

Family 252. BORAGINACEAE

Revisions:

Johnston, IM. 1951. *Studies in the Boraginaceae*. Journal of Arnold Arboretum 32: 1-26; 99-122
Riedl, H. 1997. *Boraginaceae*. Flora Malesiana series 1,13: 43-144

Argusia Boehmer =Tournefortia

Bothriospermum Bunge

Bothriospermum zeylanicum (J. Jacq.) Druce, Rep. Bot. Exch. Cl. Brit. Is. 1916 (1917) 610; --
Riedl, Fl. Males. ser. 1, 13 (1997) 63, f. 1. --Type: Plate in J. Jacq., Eclogae 1 (1813) 47, t. 29.
Bothriospermum tenellum (Hornem.) Fisch. & Mey., Ind. Sem. Hort. Petr. (1835) 24; --Merr., EPFP 3 (1923)
379; --Backer & Bakh. f., Fl. Java 2 (1965) 463. --Type from China.

Afghanistan, Pakistan, India, China and adjacent parts of former USSR, Japan, Malasia:
Java (naturalized, fide Backer & Bakh. f., loc. cit.), Philippines.

LUZON: Benguet. Waste places about rice paddies, along streams, etc., 1300-1500m.

Carmona Cavanilles

Carmona retusa (Vahl) Masam., Trans. Nat. Hist. Soc. Formosa 30 (1940) 61; --Riedl, Fl. Males.
ser. 1, 13 (1997) 65, f. 2. --Type: Plukenet, Phytographia, t. 31, f. 1 ('Habitat in India Orientali').
Carmona microphylla (Lam.) G Don, Gen. Syst. 4 (1837) 391; --IM Johnston, J. Arnold Arb. 32 (1951) 17;
--Ehretia microphylla Lam., Tabl. Encycl. 1 (1791-97) 425; --Merr., Fl. Manila (1912) 394; EPFP 3
(1923) 374. --Type: unknown.

India, Sri Lanka, Burma, Thailand, Indochina, S China (Guangdong), Hainan, Taiwan,
Ryukyus, Sumatra, Peninsular Malaysia, Java, Philippines, Sulawesi, Lesser Sunda
Islands (Sumba, Flores), Moluccas, New Guinea, Solomon Islands. Dry regions, sunny forests.
Often cultivated in gardens for ornamental purposes.

Coldenia Linnaeus

Coldenia procumbens L., Sp. Pl. (1753) 125; --Merr., Fl. Manila (1912) 396; EPFP 3 (1923) 376, incl.
var. *aristata* Merr., EPFP 3 (1923) 376; --IM Johnston, J. Arnold Arb. 32 (1951) 13; --Riedl, Fl.
Males. ser. 1, 13 (1997) 67, Fig. 3. --Type: Plukenet, Phytographia, t. 64, Fig. 6.

Widespread in tropical and subtropical SE Asia, Africa and Australia. India, Sri Lanka,
Burma, Thailand, Indochina, Hainan, Taiwan, Peninsular Malaysia, Borneo, Java (incl.
Madura), Lesser Sunda Islands (Flores, Timor), Moluccas, New Guinea. In dry regions
subject to seasonal floodings, ricelands, etc.

Cordia Linnaeus

Cordia aspera G Forst., Fl. Austral. (1786) 18, no. 109; --Riedl, Fl. Males. ser. 1, 13 (1997) 72. --Type
from Australia.

Cordia cumingiana Vidal, Rev. Pl. Vasc. Filip. (1885) 187; --Merr., EPFP 3 (1923) 373. --Types: Cuming
1012, 1647, 1653, no lectotype selected.

ssp. aspera

Borneo, Philippines, Moluccas, New Guinea, Solomon Isls, Australia, New Caledonia, Tonga, Fiji, Samoa Isls.

LUZON: Benguet, La Union, Pangasinan, Cagayan, Rizal, MINDORO, PANAY, LEYTE, MINDANAO: Zamboanga, Bukidnon, Davao, Surigao. Low and medium altitude thickets and secondary forests.

Cordia dichotoma G Forst., Prodr. (1786) 18; --Merr., EPFP 3 (1923) 373; --IM Johnston, J. Arnold Arb. 32 (1951) 8; --Riedl, Fl. Males. ser. 1, 13 (1997) 75, f. 4. --Type from New Caledonia.

Cordia myxa CB Clarke in JD Hook., Fl. Brit. Ind. 4 (1883) 136; --Merr., Fl. Manila (1912) 393, auct. non L. New Caledonia, New Guinea, Moluccas, Lesser Sunda Isls (Bali, Lombok, Sumbawa, Flores, Alor, Timor), Sulawesi, Philippines, Java, Borneo, Singapore, Peninsular Malaysia, Sumatra.

Throughout the Philippines in most islands and provinces. Usually common in secondary forests, thickets, etc. from sea level to c. 500m.

Cordia subcordata Lam., Tabl. Encycl. 1 (1791-97) 421; --Merr., EPFP 3 (1923) 374; --IM Johnston, J. Arnold Arb. 32 (1951) 3; --Riedl, Fl. Males. ser. 1, 13 (1997) 78. --Type: Commerson *s.n.* (P-JU), 'ex insulis Praliniis'

E coast of Africa, India, Cambodia, Vietnam, Pacific Islands; Borneo, Java, Philippines, Sulawesi, Kangean Isls, Lesser Sunda Isls (Sumbawa, Flores, Alor, Timor), Moluccas, New Guinea.

LUZON: La Union, Batangas, Quezon, Camarines, POLILLO, MINDORO, PALAWAN, BURIAS, MINDANAO, TAWI-TAWI, JOLO, BASILAN. Forests and thickets along the seashore, often common.

Cynoglossum Linnaeus

Cynoglossum furcatum Wall. in Roxb., Fl. Ind. 2 (1824) 6; --Riedl, Fl. Males. ser. 1, 13 (1997) 83. --Type: Described from a plant in the Botanical Garden, Calcutta, native in Nepal.

Cynoglossum zeylanicum Brand in Engl., Pflanzenreich fam. IV. 252 (1921) 134, *pro parte, non* (Vahl) Thunb. ex Lehm., Neue Schrift. Naturf. Ges. Halle 3, 2 (1817) 20; --Merr., EPFP 3 (1923) 379.

Afghanistan, Pakistan, Himalayas, India, China, Japan, Philippines, Java.

LUZON: Mountain Province, Benguet, Nueva Vizcaya, MINDANAO: Bukidnon, Davao. Chiefly on montane meadows or grassy slopes, 1200-2200m.

Cynoglossum lanceolatum Forssk., Fl. Aegypt. Arab. (1775) 41; --Merr., EPFP 3 (1923) 379; --Riedl, Fl. Males. ser. 1, 13 (1997) 87. --Type from Yemen.

Widespread in NE, E, and S Africa, Arabian Peninsula, Afghanistan, Pakistan, Himalayas, India, China, Japan, Taiwan, Indochina, Thailand, Burma, Sumatra, Borneo, Java, Philippines, and Sulawesi.

LUZON: Mountain Province, Benguet, Cagayan, Nueva Vizcaya. Montane meadows and thin pine forests from medium altitudes to 2000m.

Ehretia Linnaeus

Ehretia acuminata R Br., Prodr. (1810) 497; --Merr., EPFP 3 (1923) 374; --IM Johnston, J. Arnold Arb. 32 (1951) 21; --Riedl, Fl. Males. ser. 1, 13 (1997) 92. --Type from Australia.

Ehretia acuminata R Br. var. *polyantha* (A DC) IM Johnston, J. Arnold Arb. 32 (1951) 23; --*Ehretia polyantha* A DC, Prodr. 9 (1845) 511; --Merr., EPFP 4 (1925) 246. --Type: Perrottet (GE), Philippines.

Australia, New Guinea, Moluccas, Lesser Sunda Isls (Bali, Sumbawa, Flores, Timor),

Java, Philippines, China.

LUZON: Cagayan, Nueva Vizcaya, Zambales, Nueva Ecija, Rizal, Laguna, Camarines, Albay, Sorsogon, NEGROS, MINDANAO: Davao. Low altitude primary and secondary forests.

Ehretia philippinensis A DC, Prodr. 9 (1845) 504; --Merr., EPFP 3 (1923) 375; --Riedl, Fl. Males. ser. 1, 13 (1997) 97. --
BABUYAN ISLS, LUZON, PALAWAN, MINDANAO. Low and medium altitude forests and secondary growth along rivers.

Ehretia resinosa Hance, J. Bot. 18 (1880) 299; --IM Johnston, J. Arnold Arb. 32 (1951) 103; --Riedl, Fl. Males. ser. 1, 13 (1997) 98. --Type from Taiwan.

Ehretia navesii Vidal, Rev. Pl. Vasc. Filip. (1886) 194; --Merr., Fl. Manila (1912) 394; EPFP 3 (1923) 375. --
Types: Vidal 471, 473 (no lectotype chosen).

Taiwan and the Philippines.

N LUZON to MINDANAO, in most islands and provinces. Low altitude thickets and secondary forests.

Heliotropium Linnaeus

Heliotropium brevifolium Wall. in Roxb., Fl. Ind., ed. Carey & Wall. 2 (1824) 2; --Riedl, Fl. Males. ser. 1, 13 (1997) 102.

Heliotropium strigosum Willd., Sp. Pl. 1 (1797) 743; --Merr., EPFP 3 (1923) 378.

India to Peninsular Malaysia and tropical Australia.

LUZON: Zambales. Open sandy places near the sea.

"The distribution is not yet clear, as *H. brevifolium* has not been recognized as a species separate from *H. strigosum* by many authors. It seems to be most common in the Philippines, where the greatest number of herbarium specimens comes from, but there also collections from N India. Whether there is really a gap between this area and the Philippines seems doubtful" --Riedl, *op. cit.*

Heliotropium curassavicum L., Sp. Pl. (1753) 130; --C Robinson, PJS 4 c (1909) 695; --Riedl, Fl. Males. ser. 1, 13 (1997) 103.

Native of the Americas from Patagonia to the US and the West Indies; Malesia: Java (near Bogor) and the Philippines. Occasionally occurring as weed.

Heliotropium indicum L., Sp. Pl. (1753) 130; --Merr., Fl. Manila (1912) 395; EPFP 3 (1923) 377; --IM Johnston, J. Arnold Arb. 32 (1951) 111; --Riedl, Fl. Males. ser. 1, 13 (1997) 105, Fig. 7.

Probably a native of tropical America, now pantropical. In Malesia: Sumatra, Peninsular Malaysia, Singapore, Borneo, Java, Philippines, Sulawesi, Lesser Sunda Isls (Lombok, Sumbawa, Sumba, Flores, Timor), Moluccas and New Guinea.

A common weed in the settled areas throughout the Philippines at low altitudes.

Unaccounted for in the FM revision:

Heliotropium bracteatum R Br., Prodr. (1810) 493; --Merr., EPFP 3 (1923) 377.

Java to tropical Australia.

LUZON: Ilocos Norte, MINDANAO: Davao. Open sites at low altitudes.

Messerschmidia Hebenstreit =Tournefortia

Rotula Loureiro

Rotula aquatica Lour., Fl. Cochinch. (1790) 121; --Merr., EPFP 3 (1923) 376; --IM Johnston, J. Arnold Arb. 32 (1951) 14; --Riedl, Fl. Males. ser. 1, 13 (1997) 115, f. 11. --Type: Not indicated.

Tropical Africa, India, Sri Lanka, S China, Vietnam, Laos, Thailand, Burma, Peninsular Malaysia, Borneo, Philippines, Sulawesi, New Guinea.

LUZON: Ilocos Norte, Cagayan, Isabela, Zambales, Bulacan, Rizal, MINDORO.

Periodically flash-flooded streambeds, characteristically growing among rocks and trailing over gravel bars at low altitudes.

Tournefortia Linnaeus

Tournefortia argentea L.f., Suppl. (1781) 133; --Merr., EPFP 3 (1923) 376; --Riedl, Fl. Males. ser. 1, 13 (1997) 117, Fig. 12. --Type from Sri Lanka.

Argusia argentea (L.) H Heine, Fl. New Caled. & Depend. 7 (1976) 108; --Dayang Awa in Tree Fl. Sabah & Sarawak 2 (1996) 95, Fig. 1.

Messerschmidia argentea (L.f.) IM Johnston, J. Arnold Arb. 16 (1935) 164; *ibid.* 32 (1951) 121.

E African coasts, across the Indian Ocean, Ryukyus, Taiwan, Hainan, Vietnam, Sumatra, Borneo, Java, Philippines, Sulawesi, Lesser Sunda Isls (Bali, Lombok, Timor), Moluccas, New Guinea, N Australia to Polynesia, New Caledonia.

BATANES and N LUZON to PALAWAN, MINDANAO, and the SULU ARCHIPELAGO.

Along sandy seashores.

Tournefortia luzonica IM Johnston, J. Arnold Arb. 16 (1935) 156; --Riedl, Fl. Males. ser. 1, 13 (1997) 118. --Type: Ad

ssp. luzonica

N Philippines, New Guinea (Biak Is.).

LUZON (N, E-Central & S). In mountainous regions.

ssp. angustissima Riedl, Blumea 41 (1996) 443; Fl. Males. ser. 1, 13 (1997) 119. --Type: Ridsdale 1477 (L*, holo). Luzon

LUZON: Zambales prov., Sta. Cruz. On ultramafic soil. Only known from type locality.

ssp. sublucens (IM Johnston) Riedl, Blumea 41 (1996) 443; Fl. Males. ser. 1, 13 (1997) 119. --

Type: BS 44553 Ramos & Edaño (A, BM, K). Luzon: Zambales prov.

LUZON: Zambales.

Tournefortia muelleri IM Johnston, J. Arnold Arb. 16 (1935) 157; --Riedl, Fl. Males. ser. 1, 13

(1997) 120. **Type from Australia.**

N Australia; Malesia: ? Java, Lesser Sunda Isls (? Bali, Sumba), New Guinea & Philippines. Along rivers and in tidal areas.

Tournefortia sarmentosa Lam., Tabl. Encycl. 1 (1797) 416; --Merr., Fl. Manila (1912) 394; EPFP 3 (1923) 377; --IM Johnston, J. Arnold Arb. 16 (1935) 147; *ibid.* 32 (1951) 115.--Riedl, Fl. Males. ser. 1, 13 (1997) 121, Fig. 13.

Tournefortia horsfieldii Miq., Fl. Ind. Bat. 2 (1858-59) 927; --Merr., EPFP 3 (1923) 376.

Tournefortia tetrandra Blume, Bijdr. (1826) 845; IM Johnston, J. Arnold Arb. 16 (1935) 150; --Riedl, Fl. Males. ser. 1, 13 (1997) 123.

Nicobars, Sri Lanka; Malesia: Anambas & Natuna Isls, Sumatra, Peninsular Malaysia, Borneo, Java, New Guinea and the Philippines. Montane forests and scrubs.

Trichodesma R Brown

Trichodesma indicum (L.) Sm. in Rees, Cyclop. 36/1 (1817) no. 1; --Merr., Fl. Manila (1912) 395; EPFP 3 (1923) 378; --Riedl, Fl. Males. ser. 1, 13 (1997) 124.

Trichodesma zeylanicum (Burm.f.) R Br., Prodr. (1810) 496; --Merr., Fl. Manila (1912) 396; EPFP 3 (1923) 378; --Riedl, Fl. Males. ser. 1, 13 (1997) 125, f. 14, 15.

Trigonotis Steven

Trigonotis apoensis Elmer, LPB 7 (1915) 2562; --Merr., EPFP 3 (1923) 379; --Riedl, Fl. Males. ser. 1, 13 (1997) 130. --Type: Elmer 11500 (isotypes in NY*, 2 sheets, and US*). Mindanao: Davao del Sur prov., Mt Apo.

Trigonotis philippinensis Merr., PJS 1 (1906) Suppl. 228; EPFP 3 (1923) 380; --Riedl, Fl. Males. ser. 1, 13 (1997) 137. --Type: Merrill 4700. Luzon.

Trigonotis subrosulata Riedl., Blumea 38 (1994) 464; Fl. Males. ser. 1, 13 (1997) 139. --Type: BS 19575 McGregor (L, holo). Luzon: Ifugao prov., Mt Polis.
LUZON: Ifugao (Mt Polis). Known only from the type collection.

Non-naturalized:

Cordia gerascanthus L., Syst. Veg., ed. 10 (1759) 936; --Riedl, Fl. Males. ser. 1, 13 (1997) 77.
--Type from Jamaica.

Native of the neotropics: Mexico, C America, West Indies, Colombia. Introduced in cultivation in the Philippines.