

CHARACTERIZATION OF R-PLASMIDS CONFERRING RESISTANCE TO STREPTOMYCIN IN ENTEROBACTERIA ISOLATED IN EGYPT

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In Egypt, streptomycin is more common for the treatment of infectious diseases than in Europe. The wide spread of enterobacteria harbouring R-factors in the faeces of Egyptian patients has been reported before (Elkhoully & Wiedemann 1980). The characterization of these R-factors is the purpose of the present studies.

Plasmid DNA was prepared from 28 isolated strains and was purified by dye buoyant density equilibrium centrifugation (Clewell & Helinski 1969). The molecular weight of these plasmids was determined by gel-electrophoresis. The occurrence of a small plasmid having a MW 4.1 MD and carrying Sm Su resistance markers was more frequent (44.5%) than large plasmids, MW 45-55 MD and carrying multiple drug resistance (31%).

The isolated plasmids were successfully transformed into *E.coli* C 600. The numbers of transformants obtained when using trans-conjugative plasmids, were 40% with Sm Su resistance and 60% with multiple resistance. While all transformants obtained from using non-transferable plasmids, conferred Sm Su resistance only. All tested plasmid-DNA samples, except 3 cases, produced one transformant from each sample. The transformants have similar resistance patterns as the original strains carrying the plasmids. In the 3 cases, two transformants were obtained from each plasmid-DNA sample. The original strains of these plasmid-DNA preparations were found to carry two plasmids.

Since many transformants exhibited Sm Su resistance, their plasmids were isolated and characterized by restriction enzyme pattern analysis, using endonuclease hind III enzyme. The results showed that these plasmids have MW= 4.1 MD, confer resistance to streptomycin and sulpha drugs, and have the same restriction pattern as rPB1 plasmid (Wiedemann et al 1979). However, it was found that two transformants although carrying Sm Su resistance, their plasmids of larger MW and with different restriction pattern from rPB1. This means that Sm Su resistance could be present on a larger plasmid, probably with a transfer factor.

The strains were also tested for the presence of the inactivating enzymes phosphotransferase (APH 3") and adenyltransferase (AAD 3"). All strains harbouring R-factors have shown APH 3" activity and lacked AAD 3" activity. There was however one strain showing AAD3" but no APH 3" activity. Although plasmid-DNA was not isolated from this strain, the presence of AAD 3" activity may indicate the existence of a transposon element conferring antibiotic resistance by enzymatic inactivation (Hedges et al 1977).

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