Gunnera is the sole genus of herbaceous flowering plants in the family Gunneraceae, which contains 63 species. Some species in this genus, namely those in the subgenus Panke, have extremely large leaves. Species in the genus are variously native to Latin America, Australia, New Zealand, Papuasia, Hawaii, insular Southeast Asia, Africa, and Madagascar.[3] The stalks of some species are edible.[4]

Gunnera is the only genus in the family Gunneraceae.[5] The APG II system, of 2003, also recognizes this family and assigns it to the order Gunnerales in the clade core eudicots. The family then consisted of one or two genera, Gunnera and, optionally, Myrothamnus, the latter optionally segregated as a separate family, Myrothamnaceae. This represents a change from the APG system, of 1998, which firmly recognized two separate families, unplaced as to order. The APG III system and APG IV system recognizes the family Gunneraceae and places Myrothamnus in Myrothamnaceae; both families are placed in the order Gunnerales in the core eudicots.[6]

The genus Gunnera was named after the Norwegian botanist Johann Ernst Gunnerus. At first it was assigned to the family Haloragaceae, though that presented difficulties that led to the general recognition of the family Gunneraceae, as had been proposed about the beginning of the 20th century. In the meantime, in many publications it had been referred to as being in the Haloragaceae, variously misspelt (as for example "Halorrhagidaceae".[7]) Such references still cause difficulties in consulting earlier works. However, currently Gunnera is firmly assigned to the monogeneric family Gunneraceae.[8]

Gunnera is thought to be a rather ancient group, with a well-documented fossil history due to the presence of fossilized pollen spores, known by the palynotaxon Tricolpites reticulatus. It is a Gondwanan lineage, having originated in South America during the Cretaceous. The earliest fossilized pollen is known from the Late Cretaceous (Turonian) of Peru, about 90 million years ago, and within the following 10 million years, Gunnera had achieved a worldwide distribution, with fossil pollen grains being found in areas where it is not found today, such as western North America, mainland Australia, and Antarctica.[9][10] Based on fossil pollen recovered from drilling cores, Gunnera is also known to have inhabited the now-submerged islands of the Ninetyeast Ridge during the Paleocene, likely having dispersed there from either Australasia or the then-emergent Kerguelen Plateau islands.[11]

Due to the widespread distribution of Gunnera during the Cretaceous, it was previously thought that the modern disjunct distribution of the genus was a relic of this period. However, phylogenetic analysis indicates that the majority of Gunnera species, even those found on entirely different continents, diverged from each other during the Cenozoic, indicating that the modern distribution of Gunnera is a consequence of long-distance dispersal from South America to other parts of the world, rather than relics of a former cosmopolitan distribution. The only species that diverged prior to the Cenozoic is Gunnera herteri of southeastern Brazil, which is thought to be the most ancient species of the genus, its lineage having diverged during the Late Cretaceous, roughly concurrent with the oldest Gunnera fossil pollen from Peru. The persistence of the Gunnera crown group since the Cretaceous makes it unique among flowering plants, and may have been facilitated by strong niche conservatism, dispersal ability, and being able to aggressively colonize disturbed land.[10]

The 40–50 species vary enormously in leaf size, with the iconic large-leaved species belonging to the subgenus Panke. The giant rhubarb, or Campos des Loges (Gunnera manicata), native to the Serra do Mar mountains of southeastern Brazil, is perhaps the largest species, with reniform or sub-reniform leaves typically 1.5 to 2.0 meters (4 ft 11 in to 6 ft 7 in) long, not including the thick, succulent petiole which may be up to 2.5 meters (8 feet 2 inches) in length. The width of the leaf blade is typically 2.5 meters (8 feet 2 inches), but on two occasions cultivated specimens (in Dorset, England in 2011[12] and at Narrowwater, Ulster, Ireland[13] in 1903) produced leaves fully 3.3 meters (10 feet 10 inches) in width. The seeds germinate best in very moist, but not wet, conditions and temperatures of 22–29 °C.

Only slightly smaller is G. masafuerae of the Juan Fernandez Islands off the Chilean coast. They can have leaves up to 2.9 m (9 ft 6 in) in width on stout leaf stalks 1.5 m (4 ft 11 in) long and 11 cm (4+1⁄2 in) thick according to Skottsberg.[14] These leafstalks or petioles are the thickest of any dicot, and probably also the most massive. On nearby Isla Más Afuera, G. peltata frequently has an upright trunk to 5.5 m (18 ft 1 in) in height by 25–30 cm (10–12 in) thick, bearing leaves up to 2 m (6 ft 7 in) wide. The Hoja de Pantano (G. magnifica) of the Colombian Andes bears the largest leaf buds of any plant; up to 60 cm (2 ft) long and 40 cm (16 in) thick.[15] The succulent leaf stalks are up to 2.7 m (8 ft 10 in) long. The massive inflorescence of small, reddish flowers is up to 2.3 m (7 ft 7 in) long and weighs about 13 kg. The flowers of Gunnera species are dimerous (two sepals, two petals (or none) . two stamens (or one), and two carpels.[16] Other giant Gunnera species within the subgenus Panke are found throughout the Neotropics and Hawaii. Gunnera insignis is also known by the name "poor man's umbrella" in Costa Rica.

Outside of the subgenus Panke, most of the more basal Gunnera species have small-to-medium-sized leaves. There are some species with moderately large leaves in Africa (G. perpensa, in the subgenus Perpensum) and Southeast Asia (G. macrophylla, in the subgenus Pseudogunnera), but the majority of more basal species are low-lying, mat-forming plants with small leaves. There are several small species are found in New Zealand, notably G. albocarpa, with leaves only 1–2 cm long, and also in South America, with G. magellanica having leaves 5–9 cm wide on stalks 8–15 cm long. The most basal species in the genus, G. herteri of Brazil, also has small leaves.[17][18]

Some fossil leaf impressions of Gunnera from the Cretaceous of North America have large leaves akin to those of Panke, and the most basal extant species within Panke (G. mexicana) is the most northern member. For this reason, it has been suggested that Panke originates from South American Gunnera that colonized North America during the Cretaceous and grew into giant forms, with the remaining South American Gunnera evolving into the subgenus Misandra, with a low-lying, matlike growth. During the Cenozoic, the North American Panke would have colonized Hawaii and retreated southwards on the mainland before recolonizing South America. However, more recent phylogenetic evidence suggests that Misandra and Panke diverged only 15 million years ago, much too recent to assign the Cretaceous Gunnera to Panke. Due to this, the large-leaved Cretaceous Gunnera from North America may represent a distinct lineage that convergently evolved giant leaves similar to those of Panke, but did not leave any descendants. [10][17][19]

As of April 2023[update], Plants of the World Online accepts the following species[20] separated by subgenus:[21]

In 2022, it was shown that plants in cultivation under the name Gunnera manicata were actually a hybrid, Gunnera × cryptica.[22]

At least some species of Gunnera host endosymbiotic cyanobacteria such as Nostoc punctiforme. The cyanobacteria provide fixed nitrogen to the plant, while the plant provides fixed carbon to the microbe.[23] The bacteria enter the plant via glands found at the base of each leaf stalk[2] and initiate an intracellular symbiosis which is thought to provide the plant with fixed nitrogen in return for fixed carbon for the bacterium. The Nostoc filled symbiotic tissue makes up just a small portion of the plant's total biomass. Gunnera is the only known genus of angiosperms that hosts cyanobacteria, and the only known landplants with intracellular cyanobionts. Although the endosymbionts enters the cell wall, they do not penetrate the cell membrane.[24][25] This relationship may provide insights to allow the creation of novel symbioses between crop plants and cyanobacteria, allowing growth in areas lacking fixed nitrogen in the soil.

The stalks of G. tinctoria (nalca), from southern Chile and Argentina, are edible.[4] Their principal use is fresh consumption, after peeling, but also they are prepared in salads, liquor or marmalade. Leaves of this species are used in covering curanto (a traditional Chilean food).

Gunnera perpensa is a source of traditional medicine in southern Africa, both in veterinary and human ailments, largely in obstetric and digestive complaints, but also as a wound dressing.[7] It also is eaten in various ways, largely the petioles, flower stalks and leaves, fresh and raw, preferably with skins and fibre removed, which is said to remove bitterness, but also cooked. The plant also is said to be used in making a beer.[26]