

PYROLACEAE WINTERGREEN FAMILY

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Perennial, rhizomatous evergreen herbs or sub-shrubs, mainly mycorrhizal autotrophs but with some species of *Pyrola* producing leafless flowering shoots. LEAVES simple, alternate, whorled or in rosette-like clusters. FLOWERS perfect, hypogynous, actinomorphic or somewhat zygomorphic, in bracteate inflorescences; sepals and petals in 5's, separate; stamens 10; anthers generally with apical tubular extensions with pores; pollen in tetrads or single; ovary 5-locular; nectaries present or absent. FRUITS globose loculicidal capsules. --4 genera, about 25 spp., mainly of north temperate regions. Haber, E. 1974. *Canad. J. Bot.* 52:877-883.

- 1. Flowers solitary, nodding *Moneses*
- 1' Flowers several to many in racemes, corymbs or umbel-like inflorescences.
 - 2. Inflorescence corymbose or umbel-like *Chimaphila*
 - 2' Inflorescence racemose.
 - 3. Raceme 1-sided and drooping, minutely papillate *Orthilia*
 - 3' Racemes symmetric, erect, smooth *Pyrola*

Chimaphila Pursh Prince's Pine, Pipsissewa

Rhizomatous evergreen sub-shrubs with shoots topped by a few-flowered corymb or umbel. LEAF blades lanceolate to oblanceolate, leathery; teeth generally prominent; petioles shorter than blade. FLOWERS actinomorphic, drooping; petals without basal tubercles, spreading, waxy; filaments dilated and hairy; anthers with tubes and pores; pollen grains single, spherical, released in clumps; disk present; style short straight; stigma broadly peltate, the lobes 5, flattened, radiate. FRUITS erect capsules, without fibers connecting opened valves. --4-5 spp.; world-wide in Northern Hemisphere. (Greek: *cheima* = winter + *philein* = to love, perhaps because of the evergreen habit).

- 1. Leaves ovate, lanceolate or elliptic; veins white-margined; lower leaf surface commonly reddish *C. maculata*
- 1' Leaves oblanceolate; veins without white margins; lower leaf surface pale green *C. umbellata*

Chimaphila maculata (L.) Pursh (spotted). Spotted Wintergreen. --LEAVES mainly 2-3 per node; blades ovate-lanceolate to mainly lanceolate, to 4 cm long, remotely toothed; upper surface dark green variegated with white along the main veins; lower surface commonly red-purple. SCAPES to 20 cm tall, minutely papillate becoming densely glandular papillate in the inflorescence; inflorescence bracts linear-lanceolate, fragile. FLOWERS 1-5; sepals ovate to oblong ovate, to about 2.5 mm long; apex rounded; margins fringed; petals white, minutely fringed, about 8 mm long; filament apical enlargement densely hairy on margins, sparsely on face; anthers 3 mm long. --Coniferous forests: Cochise, Pima, Pinal cos.; 2000-2400 m (6500-8000 ft); Jun-Aug; widespread in e North America from s MI and s Ontario e to s ME, s to GA and AL; also disjunct in Mex. and C. Amer. The differentiation of Arizona plants as var. *dasystemma* (Torrey ex Rydb.) Kearney & Peebles on the basis of leaf shape and anther tube length, is not warranted.

Chimaphila umbellata (L.) Bartram (flowers in umbels). Prince's Pine. --LEAVES generally many per node; blades oblanceolate, 3-7 cm long, toothed; upper surface dark green, veins not white-bordered; lower surface pale green. SCAPES to 30 cm tall, minutely papillate, becoming densely glandular papillate in the

inflorescence; inflorescence bracts linear-lanceolate, fragile. FLOWERS 3-10; sepals broadly ovate, about 2 mm long; apex mainly rounded; margins fringed; petals pink to red, 6-8 mm long; filament enlargement lightly hairy on margins only; anthers 2.5-3.0 mm long. [*C. acuta* Rydb.]. --Coniferous forests: Apache, Coconino, Gila, Graham, Greenlee cos.; 1800-2900 m (6000-9500 ft); Jun-Aug; widespread in N. Hemisphere; Newfoundland to AK, s to CA e to CO and NM, and in e U.S. The species shows some variability across its range in overall size, blade length, number of teeth, prominence of lower leaf surface venation, sepal shape and stigma and capsule size. Arizona plants are not readily separable as a distinct element.

Moneses Salisb. Woodnymph

Perennial scapose herb with slender rhizome-like root. LEAVES in basal rosette; blades ovate, elliptic to obovate, 1-2.5 cm long; apex rounded; bases partly decurrent; teeth small, rounded; petiole generally shorter than blade. Scapes to 8 cm tall. FLOWER single, actinomorphic, drooping; sepals ovate, about 3 mm long, the apex rounded, the margins fringed; petals waxy-white to pinkish, widely spread, entire or minutely fringed, without basal tubercles on upper side; filaments tapered from base, glabrous; anthers with prominent tubes and pores, the sacs about 3 mm long; pollen in tetrads; style straight; stigmatic lobes 5, prominent and marginal. FRUIT an erect globose capsule without fibers connecting the opened valves. --A monotypic genus with a wide distribution in the Northern Hemisphere. (Greek: *monos* = single + *hesis* = delight; in reference to the single flower).

Moneses uniflora A. Gray (single-flowered). Woodnymph. -- $2n = 26$. [*Moneses reticulata* Nutt.; *Pyrola uniflora* L.]. --Coniferous forest: Apache, Coconino cos.; 2700-3500 m (8700-11,500 ft); Jul-Aug.

Orthilia Raf. Sidebells Wintergreen

Perennial rhizomatous, scapose herbs or sub-shrubs. LEAVES alternate, simple, generally leathery, clustered in false yearly whorls; blades ovate, elliptic, to obovate (1-)2-4(-6) cm long; margins entire to crenate; petioles generally shorter than blades. SCAPES bracteate, under 20 cm tall, the bracts lanceolate to narrowly oblong or obovate, generally longer than the pedicels; inflorescence a one-sided drooping raceme, minutely papillate. FLOWERS drooping, actinomorphic, bell-like; sepals ovate, generally about 1 mm long, the tips blunt, the margins finely erose; petals greenish to cream-white, (4-)4.5-5.5(-6) mm long, with two basal tubercles on upper side; filaments narrow; anther sacs minutely papillate, 1.3-2.0 mm long, without tubes, the sacs open at the ends; pollen grains single, ellipsoid; disk present; style straight, exserted; stigma peltate, with 5 small marginal lobes. FRUITS 5-locular drooping capsules with fibers connecting opened valves; fruiting axis becomes erect at maturity. --A monotypic genus. (Greek: *orthos* = straight + *helix* = spiral, in reference to the 1-sided raceme).

Orthilia secunda (L.) House (one-sided). -- $2n = 38$. [*Pyrola secunda* L.; *Ramischia secunda* Garcke]. --Coniferous forest: Apache, Coconino, Graham, Greenlee, Pima? cos.; 2100-3400 m (7000-11000 ft); Jul-Aug; widespread in N. Hemisphere; across Canada s to CA and NM, ne to SD and in ne states, also in Mex. and Guatemala.

Pyrola L. Wintergreen, Shinleaf

Perennial rhizomatous, scapose herbs. LEAVES alternate, in basal clusters of one to several year's growth. SCAPES with bud scales at base and one to several bracts along scape; inflorescences glabrous symmetric bracteate racemes. FLOWERS actinomorphic, drooping, and bell-like (*P. minor*), or zygomorphic, bowl-like; petals without basal tubercles on upper surfaces, the upper two generally forming a hood over the upturned stamens; filaments tapered from base, glabrous; anther sacs mainly with tubes, each opening by a pore; pollen grains in tetrads; disk absent; style short, straight, included, or elongate, downward curved, exserted; stigma peltate, the style apex forming a reflexed collar, the collar enlarged, with 5 radiate lobes (*P. minor*), or small, with 5 erect, finger-like lobes. FRUITS 5-locular drooping capsules

with a depressed center and fibers connecting opened valves. $x = 23$. --About 15 spp. worldwide, mainly in north temperate regions; 6 spp. in North America. (Diminutive of *Pyrus*, pear, from vague similarity in leaves). Haber, E. 1972. *Rhodora* 74:396-397; Haber, E. 1984. *Canad. J. Bot.* 62:1054-1061; Haber, E. 1987. *Syst. Bot.* 12:324-335.

1. Style straight, shorter than petals; flowers bell-like, white, tinged with pink; anthers about 1 mm long, without tubes *P. minor*
- 1' Style downwardly curved longer than petals; flowers bowl-like, white, green, or pink; anthers generally over 2 mm long, with tubes.
 2. Leaf blades ovate to elliptic, leathery, dark green with white-margined veins above, commonly purple-red below (leaves absent in some); flowers greenish-white, white or pink *P. picta*
 - 2' Leaf blades ovate to elliptic or obovate, leathery or not, green above and below, the veins without white margins.
 3. Petals pale green; lower scape bracts subulate; leaf blades ovate to elliptic, leathery, generally less than 2.5 cm long *P. chlorantha*
 - 3' Petals white; lower scape bracts somewhat leafy, lanceolate to oblanceolate; leaf blades broadly elliptic, oblong to obovate, soft textured, mainly over 4 cm long *P. elliptica*

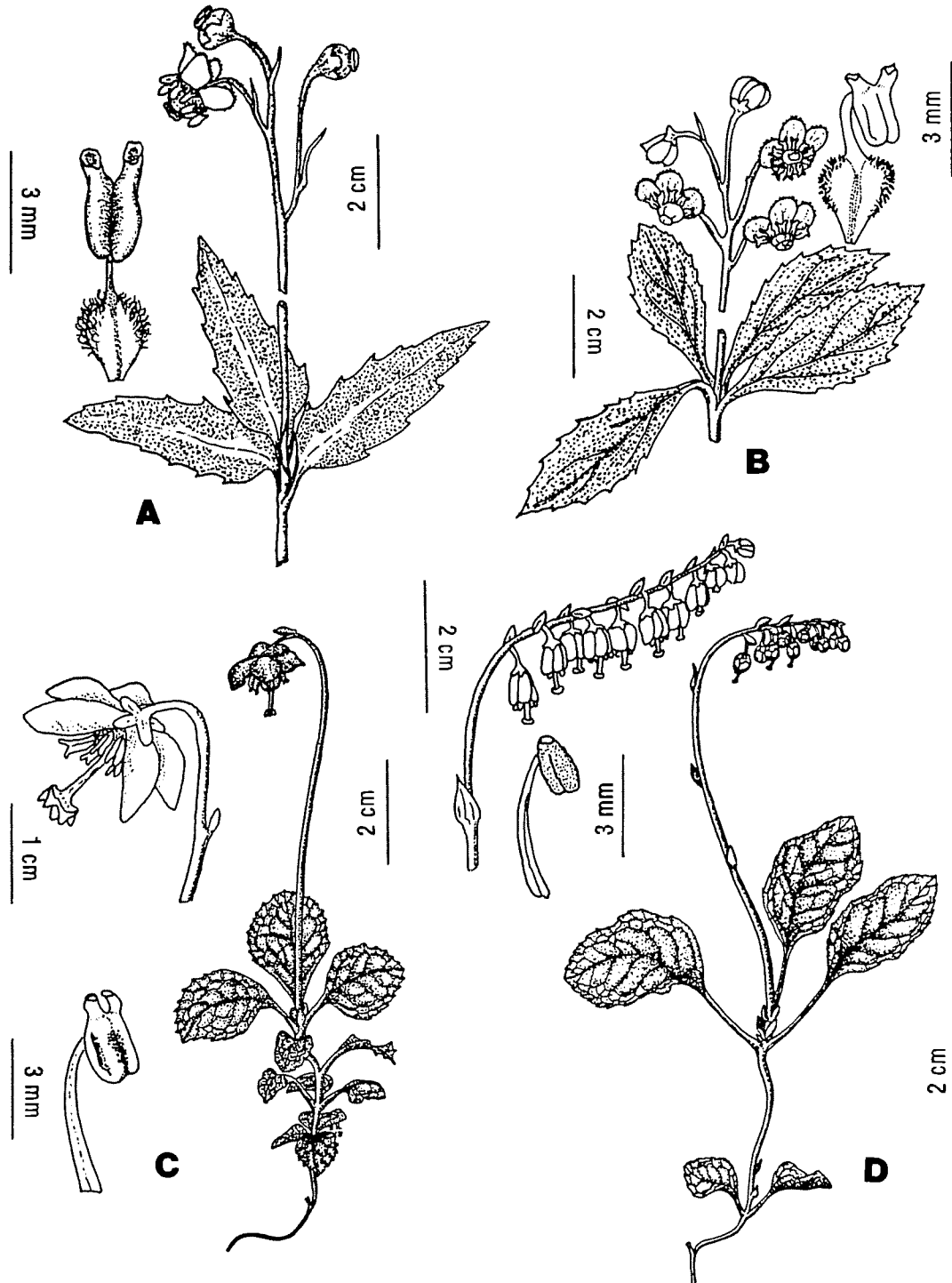
***Pyrola chlorantha* Sw.** (green-flowered). Green-flowered Wintergreen. --LEAF blades ovate-elliptic, obovate or reduced to bracts, generally under 2.5 cm long; petioles shorter than to several times the blade length. SCAPES mainly 14-22 cm tall; bracts all narrow lanceolate or subulate, shorter than pedicels. FLOWERS with sepals broadly ovate, 1.2-1.6 mm long, tips acute to mainly obtuse; petals pale green, drying dull olive with yellow margin, mainly 5-7 mm long; anthers 2-3(-4) mm long, the tubes relatively prominent, curved with pores at ends. [*P. virens* Schreber in Schweigger et Koerte]. --Coniferous forest: Apache, Cochise, Coconino, Graham, Greenlee, Pima cos.; 1900-3100 m (6500-10500 ft); Jun-Jul; circumboreal; Eurasia, e N. Amer. nw to AK, s to CA; scattered in sw states.

***Pyrola elliptica* Nutt.** (elliptic-leaved). Shinleaf. --LEAF blades broadly elliptic, oblong to commonly obovate, (2.5-)3.5-5.5(-7.5) cm long, the bases partly decurrent; petioles generally shorter than blade. SCAPES 10-20(-28) cm tall with leafy ovate, oblong to obovate basal bracts; upper scape bracts linear-lanceolate, shorter than pedicels. FLOWERS with triangular sepals and short acuminate reflexed tips, 0.9-2.3 mm long; petals white, 5-7 mm long; anthers 2-3.5 mm long, the tubes slightly curved with small pores at ends. --Mesic streamside and ravine woodlands: Apache, Coconino, Graham?, Pima, Yavapai cos.; 2100-2700 m (7000-9000 ft); Jul-Aug; most common in e N. Amer. in deciduous and mixed woods; Newfoundland s to WV, nw to British Columbia, s to n ID, MT, WY and in NM.

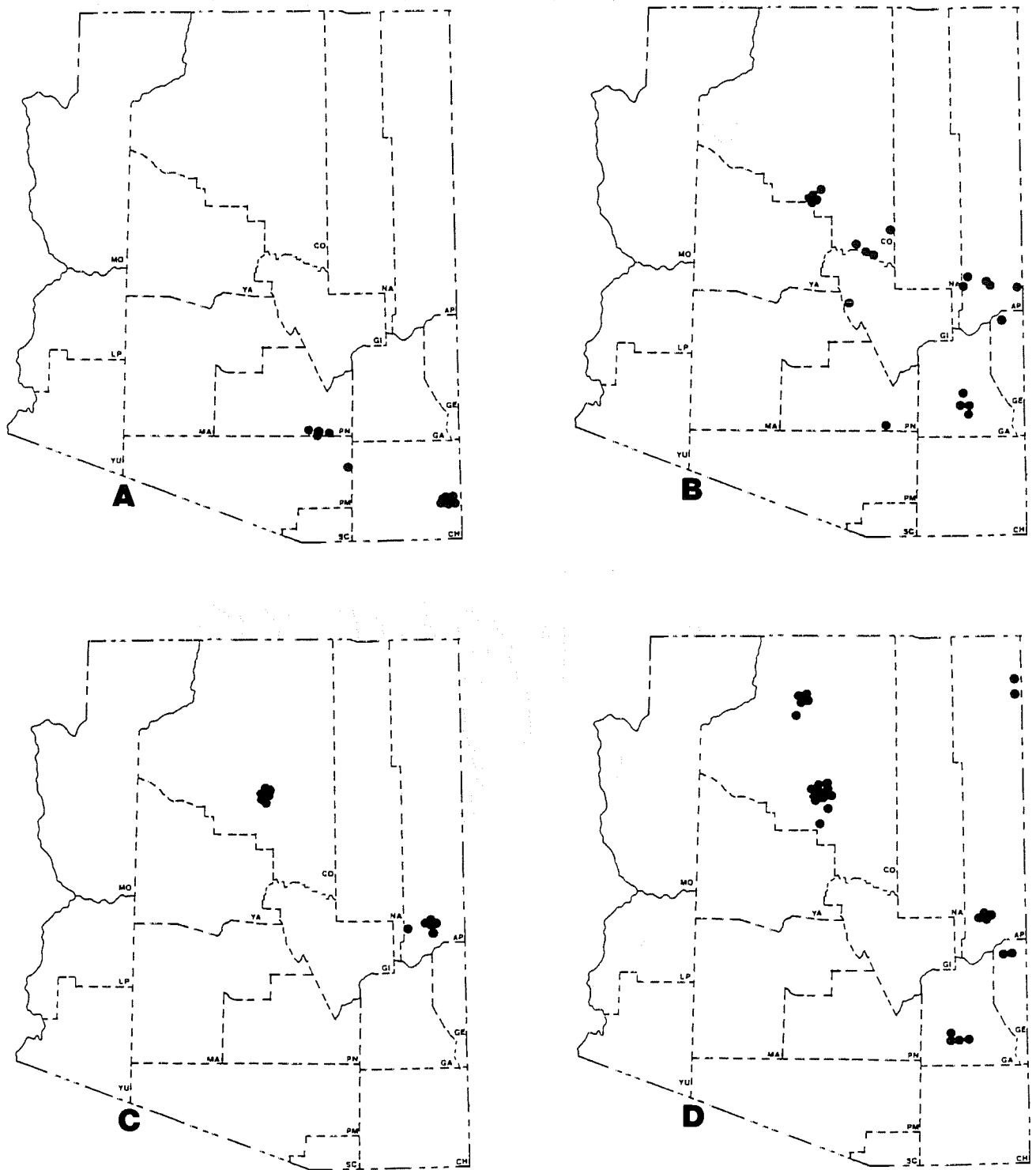
***Pyrola minor* L.** (lesser). Lesser Wintergreen. --LEAF blades broadly elliptic, oblong to commonly obovate, (1-)2-3(-4) cm long; petioles shorter or longer than blade. SCAPES (6-)12-18 (-30) cm tall; upper scape bracts lanceolate to ovate, shorter than to somewhat exceeding pedicels, the basal scape bracts larger, ovate to oblong. FLOWERS with sepals triangular, these 1.5 mm long, the tips acute; petals white to pinkish, (2.7-)3.5-5.0(-5.4) mm long; anthers about 1 mm long, truncate without tubes, the ends of sacs open; style short, straight, included. --Moist coniferous forest: Apache, Coconino, Graham, Greenlee, Navajo cos.; 2600-2900 m (8500-9500 ft); Jul-Aug; circumboreal, subarctic; Eurasia, e N. Amer. nw to AK, s to CA, NV, NM. (Hybridizes elsewhere with several species.)

***Pyrola picta* Smith** (painted). White-veined Wintergreen. --LEAF blades ovate, elliptic, to oblanceolate, (0.8-)3.5-6.0 (-8.0) cm long, leathery, dark green above, commonly purple below; veins generally white-bordered; margins minutely crenately toothed or denticulate. SCAPES (3-)15-25(-36) cm tall; bracts all ovate-lanceolate to subulate, shorter than pedicels. FLOWERS with sepals ovate, these (1.0-)1.5-3.0(-3.9) mm long, the tips acute; petals greenish, cream-white or pink, (5.0-)6.0-7.5(-8.9) mm long; anthers (2.5-)3.0-4.0(-4.5) mm long, the tubes prominent, the pores small. Dry coniferous forest: Apache, Coconino,

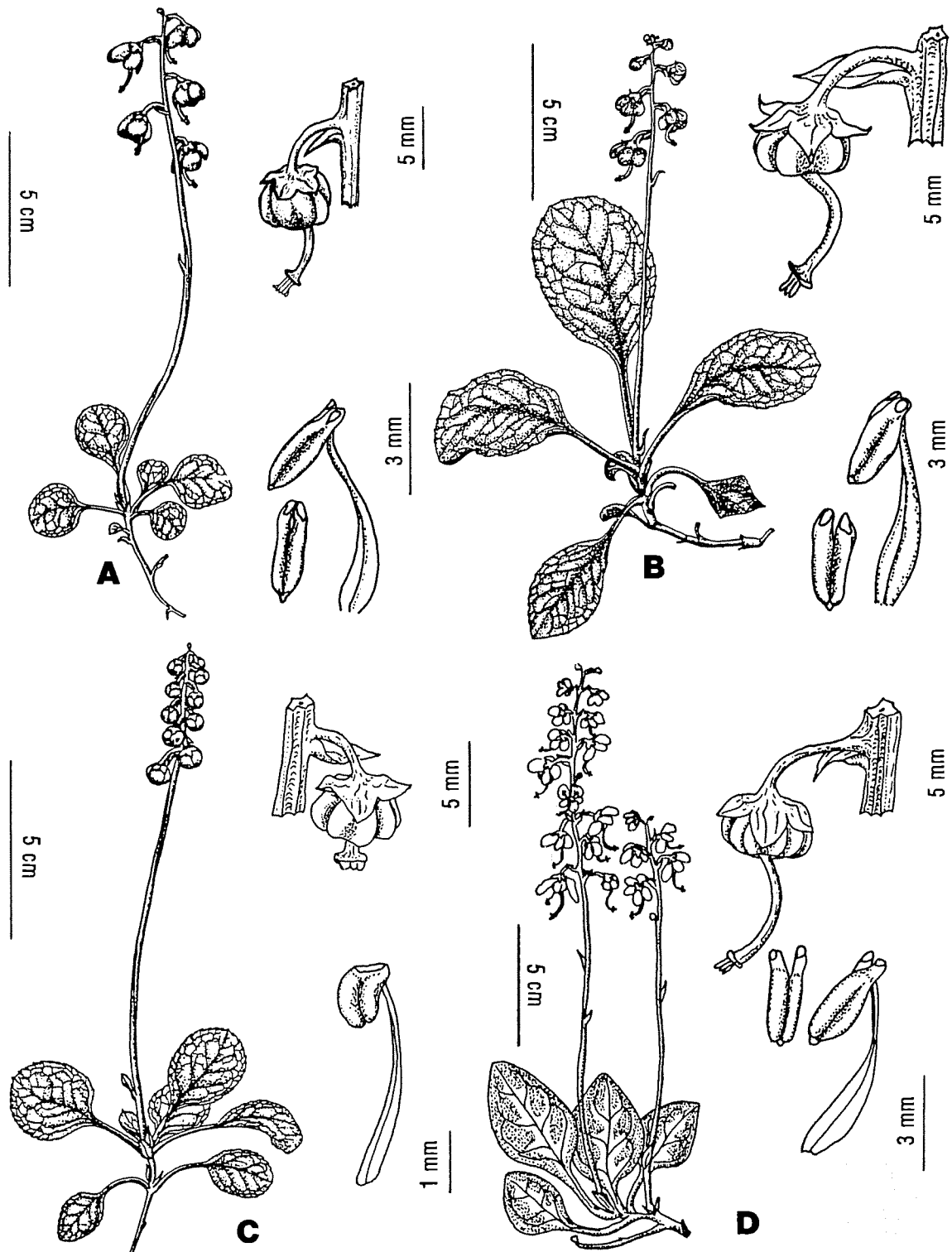
Graham cos.; 2400-2900 m (8000-9500 ft); Jul-Aug; s British Columbia and sw Alberta to s CA, NV, NM. Pollen and seeds are often abortive. Hybridization is suspected. Leafless variants (*P. aphylla* Smith) and those with oblanceolate blades with entire or denticulate margins without white-bordered veins (*P. dentata* Smith) are common in the nw states. These are best treated as morphs of a variable and possibly facultatively mycotrophic species.



Pyrolaceae Fig. 1. Plant habit and floral details of *Chimaphila maculata* (A), *C. umbellata* (B), *Moneses uniflora* (C), and *Orthilia secunda* (D).



Pyrolaceae Fig. 2. Distribution of *Chimaphila maculata* (A), *C. umbellata* (B), *Moneses uniflora* (C), and *Orthilia secunda* (D).



Pyrolaceae Fig. 3. Plant habit and floral details of *Pyrola chlorantha* (A), *P. elliptica* (B), *P. minor* (C), and *P. picta* (D).

