

*Capsicum frutescens* L.  
SOLANACEAE

red pepper

Synonyms: *Capsicum fastigiatum* Blume  
*Capsicum annuum* L. var. *frutescens* (L.) Kuntze



**General Description.**—Red pepper, also known as bird pepper, chili pepper, Cayenne pepper, Guinea pepper, ají, and ají picante, is a short-lived evergreen shrub usually 1 to 1.5 m in height and 1 to 3 cm in basal stem diameter. The shrub is supported by a short to long taproot (depending on soil conditions), many spreading lateral roots, and moderately abundant fibrous roots. The stem and larger branches of mature plants are woody but moderately soft and weak. Bark of stems and older branches is light gray. The form is upright, the abundant branching is often dichotomous, and the branches and twigs are slender. The ovate to ovate-lanceolate leaves vary in size. The larger of them are 4 to 12 cm long and 1 to 4.5 cm broad. Greenish-white to yellowish-white flowers with blue, violet, or yellow anthers occur in groups of two or more at the nodes. The berries are red or red-orange at maturity, elongated with a pointed or rounded tip, 1.5 to 3.5 cm long and 0.5 to 1.2 cm

thick. The fruits are somewhat dry and contain few to many (depending on fruit size) cream to yellow lenticular seeds about 3 mm in diameter. The fruits, especially the seeds and placenta, have a biting, pungent taste. The species has  $2n = 24$  chromosomes (Bailey 1941, Bentley and Trimer 1880, Bosland and Votava 2000, Liogier 1995).

**Range.**—The original range of red pepper is unknown, but it is believed to have been domesticated in Central America, possibly Panama, thousands of years ago. It spread throughout the Neotropics before Columbus and has since become almost pan-tropically cultivated and naturalized (Bosland and Votava 2000). Unlike *C. annuum* L., which has many widely varying varieties, domesticated red pepper has relatively few varieties with a minimum of variation (Bentley and Trimer 1880) and is not greatly different from the wild type.

**Ecology.**—Red pepper grows on soils of all textures in a wide range of fertilities. Moist, well-drained conditions and loose structure is best for rapid growth. Soil pH's of 4.3 to 9.7 are tolerated (Center for New Crops and Plant Products 2002). The species is intolerant of shade: it will grow with broken overhead shade and moderate competition from grass and forbs, but fruits best in full sun. Red peppers can be cultivated in areas that receive from 30 to 430 cm of annual precipitation at elevations from near sea level to more than 2,000 m. The species is not frost tolerant and does not grow in temperatures below 7 °C (Center for New Crops and Plant Products 2002). Wild red pepper grows as individuals or groups in gardens, fields, vacant lots, river flood plains, abandoned fields, roadsides, and early secondary forest. Although damping-off fungi, various species of insects, and nematodes sometimes damage or kill individual plants, serious effects are rarely widespread.

**Reproduction.**—After about 3 months of growth, red pepper plants flower (Center for New Crops and Plant Products 2002) and fruit continuously as long as they live. The flowers are insect pollinated

(Bosland and Votava 2000). Production of fruits and seeds can be abundant. Fresh fruits from several plants in a stand in Puerto Rico averaged  $0.3668 \pm 0.0242$  g/fruit. The variability was high (CV = 39.5 percent). They ranged from 2 to 35 seeds/fruit and averaged  $16.6 \pm 2.9$  seeds/fruit. Air-dried seeds averaged  $0.0041 \pm 0.0001$  g/seed or 244,000 seeds/kg. Placed in moist potting mix, 72 percent of the seeds germinated between 13 and 34 days after sowing. Germination is epigeous. The seeds can be safely stored under refrigeration after air-drying and need no treatment before planting. The seeds are dispersed by birds that eat the fruits and are immune to the pungent chemicals they contain. Young plants coppice when cut or broken. Rooting of cuttings and tissues has been demonstrated for *Capsicum* (Bosland and Votava 2000).

**Growth and Management.**—Under continually favorable conditions, red peppers live about 2 years. They grow rapidly during the first year, then much more slowly, and finally dwindle and die. Red peppers grown commercially are managed as annuals, much as other *Capsicum* peppers but for a longer season. Plants that arise spontaneously in gardens and vacant land are usually allowed to grow for occasional future harvest.

**Benefits.**—Red pepper is used and loved the world over as a condiment, added to food fresh, dried, refined, and ground (for Cayenne pepper and curry), and as the principal or incidental ingredient in sauces. The source of the popular biting sensation are the capsaicinoids, principally capsaicin, which ranges from 600 to 13,000 ppm in the fruits (Center for New Crops and Plant Products. 2002). The fruits are an excellent source of vitamins A and C (Bosland and Botava 2000). A few thousand hectares are grown commercially, and probably even more are grown in gardens or harvested from the wild in rural areas of the tropics. Coatings and powders are used with varying degrees of success to deter browsing animals and insects, and break children of thumb sucking and nail biting. Pepper spray, whose active ingredient is capsaicin, is used widely for personal protection, law enforcement, and defense. Acetone and petroleum ether extracts caused complete mortality of rice weevil (*Sitophilus oryzae*) in 15 days. Fruit powder was much less effective (El-Lakwah and others 1997). Red pepper has many medicinal applications. Some of the most widely used and reliable are as a salve to relieve muscle, joint, and toothache pain, to treat cough, asthma, and sore throat, as a stimulant, and

to treat stomach ache, seasickness, and flatulence. Anciently, it was even used as an instrument of torture (Bentley and Trimer 1880, Bosland and Votava 2000, Center for New Crops and Plant Products 2002, Gardenguides.com 2002).

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