

GEITONOPLESIACEAE

(Joseph E. Laferrière, Tucson, U.S.A.)¹

Geitonoplesiaceae [R. Dahlgren, Bot. J. Linn. Soc. 80 (1980) 98, nom. nud. ex] Conran, *Telopea* 6 (1994) 39.

Glabrous, hermaphroditic, perennial, much-branched leafy *climbers* or *subshrubs* up to 5 m tall. Stems woody below, thin and flexuous above, green, much branched, twining, terete to compressed. *Leaves* alternate, distichous, with a prominent to obscure midrib, sessile or with a short petiole, sometimes sheathing at the base, lanceolate to ovate or sometimes linear; veins numerous, parallel with few or no cross veins; midrib prominent; spines and stipules lacking; leaves reduced to scales under each branch. *Inflorescence* an axillary fascicle or a loose terminal cyme or panicle; pedicel articulate immediately under the flower. *Flowers* small, perfect, actinomorphic, campanulate, hypogynous, often pendulous. *Perianth* segments 6, oblong, spreading, equal in length, white or greenish to pink or pale violet, free almost to the base or fused, often prolonged at the base into a pericladium, nectariferous at the base, corona absent. *Sepals* firm, valvate in bud, shortly hood-shaped at apex. *Petals* flat, obtuse, slightly imbricate, the margins thin and entire. *Stamens* 6, in two whorls, hypogynous, not exceeding the perianth; filaments free or fused at the base; anthers oblong-linear, bilocular, basifixed, introrse, sagittate at base, erect, yellow, poricidal. *Ovary* superior, trilocular with axile placentae; ovules few, anatropous or campylotropous, crassinucellate; style filiform; stigma punctate. *Fruit* a berry or capsule. *Seeds* several, rounded to angular-crescentic, black, shiny, sometimes strophiolate; endosperm copious, lacking starch; embryo linear.

DISTRIBUTION

Two genera, each with one species, both occurring in *Malesia*.

TAXONOMY

Dahlgren et al. (1985) placed both genera, plus *Luzuriaga*, *Behnia* and *Elachanthera*, in the *Luzuriagaceae*, separate from the *Philesiaceae*, whereas Dahlgren & Clifford (1982) included them in the *Philesiaceae*. Cronquist (1981) put them in the *Smilacaceae*. More recent cladistic and phenetic evidence suggests that, while *Eustrephus* and *Geitonoplesium* are closely related to each other, they are only distantly related to *Luzuriaga* and *Philesia* (Conran 1987a). Their closest relatives appear to be in the *Phormiaceae* (Conran 1989). The two genera are here treated in the separate family *Geitonoplesiaceae*. Both species are highly variable. Several synonyms and infraspecific taxa have been proposed, although none is here accepted (Schlittler 1951; Conran 1987b; Laferrière 1995).

1) With a contribution on palynology by R.W.J.M. van der Ham, Leiden. Drawings by J.G. Conran, Adelaide, reproduced with permission from *Flora of Australia* 46.

References: Conran, J.G., *Taxon* 34 (1985) 346–347. — Conran, J.G., *Austral. J. Bot.* 35 (1987a) 283–300. — Conran, J.G., *Muelleria* 6 (1987b) 363–369. — Conran, J.G., *Pl. Syst. Evol.* 168 (1989) 123–141. — Conran, J.G., *Telopea* 6 (1994) 39–41. — Cronquist, A., *An integrated system of classification of flowering plants* (1981). — Dahlgren, R.M.T. & H.T. Clifford, *The monocotyledons: a comparative study* (1982). — Dahlgren, R.M.T., H.T. Clifford & P.F. Yeo, *The families of the Monocotyledons: structure, evolution, and taxonomy* (1985). — Laferrière, J.E., *Austrobaileya* 4 (1995) 391–399. — Schlittler, J., *Ber. Schweiz. Bot. Ges.* 61 (1951) 175–239.

PALYNOLOGY

(R.W.J.M. van der Ham)

Eustrephus and *Geitonoplesium* have different pollen types (Schulze 1982). Pollen of *Eustrephus* is monocolpate, elliptic in polar view, and measures 40–(47)–52 × 29–(32)–35 µm. Radulescu (1973) gives larger sizes: 53–62 × 31–41 µm. The colpus ends extend slightly on the proximal side of the pollen grain. Exine thickness is 1–1.5 µm. The sexine, which consists of a tectum and a columellate infratectal layer, is slightly thicker than the nexine. The ornamentation is microreticulate all-over. The diameter of the lumina (< 1 µm) decreases towards the aperture.

Pollen of *Geitonoplesium* is trichotomocolpate, obtusely triangular with convex sides in polar view, oblate (P/E = c. 0.67), and measures 23–(26)–33 µm in equatorial diameter. The ends of the three-armed colpus reach the proximal side. Exine thickness is c. 1 µm. The ornamentation is microreticulate (diameter lumina < 1 µm). Along with several trichotomocolpate collections Erdtman (1952) describes a deviating pollen sample from New Caledonia (*Franc* 627; “determination confirmed by Skottsberg”) as monocolpate, 49 × 36 µm, which reminds much of *Eustrephus* pollen.

Monocolpate pollen is common in the *Asparagales* (sensu Dahlgren & Clifford 1982). Trichotomocolpate pollen occurs (see also Schulze 1982) in the *Asphodelaceae* (subfam. *Anthericoideae*: 9 genera), *Dianellaceae* (*Dianella*: also tetrachotomocolpate; *Stypandra*), *Doryanthaceae* (*Doryanthes*: rarely; *Herpolirion*) and *Phormiaceae* (*Phormium*).

References: Erdtman, G., *Pollen morphology and plant taxonomy* (1952). — Dahlgren, R.M.T. & H.T. Clifford, *The monocotyledons: a comparative study* (1982). — Radulescu, D., *Acta Bot. Hort. Bucurest.* 1972–1973 (1973) 133–248. — Schulze, W., *Wiss. Zeitschr. Friedrich-Schiller-Univ. Jena, Mat.-Nat. R.* 31 (1982) 277–283, 291–307.

KEY TO THE GENERA

- a. Flowers in axillary clusters arising from a globose to oblong cluster of imbricate scales; petals ciliate; filaments broad, flat, fused; roots often tuberous; fruit orange, dehiscent ***Eustrephus*** (*p.* 000)
- b. Flowers in terminal cymes or panicles; petal margins entire; filaments filiform, separate; roots fibrous; fruit black, indehiscent ***Geitonoplesium*** (*p.* 000)

EUSTREPHUS

Eustrephus R. Br. in Ker Gawl., Bot. Mag. 31 (1809) t. 1245. — Type species: *Eustrephus latifolius* R. Br.

Distribution — Only one species; for distribution see there.

***Eustrephus latifolius* R. Br.**

Eustrephus latifolius R. Br. in Ker Gawl., Bot. Mag. 31 (1809) t. 1245; Prodr. Fl. Nov. Holl. (1810) 281; Standley & Ross, Fl. SE Queensl. 3 (1989) 67; Conran & Clifford in Fl. Austral. 46 (1986) 192. — *Luzuriaga latifolia* (Ker Gawl.) Poir., Encycl. Suppl. 3 (1813) 535. — Type: *Brown 5663* (BM), New South Wales.

Eustrephus angustifolius R. Br., Prodr. Fl. Nov. Holl. (1810) 281. — *Eustrephus latifolius* var. *angustifolius* (R. Br.) Benth., Fl. Austral. 7 (1878) 18. — Type: *Brown 5664* (BM), Queensland.

Small shrubs or twining climbers, 1–5 m tall. Roots fusiform, sometimes tuberous. *Leaves* non-resupinate, sessile or nearly so, broadly ovate to lanceolate or narrowly linear, 2–20 by 0.2–5 cm, firm, longitudinally striate-nerved, the apex usually acute, with scarcely distinct costa. *Inflorescence* an axillary cymose bundle with 1–6 flowers; pedicels filiform but rigid, persistent, 5–18 mm long, with an ovate bract at the base, these scarious and imbricate. *Perianth* segments oblong, nearly equal, c. 6 mm long. *Sepals* elliptic-oblong, acute, 7–9-nerved, convex, firm, shortly hood-shaped at the apex. *Petals* elliptic, thinner than sepals, flat, obtuse, bearing yellow or pellucid markings, fimbriate. *Stamens*: filaments short, flat, connate at base; pollen monosulcate. *Fruit* a yellow, globular or rarely pyriform fleshy capsule 0.7–2 cm in diam. *Seeds* 8–12, subspherical to obtusely angled, strophiolate. $2n = 18$ [Stenar, Acta Horti Berg. 16 (1952) 219–232]. — Fig. 1.

Distribution — East coast of Australia, New Caledonia; *Malesia*: southern New Guinea. Reported from West Java but probably as an escape from cultivation at the Botanical Garden in Bogor.

Habitat & Ecology — Found on riverbanks, lakeshores, roadsides, thickets, grassy savannas, early secondary forest, and other relatively sunny areas, from sea level to 3000 m altitude.

Uses — Tuberous roots and strophiolate arils used as food by native Australians; use as food not recorded from Malesia.

GEITONOPLESIMUM

Geitonoplesium A. Cunn. ex Hook., Bot. Mag. 59 (1832) t. 3131. — Type species: *Geitonoplesium cymosum* (R. Br.) Hook.

Luzuriaga auct. non Rufz & Pavón (1802): R. Br., Prodr. Nov. Holl. (1810) 281.

Distribution — Only one species; for distribution see there.

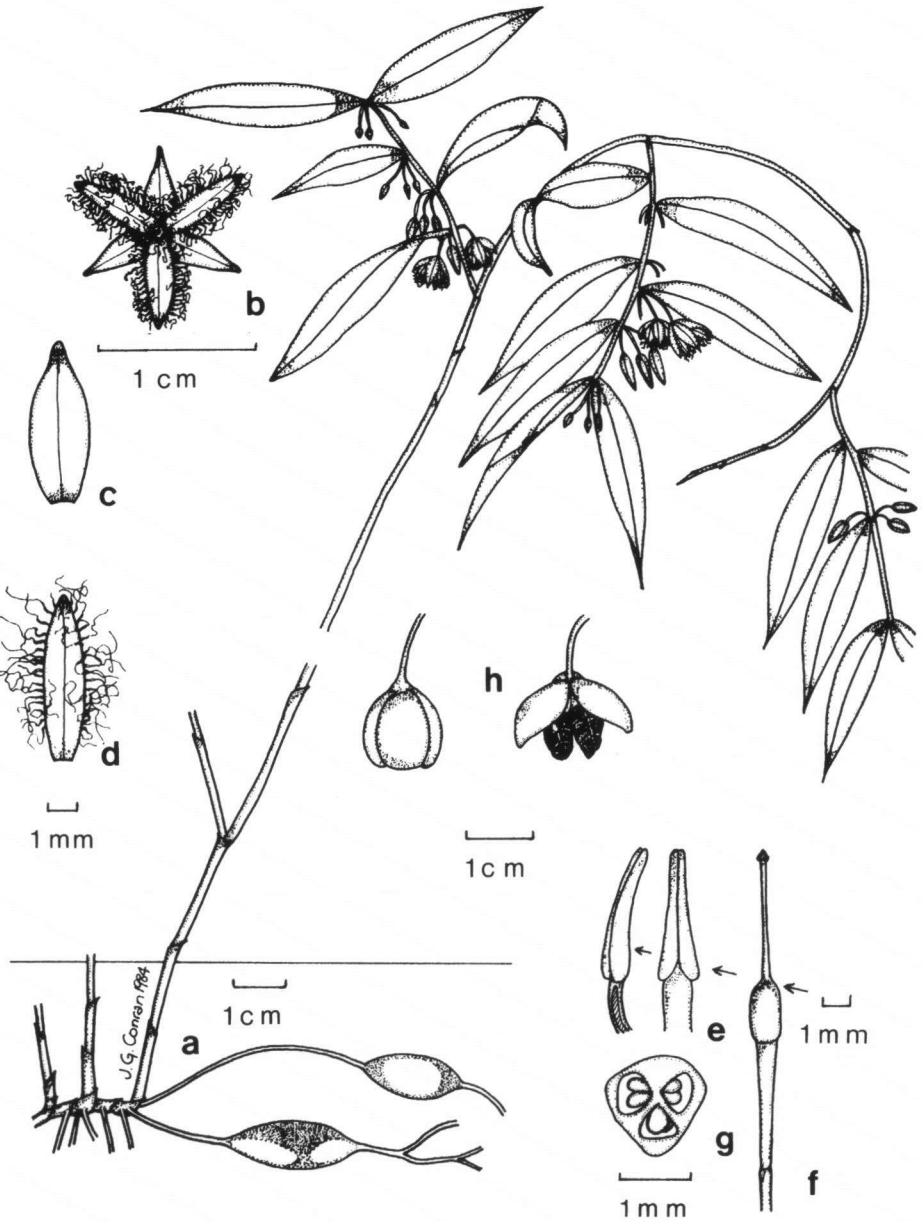


Fig. 1. *Eustrephus latifolius* R.Br. a. Flowering plant; b. flower; c. sepal; d. petal; e. stamen, side and front view, other fused stamens removed; f. pistil; g. ovary, section; h. fruit, closed and open (Conran 112). Drawing J.G. Conran.

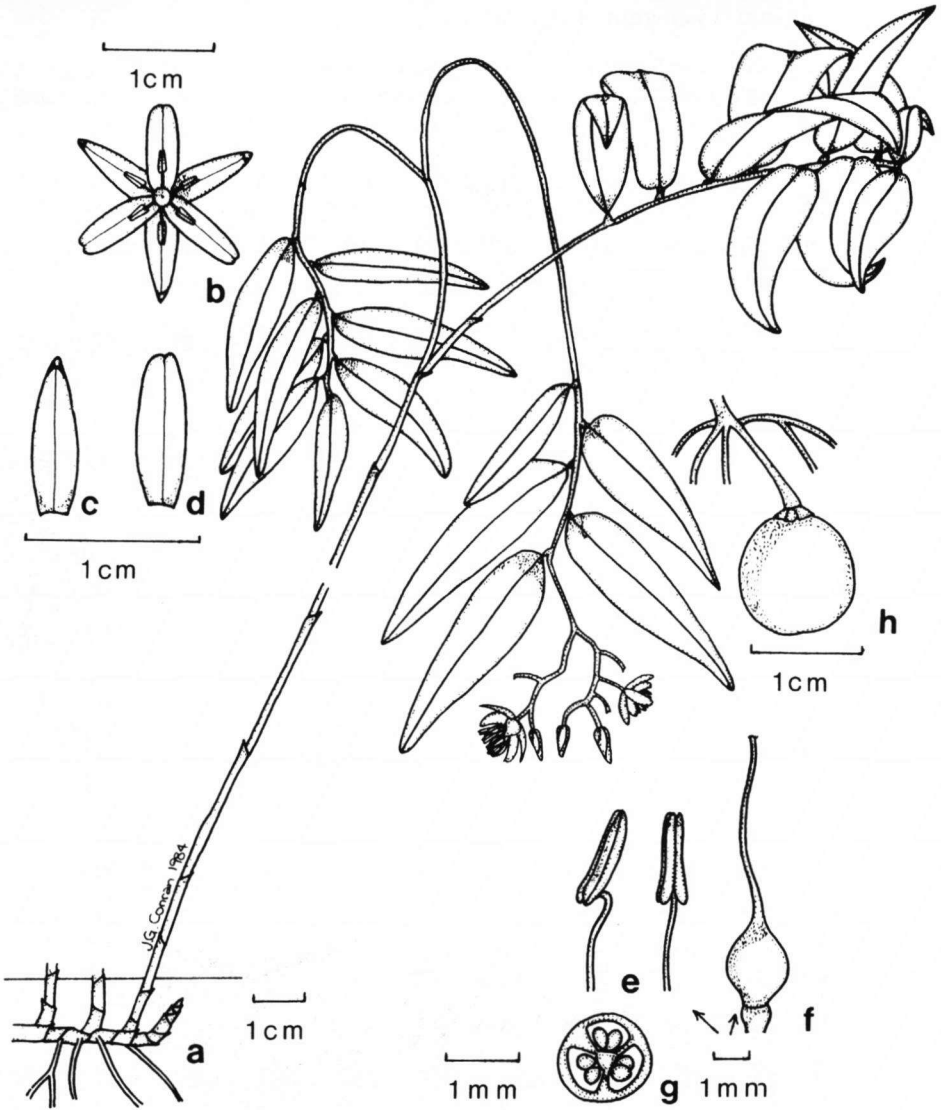


Fig. 2. *Geitonoplesium cymosum* (R.Br.) Hook. a. Flowering plant; b. flower; c. sepal; d. petal; e. stamen, side and front view; f. pistil; g. ovary, section; h. fruit (Conran 107). Drawing J.G. Conran.

Geitonoplesium cymosum (R.Br.) Hook.

Geitonoplesium cymosum (R.Br.) A. Cunn. ex Hook., Bot. Mag. 59 (1832) t. 3131. — *Luzuriaga cymosa* R.Br., Prodr. Fl. Nov. Holl. (1810) 282; Standley & Ross, Fl. SE Queensl. 3 (1989) 67; A.C. Sm., Fl. Vit. Nova I (1979) 160; Conran & Clifford in Fl. Austral. 46 (1986) 194. — Type: *Brown 5665* (BM), New South Wales.

Eustrephus timorensis Ridley in Forbes, Nat. Wand. East. Arch. (1885) 520. — Type: *Forbes 3530* (K), Timor.

Luzuriaga laxiflora Hallier f., Nova Guinea 8 (1914) 991. — Type: *von Römer 932* (L), Irian Jaya.

Luzuriaga aspericaulis Hallier f., l.c. — Type: *Gjellerup 1078* (L), Irian Jaya.

Twining climber, 1–5 m tall. Roots fibrous. *Leaves* resupinate, with a short twisted petiole, broadly ovate to lanceolate or narrowly linear, 5–20 by 0.5–5 cm, rigid, the apex obtuse, acute or apiculate, with a prominent to obscure midrib. *Inflorescence* a small, loose terminal cyme or panicle of 1–many flowers; pedicel 0.5–3 cm long, with a small bract. *Perianth* segments 6–8 mm long, white, green or pink to purplish, sometimes streaked, oblong, distinctly nerved, equal in length, free almost to the base; pericladium short and subattenuate or absent. *Sepals* firm, shortly hood-shaped at apex. *Petals* flat, obtuse, slightly imbricate, the margins thin and entire. *Stamens*: filaments filiform, separate, geniculate below anther; pollen trichotomosulcate. *Fruit* a blue-black, globular, succulent, indehiscent berry, 8–15 mm in diam. *Seeds* 1–10, black, trigonovate. $2n = 20$ [Conran, Taxon 34 (1985) 346–347]. — **Fig. 2.**

Distribution — Eastern Australia and Fiji, north to New Ireland; **Malesia**: Lesser Sunda Islands (from Lombok eastwards), New Guinea.

Habitat & Ecology — Found on riverbanks, lakeshores, roadsides, thickets, grassy savannas, early secondary forest, and other relatively sunny areas, from sea level to 3000 m altitude.

Uses — Stems occasionally used as rope; in Australia young shoots sometimes eaten as a potherb.