

Mutation breeding of microbial strain (*Streptomyces fradiae*) for increased antibiotic yield

ABSTRACT

A strain improvement programme for higher yield has been attempted for a local anti-biotic-producing strain, *Streptomyces fradiae*. An empirical approach of sequential mutation-selection and rediversification is adopted resulting in the selection of more superior strains through the accumulation of favourable minor genes. A stepwise selection over six phases have been successfully tried. Each phase consists of a two-stage selection; selection in the first stage being made on colonies which have arisen from spores subjected to mutagenic treatment and selection in the second stage is a reselection of the selected first stage mutants. In the first stage selection, the use of the Agar Piece Method (Ichikawa, 1971) is effective and resulted in the saving of valuable screening time. In the second stage selection the selection is performed on shaken flask cultures. The two-stage test compromises between time saved (in the first stage) and reliability. Ultraviolet radiation and N-methyl-N'-nitro-N-nitrosoguanidine are effective mutagens and the combined use of both is more superior to the single use of one in the breeding programme. The effect of selection is expectedly greatest in the beginning of the programme. The two main limitations of the selection procedure are the ignorance of the particular gene(s) responsible for oversynthesis of the antibiotic and the laborious nature of the procedure. However as an empirical approach, it is still overall, a very effective method of microbial breeding.

Keyword: Breeding; Microbial; Antibiotic; Mutation; Selection; Malaysia