

Studies on effect of mutations on the growth of *Colletotrichum capsici*

R.M. KADAM, S.D. DHAVLE, R.B. ALLAPURE AND V.S. NAGPURNE

Accepted : August, 2008

See end of the article for authors' affiliations

Correspondence to:

R.M. KADAM

Department of Botany,
Mahatma Gandhi
Mahavidyalaya,
Ahmedpur, LATUR (M.S.)
INDIA

ABSTRACT

The different mutagens were used to study the growth of *Colletotrichum capsici*. These mutagens were viz. ultraviolet radiation and chemical mutagens like 5-Bromouracil and Sodium azide, which shows variation in per cent frequency. The spore suspension was treated with ultraviolet radiation and chemical mutagens viz. 5- Bromouracil and Sodium azide, Among these, 5- Bromouracil showed maximum, while Sodium azide showed minimum frequency of mutation.

Key words : *Colletotrichum*, Mutations, Frequency.

Turmeric (*Curcuma longa L.*) is one of the important condiments in India, which belongs to the family Zingiberaceae. It is mainly grown in the states of A.P., Tamil Nadu, Kerala, Karnataka, Bihar, Orissa and Maharashtra. The area under cultivation is about 99200 hectares with a production of 167500 tonnes. The different varieties of turmeric are as Allepy, Armoor, Chintamani, Duggirala, Krishna, Lokhandi, Rajapuri, Salem, Tekurpeta red and Waigon (Indiresh and Uthalah, 1996)

There is variation in morphology, rhizome and quality characters in different varieties of turmeric (Philip, 1978; Philip *et al.*, 1980). The rhizome is the main commercial, cosmetic, medicinal, edible part of the plant. It contains (curcumin, mentanil yellow, lead, chromate etc (Sambamurthy and Subrahamanyam, 1989)

It also contains considerable amount of starch and small quantity of an alkaloid (Ghosh and Dubey, 1982) The effect of physical and Chemical mutagens was studied in soybean (Dixit *et al.*, 1987). Such a economically important crop get affected by different diseases and present investigation gives guideline for management of leaf spot of turmeric caused by *Colletotrichum capsici*.

MATERIALS AND METHODS

The isolate of *Collectotrichum capsici* isolated from salem variety of tumeric was used to study the mutations.

One week old mycelial mat was used for the preparation of mycelial fragments in suspension and used for mutational purpose.

The mycelial suspension was thoroughly washed with sterile distilled water by centrifuging for several times. This suspension was used for the mutational study. The different mutagens used were chemical mutagens like 5-

Bromo uracil and Sodium azide. These mutagens were used in different concentrations for the different tie intervals.

The spore suspension (1ml) was mixed with 1 ml of 0.25, 0.5 and 1.0 per cent of 5 - Bromouracil and Sodium azide. These tubes were kept for 6, 12 and 24 hrs at room temperature. After 6, 12 and 24 hours Mixture was centrifuged and 1 ml treated suspension was spread on czapek-dox agar plate. After 12 hours of incubation period colony count was taken. Untreated spore suspension acts as control. The colonies were counted and expressed in per cent frequency of mutation on the basis of control plate colonies.

RESULTS AND DISCUSSION

The *Collectotrichum capsici* isolate of salem variety was used to study the effect of mutation. The spore suspension was washed with sterile distilled water. This spore suspension was treated with ultra violet radiation for 30 minutes. The chemical mutagens like 5-Bromouracil and Sodium azide were used for treatment at 0.25, 0.50 and 1.0% concentration for 6, 12 and 24 hours. After treatment the suspension was spread on plates. The colonies were counted and expressed in per cent frequency of mutant (Table 1 and Fig. 1)

The treatment of 5- Bromouracil at 0.25%, 0.5 and 1.0% for 6 hours, 12 hours and 24 hours showed maximum per cent frequency of mutation where as Sodium azide at 0.25 %, 0.5%, 1.0% for 6, 12 and 24 hours showed minimum per cent frequency of mutation.

It was also found that in lower concentration of 5- Bromouracil and Sodium azide there was more number of mutants than the higher concentrations. It was observed that as the treatment hours increased, the per

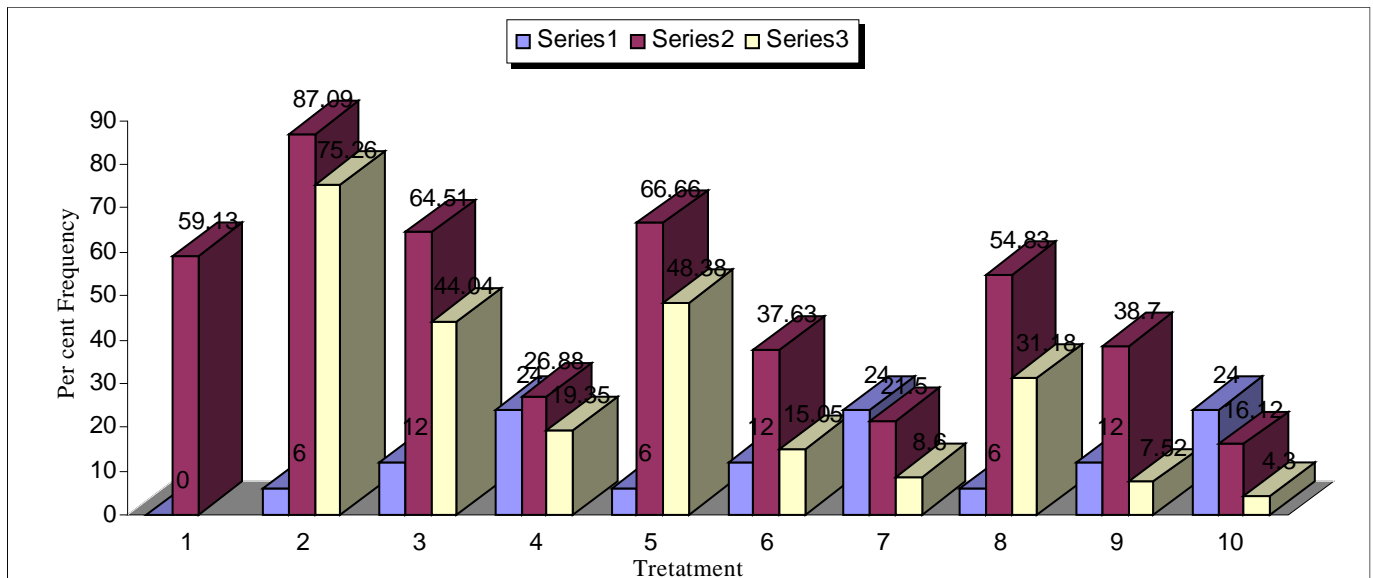


Fig. 1 : Effect of mutation on the growth of *Colletotrichum capsici*

Table 1 : Effect of mutation on the growth of *Colletotrichum capsici*

Treatment	Per cent frequency
U.V. radiation	59.13
5-Bromo uracil	
0.25% (6 hrs.)	87.09
(12 hrs.)	64.51
(24 hrs.)	26.88
0.5% (6 hrs.)	66.66
(12 hrs.)	37.63
(24 hrs.)	21.50
1.0% (6 hrs.)	54.83
(12 hrs.)	38.71
(24 hrs.)	16.12
Sodium azide	
0.25% (6 hrs.)	87.09
(12 hrs.)	64.51
(24 hrs.)	26.88
0.5% (6 hrs.)	66.66
(12 hrs.)	37.63
(24 hrs.)	21.50
1.0% (6 hrs.)	54.83
(12 hrs.)	38.71
(24 hrs.)	16.12

cent frequency of mutation decreased. The per cent frequency of mutation of *Colletotrichum capsici* by the treatment of 5 - Bromouracil and Sodium azide was found to be maximum and minimum, respectively.

Authors' affiliations:

S.D. DHAVLE, Department of Botany, S.A.S. Mahavidyalaya, Mukhed, NANDED (M.S.) INDIA

R.B. ALLAPURE AND V.S. NAGPURNE, Department of Botany, Maharashtra Udaygiri Mahavidyalaya, Udgir, LATUR (M.S.) INDIA

REFERENCES

Dixit, P. and Dubey, D.K. (1987). Effect of chemicakl mutation on seed germination of Soybean, *Ind. Bot. Rep.*, **6(1)** : 41.

Ghosh, S.P. and Govind, Sheo (1982). Yield and quality of turmeric in north eastern hills. *Indian J. Horticulture*, **39** : 70-86

Indires, K.M. and Uthalah, B.C. (1990). Morphological, rhizome and yield characters of different varities of turmeric in coastal Karanataka *J. Agri sci Mysore*, **24** : 484-490.

Philip, J. (1978). Morphological studies and quality evaluation of turmeric (*Curcuma longa L.*) types M.Sc. (Hort) Thesis, Kerala Agri Uni, Vellanikara, Trichur.

Philip, J. (1980). Variation in yield and quality of turmeric types. National seminar on Ginger and Turmeric at C.P.C.R.I. Regional station Calicut. 8 th and 9th April 1980.

Sambamurthy, A.V.S.S. and Subrahmanyam, N.S. (1989). *Economic Botany*, Wiley eastern, publication limited, New Delhi.
