413/D

A preliminary study on application of phage-indicator model in evaluation of antiviral drugs.

A M A L R Malalasekara* and D L Jayaratne

Department of Microbiology, University of Kelaniya, Kelaniya

Due to newly emerging viral diseases and the building of rapid resistance among targeted viruses, the continuous search for useful and novel antiviral compounds has become important. Hence, a study was carried to develop a method for the preliminary screening of antiviral drugs and identification of their targeted stage of the viral replication cycle.

A model system of bacteriophage and susceptible *Escherichia coli*, isolated together from a sewage effluent was used for the screening process. Two plant extracts, each from *Carica papaya* leaves and *Psidium guajava* leaves and two plant based products each "Sudarshana Churnaya", an aurvedic drug and black tea produced from *Camellia sinensis* leaves were screened using two approaches developed based on plaque reduction assay to detect their effect on different stages of the phage replication cycle. In the first approach, the purified virus suspensions pre-incubated with filter sterilized herbal extracts were used to detect the antiviral effects of herbal extracts on adsorption and penetration steps. For the second approach, the host bacterium pre-incubated in filter sterilized herbal extracts were used as the indicator host to detect the effects of herbal extracts on intracellular replication steps of the virus replication cycle.

Screening revealed that black tea has the ability to inhibit viral propagation by preventing phage attachment to their host and *Carica papaya* leaf extract showed an ability to inhibit intracellular stage(s) of the bacteriophage's replicative cycle. The study provides evidence for the availability of antiviral compounds in plant extracts and plant based products which are used in routine life and traditional healing methods. The results also indicate that different herbal extracts apply different modes of action to prevent the propagation of the targeted virus.

Keywords: Antiviral drugs, bacteriophages, phage replication, plaque reduction assay

larirumalalasekara@gmail.com Tel: +94 7106378867