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journal homepage: www.elsevier.com/locate/apjtbOriginal article <http://dx.doi.org/10.1016/j.apjtb.2017.06.003>Antiviral activity of the dichloromethane extracts from *Artocarpus heterophyllus* leaves against hepatitis C virus

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ABSTRACT

Objective: To determine anti-viral activities of three *Artocarpus* species: *Artocarpus altilis*, *Artocarpus camansi*, and *Artocarpus heterophyllus* (*A. heterophyllus*) against Hepatitis C Virus (HCV).

Methods: Antiviral activities of the crude extracts were examined by cell culture method using Huh7it-1 cells and HCV genotype 2a strain JFH1. The mode of action for anti-HCV activities was determined by time-of-addition experiments. The effect on HCV RNA replication and HCV accumulation in cells were analyzed by quantitative reverse transcription-PCR and western blotting, respectively.

Results: The dichloromethane (DCM) extract of *A. heterophyllus* exhibited strong anti-HCV activity with an inhibitory concentration (IC₅₀) value of (1.5 ± 0.6) µg/mL without obvious toxicity. The DCM extracts from *Artocarpus altilis* and *Artocarpus camansi* showed moderate anti-HCV activities with IC₅₀ values being (6.5 ± 0.3) µg/mL and (9.7 ± 1.1) µg/mL, respectively. A time-of-addition studies showed that DCM extract from *A. heterophyllus* inhibited viral entry process through a direct virucidal activity and targeting host cells. HCV RNA replication and HCV protein expression were slightly reduced by the DCM treatment at high concentration.

Conclusions: The DCM extract from *A. heterophyllus* is a good candidate to develop an antiviral agent to prevent HCV re-infection following liver transplantation.

1. Introduction

Hepatitis C Virus (HCV) infection is a major health problems that lead to liver diseases such as chronic hepatitis, liver cirrhosis, and hepatocellular carcinoma. Approximately 170 million people of world population are chronically infected with HCV [1–3]. HCV exhibits high genetic diversity and different genotypes which are classified into seven (1–7) genotypes with 67 confirmed and 20 provisional subtypes [4]. In

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