

Papaveraceae A. L. de Jussieu
(Poppy Family)

Herbs to soft-wooded shrubs; stem with vascular bundles sometimes in several rings; with laticifers present and plants with white, cream, yellow, orange, or red sap, or with specialized elongated secretory cells and sap then mucilaginous, clear; sap with various alkaloids (including the benzyl-isoquinoline type). Hairs simple. *Leaves usually alternate, simple, but often lobed or dissected, entire to more commonly variously toothed, sometimes spinose, with ± pinnate venation; stipules lacking.* Inflorescences various. Flowers bisexual, radial (with numerous or only 2 planes of symmetry) to bilateral. *Sepals usually 2 or 3, usually distinct, imbricate, usually quickly deciduous, large and surrounding bud to small and bractlike.* *Petals usually 4 or 6, sometimes numerous, distinct, imbricate and often crumpled in bud and thus wrinkled when expanded; often the 2 (or 3) inner differentiated from the 2 (or 3) outer, and sometimes with 1 or 2 of the outer petals with a prominent basal nectar spur or pouch and the 2 inner sticking together at apex, forming a cover over the stigmas.* *Stamens numerous, to 6 that are ± connate in 2 groups of 3, rarely reduced to 4; filaments distinct to connate; pollen grains tricolporate to polyporate.* Carpels 2 to numerous, connate; ovary superior, with parietal placentation, the placentas sometimes intruded; stigma(s) distinct to connate, 1 or equaling number of carpels, often discoid and lobed, sometimes capitate. Ovules usually numerous, but sometimes reduced to 1 or 2. Nectaries lacking, or sometimes one or more of the filaments with a basal nectar gland. Fruit a capsule, opening variously, but often by apical pores, valves, or longitudinal slits, *sometimes with a persistent thickened rim (developed from the placenta), occasionally a nut or loment-like; seeds sometimes arillate* (Figure 8.42).

Floral formula:

* or X, 2-3, 4-6 ($-\infty$), $\overbrace{4-\infty}^{\text{or } 3} + \overbrace{3}^{\text{or } 2-\infty}$; capsule

Distribution: Widely distributed in mainly temperate regions; especially diverse in the Northern Hemisphere, but also in southern Africa and eastern Australia.

Genera/species: 40/770. **Major genera:** *Corydalis* (400 spp.), *Papaver* (100), *Fumaria* (50), and *Argemone* (30). Genera occurring in the continental United States and/or Canada include *Adlumia*, *Arctomecon*, *Argemone*, *Canbya*, *Celidonium*, *Corydalis*, *Dendromecon*, *Dicentra*, *Eschscholzia*, *Fumaria*, *Hesperomecon*, *Meconella*, *Papaver*, *Platystemon*, *Romneya*, *Sanguinaria*, and *Stylophorum*. Delimitation of genera is often difficult (see Jork and Kadereit 1995).

Economic plants and products: *Papaver somniferum* (opium poppy) is the source of opium and derivatives such as morphine, heroin, and codeine; the seeds of this species (which do not contain opium) are used as a spice. Many have showy flowers and are cultivated as ornamentals, such as species of *Argemone* (prickly poppy), *Eschscholzia* (California poppy), *Papaver* (poppy), *Macleaya* (plume poppy), *Corydalis* (harlequin), *Sanguinaria* (bloodroot), and *Dicentra* (Dutchman's-breeches, bleeding heart). Most species are highly poisonous.

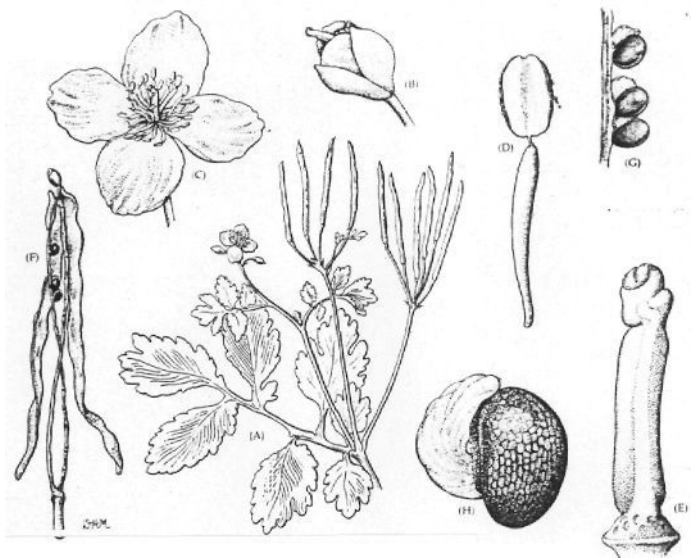


Figure 8.42 Papaveraceae. *Chelidonium majus*: (A) flowering and fruiting branch (x 1); (B) opening flower bud, note two sepals (x 6.5); (C) flower (x 6.5); (D) stamen (x 22); (E) gynoecium (x 22); (F) two-valved capsule, note persistent rim (x 4.5); (G) seeds attached to rim (X 9); (H) arillate seed (x44). (From Ernst 1962, *J. Arnold Arbor.* 43:p.325.)