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Research Paper

EFFECT OF COLCHICINE ON MORPHOLOGICAL VARIATION OF *Trichosanthes anguina* L.

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Abstract

Tricosanthes anguina is scientifically well known medicinal plant is an annual climber belonging to the family Cucurbitaceae. It is commonly called as snake gourd, viper gourd, snake tomato or long tomato. The fruit is usually consumed as a vegetable due to it is good nutritional value. The fruit is a good source of Vitamin A, Vitamin B and Vitamin C. It improves the appetite and acts as a tonic and stomachic and cures biliousness. Analysis of morphological variation were studied in *Trichosanthes anguina* after the treatment of colchicines. Among all the diploid variety was found very common in nature as well as after the treatment of colchicines. Triploid were average in number, however tetraploid are found rare in nature which was produced after the treatment of colchicines in different aqueous solution. The morphology of stem, Leaf, tendril is average in all the diploid variety was found average, intermediate in triploid however it was more advanced in case of tetraploid.

Key words: Colchicine, Treatment, Trichosanthes anguina, Morphology.

INTRODUCTION

Trichosanthes anguina is a monoecious annual vine climbing by means of tendrils. Leaves are palmately lobed, up to 25 cm long. Flowers are unisexual, white, opening at night, with long branching hairs on the margins of the petals. These hairs are curled up in the daytime when the flower is closed, but unfurl at night to form a delicate lacy display (see photos in gallery below). Fruits may be up to 200 cm long, deep red at maturity, hanging below the vine. The related Japanese snake gourd (*Trichosanthes pilosa*, sometimes called *T. ovigera* or *T. cucumeroides*), very similar in vegetative morphology, but the fruit of *T. pilosa* is round to egg-shaped, only about 7 cm long. The common name "snake gourd" refers to the narrow, twisted, elongated fruit. The soft-skinned immature fruit can reach up to 150 cm (59 in) in length. Its soft, bland,

somewhat mucilaginous flesh is similar to that of the luffa and the calabash. It is popular in the cuisines of South Asia and Southeast Asia and is now grown in some home gardens in Africa. With some cultivars, the immature fruit has an unpleasant odor and a slightly bitter taste, both of which disappear in cooking. The fruit becomes too bitter to eat as it reaches maturity, but it does contain a reddish pulp that is used in Africa as a substitute for tomatoes. The green fruits are superior with regard to nutritive value and can be very well compared with any other vegetables, the fruit contain 0.5 g Protein, 4.4 g of carbohydrate, 94.1 g water, 18 calories, 50 mg calcium, 34 mg potassium, 160 IU vitamin 'A' 53 g magnesium and 20 mg of phosphorus in 100 g of edible portion. The fruits are cooked green as curry and they acts as purgative when used ripe. It is used in ready to serve, pickles and also its tender leaves as vegetable. The fruit improves the appetite, acts as tonic, stomachic and cures blindness. The roots and seeds are anthelmintic and are also used in the treatment of diarrhea, bronchitis and fever (Varghese and Rajan, 1993). Snake gourd is one of the few vegetable which fetches more yields per unit area but average yield of crop is low in India. A large number of local cultivars are grown in the country but there is only few recommended cultivars are available. Despite of economic and medicinal importance of the crop due attention was not given towards a need based crop improvement programme and also no serious attempts have so far been made to upgrade the productivity and acceptability of this crop. The productivity of vegetable can be increased to a greater extent through varietal improvement. The improvement of work should be focused on selection of genotype for better yield, superior quality and resistance to biotic stresses.

MATERIALS AND METHODS:

Altogether 100 seeds were taken in a petridish. The seeds were thoroughly washed in tap water. Different aqueous solution of Colchicine (0.1, 0.2, 0.3, 0.4, 0.5,0.6, 0.7, and 1.0%) were prepared and seeds were treated upto 16 hours. Seeds were sown without washing with water in different pots for further studies. The controlled plants were raised in each case. In second experiment Seedling sown in the pots were treated at their apical points when they were 2-6 days old. The apical buds were exposed and covered with cotton, soaked in colchicine solution of 0.1 to 0.7% daily for 5 hours upto 2-4 days. The cotton was frequently resoaked. After every treatment the buds were thoroughly washed. After a week of treatment the plants were transferred to the field for further studies and observation. In third experiment the roots of young seedlings were dipped in 0.025 to 0.3% of colchicines solution for 6-10 hours and then after washing with water they were sown in pots. A regular survey was made after a gap of 15 days up to 6 months.

RESULTS:

In the present investigation only first method gave polyploidy plants.

The results are depicted in the Table-1.

Characters	**Diploid**	**Triploid**	**Tetraploid**
Stem	Nell branched, Long internodes	Intermediate between Diploid and tetraploid	Less branched, Short internodes
Leaf	Broad green with veins and vein lets	Intermediate between Diploid and tetraploid	Broader and thicker than diploid. Dark green with prominent veins and vein lets
Tendril	Long	Intermediate	Longer than the diploid
Stomata	Small	Large	Large
Flower	All parts of the flower were small	Intermediate	Enlarged than the diploid
Pollen fertility	94.2% Small	27.2% Large	43% Large
Fruit	Long, Cylindrically oblong	Small, Less oblong	Small, Less oblong
Seed viability	91.7%	Seedless	40%

DISCUSSION:

From the table 1 it is apparent that tetraploid is not common in Trichosanthes anguina. It is only produced by the application of external factors like colchicines, X- ray and others. Diploid variety showed stem with nell branched, long internodes, leaf with broad green with veins and vein lets, Long tendril, small stomata, small flowers with 94.2% pollen fertility, long cylindrically oblong fruit with 91.7% viable seeds. Triploid plants showed intermediate stem, tendril and leaves with large stomata, intermediate flowers with 27.2 % pollen fertility, small less oblong fruit with no seeds. However, the tetraploid have shown stem with less branched, short internodes, leaves with broader and thicker than diploid. Dark green with prominent veins and vein lets, Tendril longer than the diploid, large stomata, flower enlarged than the diploid with 43% pollen fertility, Fruit small and less oblong with 40% viable seeds. For character association, genotypic and phenotypic correlations were considered. In most cases genotypic correlations were higher than phenotypic correlations indicating highly heritable nature of the character like yield per plant showed positive and significant correlation with vine length, productive length of vine, number of fruits per plant, mean fruit weight and mean fruit length both at phenotypic and genotypic level. Since, the association is in desirable direction, selection for these traits may ultimately improve the yield.

CONCLUSION:

Morphological analysis, flowering behavior and pollen grain morphology were studied in *Trichosanthes anguina*. The diploid variety was found very common in nature as well as after the treatment of colchicines. Triploid were average in number, however tetraploid are found rare in nature which was produced after the treatment by colchicines in different aqueous solution. The morphology of stem, Leaf, tendril is average in all the diploid variety was found average, intermediate in triploid however it was more advanced in case of tetraploid. This is due to the natural morphological variation as well as after the treatment by colchicines.

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