OXALIDACEAE OXALIS FAMILY

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Annual or perennial herbs, shrubs, or rarely trees. LEAVES alternate, palmately or pinnately compound (sometimes reduced to 1 leaflet), usually with petioles. INFLORESCENCES cymes, sometimes umbel- or raceme-like, or flowers solitary, usually axillary; peduncle bracted. FLOWERS generally perfect, actinomorphic, often heterostylous, with 5 distinct sepals and petals or these fused at base; stamens 10 or 15, connate below, usually of 2 lengths; pistil 1, with 3-5 carpels, the locules equalling carpels in number; styles 1-5, usually distinct. FRUITS usually fleshy loculicidal capsules. SEEDS usually arillate. --8 genera, 575 spp., chiefly of temperate regions.

Oxalis L. Oxalis, Wood-sorrel

In AZ perennial herbs with bulbs or creeping stems, caulescent or acaulescent. LEAVES petiolate, palmately compound, with 3 or more obcordate leaflets. FLOWERS perfect, the petals clawed, connate at base; stamens 10; pistil 5-carpelled; styles 5. FRUITS fleshy explosive capsules. SEEDS arillate. --ca. 500 spp., mostly of temperate regions and especially concentrated in s S. Amer. and s Afr. Many species are of considerable ornamental value, although several of these have become invasive weeds in many regions. (Greek: *oxus* = sour). Collections must include underground parts to facilitate identifications and labels should note fresh corolla color. Eiten, G. 1963. Amer. Midl. Naturalist 69:257-307; Lourteig, A. 1975. Phytologia 42:57-197; Denton, M. 1973. Pub. Museum Michigan State Univ., Biol. Series 4:459-615.

1. Plants without an above ground stem, with bulbs; corollas yellow, purple, blue, pink, or white.
   2. Leaves arising mostly from underground stems; corollas yellow; [section ***Cernuae***] ..... ***O. pes-caprae***
   2' Leaves arising directly from bulbs; corollas purple, blue, pink, white, or intermediate shades (not yellow); [sect. *Ionoxalis*].
      3. Flanges (conspicuous membranous margins) at petiole bases extended 0.5-1.5 cm above the bulb; leaflets 3-5, often with 2 or more oxalate deposits at the distal end of each lobe ..... ***O. caerulea***
      3' Flanges at petiole bases barely, if at all, extended above the bulb; leaflets 3-11, with oxalate deposits at the notch, along the margins, randomly distributed, or absent.
         4. Leaflets 5-11 on mature plants, usually 1.2 times or more longer than wide; bulb scales usually with 5 or more veins ..... ***O. decaphylla***
         4' Leaflets 3 on mature plants, as wide or wider than long; bulb scales 3-veined.
            5. Seeds with longitudinal ridges, rarely with faint transverse ridges, 0.8 mm wide or less; leaflet lobes to 1/5 leaflet length; bulblets frequently formed ..... ***O. alpina***
            5' Seeds with longitudinal and transverse ridges, 0.8 mm wide or more; leaflet lobes to 1/4 or more leaflet length; bulblets absent ..... ***O. drummondii***

1' Plants with an above ground stem, without bulbs; corollas yellow or orange; [section ***Corniculatae***]
- 6. Septate hairs present on stems, petioles, or pedicels; 1-3 erect stems arising from a slender underground rhizome ..... ***O. stricta***
- 6' Septate hairs absent from stems, petioles, or pedicels; few to many lax or prostrate stems arising from a thickened taproot.
  - 7. Taproot woody; stem hairs often s-shaped ..... ***O. albicans***
  - 7' Taproot fleshy; stem hairs, if present, straight or slightly curved.
    - 8. Stem hairs absent, or, when present, straight or slightly curved; stipules rectangular; stems often rooting at nodes ..... ***O. corniculata***
    - 8' Stem hairs straight; stipules oblong; stems not rooting at nodes ..... ***O. dillenii***

Oxalis albicans Kunth (tending to white). --BULBS absent. STEMS lax to 40 cm long, decumbent, at least at base, not rooting at the nodes. LEAVES cauline; leaflets 3, to 1.5 cm long, pale green. INFLORESCENCES 1-3-flowered; pedicel less than 2 cm long. COROLLAS yellow or orange, 8-12 mm long. FRUITS cylindric, 6-18 mm long. SEEDS 1.2-1.7 mm long. 3 subspp.; CA to TX, s to Guatemala.

Subsp. **albicans** --Stem and pedicel hairs crisped or straight, appressed or ascending; longer stem hairs 0.3-0.8 mm long. Desert scrub, oak, pine, or oak-pine woodland: Gila, Graham, (La Paz?), Maricopa, Mohave, Pima, Pinal, Santa Cruz, Yavapai, Yuma cos.; 750-2000 m (2200-6000 ft); Feb-Oct; w TX to Baja C. Sur, Mex.; Guatemala.

Subsp. **pilosa** (Nuttall) Eiten (pilose). --Stem and pedicel hairs straight, appressed, spreading, or retrorse; longer stem hairs 0.7-1.2 mm long. [*O. pilosa* Nuttall]. --Chaparral, desert woodland, oak or mixed deciduous woodland, or occasionally weedy in urban areas: Cochise, Coconino, Gila, Graham, (La Paz?), Maricopa, Mohave, Pima, Pinal, Santa Cruz, Yavapai, Yuma cos.; 600-2200 m (1900-6600 ft); Feb-Oct; CA to TX; n Mex.

Oxalis alpina (Rose) Knuth (alpine). --BULBS 0.8-2 cm long, often with up to 20 bulblets. LEAVES 4-30 cm tall; leaflets 3, 4-27 mm long, 4-38 mm wide. INFLORESCENCES 1-7-flowered; pedicels less than 5 cm long. COROLLAS blue, lavender, pink, or white, to 27 mm long. FRUITS ellipsoid, 5-12 mm long. SEEDS 1-1.5 mm long. [*O. metcalfei* Small]. $2n$ = 14, 28, 42, 56, 84. --Open, moist, often rocky places in deciduous, pine-oak, or coniferous forests: Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Pima, Pinal, Santa Cruz, Yavapai cos.; 1700-3200 m (5000-9600 ft); Jul-Sep; NM, TX, s to Guatemala.

Oxalis caerulea (Small) Knuth (dark blue). --BULBS 0.8-1.5 cm long. LEAVES 3-14 cm tall; leaflets 3-5, 5-23 mm long, 5-22 mm wide. INFLORESCENCES 1-7-flowered; pedicels less than 15 mm long. COROLLAS rose-red or lavender, 3.5-14 mm long. FRUITS ellipsoidal, 3.5-6 mm long. SEEDS 1 mm long. --Pine forests: Apache, Coconino, Yavapai cos.; 2300-3000 m (6900-9000 ft); Jul-Sep; NM; s to Dgo., Mex.

Oxalis corniculata L. (with small curved horn-like appendages). --BULBS absent. STEMS prostrate or decumbent, to 30 cm long, often rooting at nodes. LEAVES cauline; leaflets 3, to 2 cm long, often maroon. INFLORESCENCES 2-5-flowered; pedicels less than 1 cm long. COROLLAS yellow, 4-8 mm long. FRUITS cylindric, angled, 6-25 mm long. SEEDS 1.2-1.5 mm long. $2n$ = 24, 28, 44, 48. -- Common in lawns, gardens, disturbed places, greenhouses, and occasionally woodlands or grasslands: Apache, Gila, Maricopa, Mohave, Pima, Santa Cruz cos,; 250-1300 m (1100-3900 ft); flowers all year; introduced from the Old World.

Oxalis decaphylla HBK (ten leaflets). Agritos. --BULBS 1-3 cm long. LEAVES 6-24 cm tall; leaflets 5-11, 10-72 mm long, 2-40 mm wide. INFLORESCENCES 5-12-flowered; pedicels less than 30 mm long. COROLLAS purplish, pink, or lavender, 7-22 mm long. FRUITS ellipsoid, 3-11 mm long. SEEDS 0.8-1.2 mm long. [*O. grayi* Rose]. $2n$ = 28, 56. --Coniferous, oak, or mixed deciduous forests, sometimes

scrubland or grassland; occasionally weedy: Apache, Cochise, Coconino, Gila, Greenlee, Navajo, Pima, Santa Cruz, Yavapai cos.; 1700-3200 m (5000-9500 ft); Jul-Sep; NM to Mex.

Oxalis dillenii Jacquin (for J. J. Dillenius). --BULBS absent. STEMS erect or decumbent, to 40 cm long. LEAVES cauline; leaflets 3, 4-18 mm long, pale green. INFLORESCENCES 1-5-flowered; pedicels 10-30 mm long. COROLLAS yellow, 5-12 mm long. FRUITS cylindric or prismatic, 8-25 mm long. SEEDS 1-1.5 mm long. $2n$ = 16, 18, 20, 22. --Moist areas, grassland, coniferous forests: Apache, Coconino, Gila, Graham cos.; 2100-2500 m (6300-7500 ft); May-Sep; s Can; e US to WA, MT to NM, and TX.

Whether the AZ plants are correctly assigned to this species or are more correctly referred to *O. priceae* Small is unclear.

Oxalis drummondii Gray (for T. Drummond). --BULBS 1-2 cm long. LEAVES 6-20 cm tall; leaflets 3, 6-34 mm long, 10-50 mm wide. INFLORESCENCES 3-10-flowered; pedicels less than 35 mm long. COROLLAS pink or lavender, 8-20 mm long. FRUITS cylindrical, 4-12 mm long. SEEDS 1-1.5 mm long. [*O. amplifolia* (Trelease) Knuth in part]. $2n$ = 14. Scrublands or coniferous forests: Cochise, Santa Cruz cos.; 1200-2700 m (3500-8000 ft); Aug; TX, s to Tamp., Mex. Many AZ specimens variously exhibit features of *O. alpina, O. latifolia,* and *O violacea* and require further study.

Oxalis pes-caprae L. (foot of a goat). Bermuda Buttercup. --BULBS 0.5-2.5 cm long. LEAVES 3-42 cm tall; leaflets 3, 10-40 mm long, 20-45 mm wide. INFLORESCENCES 3-20 flowered; pedicels less than 2 cm long. COROLLAS yellow, 15-25 mm long. FRUITS and SEEDS unknown in N. Amer. specimens. $2n$ = 14, 28, 35. --Disturbed urban or agricultural lands: Maricopa, Pima, Yavapai cos.; 400-650 m (1100-2000 ft); Feb- Apr; introduced from South Africa.

In its native South Africa this species is represented by tristylous populations, but in N. Amer. only a pentaploid, sterile, short-styled morph is known.

Oxalis stricta L. (very upright). -- BULBS absent. STEMS usually erect, unbranched, to 75 cm tall. LEAVES cauline; leaflets 3, 5-20 mm long, pale green. INFLORESCENCES 1-9, rarely more, 2-5-flowered; pedicels 8-10 cm long. COROLLAS yellow, or orange-yellow, 3.5-11 mm long. FRUITS cylindrical, 8-13 mm long. SEEDS 0.8-1.3 mm long. $2n$ = 18, 24. Woodlands: Coconino, Maricopa cos.; 2100-2200 m (6300-6700 ft); Apr-Jul; s Can. to se U.S., scattered in c and sw U.S.; e Asia; introduced elsewhere.

This treatment was prepared by Ornduff, and was adapted from Eiten's revision of sect. *Corniculatae*, from Denton's 1973 monograph of sect. *Ionoxalis* and her unpublished 1974 treatment of that group for the projected Chihuahuan Desert Flora, and from specimens at ARIZ, ASC, ASU, and MNA. Denton reviewed and slightly revised the sect. *Ionoxalis* treatment that appears here, before her death in 1994. In respect to AZ plants, the treatments of sect. *Corniculatae* published by Eiten and by Lourteig differ from each other in several important respects. The disagreements cannot be resolved without a worldwide study of the section using modern methods. Our treatment must be regarded as a tentative and provisional one. Because specific differences in sect. *Corniculatae* are unclear, only a map for the section has been made.

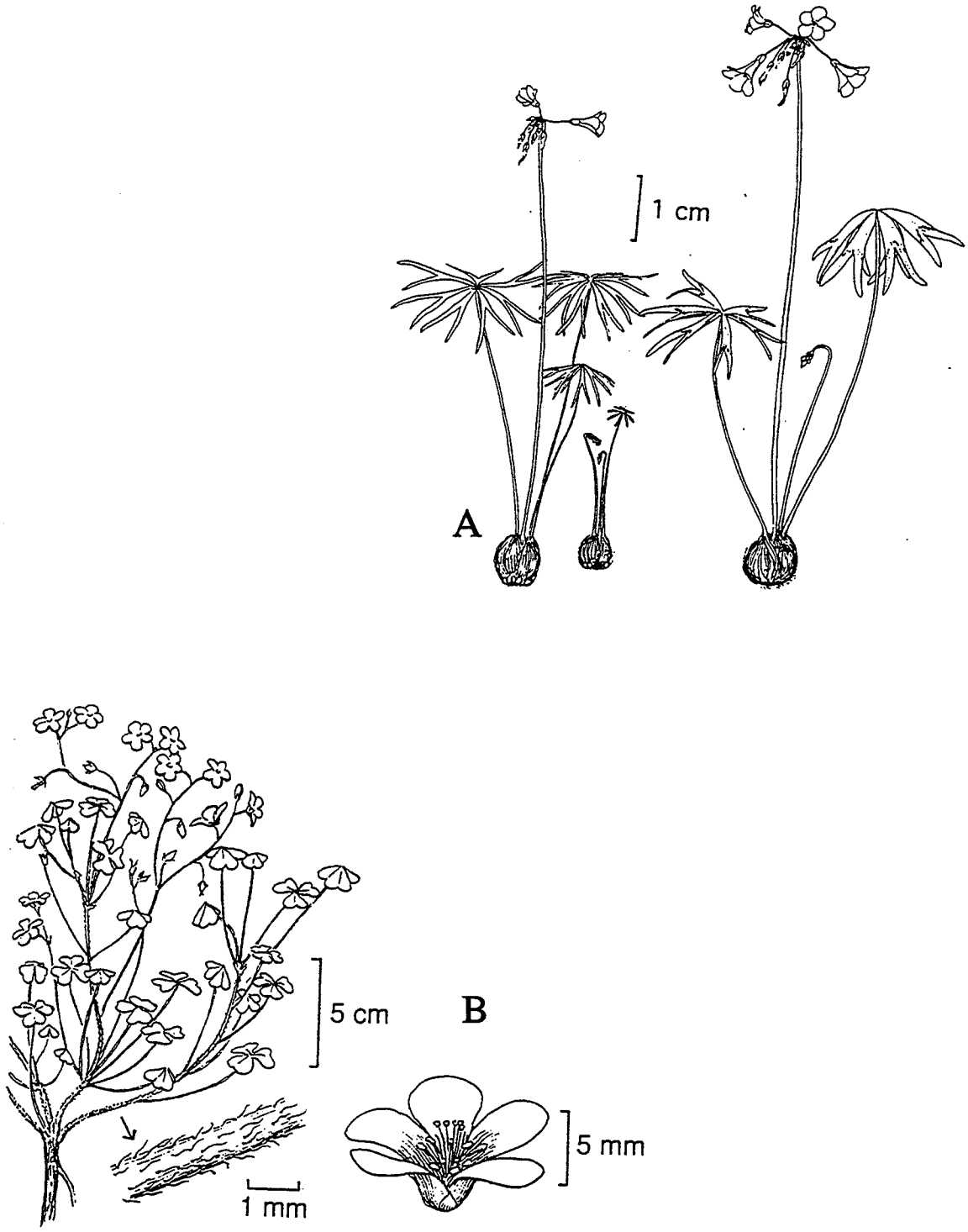

Figure 1. A, *Oxalis decaphylla* (reproduced from M. Denton's thesis). B, *Oxalis albicans* ssp. *pilosa* (reproduced with permission from The Jepson Manual, University of California Press).

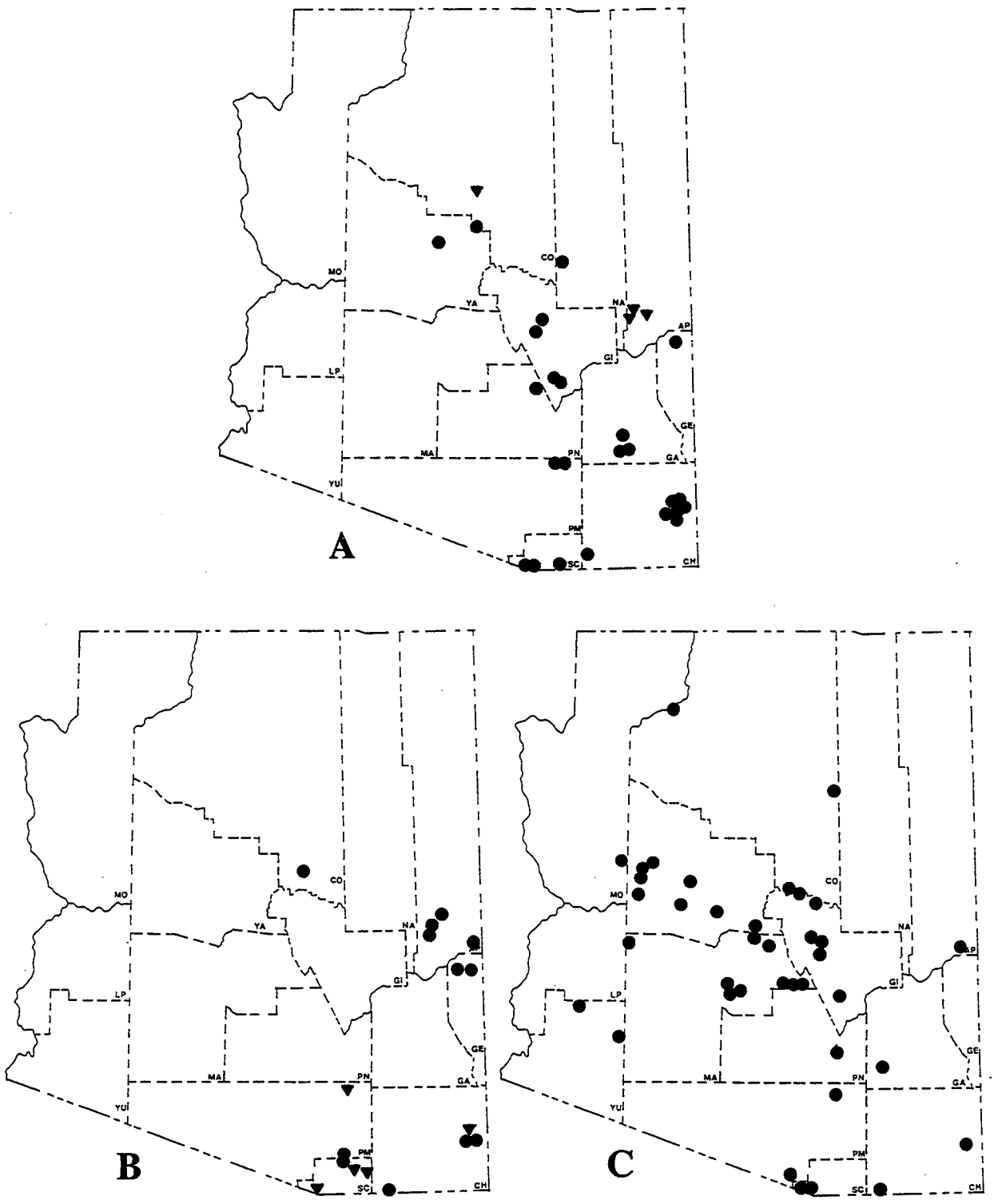

Figure 2. Distribution of: A, *Oxalis alpina* (dots), *O. caerulea* (triangles); B, *O. decaphylla* (dots), *O. drummondii* (triangles); C, *Oxalis* section Corniculatae (including *O. albicans*, *O. corniculata*, *O. dillenii*, and *O. stricta*).