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Antileukemic Activity Of Bulb And Root Of Eleutherine Americana L. Merr. On Jurkat Human Leukemia Cell Line

Aisyah Al Humairo Rinaldi[1], *Waheedah Abdul Hakeem[1], Rozila Ismail[1], Rozita Rosli[2], Maha Abdullah[2]

[1]Faculty of Pharmacy, University of Cyberjaya, 63000 Cyberjaya, Selangor, Malaysia.

[2]Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

*Email waheedah@cyberjaya.edu.my

Abstract

Objectives: This study was designed to evaluate the antileukemic properties of bulb and root of Eluetherine americana L. Merr. extracts on Jurkat cell line and to determine the mode of cell death of Jurkat induced by both extracts.

Methodology: Jurkat and MRC-5 cell lines were treated with desired concentrations of ethanolic extracts of bulb (EEBE) and root (EERE) of E. americana and doxorubicin (positive control). MTT assay was conducted to calculate the cell viability. The half maximal inhibitory concentrations (IC_{50}) were then calculated based on the dose-response curves. Besides, morphological changes of Jurkat were observed under inverted microscope.

Results and discussion: Bulb exhibited a significant cytotoxic activity on Jurkat (IC_{50} = 3.855 ± 0.55 µg/mL) and MRC-5 (IC_{50} = 5.906 ± 0.125 µg/mL), while root exhibited a significant cytotoxic activity on Jurkat (IC_{50} = 13.087 ± 1.799 µg/mL) but a very weak cytotoxic activity on MRC-5 (IC_{50} = 98.547 ± 2.172 µg/ml). Doxorubicin (pure compound) also exhibited a significant cytotoxic activity on Jurkat (IC_{50} = 0.043 ± 0.015 µg/mL) and MRC-5 (IC_{50} = 0.082 ± 0.009 µg/mL). All samples induced apoptosis in Jurkat at concentrations near to IC_{50} and about 10 times higher of IC_{50}. Root and doxorubicin also induced necrosis at concentration about 10 times higher of IC_{50}, but only doxorubicin prominently induced necrosis.

Conclusion: EEBE and EERE can be further studied as the alternative for leukemia treatment.

Keywords Eleutherine americana, Jurkat, MTT assay, cytotoxicity, IC_{50}, apoptosis, necrosis.