THE HOST SPECIFICITIES OF THE LYSOGENIC PHAGE OF *ESCHERICHIA COLI* STRAIN W AND OF PHAGE Mu.

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A B S T R A C T

Investigation of the bacteriophages present in the supernant of broth cultures of E.coli strain W have demonstrated a phage which plates on E.coli strain C, designated W.C, and another phage which plates on E.coli strain K, designated W.K. Both phages are very closely related. Differences were observed in the ability of their respective lysogens to exclude phage Pl_v. By available criteria, the phage W.K was found to be indistinguishable from phage Mu. As such, E.coli W may be a natural reservoir for phage Mu.

Antisera were prepared against the phage W.C, W.K and Mu.K respectively. Neutralisation tests have demonstrated that the W phages and Mu phage may express one of several tail forms with respect to their tail components associated with host adsorption and therefore host specificity; the 'C' form is recognised by neutralising antibodies in the W.C antiserum, and the 'K' form is recognised by neutralising antibodies in the W.K and Mu.K antisera. Failure of any of these antisera to neutralise phage Mu propogated on Citrobacter freundii support the proposal for a third tail form 'F'.

Observation of the plating behaviour of these phages, W.C, W.K and Mu.K, together with their neutralisation characteristics established that the phages can vary their host range specificities in two different ways: either they behave as host range mutants, plating on E.coli strains C and K with approximately equal frequencies - extended host range mutants; or they exhibit an alternate host-specificity type of behaviour, plating efficiently, only on the host in which they were last propogated. In this latter mode, a distinct event, or possibly two events, are required at the genome level to permit the observed change in the host range phenotype. As phages W.K and Mu.K appear identical, and phage W.C is very closely related to phage W.K, the events required for this

phenotypic change to occur may as postulated include inversion of the G region of the phage DNA.

Recent studies overseas, and as presented here, demonstrate that induced phage Mu (or phage W.K) are of two type, a G(+) form and a G(-) form, which differ in the orientation of their G region. The G(+) form is the form of the phage adsorbing to, and propogating lytically on the host bacterium E.coli K, the G(-) form has been found to adsorb to and propogate on a restrictionless strain of C. freundii. The G(-) form of phage Mu was not neutralised by the W.C or the Mu.K antisera. As such, it represents a third tail form that the phage Mu is capable of expressing. Evidence is also presented that all these phage, W.C, W.K and Mu.K, and their derivatives may express a mom-like function.

A C K N O W L E D G E M E N T S

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