

CLEOMACEAE CLEOME FAMILY

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Annual to rarely perennial in our flora, ill-smelling herbs. LEAVES stipulate, alternate, palmately compound; leaflets 3 to 7, rarely simple above. INFL a bracteate raceme. FLOWER actinomorphic or zygomorphic by displacement of petals to one side, perfect; sepals 4 free; petals 4, free, ± clawed; stamens typically 6 but up to 20 in Polanisia; pistil 1, 2-carpellate; ovary superior, with a replum (but no false septum as in Brassicaceae), stipitate on an elongated gynophore or sessile, locule 1, placentae 2, parietal, style 1, stigma 2-lobed. FRUIT a 2-valved septicidal capsule or didymous and forming a pair of 1–3-seeded nutlets. x = 8–17. (Ernst 1963 J. Arnold Arbor. 44:81-93; Iltis 1957 Ann. Missouri Bot. Gard. 44:77-119; Iltis 1957 Brittonia 10:33-58). 37–50 genera, 800–900 species. Worldwide in tropic and subtropic regions, with few species in warm-temperate, primarily arid regions. Many members of the family have an unpleasant odor, hence common names like stinkflower, stinkweed, and skunkweed. Clammyweed is another common name referring to the sticky stems and foliage of some species. Cleomaceae is here recognized as distinct from Capparaceae, which lacks a replum and has a woody habit (Hall et al. 2002 Amer. J. Bot. 89:1826-1842).

- 1. Stamens 8–20; plants sticky, glandular-puberulent; petals white to cream; ovary sessile *Polanisia*
- 1' Stamens 6; plants glabrous or at least not glandular; petals colored, not or very rarely white or cream; ovary stipitate (2)
- 2. Fruit didymous, indehiscent, forming 2 nutlets *Wislizenia*
- 2' Fruit a dehiscent capsule (3)
- 3. Fruits short and broad, as wide as long or wider, 2–12-seeded, not constricted between the seeds. *Cleomella*
- 3' Fruits clearly longer than broad, many-seeded, somewhat constricted between the seeds *Cleome*

Cleome L. Beeplant, spiderplant, waa' (Navajo), tu'mi (Hopi)

(Derivation obscure, an early European name for a mustard-like plant.) LEAVES palmately compound, leaflets 3 to 7. FLOWER ± zygomorphic but occasionally appearing ± actinomorphic, petals yellow or pink to pinkish purple (rarely white in a few); stamens 6; ovary stipitate with a basal gland. FRUIT a capsule, longer than wide, linear to oblong, spreading or pendulous, somewhat constricted between the seeds. SEEDS many. Mostly tropical and subtropical America and Africa. 150–200 species primarily in warm tropical areas.

- 1. Petals pink to purplish (rarely white); leaflets 3 *C. serrulata*
- 1' Petals yellow; leaflets 3 to 7 *C. lutea*

Cleome lutea Hook. (Latin lute = yellow). Yellow beeplant, waa' (Navajo). Plants erect, herbage glabrous or slightly hairy. STEMS mainly 3–15 dm tall, branched or simple. LEAFLETS 3–5 (7), oblong to lanceolate or elliptic, 0.8–5 cm long, 2–10 mm wide. INFL 2–10 cm long. FLOWER with pedicels 3–10 mm long; sepals and petals yellow; stamens yellow. FRUIT 1–3 (4) cm long, surface striate, spreading, on stipes 6–12 mm long. 2n = 32, 34. [*Peritoma luteum* (Hook.) Greene] Clay flats, desert scrub, piñon-juniper to ponderosa pine communities from 900–2400m (2950–7900'). ARIZ: Apa, Coc, Nav; COLO: Mon; NMEX: SJn; UTAH. May–Jul. Washington to Nebraska, south to California and New Mexico. The seeds were used as a food source prior to the introduction of the Spanish horse (Ute Mountain Ute).

Cleome serrulata Pursh (Latin *serr* = saw, referring to the minutely serrulate sepals). Rocky Mountain beebplant, Rocky Mountain beeweed, blue Colorado beebplant, spiderplant, clammyweed, stinkflower, stinkweed, guaco, waa' (Navajo). Plants erect, herbage glabrous or slightly hairy. **STEMS** mainly 3–20 dm tall or more, simple or branched above. **LEAFLETS** 3, lanceolate, elliptic, or oblanceolate, 1.5–7 cm long, 4–14 mm wide, entire. **INFL** 5–25 cm long or more. **FLOWER** with pedicels 12–23 mm long; petals lavender; sepals purple to green; stamens with purple filaments; **FRUIT** 2.5–7 cm long, surface smooth, descending to pendulous, on stipes 1–25 mm long. $2n = 32, 34, 60$. [*C. inornata* Greene, *C. integrifolia* Torr. & A. Gray, *C. serrulata* Pursh var. *angusta* (Jones) Tidestrom, *C. serrulata* Pursh forma *inornata* (Greene) W. A. Weber, *Peritoma inornatum* Greene, *P. serrulatum* (Pursh) DC.] Disturbed sites and often along roads and streambanks from 900–2800m (2950–9200'). ARIZ: Apa, Nav; COLO: LPl, Mon; NMEX: McK, RAr, San, SJn; UTAH. May–Aug. Washington to Saskatchewan, south to California and Arizona. Young plants used among the Navajo as a pot-herb (its foul odor dissipates upon cooking); seeds ground for meal when mixed with corn; plants used in making prayer-sticks (*paho*) for the *Powamu* ceremony (Hopi). Boiled stems produce an important yellow dye used in Anasazi pottery. This dye, when mixed with other ingredients, produces a permanent black color when the pots are fired. The plant is also reported as a treatment for stomach disorders, fever, and worms, and as a general tonic.

Cleomella DC. Stinkweed, cleomella

(Diminutive of *Cleome*). Plants generally ascending to erect, usually branched from the base, glabrous, often red-tinged. **STEMS** 6–30 cm tall. **LEAVES** palmately compound, leaflets 3. **FLOWER** ± actinomorphic, petals yellow to yellow-orange, upper 2 often recurved, stamens 6, anthers coiled when dry, ovary stipitate. **FRUIT** obdeltoid, rhomboidal, deltoid, or ovoid, usually wider than long, seeds 2–12. (Payson 1922 Univ. Wyoming Publ. Sci. Bot. 1:29-46). 10 species limited to arid Mexico and southwestern U. S.

- 1. Leaflets ca. 3.5 times longer than wide (2–7 mm wide); foliage bracts reduced to setae *C. palmeriana*
- 1' Leaflets ca. 5.5 times longer than wide (1–3 mm wide); foliage bracts linear to 3-foliolate *C. plocasperma*

Cleomella palmeriana M.E. Jones (for Edward Palmer, southwestern botanist). Palmer cleomella. Plant erect–ascending. **STEMS** branching from the base, 6–30 cm tall. **LEAFLETS** 9–20 mm long, 2–9 mm wide, elliptic to oblong or lance-oblong; upper bracts reduced to setae. **FLOWER** on pedicels 5–6 mm long; sepals, acute; petals 3–4 mm long and tipped with red in bud; filaments to about twice as long as petals. **FRUIT** obtuse apically, base triangular-acute, 2–5 mm long and 5–9 mm wide on an often recurved stipe 3–7 mm long. **SEEDS** few to several. [*C. nana* Eastw., *C. cornuta* Rydb., *C. montrosae* Payson, *C. oöcarpa* A. Gray] Mancos Shale in desert shrub communities from 1200–1850 m (3900–6100'). ARIZ: Apa; COLO: Mon; NMEX: SJn. May–Jul. A Colorado Plateau endemic limited to the Four Corners region except for var. *goodrichii* Welsh with conspicuously horned fruits which is endemic to the Uinta Basin.

Cleomella plocasperma S. Wats. (Greek *ploc* = twisted and *sperma* = seed, referring odd-shaped fruits). Watson's cleomella. Plants erect–ascending. **STEMS** several, diffuse, generally branching from upper nodes, 15–40 cm tall. **LEAFLETS** 7–18 mm long, 1–3 mm wide, linear to narrowly oblong; bracts linear or lowermost 3-foliolate. **FLOWER** on pedicels 9–15 mm long; sepals lanceolate, 0.9–2.2 mm long; petals 3–5 mm long. **FRUIT** ovoid, rhomboidal, or obovoid, 1.5–3 mm long and 3–6 mm wide on a stipe 2–7 mm long. **SEEDS** several. Moist or seasonally moist saline-alkaline areas with saltgrass and other salt-tolerant species from 1400–1525 m (4670-5000'). ARIZ: Apa; COLO: Mon. Jun–Aug. Mostly limited to the Great Basin in Utah, Oregon, Idaho and California, apparently disjunct in our area.

Polanisia Raf. Clammyweed

(Greek *polys* = many and *anisos* = unequal, referring to the many unequal stamens.) Plants viscid-puberulent and strongly rank-smelling. **LEAVES** palmately compound, leaflets 3. **INFL** a dense terminal raceme. **FLOWERS** zygomorphic, petals white, stamens 8–20 long-exserted, purple, and unequal. **FRUIT** capsular, elongate, erect, sessile, glandular, somewhat flattened, valves persistent and dehiscent apically, seeds many. (Iltis 1954 *Rhodora* 56:65-70; Iltis 1958 *Brittonia* 10:33-58; Iltis 1966 *Rhodora* 68:41-47). 4–6 species limited to North America.

Polanisia dodecandra (L.) DC. (Greek *dodeca* = 12 and *andro* = man, referring to 12 stamens). Clammyweed. Plants glabrous. **STEMS** 1.5–8 dm tall. **LEAFLETS** 0.8–4.5 cm long, 3–18 mm wide, obovate to oblanceolate or elliptic. **FLOWER** on pedicels 10–21 mm long; sepals purplish; petals white to cream, emarginate; stamens with filaments purple, long-exserted. [*P. graveolens* Raf., *P. trachysperma* Torr. & A. Gray, *P. uniglandulosa* DC.] Desert shrub and juniper communities, often in wash bottoms and often growing on soil derived from Mancos Shale from 1060–2000 m (3480–6560'). COLO: Arc; NMEX: SJn. May–Oct. British Columbia east to South Dakota, south to Texas and Mexico and west to California. Our plants belong to var. *trachysperma* (Torr. & A. Gray) Iltis.

Wislizenia Engelm. Jackass-clover

(Named for Friedrich Adolph Wislizenus, 19th century naturalist-physician and plant collector). (Keller 1979 *Brittonia* 31:333-351). A genus of one species.

Wislizenia refracta Engelm. (Latin *refractus* = bent abruptly backward, referring to the reflexed stalk of the fruits). Jackass-clover. Plants annual or perennial, glabrous to puberulent. **STEMS** branched from the base, 0.5–24 dm tall. **LEAVES** palmately compound with usually 3 leaflets, petiole 3–25 mm long. **INFL** a dense, terminal raceme up to 20 cm in fruit. **FLOWER** actinomorphic; pedicels 5–10 mm long; sepals ca 2 mm long, green; petals elliptic, yellow, tapered to the base; stamens 8–14 mm long, yellow; ovary of 2 nearly separate lobes, each usually with 1 ovule. **FRUIT** of 2 nutlets with deciduous valves on a reflexed, stalk-like receptacle. **SEEDS** usually one per nutlet. $2n = 40$. Alkaline soils in valleys and washes up to 2000 m (6560'). ARIZ: Nav; UTAH. May–Jun. California to Texas and northwest Mexico. Plants are reported to be toxic to humans, but in California are considered to be an important honey plant. Our plants belong to var. *refracta*.

