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149. LINACEAE

By M.J. Stafford.

Annual or perennial herbs, glabrous or sparsely pubescent with simple hairs. Leaves alternate, opposite or verticillate, sessile or subsessile, simple, entire, with or without stipular glands. Inflorescences cymose. Flowers actinomorphic, bisexual, 5-merous. Sepals imbricate, free or united at the base. Petals convolute, free. Stamens 5, hypogynous, alternating with the petals; filaments united at the base forming a tube; anthers 2-celled, longitudinally dehiscent. Gynoecium syncarpous, 5-carpellate; ovary superior; styles free or partially united; stigmas capitate; ovules 2 per locule, separated by a false septum, placentation axile. Fruit a capsule; seeds compressed. 14 gen.; approx. 250 spp. Primarily in temperate and subtropical regions, less common in tropical regions.

ADD KEY TO GENERA

1. *Linum* L.

Cathartolinum Rchb. *Mesyinium* Raf.

By M.J. Stafford.

Herbs, often slender. Stems usually branched from the base and striate. Leaves mostly small and narrow, usually alternate above, often opposite or verticillate below, pinnately-veined, often only the midvein prominent. Inflorescences terminal or axillary, lax cymes, often paniculate. Flowers delicate; sepals 5, 1-3-veined, the midrib often prominent, persistent in fruit, the margins entire or glandular-stipitate; petals 5, blue, yellow or white, ephemeral; stamens usually with small, tooth-like, interposed staminodia; ovary 5-locular, but becoming more or less 10-locular through the intrusion of false septa, the false septa partially developed; styles 5, free or united below. Capsules ovoid to subglobose, dehiscent loculicidally and septicidally into 10 1-seeded segments (Mesoamerica); seeds reddish brown, shiny. Approx. 180 spp., Cosmopolitan, most common in temperate and subtropical regions.

Literature: Rogers, C.M. *Brittonia* 20: 107-135 (1968).

1. Petals 9-15 mm, blue or rarely white; capsules 7-10 mm; stipular glands absent.

6. L. usitatissimum

1. Petals 3-11 mm, yellow; capsules 1.5-3.5 mm; stipular glands present.

2. Outer sepals entire or very sparingly glandular-stipitate; styles united below.

3. Petals 7.5-11 mm; sepals puberulent within.

1. L. mexicanum

3. Petals 4-8 mm; sepals glabrous within. **2. L. guatemalense**

2. Outer sepals conspicuously and regularly glandular-stipitate; styles separate.

4. Leaves caducous, linear, alternate or opposite below, the apex acuminate with a long pale mucro. **3. L. rupestre**

4. Leaves persistent, elliptic or lanceolate to ovate, obovate or suborbicular, 3-4(-6)-verticillate below, the apex obtuse to acute, sometimes apiculate.

5. Pedicels glabrous; capsules glabrous.

4. L. schiedeanum

5. Pedicels pilose, sometimes sparsely so; capsules usually pilose near the apex. **5. L. nelsonii**

1. *Linum mexicanum* Kunth in Humb., Bonpl. et Kunth, *Nov. Gen. Sp.* 6: 39 (1823). Holotype: Mexico, Guanajuato, *Humboldt & Bonpland s.n.* (P). Illustr.: Rogers, *N. Amer. Fl.* ser. 2, 12: 13, t. 5 (1984).

Cathartolinum mexicanum (Kunth) Small, *Mesynium mexicanum* (Kunth) Raf.

Perennial herbs up to 100 cm or more. Stems erect, branched at the base, simple to the inflorescence, angular, glabrous or nearly so. Leaves 15-40 × 5-15 mm, opposite below, the uppermost usually alternate, lanceolate to oblong-ovate, glabrous or ciliate near the base, the base truncate or subcordate, the apex acute, subacute or subacuminate, occasionally with a small tuft of hairs; stipular glands present and sometimes also at the base of the bracts and sepals. Bracts linear-lanceolate to oblanceolate, entire, acute, glabrous or pubescent above. Pedicels up to 4 mm, glabrous. Sepals 2.5-3.5 mm, lanceolate to ovate, acute, puberulent within and usually with a small tuft of hairs at the apex, the outer entire or very sparsely glandular-stipitate, the inner somewhat broader, scarious-margined towards the base, glandular-stipitate; petals 7.5-11 mm, obovate, yellow; stamens 5-8 mm, the anthers 0.8-1 mm; styles united c. 1/2-3/4 or more from the base. Capsules 3-3.5 mm, ovoid, acuminate,

glabrous externally, the true septa with long marginal cilia; seeds 1.4-1.6 mm, elliptic to oblong in outline. Flowering: May-Oct. *Forests. Ch (Breedlove 27054, MEXU).* (1300-)2000-2700 m. (C. y S. Mexico, Mesoamerica.)

2. *Linum guatemalense* Benth., *Bot. Voy. Sulphur* 67 (1844). Holotype: Guatemala, *Skinner s.n.* (K). Illustr.: not found.

Cathartolinum guatemalense (Benth.) Small.

Annual or perennial herbs up to 150 cm, glabrous or occasionally with scattered pilose hairs. Stems erect, branched at the base, simple to the inflorescence, terete or angular. Leaves 15-35 × 2-8 mm, opposite or sometimes 3-4-verticillate below, alternate above, linear, elliptic or linear-lanceolate, the base cuneate, the apex mostly acute; stipular glands usually present and sometimes also at the base of the bracts. Bracts linear to lanceolate, acute. Pedicels up to 5 mm, usually glabrous. Sepals 2-3.5 mm, ovate, acute, glabrous within the outer entire or occasionally very sparsely glandular-stipitate, the inner somewhat broader, scarious-margined towards the base, entire to somewhat erose or glandular-stipitate; petals 4-8 mm, narrowly obovate, yellow; stamens 3-5 mm, the anthers 0.5-0.8 mm; styles shortly united at the base or rarely up to 3/4 of their length. Capsules 2.2-3.5 mm, ovoid, acute to acuminate, glabrous externally, the true septa with long marginal cilia; seeds 1.4-1.5 mm, ovate in outline. Flowering: Jul.-Jan. *Moist banks and thickets. G (Proctor 25354, MO); H (Molina R. 8731a, F); ES (Montalvo 4807, MO); CR (Herrera y Gamboa 3606, F).* 1500-3100 m. (Endemic.)

Linum guatemalense is very similar to *L. mexicanum* and, as suggested by Rogers (1984: 20), in perhaps only a variety of that species. Rogers (1984: 5) distinguished the two taxa in his key on the basis of whether the styles were united only near the base (*L. guatemalense*) or united to the middle or above (*L. mexicanum*). However, specimens of *L. guatemalense* examined from Dept. Guatemala in Guatemala and Costa Rica were found to have styles united up to three-quarters of their length.

3. *Linum rupestre* (A. Gray) Engelm. ex A. Gray, *Boston J. Nat. Hist.* 6: 232 (1850). *Linum boottii* Planch. var. *rupestre* A. Gray, *Boston J. Nat. Hist.* 6: 155 (1850). Holotype: United States, *Lindheimer 337* (GH). Illustr.: Diggs, M. et al., *Ill. Fl. N. Central Texas* 791 (1999).

Cathartolinum rupestre (A. Gray) Small.

Delicate perennial herbs, 25-50 cm. Stems erect, stiff, branched at the base, simple or sparingly branched to the inflorescence, terete, slender, glabrous. Leaves 3.5-10(-20) × 0.4-1.5 mm, alternate throughout or the lowermost opposite, caducous, linear, glabrous or the lowermost sparsely and shortly pubescent, the base cuneate, the apex acuminate, with a long pale mucro; stipular glands present and usually also at the base of the bracts. Bracts linear-lanceolate, the margins glandular-stipitate, the apex acuminate, with a long pale mucro. Pedicels up to 2(-3) mm, glabrous. Sepals 2.5-4 mm, lanceolate to ovate, glabrous, the margins conspicuously glandular-stipitate, the apex acuminate, with a long pale mucro, the inner sepals somewhat broader and scarious-margined towards the base; petals 5-9 mm, narrowly obovate, yellow; stamens 2.5-6 mm, the anthers 0.5-0.7 mm; styles separate. Capsules 2-2.5 mm, globose-ovoid, acute, glabrous externally, both the false septa and the true septa with marginal cilia; seeds 1.4-1.5 mm, oblong-ovate in outline. Flowering: Aug.-Nov. *Rocky limestone slopes*. Ch (*Breedlove 41236*, MEXU); G (*Steyermark 51635*, F). 800-1500 m. (SW. United States, Mexico, Mesoamerica.)

4. *Linum schiedeanum* Schltld. & Cham., *Linnaea* 5: 234 (1830). Isotype?: Mexico, Veracruz, *Schiede & Deppe 517* (MO!). Illustr.: Rzedowski & Rzedowski, *Fl. Tehuacán-Cuicatlán* 5: 14, t. 1 (1994).

Cathartolinum schiedeanum (Schltld. & Cham.) Small.

Slender perennial herbs, (3-)12-60 cm. Stems ascending to erect, often much branched at the base, simple or sparingly branched to the inflorescence, terete, glabrous. Leaves 6-13(-18) × 1.5-4(-6.5) mm, the lower in whorls of 4, the upper alternate, or sometimes all mostly alternate, narrowly elliptic or oblanceolate to obovate, glabrous or sometimes with scattered hairs near leaf bases, the base cuneate, the apex mostly subacute to obtuse; stipular glands present, also on the lower floral bracts. Bracts linear-lanceolate, the margins glandular-stipitate, the apex acuminate. Pedicels up to 1(-2) mm, glabrous. Sepals 2-3 mm, lanceolate, glabrous, the margins conspicuously glandular-stipitate, the apex subacuminate to acute, the inner sepals narrowly scarious towards the base; petals 3-6 mm, oblanceolate, yellow; stamens 2-5 mm, the anthers 0.3-0.7 mm styles separate. Capsules 1.5-2.5 mm, broadly ovoid, acute, glabrous externally, the true septa with occasional long marginal cilia; seeds 1-1.2 mm, ovate in outline. $2n = 36$. Flowering: Mar.-Dec. *Damp pastures, forests,*

fields or open, rocky places. Ch (Breedlove 11288, MEXU); G (Steyermark 50354, F). 1200-3000 m. (SW. United States, Mexico, Mesoamerica.)

5. *Linum nelsonii* Rose, *Contr. U.S. Natl. Herb.* 10: 117 (1906). Holotype: Mexico, Veracruz, *Nelson 210* (US). Illustr.: not found.

Cathartolimum muelleri Small, *Linum muelleri* (Small) H.J.P. Winkl.

Slender perennial or sometimes annual herbs, 13-70 cm. Stems erect, sometimes decumbent at the base, usually branched at the base, simple or sparingly branched to the inflorescence, terete, glabrous or sparsely pilose at the nodes or occasionally pubescent throughout. Leaves 4-15(-20) × 2-7.5 mm, 3-4(-6)-verticillate below, the uppermost opposite or alternate, lanceolate to ovate, obovate or suborbicular, glabrous or sparsely pilose above or occasionally pubescent throughout, the base cuneate to obtuse, the apex obtuse to acute or apiculate, the upper leaves sometimes sparsely glandular-stipitate; stipular glands present, also at the base of the floral bracts and sometimes at the base of the sepals. Bracts lanceolate, the margins glandular-stipitate, the apex acute to acuminate. Pedicels up to 6(-10) mm, pilose, sometimes sparsely so. Sepals 2-3(-4) mm, lanceolate, sparsely pubescent within towards the apex, the margins conspicuously glandular-stipitate, the apex acute to acuminate, the inner sepals often narrower, not or scarcely scarious; petals 3-5.5 mm, oblanceolate, yellow; stamens 2-4 mm, the anthers 0.5-0.9 mm; styles separate. Capsules 1.5-2.5 mm, broadly ovoid, obtuse, usually sparsely pilose near the apex, the true septa sometimes with a few marginal cilia; seeds 1-1.2 mm, ovate to broadly elliptic in outline. Flowering: all year. *Forest slopes, moist banks, pastures. Ch (Breedlove & Smith 32154, MEXU); G (Williams et al. 40110, F); H (Bustillo 190, MO); N (Stevens & Grijalva 15057, BM). (700-)1000-3500 m. (Mexico Mesoamerica.)*

6. *Linum usitatissimum* L., *Sp. Pl.* 277 (1753). Lectotype (designated by Seegeler, 1989): Herb. Clifford 114, *Linum* no. 1 (BM). N.v. Lino, linaza. Illustr.: Brown & Brown, *Herb. Pl. Maryland* 602 (1984).

Annual herbs 20-100 cm, glabrous. Stems erect, simple or sometimes sparingly branched from the base, terete, more or less smooth. Leaves 10-40 × 0.7-3(-4) mm, alternate, linear to linear-lanceolate, the base cuneate, the apex acute to acuminate; stipular glands absent. Bracts leaf-like. Pedicels up to 20 mm in flower, 35

mm in fruit. Sepals 5-8 mm, elliptic to ovate, the margins scarious, acuminate, the outer entire or minutely ciliate towards the apex, the inner finely ciliate-fimbriate; petals 9-15 mm, obovate, blue or white; stamens 4-5 mm, the anthers 1.8-2 mm; styles separate. Capsules 7-10 mm (including the beak), broadly ovoid, glabrous externally, the false septa ciliate; seeds 4-5.5 mm, lanceolate in outline. Flowering: Dec.-Jul. *Fields, gardens, waste places.* G (Standley 60910, F); H (Standley & Williams 4589, F); ES (Tucker 1193, F); N (Moreno 15757, MO); CR (Khan et al. 525, MO). (500-1100-2400 m. (Probably native to Europe and western Asia; widely cultivated.)

This species is cultivated for its seeds, the source of linseed oil, and for its fibers which are used to make linen cloth. It is also grown as a garden ornamental.

2. *Roucheria* Aubl. Planch.

ADD GENERIC DESCRIPTION

1. *Rocheria columbiana* Hallier f., *Beih. Bot. Centralbl.* 39(2): 49 (1923)

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