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# Influence of Selected Chemical Constituents on the Lethal Effect of BACTIVEC® on Dengue Vector *Aedes aegypti*

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BACTIVEC® is a commercial larvicide containing toxin of *Bacillus thuringiensis* (*Bt*), soil dwelling bacterium, commonly used as a biological pesticide. This larvicide has been tested and sprayed for dengue vector control programmes. Spores and crystalline insecticidal proteins produced by *Bt* have been used to control insect pests since 1920. The objective of this study was to determine the influence of selected chemical constituents on the lethal effect of BACTIVEC® on dengue vector *Aedes aegypti*. *Ae. aegypti* 2nd instar larvae were reared in different concentrations of solutions containing $PO_4^{3-}$ and $NO_3^-$. Three ppm was found to be the concentration of BACTIVEC® that caused 100% mortality among *Ae. aegypti* larvae in tap water. Experiments were carried out using different concentrations of $PO_4^{3-}$ and $NO_3^-$ with and without fixed concentration (3 ppm) of BACTIVEC®. 10 larvae (2nd instar) of *Ae.aegypti* were reared in 100 ml water in 150 ml capacity plastic cups. Solutions having concentrations ranging from 500 to 3000 ppm of $PO_4^{3-}$-P and 250 to 2500 ppm $NO_3^-$-N were tested. Three replicates were run in parallel for every concentration of $PO_4^{3-}$ and $NO_3^-$. Larval mortality was recorded after 24, 48 and 72 h. The results revealed that 3000 ppm $PO_4^{3-}$-P solution and 2500 ppm $NO_3^-$ -N solution were able to cause 100% mortality on *Ae. aegypti* larvae in the absence of BACTIVEC®. Two-way ANOVA was performed to determine the effect of $NO_3^-$ and $PO_4^{3-}$ on the lethality of BACTIVEC®. The results showed a significant effect by $NO_3^-$ ($p= 0.03$) and insignificant effect by $PO_4^{3-}$ ($p= 0.49$) on the lethality of BACTIVEC®. The present study demonstrates that quality of water might influence the larvicidal property of BACTIVEC® and this should be taken into consideration when this larvicide is sprayed in different water bodies to control dengue vector in Sri Lanka.

*Keywords: Aedes aegypti, BACTIVEC®, dengue, larvicide, vector control*