A Literature Review: Indonesian Plants as an Antiviral Against Herpes Simplex Virus Type-1 (HSV-1)

Aktsar Roskiana Ahmad[1,a,*], Rachmat Kosman[2,a], Chikyta Putri Hijriah[3,a]

[a]Faculty of Pharmacy, Universitas Muslim Indonesia

[*]aktsar.roskiana@umi.ac.id

Abstract. ABSTRACT Background Herpes is a double-stranded DNA virus from the family Herpesviridae and subfamily Alphaherpesvirinae that infects humans. Acyclovir is the main therapy for herpes simplex infection with other prodrugs. However, this drug has various adverse effects so it is necessary usage the natural-based treatment by plants to treat herpes simplex infections. The aim of this research was to determine the potential of medicinal plants in Indonesia as an antiviral against the herpes simplex virus through review articles. Methodology This literature study was analyzed using the narrative method by classifying the extracted data and determining total flavonoid levels with the first stage, namely searching journals in databases such as Google Scholar, Pubmed, Elsevier, and Science Direct based on the keywords antivirus activity, antiviral activity, antiviral effectiveness. extract, and activity extract as an antiviral. The journals obtained were then screened based on inclusion criteria, namely Indonesian and English-language journals, journals with ISSN, journals published in 2011-2021, full-text pdf journals, and journals containing plant antivirals against herpes simplex virus. Results This research found that several Indonesian plants that have potential as antiviral including Phyllanthus niruri EC50 60, Phyllanthus amarus IC50 15,5, Phyllanthus urinaria IC50 <12,5, Phyllanthus watsonii IC50 11,9, Rhizophora mangle L 112,66, Orthosiphon stamineus (Flos EC50 73,5 and Leaf), EC50 44, Hibiscus EC50 2140, Pistacia vera L EC50 400, Cuminum cyminum IC50 180. Discussion The research reported the antiherpetic activity of several species of the Phyllanthus genus. The investigators assumed that the extract's activity depended on the direct inactivation of viral after virus adsorption and this might also occur in antiviral assays. Other research showed that the trigalloylglucopyronoside compound was only found in P. urinaria while quercetin rhamnoside was only found in P. urinaria and P. watsonii. The presence of trigalloylglucopyronoside in P. urinaria contributes to the stronger antiviral activity (Wee et al, 2013). Furthermore, Ripim et al, (2018) in their research reported that Orthosiphon stamineus contains secondary metabolites such as glycosides, phenolic compounds such as lipophilic flavones, flavonol glycosides and caffeic acid derivatives, mono-, di- and sesqui-terpenoids. Motamedifar (2011) in their research showed that the water and ethanol extract of CSE (Cinnamon Seed) did not show a significant inhibitory effect on HSV-1 in vero cells. The exact mechanism of antiviral activity of CSE (Cumin Seed) has not been studied. This may be due to the interaction of several components of CSE (Cumin Seeds) including phenolics with Vero cell membranes and/or the HSV-1 envelope. These findings can be the basis for further research to isolate the active compound, explain its structure, and evaluate it against a wider range of microorganisms with the aim of discovering new therapeutic principles in the treatment of HSV-1. Conclusion This study reports a few Indonesian plants that have antiviral against herpes simplex virus in which extract ethanol 70% Phyllanthus niruri has effective antiviral activity with CC50, IC50, and Selectivity index values about 2542 µg/mL, 60 µg/mL; and 42.37 respectively.

Keyword: medicinal plants, antiviral, and herpes simplex virus.