

Conservation of endangered medicinal plant *costus speciosus* by tissue culture technique

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Abstract

Costus speciosus is traditionally, medicinally and pharmacologically important plant. *Costus speciosus* plays an important role as herbal medicine for the treatment of various health ailments. Rhizomes are given in pneumonia, rheumatism, dropsy, urinary diseases, jaundice while leaves are given in mental disorders. leaves are applied in fever; decoction of stem is used in fever and dysentery. In general, plant based medicines are safe and there are no side effects compared to other drugs and more effective treatment of health disorders. Because of the popularity of herbal medicines, there is a growing demand for natural plant based medicines in both developing countries and international market. In India, the herbal preparations of *Costus speciosus* are presently used by local people which regulates body sugar and cholesterol levels. However, due to urbanization, industrialization and increase in commercial demand of *Costus speciosus*, this medicinal plant has been over exploited for its innumerable medicinal properties from natural habitat. Therefore, *Costus speciosus* has become endangered and now-a-days *Costus* species are available only in the wild habitat. Hence there is need for alternative propagation methods of these plants. Conservation of *Costus speciosus* using in vitro micropropagation protocols plays a significant role in preserving this endangered plant species in the natural habitat and alternative for the production of valuable secondary metabolite.

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Access this article online

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Accessed Date:
26 March 2018

INTRODUCTION

Costus speciosus (Koen) Sm. family Zingiberaceae is a well known Ayurvedic medicinal plant. *Costus* is an important medicinal and ornamental plant. *Costus speciosus* is native to South East Asia, especially found in India, Srilanka, Indonesia and Malaysia. It is widely distributed in Kerala, Tamil Nadu Assam, Meghalaya, Bihar, Khasi and Jaintia Hills, Uttaranchal, Orissa, MP, North Bengal while the Himachal sub Himalayan tracts and Western Ghats are the ideal places for its collection In Ayurveda rhizomes are used as a medicine. Rhizomes are edible and use in diseases as pneumonia, rheumatism, urinary diseases, jaundice and leaves are very useful for

diabetes patient. The curative properties of medicinal plants are attributed to the presence of various secondary metabolites such as alkaloids, flavanoids, glycosides, phenols, saponins, sterols and sesquiterpenes. *Costus speciosus* is a rich reservoir of many such phytoconstituents The plant is vegetatively propagated by rhizomes. These techniques are very slow for large scale production. *Costus speciosus* disappear very rapidly due to collection of its rhizomes. The curative properties of medicinal plants are attributed to the presence of various secondary metabolites such as alkaloids, flavanoids, glycosides, phenols, saponins, sterols and sesquiterpenes. *Costus speciosus* is a rich reservoir of many such phytoconstituents.

TISSUE CULTURE

The plant of *Costus speciosus* with rhizomes were collected from Vindhya herbal Nursery. Its botanical identity was confirmed by the Lab faculty. Rhizome is material used as explants source of tissue culture. Tissue culture success mainly depends on the age, types and position of explants. Micropropagation is the process of vegetative growth and multiplication from plants tissues or seeds. It is carried out in aseptic and favourable conditions on growth media, using various plant tissue

culture techniques. Tissue culture is based on concept of totipotency; the ability of plant cells and tissues to develop into whole new plant. Tissue culture has been increasingly applied to many medicinal plants in particular for mass propagation, conservation of germplasm and production of bioactive compounds and for genetic improvement. Large-scale plant tissue culture is found to be an attractive alternative approach to the traditional methods of plantations, as it offers a controlled supply of biochemical independent of plant availability and more consistent product quality. *Costus speciosus* were successfully micropropagated with a pseudostem without any significant damage to the mother plant. highest shoot proliferation was obtained on Murashige and Skoog medium supplemented with benzylaminopurine.

PHYTOCHEMICALS

Costus speciosus commonly known as crepe ginger are commonly used as medicine in India. *Costus speciosus* contain diosgenin as a bioactive component which is utilized as a precursor for the synthesis of various drugs. *Costus speciosus* plant are very important for medicinal purpose. This is a source of antidiabetes and antimicrobial compounds. *Costus speciosus* are perennial rhizomatous herb. Leaves are simple, smooth and spirally arranged on stems. The rhizome is the major source of diosgenin. *Costus speciosus* plant contain some phytochemical such as tannins, alkaloids, saponins, steroids, phenols, flavanoids and terpenoids these bioactive substances are referred to as phytochemicals.

CONCLUSION

Costus speciosus is a medicinal plant which can be successfully used in many health problem. The use of medicinal plant as a rich source of phytochemicals. There is huge demand for diosgenin by the pharmaceutical companies. To meet this demand *costus* plant are constantly exploited so the depletion of *costus speciosus* plant from natural flora. So there is need of large scale multiplication by alternative method. We can develop a thousand of plantlets by small segment of rhizome with the help of Tissue culture technique.

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Source of Support: None Declared
Conflict of Interest: None Declared