Penstemon

See text.

Penstemon /■p■nst■m■n/,[1] the beardtongues, is a large genus of roughly 280 species of flowering plants native mostly to the Nearctic, but with a few species also found in the North American portion of the Neotropics.[2] It is the largest genus of flowering plants endemic to North America.[3][4] As well as being the scientific name, penstemon is also widely used as a common name for all Penstemon species alongside beardtongues.

Formerly placed in the family Scrophulariaceae by the Cronquist system, new genetic research has placed it in the vastly expanded family Plantaginaceae.[5][6] The total number of species is uncertain due to on going research into if some of the named species are actually subspecies or misidentifications of already identified species.[7]

They have opposite leaves,[8] partly tube-shaped, and two-lipped flowers and seed capsules. The most distinctive feature of the genus is the prominent staminode, an infertile stamen.[8] The staminode takes a variety of forms in the different species; while it is typically a long straight filament extending to the mouth of the corolla, some are longer and extremely hairy, giving the general appearance of an open mouth with a fuzzy tongue protruding and inspiring the common name of "beardtongue".[8]

Most penstemons form a durable woody stem (a caudex) and have persistent basal leaves, but some are fully deciduous perennials, the remainder being shrubs or subshrubs.[9]: 7 Heights can range from 10 cm to as much as 3 meters. Along with their variable growth forms the penstemons have highly variable leaves, often with different leaf shapes on different parts of the same plant. Some species have highly reduced needle like leaves and others broad and rounded leaves, with their texture also running the range of hairy to smooth/glaborous.[9]: 11 [10]: 38 In the view of penstemon expert Robert Nold the defining evolutionary characteristic of the genus is adaptation to drought, as demonstrated by their numbers and diversity in the interior west of North America.[10]: 53–54

The one Asiatic species previously treated in Penstemon is now placed in a separate genus Pennellianthus. This leaves Penstemon a mostly Nearctic genus, with a few neotropical species.[10]: 19 Although widespread across North America, and found in habitats ranging from open desert to moist forests, and up to the alpine zone,[9]: 7 they are not typically common within their range.

John Mitchell published the first scientific description in 1748; although he only named it as Penstemon, researchers David Way, Peter James, and Robert Nold identify it as P. laevigatus.[11][10]: 58–59 Linnaeus then included it in his 1753 publication, as Chelone pentstemon, altering the spelling to better correspond to the notion that the name referred to the unusual fifth stamen (Greek "penta-", five). The botanist Casimir Schmidel published a description of the species in 1763, and for this reason he is given priority in botanical publication.[10]: 58–59 Mitchell's work was reprinted in 1769, continuing with his original spelling, and this was ultimately accepted as the official form, although Pentstemon continued in use into the 20th century.[12][11]

Although several more species were found in the early 18th century, they continued to be

classified in Chelone until 1828 in some publications. The period of 1810 to 1850 increased the number of known species from 4 to 63, as expeditions traveled through Mexico and the western United States, followed by another 100 up to 1900, although not all these species remained classified as Penstemon.[11]

The American members of the genus were extensively revised by David D. Keck between 1932 and 1957[12] and Richard Straw did similar work on the Mexican species slightly later.[11] In 1960 the important book Penstemon Taxonomy was published by American Penstemon Society president Ralph Bennett with the advice of Keck. This book was updated and republished with the Robin Lodewick in 1980 and continued to be an important source of information about the genus through the year 2000.[11]

Fieldwork in the remote parts of the Great Basin during the 20th century brought the total number of species known to over 270, though some of this total may be errors or now extinct species.[11]

Penstemon has been subdivided into six subgenera by using anther dehiscence patterns. Subgenera Cryptostemon and Dissecti each contain one species. As traditionally defined subgenus Penstemon contains about 128 species, subgenus Habroanthus contains about 50, subgenus Saccanthera has about 28 species, and subgenus Dasanthera contains nine. Genetic analysis by Andrea D Wolfe et al. indicates that while some of the previously identified subgenera are natural groupings, many are hopelessly confused.[13]

Although penstemons are among the most attractive native flowers of North America, Europe has traditionally been far more active in their hybridization with hundreds of hybrids developed since the early 19th century. The first offer of seeds for sale as by John Fraser in 1813.[11] The earliest development is somewhat shrouded in mystery; for instance Flanagan & Nutting's 1835 catalog mentions a 'Penstemon Hybridum' but does not describe it.[14]

By 1860, a half-dozen French growers are known to have developed hybrids, most notably Victor Lemoine, while in 1857 the German Wilhelm Pfitzer listed 24 varieties. In 1861 the British Royal Horticultural Society held trials in which 78 varieties were entered. The Scottish firm of John Forbes first offered penstemons in 1870, eventually becoming the biggest grower in the world; in 1884 their catalog listed 180 varieties. By 1900 Forbes had offered 550 varieties, while Lemoine had developed nearly 470 by the time of his death in 1911. Few of these have survived to the present day.[14]

A number of different species have been used in the hybridization process, notably P. cobaea and P. hartwegii.[14]

The American Penstemon Society was formed in 1946 to promote both horticultural and botanical interest, and is now the International Cultivar Registration Authority for the genus.[11]

In North America, penstemons are often used in xeriscape landscaping, as many are native to desert or alpine regions and thus quite hardy.[2] One of the largest collections of penstemons in North America is found at The Arboretum at Flagstaff, Arizona, which hosts a Penstemon Festival each summer.[15]

The following species and cultivars have gained the Royal Horticultural Society's Award of Garden Merit:-[16]

Others include 'Dark Towers', developed by Dale Lindgren at the University of Nebraska.[39]

These 269 species are valid according to both World Flora Online (WFO) and Plants of the World Online (POWO) as of 2023.[40][41]

These five naturally occurring hybrids are valid according to WFO and POWO.[40][41]

These 35 species and two natural hybrids are of uncertain validity. Twenty-seven are recognized as valid by either WFO or POWO, but not both.[40][41] The USDA Natural Resources Conservation Service PLANTS database (PLANTS) uses eight species not recognized by either WFO or POWO.[44]