a commercial sugarcane variety has been reported to result in F_1 progeny with different stages of pistillody[2]. The expression of the character has been attributed to be genic[1] as well as environment-induced[3].

During the flowering season of 1980, a commercial sugarcane variety of Punjab (India) CoJ 73 was noticed to exhibit pistillody. The variety came to flowering in the last week of October. At random 25 arrows (sugarcane inflorescence) were examined and in each arrow 25 spikelets collected from different portions of the inflorescence were examined. Besides the normal pair of stigmatic branches, all the three or one or two anthers in part or in full were converted into stigmatic branches. Even when anthers were present they were not well developed and remained non-functional. Protogyny was noticed in all the instances when anthers were present.

The variety is a derivative of Co 62175 as seed parent and Co 1148 as pollen parent. Co 62175 is a shy flowerer and Co 1148 a profuse flowerer both with normal floral parts. The report on the occurrence of pistillody in a commercial sugarcane variety is probably the first of its kind and can be traced to *S. spontaneum* parent(s) involved in the geneology and not to the immediate parents as both do not have the character.

In the absence of functional anthers, the possibility of utilising the variety as a male sterile seed parent was tested. Seeds of the variety from open pollinated arrows and selfs were collected and examined for seed-setting. No seedling could be obtained by selfing and very little from open pollinated crosses. The former observation confirms the male sterility in the variety while the latter indicates the poor cross-compatibility and (or) female sterility. Further studies are in progress to overcome the difficulty of seed-setting in this variety through a wide spectrum of parental combinations and other aspects of post-fertilisation phenomenon.

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PENICILLINASE ACTIVITY OF A BLUE-GREEN ALGA *SYNECHOCOCCUS CEDRORUM*

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Several workers have used penicillin to obtain mutants of antibiotic resistant strains of blue-green algae[1]. Kushner and Breuil[2] reported the occurrence of penicillin breaking enzyme penicillinase (β-lactamase) from *Coccochloris elebens* and *Anabaena* Sps. Penicillinase was first recognized as inducible enzyme in organisms of subtilis group *Bacillus licheniformis*[3]. However, Richmond and Sykes[4] reported in gram-negatives that penicillinase is often constitutive but rarely inducible. Our studies on four strains of *Synechococcus cedrorum* obtained by us, parent, penicillin resistant (Pen–R), streptomycin resistant (Strep–R) and polymyxin resistant (Polym–R) strains showed resistance to penicillin (10 units) as tested with Bacto–Unidisk[5]. We report here induction and activity of penicillinase in the above four strains.

The penicillinase activity has been studied by macro-iodometric method of Perret[6] which is based on the estimation of the hydrolysis products of penicillin.

The four strains of *Synechococcus cedrorum* were grown in modified Hughes medium[7] at pH 8·5 for 48 h. The algae were transferred to growth medium containing 0·2 μg/ml penicillin-G (benzyl penicillin, sodium salt). Samples were taken at intervals of 0, 6, 24 and 50 h and one ml of sodium tungstate (0·05%) was added to stop enzymatic activity. After centrifuging the suspensions to remove the cells, equal amount of 0·01 M iodine solution was added to the supernatant and incubated for 30 minutes at 28°C after which it was titrated with 0·01 N sodium thiosulfate using starch as indicator. For calculation it was taken that eight equivalents of iodine to correspond to one molecule of penicilloic acid[8]. The enzyme activity is expressed as μ moles penicilloic acid formed/mg protein. Protein was estimated by the method of Lowry *et al.*[9].

All the four strains of *Synechococcus cedrorum* did not show any penicillinase activity in the absence of the drug in the medium. They developed considerable penicillinase activity by 6 hr in the presence of penicillin which further increased by 24 hr (Fig. 1). The highest amount of activity was present in the Pen-R strain, which in fact could grow in the presence

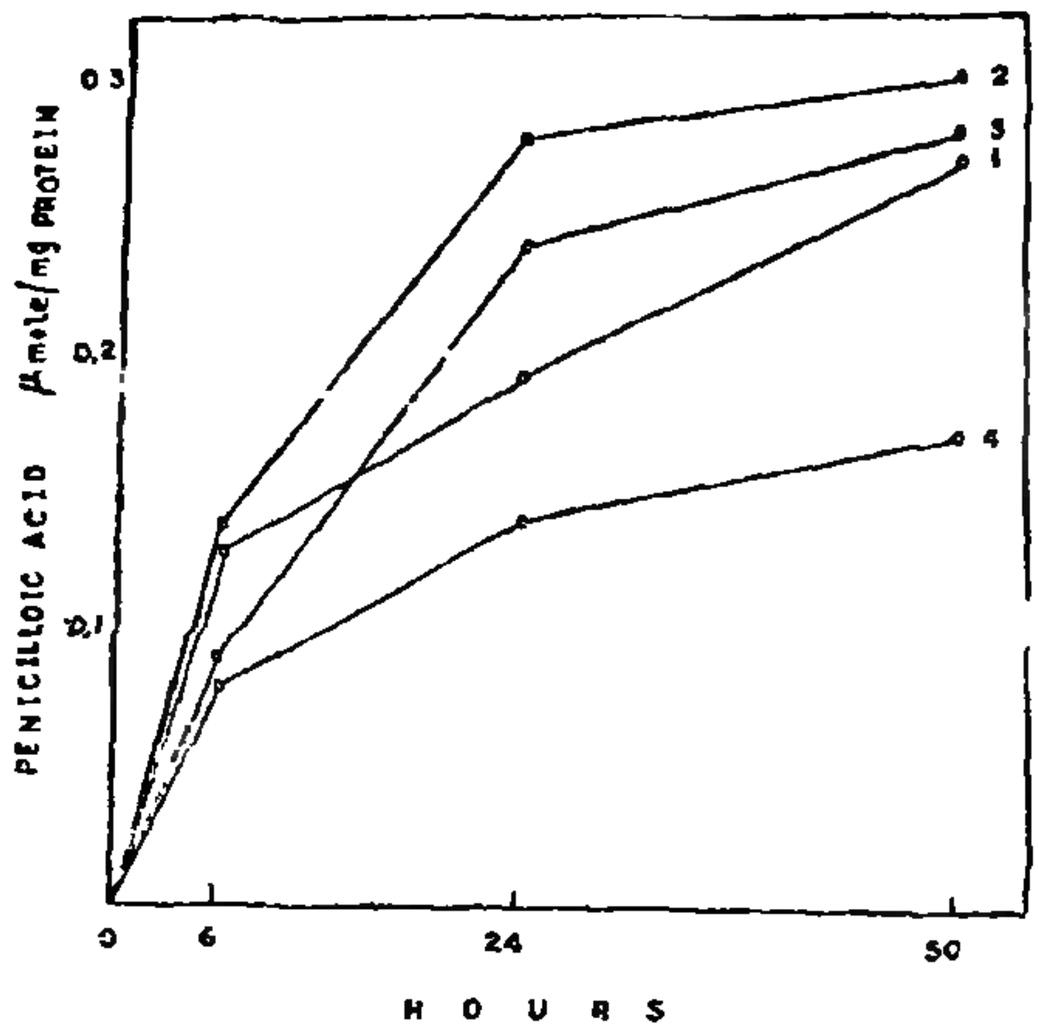

FIG. 1. Activity of enzyme penicillinase in different strains of *Synechococcus cedrorum*. 1—Parent, 2—Pen–R, 3—Strep–R, 4—Polym–R.

of 300 μg/ml penicillin. The Strep–R strain (resistant to streptomycin 250 μg/ml) had a little less activity of the enzyme, while much lower activity was present in the strain resistant to polymyxin (resistant to polymyxin 80 μg/ml). The parent strain also had penicillinase activity but much less than Pen–R strain. It may be pointed out from the observations not reported here that the parent strain was found to be capable of growing only at a very low levels of penicillin (10 units) whereas the Pen–R strain could tolerate up to 300 μg/ml of the antibiotic. However, it appears that the total degradation of penicillin at 50 hr by the parent strain and Pen–R strain is not very significant, as it is at 24 hr. This appears to be due to faster rate of penicillin breakdown by the Pen–R strain between 6 and 24 hrs. The difference between the two strains could be due to some regulatory control.

Synechococcus in an unicellular blue-green alga having 3 μm in length and 1 μm in breadth. It is difficult to classify different species and strains of this alga by morphological features. Biochemical characteristics like the inducibility of certain enzymes and their levels can be profitably used for taxonomic purpose.

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A NEW BACTERIAL LEAF-SPOT DISEASE OF *THESPESIA POPULNEA* SOL. EX CORR.

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IN September 1978, a bacterial leaf-spot disease of *Thespesia populnea* was observed in the vicinity of Khandala Ghats (Dist. Pune). The disease first appears on leaves as minute water-soaked translucent round spots with a clear yellow halo. The spots increase in size and become angular. Several spots coalesce towards the tip of the leaf giving blighted appearance. (Fig. 1).

The bacterium was isolated by serial dilution method on P.D.A. (Potato Dextrose Agar) medium. Healthy two month old seedlings showed typical water-soaked spots after automising the bacterial suspension in sterile water on leaves slightly pricked with a sterile pin in about 15 days. The oragnism was reisolated.

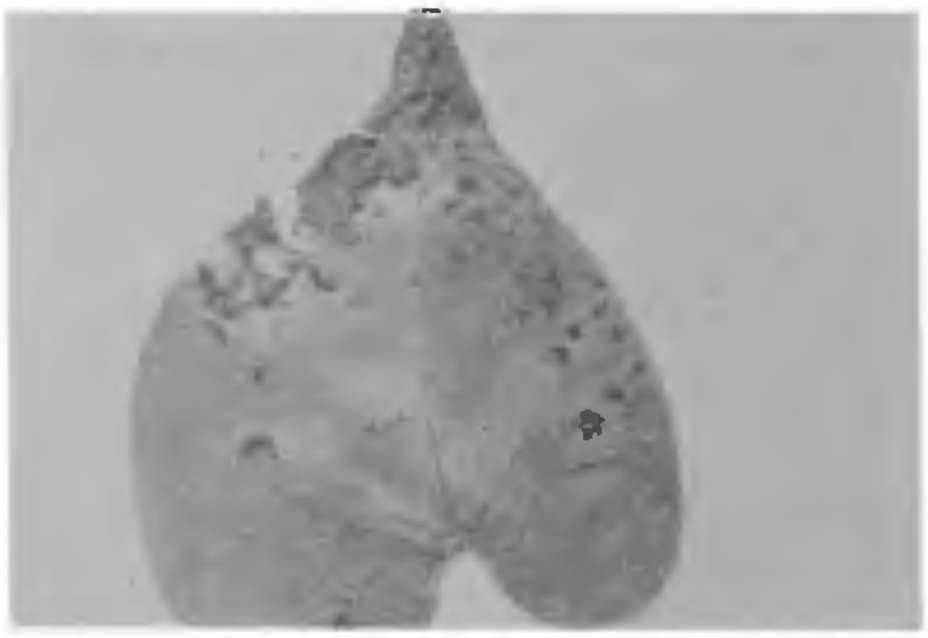

FIG. 1. Bacterial leaf-spots on *Thespesia populnea* Sol. ex CORT.