

Chenopodium is a cosmopolitan paraphyletic genus. Belongs to the Amaranthaceae family and the Chenopodioideae monophyletic subfamily. Diploid, tetraploid and hexaploid species are found in almost all evolution branches of Chenopodioideae, in the case of *Chenopodium album*, different degrees of ploidy occur within a single species. The degree of ploidy is an important factor in the study of evolution and phylogenetic relationships between *Chenopodium* species and it also affects the speciation and morphology. The genus *Chenopodium* includes weeds as well as cultivated crops, such as *Chenopodium quinoa*, *Ch. pallidicaule*, *Ch. ambrosioides* or *Suaeda foliosa*.

Quinoa (*Chenopodium quinoa*) is the best known species of the *Chenopodium* genus. It is an allotetraploid ($2n = 4x = 36$), derived from the same albeit not yet known diploid parents as a closely related tetraploid *Ch. berlandieri*. Some of its alleles segregate as in a functional diploid, which complicates genetic analyses and breeding efforts. This species features high genetic variability due to gene flow between weed and crop populations and some other evolution processes that are affected by polyploidy.

Quinoa is referred to as a pseudocereal and it has been used as a crop in South America as early as in the Inca times. It can survive at locations unsuitable for other plants thanks to its high variability, adaptability and resistance to abiotic stress factors. It contains high amounts of high quality proteins, oils, fibre, vitamins and minerals, which gives it a chance to become an important cultural plant. In spite of all its great characteristics, *Chenopodium quinoa* is not widely used in the food industry; this may be caused, among other factors, by lack of information about the crop.