
Leguminosae

**Martyn Rix** | **Mark Nesbitt** | **Christabel King**

Royal Botanic Gardens, Kew, Richmond, UK

**Correspondence**
Martyn Rix, Royal Botanic Gardens, Kew, Richmond, UK.
Email: martynrix@aol.com

**Summary**
A wild relative of the garden pea, formerly called *Pisum sativum* L., but now included in the genus *Lathyrus*, is illustrated, and its relationship to cultivated peas is discussed. Recent studies of the DNA of *Pisum* and *Lathyrus* have led to the change of name for this common species.

It is generally confusing to non-specialists (and most specialists) when a familiar Linnean species undergoes a sudden name change, and even more remarkable when the ‘new’ name turns out to have been published in the late 18th century, not long after Linnaeus’ first edition of *Species Plantarum*. The author of *Lathyrus oleraceus* was Jean Baptiste Antoine Pierre de Monnet de Lamarck (1744–1829). Lamarck’s career was remarkable even for those unsettled times, and he was well-known, and sometimes derided, for his belief in the inheritance of acquired characters. He was however an early proponent of evolution and adaptation of organisms to the environment which he saw in his studies of molluscs as well as of plants. Lamarck’s *Flore Française ou description succincte de toutes les plantes qui croissent naturellement en France*, was arranged like an analytical key, to help identification of the species. Most of the names followed Linnaeus, but in the case of the garden pea, he quoted *Pisum sativum* L. as a synonym of *Lathyrus oleraceus*, and under it he described the wild variety, *Pisum arvense* L., recognised by Tournefort, writing that it appeared to be naturalised in Alsace. Therefore *Pisum sativum* L. Sp. Pl.: 727 (1753) becomes *Lathyrus oleraceus* Lam., Fl. Franç. 2: 580 (1779) (Kenicer & Parsons, 2021).

The second commonly recognised species of *Pisum*, *P. fulvum* Sibth. & Sm., a very slender plant with orange-yellow flowers, is now *Lathyrus fulvus* (Sm.) Kosterin.

Schaefer et al. (2012) studied the DNA of *Lathyrus* and related genera and concluded that *Lathyrus* was only monophyletic if it included *Pisum* and *Vavilovia*. This change from *Pisum sativum* to *Lathyrus oleraceus* has been accepted, somewhat reluctantly, in botanical circles, less so in horticulture and agronomy. Schaefer et al. also suggest that the genus *Lathyrus* evolved in the eastern Mediterranean region and spread from there to the Americas (directly and via Asia) and to Africa. In the tree shown there was no definite grouping of the different subspecies described within *P. sativum*.

Wild forms of pea, as illustrated in plate 1063 and in Figures 1–4 are not uncommon around the Mediterranean and are recorded as being widespread in Morocco (Valdés et al., 2002) as well as in...
Spain and Portugal (Romero Zarco, 2002). They extend to the eastern Mediterranean in Turkey, Israel and Egypt, and as far east as Georgia, Armenia and western Iran (Kosterin et al., 2020; Meikle, 1977). They have usually been named *Pisum sativum* subsp. *elatius* (M. Bieb.) Aschers. & Graebn., but are now *Lathyrus oleraceus* Lam. subsp. *biflorus* (Raf.) H. Schaefl., Coulot & Rabaute.

Ancient pea cultivars are also found wild in Ethiopia. Trnéný et al. (2018) compared the DNA of 134 accessions of wild ‘elatius’, 20 of *L. fulvus* and compared them with domesticated peas (64 races) and the Ethiopian cultivated pea ‘abyssinicum’ (10 accessions). They concluded that the domesticated peas and the Ethiopian varieties were derived from different gene pools of ‘elatius’. Further genetic analysis also points to an independent domestication of Ethiopian pea (Hellwig et al., 2022).

Numerous other variants have been described as subspecies or varieties of *Pisum sativum*, but the recent account in *Kew*’s POWO rejects all the 221 names that are listed under the species.

The variants found wild in Turkey are summarised in *Flora of Turkey*, vol. 3 (Davis, 1970), where *Pisum sativum* is divided into two subspecies, subsp. *sativum* with smooth or wrinkled seeds, peduncles to twice as long as the stipules, flowers white or bicoloured and legume width 12–17 mm (to 30 mm wide in cultivars), and subsp. *elatius* (Bieb.) Aschers. & Graebn. with papillose seeds, peduncles to 4 times as long as the stipules, bicoloured flowers and legumes 7–12 mm wide. Subsp. *sativum* is further divided into var. *sativum* with white flowers which includes most of the garden peas, and var. *arvensis*, with bicoloured flowers which includes fodder peas and some cultivated peas but is also found apparently wild; subsp. *elatius* is divided into var. *elatius* with flowers 20–30 mm across, var. *pumilio* Meikle (= *P. humile* Boiss. & Noë) a generally smaller plant with flowers 15–18 mm across and var. *brevipedunculatum* Davis & Meikle with peduncles usually shorter than the stipules and standard around 20 mm wide; the last two varieties usually have only one or two pairs of leaflets; all three are wild and not derived from recent cultivars.

Most records of wild ‘elatius’, (now *Lathyrus oleraceus* subsp. *biflorus*), have been in disturbed ground on road sides, but a recent population in western Turkey (northern Antalya vilayet) was in an old graveyard, accompanied by a range of other annual Leguminosae. A more compact plant was found in a roadside ditch near Akseki (Figure 3). The original habitat of *Lathyrus oleraceus* was probably in open *Quercus* forest, such as occurred in the hills around the fertile crescent, growing particularly in disturbed areas and along intermittent streams.

**HISTORY OF CULTIVATION**

Peas were until recently considered one of the first wild plants to be brought into cultivation in southwest Asia, as part of a group of Neolithic founder crops including wheat and barley (Zohary & Hopf, 1988). However, a more recent analysis of evidence from 135 archaeological sites in and adjoining southwest Asia has found that it is difficult to identify a uniform group of founder crops. Wild peas, identified by their papillose seed coat, occur in a small number of pre-agricultural sites, mainly near the Syrian and Turkish Euphrates river valley. The earliest definite evidence for domesticated peas, with a smooth seed coat, comes from sites distributed widely in the region, including Jericho in the Levant, and in Cyprus, dating to about 10,500–10,000 years ago. It is not until the Pottery Neolithic period (8500–6500 years ago) that peas become a widespread crop. Even then, the presence of both wild and domesticated seed types in pottery Neolithic levels at Çatalhöyük in Turkey suggests that the pea, like many cereals, may have a complicated and protracted domestication history (Arranz-Otaegui & Roe, 2023).

Zohary and Hopf (1988) recognise the two main races of wild pea, *elatius* from maquis-type vegetation, mainly coastal and extending to the western Mediterranean and Black Sea and *humile* in more inland, steppe-like habitats from Egypt and the southern Zagros, extending across Anatolia. They consider that the *humile* form is the most likely progenitor of cultivated peas. A recent genetic study found *elatius* to be the most closely related to domesticated peas, but the authors caution that ‘the precise origin of the closest extant progenitor(s) of *P. sativum* subsp. *sativum* remains uncertain’ (Hellwig et al., 2022). It is likely that more numerous and better-characterised collections of wild pea from southwest Asia are required to clarify the genetics of its domestication.
PLATE 1063  Lathyrus oleraceus subsp. biflorus  CHRISTABEL KING
CULTIVATION

The plants illustrated here are from northern Greece (Figure 1), the Nebrodi in Sicily (Figure 2), central Turkey (Figure 3) and the plant in the painting and in Figure 4 was grown from seeds collected in southern Turkey west of Antalya below Termessos. Subsp. elatius is recognised by its larger leaves and flowers, but shows primitive characters in its small, hard, papillose seeds and dehiscing pod.

FIGURE 1  Lathyrus oleraceus subsp. biflorus in northwestern Greece, east of Mount Pelion. Photograph: Martyn Rix.
The illustration in Plate 1063 and in Figures 3 and 4, has been made from plants growing in an unheated greenhouse in Devon. It has persisted for many years in an area where winter-growing bulbs are cultivated. Watering begins in October and ceases in May, giving the plants a more or less Mediterranean climate.

The early flowers open normally, but as noted by Kosterin et al. (2020), the later flowers are usually cleistogamous. A few self-sown seeds of the pea germinate each year in late winter in a bed of sand and begin to flower in April. We have not needed to sow the seeds by hand but have relied on seed scattered when the pods dehisce. Chipping of the hard seed coat might hasten germination.
In cultivation the pods suffer from callus-like eruptions as they mature, but the viability of the ripe seeds appears to be unaffected; these may be a response to pea weevil (*Bruchus pisorum* L.) attack. (Doss et al., 1995).

Mice have sometimes eaten most of the unripe pods, so need to be trapped if any ripe seeds are to be formed.

**NOMENCLATURE AND DESCRIPTION**


**Description**


Winter-growing annual herb. Stems creeping or sprawling, simple or branched, to 2 m, terete. Stipules large, glaucous-green splashed with white, to 80 mm long, 38 mm wide, cordate or semi-amplexicaul with margin dentate near the base. Leaflets in 1, 2 or 3 pairs, to 6 cm long, 3.5 cm wide, oblong, with few, shallow teeth, sometimes splashed with white, and with a red spot at the base when young. Tendrils repeatedly branched. Peduncles 1 or 2-flowered, 2–4 times as long as the stipules. Flowers bicoloured; calyx 14 mm, deeply 5-toothed, the upper pair larger than the other 3: standard lilac veined with blue, paler and gibbous at the base, obcordate, apex emarginate, 4.3 cm wide, 2.5 cm long; wings dark purple, limb suborbicular, to 16 mm long and 15 mm wide; keel greenish, strongly curved, around 12 mm long. Legume linear, 3–8 cm long, dehiscing when ripe. Seeds globose 5–6 mm in diameter, dark brown, not wrinkled, minutely papillose.

**Cytology**

2n = 14 for all forms of *L. oleraceus*.

**Distribution**

Around the Mediterranean from Portugal and Spain and Morocco to Jordan and northern Greece and along the Black Sea to Georgia and in western Iran. Only var. *pumilio* is reported from Iraq (Townsend, 1974).
Habitat and ecology

In waste rocky places, among ruins and on roadsides, generally near the coast, below 800 m, but reaching 1700 m in northern Adana, Turkey.

Phenology

Flowering in April and May.

Etymology

*Lathyrus* from the Greek, the name of a type of vetch or pea; *oleraceus* from the Latin *olis*, a garden.

REFERENCES


