

The lesser-sized Lobelias of Asia and Malesia

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ABSTRACT. Recognition, enumeration, and discussion of 21 species of lesser-sized Lobelias in South and South East Asia and Malesia are presented. A key to the lesser Lobelias, primarily based on seed shape and growth habit, is given. In Indochina and in the Malesian area the name *Lobelia alsinoides* Lam. is replaced by *L. dopatrioides* Kurz var. *cantonensis* (Danguy) W.J.de Wilde & Duyfjes. In the remaining area of *L. alsinoides*, mainly India, that species is divided into two varieties, viz. var. *alsinoides* and var. *trigona* (Roxb.) W.J.de Wilde & Duyfjes. *Lobelia dioica* R.Br. is a new record for Malesia. *Lobelia reinwardtiana* (C.Presl) A.DC. and *Lobelia thorelii* E.Wimm. are reinstated. *Lobelia zeylanica* L. var. *walkeri* C.B.Clarke is raised to species rank, *L. walkeri* (C.B.Clarke) W.J.de Wilde and Duyfjes. *Lobelia reinwardtiana* (C.Presl) A.DC. var. *megalantha* W.J.de Wilde & Duyfjes (India), *L. dopatrioides* Kurz var. *kradungensis* W.J.de Wilde & Duyfjes (Thailand), *L. reptans* W.J.de Wilde & Duyfjes (New Ireland), and *L. serratifolia* W.J.de Wilde & Duyfjes (Bougainville Isl.) are described as new.

KEY WORDS: Campanulaceae, Lobelioideae, *Lobelia* taxonomy, nomenclature, Asia, Malesia.

INTRODUCTION

The delimitation of *Lobelia* species (Campanulaceae, subfam. *Lobelioideae*) in Asia has long been confusing due to sometimes great superficial resemblance of the species and unclear typification of the names. For instance: the treatment of *Lobelia trigona* Roxb. by Arnott (1841) for India is a mixture of two species, and the circumscription of *L. alsinoides* by Moeliono in Flora Malesiana (1960) and by Thuan in Flora of Indochina (1969) is much too wide. Especially the group of closely allied species of small stature around the older name *L. alsinoides* posed problems when writing up *Lobelia* for Flora of Thailand (De Wilde & Duyfjes, expected in 2012).

Although uncertainties remain, the enumeration of species here presented covers the whole Asian-Malesian area. In that area 21 species of small Lobelias can be recognized. As lesser-sized Lobelias we consider those plants usually not growing over 20(–40) cm tall, and having stems not thicker than 3 mm in diam. Lammers (2011), when defining 18 sections for 415 species in the whole world-wide genus *Lobelia* uses the term ‘gracile’ for plants with stems of 5 mm diam. or less. In New Guinea four of the species are

endemics from high altitude, not of direct interest for Thailand, and these have not been further studied. Furthermore *L. dioica*, a lowland species from Australia, is a new record for New Guinea. These five species are included in the key presented in this study, which was framed as a result of the study of species to be accepted or considered for Thailand. Of the remaining 16 species of lesser Lobelias in Asia and Malesia, 10 species, including the reinstated *L. thorelii*, are accepted to occur in Thailand. The Indochinese and Malesian populations formerly identified as *L. alsinoides* are now assigned to *L. dopatrioides* and segregated at the rank of variety. *Lobelia alsinoides* proper is largely confined to India and divided into two varieties, var. *alsinoides* and var. *trigona*. *Lobelia reinwardtiana*, with a newly described variety, var. *megalantha*, is reinstated for a widespread species occurring in S India and Malesia, with a closely related species, *L. walkeri* in Sri Lanka. Another species, *L. reptans*, possibly related to *L. reinwardtiana* and endemic to New Ireland, and the species *L. serratifolia*, endemic to Bougainville Isl., are newly described. *Lobelia dopatrioides* var. *kradungensis* is newly described for Thailand.

The flower (corolla) colour of *L. nummularia* Lam. is largely pinkish; that of *L. chinensis* Lour.

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pale pinkish or pale bluish, and in highland New Guinea species the corolla is some shade of red or chocolate coloured. All other Asian lesser *Lobelias* have blue flowers.

SE Asian lesser *Lobelias* all have alternate leaves. In the field they may be confounded with especially *Lindernia* of Scrophulariaceae, a genus with opposite leaves and superior ovary.

All species, with the principal synonyms, are enumerated with literature references, description, distribution, and notes. For complete synonymy and references one is referred to Lammers (2007), and for infrageneric classification to Lammers (2011).

The name *L. loochooensis* Koidz. (1929) from Kume and Okinawa (Ryukyu Islands) is listed by Lammers (2007) as a standing species. It is similar to the Australian *L. quadrangularis* R.Br. Its status is not evaluated in the present treatment.

In order to assist in the finding of a name of a collected specimen, an enumeration of the species per geographic region is presented at the end of this article.

CHARACTERS

For the recognition of lesser-sized *Lobelia* specimens the following characters are of major importance and they preferably need to be employed in the given sequence:

1. Shape of the seed, *either* ellipsoid *or* trigonous. This is not difficult to determine, because the plants easily and quickly produce fruits with seeds and hence seeds are generally present in a collection. A discussion of the characters of seed anatomy and seed shape in *Lobelia* in general is presented by Lammers (2011).

2. Growth habit: plant *either* strictly erect with only one main stem and with roots only at its very base (not always easy to decide when collections contain only apical branches of the plant or suberect branches thereof), *or* plant with (few or) several ramifications, growing directly from near the place of the main roots, with the branches sagging, ascending, or decumbent, or creeping with adventitious roots at least in the (very) lowest part.—Fig. 1.

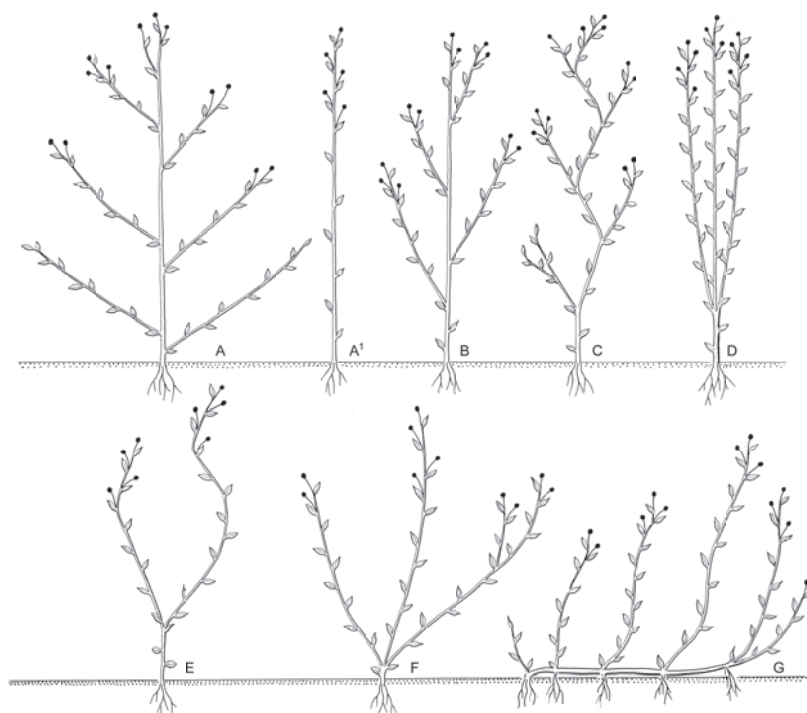


Figure 1. Growth forms of Lesser *Lobelias*. A–D. erect forms; E–G. decumbent forms. A–A'. *L. heyneana*; B. *L. griffithii*; C. *L. terminalis*; D. *L. dopatrioides* var. *dopatrioides*; E. *L. dopatrioides* var. *cantonensis*; F. *L. dopatrioides* var. *kradungensis*; G. *L. zeylanica*.

3. Shape and size of leaves. Distinction should be made between the *lower* leaves, i.e. those in the lower part of the plant and not bearing flowers in their axils, and the *upper* leaves bearing single flowers in their axils (sometimes these latter leaves are small so that they may be called bracts).

4. Whether the stem is (sub)terete, angular, or distinctly winged. Useful as an additional character, but not always easy to ascertain in dried material. *Lobelia. alsinoides*, *L. heyneana*, and *L. reinwardtiana* have distinctly angular or winged stems. (Sub)terete stems may be somewhat fleshy in the living state and become winged when dry.

5. Whether only two anthers are bearded at apex, or all five anthers are bearded at apex.

6. Whether the two anterior filaments are wider, or all five filaments are equal in width. This character needs further investigation. It was used by Thuan in his key to the species in Flora of Indo-China (1969), discriminating between his widely conceived *L. alsinoides* and few other smaller Lobelias as accepted by him. As for the present treatment, this character appeared not easily to be ascertained in (boiled) herbarium specimens and possibly it is not practical in living plants either. We have refrained from recording this character.

SECTIONS

Of the 18 sections recognized by Lammers (2011) in *Lobelia*, five sections occur in SE Asia, of which three sections comprise the lesser Lobelias. The 21 species at present recognized for Asia are divided over the sections as follows, largely corroborated by the species as they appear in the presented key:

1. Sect. *Delostemon* (E.Wimmer) J.Murata: *L. alsinoides*, *L. chevalieri*, *L. chinensis*, *L. dopatrioides*, *L. griffithii*, *L. microcarpa*, *L. nummularia*, *L. terminalis*, *L. thorelii*, and *L. zeylanica* (with bibracteolate pedicels, bearded anthers with tufts of filiform hairs, and striate seed coat).

2. Sect. *Hypsala* (C.Presl) Lammers: *L. archboldiana*, *L. brachyantha*, *L. conferta*, *L. dioica*, *L. donanensis*, and *L. serratifolia* (with ebracteolate, or less often bibracteolate pedicels, a bristle rather than a tuft of hairs on the anthers, and reticulate (not striate) seed coat).

3. Sect. *Stenotium* (C.Presl) Lammers: *L. hainanensis*, *L. heyneana*, *L. reptans*, *L. reinwardtiana* and *L. walkeri* (with ebracteolate or bibracteolate pedicels, tufts of filiform hairs on the anthers, and striate seed coat).

KEY TO THE LESSER-SIZED LOBELIAS OF ASIA AND MALESIA

Note.— Four narrowly endemic, high altitude species of E New Guinea (2000 m or more), are keyed-out and have been marked with an asterisk. They are mentioned in the enumeration of species below, but not further described; one is referred to Moeliono (1960). A fifth high altitude species in New Guinea is the wide spread *L. nummularia* Lam., a species also occurring at lower altitudes.

- | | |
|--|-----------------------------------|
| 1. Plant dioecious, flowers unisexual | 7. <i>L. dioica</i> |
| 1. Flowers hermaphroditic | |
| 2. Plant stemless. Plants from high altitude in E New Guinea | |
| 3. Leaves membranous, margin (sub)entire, not glandular | 2. <i>L. archboldiana</i>* |
| 3. Leaves coriaceous, margin glandular | 8. <i>L. donanensis</i>* |
| 2. Plant with creeping, ascending, or erect stems | |
| 4. Corolla less than 5 mm long. Plants from high altitude in E New Guinea | |
| 5. Leaves 1–3 mm petiolate | 3. <i>L. brachyantha</i>* |
| 5. Leaves sessile, blade semi-amplexicaul | 6. <i>L. conferta</i>* |
| 4. Corolla more than 5 mm long | |
| 6. Corolla (sub)unilabiate, lobes all more or less similar and placed in one row, dorsal slit wide, ca 90° or more | |
| 7. Fruit berry-like (capsular fruits in certain specimens of <i>L. nummularia</i> from Philippines, Sulawesi or New Guinea excepted). Leaves (sub)circular, coarsely dentate | 14. <i>L. nummularia</i> |
| 7. Fruit a capsule. Leaves not circular, dentate or not | |
| 8. Leaves elliptic, to 5 mm wide, margin (sub)entire | 5. <i>L. chinensis</i> |
| 8. Leaves (broadly) ovate-elliptic, 10–20 mm wide, margin serrate-dentate [Bougainville Isl.] | 17. <i>L. serratifolia</i> |
| 6. Corolla bilabiate, upper lip 2-lobed, lower lip 3-lobed, dorsal slit, at least towards base, narrow, ca. 10° wide or less | |
| 9. Seed ellipsoid. Only 2 anthers bearded at apex. Stem winged or angular | |
| 10. Plant (main stem) erect. Flowers small, corolla 3–5 mm long | 12. <i>L. heyneana</i> |

10. Plant with lower part of main stem or (basal) branches decumbent or creeping. Flowers larger, corolla 6 mm long or more
11. Plant stout, with long, rooting runners (1–)2–2.5 mm in diam. Pedicel 40–60 mm long, 2 or 3 times longer than sustaining leaf or bract. [New Ireland.] **16. *L. reptans***
11. Plant less stout, branches decumbent, 1–2 mm in diam. Pedicel 10–20(–35) mm long, longer or shorter than sustaining leaf or bract
12. All leaves broad, $\pm$ circular or rhombic or ovate, at base shortly cuneate into petiole 2–5 mm long. Plant delicate, sub-annual; stems 1–1.5 mm in diam. [Sri Lanka.] **20. *L. walkeri***
12. Only lower leaves subcircular; other leaves and bracts narrower, sessile, base rounded or at base tapering forming a 1–6(–10) mm long petiole. Plant stouter, perennial, stems (1–)1.5–2 mm in diam.
13. Stem 2- or 3-winged. [S India, Sumatra, Java.] **15. *L. reinwardtiana*** (with 2 varieties)
13. Stem 4-angular [Hainan.] **11. *L. hainanensis***
9. Seed trigonous. All anthers bearded at apex. Stem angular or terete
14. Plant with one (or more) main stem(s), all erect or $\pm$ zig-zag, not decumbent or sagged in lower portion, not rooting from the lower nodes
15. Plant, especially the ovary, usually wholly long-hairy. Pedicel long, 15–40 mm long **18. *L. terminalis***
15. Plant (ovary) (almost) glabrous. Pedicel 10–20(–25) mm long
16. Leaves all small and narrow, ca 8 mm long or less. Flowers small, corolla ca 5 mm long **10. *L. griffithii***
16. Leaves larger and broader, ca 10 mm long or more
17. Lower leaves (narrowly) elliptic. Flowers larger, corolla (6–)8–10 mm long **9a. *L. dopatrioides*** (var. *dopatrioides*)
17. Lower leaves subcircular (upper leaves narrower). Flowers small, corolla 4–5 mm long **13. *L. microcarpa***
14. Plant with one or more main stem(s), commonly at base $\pm$ sagged, decumbent or creeping, commonly rooting from (the lower) nodes
18. Leaves all with distinct petiole (2–)4–10 mm long. Ovary (usually) hairy **21. *L. zeylanica***
18. Only the lower leaves petiolate, or all leaves (sub)sessile. Ovary glabrous or hairy
19. Lower and upper leaves all broad, subcircular or ovate
20. Stem (when fresh) angular, winged when dry. Ovary glabrous **1. *L. alsinoides*** (with 2 varieties)
20. Stem (when fresh) subterete, neither angular nor winged when dry. Ovary usually hairy
21. Corolla ca 10 mm long, 3-coloured: upper lobes pink-lilac, lower lobes dark blue, with two white markings near the throat **19. *L. thorelii***
21. Corolla 4–7(–8) mm long, all lobes uniformly blue (white markings excepted) **18. *L. terminalis***
19. Leaves narrower, the lower ones (broadly) elliptic, the upper ones elliptic or narrowly elliptic. Ovary glabrous
22. Fruit (ovary) for more than halfway superior **4. *L. chevalieri***
22. Fruit largely (wholly) inferior **9. *L. dopatrioides*** (with 3 varieties)

ENUMERATION OF SPECIES

1. *Lobelia alsinoides* Lam., Encycl. [J. Lamarck et al.] 3 (2): 588. 1792; E.Wimm., Ann. Naturhist. Mus. Wien 41: 348. 1948; Pflanzenr. [Engler] IV.267b (107. Heft) II. Teil: 571. 1953.— Type: Herb. Lamarck. *Lobelia*. a cap. b. spei. *Sonnerat s.n.* (**P-LAM** 00356087, image available from <http://www.lamarck.cnrs.fr/herbier.php>), see note. For synonyms see the varieties.

Subperennial herb, glabrous; branches few or several, ascending; stems angular or winged. *Leaves*: petiole to 4 mm long or leaves subsessile; lower and upper blades similar, subcircular or broadly ovate. *Bracteoles* present. *Flowers*: ovary glabrous; corolla bilabiate, 5–7 mm long; anthers all bearded at apex. *Fruit* a capsule, glabrous. *Seeds* trigonous.

Distribution.— See under the varieties.

Notes.— 1. *Lobelia alsinoides* was for a long

time regarded as a species with a much wider distribution than here accepted. Lammers (1992) roughly regarded the north-eastern part of its then distributional area to represent a separate subspecies, subsp. *hancei* (H.Hara) Lammers, but we found that also the Indo-Chinese and Malesian material belongs to this taxon. We accept it on species level, under the older name *L. dopatrioides*, with three varieties, although some specimens from the area where *L. alsinoides* and *L. dopatrioides* overlap are sometimes not easy to name.

2. We recognise two sympatric varieties in *L. alsinoides*, different from the varieties as accepted by Wimmer (1953).

3. The type of *L. alsinoides* (*Sonnerat s.n.*; P00356087) was said to originate from the Cape (“Cap de Bonne-Espérance”) but it must have been collected rather in Asia, presumably in southern India or in Sri Lanka, because plants similar to *L. alsinoides* are not known from Africa.

KEY TO THE VARIETIES

1. Lower leaves (sub)circular, upper leaves subcircular or ovate-elliptic
 1. All leaves somewhat narrower, ovate or broadly elliptic

- a. var. **alsinoides**
 b. var. **trigona**

a. var. alsinoides.— *Lobelia stipularis* Roth ex Schult., Syst. Veg., ed. 15 bis [Roemer & Schultes] 5: 67. 1819; Roth, Nov. Pl. Sp.: 144. 1821.— Type: S India, near Mangalore, *Hohenacker 1617* (neo-type **L**, here designated).

Lower leaves (sub)circular, upper leaves subcircular or ovate-elliptic.

Distribution.— Northern and southern India; Sri Lanka; Myanmar, NW Thailand, east (perhaps) to approximately the lower Salween River basin; one odd collection *Veldkamp 7157* (BO, L, K), from Sumatra (Toba Lake: Samosir Isl.). Possibly also China, but no collections seen.

Ecology.— In paddy fields and forest edges, 300—1000 m altitude.

Note.— Neotypification of *L. stipularis*. The description of *L. stipularis* (Roth in ms) was based on Heyne material that was sent to Roth (in Germany) under the name *L. zeylanica*, but this original material is no longer extant. Clarke (1881) placed *L. stipularis* in the synonymy of *L. trigona*, arguing in a note under the latter species that Heyne's material at **K** and **BM** (and named *L. zeylanica* by Heyne) belongs to *L. trigona*, but that Roth's description (published in 1821) rather points to a similar though different species. Roth's manuscript was published, somewhat shortened, by Schultes (1819), which was followed by Roth's own elaborate description (1821), without mentioning Schultes. We agree with Clarke's view, i.e. that Roth's description also contains elements of a second species (in fact our present *L. walkeri*), and that the material at the time at the hand of Roth was a mixture. In order to stabilize the current concept of *L. stipularis* Roth ex Schult. as being a synonym of *L. alsinoides* var. *alsinoides*, we designate a neo-type. *Lobelia alsinoides* var. *alsinoides* is a taxon with distinct bracteoles ('stipules') and (sub)circular lower leaves. In *L. walkeri* the bracteoles at the base of the pedicel are absent or very small, ca 0.5 mm long only.

b. var. trigona (Roxb.) W.J.de Wilde & Duyfjes, **stat. nov.**— Basionym: *Lobelia trigona* Roxb., Fl.

Ind. (Carey & Wallich ed.) 2: 111. 1824; Wight, Icon. Pl. Ind. Orient. t. 1170. 1848.— Type: not indicated; the drawing in Roxburgh Icones, ined. (**K**, <http://apps.kew.org/floraindica/home>) gives a good picture, but the specimen in Herbarium Hookerianum (**K**), indicated by Hooker as from Roxburgh, is herewith designated as the lectotype.

All leaves ovate or broadly elliptic.

Distribution.— N & S India, Sri Lanka (?), north-eastern boundary in India not certain.

2. Lobelia archboldiana (Merr. & L.M.Perry) Moeliono, Fl. Males., Ser. 1, Spermat. 6: 131. 1960.— *Pratia archboldiana* Merr. & L.M.Perry, J. Arnold Arb. 30: 59. 1949.— Type: Papua New Guinea, Murray Pass, *Brass 4943* (holo **GH**, not seen).

This is a low-growing "stem-less" herb, endemic of eastern New Guinea, from high altitude, 2840–3600 m.

3. Lobelia brachyantha Merr. & L.M.Perry, J. Arnold Arbor. 22: 385. 1941.— Type: Indonesia: West Papua (NE of Lake Habbema), *Brass 11570* (holo **GH**, not seen; iso **L**).

This is a creeping herb, only known from one collection, of high mountain habitat (2350 m altitude) in western New Guinea.

4. Lobelia chevalieri Danguy, Bull. Mus. Natl. Hist. Nat., Ser. 2. 1: 263. 1929; Fl. Indo-Chine [P.H.Lecomte et al.] 3: 683, f. 76: 9. 1930.— Type: Vietnam, Annam, *Chevalier 30607*, (lecto **P00243509**, designated by Danguy, 1930; photo seen).

As taken from the protologue (Danguy, 1929) the characters relevant for our present species description are as follows:

Annual herb, glabrous, branches several, decumbent; stem angular. *Leaves* (sub)sessile; all blades elliptic to lanceolate. *Bracteoles* present.

Flowers: ovary glabrous, for the greater part superior; corolla bilabiate, 8–10 mm long; anthers all bearded at apex. *Fruit* a capsule, glabrous, largely superior, sepals reflexed. *Seeds* trigonous.

Distribution.— Vietnam (Annam, between Dabang and Dran).

Ecology.— Altitude between 200 and 1200 m, exact altitude not known.

Notes.— 1. Pencil sketches by the author of the superior ovary (and other details) are on the lectotype sheet (P00243509). The superior ovary is also depicted in Danguy (1930, l.c.).

2. Lammers (2007) placed *L. hancei* in the synonymy of *L. chevalieri*, maybe disregarding the fact that the latter species was described as having a largely superior ovary. We consider *L. hancei* as synonym of *L. dopatrioides* var. *cantonensis*. *Lobelia chevalieri* is known only from two collections. If the superior position of the ovary is due to an aberrant condition, which could be ascertained when more similar material becomes available from the type locality, then this name would go under *L. dopatrioides* var. *cantonensis*.

5. *Lobelia chinensis* Lour., Fl. Cochinch. 2: 514. 1790; Merr., Trans. Amer. Philos. Soc. 24: 382. 1935.— Type: Hong Kong, *Lamont 403A*, barcode L0585148 (neotype **L**, here designated, see note 1). — *L. radicans* Thunb., Trans. Linn. Soc. London 2: 330. 1794.— *Pratia thunbergii* G.Don, Gen. Hist. 3: 700. 1834.— *Isolobus radicans* (Thunb.) A.DC., Prodr. (DC.) 7, 2: 353. 1839.— Type: not indicated, but no. 21068 in herb. Thunberg (**UPS**) agrees, (lectotype no. 21068 in herb. Thunb **UPS**, here designated).— *Lobelia caespitosa* Blume, Bijdr. Fl. Ned. Ind. 13: 729. 1826.— Type: Java, Mt Gede, *Blume s.n.*, barcode L0820633 (holo **L**).— *Pratia radicans* G.Don, Gen. Hist. 3: 700. 1834.— *Isolobus roxburghianus* A.DC., Prodr. (DC.) 7, 2: 353. 1839.— *Lobelia roxburghiana* (A.DC.) Heynh., Nom. Bot. Hort. 1: 471. 1840.— Type: *Wallich 1308* (holo **K**, 2 sheets).

Perennial herb, glabrous, caespitose, branches ascending, rooting at lower nodes; stem subterete; roots fibrous. *Leaves* distichous; petiole absent; lower and upper blades similar, (broadly) elliptic. *Bracteoles* absent. *Flowers*: ovary glabrous; corolla unilabiate, 10–15 mm long; only 2 anthers

bearded at apex. *Fruit* a capsule, glabrous. *Seeds* compressed, ellipsoid.

Distribution.— China; widely naturalized a.o. in Sri Lanka, Thailand, and Indonesia (Java).

Ecology.— Wet places; at low altitudes.

Notes.— 1. Loureiro (1790) gave ‘Canton’ as provenance for *L. chinensis*, but did not indicate the type. As no material of Loureiro could be traced, a neotype is chosen here.

2. The species is said to be often not fruit-setting outside its area of origin.

6. *Lobelia conferta* Merr. & L.M.Perry, J. Arnold Arbor. 30: 59. 1949.— Type: Papua New Guinea, Mt Albert Edward, *Brass 4417* (holo **GH**, not seen).

This is a high-altitude (3680 m) prostrate herb from Papua New Guinea.

7. *Lobelia dioica* R.Br., Prodr. Fl. Nov. Holland.: 565. 1810.— Type: Australia, Gulf of Carpentaria, *Brown s.n.* (**BM**, not seen).

This annual herb was so far known only from Australia. However, *L. dioica* also occurs in New Guinea. It is known there from two collections: one from West Papua (*Van Royen 4906*) and one from Papua New Guinea (*Henty & Foreman NGF 49367*). Moeliono (1960) did not recognize these collections, the reason that *L. dioica* was omitted in Flora Malesiana.

8. *Lobelia donanensis* P.Royen, Kew Bull. 20: 305. 1966; Steenis, Fl. Males., Ser. 1, Spermat. 6, addenda: 928. 1972.— Type: Papua New Guinea, Milne Bay Distr., Mt Donana, *Cruttwell 1250* (holo **K**; iso **L**).

A middle altitude herb from eastern Papua New Guinea, once found at 2250 m altitude.

9. *Lobelia dopatrioides* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 39 (2): 77. 1870; Kerr, Fl. Siam. 2: 303. 1936.

Annual or (sub)perennial herb, glabrous, with one or more main stems; stems erect or suberect and commonly sagged in lower portion, or

decumbent, not rooting at the nodes; stem angular or subterete, not winged. *Leaves*: lower ones sessile or short-petiolate, and blades (broadly) elliptic; upper ones (sub)sessile, and blades elliptic or narrowly elliptic, apex acute. *Bracteoles* present or

not obvious. *Flowers*: pedicel 10–20(–25) mm long; ovary glabrous; corolla bilabiate, 6–12 mm long; all anthers bearded at apex. *Fruit* a capsule. *Seeds* trigonous.

KEY TO THE VARIETIES

1. Plant erect
1. Plant suberect or decumbent
 2. Flowers small, corolla 6–9 mm long
 2. Flowers large, corolla 10–12 mm long

a. var. **dopatrioides**

b. var. **cantonensis**

c. var. **kradungensis**

a. var. dopatrioides.— *Lobelia griffithii* Hook.f. & Thomson var. *dopatrioides* (Kurz) Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 46 (2): 211. 1877.— Type: Myanmar, Arracan, Kurz s.n. (holo **CAL**, not seen; iso **K**).

Erect annual herb, with one or few main branches; stem angular. *Leaves* sessile, lower blades (5–)10–20 mm long, upper blades (5–)10 mm long. *Flowers*: corolla (6–)8–10 mm long.

Distribution.— S Myanmar; Thailand; Indochina.

Ecology.— In wet places, open marshy and grassy grounds, open areas on sandy soil; from sea level to 520 m altitude. Flowering and fruiting all year round.

Notes.— *Lobelia dopatrioides* var. *dopatrioides* and *L. griffithii* both have an erect growth habit but the latter differs in having much smaller leaves. *Lobelia dopatrioides* var. *dopatrioides* may be confused with both *L. alsinoides* and *L. dopatrioides* var. *cantonensis*. However, both are distinct in having basically sagged or ascending main branches, although the difference with var. *cantonensis* is sometimes gradual and may be influenced by habitat.

The flowers are sometimes recorded as white.

b. var. cantonensis (Danguy) W.J.de Wilde & Duyfjes, **comb. nov.**— Basionym: *Lobelia chinensis* Lour. var. *cantonensis* Danguy forma *cantonensis*, Fl. Indo-Chine [P.H.Lecomte et al.] 3: 681. 1930.— *L. alsinoides* Lam. var. *cantonensis* (Danguy) E.Wimm., Ann. Naturhist. Mus. Wien 56: 360. 1948.— Type: China, Canton, Hance 634 (lecto **W**, here designated, not seen; iso **K**).— *L. chinensis* Lour. var. *cantonensis* Danguy forma

elongata Danguy, Fl. Indo-Chine [P.H.Lecomte et al.] 3: 681. 1930.— Syntypes: Tonkin, Quang-yen, Balansa; Cambodia, Kampot, Harmand, Lecomte & Finet, Geoffray; Annam Thua-thien Eberhardt (lectotype not yet designated.— *L. hosseusii* E.Wimm., Repert. Spec. Nov. Regni Veg. 26: 2. 1929.— Type: Thailand, Doi Chiang Dao, Hosseus 462 (holo **W**, photo seen; iso **K**).— *L. hosseusii* E.Wimm. var. *villosa* Kerr, Fl. Siam. 2: 304. 1936.— Type: Thailand, Put 1950 (holo **K**).— *L. hancei* H.Hara, J. Jap. Bot. 17: 23. 1941.— *L. alsinoides* Lam. subsp. *hancei* (H.Hara) Lammers, Bot. Bull. Acad. Sin. (Taipei) 33(3): 287. 1992.— Type: China, Canton, Sampson in Hance 634 (holo **GH**, photo seen; iso **K**).

Annual or subperennial herb with one or several branches, ascending; stem subterete or angular. *Lower leaves*: petiole up to 3 mm long and blades (broadly) elliptic; upper leaves sessile and blades narrowly elliptic or linear. *Flowers*: corolla 6–9 mm long.

Distribution.— NE India(?), east through China (Hong Kong, Guangzhou: Canton, Hainan, Kung Tung) and Indochina (including Thailand and Vietnam: Tonkin, Annam to Japan, and south-east to New Guinea.

Ecology.— Common in wet areas like moist sandy and marshy soils, on open grassy ground, and edges of flooded rice fields; from sea level to 200 m altitude. Flowering and fruiting all year round.

Notes.— Most material of the present *L. dopatrioides* var. *cantonensis* was formerly included in a widely accepted *L. alsinoides*, but the distinctness from proper, now more narrowly conceived *L. alsinoides*, was blurred by the inclusion

of material of quite distinct species, e.g. *L. reinwardtiana*, *L. terminalis*, and *L. zeylanica*. In general, the corolla of *Lobelia dopatrioides* var. *cantonensis* is larger (6–9 mm long) than that of *L. alsinoides* (5–7 mm long).

c. var. kradungensis W.J.de Wilde & Duyfjes, **var. nov.** A varietate *cantonensis* habitu validiore (sub)perennanti, floribus lazulineis, corolla 10–12 mm longa differt.— Typus: Thailand, Loei, Phu Kradueng, 16 Jan. 1966, *Hennipman 3703* (holo **BKF**, iso **L**).

Perennial herb, often purplish tinged, stems ascending, one or several growing from primary root-tuft, not or but occasionally rooting from lower nodes; stem subterete, not winged. *Leaves*: blade 10–20 by 5–10 mm, upper blades smallest. *Bracteoles* 0.5–1 mm long. *Flowers*: sepals 3–3.5 mm long; corolla 10–12 mm long, corolla lobes uniformly bright dark blue, except for white markings in the throat, lower 3 lobes broadly obovate, each ca 3 mm wide. *Fruit* subglobose, rounded at base, ca 3 by 3 mm. *Seeds* trigonous.

Distribution.— Endemic to Phu Kradueng and its surroundings, Loei, NE Thailand.

Ecology.— Common in open grassy places on slightly peaty sandy soil (on the plateau of Phu Kradueng,); 800–1300 m altitude.

Notes.— Variety *kradungensis* obviously is close to the widely conceived and very widespread *L. dopatrioides* var. *cantonensis*, but on the plateau of Phu (= Mt) Kradung the latter is replaced by distinct plants of a stouter and perennial habit and with conspicuously large dark blue flowers.

10. *Lobelia griffithii* Hook.f. & Thomson, J. Proc. Linn. Soc., Bot. 2: 28. 1858; Kerr, Fl. Siam. 2: 303. 1936.— Type: Myanmar, Mergui, *Griffith 660* (holo **K**, two sheets).

Annual herb, glabrous, erect, few- or many-branched; stem (sub)terete, not winged. *Leaves*: petiole absent; lower and upper blades similar, elliptic (or linear), to 5(–8) mm long, apex acute. *Bracteoles* present. *Flowers*: pedicel 10–20 mm long; ovary glabrous; corolla bilabiate, 5–6 mm long; anthers all bearded at apex. *Fruit* a capsule, glabrous. *Seeds* trigonous.

Distribution.— Myanmar, Thailand, Laos,

Cambodia, Vietnam (Annam, Tonkin), northern Peninsular Malaysia.

Ecology.— Wet and dry fallow rice fields, open grassy fields, lower montane pine-oak forest; sea level to 250–1300 m altitude.

Notes.— Various authors, e.g. Clarke (1881) and Lammers (2007), united *L. dopatrioides* with *L. griffithii*. Apart from having different leaf size and shape, the former has (mostly) a different growth habit, stems more or less sagged at base, or ascending, and larger flowers, with corolla 6–12 mm long.

11. *Lobelia hainanensis* E. Wimm., Ann. Naturhist. Mus. Wien 41: 348. 1948; Pflanzenr. (Engler) IV.267b (107. Heft) II. Teil: 506, f. 76: l. 1953; Lammers, World Checkl. & Bibliogr. Campanulaceae: 424. 2007; D.Y.Hong & Lammers in D.Y.Hong, Ge Song, Lammers & L.L.Klein, Fl. China, 19: 557. 2011 (electronic version).— Type: Hainan, *Liang 64115* (**NY**, not seen (drawing made from the type published in Wimmer, l.c.: fig. 76: l. 1953); iso **S**).

Subperennial ascending or erect herb, glabrous; stem 4-angular. *Leaves*: petiole absent; lower and upper blades similar, spatulate-oblong or elliptic, ca 15 mm long. *Bracteoles* not seen. *Flowers*: pedicels shorter than the leaves; ovary glabrous; corolla bilabiate, ca 10 mm long; all anthers bearded at apex. *Fruit* and *seeds* unknown.

Distribution.— Hainan, only known from the type-collection.

Ecology.— Possibly lowland; altitude not recorded.

Notes.— We have seen an isotype of *L. hainanensis* at **S**, which bears flowers but no fruits. According to its protologue and the corresponding drawing (Wimmer, l.c.: fig. 76: l. 1953) this plant looks most similar to *L. reinwardtiana* from S India and Indonesia (Sumatra and Java). We found Wimmer's description correct, except that the **S**-specimen shows all anthers bearded at apex. For the key to the species it is assumed that it has ellipsoid seeds, but this can only be ascertained when fruiting material becomes available.

12. *Lobelia heyneana* Schult., Syst. Veg., ed. 15

bis [Roemer & Schultes] 5: 50. 1819.— Type: *Heyne* s.n. in herb. Roth (B100154255, photo seen).— *L. decurrens* Roth, Nov. Pl. Sp.: 145. 1821, *nom. inval.* (non Cav., Icon. 6: 13, tab. 521. 1801).— Type: *Heyne* s.n. in herb. Roth (B100154255, photo seen).— *L. trialata* D. Don, Prodr. Fl. Nepal.: 157. 1825.— Type: Nepal, *Hamilton* s.n. (BM, not seen).— *L. subincisa* A. DC., Prodr. (DC.) 7: 367. 1836.— Type: *Wallich* 1310 (holo K).— *L. subracemosa* Miq., Fl. Ned. Ind. 2: 576. 1857.— Type: Java, *Horsfield* 1339 (holo K).— *L. subracemosa* var. *β rigidior* Miq., Fl. Ned. Ind. 2: 576. 1857.— Type: Java, *Horsfield* 728 (holo K).— *L. trialata* D. Don var. *lamiifolia* C. B. Clarke, Fl. Brit. India [J. D. Hooker] 3: 425. 1881.— Type: S India, *Wight* 1278 (lecto K, here designated).— *L. trialata* D. Don var. *asiatica* Chiov., Res. Sci. Somalia Ital. 1: 109. 1916.— Locality and type not indicated.— *L. bialata* Merr. in Philipp. J. Sci., C 7(2): 105. 1912.— Type: Philippines, Luzon, Bontoc, *Vanoverbergh* 902 (PNH, not seen).— *L. micrantha* Hook., Exot. Fl. 1: t. 44. 1823, *nom. inval.* (non Kunth, Nov. Gen. Sp. [H. B. K.] 3: 316. 1820).

Annual herb, glabrous, with one single erect main stem, sometimes with long lateral branches from above the base; stem 3-winged. *Leaves*: petiole up to 4 mm long; lower blades broadly ovate or rhombic, with narrowed base, decurrent on the petiole, upper blades similar, but somewhat narrower and smaller. *Bracteoles* present. *Flowers*: ovary glabrous; corolla bilabiate, 3–4(–5) mm long; only 2 anthers bearded at apex. *Fruit* a capsule, glabrous. *Seeds* compressed, ellipsoid.

Distribution.— N & S India; Sri Lanka; east to China; south-east through Indochina to Indonesia (the Lesser Sunda Islands); sea level to 2000 m altitude; not in wet localities. Also known from Africa (e.g. Ethiopia).

Ecology.— Common; 750–1700 m altitude.

Notes.— *Lobelia heyneana* has in the past been mixed up with *L. stipularis* (here treated as a synonym of *L. alsinoides* var. *alsinoides*), but the latter differs in having a procumbent growth form and a larger corolla, 5–7 mm long. Both species are also distinct in the shape of the seeds, which are ellipsoid in *L. heyneana*, whereas they are trigonous in *L. alsinoides*.

13. *Lobelia microcarpa* C. B. Clarke, Fl. Brit. India [J. D. Hooker] 3: 424. 1881.— Type: Myanmar, Moulmein, *Lobb* 410 (lecto K, here designated).

Annual herb, erect, glabrous, with one stem or with several main branches from the base, not rooting from lower nodes; stem (sub)terete, somewhat fleshy at base; roots ‘spongy’, whitish. *Leaves*: petiole absent; lower blades subcircular, upper blades (narrowly) elliptic. *Bracteoles* minute. *Flowers*: pedicel 10–20(–25) mm long; ovary glabrous; corolla bilabiate, 4–5(–6) mm long; anthers all bearded at apex. *Fruit* a capsule, glabrous, (hemi)globose, small, 2–2.5 mm in diam. *Seeds* trigonous.

Distribution.— India (Calcutta?, Andaman Islands), Myanmar (Tenasserim, Moulmein), S China (Canton), Thailand, Laos, Cambodia.

Examined collections.— India: S Andaman, 23 Nov. 1973, *Balakrishnan* 632 (L), deviating, see note; near Calcutta, anno 1937, *Helper* 134 (L). Myanmar: Moulmein, *Lobb* 410 (K, lectotype). Thailand: Chanthaburi, 17 Oct. 1956, 200 m alt., *Smitinand* 3579 (BKF). Cambodia: Mekong River, 12° 40' N; 106° 05' E, 04 August 2007, *Maxwell* 07-508 (L).

Ecology.— Wet places on poor soil at low altitudes.

Notes.— 1. *Lobelia microcarpa* is characterized by its annual, erect growth habit, by circular lower leaves, and short corolla, 4–5(–6) mm long. Possibly the ‘spongy’ whitish roots are also diagnostic.

2. Unusual large plants, 40 cm tall, from South Andaman (*Balakrishnan* 632) may belong here.

14. *Lobelia nummularia* Lam., Encycl. [J. Lamarck et al.] 3(2): 589. 1792.— Type: *Commerson* s.n. in Herb. Lamarck. “ex Java” [also annotated “2, *Piddingtonia* Alph. DC.”], (P-LAM photo seen).— *Lobelia begoniifolia* Wall., Asiat. Res. 13: 377. 1820.— *Pratia begoniifolia* (Wall.) Lindl., Edwards’s Bot. Reg. 16: t. 1373. 1830.— Type: Nepal, *Wallich* 1306 (holo K, 2 sheets).— *Lobelia horsfieldiana* Miq., Fl. Ned. Ind. 2: 577. 1857.— Type: Java, Sello, *Horsfield*, not seen.— *L. angulata* auct. non G. Forst., Fl. Ins. Austr.: 58. 1786: Moeliono, Fl. Mal. Ser. 1, Spermat. 6: 133. 1960.

Low creeping herb, glabrous or hairy, rooting at the nodes; stem terete; roots fibrous. *Leaves* distichous; petiole distinct; lower and upper blades similar, subcircular, dentate on margins. *Bracteoles* absent. *Flowers*: ovary glabrous or hairy; corolla sub-bilabiate, 5–12 mm long; only 2 anthers bearded at apex. *Fruit* berry-like (also capsular in Philippines, Sulawesi and New Guinea), ellipsoid or globose. *Seeds* compressed, ellipsoid, with reticulate surface.

Distribution.— SE Asia to Australia; also naturalized in S America.

Notes.— *Lobelia nummularia* is very variable in growing habit and it is recorded from sea level to high up in the mountains (New Guinea). Plants from eastern Malesia are peculiar as they sometimes have capsular fruits; see Moeliono (1960: 133, as *L. angulata* Forst.).

15. *Lobelia reinwardtiana* (C.Presl) A.DC., Prodr. (DC.) 7(2): 367. 1839.— *Rapuntium reinwardtianum* C.Presl, Prodr. Monogr. Lobel.: 14. 1836.— Type: Java *Reinwardt s.n.* (holo L0846159).— *Lobelia dichotoma* Miq., Fl. Ned. Ind. 2: 576. 1857.— Type: Indonesia, Java, *Horsfield* 327 (holo K).— *L. aligera* Haines, J. Proc. Asiat. Soc. Bengal

15: 316. 1920.— *L. zeylanica* L. var. *aligera* (Haines) Haines, Bot. Bihar Orissa 4: 501. 1922.— *L. dichotoma* Miq. var. *aligera* (Haines) E.Wimm., Ann. Naturhist. Mus. Wien 56: 345. 1948.— Type: India, mountains of Chota Nagpur, *Haines s.n.*, not seen.— *L. dichotoma* Miq. var. *pilosella* E.Wimm, Repert. Spec. Nov. Regni Veg. 38: 78. 1935.— Type: Java, *Docters van Leeuwen* 2364 (L).— *L. zeylanica* auct. non L., Sp. Pl.: 932. 1753: C.B.Clarke, Fl. Brit. India [J. D. Hooker] 3: 425, p.p. 1881. Fig. 2.

(Sub)perennial herb, glabrous or sparsely hairy, branches few, ascending; stem 2- or 3-winged (winged when dry). *Leaves* subsessile, or with a petiole up to 5 mm long; lower blades broadly ovate, rhombic, or elliptic, at base long and narrowly decurrent on the petiole, upper blades only slightly narrower and somewhat smaller. *Bracteoles* absent or minute, 0.5–1 mm long, linear. *Flowers*: ovary (sub)glabrous; corolla bilabiate, 7–12 mm long; only two anthers bearded at apex. *Fruit* a capsule, glabrous. *Seeds* compressed, ellipsoid.

Distribution.— S India; Indonesia (Sumatra, Java).

Ecology.— At high altitudes, (1200–)1700–2200 m.

KEY TO THE VARIETIES

1. Corolla 7–8 mm long
1. Corolla 10–12 mm long

- a. var. **reinwardtiana**
- b. var. **megalantha**

a. var. **reinwardtiana**

Corolla 7–8 mm long.

Distribution.— South and Central India, Indonesia.

Ecology.— Possibly confined to areas between 1000 and 2000 m altitude.

Notes.— In various flora treatments (e.g. Moeliono, 1960) material of *L. reinwardtiana* was mistaken with *Lobelia heyneana*, an annual species with one single, usually strictly erect main stem, and smaller flowers.

b. var. megalantha W.J.de Wilde & Duyfjes, var. nov.— A varietate typica floribus maioribus, corolla 10–12 mm longa differt.— Typus: India,

Kerala, Umaiya Malai-Devicolam, *Shetty, Bot. Survey India* 27332 (holo K).

Corolla 10–12 mm long.

Distribution.— India.

Ecology.— Flowers blue; 2150 m altitude.

Examined collections.— *Fischer* 3336 (K); *Shetty, Bot. Survey India* 27332 (K).

16. *Lobelia reptans* W.J.de Wilde & Duyfjes, sp. nov.— *Lobelia reinwardtiana* similis stolonibus longioribus validioribus, pedicellis 40–60 mm longis, floribus maioribus, fructibus ca 10 mm longis differt.— Typus: Papua New Guinea, New Ireland, East-coast, 21 Oct. 1975, *Sands, Pattison, Wood & Croft* 2455 (holo K; iso K). Fig. 3.

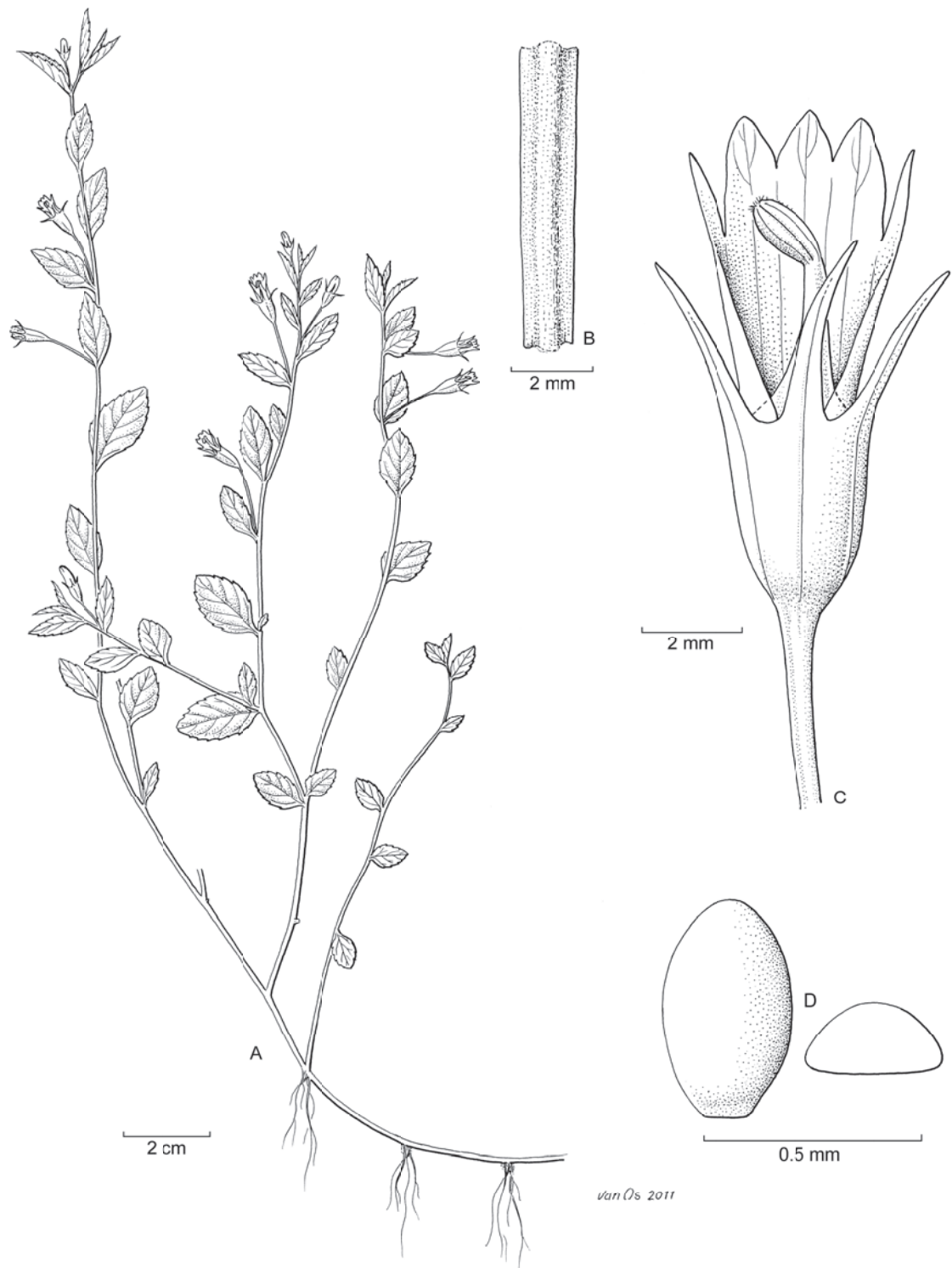


Figure 2. *Lobelia reinwardtiana* (C.Presl) A.DC. var. *reinwardtiana*: A. Habit; B. detail of stem; C. mature flower bud, corolla laid open; D. ellipsoid seed, frontal view and cross section (all: Junghuhn s.n.; L0846173).

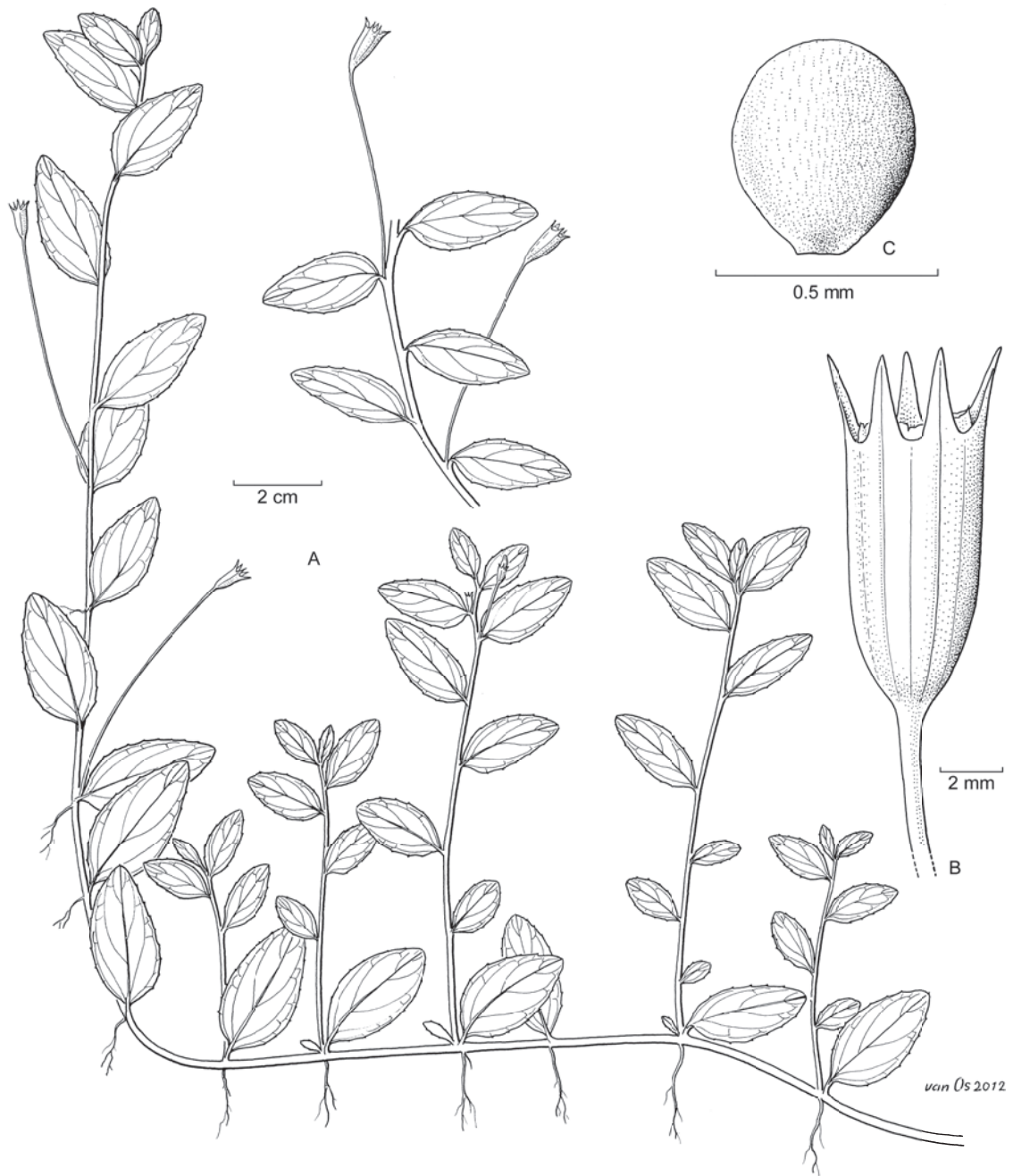


Figure 3. *Lobelia reptans* W.J.de Wilde & Duyfjes: A. Habit; B. capsule; C. seed (all: Wood & Croft 2455).

Perennial herb, glabrous, with epigeous creeping shoots up to 80 cm long, rooting at the nodes, with erect shoots from nodes to 15 cm long; stem (1–)2–2.5 mm in diam., somewhat winged when dry. *Leaves*: petiole (1–)2–4 mm long; all blades ovate-elliptic. *Bracteoles* absent. *Flowers*: pedicel 2 or 3 times longer than sustaining leaf, 40–60 mm long; ovary glabrous; corolla bilabiate, seen in bud only. *Fruit* a capsule, glabrous, ob-ovoid, ca 10 by 4.5 mm. *Seeds* somewhat compressed, ellipsoid, with finely reticulately sculptured surface.

Distribution.— Endemic to Papua New Guinea (New Ireland); only known from the type-collection.

Ecology.— Middle-altitude forest, open mossy places; in damp disturbed vegetation on very steep slope at the side of stony landslip; creeping in partial shade; 1575 m altitude. Flowering & fruiting in October.

Notes.— The seed coat of *L. reptans* is similar to type D as designated by Murata (1992).

17. *Lobelia serratifolia* W.J.de Wilde & Duyfjes, **sp. nov.**— A congeneribus asiaticis minoribus foliis (anguste) ovato-ellipticis 8–20 mm latis margine serrato-dentato differt.— Typus: Papua New Guinea, Bougainville Isl., Port-Mine Road, 19 June 1974, Womersley NGF 46500 (holo **K**, iso **A**, **BRI**, **CANB**, **L**). Fig. 4.

Perennial herb, glabrous, with thin creeping leafless stem to ca 50 cm long, ascendent at apex and producing (10–)20–30 cm long vertical shoots, possibly also from the rooting nodes; stem terete, unwinged, 1–1.5 mm in diam. *Leaves* distichous, 8–12(–20) per shoot, the lower ones withered; petiole (1–)2 mm long; blade narrowly ovate-elliptic, 20–35 by 8–20 mm, base rounded, margin at each side with 10–20 teeth, 1–1.5 mm long, apex acute-acuminate. *Bracteoles* absent. *Flowers* axillary, solitary, glabrous; pedicel 30–60(–70) mm long; ovary turbinate, ca 3 mm long; sepals narrowly triangular, ca 3 mm long, at base 0.7(–1) mm wide; corolla blue, sub-unilabiate, (8–)10–13 mm long, united at base for 2–3 mm (except dorsal slit), lobes very minutely hairy at throat, oblong-linear, acute; filaments ca 2.5 mm long, connate at apex, only 2 filaments finely hairy about halfway;

synandrium glabrous, ca 1.5 mm long; style ca 4.5 mm long, broadened at base, glabrous, stigma (stigma lobes) 2, each ca 0.3 mm long. *Fruit* a capsule, long-obconical, 6–7 by 3.5 mm, at apex with short-conical extension above somewhat reflexed persistent sepals. *Seeds* numerous, flattened, broadly ellipsoid (to nearly circular) in outline, ca 0.5 mm long, with minutely sculptured surface.

Distribution.— Only known from the type-collection: Papua New Guinea, Bougainville Isl., Port-Mine Road, Crown Prince Range, Kieta District, 6° 20' S; 155° 30' E.

Ecology.— On open ground after road building; 900 m altitude. Flowering & fruiting in June.

Note.— The creeping growth-habit, distichous leaves, and sub-unilabiate corolla suggest a relationship with *L. chinensis*.

18. *Lobelia terminalis* C.B.Clarke, Fl. Brit. India [J. D. Hooker] 3: 424 (incl. var. *minuta* C.B.Clarke). 1881.— Type: Sikkim, Clarke s.n. (lectotype **K**, here designated).

Annual herb, soft-hairy, sometimes glabrescent (see note), erect or suberect and branching from (somewhat) above the base; stem subterete; roots fibrous, not 'spongy'. *Leaves*: petiole ± winged, to 2 mm long, or subsessile; lower blades subcircular or broadly ovate, upper blades smaller, the highest also narrower. *Bracteoles* absent or present (see note). *Flowers*: pedicel comparatively long, 15–40 mm long; ovary soft hairy (or glabrous, see note); corolla bilabiate, all lobes uniformly blue, white marking excepted, 4–7(–8) mm long; anthers all bearded at apex. *Fruit* a capsule, hairy, glabrescent or glabrous (see note). *Seeds* trigonous.

Distribution.— India (Bengal), China (Yunnan), Thailand, Laos.

Ecology.— Between 300–800 m altitude.

Notes.— The collection *Van Beusekom et al.* 3621, Kanchanaburi, from limestone, is somewhat deviant, since it consists of a mixture of hairy and subglabrous specimens. The latter have conspicuous bracteoles (2–)3–6 mm long, sometimes foliaceous, the ovaries and capsules are glabrous, and these plants are reminiscent of *L. microcarpa*. Possibly they are of hybrid origin; they also come

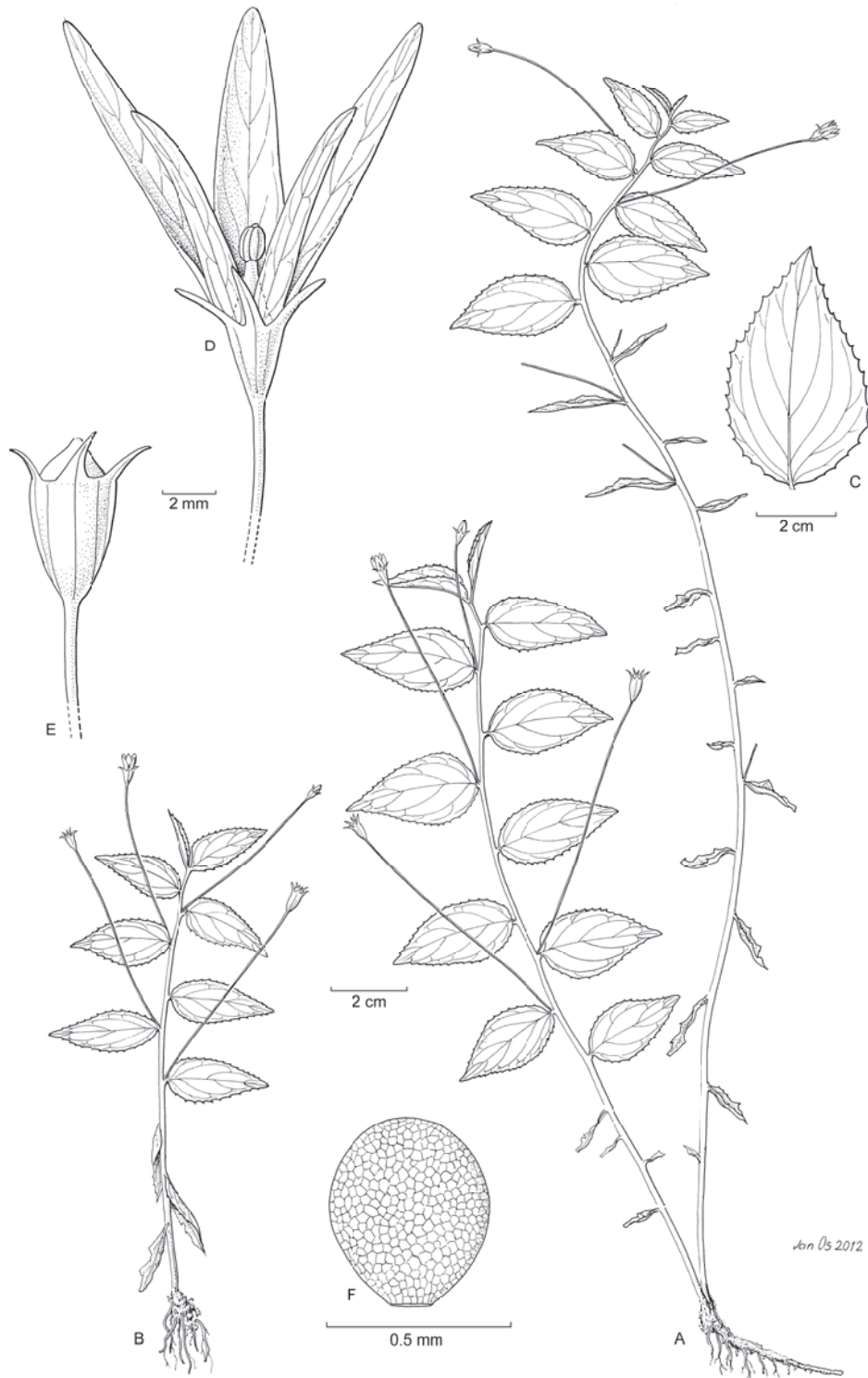


Figure 4. *Lobelia serratifolia* W.J.de Wilde & Duyfjes: A, B. Habit; C. leaf; D. flower, in dorsal view; E. capsule; F. seed (all: Womersley NGF 46500).

close to *L. thorelii*, a species with a more prostrate growth habit and 3-coloured flowers.

19. *Lobelia thorelii* E.Wimm., Repert. Spec. Nov. Regni Veg. 26: 3, t. 71, f. 3. 1929.— Type: Laos, Expédition du Mékong, rivière d'Ubon, anno 1866, *Thorel s.n.* (holotype **P** P0243511, photo seen).

Annual herb, sparingly soft-hairy, especially on ovary (partly glabrescent), few-branched at base, branches ascending but not or rarely rooting at the lower nodes; stem subterete (low-winged when dry). *Leaves*: petiole up to 2 mm long; lower blades subcircular, narrowly cuneate at base, upper blades smaller, only somewhat narrower, (narrowly) ovate. *Bracteoles* linear, 2 mm long. *Flowers*: pedicel 15–60 mm long; ovary soft-hairy; corolla bilabiate, bright blue with two white markings near the throat, but upper lobes lilac (pinkish), 7–10 mm long; anthers all bearded at apex. *Fruit* a capsule, hairy (or glabrescent). *Seeds* trigonous.

Distribution.— Northeastern and eastern Thailand, Laos (type), can be expected in Cambodia; in harvested paddy fields.

Ecology.— In open areas in rice fields, on small dikes and in harvested rice fields, also in open wet areas; 130–300 m altitude.

Examined collections: Thailand: North-Eastern: Udon Thani, Kumphawapi, 27 Nov. 2010, *Phonsena et al.* 6614 (**BKF**, **KKU**, **L**); Maha Sarakham, Borabue, Bo Yai, Ban Bo Yai, 14 Dec. 2010, *Phonsena et al.* 6640 (**BKF**, **KKU**, **L**). Eastern: Nakhon Ratchasima, Pak Thong Chai, 24 Dec. 1924, *Kerr* 8099 (**L**); Nakhon Ratchasima, Korat, 22 Jan. 1931, *Kerr* 19927 (**L**); Buri Ram, 27 Nov. 1976, *Phengklai et al.* 3468 (**BKF**); *ibid.*, 23 Dec. 2005, *Pooma et al.* 6100 (**BKF**, **L**); *ibid.*, 20 Dec. 2005, *Pooma et al.* 5959 (**BKF**, **L**); Surin, 27 Nov. 2007 *Norsaengsri et al.* 3126 (**QBG**).

Ecology.— Between 150–200 m altitude.

Notes.— 1. Edible; the whole plant, with stems, leaves and flowers, raw served with rice.

2. Occurs occasionally gregarious, brightly blue colouring large patches in the fields.

3. *Lobelia thorelii* is similar to *L. terminalis*, the latter either with a single rather erect main stem, or branching higher up or towards the base, and with smaller flowers, uniformly blue (except

for white markings on lower lip).

20. *Lobelia walkeri* (C.B.Clarke) W.J.de Wilde & Duyfjes, *stat. nov.*— Basionym: *Lobelia zeylanica* L. var. *walkeri* C.B.Clarke, Fl. Brit. India [J. D. Hooker] 3: 425. 1881.— Type: Ceylon, *Walker* 123, the lower specimen (lectotype **K**, here designated).

Rather delicate annual or subperennial herb, glabrous, few-branched, ascending; stem ca 1 mm in diam., 3-winged (when dry). *Leaves*: petiole 1–4(–7) mm long; all blades subcircular, at the very base shortly attenuate into petiole. *Bracteoles* ca 0.5 mm long. *Flowers*: ovary glabrous; corolla bilabiate, 6–7 mm long; only 2 anthers bearded at apex. *Fruit* a capsule, glabrous. *Seeds* ± compressed, ellipsoid.

Distribution.— Sri Lanka.

Examined collections.— *Cramer* 4447 (**L**); *Hepper* 4450 (**K**); *Kostermans* 23020 (**L**), 24230 (**L**); *Van Beusekom* 1483 (**L**); *Walker* 123 (**K**, lectotype).

Ecology.— Between 2000–2100 m altitude.

Notes.— Clarke (l.c.) cites 2 collections: *Walker*, and *Wight*. The collection by *Wight* (**K**) is however *L. alsinoides*.

21. *Lobelia zeylanica* L., Sp. Pl. 2: 932. 1753; Moeliono, Fl. Mal. Ser. 1, Spermat. 6: 128. 1960; C.E.Jarvis, Order out of chaos: 639. 2007.— Type: Herb. Linnaeus, no. 1051.41 (LINN), left hand specimen: *Osbeck?* “18 *zeylanica*” (lecto LINN, here designated).— *L. succulenta* Blume, Bijdr. Fl. Ned. Ind. 13: 728. 1826.— Type: Java, Buitenzorg, *Blume* 760 (holo **L**; iso **L**).— *L. affinis* G.Don, Gen. Hist. 3: 709. 1834.— Type: India, Sylhet, *Wallich* 1311 (holo **K**, two sheets).— *L. subcuneata* Miq., Fl. Ned. Ind. 2: 574. 1857.— Type: Java, Banjoemas, *Horsfield s.n.* (U0000945 at **L**, photo seen).— *L. lobbiana* Hook.f. & Thomson, J. Proc. Linn. Soc., Bot. 2: 28. 1858.— *L. affinis* G.Don var. *lobbiana* (Hook.f. & Thomson) C.B.Clarke, Fl. Brit. India [J. D. Hooker] 3: 424. 1881.— *L. succulenta* Blume var. *lobbiana* (Hook.f. & Thomson) E.Wimm., Ann. Naturhist. Mus. Wien 56: 361. 1948.— *L. zeylanica* L. var. *lobbiana* (Hook.f. & Thomson) Y.S.Lian, Fl. Reipubl.

Popularis Sin. 73(2): 149. 1938.— Type: India, Khasia Mountains, Lobb s.n. (holo **K**).— *Dortmanna trigona* (Roxb.) Kuntze var. *nummulariifolia* Kuntze, Revis. Gen. Pl. 2: 380. 1891 ('*nummulariaefolia*').— Type from Bengal, not further indicated, not traced.— *Lobelia macraeana* E.Wimm, Ann. Naturhist. Mus. Wien 56: 361. 1948; Pflanzenr. (Engler) IV.267b (107. Heft) II. Teil: 575, f. 93: f. 1953.— Type: Sri Lanka, *Macraea* 1227 (holo **CGE**, not seen).

(Sub)perennial herb, usually hairy to some degree, ascendant, rooting at lower nodes; stem subterete; roots fibrous. *Leaves*: petiole (2–)4–10 mm long; lower and upper blades similar, broadly ovate. *Bracteoles* absent (always?). *Flowers*: ovary usually (soft) hairy; corolla bilabiate, 5–15 mm long; anthers all bearded at apex. *Fruit* a capsule, usually hairy. *Seeds* trigonous.

Distribution.— Widespread, from N and S India, Sri Lanka, east to China (including Taiwan), south-east to whole of Malesia (not yet found in Indonesia: Lesser Sunda Islands and Moluccas); also Solomon Islands, naturalized in Fiji.

Ecology.— Damp, (half)shaded places, from sea level to 1200 m altitude.

Notes.— 1. *Lobelia zeylanica* is readily distinct by a decumbent growth habit, some hairiness especially on ovary (and fruit), and distinctly petiolate leaves.

2. Subglabrous forms are known from Sri Lanka.

3. We regard *L. lobbiana* as a synonym, representing a large-flowered local form, with corollas to 15 mm long, from Khasia Mts. Similar forms with large corollas are also known from S China and Sumatra. The larger flowered form gradually merges into smaller flowered specimens, and the

variation apparently is found all over the wide area of *L. zeylanica*.

4. We regard *L. macraeana* as a synonym, although in the protologue bracteoles at the base of the fruiting pedicel are mentioned.

DOUBTFUL SPECIES

Lobelia luzoniensis (Pers.) Merr., Enum. Philipp. Fl. Pl. 3: 588. 1923; Moeliono, Fl. Males., Ser. 1, Spermat. 6: 128. 1960 (in note under *L. alsinoides*); Lammers, World Checkl. & Bibliogr. Campanulaceae: 433. 2007.— *L. filiformis* Lam. var. β *luzoniensis* Pers., Syn. Pl. 2: 214. 1806; Schult., Syst. Veg., ed. 15 [Roemer & Schultes] 5: 61. 1819; A.DC., Prodr. (DC.) 7: 368. 1839.— *L. filiformis* auct. non Lam., Encycl. [J. Lamarck & al.] 3(2): 588. 1792; Cav., Icon. 6: 7, t. 511, f. 1. 1801; Miq., Fl. Ned. Ind. 2: 577. 1857; Fern.-Vill., Nov. App.: 121. 1880.

Notes.— Typification: *Lobelia filiformis* var. *luzoniensis* was based on the description and drawing by Cavanilles (l.c.), who mentioned that these were made after a collection by Née (at **MA**?; not seen) from near Santa Cruz, at Laguna, Luzon, Philippines.

The description and figure, which describes and depicts a strictly erect growing specimen with small roundish leaves at base and larger narrow leaves higher up, cannot be judged as identical with any later *Lobelia* collection from that region, despite the two specimens added by Merrill (l.c.), and discussed by Moeliono (l.c.).

Until truly similar plants are found in the area (Luzon), we regard the name as possibly based on a plant from a remote locality, and as doubtful for Asia.

LIST OF NAMES AND SYNONYMS OF LESSER-SIZED LOBELIAS OF ASIA AND MALESIA

Lobelia

affinis G.Don (1834) = *L. zeylanica*

affinis G.Don var. *lobbiana* (Hook.f. & Thomson)

C.B.Clarke (1881) = *L. zeylanica*

aligera Haines (1920) = *L. reinwardtiana*

alsinoides Lam. (1792)

alsinoides Lam. var. *cantonensis* (Danguy)

E.Wimm. (incl. f. *elongata* Danguy) (1948) = *L.*

dopatrioides var. *cantonensis*

alsinoides Lam. var. *hirta* E.Wimm. (1948) [see *L. chinensis* var. *hirta*] = possibly *L. thorelii*

alsinoides subsp. *hancei* (H.Hara) Lammers (1992) = *L. dopatrioides* var. *cantonensis*

alsinoides var. trigona (Roxb.) W.J.de Wilde & Duyfjes (2012)

archboldiana (Merr. & L.M.Perry) Moeliono (1960)

arenarioides (C.Presl) A.DC. (1839) = L. heyneana

arfakensis Gibbs (1917) = L. nummularia

begoniifolia Wall. (1820) = L. nummularia

bialata Merr. (1912) = L. heyneana

brachyantha Merr. & L.M.Perry (1941)

caespitosa Blume (1826) = L. chinensis

chevalieri Danguy (1929)

chinensis Lour. (1790)

chinensis Lour. var. cantonensis Danguy f. cantonensis (1930) = L. dopatrioides var. cantonensis

chinensis Lour. var. cantonensis Danguy f. elongata Danguy (1930) = L. dopatrioides var. cantonensis

chinensis Lour. var. hirta Danguy (1930) = possibly L. thorelii

conferta Merr. & L.M.Perry (1949)

decurrens Roth (1821) = L. heyneana

dichotoma Miq. (1857) = L. reinwardtiana

dichotoma Miq. var. aligera (Haines) E.Wimm. (1948) = L. reinwardtiana

dichotoma Miq. var. pilosella E.Wimm. (1935) = L. reinwardtiana

dioica R.Br. (1810)

donanensis P.Royen (1966)

dopatrioides Kurz (1870)

dopatrioides Kurz var. cantonensis (Danguy) W.J.de Wilde & Duyfjes

dopatrioides Kurz var. kradungensis W.J.de Wilde & Duyfjes (2012)

filiformis Lam. var. β luzoniensis Pers. (1806) = doubtful species

griffithii Hook.f. & Thomson (1858)

griffithii Hook.f. & Thomson var. dopatrioides (Kurz) Kurz (1877) = L. dopatrioides var. dopatrioides

hainanensis E.Wimm. (1948)

hancei H.Hara (1941) = L. dopatrioides var.

cantonensis

heyneana Schult. in Roem. & Schult. (incl. var. lamiifolia (C.B.Clarke) E.Wimm) (1819)

horsfieldiana Miq. (1857) = L. nummularia

hosseusii E.Wimm. (1929) = L. dopatrioides var. dopatrioides

hosseusii E.Wimm. var. villosa Kerr (1936) = L. dopatrioides var. dopatrioides

javanica Thunb. (1825) = L. nummularia

lobbiana Hook.f. & Thomson (1858) = L.

zeylanica

luzoniensis (Pers.) Merr. (1923) = doubtful species

macraeana E.Wimm. (1948) = L. zeylanica

micrantha Hook., non Kunth, nom. inval. = L. heyneana

microcarpa C.B.Clarke (1881)

nummularia Lam. (1792)

obliqua D.Don (1825) = L. nummularia

paradoxa E.Wimm. (1929) = L. nummularia

radicans Thunb. (1794) = L. chinensis

reinwardtiana (C.Presl) A.DC. (1839)

reinwardtiana (C.Presl) A.DC. var. megalantha W.J.de Wilde & Duyfjes (2012)

reptans W.J.de Wilde & Duyfjes (2012)

roxburghiana (A.DC.) Heynh. (1840) = L. chinensis

serratifolia W.J.de Wilde & Duyfjes (2012)

stipularis Roth ex Schult. (1819) = L. alsinoides var. alsinoides

subcuneata Miq. (1857) = L. zeylanica

subincisa A.DC. (1839) = L. heyneana

subracemosa Miq. (incl. var. β rigidor) (1857) = L. heyneana

succulenta Blume (1826) = L. zeylanica

succulenta Blume var. lobbiana (Hook.f. & Thomson) E.Wimm. (1948) = L. zeylanica

terminalis C.B.Clarke (1881)

terminalis C.B.Clarke var. minuta C.B.Clarke = L. terminalis

thorelii E.Wimm. (1929)

trialata D.Don (1825) = L. heyneana

trialata D.Don var. asiatica Chiov. (1916) = L.

heyneana
 trialata D.Don var. lamiifolia C.B.Clarke (1881) = L. heyneana
 triangulata Roxb., nom. nud. (Hort. Beng.: 16. 1814)
 trigona Roxb. (1824) = L. alsinoides var. trigona walkeri (C.B.Clarke) W.J.de Wilde & Duyfjes (2012)
zeylanica L. (1753)
 zeylanica L. var. aligera (Haines) Haines (1921) = L. reinwardtiana
 zeylanica L. var. lobbiana (Hook.f. & Thomson) Y.S.Lian (1938) = L. zeylanica
 zeylanica L. var. parviflora Danguy (1930) = L. heyneana
 zeylanica L. var. walkeri C.B.Clarke (1881) = L. walkeri

Dortmanna

Dortmanna trigona (Roxb.) Kuntze var. nummulariifolia Kuntze (1891) = L. zeylanica

Isolobus

keri A.DC. (1839) = L. chinensis

roxburghianus A.DC. (1839) = L. chinensis

Piddingtonia

nummularia (Lam.) A.DC. (1839) = L. nummularia

Pratia

archboldiana Merr. & L.M.Perry (1949) = L. archboldiana

begoniifolia (Wall.) Lindl. (1830) = L. nummularia

ovata Elmer (1909) = L. zeylanica

papuana S.Moore (1917) = L. nummularia

podenzanae S.Moore (1917) = L. nummularia
 radicans G.Don (1834), (not Lobelia radicans Thunb.) = L. chinensis

thunbergii G.Don (1834) = L. chinensis

torricellensis Lauterb. (1905) = L. zeylanica

wollastonii S.Moore (1917) = L. nummularia

Rapuntium

arenarioides C.Presl (1836) = L. heyneana

reinwardtianum C. Presl (1836) = L. reinwardtiana

LISTS OF LESSER LOBELIA SPECIES PER REGION

S India, south of the Ganges River, and Sri Lanka

alsinoides (2 varieties)
 heyneana
 reinwardtiana (2 varieties)
 walkeri
 zeylanica

N India east to Myanmar, west of the Irrawaddy River

alsinoides var. alsinoides
 chinensis
 heyneana
 nummularia
 terminalis
 zeylanica

China (Japan)

alsinoides var. alsinoides (no specimen seen)
 chinensis

hainanensis (Hainan)
 dopatrioides var. cantonensis
 heyneana
 microcarpa (Hong Kong)
 nummularia
 terminalis
 zeylanica

Indochina, including E Myanmar east of the Irrawaddy River

alsinoides var. alsinoides
 chevalieri
 chinensis
 dopatrioides (3 varieties)
 griffithii
 heyneana
 microcarpa
 nummularia

terminalis

thorelii

zeylanica

Malesia, excluding New Guinea

alsinoides var. alsinoides (Sumatra: Samosir Isl. only)

chinensis

dopatrioides var. cantonensis

griffithii

heyneana

nummularia

reinwardtiana var. reinwardtiana

zeylanica

New Guinea

archboldiana

brachyantha

conferta

dioica

donanensis

dopatrioides var. cantonensis

nummularia

reptans (New Ireland)

serratifolia (Bougainville Isl.)

zeylanica

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