

PAPAVERACEAE (C. G. G. J. van Steenis, Leyden)

Annual or perennial, laticiferous herbs, rarely shrubs. *Leaves* (in *Mal. spp.*) spirally arranged, often incised. Stipules 0. *Flowers* mostly solitary, large, actinomorphic, ♂, 2–3-merous. *Sepals* caducous or calyptrate, free or united. *Petals* free, 4–6, rarely more or absent, biseriate, imbricate, often crumpled in bud; nectaries absent. *Stamens* ∞, free; anthers 2-celled, dehiscing lengthwise. *Ovary* superior, 1-celled, with 2 or more parietal placentas (sometimes with protruding placentas or a spurious wall). Stigmas opposite or alternate with the placentas. Ovules 1 to numerous. *Capsule* opening by valves (or pores). *Seeds* small, with a crested or smooth raphe, or arillate; embryo minute; endosperm copious, fleshy or oily.

Distr. About 23 genera, of which the bulk on the N. hemisphere, few in Central & S. America, almost absent from Africa and Australia, in *Malaysia* none native.

Note. The family is treated here in the strict sense, leaving the *Fumaria*-group as a separate family.

KEY TO THE GENERA

1. Prickly, annual herb. Flowers solitary. Corolla large 1. *Argemone*
1. Unarmed, perennial shrub. Flowers in rich-flowered panicles. Corolla absent 2. *Bocconia*

1. ARGEMONE

TOURNEF. *ex* LINNÉ, Gen. Pl. ed. 5 (1754) 225, no 574; PRAIN, J. Bot. 33 (1895) 130, 208; FEDDE, Pflanzenreich Heft 40 (1909) 271.—Fig. 1.

Erect, mostly annual, glaucous herbs, rarely shrubby or woody at the base; milk yellow, fetid. *Leaves* pinnatifid-dentate (cnicoid or ilicoid), mostly prickly (rarely hispid). *Flowers* terminal, solitary, surrounded by *c.* 3 foliaceous bracts, in old plants often in a large, leafy inflorescence, 3-merous. *Flowers* white, rarely yellow or rose, erect in bud; receptacle narrow-conical. *Sepals* 3, valvate, vaulted, horned below the apex, caducous in anthesis, falling off together. *Petals* 6, strongly plicate in bud, patent during anthesis. Filaments filiform; anthers basifixed, extrorse, twisted after flowering. *Ovary* ovate to oblong; placentas 3–7, each ∞-ovulate; style very short, stigma 3–7-lobed, lobes opposite the placentas. *Capsule* oblong, valves dehiscing from the apex to about $\frac{1}{3}$ (rarely to the base) loosening from the placentas, replum mitre-shaped, attached to the style-base. *Seeds* ∞, globular, reticulate-ribbed; raphe cristate; endosperm oily.

Distr. About 6–9 *spp.* in Mexico, West Indies and the Western and Eastern United States, one introduced in the Old World and now a pantropical weed.

1. *Argemone mexicana* LINNÉ, Sp. Pl. 1 (1753) 508; BL. Bijdr. (1825) 49; MIQ. Fl. Ind. Bat. 1, 2 (1858) 92; WARB. Bot. Jahrb. 13 (1891) 317; BACKER, Fl. Bat. (1907) 46; FEDDE, Pflanzenreich Heft 40 (1909) 273; BACKER, Schooflora Java (1911) 52; MERR. Fl. Manila (1912) 212; En. Philip. 2 (1923) 206; SCHROO, Trop. Natuur 5 (1916) 102–106, f. 1–5; BACKER, Onkruid. Jav. Suiker. (1930) 249, Atlas t. 160; BRUGGEMAN, Ind. Tuinb. (1948) 72, f. 30.—Fig. 1.

Annual, thistle-like prickly, glabrous, 30–100 cm, with a firm taproot; latex bitter. Stem firm, terete, pithy, with scattered prickles. Lower leaves crowded ± in a rosette, petioled, higher ones sessile, semi-amplexicaulous, very variable in shape, sinuate-pinnatifid, glaucous, white variegate-pruinose along the main nerves, 5–22

by 3–7 cm, prickles both scattered along the margin and on the nervation of the undersurface. *Flowers* scentless, sessile or on a very short pedicel. *Calyx*-lobes green with a very acute terete horn below the apex and a few prickles. *Petals* obovate, bright yellow, $1\frac{3}{4}$ –3 cm long. *Stamens* 7–12 mm; anthers ± $2\frac{1}{2}$ mm long. *Ovary* ovate, with long soft bristles, 8–10 mm. Stigma dark-red, 3–6-lobed. *Capsule* $2\frac{1}{2}$ –4 cm long, with rounded ribs (later valves of the fruit) separated by pruinose grooves, on the ribs with sharp, erect prickles, dehiscing to about $\frac{1}{3}$; valves 3–6. *Seeds* ± globular, ± $1\frac{1}{2}$ – $1\frac{3}{4}$ mm diam., fine trabecular-reticulate, black-brown, hilum pale, prominent.

Distr. Native of the West Indies, Mexico, *etc.*, introduced in *Malaysia*: Penang, Java (*e.g.* Djakarta, Klaten, Probolinggo), Lesser Sunda



Fig. 1. *Argemone mexicana* L. a. Twig with flower and fruits, $\times 2/3$, b. bud showing 3-tipped calyx, $\times 2/3$, c. top of dehisced fruit, showing 5 valves and replum attached to style, $\times 2^{1/2}$, d. seed, $\times 10$ (partly after SCHROO, l.c.)

Islands (Sumbawa: Bima), Central Celebes (Bone), Moluccas (Ternate, Aru, Key, Ceram-laut = Gèsèr), Philippines (widely distributed), locally common, but on the whole scattered and rare, evanescent, absent from large areas.

According to PRAIN (l.c. 325 seq.) its introduction to Asia took place via Europe, where it was introduced in 1592. It has neither been mentioned by RHEEDE nor by RUMPHIUS. The first record is apparently by BURMAN (Fl. Ind. 1768, 119) 'habitat in Indiis', the next one by THUNBERG in Java about 1775 (Florula Javanica 1825, 14), followed, before 1790, by LOUREIRO in Indo-China (cf. MERR. Comm. LOUR. 1935, 168). From the Philippines there are no earlier records than

BLANCO in 1837 (cf. MERR. Bur. Govt Lab. Publ. Manila no 6, 1904, 33). It is, therefore, indeed not probable that an independent, inadvertant import took place through the Spaniards to Manila and Indo-China via the Acapulco-Manila route of their galleons which persisted following 1565 for more than 250 years.

Ecol. Only in regions with a pronounced dry season, mostly in the lowland, but up to c. 850 (-1000?) m, a ruderal of vacant lots and open waste land, along roadsides, in fields (also of sugar-cane), on railway-yards, and along railway-dikes; fl. Jan.-Dec.

According to SCHROO (l.c.) the flowers are only open in the morning hours, unfolding rather

rapidly between 7 and 8; they persist for about 3 days. Small stingless bees ardently collect pollen and may transfer this partly to the stigma which is mature simultaneously with the stamens. The cotyledons of the seedlings are grass-like, long and narrow.

Uses. According to HEYNE (Nutt. Pl. 1927, 675-676), BURKILL (Dict. 1935, 237-238), and QUISUMBING (Medic. Pl. Philip. 1951, 329-332) the plant is of hardly any use in Malaysia; oil from the seeds might be used in the soap industry; medicinal value consists of doubtful and minor records. The plant is sometimes cultivated as an ornamental.

According to C. T. WHITE (Queensl. Agr. J. 11, 1919, 118-119, t. 10) it is a noxious weed through-

out Queensland, where it is mostly represented by the var. *ochroleuca* (see below).

The plant, specially the oil pressed from the seed, is reputed to be poisonous in India (Agric. Ledger of India 1907, no. 5). The oil seems to possess drying properties.

Vern. *Mexican poppy*, *prickly poppy*, E, *stekelpapaver*, D, *drudju* (in confusion with *Acanthus*), *tjēlangkringan*, J; Philippines: *kuchumba*, standard, *kasubang-áso*, Ilk., *baruás*, Iv., *diluáriu*, Tag., *kagang-kágang*, C. Bis.

Note. PRAIN records (*l.c.* p. 310) that the early Australian specimens belong to the Chilean form of var. *ochroleuca* (SWEET) LINDL., distinguished by pale yellow, ± stalked flowers, with a distinct style.

2. BOCCONIA

PLUM. *ex* LINNÉ, Gen. Pl. ed. 5 (1754) 223, no 569; FEDDE, Pflanzenreich Heft 40 (1909) 217; HUTCHINSON, Kew Bull. (1920) 275.—Fig. 2.

Small trees or erect shrubs, with yellow, bitter, fetid latex. *Leaves* large, mostly pinnate-lobed to pinnatifid. *Flowers* in large, terminal, bracteate panicles, protogynous. *Sepals* 2, ovate to suborbicular, caducous. *Petals* 0. *Stamens* 8-24, in 4 whorls. *Ovary* stipitate, ovate, compressed; style distinct, persistent; stigmas 2, patent. *Ovules* 1, rarely 2. *Infructescence* hanging. *Capsule* fleshy, 1(-2)-seeded, 2-valved, mostly erect on the upcurved gynophore, the 2 valves opening from below upwards, drying up, falling off the gate-like replum from which the arillate, basifixed seed bungles freely on the short funicle (fig. 2).

Distr. About 6 or 9 *spp.* in Central and S. America.

1. *Bocconia frutescens* LINNÉ, Sp. Pl. 1 (1753) 505; FEDDE, Pflanzenreich Heft 40 (1909) 218; BACKER, Schoolflora Java (1911) 53; HUTCH. Kew Bull. (1920) 278; BACKER, Bekn. Fl. Java (em. ed.) 4A (1942) fam. 41, p. 3.—Fig. 2.

Branched, firm shrub, 2-6 m; stem terete, with thick, white pith. *Leaves* petioled, in outline oblong-obovate, or oblong-lanceolate, with acute, blunt, rounded or subcordate base, and acute, serrate-dentate lobes (incised ± halfway the blade), glaucous, short crisped-hairy underneath, 10-45 by 4-16 cm. *Panicles* densely branched, pyramidal, 20-60 cm long. *Bracts* lanceolate, acute, 2-5 mm, the lower ones hairy, upper ones glabrous. *Pedicels* 1/4-1 cm. *Sepals* erect, elliptic, blunt-acuminate, green, 8-10 mm long, reticulations red. *Stamens* 8-10; anthers linear, yellow, longer than the filaments, pendent in anthesis. *Style* 3-5 mm; stigmas at last recurved, already

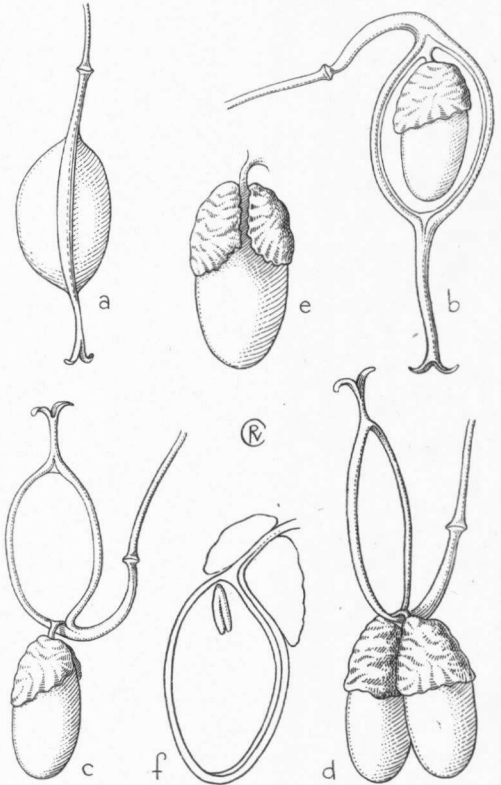


Fig. 2. *Bocconia frutescens* L. a. Unopened capsule, b-d. dehiscent capsule, leaving the seed hanging from the replum on the curved gynophore, e. seed showing seed-coat structure, f. seed in section (all enlarged, drawn by CORNER).

protruding in bud! *Fruit* \pm 12 by 7 mm, ripening greyish, internally light-yellow, pulpy, smooth, \pm $\frac{1}{2}$ cm stipitate. *Seed* c. 7 by 3–3 $\frac{1}{2}$ mm, black, smooth, shiny, hard (crustaceous testa), covered in the lower $\frac{1}{3}$ – $\frac{1}{2}$ with the red, pulpy, plicate aril, hanging out of the mostly erect replum on a 1 mm long funicle; endosperm white; embryo small, basal.

Distr. Native of Central and tropical America, in Java sometimes cultivated and run wild along forest borders and thickets in the everwet mountains of West Java (Lembang, Tjinjiruan), locally abundant, 1200–1600 m.

Note. The Javanese material cannot be identified with HUTCHINSON's key. In the Javanese material the leaf-base is cuneate not rotundate but the lobes are acute and not acuminate. There are 9–10 stamens but the bracts vary in one inflores-

cence from glabrous to crisped-pubescent. It is beyond the scope of this work to make a new revision of the genus.

Cultivated Papaveraceae

Several other *Papaveraceae* are recorded to be or have been cultivated in Java. The following are treated by BACKER, *Bkn. Fl. Java* (em. ed.) 4A (1942) fam. 41, p. 1–5:

Eschscholzia douglasii WALP. [*E. californica* (non CHAM.) LINDL.], *Macleaya cordata* R.BR., *Papaver nudicaule* L., *P. rhoeas* L., and *P. somniferum* L.

About the latter already BLUME (*Bijdr.* 92–97) reported extensively, but the cultivation of the opium poppy was prohibited in the Netherlands Indies.