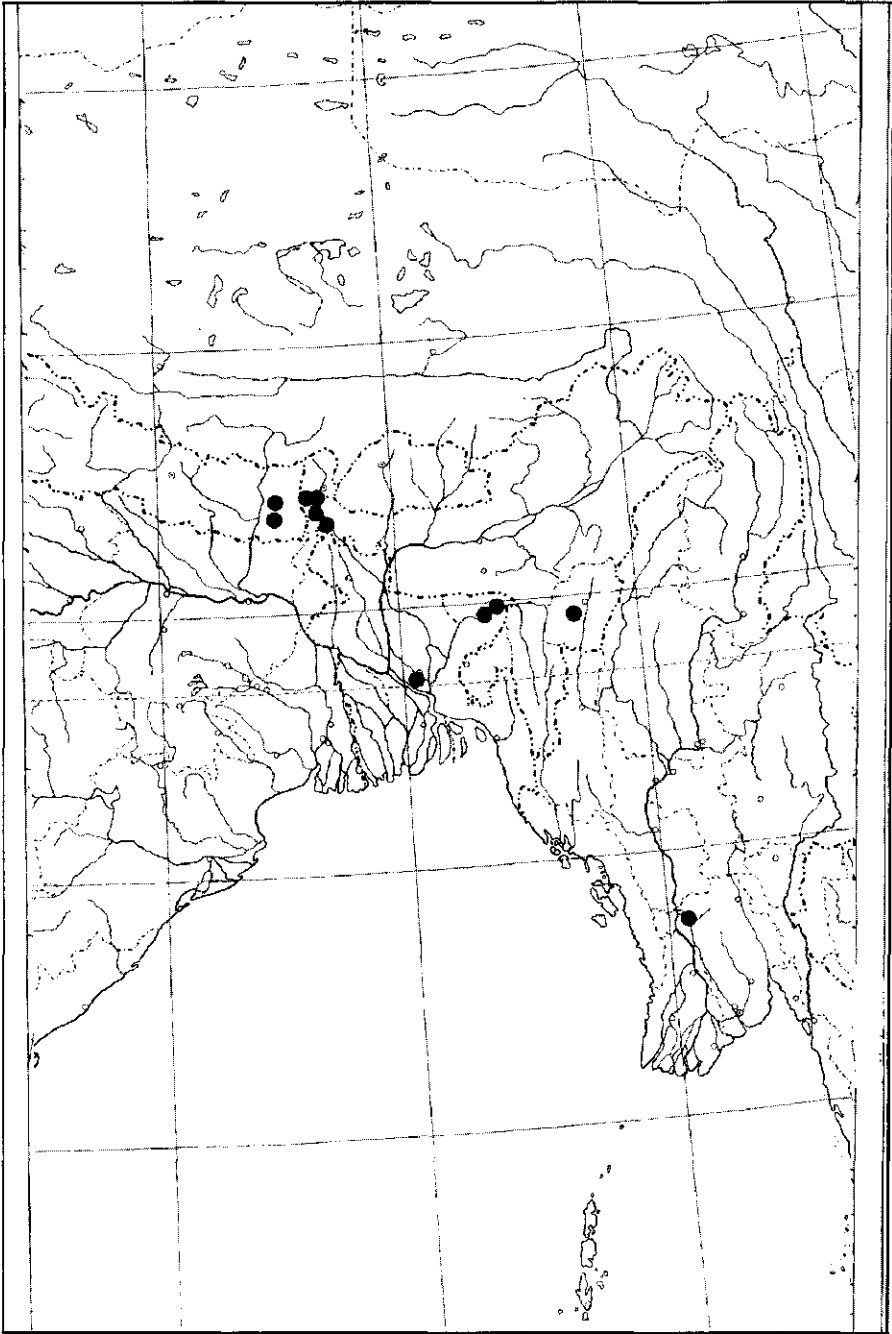
Heterotypic synonyms: *Dunbaria finlaysonianus* Graham ex Wall., Cat. 5565, nomen nudum. Based on *Hb. Finlay s.n.* (K-Wall.).

Dunbaria rotundifolia (Lour.) Merr., Philipp. J. Sci. 15: 242 (1919, publ. 1920); Merrill, Transact. Amer. Philos. Soc. n.s. 24-2: 212 (1935); Backer & Bakh. f. Fl. Java 1: 634 (1963); Huang & Ohashi, Fl. Taiwan 3: 276, 278-279 (1977); Thuan, Fl. Cambodge, Laos, Vietnam 17: 121 (1979); Lee Shukang, Fl. Reip. Pop. Sin. 41: 310-311, 314 (1995). Basionym: *Indigofera rotundifolia* Lour., Fl. Cochinchin. 458 (1790); id. ed. 2: 559 (1793); Wu, C.Y., Index Fl. Yunnan 1: 598 (1984). Type: not conserved. See notes.

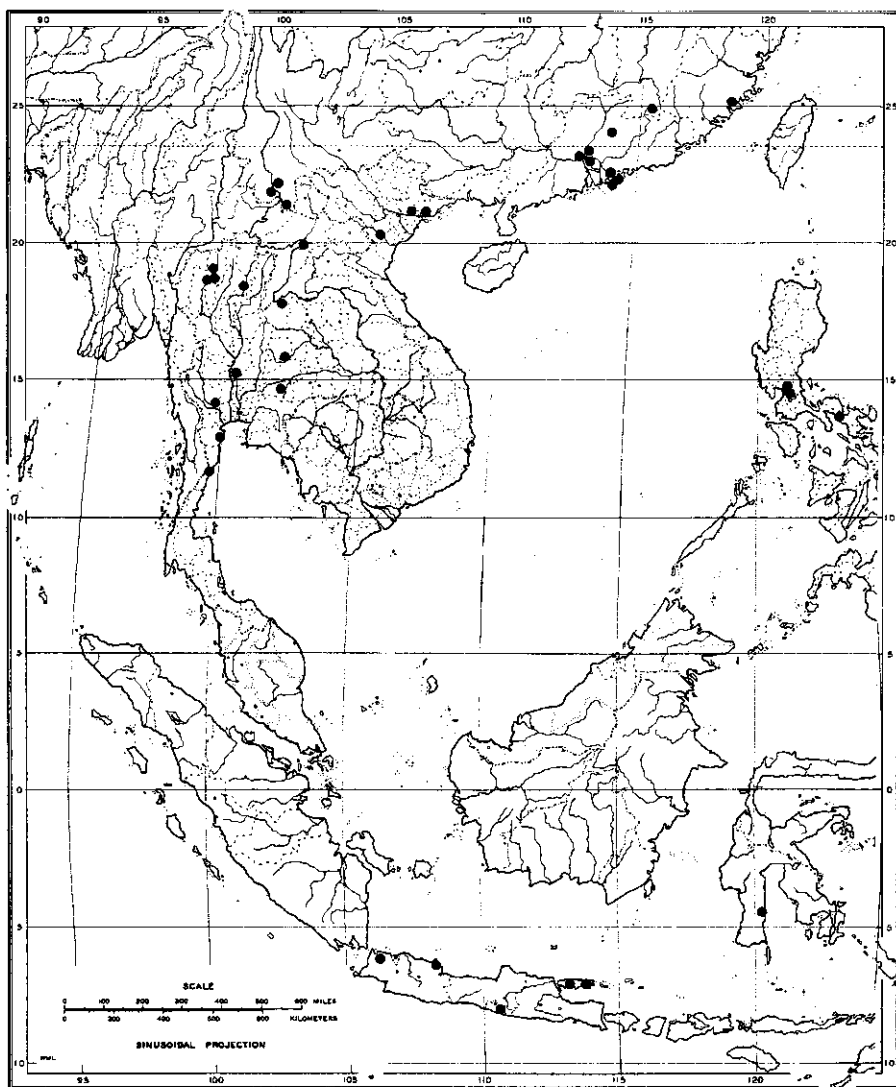
Dolichos? rhynchosoides Miquel, Fl. Ind. Bat. 1: 185 (1855). Type: Java, Surakarta, *Horsfield L 124* (holo: K; iso: K, U).

Dunbaria conspersa Graham ex Benth. in Miquel, Pl. Jungh. 1: 241 (1852), nom. illeg.; Miquel, Fl. Ind. Bat. 1-1: 177 (1855); Bentham, Fl. Austral. 2: 261 (1864); Kurz, J. Asiatic Soc. Bengal 45-2: 255 (1876); Clarke, J. Linn. Soc. 25-1: 17 (1889); Bourne, List Pl. S India 10 (1897); Backer, Voorloper Schoolfl. Java 92 (1908); Craib, Contrib. Fl. Siam, Univ. Aberdeen Stud. 57: 67 (1912); Dunn & Tutcher, Fl. Kwangtung & Hongkong 85 (1912); Koorders, Exk.fl. Java 404 (1912); Boldingh, Zakflora Java 120 (1916); Thuan, Pollen et Spores 15-3/4: 376, 378-379. Type: Bangladesh, Sillet (Sylhet) 1831, *Graham, in Wallich 5542 B* (lecto: K; isolecto: BM, CAL, G, K). Paratype: Burma, Prome Hills, *Wallich 5542 A* (CAL, K).

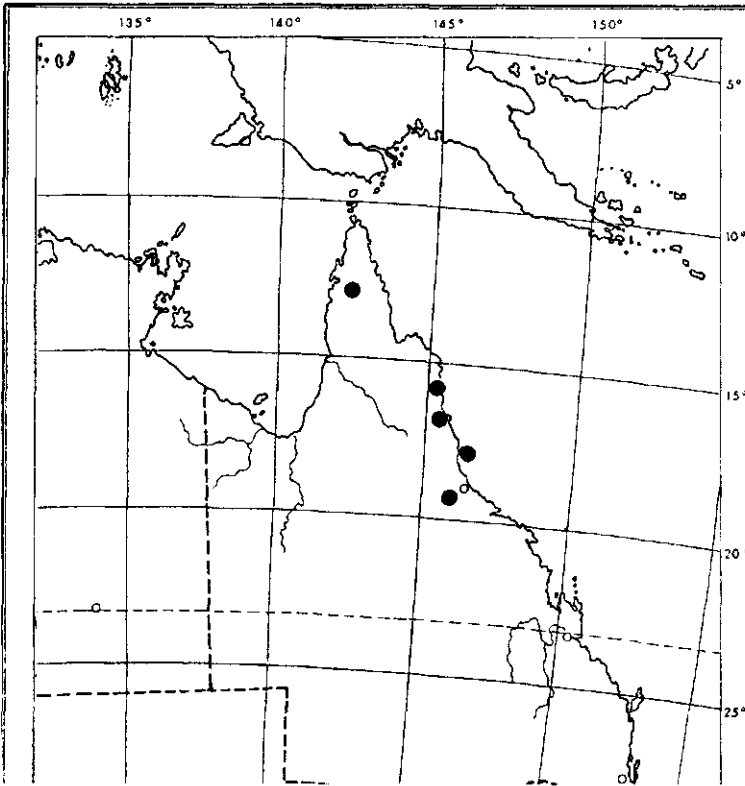
Perennial climber. Stem thin, to 0.5–1 mm diameter, at the base of the plant to 2.5 mm. *Branches* 0.5–2.5 m, ends filiform,



Map 14a. Distribution of *Dunbaria punctata* in the Indian subcontinent and Myanmar/Burma



Map 14b. Distribution of *Dunbaria punctata* in E and SE Asia



Map 14c. Distribution of *Dunbaria punctata* in Queensland, Australia

finely ribbed. *Indumentum* short, grey, dense on veins of lower leaf surface and pod sutures. Vesicular glands conspicuous, orange to red, black when dried. *Stipules* narrow-elliptic, c. 2 mm. *Leaf petiole* striate, canaliculate above, petiole 1–2 cm, rachis 0.5–1 cm. *Leaflets* green above, greyish green below and more densely glandular, top leaflet rhomboid, slightly acuminate, apex obtuse or acute, mucronulate, often as wide as long, sometimes longer than wide, 1–3 (–4.5) cm long, 1–3 (–3.5) cm wide, side leaflets obliquely so, 1.2–2(–3) cm long and wide, petiolules 1 mm, stipellae minute setae, c. 1 mm, hairy. *Pseudoracemes* axillary, sessile to short, peduncle 1–2(–5) mm, pedicel 1–2 mm. *Bracts* minute, narrow-elliptic, c. 1 mm, sometimes quite persistent. *Flowers* 1–3 together. *Corolla* yellow. *Calyx* pubescent, densely glandular, tube 3–4 mm, teeth narrow-elliptic, tip acute, upper teeth connate except at the tip, c. 2

mm, lateral teeth c. 1.5 mm long, lowest tooth 3–4 mm. *Vexillum* rounded, 6–8 mm long and wide; *alae* obovate, c. 6 mm long, c. 2 mm wide, ventral side auriculate near the claw; *keel* boat-shaped, longest dimension c. 6–10 mm, basal suture adnate. *Ovary* c. 3.5 mm long, linear to ovate, whitish silken-hairy, style c. 3–7 mm, base hairy, upper 4 mm glabrous, curved, stigma terminal, oblique. *Stamens* quite persistent, c. 4–7 mm fused, c. 1–4 mm free, tube curved upward, anthers basidorsifix. *Pods* sessile, flat, linear or slightly falcate, (chestnut)brown, 3–4(–6) cm long, 0.6–0.8 (–10) mm wide, valves curling when ripe. *Seeds* (5–)6–8, (irregularly) rounded, 3–4 mm long and wide, 2–2.5 mm thick, light brown to dark red-brown, variegated with black, strophiole divided, prominent, 1 mm thick, 2 mm long, funicle sometimes persistent.

Distribution: Australia: Queensland; Bangladesh; Burma; China: Fujian, Guangdong, Guizhou, Guangxi, Hainan, Hongkong, Jiangxi; Laos; India: Assam, Manipur, Meghalaya, Sikkim, West Bengal, Tamil Nadu; Indonesia; Nepal; Philippines; Thailand; Vietnam.

Ecology: scandent in shrubs and hedges, trailing and climbing in (tall) grasses, fire-influenced open forests, mixed jungle, in open deciduous dipterocarp forest, rarely in ruderal places or along roadsides, sometimes in cultivated fields, on sandy steep slopes on decomposed granite with *Themeda australis* in *Eucalyptus drepanophylla* and *Edichromophloa* woodland. Altitude: 0–300 (–1200 m).

Flowering: Australia: May–July, China: Aug.–Oct., Indian subcontinent and Indo-China: Sept.–Oct. (–Nov.), Indonesia: March–April, Philippines: Sept–Oct.

Fruiting: Australia: May–July, China: Sept.–Oct., Indian subcontinent and Indo-China: Sept.–Nov., Indonesia: April–May, Philippines: Sept.–Oct.

Vernacular names: China: Nodoa, Sai Ngau Kok Tau, Tianxingcao. Vietnam: Jörai: Röbei tökvih, Röbei atau.

Specimens examined:

AUSTRALIA: Dunk island, *McGillivray* 265 (K). Queensland: Cook distr., 12.2 km S of Batavia Downs on the Peninsula Development Rd, *Clarkson & Neldner* 8291 (BRI); Yorkey's Knob Beach, near Cairns, *McKee* 9017 (NSW); Cooktown area rd to Rosseville, Cook distr., *Scarth-Johnson* 1258A (BRI); Inaroo Creek Road nr Mareeba, 14.6 km from junction with Kennedy Highway, *Staples & Pedley* 2446 (BRI).

BANGLADESH: Dhaca (Dacca), *Clarke* 7885 (K); Thavia, Sylhet, *Clarke* 17438A

(BM); Sylhet (Sillet), *Wallich 5542B* (lectotype of *Dunbaria conspersa* Wight & Arn. ex Benth., lecto: K; isolecto: BM, G, K).

BURMA: Prome, *Wallich 5542A* (paratype of *Dunbaria conspersa* Wight & Arn. ex Benth.: G, K).

CAMBODIA: betw. Ton Choum & Sam Rong, foot of Dangrêk massif?, prov. Battambang & Siem Reap, *Poilane 14461* (P).

CHINA: sine loc.: *Beauvais s.n.* (P); Guangdong / Kwangtung: Kwangnan, Honan isl., Poon Ue dt. Lingnan Univ., *Fung Hom A 411 = 18817* (NY); Honam isl. nr Guangzhou (Canton), *Levine 1111* (A, MO, US); Shon Hei Shan, Lin distr., *Levine 3345* (US); Canton?, *McClure CCC7693* (MO); rd from Yentong to the small North Gate of Canton, *Sampson 166* (BM, K); Lieng-Nan, *P.C. Tan 58867* (KUN); Lo Fu Hang, Taai Tsan, Ying Tak, *W.T. Tsang & K.C. Wong CCC 14317* (A); Sai Ip Ye Wong Tau, Tung Koo Shan, Tapu distr, *W.T. Tsang 21722* (BM, BO, GH, K, NY, P, S, Z); Guangzhou, *H.G. Yip 500* (BM). Fukien prov.: Hingwa & vicinity, *Metcalf 6524* (MO). Guangxi / Kwangsi: Bako Shan, W Poseh, *R.C. Ching 7553* (A, NY, W); Lungchow, *Morse 358* (NY); Po Yam Shan, along Guangdong border, nr Tai Chung village, Sun-To distr., *W.T. Tsang 22934* (A, P). Guizhou / Kweichow: Yoa-ren-shan, Sankoa, *Anon. 6277* (A). Hainan prov.: Ad Hoi Low, *Bullock 1216* (BM). Hongkong: *Anon. s.n.* (RNG); N.T. Univ. Campus, *K.Y. Chan 017* (P); N.T. Kadoorie Farm, *K.Y. Chan 120* (P); without location, *Hance 1316* (BM, GH, K); Pond village, Taipo, New Territories, *S.H. Hu 5718* (US); Deep Bay, *S.H. Hu 5794* (K, US); Chung Chi College, *S.H. Hu 12145* (K, US); waste place, Victoria, *Lamont 186* (BM); Campus Univ. of Hongkong, *J.P.W. Woo & T.K. Woo 928* (P). Jiangxi / Kiangsi prov.: Sai Hang Cheung, nr Tung Lei village, Kiennan distr., *S.K. Lau 4339* (BM, G, GH, S, US); Xunwu xian, *J.S. Yue 2201* (KUN); Yunnan prov.: Simao, *K.D. Chen & L.H. Zhang 16-11-1985* (KUN); Mong-la, Xishuangbanna, *H.W. Li 59-13486* (KUN); Chinghong, Xishuangbanna, *Mao Ping Yi C. 7442* (KUN).

INDIA: Assam: *Beddome 2296* (Assam?) (Z); *Bentham 1849* (G); *Masters 10* (K); *Erik Wall 416*, dd. 1926 (S). Upper Assam, *Jenkins s.n.* (BO, GH, K, L). Kerala: Quilon, *Wight 765* pp. (K). Manipur (Muneypoor): Laimetak, *Clarke 42147* (K); Noongha, *Clarke 42240* (BM). Meghalaya: Theria, Khasi hills, *Clarke 44993 A, C* (G); Khasia, *King's collectors s.n.* (DD). Tamil Nadu: Anaimalai hills, *Beddome s.n.* (BM)(check). Sikkim: Sikkim Terai, Sukna, *Clarke 36641* (K), Sukna, *Clarke 36654 B* (G) *36654 D* (BM), *36654A* (LE). West Bengal: Balasun, Darjeeling Terai, *Clarke 36579* (BM, G, K, US); 16 km W of Jalpaiguri, nr concrete elephant, *van der Maesen 4900* (ICRISAT, WAG).

INDONESIA: Java: betw. Jogjakarta & Wonosari, *Backer 2523* (BO, L); Surakarta, *Horsfield L 124* (BM, K, U); Indramayu, forest area Plosokerep nr Ferisi station, *van Steenis 8166b* (L); Cikoya to Cikandi, *Zollinger 1198* (G, P). Madura: N coast, SW of Ketapang, *Backer 19961* (L); W of Sumenep, *Backer 20927* (K). Sulawesi: SW Sulawesi, Malino, *Bünnemeyer W 10759* (BO, L); Dago, *Holstvoogd 387* (L); S Sulawesi, Bone, Tempe plain, *Monod de Froideville 102* (BO, L).

LAOS: Louang Prabang aerodrome, *Tixier s.n.* (P).

NEPAL: Dhara Pana - Tambur bridge, *Hara et al. 6301700* (BM); Dhankuta, *Hara et al. 6301701* (BM).

PHILIPPINES: Luzon: Pasig boulevard, Rizal prov., *Mendoza 4201* (A); Manila & vicinity, *Merrill 8039* (P, US); Malapad na Bato, Rizal prov., *Ramos 433* (BM, G, K, L, M, LY, U, US, Z).

TAIWAN: Higashita nr Kizan, pref. Takao, *Hosokawa 3206* (NY); Kyukyukudo

nr Takao, *Hosokawa 3208* (NY); Chia hsien, Kaohsiung county, *T.C. Huang & W.Y. Huang 14502* (NY).

THAILAND: Pak Thong Chai, Sakaerat forest reserve, along Huai Krae stream, *van Beusekom & Charoenpol 1994* (AAU, E, K, L); Den Chai (Prae), *Franck 204* (US, C); Base of Doi Sutep, *Kerr 1483, 1483B* (AAU, BM, BO, C, E, K, L, P, TCD); Hua Hin, Prachuap, *Kerr 13447* (BM, K, TCD); 15 km NE Chaiyaphum, *Larsen 31844* (AAU); Ban Takli, *Marchan 1058* (BM, C); Hua Hin, *Marchan 2252* (AAU, BM, C, E, K); Doi Sutep Nat. Park, S side nr Mae Heeyah stream above Mae Heeyah Nai village, *Maxwell 89-1422* (L); NE Loei, Wangsaphung, *Smitinand 3066* (L).

VIETNAM: Ouong Bi, *Balansa 1186* (G, P); Tu Phap, *Balansa 2267* (P); Hau Bon (Cheo Reo), Dac Lac, *Dournes s.n.* (P); Dao men Rung, Mt Pursat, *Godefroy 460* (K); Ho Chi Minh Ville (Saigon), *Lefèvre 265* (P); Tonkin, Sept Pagodes, *Sergent Mouret 46* (P); Cho Ganh, *Petelot 1141* (C, P, US); Cap St. Jacques, *Poilane 563* (P); Pho Van - Van Ly, 8 km SE of Pho Van, *Schultze-Kraft et al. 22025* (CIAT, WAG); Tonkin, Long Tchéou, *Simond 296bis* (P); sine loc., *Thorel 716* (LY, P).

Notes: For the time being I reject Merrill's decision to apply the epithet *rotundifolia* to the species earlier generally known as *Dunbaria conspersa*. Loureiro's protologue of *Indigofera rotundifolia*, whence the name came, described a two-seeded pod, pointing more to a *Rhynchosia*. Merrill (1935) stated that no other legume species fitted Loureiro's description but for the *Dunbaria conspersa* with more than two seeds. Loureiro's specimen is not preserved, Merrill (1920, 1935) nor Wu (1940), nor Thuan (1979) have seen it either. Wu adopted *D. conspersa*, Thuan settled for *D. rotundifolia*. The similarity between Loureiro's vernacular "o tam sin" and *Levine 1111* "chin tang" need not be decisive, it is likely that small twining *Dunbaria* and *Rhynchosia* species receive similar vernacular names. "Chin tang" means green vine, in the Guangdong area more often applied to *Sinomenium acutum* (Thunb.) Rehder & Wilson, Menispermaceae (T.L. Wu, pers. comm.), so this vernacular is obviously of quite general application. Loureiro nor Merrill (1955) mentioned *Rhynchosia minima* (L.) DC., a species which is not recorded from Kwangtung (now Guangdong), where Loureiro's material came from, or its basionym *Dolichos minimus* L. That species has the general facies of *Dunbaria punctata*, and would fit Loureiro's description better. Rather than neotypifying Loureiro's *Indigofera rotundifolia* with a specimen of a species not well fitting the short description, I prefer to apply the next oldest epithet used by Wight and Arnott: *punctata*, listed as *Dolichos? punctatus*. When Bentham made the combination *Dunbaria punctatus*, he did not see material of the Indian *Dolichos punctata* of Wight and Arnott ("mihi ignota"), and applied Graham's nomen nudum *Dolichos conspersus* (Wallich

5542, 1831-32) for the species. As a basionym the validly published epitheton *punctata* is the correct choice. The type specimen Wight 996, however, remains mysteriously untraceable.

The identity of Loureiro's *Indigofera rotundifolia* also remains a problem. In Guangdong 20 species of *Indigofera* are listed (Tropicos database based on information by Te-Chao Che and Te-Lin Wu), and one of these may fit Loureiro's description. Loureiro mentioned that the species resembled *Indigofera procumbens* L. from the Cape of Good Hope, but that species has long pseudoracemes with many flowers and rhomboid rather than rotundate leaflets. The yellow flowers of Loureiro's plant may also point to another genus: most *Indigofera* species have purple or pink flowers. Craib (1913) judged from the description that *I. rotundifolia* probably does not belong to *Indigofera*. I verified the four 3-5-foliolate *Indigofera*'s from China cf. Craib: all have more than two seeds. Loureiro must have known *Indigofera* quite well as a genus, as it was established at his time.

Uses: In Jiangxi, China, the whole plant is used to treat snake bites (Yue 2201).

17. *Dunbaria rubella* Span. ex Miquel

Fig. 14, p. 84, Map 15, p. 85

Miquel, Fl. Ind. Bat. 1-1: 178 (1855); Backer, Beknopte Fl. Java (war edition) 5: 139 (1941); Backer, F. Java 1: 635 (1963). Type: Indonesia, Java, Spanoghe, Icon. ined. pl. jav. no. 10, c. 1836 (holo: L).

Perennial climber. Branches to 3 m, up to 3–4 mm in diameter, faintly grooved, branched. *Indumentum* short on branches, absent to very sparse and short on leaves, dense short grey and few long golden hairs on calyx, pods densely so. *Stipules* caducous, leaving a rim of 2–3 mm. *Leaf petiole* slender, ribbed, glandular-dotted and short-pubescent, 2.5–8 cm, rachis 1–2.5 cm. *Leaflets* membranous, dark green above, glabrous to laxly short-bristly, rough to the touch, hardly glandular, light green below, mainly on the veins sparsely pubescent, red glandular dots abundant; top leaflet ovate, 6–16 cm long, 3.5–8.5 cm wide, apex acute, hardly acuminate at the very tip, with a small mucro, base truncate; side leaflets obli-

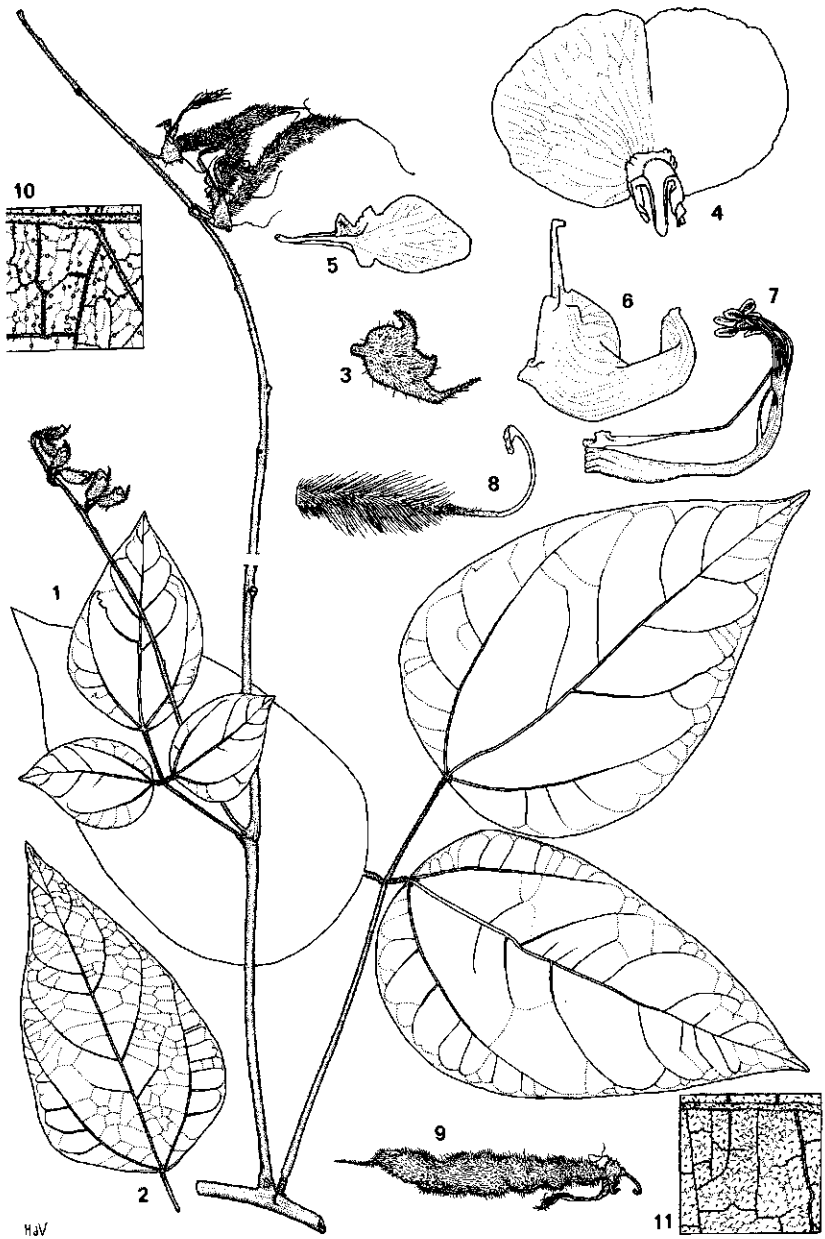
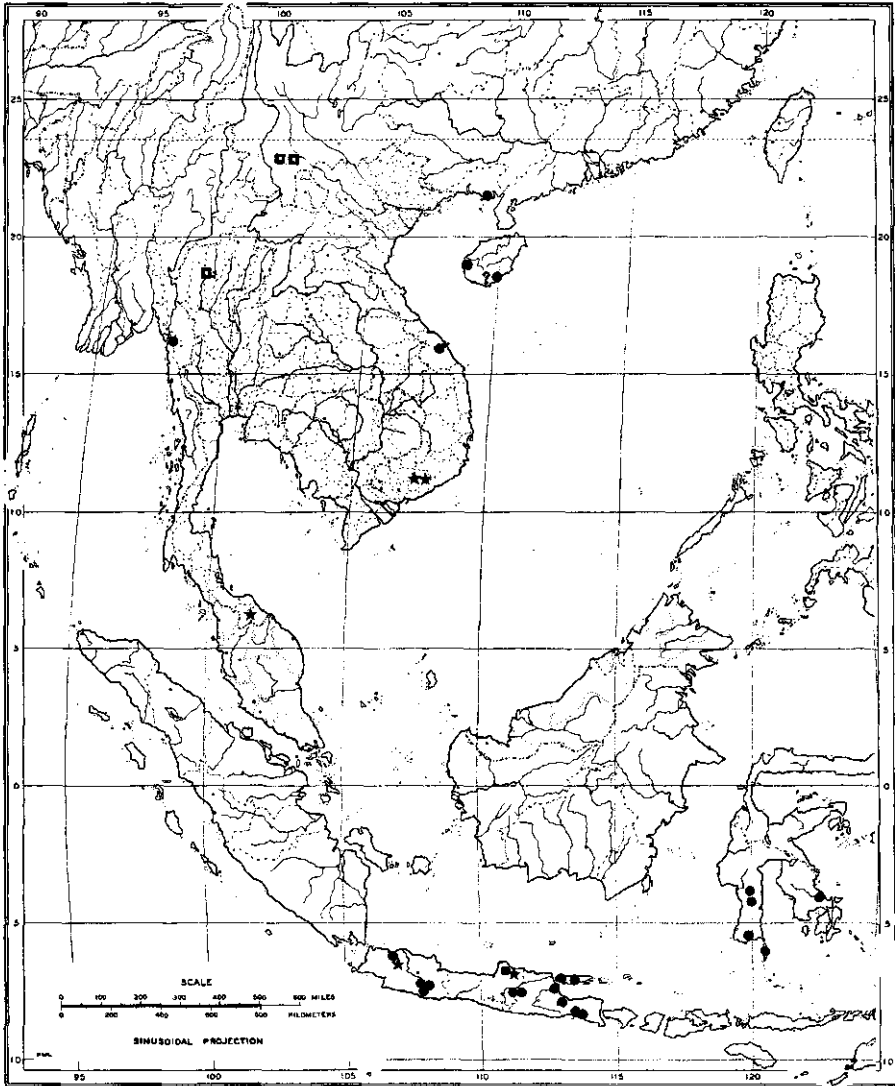


Fig. 14. *Dunbaria rubella* 1. habit with flower buds and young pods, 0.66 X; 2. lower leaflet surface, 0.66 X; 3. calyx, 2 X; 4. flag, 2 X; 5. wing, 2 X; 6. keel, 2 X; 7. staminal tube, 2 X; 8. pistil, 2 X; 9. pod, 0.66 X; 10. detail of lower leaflet surface, 4 X; 11. detail of upper leaflet surface, 4 X. — 1, 3-11: *Soegandiredja* 256, 2: *Sangkhachand et al.* 1523 (BKF 72881). Drawn by Mr. H. de Vries.



Map 15. Distribution of *Dunbaria rubella* (★), *D. trichodon* (□) and *D. truncata* (●)

quely so, 5–11 cm long, 2.5–7 cm wide; petiolules 2–4 mm, hairy; stipellae less than 1 mm. *Pseudoracemes* lax, simple, 16–32 cm, flowers 10 or more, 1–2 per node. *Bracts* ovate-acuminate, short-hairy, glandular, caducous, c. 4 mm long, 1–2 mm wide; pedicels 4–8 mm. *Mature flower buds* falcate. *Corolla* yellow, flag dark yellow veined red. *Calyx* densely short-grey and laxly golden long-pubescent, "bumped" above, tube to 5 mm, upper teeth connate or almost so, 2–3 mm, lateral teeth triangular, 2–3 mm, lower tooth narrow-elliptic, 6–8 mm long. *Vexillum* rotundate-falcate, c. 12–20 mm long and wide, apex emarginate, clawed, auricled at the base, two callosities almost touching each other; *alae* obovate, c. 10 mm long, 3–4 mm wide, one dorsal and one ventral auricle 1 mm; *keel* circinnato-rostrate, longest dimension 12(-20?) mm, 6 mm wide, pouched near claw, ventrally adnate. *Ovary* linear, c. 5 mm, densely yellow-pubescent, glandular dots orange, 5–6 ovules, style c. 11 mm, stigma terminal, hooked. *Stamens* tube c. 8 mm, free part c. 8 mm, upcurved, anthers dorsi- to basidorsifix. *Pods* slightly falcate, golden brown hairs and short grey pubescence underneath, sessile, 6–8 cm (not fully mature), tipped with 1–2 cm style. *Seeds* c. 5, immature.

Distribution: Indonesia, Thailand, Vietnam.

Ecology: in forest and thickets, on clay soil. Altitude: low, 150 m.

Flowering: Apr.–May (Indonesia), Dec.–Jan. (Vietnam).

Fruiting: May–June (Indonesia), Jan., Feb. (Vietnam).

Vernacular names: Rawehah mè (Java)

Specimens examined:

INDONESIA: Java: Depok c. 20 km N of Bogor, *Backer* 22109 (BO, L); Depok., *Soegandiredja* 256 (BO, L); Japara, Java, *Teysmann s.n.* (BO).

THAILAND: Peninsula, Yala Prov. *Sangkhachand et al.* 1523 (BKF).

VIETNAM: km 152 on Route 20 from Ho Chi Minh City (Saigon) few km from Haut-Donai Prov. limits, *Poilane* 23357 (P); Foret de Blao, *Schmid* 3-12-1960 (P).

Notes: Quite easily mistaken for the sometimes very similar *Cajanus goensis*. *Dunbaria rubella* has smaller flower bracts, shorter lateral calyx teeth, a circinnato-rostrate keel longer than the wings, much thinner leaf indumentum, very conspicuous glands on the leaves, and flat pods.

The type is Spanoghe's unissued Icones no 10 (completed by c. 1836) on which Miquel based his protologue. His description lacks the typical spirally twisted keel, otherwise the description offers

enough differences with *Cajanus goensis* Dalzell, the species so similar. I have not seen ripe pods, but the twisted keel is a character available in some *Dunbaria* species. The illustration, however, is much more like *Cajanus goensis*. The stipellae, impressions on the pod, "bad representation of the tube of the stamens" (as noted in the legend by a hand unknown) and of the keel are not typical for the sheets Backer identified. As in the water painting *Cajanus goensis* also has rarely orange-yellow flowers, whereas *D. rubella* (Backer 22109) has yellow flowers. *D. rubella* alae are much smaller than the keel, in *C. goensis* they are similar in size, as already Backer (1941, 1963) remarked. *D. rubella*'s indumentum is short and sparse, absent on upper leaf surface, in *C. goensis* short and more dense, present on upper leaf surface. Neotypification is not called for, even if the type, as a painting, is rather atypical. I concur with Backer's concept of the species, and as the protologue is applicable, this rare species should maintain its name.

18. *Dunbaria trichodon* (Dunn) Maesen comb. nov.

Fig. 15, p. 88, Map 15, p. 85

Basionym: *Atylosia trichodon* Dunn, J. Linn. Soc. Bot. 35: 491 (1903); van der Maesen, Agric. Univ. Wageningen Papers 85-4: 213 (1986). Type: China, Yunnan, Szemao W Mts, A. Henry 12474 (K, holo; iso: E, NY).

Perennial climber. Branches finely ribbed, to at least 2 mm diameter. *Indumentum* greyish, sparse, more dense on ribs and leaf veins, vesicular glands brown. *Stipules* narrow-elliptic, quite persistent, up to 7 mm long and 1–2 mm wide. *Leaf petiole* striate, canaliculate above, petiole 3–5 cm, rachis 0.7–1.5 cm. *Leaflets* membranous, dark green above; olive-green and gland-dotted above; top leaflet ovate, long-acuminate, 5–8 cm long, 3–4 cm wide, apex narrow, base cuneate; side leaflets obliquely so, 3.5–5 cm long, 2–3 cm wide; petiolules c. 2 mm, stipellae minute, caducous. *Pseudoracemes* 5–20 cm, very lax, 5–9-flowered, 1 or 2 flowers per node. *Bracts* ovate to narrow-elliptic, hairy, veined, up to 10 mm long, 3–4 mm wide, apex with 1–3 teeth. *Flowers* with yellow *corolla*, red veined. *Calyx* tube narrow, c. 4 mm long, teeth narrow-acuminate, upper teeth connate except near the tip, 5–6 mm, lateral teeth c. 5 mm, lower tooth c. 7 mm. *Vexillum* broad-rotundate, apex

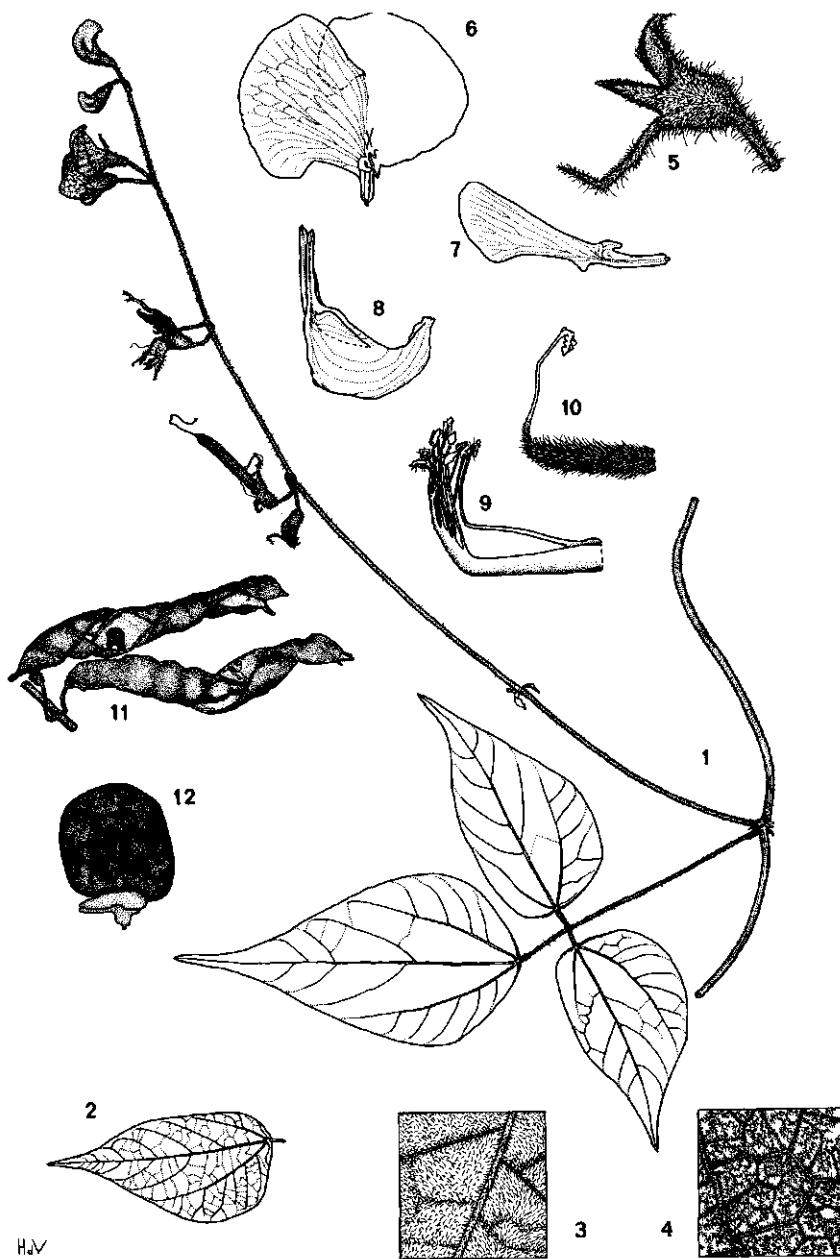


Fig. 15. *Dunbaria trichodon* 1. branch with inflorescence, 0.66 X; 2. leaflet from below, 0.66 X; 3. detail of upper leaflet side, 4 X; 4. detail of lower leaflet side, 4 X; 5. calyx, 2 X; 6. flag, 2 X; 7. wing, 3 X; 8. keel, 2 X; 9. staminal tube, 2 X; 10. pistil, 2 X; 11. pods, 0.66 X; 12. seed, 4 X. — 1-4: A. Henry 12474, 5-10: Kerr 2289, 11 & 12: A. Henry 12474A. Drawn by Mr. H. de Vries.

emarginate and folded outside plane, c. 12 mm long, 14 mm wide, base clawed, biauriculate, no callosities; *alae* obovate, 12 mm long, 4 mm wide, long-clawed, 4 mm, one auricle both margins; *keel* strongly curved, rostrate but not circinnate, longest dimension c. 13 mm, base clawed, 5 mm. *Ovary* linear, c. 8 mm, yellow-glandular and white-hairy, style c. 8 mm, glabrous except near the ovary, upper 4 mm thickened, stigma terminal, oblique. *Stamens* 14–16 mm, upper 3–7 mm free and upcurved, anthers basidorsifix. *Pods* linear, sessile, c. 7 cm long, c. 9 mm wide, softly pubescent, with 10–12 seeds. *Seeds* squarish-rounded: truncate near hilum, rounded other end, c. 4 mm long and wide, 3 mm thick, red-brown with black variegation, strophiole divided, 2 mm long, 1 mm wide.

Distribution: Yunnan-China, Thailand.

Ecology: evergreen jungle, climbing in undergrowth. Altitude: c. 1600 m.

Flowering: Dec. in Thailand.

Fruiting: Oct.–Nov. in Yunnan.

Specimens examined:

CHINA: Yunnan: Szemao W Mts, 5000 ft, A. Henry 12474 (K, holo; iso: E); Szemao E Mts, 5000 ft, Henry 12474A (K, US).

THAILAND: Doi Sutep, 5000 ft, Kerr 2289 (BM, K).

Notes: I designated the Kew specimen of *Henry 12474* as holotype, because both flowers and some juvenile pods are present. The fruiting specimens *Henry 12474A* (apparently collected later) from the Szemao E Mts do not form part of the type material but are completely identical. The unsharp depressions on the pods made me decide to transfer this species to *Dunbaria* (van der Maesen 1986). *Dunbaria trichodon* appears very little collected, and is almost only known from the protologue.

19. *Dunbaria truncata* (Miquel) Maesen comb. nov.

Fig. 16, p. 90, Map 15, p. 85

Basionym: *Dolichos truncatus* Miquel, Fl. Ind. Bat. 1-1: 186 (1855).

Type: Indonesia, Java, nr Prowoto in Demak area, *Horsfield s.n.* (holo: BM, iso: K, U).

Heterotypic synonyms: *Dunbaria henryi* Y.C. Wu, Engl. bot.

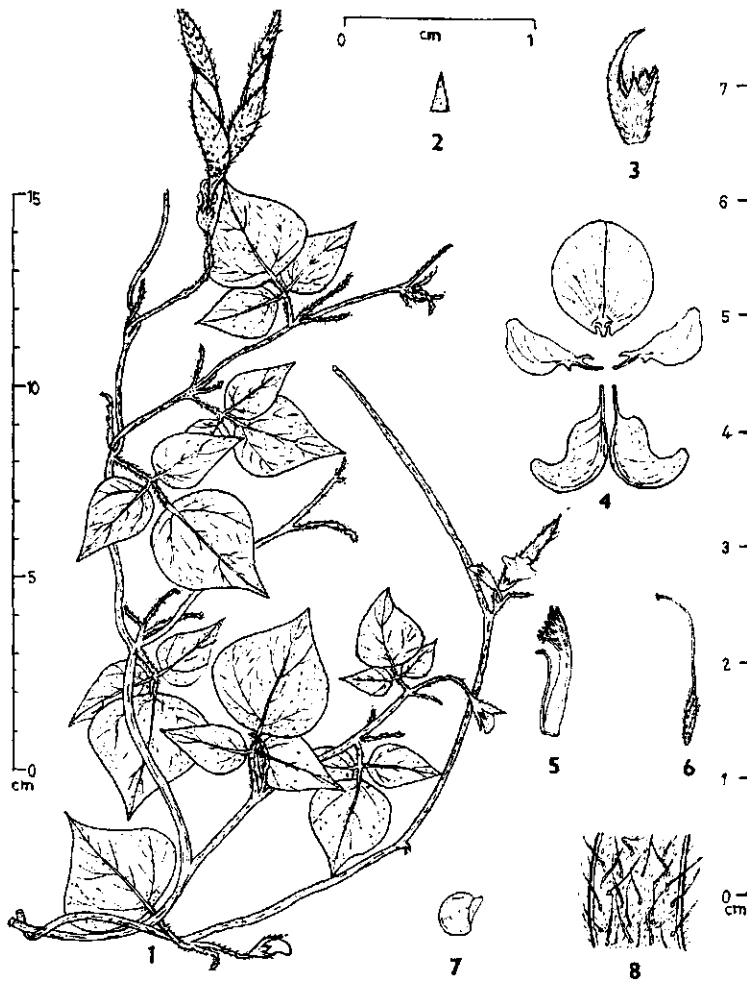


Fig. 16. *Dunbaria truncata* 1. habit, enlargements see bar; 2. stipule; 3. calyx; 4. flag; wings, and spread-out keel; 5. staminal tube; 6. pistil; 9. surface of pod, showing bulbous-based as well as simple hairs. – 1-9: Meebold 16757? Source: Journal of Japanese Botany 12:364 (1983) (as *D. burmanica* Thoth. & Satyanar.) reproduced by permission.

Jahrb. 71: 183 (1940); Lee Shukang, Fl. Reip. Pop. Sin. 41: 313-314 (1995). Type: China, Hainan, Aug. Henry 8029 (lecto: K, iso: G). Paratype: Vietnam, Tourane & vicinity, J. & M.S. Clemens 3191 (BM, C, G, MO, P, U, US, W).

Dunbaria burmanica Thoth. & P. Satyanat., J. Jap. Bot. 58-12:

363 (1983). Type: Burma, Moulmein, *Meebold 16757* (holo: CAL, not seen; iso: S). Paratypes: Burma, Tenasserim and Andamans, *Helper 1709* (CAL, not seen); Moulmein *Cole, Falconer 579 & 565* (CAL, not seen); "Bengalia circa Calcuttam", wrong label for *Helper 157* (CAL, not seen).

Perennial climber, 1 – several m. *Branches* up to 3 mm diameter, thin and twining at the end. *Indumentum* sparse, thinly short-pubescent, on young parts, leaf veins and pods, pods moreover with, sometimes without, thin long hairs. *Stipules* triangular to narrow-elliptic, thinly pubescent, 1–2 mm. *Leaf petiole* striate, grooved above, petiole (1–)2–3(–5.5) cm, rachis (0.5–)1–1.5(–3) cm. *Leaflets*: top leaflet triangular to ovate, acuminate, 1.5–4(–7) cm long, 2–5(–8) cm wide, base truncate to broad-cuneate or rounded, apex acuminate, tip obtuse with a small mucro (acute in India and Burma), rarely with 1–2 lateral acute lobes, side leaflets obliquely so, 1.2–3(–5) cm long, 1.3–2.7(–5) cm wide, petiolules 1–2(–5) mm stipellae setaceous, c. 1 mm, very caducous. *Pseudoracemes* short to medium, 1–2 per leaf axil, sometimes branched once, 2–10 cm, 4–6(–12) flowers. *Bracts* ovate, c. 2 mm long, hairy outside, caducous. *Corolla* yellow, persistent for some time. *Calyx* pubescent, interior glabrescent, tube c. 5 mm, teeth narrow-triangular, upper teeth connate, or incised at the top, c. 4 mm; lateral teeth c. 3–4 mm, lower tooth narrow-elliptic, 6–7 mm. *Vexillum* rotundate to reniform, 12–16(–18) mm long and wide, clawed, auricles pointed, reinforced, a narrow crest near the base, apex clearly emarginate; *alae* narrow-obovate, c. 12–14 mm long, 4–4.5 mm wide, ventral side with 1 prominent auricle, basal side 1 faint bulge in the margin; *keel* circinnato-rostrate, longest dimension 12–17 mm, claw 6 mm, basal suture adnate. *Ovary* short- or long grey-pubescent, c. 4–6 mm, with yellow glands, style 16 mm, basal 4–9 mm hairy, distal 5 mm flattened, stigma terminal, oblique. *Stamens* c. 15–20 mm, curved upwards in the middle, upper 7–8 mm free, anthers basidorsifix. *Pods* stipitate, broad-falcate, 4.5–6.5 cm long, 0.7–1.0 cm wide, stipe 5–10(–12) mm, dark brown to black, orange-glandular, short grey-pubescent and with (Indonesia) or without (Celebes, Hainan) long golden hairs. *Seeds* (5–)6–9(–10), squarish-rounded, black, c. 4.5 mm long and wide, 3 mm thick, strophiole narrow, around the hilum but divided with age.

Distribution: Burma, China, Indonesia, Papua New Guinea.

Ecology: in thickets and secondary forest, near rivers, along roadsides. Altitude: 0-850 m.

Flowering: Indonesia: Nov.–Feb., May, June. Vietnam: May–June.

Fruiting: Indonesia: Nov., Jan.–May. Vietnam: May–June.

Vernacular names: Madura: Kacoliping, Java: Kachangan.

Specimens examined:

BURMA: Moulmelyn, *Griffith 99* (K); as "Bengal circ. Calcuttam", *Helper 82* (A, BM, BR, C, E, G, L, P, S, US); Tenasserim, *Helper E.I.C. 1709* (paratype of *D. burmanica* Thoth. & P. Satyanat.: K, P, W).

CHINA: Hainan prov.: Dongfang, Guangba, *S.H. Chun 11171* (KUN); Yaichow, *N.K. Chun & C.L. Tso 44506* (K); Linshuixian, Nanqiao, *L. Deng 2564* (KUN); Hainan, *Henry 8029* (lectotype of *D. henryi*: K, iso: G); Hainan, *Henry 8692* (K).

INDONESIA: Java: Garut to Cipanas, Priangan, *Backer 5174* (B, BO, WAG); Garut to Waspada, *Backer 5301* (BO, L); Ngawi, Madiun resid., *Backer 6661* (BO, K, L); Pasuruan to Banjil, *Backer 7568* (BO, L); E of Wanaradja, Priangan, *Backer 32910* (BO, L); Sentiong, Jakarta, *Backer 32915* (BO, K, L); *32917* (BO, L); *34608* (BO, L); foot of Gunung Watangan, Gunung Puger, *Backer 37029* (L, U); Surabaya, riverside, *van Dorgelo 1623* (L); Kendeng Trinil, Madiun resid., *Elbert 386* (L); Prowoto nr Demak, *Horsfield s.n.* (holo: BM; iso: K, U); Java sine loc., *Horsfield 118* (K); Pangencongan, Priangan, *Koorders 26602β* (BO, L, U); Gunung Guntur, *Ridley s.n.* (BM, K); sine loc., *Zollinger II no. 3027?* (BM, K). Madura: Pecudan, *Anon. 1811 H.B.* (L); Bangkalan, *Backer 19038* (BO, L). Sulawesi (Celebes): Saleyer isl., *Docters van Leeuwen 1692* (BO, U); Sideureng to Kapang, S of Kapang nr bridge on Pucuk river, *Eyma 331* (L); Puhara, distr. Kendari, *Kjellberg 708* (BO, S); Eurekang, *Kjellberg 4096* (BO, S); Citta, S Sulawesi, *Monod de Froideville 93* (L); Bisapu, nr Bonthim, *Monod de Froideville 298* (L); Kalosi, *Monod de Froideville 442* (L).

PAPUA NEW GUINEA: Lolorua, *Carr 11508* (BO, L).

VIETNAM: Tourane & vicinity, *J. & M.S. Clemens 3191* (paratype *D. henryi* Wu (BM, C, G, MO, NY, P, U, US, W)).

Notes: *Dolichos truncatus* Miquel was put into synonymy with *Dunbaria circinalis* (Benth.) Bak. by Backer (1963), apparently not earlier, but the name had been considered a synonym a long time as herbarium labels prove. Now the major part of the Indonesian and Burmese specimens earlier considered *D. circinalis* are judged to constitute a separate taxon, the next oldest available epithet is *truncata*. *Dunbaria henryi* Wu also belongs to *D. truncata*. Wu described *Dunbaria henryi* as near to *D. villosa*, because of the medium-length inflorescence and near to *D. podocarpa* for the long-stipitate pod. The difference with *D. circinalis* should be that no more than 3–4 flowers are produced by *D. henryi*, and pods are not yellow-hispid and long-hairy but just pubescent. *D. henryi* has broad-ovate deltoid leaflets as in *D. truncatus*. The broad, 8–10-seeded

Pods with yellow bulbous-based hairs on otherwise glabrous or very short-hairy surface, and the rather short usually branched inflorescences separate this species from the Indochinese and East Indian *D. circinalis*. The Burmese populations are very close to *D. podocarpa*, but differ by the short (not almost sessile) inflorescences and the caducous bulbous-based long hairs where *podocarpa* has short hairs more or less densely distributed on the pods. The leaflets are less manifestly truncate than the Indonesian and Hainan specimens. See also notes under *podocarpa* and *circinalis*.

20. *Dunbaria villosa* (Thunb. ex Murray) Makino

Fig. 17, p. 94, Map 16, p. 95

Makino, Bot. Mag. Tokyo 16: 35 (1902); Wu, Y.C., Engl. Bot. Jahrb. 71: 184 (1940); Wang & Tang, Illustr. treatm. princip. pl. China. Legumin. 688 (1955); Steward, Manual Vasc. Pl. Lower Yangtze Valley: 197 (1958); Ohwi, Fl. Japan 567 (1965); Walker, Fl. Okinawa & S Ryukyu Isl. 591 (1976); Wu, C.Y., Index Fl. Yunnan 1: 598 (1984); Lee Shukang, Fl. Reip. Pop. Sin. 41: 311-312, 314 (1995). Basionym: *Glycine villosa* Thunb. ex Murray, Syst. Veg. ed.14: 659 (May-June 1784), Thunberg, Fl. Japan 283 (Aug. 1784); Willd., Sp. Pl. ed. 4, 3: 1056 (1802); Persoon, Syn. Pl. 2: 300 (1807); DC., Prodr. 2: 242 (1825); Sprenger, Syst. Veg. 3: 198 (1826); Type: Japonia, *Thunberg 16826* (holo: UPS, microfiche available)

Heterotypic synonyms: *Atylosia subrhombea* Miquel, Ann. Mus. Bot. Lugd.-Bat. 3: 51 (1867); and Prol. Fl. Jap. 60 (1866-67); Franchet & Savatier, Enum. Fl. Jap. 1: 112 (1875) and 2: 237 (1879); Kanitz, Anthoph. Jap. 31 (1878). Lectotype: Japan, nr Nagasaki, *Oldham 371* (lecto: L; isolecto: A, G, K, S, W, *lectotypus novus* here designated). Paratypes: Japan, Nagasaki, *Pierot s.n.* (L); Japan, *von Siebold s.n.* (paratypes of *Atylosia subrhombea* Miquel, L); Japan, *Buerger s.n.* (K, L); Japan, *Mohnike s.n.* (L).

Dunbaria subrhombea (Miquel) Hemsley, J. Bot. 207 (1876). Basionym: *Atylosia subrhombea* Miquel, Ann. Mus. Bot. Lugd.-Bat. 3: 51 (1867); Gagnepain, Fl. Gén. Indo-Chine 2: 285 (1916); Craib, Fl. Siam. Enum. 1-3: 463 (1928); Thuan, Pollen et Spores 15-3/4: 380-381 (1973); Thuan, Fl. Cambodge, Laos, Viet-nam 17: 116 (1979). *Atylosia villosa* Maxim. non Benth. ex Bak., Mém. Biol. St. Petersbourg 9: 69 (1877).

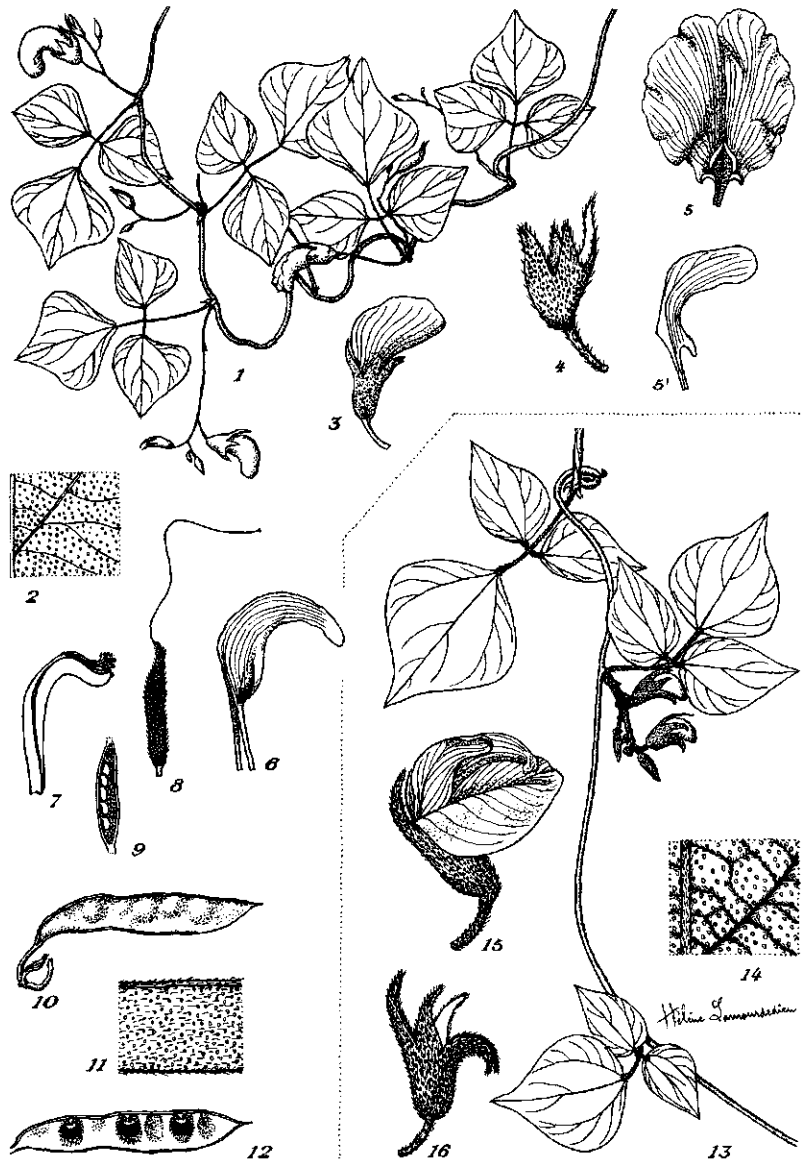


Fig. 17. *Dunbaria villosa* 1. habit, 0.66 X; 2. detail of upper leaflet surface, 6 X; 3. flower, 1.5 X; 4. calyx, 2 X; 5. flag, 2 X; 5'. wing, 1.5 X; 6. keel, 2 X; 7. staminal tube, 1.5 X; 8. pistil, 3 X; 9. ovary interior, 3 X; 10. pod, 0.66 X; 11. detail of pod, 1.5 X; 12. interior of pod showing seeds, 1.5 X. — *Dunbaria podocarpa* 13. branch with flowers, 0.66 X; 14. detail of lower leaflet surface, 5 X; 15. flower, 1.5 X; 16. calyx, 1.5 X. 1-12: Ohwi & Koyama 960; 13-16: Lichy 4. Source: Fl. Cambodge, Laos, Viet-nam 17: 117 (1979). Drawn by Mrs. H. Lamourdedieu. Reproduced by permission from Mus. Nat. Hist. Natur., Paris.



Map 16. Distribution of *Dunbaria villosa* from Japan to Indonesia

Perennial climber, small vine climbing in grasses and shrubs. *Branches* delicate to 1.5(-2.5) mm diameter, ribbed. *Indumentum* short, whitish, sparse. *Stipules* small, c. 1 mm long, to sometimes 5 mm, triangular, persistent or caducous. *Leaf petiole* ribbed, 15-30 mm, rachis 8-15 mm, petiolules 1.5-2 mm. *Leaflets* three-lobed, rather unequal, dark green and with few glands above, greyish green and densely red-glandular below, three major veins from the base, top leaflet rhomboid to deltoid, 1.5-3(-5) cm long, 2-4 (-5) cm wide, apex obtuse, sometimes acute, with a small mucro, base rounded to broad-cuneate, side leaflets obliquely so, 1-2.5 cm long and wide, stipellae 0.5 mm, inconspicuous, hairy. *Pseudoracemes* slender, peduncle (1-)3-7(-9) cm long, (1-)2-8(-11) flowers, pedicels 2-9 mm. *Bracts* obtuse, c. 1 mm long, caducous. *Corolla* yellow. *Calyx* densely short-pubescent, inside glabrous, tube c. 4 mm, teeth long-triangular, (2-)3-9 mm, about equal in bud stage, upper teeth connate except c. 2 mm at the tip, lower tooth longest, up to 9 mm. *Vexillum* obovate, c. 16 mm long, 12-13 mm wide, apex rounded-ermarginate, base clawed, reinforced, auriculate, two narrow callosities; *alae* elongate-obovate, c. 12 mm long, 3-5 mm wide, clawed, with a long auricle at the ventral side, and a small lobe or pouch dorsally; *keel* curved, tip funnel-shaped and folded back (circinnato-rostrate), c. 12 mm longest dimension, c. 5 mm wide. *Ovary* c. 6 mm, densely hairy, glands colourless, 6-8 ovules, style c. 19 mm, basal 10 mm hairy, upper 7 mm curved upwards, stigma terminal, oblique. *Stamens* c. 19 mm, free part 7-8 mm, curved upwards, anthers basifix. *Pods* brown, linear-falcate, 3.5-4.5 cm long, 7-8 mm wide, pubescent when developing, short-pubescent when grown, no bulbous-based hairs, stalk 2-6(-10) mm. *Seeds* (4-)6-7(-8), squarish-ovoid, 4 X 4 X 3 mm, black to brown with or without black mosaic, strophiole divided, quite conspicuous when fresh.

Distribution: Burma, China, India, Indonesia, Japan, Korea, Laos, Philippines, Thailand, Vietnam.

Ecology: twining herb in grasses, hedges, thickets; on slopes, near tombs in graveyards, roadsides, along riverbanks, on sandy and rocky soils. Sometimes fairly common, and forming dense tangles covering shrubs. Altitude: 0-700 m. Peculiarly few specimens have labels quoting altitudes. Once (*Yü 10520*) an altitude of 3000 m on Mt Kaakerpu in Yunnan was indicated.

Flowering: Aug. to Oct. in most areas, more rarely also

during June-July, December, in Hainan Feb.-May.

Fruiting: (Aug.-) Sept.-Oct., in Hainan Feb., May.

Vernacular names: Yeh pien tou (wild *Dolichos*) (Yangtze, China). Hime kudzu, Hime kuromaki, Kap tsai t'ang, Kima kudzu, Kitsino mame, No-azuki, No-azuki Zoku, Tankirimame (Japan); Dau ma (common for several climbing legumes), day giay dau, dau co dat (Vietnam).

Specimens examined:

BURMA: sine loc., *Toppin s.n.* (E).

CAMBODIA: Mt de Pursat, *Godefroy 460* (P).

CHINA: sine prov.: Sonosé, *d'Argy 80, Léveillé* (E); Kiukiang, Lushan Mts, *Forbes 186* (BM); Kiukiang, Lushan Mts, *Hemsley herb. Forbes 868* (BM); Ichang, *Henry 2367* (P); Ichang, *Henry 2375* (K); Kew Kiang, *Shears s.n.* (K); Anhui / Anhwei prov.: Chiu Hwan Shan, *C.S. Fan & Y.Y. Li 272* (E); Guangdong / Kwangtung: Lin distr., *Levine 3345* (E); Luichow, *Y. Tsiang 2572* (NY). Guizhou / Kweichow prov.: Yao-ren-shan, Sanhoa, *Y. Tsiang 6277* (GH, NY). Guangxi / Kwangsi prov.: Wang Tung, N. Luchen nr Shan Fang, *R.C. Ching 6208* (A, US). Hainan prov.: Nam Shan Ling, Yaichow, *Chun & Tso 44506* (A, B, P); *Henry 8029+*, dd. 1889 (DD, P, GH); *S.T. Wu 1083* (BM); Yaichow, *F.C. How 70862* (B, GH); Chiu Sam Tsuen, Ngai distr., *S.K. Lau 413* (B, BM, K, MO, P, US); Chung Ngo Shan, Changjiang / Changkiang distr., *S.K. Lau 3365* (GH, P, S); Chin Fung Ling nr Sam Mo Watt village, Kan-en distr., *S.K. Lau 3899* (GH, P, S); Yaichow, *H.Y. Liang 62513* (NY); Hainan prov.: sine loc., *H.Y. Liang 63921* (NY); Lam Ko distr. & vicinity, *C.I. Lei 1362* (A); *1363* (A); Hainan sine loc., *C. Wang 34869* (NY). Hubei / Hupeh prov.: Fuh Chih Kou, *H.G. Chao (Gheo) 18294* (G, NY, Z); Yichang (Ichang) and neighbourhood, *Henry 2317* (A, BM, GH, K, US), *Yichang, Henry 2375* (K). Hongkong: rocks nr Richmond Terrace, *Bodinier 845* (E, P); Pond village, Taipo, New Territories, *S.Y. Hu 5718* (K, US). Hunan prov.: P'u-chi-Yuen, Changnin Hsien, *C.S. Fan & Y.Y. Li 309* (A, BM, BO, G, L, P, W); between Yangliantang & Xinning (Süning) between Tsingsou and Wugang (Wukang) towns, *von Handel-Mazetti 11057 (2184)* (C, M, W). Jiangsu prov.: Liyang, *S.B. Deng et al. 2770* (KUN); Yixing (I-hsing), *W.Z. Fang 218* (KUN); I-hing, *W.Z. Fang 8029* (MO); Liyang, *F.S. Liou 2627* (KUN). Jiangxi prov.: Lianhua, Fanglou, *S.K. Lai 1431* (KUN); Wuning, Louping, *S.K. Lai 2804* (KUN); Xushuixian, Huangshagang, *S.K. Lai 3138* (KUN); Anfuxian, Wugongshan, *S.K. Lai & X.H. Hu 1886* (KUN); Dayou, *M.X. Nie et al. 9310* (KUN). Yunnan prov.: Kunming (Yunnan-sen), *Maire 1765* (E); Atuntze, Mt. Kaakerpu, *T.T. Yü 10520* (BM). Liaoning prov.: Chang Hai, *Bodinier s.n.* (E). Zhejiang / Chekiang prov.: *Barchet 131* (US); Ch'nchou, Sung Yang, *CCC 51816* (A); Zhoushan, *G.R. Chen 2192* (KUN); Nanking, *C.Y. Chiao 12908* (E); Hangchow, *C.Y. Chiao 18901* (US); Yung Hu Shan, Nanking, *C.N. Chun 2347* (M, W); Double Island, 8 km off the coast from Swatow, *Dalziel s.n.* (E); Ningbo (Ningpo) Mts, *Faber 1891* (BM, K); Tianmushan, Shiguping, *T. Hong & B.J. Keng 349* (KUN); Sung-Yang Hsien, *Hu 392* (K); vicinity of Ningbo, *Macgregor 5232* (A).

INDIA: Andhra Pradesh?, Samalcottah (Samalkot?), *Anon. s.n.*, 10-1822 (E).

INDONESIA: Aceh, Sumatera, *CIAT 20649* (WAG); Gunung Guntur, Java, *Ridley s.n.* (BM); *Herb. Proefstation Javasuikeerindustrie 222* (L).

JAPAN: sine loc.: *Buerger* (paratypes of *D. subrhombica*, K, L, S); Kyushu:

Unzen, *Greatex* s.n. 1930 (K); nr Miye, *Greatex* s.n. 1937 (K); Nagasaki, *Maximowicz* s.n. (C, L, P, US); Yagityo, Funaigan, Tanba prov., *Murata 10777* (U, W); Nagasaki, *Oldham 371* (lectotype of *Atylosia subrhombea* Miquel: L, isolecto: G, GH, K, NY, P, S, W); nr Nagasaki, *Pierot* s.n. (paratype of *Atylosia subrhombea* Miquel: L); Kasuya-gun, Shiga-machi, Fukuoka pref., *Tateishi 3111* (MO); Uku-shima Isl., Goto Islands, Nagasaki pref., *Tateishi & Hoshi 8776* (MO); Yamamoto, Kawate-gun prov., *Togashi* s.n. 9-9-1953 (MO); Omura, *Yamashiro* s.n., Sci. Coll. Imp. Univ. Tokyo (K); Sakawa, Tosa, *USDA Legumin. 1822* (US); Sakawa, Tosa, *Watanabe* s.n. (GH)

Honshu: Mt Nagi, Mimasaka prov., *Arimoto ?460* (MO); Kanagawa, Yokohama, *Bisset 615* (E); Onohara, *Dorsett & Morse 1611* (K, P, US); Kinkazan Mt, Mino prov., *Anon. s.n.* dd. 8/1906 (S); Kyushu: Unzen, *F.C. Greatrex* s.n. (K); nr Miye, *F.C. Greatrex* s.n. (K); Aho Tateyama, *Hayakawa* s.n. 1904 (S); Shimotagamura, Izu prov., *Hayakawa's collector N645* (W); Shikoku, Tokushima area, *B. Krug 674* (B); Yokohama, *Maximowicz* s.n. (A, BM, G, K, MEL, P); Nagasaki, *Maximowicz* s.n. (C, L, US); Mino prov., Hondo, *Mizumo 8213* (GH); Hikita-Ome, Mudashi prov, *Mizushima 444* (E); Motara to Yatsumi, Nagao-gum, Chiba pref., Kanto distr., *Mizushima 17129* (S); Yagityo, Funaigan, Tanba prov., *Murata 10777* (U, W); Toyonaka city betw. Kamishinden & Shiba, Settsu prov., *Murata 12244* (U); Inahumura, Kawagigun, Ise prov., *Nakai 5658* (U); Mobara in Kadzusa, *Ohwi & Koyama TSM 960* (A, B, BM, BR, E, K, NY, P, S, UPS, W); Shikoko isl.: Shikoko, Tokushima area, *Krug 674* (B); Koshu Kaido, *Rim 61* (G); *113* (W); Kisarazu, Kadzusa, *Sakurai* s.n. (E, L); nr, Yokoska, Sagami, *Savatier 303* (K); Suruga prov. (Bay?), *Sci. Coll. Imp. Univ. Tokyo* s.n. dd. 1881 (G); Mino prov., Hondo, *Kenzo Shiota 1670, 1671, 2110, 3872, 6990, 9814* (GH); Mino prov., Hondo, *Takagi 8233* (GH); Imadzu, Itorhimagun, Chibuzen prov., *Takenuchi* s.n. (B); Akama, Munakata-gun, Chikuzen prov., *M. Takenuchi 16319?* (NY); Ichikawa-shi, Kitakoby-machi, Chiba pref., *Tateishi 441* (K, MO, U, US, WAG); Mobara, Kazusa prov., *T. Yamazaki 145* (E, S); Huga, *Zollinger 570* (P); Ryukyu Islands: Kunigami-gun, Okinawa pref., *Sonohara 5* (A, K, L, US).

KOREA: Cheju Do (as Quelpaert Island), *Abbé Faurie* s.n. (P); Quelpaert, *Taquet 84* (P), Quelpaert, Hongno, *Taquet 739*, (C, E), Huzan? (Pusan), *Kakuo Uno 22946* (GH), Chungchong Namdo, Sosan-Gun, Sowon-Myon, Kihang-Ri 2 km, *B.R. Ringer et al. 2634* (K).

LAOS: Bassac, *Thorel* s.n. (P).

PHILIPPINES: Luzon, Malapad na Bato, prov. Rizal, *M. Ramos 433* (US).

THAILAND: Kaw Khao, *Sørensen, Larsen & Hansen 711* (C, WAG).

VIETNAM: Yen Bay, *d'Alleizette* s.n., Oct. 1908 (P); Quangnam to Danang, Cu Lao Cham, *Averyanov & Kudryavtzeva 431, 488* (LE); Tankeuin, nr Luang-yen, Prov. Quang Ninh, *Balansa 1229* (G, P); Khang Thuong, *Bon 20, 561* (P); Tonkin, Cau Nga, *Bon 5694* (P, Z); Huê, *Eberhardt 1252* (P); Thanh Thuy, *Eberhardt 2280* (P); Thua Luu, Prov. Thua-thieu, *Eberhardt 2641* (P); W of Ca Na, Prov. Thuan Hai, *Evrard 2498* (P); Tourane (Da Nang), *Gaudichaud 248* (P); Mts de Pursat, *Godefroy-Lebeuf* s.n. (K); Nha Trang, *Hayata 454* (P); Tom pa nr Khatrang (Nha Trang) (P); Tourane, *Lazaret 12-11-1911* (P); Cochinchine, *L. Pierre* s.n. (A, BM, E, GH, US); Cap St. Jacques, *Poilane 625* (P); Tourane, *Poilane 1450, 28889* (P); Ninh Hoa nr Nha Trang, *Poilane 3156, 4734, 6063* (P); Ca Na, *Poilane 8473, 8691* (P); Mt Bach Ma, S of Huê, *Poilane 27835* (P); Cap St. Jacques, *Talmy 111* (P).

Notes: *Poilane 625* from Cap St. Jacques, Vietnam, are glabrous specimens with longer inflorescences and somewhat larger flowers than average. The flowers are described as fragrant. The flowers and stipitate pods are quite different from those in *D. glabra*. Seeds of *Dunbaria villosa*, obtained through CIAT from Indonesia, produced plants in 1990. The plants were kept in a greenhouse. After the winter the plants flowered and pods set after hand-pollination early 1991. Short days obviously induced flowering, otherwise flowering might have occurred late 1990.

9 EXCLUDED SPECIES AND REJECTED NAMES

Dunbaria acuminatissima Miquel, Fl. Ind. Bat. 1-1: 180 (1855), type: Java, nr Surakarta, *Horsfield s.n.* (holo: BM?): *Rhynchosia acuminatissima* Miquel, Fl. Ind. Bat. 1-1: 171 (1855), type: Java, prov. Bandung, *Zollinger s.n.* (holo: L? P?).

Dunbaria barbata Benth. in Miquel, Pl. Jungh. 1: 242 (1852); *Cajanus goensis* Dalzell in Hook. Kew J. 2: 264 (1850); van der Maesen, Agric. Univ. Wageningen Papers 85-4: 117 (1986). Type: Burma, Kogun ad ripas Saluan in Martabania 1827, *Wallich 5548* (holo: K) (*Dolichos barbatus* Wall. nom. nud.).

Dunbaria calycina Miquel, Fl. Ind. Bat. 1: 180 (1855); *Cajanus goensis* Dalzell in Hook. Kew J. 2: 264 (1850); van der Maesen, Agric. Univ. Wageningen Papers 85-4: 117 (1986). Type: Indonesia, Java, nr Surakarta, *Horsfield L 123* (holo: K; iso: BM, CAL, U).

Dunbaria heynei Wight & Arn., Prodr. 1: 258 (1834); *Cajanus heynei* (Wight & Arn.) Maesen, Agric. Univ. Wageningen Papers 85-4: 129 (1986). Type: India, 28 Dec. 1816, *Wallich 5572 A* (holo: K; iso: K).

Dunbaria horsfieldii Miquel, Fl. Ind. Bat. 1: 179 (1855); *Cajanus crassus* (Prain ex King) Maesen, Agric. Univ. Wageningen Papers 85-4: 112 (1986). Syn. nov., designated here. Type: Indonesia, *Horsfield LI27* (holo: K; iso: BM, CAL, GH, MEL, U).

Dunbaria latifolia Wight & Arn., Prod. 258 (1834); *Rhynchosia courtallensis* Maesen, Rheedea 5-1: 54-59 (1995). Type: Peninsular India, *Wight Herb. Propr. 878 pro parte* (holo: K; iso: A, BM, C, E, G, P).

Dunbaria oblonga Arn., Nov. Act. Nat. Cur. 18: 333 (1836); *Cajanus heynei* (Wight & Arn.) Maesen, Agric. Univ. Wageningen Papers 85-4: 129 (1986). Type: *Walker-Arnott, Ceylon no. 207* (holo: E).

Dunbaria polysperma Miquel, Fl. Ind. Bat. 1: 179 (1855), Koorders, Exk.Fl. Java 404 (1912); *Cajanus crassus* (Prain ex King) Maesen, syn. nov. See Backer, Beknopte Fl. Java 5: (1941). Type: Indonesia, E Java, Trètès, near waterfall, *Zollinger 2266* (holo: P; iso: G, U).

In U the type material sheet contains a few leaves of *C. crassus* and an infructescence of *Pueraria phaseoloides* (Roxb.) Benth. (cf. Backer).

Dunbaria pulchra Benth. ex Bak. in Hooker, Fl. Brit. India 2: 218 (1876); *Cajanus grandiflorus* (Benth. ex Bak.) Maesen, Agric. Univ. Wageningen Papers 85-4: 125 (1986). Type: India, lower hills of Sikkim, 1000-2000 ft, *Hooker fil. s.n.* (holo: K; iso: GH, K, P).

Dunbaria spanoghei Miquel, Fl. Ind. Bat. 1-1: 178 (1855). Type: Spanoghe icon. ined. 9 (c. 1836): *Dunbaria heynei* (non Wight & Arn.) Spanoghe.

Dunbaria stipulata Thuan, Adansonia sér. 2, 16-4: 514 (1977); *Cajanus goensis* Dalzell in Hook. Kew J. 2: 264 (1850); van der Maesen, Agric. Univ. Wageningen Papers 85-4: 119 (1986).

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- A: Herbarium, Arnold Arboretum of Harvard University, Cambridge Massachusetts, USA.
AAU: Herbarium Jutlandicum, Bot. Inst., Univ. Aarhus, Risskov, Denmark.
B: Botanischer Garten und Botanisches Museum Berlin-Dahlem, Fed. Rep. of Germany.
BLAT: Blatter Herbarium, St. Xavier's College, Bombay, India.
BM: Herbarium, British Museum (Natural History), London, Great Britain.
BO: Herbarium Bogoriense, Bogor, Indonesia.
BR: Herbarium, Jardin Botanique National de Belgique, Meise, Belgium.
BRI: Queensland Herbarium, Indooroopilly, Australia.
C: Herbarium, Botanical Museum, University of Copenhagen, Gothersgade 130, DK-1123 Copenhagen K, Denmark.
CAL: Central National Herbarium, Botanical Survey of India, Howrah, Calcutta 711 103, West Bengal, India.
DD: Herbarium, Forest Research Institute and College, Dehra Dun 248 006, Uttar Pradesh, India.
E: Herbarium, Royal Botanic Garden, Edinburgh EH3 5LR, Scotland, U.K.
FI: Herbarium Universitatis Florentinae, Via la Pira 4, I-50121 Florence, Italy.
G: Herbarium, Conservatoire et Jardin botaniques de la Ville de Genève, CH-1292 Chambésy-Genève, Switzerland.
ICRISAT: International Crop Research Institute for the Semi-Arid Tropics, Patancheru P.O., 502 324 Andhra Pradesh, India.
K: Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, England, U.K.
KUN: Herbarium, Kunming Institute of Botany, Academia Sinica, Heilongtan, Kunming, Yunnan, China.
L: Rijksherbarium, P.B. 9514, 2300 RA Leiden, the Netherlands.
LE: Herbarium, V.L. Komarov Botanical Institute, Academy of Sciences, 190 000 St. Petersburg, Russia.
M: Herbarium, Botanische Staatssammlung, D-8000 München 19,

Germany.

- NY: Herbarium, New York Botanical Garden, Bronx, New York 10458-5126, U.S.A.
- NSW: National Herbarium of New South Wales, Sydney, Australia.
- OXF: Fielding-Druce Herbarium, Dept. of Botany, Univ. of Oxford, Oxford OX1 3RB, England, U.K.
- P: Muséum National d'Histoire Naturelle, Lab. de Phanérogamie, F-75005 Paris, France.
- PE: Herbarium, Institute of Botany, Academia Sinica, Xiang Shan, Beijing 100 093, China.
- PNH: Philippine National Herbarium, Pb 2659, Manila, the Philippines.
- RNG: Herbarium, Plant Sciences Laboratory, University of Reading, Whiteknights, Reading, Berkshire RG6 2AS, U.K.
- TI: Herbarium, Botanical Gardens, University of Tokyo, 3-7-1 Hakusan, Bunkyo-ku, Tokyo-shi, Tokyo 112, Japan
- U: Inst. of Systematic Botany, Pb 80.102, 3508 TC Utrecht, the Netherlands.
- US: United States National Herbarium, Smithsonian Institution Washington D.C. 20560-0001, U.S.A
- W: Naturhistorisches Museum, Botanische Abteilung, Burggring 7, A-1014 Vienna, Austria.
- WAG: Herbarium Vadense, Dept. of Plant Taxonomy, Agric. Univ. Wageningen, Pb. 8010, 6700 ED Wageningen, the Netherlands.
- Z: Herbarium, Institut für Systematische Botanik, Universität Zürich, Zollikerstrasse 107, CH-8008, Zürich, Switzerland.

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Index to plant names

The accepted names in this revision are printed in roman face, and the page numbers of their main entries are in **bold face**. The headings of the main entries contain reference to the maps and illustrations. Synonyms and nomina nuda are in *italics*, new combinations, names or synonyms are listed as such.

- Atylosia** Wight & Arn. 5, 6, 8, 57
circinnalis Benth. 22, 25
crinita Dunn 26, 29
glandulosa (Dalzell & A. Gibson) Dalzell 56
punctata (Wight & Arn.) Dalzell 76
subrhombea Miquel 93, 98
rostrata Bak. 56, 57
trichodon Dunn 87
villosa Maxim. non Benth. ex Bak. 93
- Cajanastrae** 8
- Cajaninae** 4, 5, 6, 8
- Cajanus** 5, 6, 8, 12, 13, 29, 48, 51
cajan (L.) Millsp. 4, 5
crassus (Prain ex King) Maesen 44, 100, 101
glandulosus Dalzell & A. Gibson 53
goensis Dalzell 86, 87, 100, 101
grandiflorus (Benth. ex Bak.) Maesen 8, 101
heynei (Wight & Arn.) Maesen 8, 100
scarabaeoides (L.) Thouars 10, 40
- Collaea** *gibba* 43
venosa Graham 40
- Cylista?* *ferruginea* nom. nud. 40
- Desmodium** *timoriense* DC. 61
- Dipterocarpus** 20, 74
- Dolichos** 97
barbatus Wall. nom. nud. 100
conspersus Graham 82
minimus L. 82
? *punctatus* Wight & Arn. 76, 82
? *rhynchosoides* Miquel 76
truncatus Miquel 89, 92
- Dunbaria** Wight & Arn. 4, 5, 6, 7, 8, 10, 11, 12, 13, 26, 29, 30, 44, 51, 87

acuminatissima Miquel 100
 barbata Benth. 100
 bella Prain 4, 15, 17, 18, 19, 21
 burmanica Thoth. & Satyan. 90, 92
 calycina Miquel 100
 circinalis (Benth.) Bak. 14, 22, 23, 24, 25, 26, 69, 75, 92, 93
 conspersa Graham ex Benth. 13, 76, 81, 82
 crinita (Dunn) Maesen comb. nov. 15, 26, 27, 28, 29, 30, 71
 cumingiana Benth. 13, 16, 30, 31, 32, 34, 35, 47, 48, 64
 debilis Bak. 10, 14, 35, 36, 37, 38, 39, 40
 discolor Harms & K. Schum. 30, 34
 ferruginea Wight & Arn. 6, 8, 12, 13, 14, 40, 41, 42, 44
 finlaysonianus Graham ex Wall. nom. nud. 76
 flavescens Thuan 26, 29, 30, 71
 floresiana Maesen spec. nov. 4, 10, 15, 44, 45, 46, 48
 fusca (Wall.) Kurz 15, 29, 30, 46, 48, 49, 51, 71
 fusca var. *longicarpa* Thuan 69, 71
 glabra Thuan 10, 15, 46, 51, 52, 71, 99
 glandulosa (Dalzell & A. Gibson) Prain 9, 10, 15, 53, 54, 55, 57
 gracilipes Lace 10, 15, 58, 59, 60
 harmandii Gagnep. 61, 64
 henryi Y.C. Wu 89, 92
 heynei Wight & Arn. 8, 12, 100
 heynei (non Wight & Arn.) Span. 101
 horsfieldii Miquel syn. nov. 100
 incana (Zoll. & Moritzi) Maesen comb. nov. 5, 16, 52, 61, 62, 65
 latifolia W & A. 6, 44, 100
 lecomtei Gagnep. 14, 65, 66, 67
 longeracemosa Craib 4, 17, 21
 longicarpa (Thuan) Maesen stat. nov. 15, 52, 67, 69, 70
 maymyoensis Satyan. & Thothathri syn. nov. 58
 merrillii Elmer syn. nov. 30, 34, 35
 nivea Miquel syn. nov. 61, 64, 65
 oblonga Arn. 100
 parvifolia X.X. Chen 35, 40
 podocarpa Kurz 14, 26, 69, 71, 72, 75, 76, 92, 93, 94
 polysperma Miquel syn. nov. 100
 pulchra Benth. ex Bak. 8, 101
 punctata (Wight & Arn.) Benth. 13, 14, 52, 76, 77, 78, 79, 82, 83
 rostrata Benth. 56
 rotundifolia (Lour.) Merr. 76, 82

rubella Span. ex Miquel 15, 83, 84, 85, 86, 87
scortechinii Prain 61, 64
singuliflora F. Muell. 10, 35, 39, 40
spanoghei Miquel 101
stipulata Thuan 101
subrhombea (Miquel) Hemsley 93, 97
thorelii Gagnep. 22, 25, 26
trichodon (Dunn) Maesen comb. nov. 15, 85, 87, 88, 89
truncata (Miquel) Maesen comb. nov. 14, 26, 76, 85, 89, 90, 92
villosa (Thunb. ex Murray) Makino 4, 5, 10, 14, 92, 93, 94, 95,
 99
villosa var. *peduncularis* Hand.-Mazz. 65, 68
Edichromophloa 80
Eucalyptus drepanophylla 80
 tetrodonta 39
Eudunbaria 13
Fagelia Neck. 6
Glycine villosa Thunb. ex Murray 93
Indigofera 83
 procumbens L. 83
 rotundifolia Lour. 76, 82, 83
Lithocarpus 74
Phaseolus
 circinnalis Ham. ex Wall. nom. nud. 22
 fuscus Hosseus non Wall. 17
 fuscus Wall. 48
 incanus Zoll. & Moritzi 61, 64, 65
Pinus 20, 74
Pseudarthria timoriensis Zoll. & Moritzi nom. nud. 61, 64, 65
Pueraria phaseoloides (Roxb.) Benth. 53, 101
Rhyncholobium 13
Rhynchosia 5, 44, 82
 acuminatissima 100
 courtallensis Maesen 44, 100
 minima 82
Rhyncolobium 13
Sesbania grandiflora 21
Sinomenium acutum (Thunb.) Rehder & Wilson 82
Themeda 39
 australis 80
Vigna retusa Williams non Walp. nom. nud. 73, 75