Cuban royal palm, Description

Short Description

Roystonea regia, commonly known as the **Cuban royal palm**, **Florida royal palm**, or simply the **royal palm** is a species of palm which is native to southern Florida, Mexico and parts of Central America and the Caribbean. A large and attractive palm, it has been planted throughout the tropics and subtropics as an ornamental tree. Although it is sometimes called *R. elata*, the conserved name *R. regia* is now the correct name for the species. Populations in Cuba and Florida were long seen as separate species, but are now considered to belong to a single species.

Best known as an ornamental, *R. regia* is also used as a source of thatch, construction timber, and in some forms of so-called traditional medicine, although there is currently no valid scientific evidence to support the efficacy or use of any palm species for medicinal purposes. The fruit is eaten by birds and bats (which disperse the seeds) and fed to livestock. Its flowers are visited by birds and bats, and it serves as a roosting site and food source for a variety of animals. *Roystonea regia* is the national tree of Cuba,[2] and has a religious role both in Santería and Christianity, where it is used in Palm .

Taxonomy

Roystonea is placed in the subfamily Arecoideae and the tribe Roystoneae.[9] The placement *Roystonea* within the Arecoideae is uncertain; a phylogeny based on plastid DNA failed to resolve the position of the genus within the Arecoideae.[10] As of 2008, there appear to be no molecular phylogenetic studies of *Roystonea*[9] and the relationship between *R. regia* and the rest of the genus is uncertain.

The species was first described by American naturalist William Bartram in 1791 as *Palma elata* based on trees growing in central Florida.[5] In 1816 German botanist Carl Sigismund Kunth described the species *Oreodoxa regia*[1] based on collections made by Alexander von Humboldt and Aimé Bonpland in Cuba.[11] In 1825 German botanist Curt Polycarp Joachim Sprengel moved it to the genus *Oenocarpus* and renamed it *O. regius*.[1]

The genus *Oreodoxa* was proposed by German botanist Carl Ludwig Willdenow in 1807[12] and applied by him to two species, *O. acuminata* (now known as *Prestoea acuminata*) and *O. praemorsa* (now *Wettinia praemorsa*). Although these species were transferred to other genera, the genus *Oreodoxa* continued to be applied to a variety of superficially similar species which were not, in fact, closely related.[13] To address this problem, American botanist Orator F. Cook created the genus *Roystonea*,[14] which he named in honour of American general Roy Stone,[13] and renamed Kunth's species *Roystonea regia*.[14]

Botanical garden Aswan, Egypt

Stem base of two individuals in Kolkata showing fibrous roots typical of monocots.

Cook considered Floridian populations to be distinct from both the Cuba *R. regia* and the Puerto Rican *R. borinquena*, and he placed them in a new species, *R. floridana*,[13] which is now considered a synonym of *R. regia*.[1] In 1906 Charles Henry Wright described two new species based on collections from Georgetown, British Guiana (now Guyana) which he placed in the genus *Euterpe* — *E. jenmanii* and *E. ventricosa*.[15] Both species are now considered synonyms of *R. regia*.[1] The name *R. regia* var. *hondurensis* was applied by Paul H. Allen to Central American

populations of the species. However, Scott Zona determined that they did not differ enough from Cuban populations to be considered a separate variety.[3]

Based on the rules of botanical nomenclature, the oldest properly published name for a species has priority over newer names. Bartram applied the Linnaean binomial *Palma elata* to a "large, solitary palm with an ashen white trunk topped by a green leaf sheath [the crownshaft] and pinnate leaves"[16] growing in central Florida. While no type collection is known, there are no other native palms that would fit Bartram's description.[16] In 1946 Francis Harper pointed out that Bartram's name was valid and proposed a new combination, *Roystonea elata*.Liberty Hyde Bailey's use of the name in his 1949 revision of the genus, established its usage.[16]

Harper's new combination immediately supplanted Cook's *R. floridana*, but there was disagreement as to whether Cuban and Floridian populations represented a single species or two species. Zona's revision of the genus concluded that they both belonged to the same species. According to the rules of botanical nomenclature, the correct name of the species should have been *Roystonea elata*. Zona pointed out, however, that the name *R. regia* (or *Oreodoxa regia*) has a history of use in horticulture that dated from at least 1838, and that the species had been propagated around the world under that name. *Roystonea elata*, on the other hand, had only been used since 1949, and was used much less widely. On that basis, Zona proposed that the name *Roystonea regia* should be conserved.[16]

Reproduction and growth

A pair of trees in Kolkata. Alongside on the ground is a freshly shed leaf with the sheath still green.

Roystonea regia produces unisexual flowers that are pollinated by animals.[3] European honey bees and bats are reported pollinators.[3][18] Seeds are dispersed by birds and bats that feed upon the fruit.[3]

Seed germination is adjacent ligular—during germination, as the cotyledon expands it only pushes a portion of the embryo out of the seed.[3] As a result, the seedling develops adjacent to the seed. The embryo forms a ligule, and the plumule protrudes from this.[19] Seedlings in cultivation are reported to begin producing a stem two years after germination, at the point where they produce their thirteenth leaf.[3] Growth rates of seedlings averaged 4.2 cm (1.7 in) per year in Florida.[20]

Distribution

Roystonea regia is found in central and southern Florida, Mexico (Veracruz, Campeche, Quintana Roo, Yucatán), Central America, Cuba, Puerto Rico, the Cayman Islands, Hispaniola, the Lesser Antilles and The Bahamas.[1][21] William Bartram described the species from Lake Dexter, along the St. Johns River in the area of modern Lake and Volusia Counties in central Florida, an area well north of its modern range. [3][22]

Today Roystonea is cultivated in tropical and subtropical climates in the United States, Australia, Brazil, and parts of southern Asia as a landscape palm. In the United States it grows mostly in central and southern Florida and in some areas of southern California. [23]

Botanical garden Aswan, Egypt

Ecology

The leaves of *Roystonea regia* are used as roosting sites by *Eumops floridanus*, the Florida bonneted bat,[24] and is used as a retreat for Cuban tree frogs (*Osteopilus septentriolalis*), a non-native species, in Florida.[25] InPanama (where *R. regia* is introduced), its trunks are used as nesting sites by yellow-crowned parrots (*Amazona ochrocephala panamensis*).[26] The flowers of *R. regia* are visited by pollen-collecting bees and are considered a good source of nectar. Its pollen was also found in the stomachs of *Phyllonycteris poeyi*, the Cuban flower bat (a pollen-feeder) and *Monophyllus redmani*, Leach's single leaf bat (a nectar-feeder). *Artibeus jamaicensis*, theJamaican fruit bat, and *Myiozetetes similis*, the social flycatcher, feed on the fruit.[3]

Roystonea regia is the host plant for the royal palm bug, *Xylastodoris luteolus*, in Florida.[27] It also serves as a larval host plant for the butterflies *Pyrrhocalles antiqua orientis* and *Asbolis capucinus* in Cuba,[28] and *Brassolis astyra* and *B. sophorae* in Brazil.[29] It is susceptible to bud rot caused by the oomycete *Phytophthora palmivora*[30] and by the fungus *Thielaviopsis paradoxa*.[31]

The species is considered an invasive species in secondary forest in Panama.[32]

Uses

Roystonea regia has been planted throughout the tropics and subtropics as an ornamental.[16] The seed is used as a source of oil and for livestock feed. Leaves are used for thatching and the wood for construction.[4] The roots are used as a diuretic,[33] and for that reason they are added to *tifey*, a Haitian drink, by Cubans of Haitian origin.[34] They are also used as a treatment for diabetes.[33]

Fibres extracted from the leaf sheath of *R. regia* have been found to be comparable with sisal and banana fibres, but lower in density, making it a potentially useful source for the use in lightweight composite materials.[17] An extract from *R. regia* fruit known as D-004 reduces benign prostate hyperplasia (BPH) in rodents. D-004, is a mixture of fatty acids, is being studied as a potential alternative to finasteride for the treatment of BPH.

Religious significance

Roystonea regia plays an important role in popular religion in Cuba. In Santería it is associated primarily with Shango or with his father Aggayú. It also has symbolic importance in the Palo faiths and the Abakuá fraternity. In Roman Catholicism, *R. regia* plays an important role in Palm Sunday observances.[36]