Indian J. mycol. Res., 9 (1 & 2), 33—34 (1971)

EFFECT OF X-RAYS ON THE PRODUCTION OF OXALIC ACID BY *SCLEROTIUM ROLFSII*

Higgins (1927) reported that the ability of *Sclerotium rolfsii* to produce large quantities of oxalic acid was instrumental in its pathogenic capabilities. Since then several research workers studied the ability of oxalic acid synthesis of this organism in order to consider the significance of this acid production during pathogenesis.

The purpose of this paper is to report studies on the effect of X-rays on the production of oxalic acid by *S. rolfsii* in order to evaluate its possible role in industry.

The culture of *S. rolfsii* was isolated from infected cotton seedlings collected from the Agricultural Farm of the Department of Agriculture, Calcutta University at Baruipur, 24-Parganas. Cultures were maintained on *potato dextrose agar*. For the induction of mutants, following Beadle and Tatum (1945), mycelial fragments were treated with X-rays at the rate of 550 r units per seconds. During the experimental period it was observed that 11,000 r was a good source for producing mutants of several strains. Of the different strains developed, two strains, viz, S. r. – X1 and S. r. – X2 were selected for the production of oxalic acid. Following Maxwell and Bateman (1968), the natural isolate and mutated strains S. r. – X1 and S. r. – X2 were grown on *potato broth* medium (30 ml) in 250 ml Erlenmeyer flasks and incubated at 30°C for 12 days. After 12 days of growth, the contents of the culture flasks were harvested on tared Whatman No. 1 filter papers and dried at 65°C for 24 hrs. The dried mycelia with filter papers were then cooled in desiccator and weighed in a Sartorius Chemical balance. From the culture filtrate, oxalic acid was estimated following the method of Maxwell and Bateman (1968). All the experiment were done with ten replicates.

The results obtained during the experimental period are given in Table 1.

Table 1. Data (mean) showing the growth (mg) and yield of oxalic acid (mg) of natural and mutated strains of *S. rolfsii* at 12 days of growth.

Strains	Growth (Dry weight of mycelium in mg)	Oxalic acid yield (mg)
Natural	435±11	67±5
S. r.–X1	552±9.6	83±3.5
S. r.–X2	558±11.5	92±2.6

From the Table 1, it is evident that both the mutated strains produced more oxalic acid than the natural one. Strains S. r.–X1 produced about 30 percent more oxalic acid than the normal one while the strain S. r.–X2 by 36 percent. It has been further observed that in all cases the yield of oxalic acid is possibly related with the growth of the organism. This better yielding capabilities of both the mutated strains of *S. rolfsii* might be helpful in the industrial production of the acid.

Further research works are already in progress with these two mutated strains of *S. rolfsii* in order to find out the optimum conditions for the maximum yield of oxalic acid.

The authors are grateful to Prof. A. K. Sharma, D.Sc., Sir Rashbehari Ghosh Professor and Head of the Department of Botany, University of Calcutta for providing the necessary facilities during the experimental period.

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REFERENCES

Beadle, G. W. and Tatum, E. L. (1945). *Neurospora*. II. Method of producing and detecting mutants concerned with nutritional requirements. *Amer. J. Bot.*, 32 : 678-686.

Higgins, B. B. (1927). Physiology and parasitism of *Sclerotium rolfsii* Sacc. *Phytopathology*, 17 : 417-448.

Maxwell, D. P., and Bateman, D. F. (1968). Influence of carbon source and *p*H on oxalate accumulation in culture filtrates of *Sclerotium rolfsii*. *Phytopathology*, **58** : 1351-1355.

(Accepted for publication 11th October 1971)