

GOODENIACEAE

草海桐科 cao hai tong ke

Hong Deyuan (洪德元)¹; Dianella G. Howarth²

Herbs, shrubs, or rarely small trees [or vines], without laticifers. Stipules absent. Leaves alternate, rarely opposite or whorled, simple. Inflorescences a cyme, raceme, head, or sometimes single flowered in axils. Flowers perfect, protandrous. Calyx epigynous, tubular, mostly (3–)5-lobed. Corolla sympetalous, irregular, 2-lipped or sometimes 1-labiate due to 2-segmentation of posterior lip to base; lobes 5, valvate, often induplicate. Stamens 5, alternate with corolla lobes, free from corolla or adnate to base of corolla tube; anthers 4-sporangiate and dithecal, introrse, longitudinally dehiscent. Ovary inferior, semi-inferior [or rarely (*Velleia* Smith) essentially superior], (1 or)2-locular [occasionally 4-locular (*Scaevola porocarya* F. Mueller)]; ovules 1 to many per locule, on axile or basal-axile placentas, anatropous. Fruit usually a capsule, less often a drupe or a small nut, often with persistent calyx. Seeds with a straight embryo embedded in copious endosperm.

Twelve genera and ca. 400 species: pantropical and extending into subtropics; two genera and three species in China.

The greatest diversity of the family is in Australia.

Pollen presentation mechanism in the family is complex. The anthers are connivent or connate to form a tube into which pollen grains shed. The style, with a cupular indusium below the small stigma, grows up through the anther tube and collects the pollen grains, which are subsequently deposited or brushed onto visiting insects.

Hong De-yuan. 1983. Goodeniaceae. In: Hong De-yuan, ed., Fl. Reipubl. Popularis Sin. 73(2): 177–180.

- 1a. Fruit a drupe; shrubs or small trees 1. *Scaevola*
1b. Fruit a capsule; herbs 2. *Goodenia*

1. SCAEVOLA Linnaeus, Mant. Pl. 2: 145. 1771, nom. cons.

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Lobelia Miller (1754), not Linnaeus (1753).

Shrubs or small trees [or herbs]. Leaves alternate and spirally arranged, or opposite. Flowers in axillary cymes, or solitary and axillary; bracts opposite; bracteoles opposite. Calyx epigynous; tube adnate to ovary; limb cupular, short, 5-dentate or 5-lobed. Corolla zygomorphic, posterior side longitudinally divided to near base; lobes 5, subequal in size. Ovary 2-locular; each locule with 1 upright ovule on axile placenta [or 1-locular, with 1 or 2 ovules also on axile placenta]; stigma 2-cleft. Drupe often fleshy; endocarp hard; each locule with 1 seed.

About 80 species: pantropical but mainly in Australia; two species in China.

- 1a. Flowers in an inflorescence; leaf blade spatulate to obovate, 10–22 × 4–8 cm 1. *S. taccada*
1b. Flowers solitary, axillary; leaf blade linear-spatulate, 1–2.5 × 0.2–0.5 cm 2. *S. hainanensis*

1. *Scaevola taccada* (Gaertner) Roxburgh, Hort. Bengal. 15. 1814.

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Lobelia taccada Gaertner, Fruct. Sem. Pl. 1: 119. 1788;
Scaevola frutescens Krause, nom. illeg. superfl.; *S. koenigii* Vahl; *S. sericea* Vahl.

Shrubs or small trees, to 7 m tall, erect or diffuse. Twigs 5–10 mm in diam., sometimes rooting, hollow, usually glabrous but axils with a tuft of dense white barbate trichomes. Leaves spirally arranged, mostly aggregated at apex of branches, sessile or shortly petiolate; leaf blade spatulate to obovate, 10–22 × 4–8 cm, slightly succulent, glabrous or abaxially sparsely villous, base cuneate, apex rounded, truncate, or emarginate. Cymes axillary; bracts and bracteoles small, with a tuft of barbate trichomes in axils. Pedicel with a joint at apex. Calyx glabrous;

tube obovoid; lobes linear-lanceolate, ca. 2.5 mm. Corolla white to pale yellow or purple, ca. 2 cm; tube thinly tubular, posterior side divided to base, outside glabrous, inside densely white villous; limb patent; lobes lanceolate, thickened at center, each side with a wide membranous and induplicate wing above middle, margin sparsely ciliate. Anthers connivent into a tube with basal part of indusium, becoming free after anthesis; connective longer than cells, becoming lamellar at apex. Drupe white, ovoid-globose, 7–10 mm in diam., divided longitudinally by furrows into 2 parts each 4-ribbed, 2-locular; locules each with 1 seed. Fl. and fr. Apr–Dec. $2n = 16$.

Open coastal sands or rocks; near sea level. Dongsha Qundao, SE Fujian, Guangdong, Guangxi, Hainan, Nansha Qundao, Taiwan, Xisha Qundao [India, Indonesia, S Japan, Malaysia, Myanmar, Papua New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; E Africa, tropical Australia, Indian Ocean islands, Madagascar, Pacific islands].

¹ State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, 20 Nanxincun, Xiangshan, Beijing 100093, People's Republic of China.

² St. Albert Hall, Room 272, Department of Biological Sciences, St. John's University, 8000 Utopia Parkway, Queens, New York 11439, U.S.A.

Scaevola taccada is naturalized in some coastal areas of tropical and subtropical America. It likely occurs in coastal Cambodia and the SE coast of Bangladesh, although these potential distributions need to be confirmed. For a discussion of the nomenclatural problems concerning the Indo-Pacific species *S. taccada* and the Indo-Atlantic species *S. plumieri* (Linnaeus) Vahl see P. S. Green (Taxon 40: 118–122. 1991), C. Jeffrey (Kew Bull. 34: 537–545. 1980), and R. K. Shannon et al. (Taxon 46: 801–802. 1997). The *Vienna Code*, Art. 33.3 Ex. 8, explains why the new combination as *S. taccada* was validly published by Roxburgh in 1814 due to reference to the published illustration by Rheede (Hort. Malab. 4: t. 59. 1683) which was also cited by Gaertner in his 1788 publication.

2. *Scaevola hainanensis* Hance, J. Bot. 16: 229. 1878.

小草海桐 xiao cao hai tong

Shrubs, small, diffuse. Old twigs elongate, glabrous; young shoots numerous, short, scaberulose, with a tuft of

woolly trichomes in axils. Leaves spirally arranged, aggregated at apex of branches, sometimes branches undeveloped and becoming extremely short and thus leaves appearing fascicled, sessile or shortly petiolate; leaf blade linear-spatulate, 1–2.5 × 0.2–0.5 cm, succulent, glabrous, only 1 main vein visible on abaxial side, margin entire. Flowers axillary, solitary. Pedicel ca. 1 mm; bracteoles opposite, at apex of pedicels, broadly linear, 3–4 mm, with a tuft of woolly trichomes. Calyx glabrous; tube obovoid-oblong, ca. 2 mm; limb shallowly cupular, apex sinuously 5-lobed. Corolla pale blue, ca. 8 mm, posterior side divided to base, remaining parts divided to middle, outside glabrous, inside of tube densely villous; lobes linear-elliptic, patent into 1 direction, with broad and membranous wings; wing margin basally ± fimbriate. Connective exerted beyond anther cells. Ovary 2-locular. Fl. and fr. Mar–Dec.

Coastal salt marshes, mangroves; near sea level. Dongsha Qundao, SE Fujian, Guangdong, Hainan, Taiwan [Vietnam].

2. GOODENIA Smith, Spec. Bot. New Holland 1: 15, t. 5. 1793.

离根香属 li gen xiang shu

Balingayum Blanco; *Calogyne* R. Brown.

Herbs, perennial [or more often annual], erect [or diffuse]. Leaves variable. Flowers axillary, inflorescence variable; both bracts and bracteoles present or absent. Calyx tube adnate to ovary or free; limb 5-lobed. Corolla usually cleft over 1/2 at posterior side; lobes patent toward anterior side, with a broad wing on each side; posterior 2 lobes with asymmetrical wings. Stamens free, epigynous. Ovary inferior, incompletely 2-locular; locules each with several ovules; style with 2 or 3 segments from middle; indusium cupular, shallowly 2-lobed, margin densely ciliate; stigma lamellar, entire. Fruit usually a capsule, 2-valvate. Seeds compressed, slightly thickened on margins, usually winged.

About 180 species: E and SE Asia, Australia; one species in China.

1. *Goodenia pilosa* (R. Brown) Carolin subsp. **chinensis** (Benth.) D. G. Howarth & D. Y. Hong, **comb. nov.**

离根香 li gen xiang

Basionym: *Calogyne chinensis* Benth., J. Proc. Linn. Soc., Bot. 5: 78. 1860; *Calogyne pilosa* R. Brown subsp. *chinensis* (Benth.) H. S. Kiu.

Herbs, perennial, erect. Stems slender, branched, single or several and caespitose, 5–15 cm tall but sometimes decumbent after anthesis, basally glabrous, apically sparsely hirsute. Basal leaves several; petiole to 1.5 cm; leaf blade long elliptic to linear-oblong, 2–5 × 0.3–0.6 cm, sparsely hirsute only along main vein on abaxial side and on margin, margin sparsely triangular serrate. Basal cauline leaves with a shorter petiole; leaf blade similar to but smaller than basal leaves. Apical cauline

leaves sessile; leaf blade similar in shape to but smaller than more basal leaves, often less than 1 cm. Flowers axillary, solitary, each cauline leaf with a flower but sometimes branches short and multiflowered to almost becoming a raceme. Pedicel 2–8 mm, slender, sparsely hirsute. Calyx tube ca. 2 mm, densely hirsute; lobes linear-lanceolate, ca. 4 mm. Corolla purple outside with bright brownish shade and inside yellow with orange spots, ca. 8 mm. Stamens ca. 3 mm; anthers mucronate at apex. Capsule ovoid-globose, ca. 3 mm in diam., with 5 seeds. Seeds ovoid, ca. 4 × 2 mm. Fl. and fr. Nov–Mar.

Paddy fields, grassy areas in forests or on hillsides; below 100 m. Fujian (Jinmen Dao, Xiamen), Guangdong (Huilai, Raoping), Guangxi (Fangcheng, Hepu), Hainan (Ding'an, Qionghai, Sanya) [Vietnam].

The typical subspecies is an annual herb that occurs in tropical Australia, Indonesia, Papua New Guinea, and the Philippines.