



## Pharmacological Characterization of Cardamom Varieties in Botanical Science

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### DESCRIPTION

The morphological variation within the population of the species is an exceptionally vast and challenging issue due to its association with the historic race of the past. In nature, the development of intraspecific heterogeneity that occurs by selecting mechanisms, including adaptation, manual selection, offspring-parental conditions, and phenotypic variation plasticity. The characteristics of plasticity can vary among the varieties and vary dramatically across populations in various environments. Irrespective of the automatic reinforcements, the phenotypic expression of the variation generates ecological impacts. The biological consequences of intraspecific variability can be determined by analyzing different variables such as life history, genotype, ecotype behaviour and prior exposure to the environment.

Morphology is the preliminary tool needed for the identification and classification of plants within the species. Agronomic production is sensitive to deviations in weather and climate. A cultivar of the same species performs contrarily under different agro-climatic conditions and gives different percentage yields even though it is cultivated in the same conditions. Worldwide, green cardamom is cultivated by 15 countries and among this, India and Guatemala are the leading exporters. It has been reported that altogether, it accounts for approximately 75% of the total world production.

It is an important cultivated plant due to its economic and medicinal contribution to the treatment and management of various diseases. In addition to this, it is an outstanding source of flavours and nutrition. India is one of the key countries to grow and export both greater and lesser cardamoms. India is the second-largest producer of both greater and lesser cardamom after Nepal and Guatemala (Central America), respectively. The Indian Cardamom Research Institute (ICRI) Centre had advanced several disease-resistant and high-yielding varieties for both the cardamoms species. The different varieties are differentiated from one another based on several morphological

features, like the presence of the number of panicles, shape and size of the fruits. And it is a preliminary tool for identifying the varieties. Cultivar or a range of the species are grown differently under the same or different agro-climatic conditions and produce different metabolites and percentage of yields.

The best time for *E. cardamomum* plantation, for harvesting (October to February), but collection largely depends on the altitudes and cultivars. The plants of *E. cardamomum* grow approximately 2-5 m in height with 40-60 cm alternate, linear-lanceolate leaves and a long tip (pointed) spike (30-60 cm long) with white and violet colour flowers. The fruit is approximately 1-2 cm long in a yellow-green pod with several black and brown seeds. It bears cardamom about three years after planting out, which may be 4-5 years after sowing. Plants can produce commercial quantities of fruits for 10-15 years. It grows well in areas with a temperature of approximately 10°C-28°C and rainfall 1500-4000 mm and 600-1500 m above the sea level.

### CONCLUSION

The propagation of *A. subulatum* plants from seeds is difficult due to the dormancy of seeds. Hence, the clonal method is widely used for the cultivation. The flower bud produced from dull red colour rhizomes base in the spring season. The fruit is approximately 2-3 cm long, dark brown in colour, and up to 1.5 cm wide. It has a tri-locular capsule with several dark brown seeds. It is generally cultivated at an altitude of 700-1700. Cardamom comes into bearing about three years after planting and can produce commercial quantities of fruit for 10-12 years.

It grows well in areas with temperature 4°C-20°C, annual rainfall of 2000-2500 mm, and humidity more than 90%. Leaf orientation is one of the good morphological characters for visible identification, especially in leaves of Seremna (drooping), Ramla (straight and erect) and Bharlangey (slanting with drooping). A cultivar of the same species performs contrarily under different agro-climatic conditions and gives different yields even if cultivated in the same conditions.

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