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Anti-Viral Activity of Ethanolic Extract Derived from Chlorella sp. AARL G049 on Inhibition of Dengue Virus Serotype 2 Infection in vitro

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Abstract : Dengue virus (DENV) infection is a major public health problem in many countries, especially in tropical and subtropical countries. DENV infection causes dengue fever that can progress to serious conditions of dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS), relevant to a high risk of mortality. However, there are no effective treatments available against the manifestation and fatalities. Currently, natural extracts have been widely used for the treatment of infectious diseases due to their safety, non-accumulation in the body, or lower side effects. Chlorella spp. is a microalgae with anti-viral activity, but there is not much report to support its ability to inhibit DENV infection. Thus, this study aimed to investigate the inhibitory effect of ethanolic extract from Chlorella sp. AARL G049, which was explored in Thailand on inhibition of DENV-2 infection. The inhibitory effect on viral infection was assessed using a foci-forming assay (FFA), which revealed that a concentration of 125 µg/mL could inhibit viral infection in Vero cells by 75.45±8.06% when treated at the same time as DENV-2 infection. Moreover, the extract at an equal concentration effectively reduced viral protein synthesis by 90.51±5.48% when assessed in human cell lines using enzyme-linked immunosorbent assay (ELISA). Concordantly, the number of infected cells after treatment was reduced as measured by immunofluorescent assay (IFA). Therefore, the finding of this study supports the potential use of Chlorella sp. extract to suppress DENV infection.

Keywords : viral infection, flavivirus, treatment, natural extract
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