

## PLANTAGINACEAE PLANTAIN FAMILY

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Annual or perennial herbs, acaulescent or short-stemmed. LEAVES spirally arranged, usually all basal, estipulate, the venation parallel. INFLORESCENCES pedunculate, bracteate spikes. FLOWERS sympetalous, regular, perfect or imperfect; sepals 4, distinct and overlapping; corolla scarious, 4-lobed; stamens 4, adnate to corolla, alternating with the lobes; ovary superior, of 2 fused carpels, with 2 locules, the placentation axile; style 1; stigma 2-lobed. FRUIT a circumscissile capsule with 2-many seeds. Approximately 3 genera and 255 spp. (almost all in *Plantago*), cosmopolitan, some world-wide weeds.

### **Plantago** L. Plantain

Plants from taproots. STEMS extremely short, disc-like, simple or branched. LEAVES simple, entire or variously toothed. INFLORESCENCES scapose, long or short spikes, loose to dense. FLOWERS several to many, inconspicuous, each subtended by a bract; sepals free (2 fused in *P. lanceolata*), usually with overlapping scarious margins; corolla whitish, scarious or membranous, persistent, the lobes with a thickened or colored basal spot; stamens 2-4, exserted; style exserted. FRUIT included in the sepals or exserted, often purplish-brown. SEEDS mucilaginous when wet, concave, the outer surface often patterned: *Plantago afra* and *P. ovata* are used as laxatives. ca. 255 spp., cosmopolitan. (Latin: *planta* = flat and spread out + *ago* = kind of).

1. Leaves linear to linear-lanceolate, rarely more than 1 cm wide (to 1.2 cm wide in *P. wrightiana*); plants annual.
  2. Seeds 6-14 per capsule ..... *P. elongata*
  - 2' Seeds 2 per capsule.
    3. Bracts broadly ovate, 1.6-3 mm long, broadly scarious-margined to apex; hairs on upper part of scape spreading at right-angles from stem ..... *P. ovata*
    - 3' Bracts subulate to broadly triangular, 2-16 mm long, scarious margined at base or to near middle; hairs on upper part of scape usually closely ascending or appressed
    4. Bracts linear-triangular, 2-16 mm long, longer than sepals ..... *P. patagonica*
    - 4' Bracts triangular, 2-3.5 mm long, about as long as sepals.
      5. Leaves silky; bracts 2-3 mm long; spikes interrupted at maturity; corolla lobes 1.6-2.3 mm long; seeds dark brown to black, narrowly elliptic, ca. 1.2 mm wide, the inner surface with thin rim, the outer surface finely pitted, not in rows ..... *P. argyrea*
      - 5' Leaves sparsely villous to glabrous; bracts 2.8-3.5 mm long; spikes rarely interrupted at maturity; corolla lobes 2.3-3.5 mm long; seeds light to dark brown, pyriform, ca. 1.5 mm wide, the inner surface with thick rim, the outer surface tuberculate in rows ..... *P. wrightiana*
- 1' Leaves lanceolate to ovate, rarely less than 1 cm wide; plants annual, biennial, or perennial (also see *P. wrightiana*).
  6. Corolla lobes of pistilate flowers erect at maturity, enclosing the capsule; plants monoecious, dioecious, or polygamous.
  7. Leaves entire; seeds 3 ..... *P. australis* var. *hirtella*

- 7' Leaves usually with 2-3 remote, shallow teeth; seeds 2.
8. Sepals acute to acuminate, usually evenly hirsute; seeds deep red, the inner surface flat . . . . . *P. rhodosperma*
- 8' Sepals obtuse to acute, often hirsute only on midrib; seeds light brown, the inner surface deeply concave . . . . . *P. virginica*
- 6' Corolla lobes of all flowers spreading or reflexed at maturity, not enclosing the capsule; plants with perfect flowers.
9. Leaves broadly ovate, abruptly narrowing into a petiole; seeds 6-many per capsule . . . . . *P. major*
- 9' Leaves lanceolate, oblanceolate, or elliptic, gradually tapering into the petiole; seeds 2-4 per capsule.
10. Outer pair of sepals (those adjacent to the bract) connate, appearing as a solitary, 2-veined, apically notched or entire sepal . . . . . *P. lanceolata*
- 10' Outer pair of sepals (those adjacent to the bract) distinct.
11. Stems densely woolly; corolla lobes 1.2-1.8 mm long; seeds 2; found in alkaline soil at lower elevations . . . . . *P. eriopoda*
- 11' Stems scarcely woolly; corolla lobes 0.6-0.8 mm long; seeds 4; found in non-alkaline soil at upper elevations . . . . . *P. tweedyi*

***Plantago argyrea*** E. Morris (silvery). --Annual herbs to 30 cm tall. LEAVES without distinct petiole; blades linear to linear-lanceolate, 2.4-17.4 cm long, 0.2-0.5 cm wide, acute to acuminate at apex, densely villous (rarely woolly), distinctly 3-veined below, with entire margins. PEDUNCLES 5-26 cm long, hirsute, with most hairs appressed-ascending. SPIKES 1-9.5 cm long, interrupted at maturity; bracts broadly triangular, 2-3 mm long, about as long as sepals, scarious-margined at base or to near middle, sparsely to densely villous, with tufts of white hairs in axils, with midvein ciliate. FLOWERS perfect; sepals obovate, 2.3-3 mm long, scarious-margined, villous; corolla lobes spreading or reflexed, broadly ovate, 1.6-2.3 mm long; stamens 4. CAPSULE breaking at or slightly below middle. SEEDS 2, narrowly elliptic, ca. 2.5 mm long, ca. 1.2 mm wide, dark brown to black, the inner surface concave, the rim thin, the outer surface finely pitted but lacking distinct rows. --Common in dry pinyon-juniper and pine forests: Apache, Navajo, Yavapai, Coconino cos.; 1800-2650 m (6000-8800 ft); Jun-Sep. NM.

*Plantago argyrea* is a member of the *P. patagonica* species complex. The complex is easily distinguished from all other species of *Plantago* by an annual habit, linear leaves, and subulate to broadly triangular bracts. In Arizona, the complex is comprised of three species (*P. argyrea*, *P. patagonica*, and *P. wrightiana*). More detailed studies are needed to determine whether these taxa are conspecific. All specimens of *P. argyrea* are from the Colorado Plateau above 6000 feet except for two from Yavapai Co., both below the Mogollon Rim: Castle Creek (Morris 592393 US--holotype of *P. argyrea*) and Oak Creek (Deaver 4445, ASC). *P. argyrea* may be distinguished from *P. patagonica* by the presence of triangular bracts that are about as long as the sepals (vs. bracts linear-triangular and longer than the sepals). Although geographically separated from *P. wrightiana*, these two short-sepaled species are only separable using a suite of mostly overlapping characteristics (see key couplet 5). *P. argyrea* may prove to be merely a high elevation, geographical variety of *P. patagonica*.

It should also be noted that some recent treatments are in need of orthographic corrections. The spelling presented here agrees with that found in the original publication of the species (Morris 1900). Some treatments use the correct spelling (ex. Wootton & Standley 1915; McDougall 1973). However, in the *Arizona Flora* (Kearney and Peebles 1969), in the *The Flora of New Mexico* (Martin and Hutchins 1980), and in both the hardcopy and electronic versions of Kartesz (1994), the species name is incorrectly spelled *P. argyrea*.

**Plantago australis** Lam. (southern). --Perennial herbs to 100 cm. LEAVES petiolate or the petiole gradually merging with the blade; blades variable, linear to elliptic to broadly or narrowly ovate to obovate, 2.5-51.5 cm long, 0.6-7.7 (-9) cm wide, attenuate at base, acute at apex, the surfaces usually glabrous, less often sparsely pubescent to densely pillose, with inconspicuously to conspicuously toothed ciliate margins. PEDUNCLES to 100 cm long, with appressed hairs. SPIKES to 56 cm long, interrupted near base, slender; bracts narrowly triangular, triangular, or broadly or narrowly ovate, 1.4-7.5 mm long, ciliate, with the lower surface glabrous. FLOWERS perfect or imperfect; sepals elliptic to obtuse to acute, 1.8-3.4 mm long, ciliate, with glabrous outer surface; corolla lobes spreading to erect, 1.3-3.2 (-3.5) mm long, longer than sepals. CAPSULE breaking well below middle. SEEDS 1-3, pyriform to ellipsoid, 1.2-2.8 mm long, the inner side planar, the outer surface finely and shallowly pitted. --9 subsp. from s AZ throughout Mex., C Amer., and S Amer. (Rahn 1974).

Subsp. **hirtella** (H.B.K.) Rahn (hairy). --Plants to 49 cm tall. LEAVES with blades ovate, 4.5-20 cm long, 1-4.5 cm wide, sparsely pilose to densely pilose on veins, distinctly 5-veined, the margins entire. PEDUNCLES 2-40 cm long, densely villous, some appearing ridged to four-sided. SPIKES 2-19 cm long; bracts narrowly triangular, 2.5-4 mm long; midvein thick, sparsely villous. FLOWERS: sepals ovate, 2-2.8 mm long, the margins thin, scarious; midvein keeled, with sparse pubescence; corolla lobes 3-3.5 mm long, lanceolate, erect, enclosing the capsule (spreading in staminate flowers), lanceolate, 3-3.5 mm long; stamens 4. SEEDS 3, 1-2 mm long, ca. 0.8 mm wide, light to dark brown, olive-green, or black, the inner surface flat, the outer surface areolate. [*P. hirtella* subsp. *galeottiana* (Decne.) Thorne; *P. hirtella* var. *galeottiana* (Decne.) Pilger; *P. hirtella* Kunth var. *mollior* Pilger]. --Pine-oak forest: Cochise, Coconino, Pima cos.; 1600-2350 m (5300-7700 ft.); Jun-Aug; Mex., s to nw Argentina.

*Plantago australis* ssp. *hirtella* is sometimes confused with *P. virginica* and *P. rhodosperma* by the presence of lanceolate leaves and erect corolla lobes on the female flowers. It may be separated easily from these two closely related species by its entire leaf margins (vs. margins with 2-3 remote, shallow teeth) and fruit with 3 seeds (vs. 2).

Rahn (1974) reduced *Plantago hirtella* to a subspecies of the mostly southern hemisphere species *P. australis*. In addition to the specimens from the Huachuca Mountains seen by Rahn (*Kearney & Peebles 14069*, ARIZ), we have seen three other specimens that should be referred to this species: one from the White Mountains (*Steed 18*, ASU), one from the Santa Catalina Mountains (*Thornber 7140*, ARIZ), and one additional sheet from Huachuca Mountains (*Goodding 893*, ARIZ). Although we appear to have no specimens of the 3-seeded coastal relative, *P. subnuda*, it may be expected to occur in Mohave County along the Colorado River. *Plantago australis* var. *hirtella* may be separated from its coastal cousin, *P. subnuda*, by its fibrous roots (vs. a taproot), bracts narrowly triangular (vs. ovate), and sepals 2.0-2.5 mm long (vs. 2.6-3.1 mm long). *P. subnuda* also occurs at lower elevations than *P. australis* (below 300 m vs. above 1500 m) (Rahn 1974). Further surveys of individuals with mature seeds may be necessary in order to determine whether *P. australis* has been mistaken for one of the species in the "virginica" complex or whether the small number of collections in Arizona accurately represent the northern distribution of this Neotropical, 3-seeded species.

**Plantago elongata** Pursh (elongated). Many-seeded Plantain. --Annual herbs to 10 cm tall. LEAVES without a distinct petiole; blades linear, 1.5-7 cm long, ca. 1 mm wide, attenuate at base, acute at apex, sparsely pubescent, with no evidence of venation, with entire margins. PEDUNCLES 2.6-16 cm long, sparsely to densely villous, usually becoming densely villous just below the inflorescence. SPIKES 0.3-5.5 cm long, sometimes interrupted at base; bracts ovate, 1.5-2.2 mm long, broadly scarious-margined; midvein thick and usually ridged, glabrous. FLOWERS perfect; sepals broadly ovate, 1.2-2.0 mm long, half as long as capsule, broadly scarious-margined; midvein thick, glabrous; corolla lobes spreading or reflexed, triangular to narrowly ovate, 0.5-0.7 mm long; stamens 2. CAPSULE breaking at middle. SEEDS 6-14, narrowly elliptic, acute at both ends, ca 1.2 mm long,

ca. 0.3 mm wide, dark brown to black, the inner surface flat to slightly convex, the outer surface areolate. [*P. bigelovii* A. Gray; *P. bigelovii* ssp. *californica* (Greene) Bassett; *P. californica* Greene; *P. elongata* var. *bigelovii* B. Boivin; *P. elongata* ssp. *pentasperma* Bassett; *P. heterophylla* Nutt.; *P. myosuroides* Rydb.] --Desert grasslands and washes: Cochise, Pima, Pinal cos.; 750-1400 m (2500-4500 ft.); Feb-Apr.; British Columbia, Alberta, Can.; MT, to OR, s to TX, LA, FL.

***Plantago eriopoda*** Torr. (woolly-foot, referring to stem). --Perennial herbs to 40 cm tall. LEAVES petiolate; blades lanceolate, 5-12 cm long, 1.0-2.5 cm wide, attenuate at base, acute at apex, sparsely villous to glabrate, distinctly 5-veined below, the margins with a few remote, shallow teeth. PEDUNCLES 5.5-16 cm long, white-villous. SPIKES 2-10 cm long, interrupted near base; bracts ovate, (1.5-) 2 mm long, ciliate, with tufts of tan hairs in axils. FLOWERS perfect; sepals broadly elliptic, ca. 2.5 mm long, broadly scarious-margined; corolla lobes spreading or reflexed, subulate to narrowly ovate, 1.2-1.8 mm long; stamens 4. CAPSULE breaking well below middle. SEEDS 2, ellipsoid, concave, ca. 1.5 mm long, ca. 0.8 mm wide, light to reddish-brown, the outer surface slightly reticulate and shiny. --Alkaline marshes: Apache Co.; 1700-2200 m (5600-7200 ft); Jun-Aug.; s Yukon; n CA, NV, UT, e to MN.

Although their ranges are distinct, *P. eriopoda* is easily confused with the somewhat similar *P. tweedyi*. *P. eriopoda* can be distinguished from *P. tweedyi* by its densely woolly stems visible between leaf bases, corolla lobes 1.2-1.8 mm long and capsules with 2 seeds (vs. stems scarcely woolly, corolla lobes 0.6-0.8 mm long, and capsules with 4 seeds).

***Plantago lanceolata*** L. (lance-shaped) Buckhorn Plantain. --Perennials to 65 (-85) cm tall. LEAVES petiolate; blades lanceolate, 4-24.5 cm long, 0.5-4.2 cm wide, long attenuate at base, acute at apex, sparsely pubescent to glabrate, distinctly 5 (-7)-veined, with margins occasionally having a few, remote teeth. PEDUNCLES 13-86 cm, strigose. SPIKES 1.5-7 cm long; bracts broadly triangular, (1.5-) 2 mm long. FLOWERS perfect; sepals obovate, 1.5-2.5 mm long, broadly scarious-margined, the 2 outermost characteristically fused, appearing as a solitary, 2-veined, apically notched or entire sepal; midvein thin, ciliate at apex; corolla lobes spreading or reflexed, subulate to narrowly ovate, 2-2.5 mm long; stamens 4. CAPSULE breaking well below middle. SEEDS 2, ellipsoid, concave, 1.5-2.5 mm long, ca. 1.0 mm wide, brown, the outer surface shiny. --Moist soils: Apache, Coconino, Gila, Maricopa, Mohave, Navajo, Yavapai cos.; 950-2450 m (3200-8200 ft); May-Aug.; native of Eurasia, now a cosmopolitan weed.

This species may be confused with *P. tweedyi* and *P. eriopoda* vegetatively but is easily differentiated when flowers or fruits are present by the two connate sepals. The high elevation collections from Yavapai and Gila counties appear to be more densely pubescent than those collected from lower elevations.

***Plantago major*** L. (larger). Common Plantain. --Perennials to 42 cm tall. LEAVES petiolate; blades broadly ovate, 3.5-15 cm long, 2-9 cm wide, attenuate at base, acute at apex, sparsely pubescent, becoming glabrate, distinctly 3 (-5)-veined, the margins with a few shallow lobes near base. PEDUNCLES 4-20 cm long, sparsely pubescent to glabrous, sometimes appearing ridged to four-sided. SPIKES 3-24 cm long, interrupted near base; bracts broadly ovate, 1.5-4.5 mm long, broad scarious-margined; midvein glabrous. FLOWERS perfect; sepals broadly ovate to elliptic, 1.2-2.3 mm long, broadly scarious-margined, midvein glabrous; corolla lobes spreading or reflexed, ovate, 0.7-1.5 mm long; stamens 4. CAPSULE breaking well below middle. SEEDS 6-many, irregular in shape, ca. 1.0 mm long, ca. 0.5 mm wide, olive-green to dark brown, the outer surface furrowed. --Weed of wet areas: in all our cos. except Pinal; 650-2500 m (2200-8200 ft.), May-Oct.; cosmopolitan.

Vegetatively, this species resembles the two species in the *P. virginica* species complex (see below). However, the bracts of *P. major* are broadly ovate and entire (vs. subulate to broadly triangular

and ciliate). If pistillate flowers are available, *P. major* may be readily distinguished by its spreading (vs. erect) corolla lobes.

***Plantago ovata* Forssk.** (for ovate bracts). Woolly Plantain. --Annuals to 38 cm tall. LEAVES usually without distinct petiole; blades linear to linear-lanceolate, 1.5-15 cm long, 0.2-0.9 cm wide, attenuate at base, acute at apex, sparsely to densely villous, obscurely three-veined, the margins entire. PEDUNCLES 1.5-29 cm long, villous, with hairs spreading at right angles from stem. SPIKES 0.5-5.5 cm long; bracts broadly ovate, 1.6-3 mm long, broadly scarious-margined to apex, with tufts of white hairs in axils; midvein villous. FLOWERS perfect; sepals ovate to obovate, 2.4-3 mm long, broadly scarious-margined; midvein densely villous, more so than bracts; corolla lobes spreading or reflexed, broadly ovate, 1.8-2.4 mm long; stamens 4. CAPSULE breaking at or slightly below middle. SEEDS 2, ellipsoid, ca 2.3 mm long, ca 1.1 wide, reddish-brown to black, the inner surface deeply concave, the outer surface shiny. [*P. fastigiata* Morris; *P. insularis* Eastw.] --Deserts and desert grasslands: all Cos. except Apache, Cochise, Greenlee, La Paz, Santa Cruz, 50-2100 m (200-6700 ft.); Mar to May; WA s to Baja C., e to NV and UT; cosmopolitan.

*Plantago ovata* could be confused with *P. patagonica* because both are common desert annuals with similar leaves. They may easily be separated by the size and shape of the floral bracts (1.6-3 mm long and broadly ovate in *P. ovata* vs. 2-16 mm long and linear triangular to subulate in *P. patagonica*).

***Plantago patagonica* Jacq.** (from Patagonia). --Annual herbs to 21 cm tall. LEAVES without distinct petiole; blades linear to linear-lanceolate, 1-15 cm long, 0.1-0.7 cm wide, acute to acuminate at apex, sparsely to densely villous, distinctly 3-veined below, the margins entire. PEDUNCLES 2-22 cm long, hirsute, with most hairs appressed-ascending. SPIKES 1-13 cm long; bracts linear-triangular to subulate, 2-16 mm long, longer than sepals, scarious-margined at base or to near middle, sparsely to densely villous, with tufts of white hairs in axils, with midvein long ciliate. FLOWERS perfect; sepals obovate, 2-5 mm long, broadly scarious-margined, villous; corolla lobes spreading or reflexed, broadly ovate, 1.2-2.5 mm long; stamens 4. CAPSULE breaking at or slightly below middle. SEEDS 2, ca. 2.2 mm long, ca. 1.2 mm wide, reddish-brown to light brown to dark brown (rarely black), the inner surface concave, the outer surface rounded and alveolate. [*P. aristata* Michx.; *P. ignota* Morris; *P. oblonga* Morris; *P. purshii* R. & S.; *P. spinulosa* Decne.] --Deserts and desert grasslands: in all cos. except La Paz, Yuma, 400-2100 m (1200-6800 ft.); Feb to Jul.; British Columbia, to Saskatchewan, Can.; s to CA, e to TX; Argentina and Chile; introduced in the se U.S.

*P. patagonica* is closely related to *P. argyrea* and *P. wrightiana*. A more detailed discussion appears following the *P. argyrea* species description.

***Plantago rhodosperma* Decne.** (red seed) Red-seeded Plantain. --Annual herbs to 33 cm tall; dioecious. LEAVES petiolate; blades lanceolate, 3-8.5 cm long, 0.8-2.2 cm wide, attenuate at base, acute at apex, sparsely villous, distinctly 3-veined, sometimes with 2-4 widely-spaced teeth. PEDUNCLES 0.5-38 cm long, sparsely to densely villous. SPIKES 1.5-14.5 cm long, interrupted near base; bracts subulate to narrowly triangular to broadly triangular, 2.4-4 mm long, narrowly scarious-margined at base, ciliate. FLOWERS with sepals ovate, 2-3 mm long, broadly scarious-margined, acute to acuminate at apex, evenly hirsute; corolla lobes erect, enclosing the capsule (sometimes spreading in staminate flowers), lanceolate, 2-3.5 mm long; stamens 4. CAPSULE breaking at middle. SEEDS 2, ellipsoid, 1-2.5 mm long, ca. 1 mm wide, deep red, the inner surface flat, the outer surface alveolate. --Sandy soils, common in shrublands: Cochise, Gila, Maricopa, Pima, Santa Cruz, Yavapai cos.; 600-1300 m (1500-2500 ft.); Mar-May; CO, native to Canada and e US, introduced further w to MT.

In Arizona, *Plantago rhodosperma* and *P. virginica* have overlapping geographical ranges (Fig. 5) and overlapping lengths of sepals, seeds, and bracts. In certain floras (Correll and Johnston 1970; Kearney and Peebles 1969; Gleason and Cronquist 1963), these same characters have been used to distinguish the two species. However, in the *Jepson Manual*, Dempster (1993) considers these two

taxa indistinguishable without fruiting specimens. We examined 51 specimens from the four major herbaria in Arizona, and agree with Dempster's findings. Seed color appears to be the only character that unmistakably distinguishes *P. rhodosperma* from *P. virginica*.

***Plantago tweedyi*** A. Gray (for F. Tweedy) --Perennials to 27 cm tall. LEAVES petiolate; blades lanceolate, 3-10 cm long, 1.0-2.5 cm wide, attenuate at base, acute at apex, sparsely villous to glabrate, distinctly 5-veined below, the margins with a few, remotely shallow teeth. PEDUNCLES 5-17 cm long, sparsely villous. SPIKES 2.5-10 cm long, interrupted near base; bracts ovate, 1.4-2.0 mm long, finely ciliate. FLOWERS perfect; sepals broadly elliptic, ca. 1.8-2.5 mm long, broadly scarious-margined; midvein thin; corolla lobes spreading or reflexed, triangular to ovate, 0.6-0.8 mm long, inconspicuous in fruit; stamens 4. CAPSULE breaking well below middle. SEEDS 4, ellipsoid, ca 1.5 mm long, ca 0.8 mm wide, brown, the inner surface rounded-convex, the outer surface slightly reticulate. --Moist meadows of Kaibab Plateau: Coconino Co.; 2600-2650 m (8600-8700 ft); Aug.; MT, s to CO, UT. Known only from two localities in AZ represented by four collections (*Ayers 1315*, ASC; *1316*, ASC; *Kearney 13739*, US; and *Galeano 1002*, ASC).

***Plantago virginica*** L. (of Virginia) Pale-seeded Plantain. --Annual herbs to 34.5 cm tall. LEAVES petiolate; blades lanceolate, 2.5-10 cm long, 0.8-2.7 cm wide, attenuate at base, acute at apex, sparsely villous, distinctly 3-veined, sometimes with 2-4 widely-spaced teeth. PEDUNCLES 1-20 cm long. SPIKES 1.5-17 cm long, sparsely to densely villous; bracts subulate to narrowly or broadly triangular, 2-4.8 mm long, narrowly scarious-margined at base, ciliate. FLOWERS more or less dioecious; sepals ovate, 2.5-3 mm long, broadly scarious-margined, acuminate at apex, obtuse to subacute at base, hirsute only on midrib; corolla lobes erect, enclosing the capsule (sometimes spreading in staminate flowers), lanceolate, 2-3 mm long; stamens 4. CAPSULE breaking at middle. SEEDS 2, ellipsoid, 0.9-3.0 mm long, 0.8-1.6 mm wide, light brown, the inner surface deeply concave, the outer surface furrowed. --Disturbed areas: Cochise, Gila, Maricopa, Pima, Santa Cruz cos.; 450-1300 m (1500-4200 ft.); Mar-Jul.; CO, native to Canada and e US.

*P. virginica* is easily confused with a closely related *P. rhodosperma*. A more detailed discussion appears following the *P. rhodosperma* species description.

***Plantago wrightiana*** Decne. (for C. Wright) --Annual herbs to 44 cm tall. LEAVES without distinct petiole; blades linear to linear-lanceolate, 5-22 cm long, 0.1-1 cm wide, acute to acuminate at apex, sparsely villous to glabrous, distinctly 3-veined below, the margins entire. PEDUNCLES 9-39 cm long, hirsute, with most hairs appressed-ascending. SPIKES 1-7 cm long, rarely interrupted at maturity; bracts broadly triangular, 2.8-3.5 mm long, about as long as sepals, scariously-margined at base, sparsely to densely villous, with tufts of white hairs in axils, with midvein long ciliate. FLOWERS perfect; sepals obovate, 3-4 mm long, narrowly scarious-margined, villous; corolla lobes spreading or reflexed, broadly ovate, 2.3-3.5 mm long; stamens 4. CAPSULE breaking at or slightly below middle. SEEDS 2, pyriform, ca. 3 mm long, ca. 1.5 mm wide, light to dark brown, the inner surface deeply concave, the rim thick, the outer surface alveolate. [*P. hookeriana* var. *nuda* (Gray) Poe]. --Moist soils, deserts and desert grasslands: Gila, Maricopa, Yavapai cos.; 1500-1700 m (5000-5500 ft); May to Sep.; e to TX.

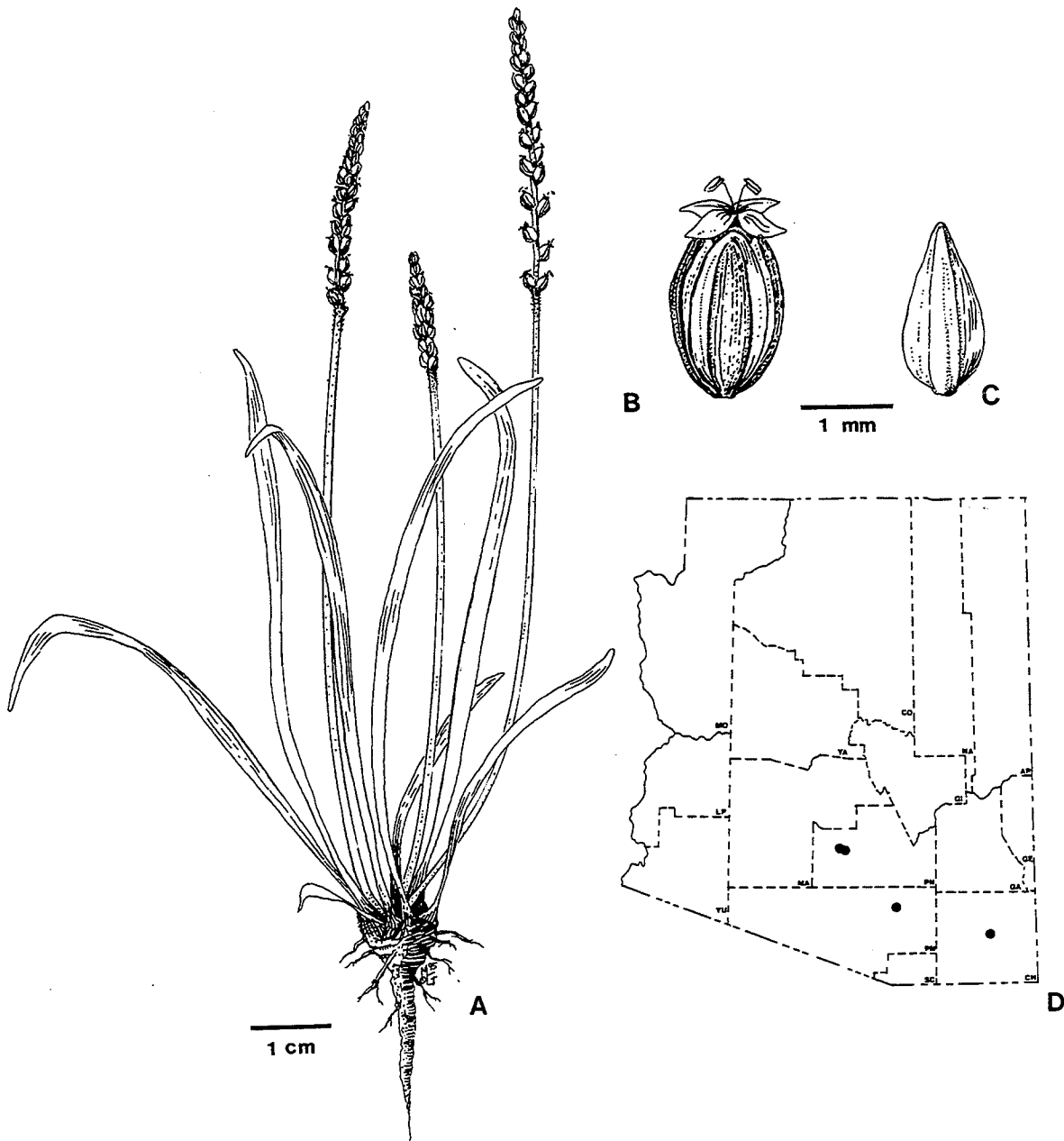
*Plantago wrightiana* may have expanded its range from Texas and New Mexico west to central Arizona associated with the influx of cattle into Arizona in the late 19<sup>th</sup> century. It is difficult to distinguish from the mostly higher elevation taxon, *P. argyrea*, and both may be better treated as conspecific with the widespread *P. patagonica* (see discussion under *P. argyrea*).

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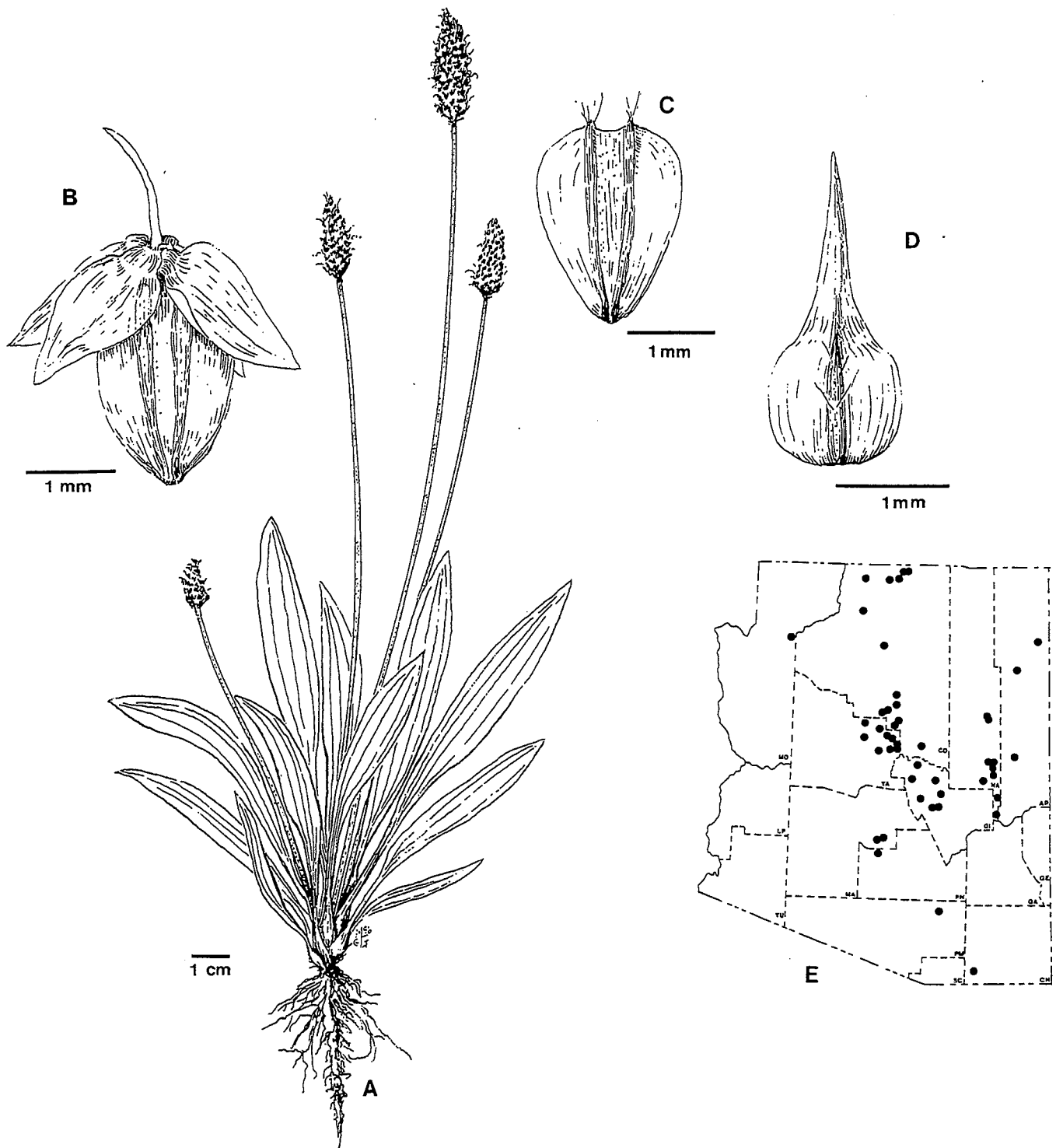
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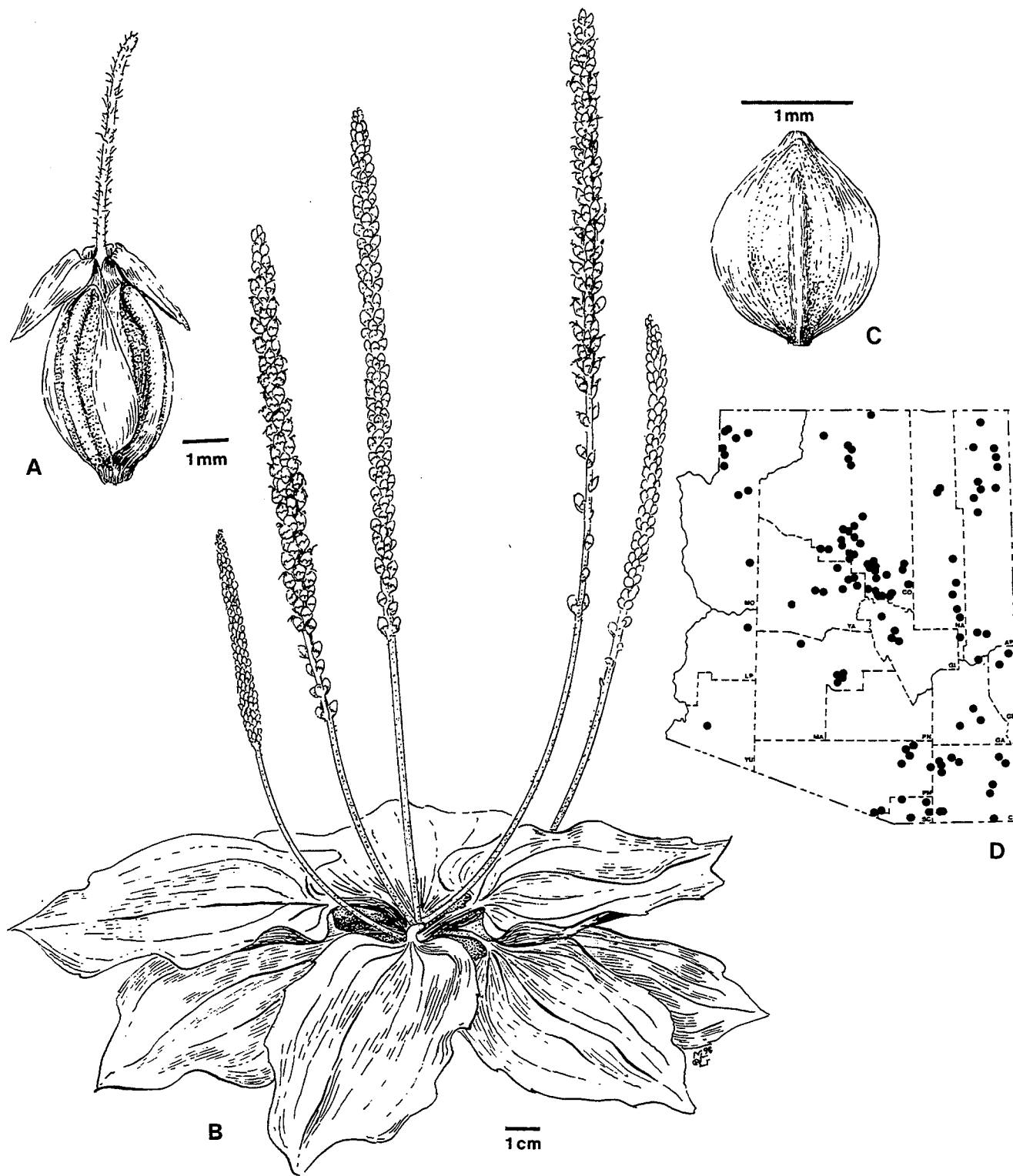


Plantaginaceae Fig. 1. *Plantago elongata* (Bird, 133426, ARIZ), A, habit. B, flower. C, bract. D, distribution map.

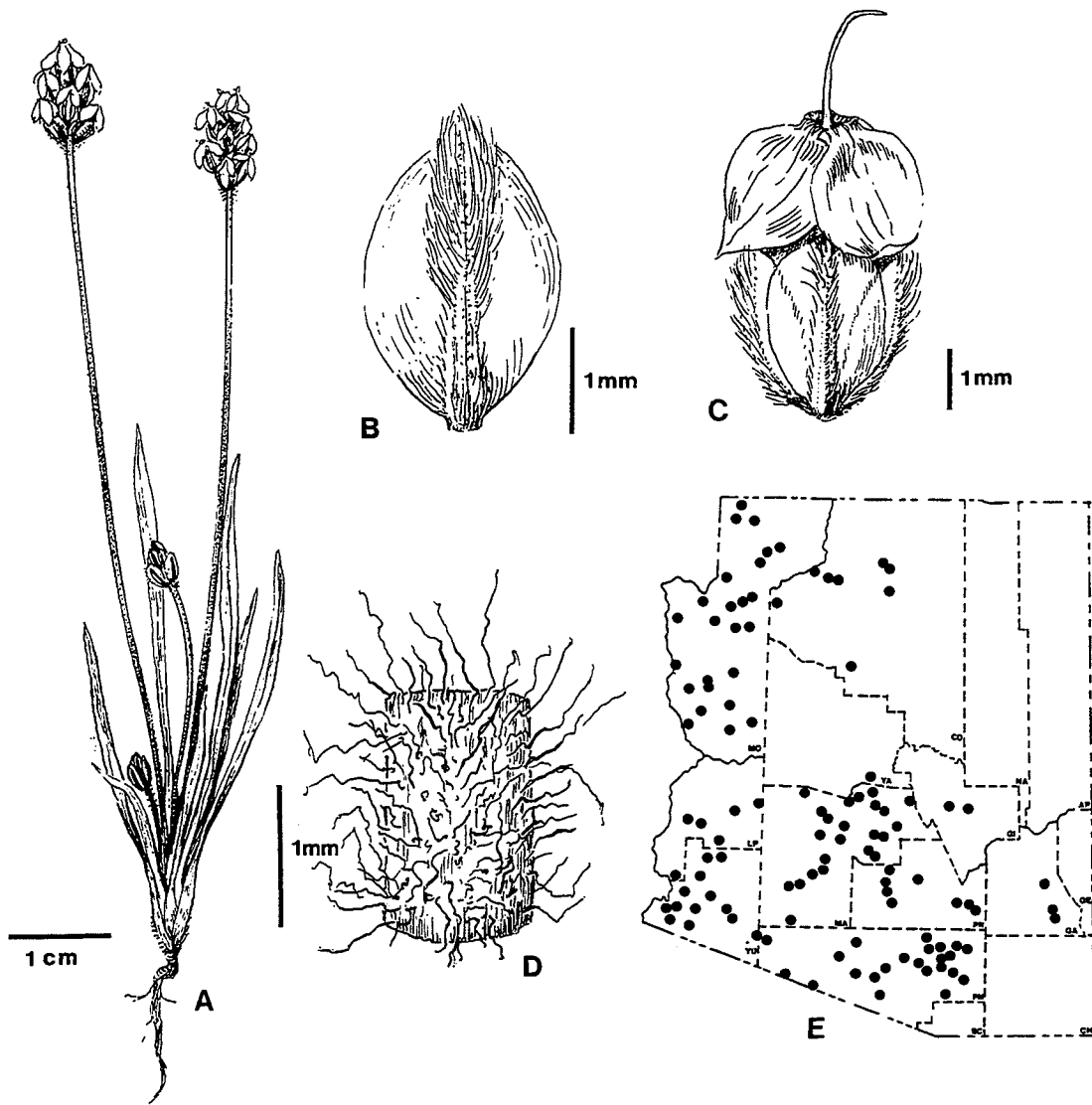




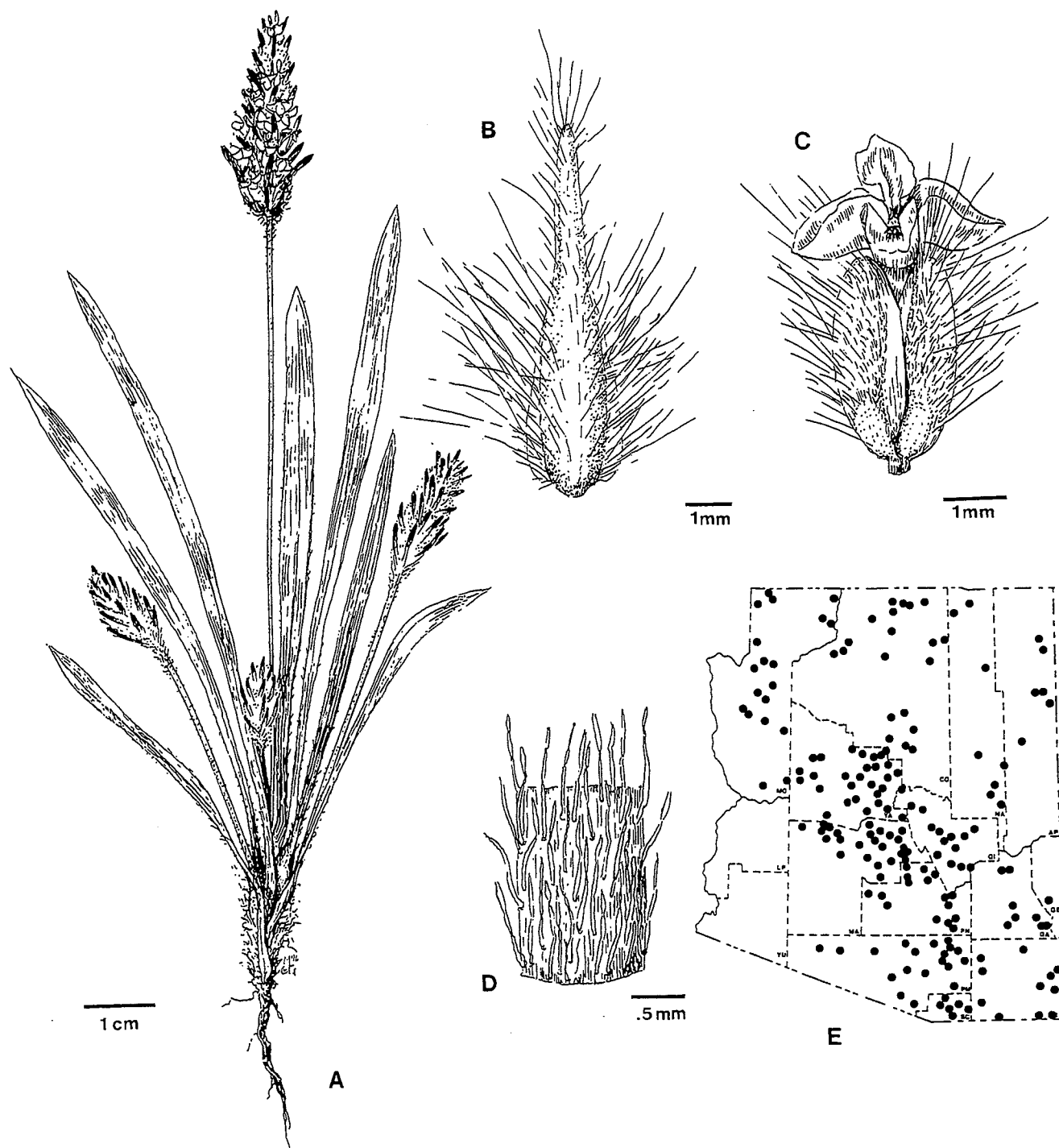
**Plantaginaceae** Fig. 2. *Plantago lanceolata* (Deaver, 2224, ASC), A, habit. B, flower. C, sepal. D, bract. E, distribution map.



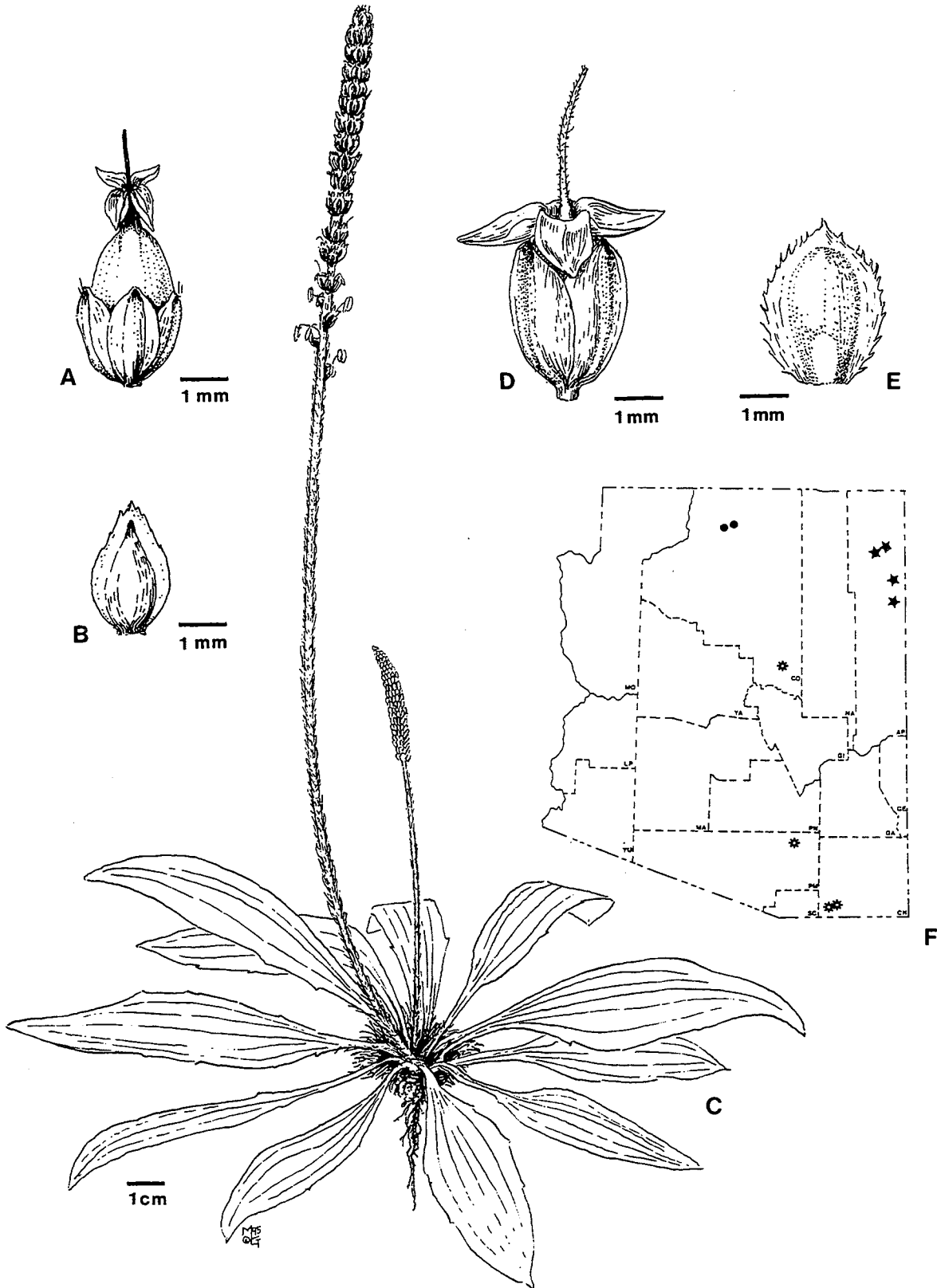
Plantaginaceae Fig. 3. *Plantago major* (Hunter, 051132, ASC), A, flower. B, habit. C, bract. D, distribution map.



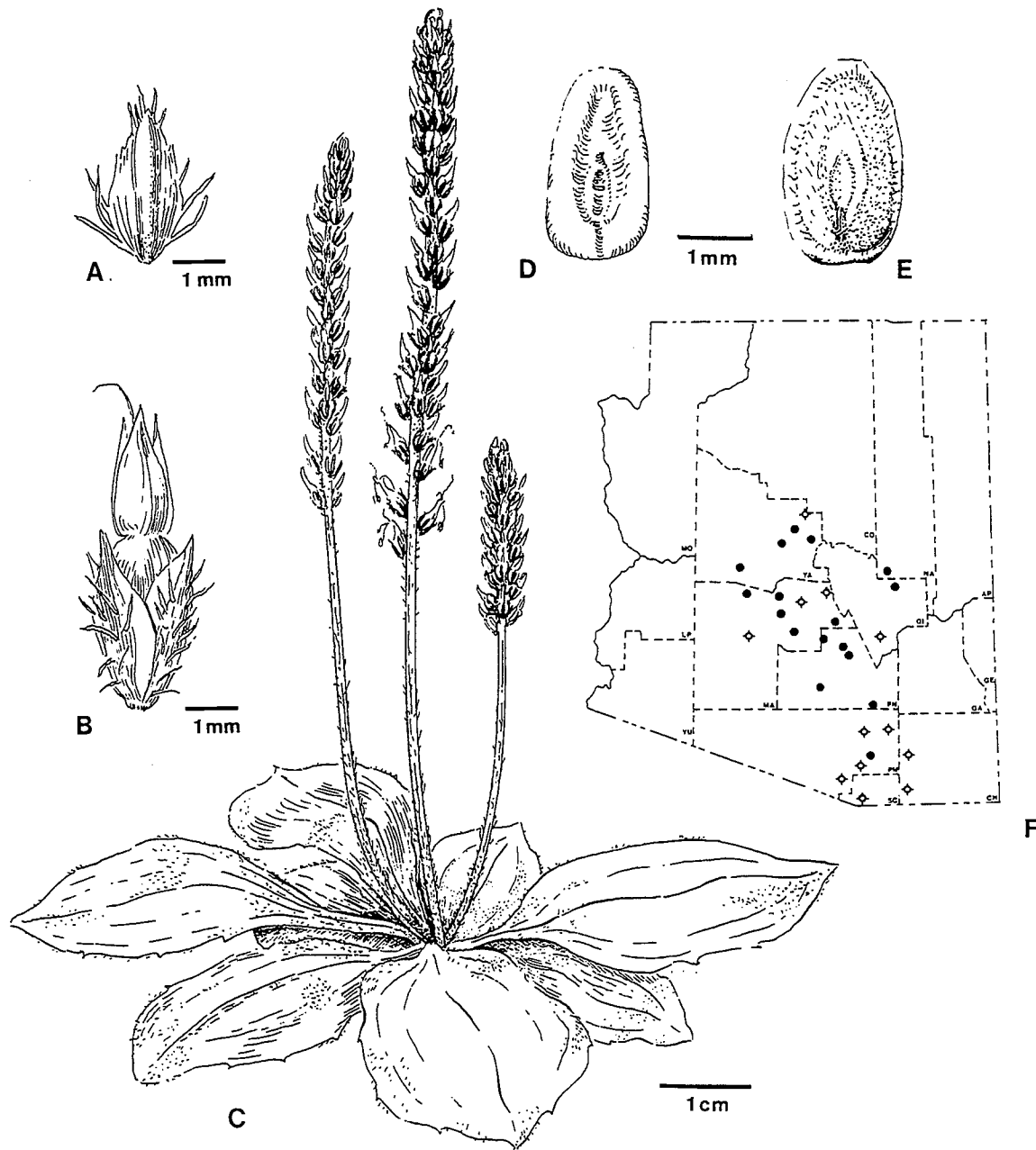
**Plantaginaceae** Fig. 4. *Plantago ovata* (Phillips, 054655, ASC), A, habit. B, bract. C, flower. D, upper scape pubescence. E, distribution map.



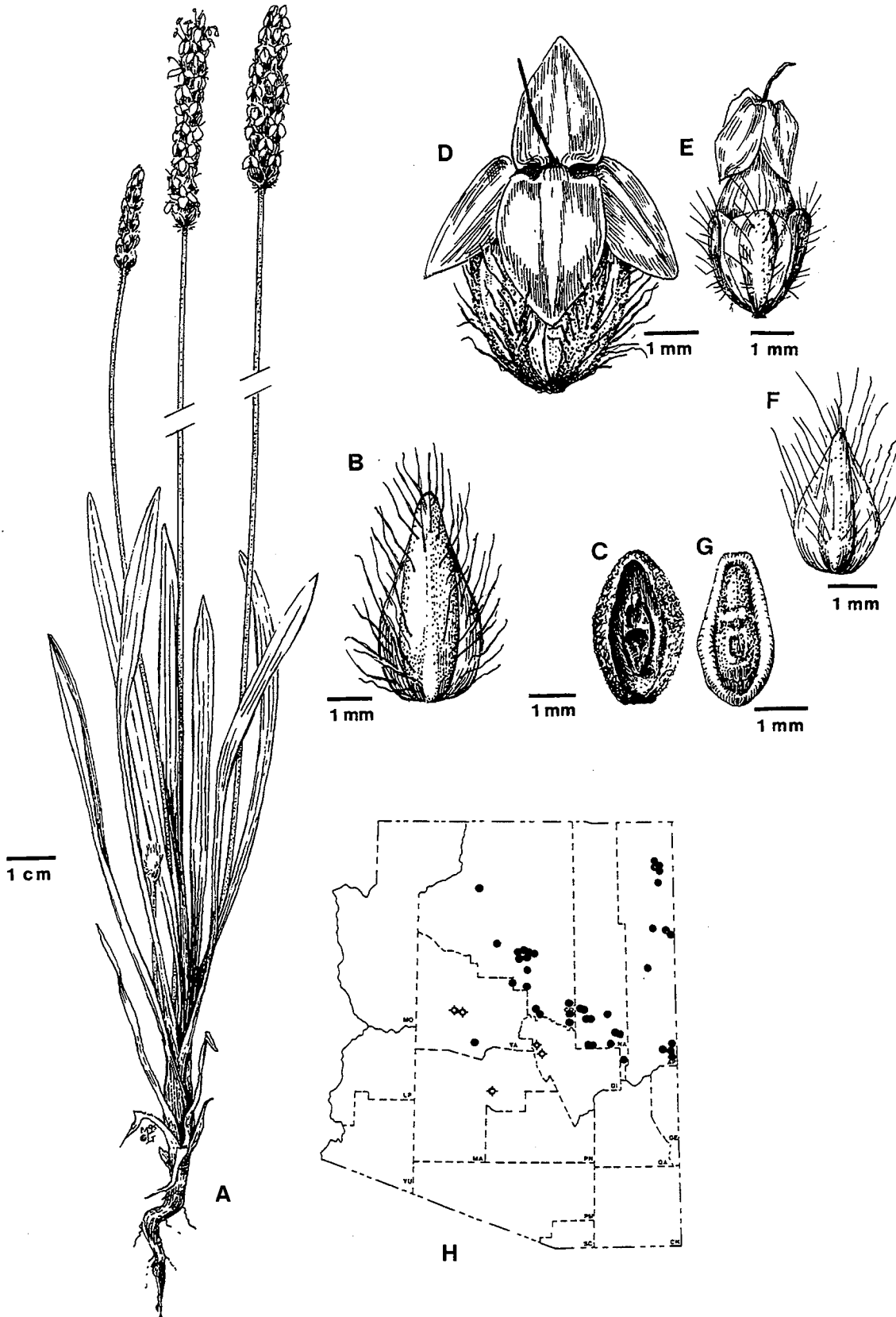
**Plantaginaceae** Fig. 5. *Plantago patagonica* (Scott, 925, ASC), A, habit. B, bract. C, flower. D, upper scape pubescence. E, distribution map.



**Plantaginaceae** Fig. 6. *Plantago tweedyi* (Galeano & McKee, 38299, ASC), A, flower. B, bract. C, habit. *P. eriopoda* (Mayes, 052381, ASC & Hand, 20214, ASC), D, flower. E, bract. F, distribution map with individual species shown as: • = *P. tweedyi*, ★ = *P. eriopoda*, ☆ = *P. australis* var. *hirtella*.



**Plantaginaceae** Fig. 7. *Plantago virginica* (Baker, 9021, ASC), A, bract. B, flower. C, habit. D, seed. *P. rhodosperma* (Dingemans, 044881, ASC), E, seed. F, distribution map with individual species shown as: • = *P. virginica*, ◇ = *P. rhodosperma*.



**Plantaginaceae** Fig. 8. *Plantago wrightiana* (Hurd, 28468, ASC), A, habit. B, bract. C, seed. D, flower. *P. argyrea* (Huisinga s.n., ASC), E, flower. F, bract. G, seed. H, distribution map with individual species shown as: • = *P. argyrea*, ◇ = *P. wrightiana*.