Elucidation of in-vitro anti-inflammatory bioactive compounds isolated from *Jatropha curcas* L. plant root

Ahmad Razi Othman\(^{1,†}\), Norhani Abdullah\(^{2,3,†}\), Syahida Ahmad\(^{2,†}\), Intan Safinar Ismail\(^{1,4,†}\) and Mohamad Pauzi Zakaria\(^{5,†}\)

**Abstract**

**Background:** The *Jatropha curcas* plant or locally known as “Pokok Jarak” has been widely used in traditional medical applications. This plant is used to treat various conditions such as arthritis, gout, jaundice, wound and inflammation. However, the nature of compounds involved has not been well documented. Hence, this study was conducted to investigate the anti-inflammatory activity of different parts of *J. curcas* plant and to identify the active compounds involved.

**Methods:** In this study, methanol (80%) extraction of four different parts (leaves, fruits, stem and root) of *J. curcas* plant was carried out. Phenolic content of each part was determined by using Folin-Ciocalteau reagent. Gallic acid was used as the phenol standard. Each plant part was screened for anti-inflammatory activity using cultured macrophage RAW 264.7 cells. The active plant part was then partitioned with hexane, chloroform, ethyl acetate and water. Each partition was again screened for anti-inflammatory activity. The active partition was then fractionated using an open column chromatography system. Single spots isolated from column chromatography were assayed for anti-inflammatory and cytotoxicity activities. Spots that showed activity were subjected to gas chromatography mass spectrophotometry (GC-MS) analysis for identification of active metabolites.

**Results:** The hexane partition from root extract showed the highest anti-inflammatory activity. However, it also showed high cytotoxicity towards RAW 264.7 cells at 1 mg/mL. Fractionation process using column chromatography showed five spots. Two spots labeled as H-4 and H-5 possessed anti-inflammatory activity, without cytotoxicity activity. Analysis of both spots by GC-MS showed the presence of hexadecanoic acid methyl ester, octadecanoic acid methyl ester and octadecanoic acid.

**Conclusion:** This finding suggests that hexadecanoic acid methyl ester, octadecanoic acid methyl ester and octadecanoic acid could be responsible for the anti-inflammatory activity of the *J. curcas* root extract.

**Keywords:** Plant parts, Hexane extract, Hexadecanoic acid methyl ester, Octadecanoic acid methyl ester, Octadecanoic acid