

RESEARCH PAPER:

Effect of colchicine on cluster bean [*Cyamopsis tetragonoloba* (L.) Taub.]

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SUMMARY

Experiment was carried out to study the effect of colchicine on seedling growth, vegetative and yield parameters of cluster bean [*Cyamopsis tetragonoloba* (L.) Taub.]. Colchicine increased the root length and shoot length significantly in all the concentrations used. The number of lateral roots increased very significantly at 10 ppm, 15 ppm, 20 ppm and 25 ppm and significantly at 5 ppm. Colchicine treatment on the 40th day increased the epicotyl length significantly at 5ppm and very significantly at all concentrations. Hypocotyl length increased significantly at 10 ppm and 15 ppm and very significantly at 20 ppm and 25 ppm. Regarding the root length, a significant increase was seen at 10ppm and very significant increase at all the rest concentrations. Internodal length, petiole length and number of lateral roots increased very all the concentrations. In contrast to colchicine treated vegetative parts, the pod character like pod circumference, pod length and pod weight decreased in all the concentrations. Regarding the pod length and pod weight a very significant reduction was noted at 15 ppm, 20 ppm and 25 ppm. The number of seeds/pod decreased at 5 ppm, 10 ppm, 15 ppm and 20 ppm and increased at 25 ppm. Weight of seeds/pod increased at 5 ppm, 10 ppm and 15 ppm and decreased very significantly at 20 ppm and 25 ppm. Thus, in conclusion, colchicine increased the vegetative parameters like root length, shoot length, epicotyl length, hypocotyl length, petiole length, internodal length and number of lateral roots.

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Cluster bean

Cyamopsis

tetragonoloba,

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Protein nutrition is one of the most crucial problems in India. Majority of Indians are vegetarian and pulses form an important constituent in the diet. Due to their nutritional value comparative to meat, pulses make an important component of vegetarian diet.

Cluster bean [*Cyamopsis tetragonoloba* (L.) Taub.] is one of the important major pulse crops in India. It is an annual, erect, self-pollinated pulse crop. It is also cultivated for hay, silage and green manure. Raw mature seeds contain 23 per cent protein. 1.7 per cent fat, 6 per cent carbohydrate and traces of vitamins and minerals.

Colchicine is obtained from the corm and seeds of autumn crocus (*Colchicum autumnale*), a member of the Lily family. In high concentration this drug is extremely toxic, but at low concentration and with proper length of exposure, it has been shown to cause chromosome doubling in a number of plants. The spindle fibres do not develop during normal mitosis, as a result the chromosomes fail to separate at metaphase. A

new cell wall does not form and a single cell with two chromosome sets results.

Plant breeders are aware of the need for diverse genotypes to meet the demands of current and future plant breeding programmes. Hence, induced mutations can be used profitably to generate useful variation for qualitative and quantitative traits and therefore it provides an alternate to natural variation.

Therefore, in the present study, an attempt has been made to understand the effect of colchicine in cluster beans.

EXPERIMENTAL METHODOLOGY

Seeds of cluster bean [*Cyamopsis tetragonoloba* (L.) Taub.] purchased from the Seed Centre, Agriculture University, Coimbatore were used for the investigations. Seeds of cluster beans were sown in experimental plots of Avinashilingam Deemed University. Three sets of experiments were conducted.

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