OBJECT AND SCOPE OF THE PRESENT STUDY

INDUCTION OF MUTATION IN LACTOBACILLI WITH PARTICULAR REFERENCE TO PROTEOLYTIC ACTIVITY
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From the review of literature presented in the preceding pages, it would be evident that although a vast amount of literature has accumulated on various aspects of mutation processes in bacteria, research work on induction of mutations in lactic acid bacteria has started gathering momentum only during the past one decade. Since different microorganisms are expected to vary in their sensitivity to various physical and chemical agents, a study on the effect of a few such selected mutagenic agents on lactic acid bacteria merits further investigation.

Enhancement of proteolytic activity among lactobacilli by mutation is yet another aspect of study which has attracted the attention of some research workers, in recent years (Pyatnitsyna, 1968; Bannikova and Maksimova, 1968; Dilanyan et al., 1970, 1971 a, b).

Although the ability of lactic acid bacteria to degrade casein and fractions of casein has been the subject of several investigations, very little information is available in regard to the use of highly proteolytic mutants of lactobacilli in such studies. A comparative evaluation of parent and selected mutant cultures of lactobacilli in casein...
breakdown studies is expected to throw more light, not only on the differing hydrolytic modes of casein and fractions of casein by the cultures but on the nature of hydrolytic products as well.

In view of considerable scope for further studies on the above problems, the following aspects have been included in the present investigations:

(i) Selection of a suitable solid medium for initial screening of two lactobacilli for proteolytic activity on petri plates, with a view to correlating clearance zones of proteolysis formed around the colonies on petri plates, with the proteolytic activity of the isolates in milk.

(ii) A study of the nature of inactivation of the two lactobacilli after exposure to selected physical and chemical agents.

(iii) Isolation of mutants of lactobacilli with reference to enhanced proteolytic activity.

(iv) A comparative study of the parent and mutant cultures for acid and flavour production and examination of some of the mutants for starter activity test.
(v) Release of different forms of nitrogen in casein and fractions of casein, after their degradation by the parent and mutant cultures of lactobacilli.

(vi) A study of the hydrolytic modes of casein and fractions of casein by parent and selected mutants of lactobacilli, using starch gel and polyacrylamide gel electrophoretic and DEAE cellulose column chromatographic techniques.

(vii) Estimation of amino acids in whole casein after its degradation by parent and selected mutant cultures of lactobacilli.

(viii) Action of parent and mutant cultures of lactobacilli on different casein species and on other protein substrates.