EFFECTIVE INOCULATION METHOD AND OPTIMUM CONCENTRATION OF *Oryctes* VIRUS TO INFECT *Oryctes rhinoceros* ADULTS

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The black beetle *Oryctes rhinoceros* (L.) is a wide spread pest of coconut, which causes economic losses to coconut in Sri Lanka. *Oryctes* virus (OrV) has been proven as an effective biological control agent of this pest. In many coconut growing countries *O. rhinoceros* adults infected with OrV in the laboratory and released to the field to spread the viral disease among healthy larvae and beetles. This research was carried out to determine the effective inoculation method and concentration of local OrV for successful infection of *O. rhinoceros* adults.

0.1 ml of 10^4 ppm of viral suspension was introduced orally to one set of beetles and another set of beetles were allowed to swimming in the suspension for 10 minutes. Beetles were dissected at different intervals to determine the period taken for infection. The infection was confirmed by the presence of characteristic milky white midgut. Five concentrations (10^1 ppm to 10^5 ppm) of virus suspensions were introduced to adult beetles orally to find the lethal concentration (LC_{50}) and lethal time (LT_{50}). Infection was ascertained by dissecting the dead beetles.

Percentage of infected beetles were significantly different ($P<0.001$) among the two methods of inoculation and untreated control. After 21 days of inoculation, oral introduction method, swim method and control recorded 88.8%, 44.4% and 11.1% of OrV infection respectively indicating the most effective inoculation method as oral introduction. The level of infection increased up to 11 days after inoculation and remaining same thereafter in all the treatments.

Cumulative percentage mortality of *O. rhinoceros* adults with 10^1ppm, 10^2 ppm, 10^3 ppm, 10^4 ppm and 10^5 ppm concentrations were recorded as 7.3%, 25.1%, 33.3%, 81.4% and 100% respectively. LC_{50} was $10^{2.7}$ppm and LT_{50} for

10^4 ppm and 10^5 ppm concentrations were 23 days and 12 days respectively. Best concentration to oral inoculation of *O. rhinoceros* with OrV for field release was selected as 10^4 ppm as infected beetles introduced should remain in the field for a reasonably long period to infect the field population.

Key words: Lethal concentration, Lethal time, *Oryctes rhinoceros, Oryctes* virus