

Plantago lanceolata L. (Plantaginaceae)
English Plantain, Ribwort Plantain
and Plantago major L., Common Plantain

Description. Scapose, herbaceous perennials, from fibrous-rooted, subterranean caudices, sometimes densely woolly at the apex (base of leaves); scapes 1.5-6 dm tall, puberulent to strigose. Leaves in a basal rosette, 5-40 cm long, 0.5-4 cm wide, petiolate, blades narrowly elliptic to narrowly lanceolate, conspicuously 3-several veined, glabrous to appressed villous, margins entire to denticulate, apices acute, the bases tapered to the petiole. Inflorescences 0.5-8 cm long, a cylindrical, terminal spike. Flowers radial, sessile, each subtended by an ovate bract, bracts 2.5-4 mm long, ovate; calyx 2-3 mm long, lobes four, ovate, outer 2 fused, inner ones distinct; corolla lobes 2-2.5 mm long, spreading; stamens 4, exerted; ovary superior, locule 1, style 1, stigma slightly 2-lobed. Fruit a capsule, 2-4 mm long, subglobose, circumscissile; seeds 2, ca. 2 mm long, shiny, black. In California, flowering from March to June (Chater and Cartier 1976, Cronquist 1984, Dempster 1993, Gleason and Cronquist 1991, Holmgren 1984, McGregor and Brooks 1986, Webb et al. 1988, Welsh et al. 1987).

The related *P. major* (common plantain) differs primarily by having ovate to widely elliptic leaf blades with rounded to cordate bases and 6 to 30 seeds per fruit. It also lacks a distinct taproot (Chater and Cartier 1976, Gleason and Cronquist 1991, Holmgren 1984, McGregor and Brooks 1986).

Note: Both *P. lanceolata* and *P. major* show considerable ecotypic variation and occupy a diversity of habitats throughout Europe (Kuiper 1992, Lotz 1990, Lotz et al. 1990, Sagar and Harper 1960, 1964, van Dijk 1989, 1992, van Dijk and Kuiper 1992, Wolff 1991).

Geographic distribution. Natives of Eurasia, both English and common plantain have become naturalized throughout North America, South America, Australia, New Zealand, Hawaii, southeast Asia, and eastern Africa. (Arnold and de Wet 1993, Chapman 1991, Chua et al. 1994, Cronquist 1984, Pereira and Romaniuc Neto 1993, Sagar and Harper 1964, Wagner 1990, Webb et al. 1988). *Plantago lanceolata* is also known from Japan and Taiwan (Chen et al. 1996, Ohwi 1965).

Both species were reported as widely distributed and naturalized by the end of the 19th century (Brewer et al. 1876, Robbins 1940). Both species have been reported from Santa Catalina and Santa Cruz islands; *P. major* is also known from San Nicolas Island (Junak et al. 1997). Both species are widely distributed throughout California (Dempster 1993, Munz 1959).

Reproductive and vegetative biology: *Plantago lanceolata* is gynodioecious, self-incompatible, and both insect- and wind-pollinated (Allard 1965, Bos et al. 1986, Proctor et al. 1996, Ross 1973, van Damme and van Delden 1982, 1984). Hoverflies (Syrphidae) are apparently the most effective pollinators (Stelleman and Meeuse 1976, Stelleman 1978, 1981). *Plantago major*, in contrast, has bisexual flowers, is self-compatible, and largely self-pollinating (Proctor et al. 1996, Wolff et al. 1994).

Plantago species have mucilaginous seeds (Samuelsen et al. 1996), which, when wetted, contribute to low dispersability and enhanced establishment of the seedling phase (Harper 1977, Tonsor 1985). Seeds of both species have a dormancy requirement that generally is broken by either a brief light requirement or by a dry period (Pons 1992, Sagar and Harper 1960, 1964). Seeds of *Plantago lanceolata* are less sensitive to light than *P. major*, the former often germinating at greater soil depths than the latter (Pons and van der Toorn. 1988, van der Toorn and Pons 1988). The highest germination rates under field conditions are generally observed in open sites and in the fall or early winter in north temperate climates (Sagar and Harper 1964), although Popay et al. (1995) reported peak emergence during the New Zealand spring months. McRill and Sagar (1973) also reported increased germinability of *P. lanceolata* seeds after ingestion by earthworms. Palmblad (1968) reported relatively high survivorship among seed cohorts of both species, with mortality experienced at later stages of plant development and strongly related to plant density.

Under competitive conditions, *Plantago lanceolata* plants live from 1 to 3 years, but survivorship can exceed 4 years in undisturbed sites (Harper 1977). *Plantago lanceolata* also reproduces by lateral crown shoots, whereas reproduction by *P. major* is restricted entirely to seeds (Sagar and Harper 1964).

Plantago lanceolata produces iridoid glycosides, which are toxic or unpalatable to most insects, except arctiid and nymphalid butterflies and weevils (Bowers 1984, Bowers and Stamp 1992, Bowers et al. 1992b, Pereyra and Bowers 1988, Dethier 1993).

Ecological Distribution. Both species are reported from waste places, roadsides, gardens, lawns, and fallow fields (McGregor and Brooks 1986, Munz 1959, Sagar and Harper 1964, Welsh et al. 1987). *Plantago lanceolata* is one of the more common herbaceous perennials reported from northern coastal prairie in California (Heady et al. 1988).

Weed status. *Plantago lanceolata* and *P. major* are considered noxious weeds in agricultural or horticultural practice at a global level (Holm et al. 1977). However, it is considered as a potentially noxious weed by the State Dept. of Food and Agriculture (Anonymous 1996). Both are listed for the United States in Lorenzi and Jeffery (1987).

Microbial pathogens. Fungal diseases reported for *Plantago major* include *Erysiphe cichoracearum* and *Peronospora altal* (Drozdovskaia and Nikolaeva. 1984). *Plantago lanceolata* has been reported as a host to *Phomopsis subordinaria* (de Nooij 1988, de Nooij and van der Aa 1987, de Nooij and van Damme 1988a, 1988b, de Nooij et al. 1986), *Diaporthe adunca* (Linders and van der Aa 1995), and *Sclerotinia* (Saito 1997).

Insect pathogens. *Plantago lanceolata* and *P. major* have been reported as hosts to arctiid and nymphalid butterfly larvae (Dethier 1993, Bowers et al. 1992a, Ehrlich et al. 1975, Pereyra and Bowers 1988, Stamp and Bowers 1992). Weevils (*Trichosirocalus troglodytes*) are important herbivores of *Plantago lanceolata* and also may serve to transmit the fungus *Diaporthe* (Linders et al. 1995, 1996)

Herbicide control. A number of herbicides, including dicamba, clopyrid, chlorflurenol, trichlopyr, and 2,4-D, have been found effective on *P. major* in turf grass (Neal 1990).

Del Amor (1981) used drip irrigation as a method for applying triazine herbicides to control *Plantago* in citrus orchards.

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