Identification of anti-inflammatory compound/compounds in hexane fraction of Jatropha curcas root extract

ABSTRACT

Jatropha curcas is a medicinal plant with many therapeutic properties such as anti-inflammatory, anti-malaria, anti-cancer and antioxidant. The root extract has been shown to possess high anti-inflammatory activity. Previously, the compounds responsible for this activity have not been fully elucidated. Two fractions (Fraction 1 and Fraction 2) obtained from a preparative HPLC of the root extract showed significant anti-inflammatory and cytotoxic activities in RAW 264.7 murine macrophage cells with Fraction 1 giving higher nitric oxide (NO) inhibition compared to Fraction 2 and L-NAME. Further purification steps involving column chromatography, thin layer chromatography and analytical HPLC of Fraction 1 produced two fractions labeled as Fraction A and Fraction B. Both fractions showed anti-inflammatory activity without cytotoxic activity in RAW 264.7 cells. Liquid chromatography tandem mass spectrometry (LC-MS/MS) analysis showed that Fraction A contained a group of 18 carbon fatty acid compounds consisting of 2 oxooctadecanoic acids; 15, 16 dihydroxy 9Z, 12Z octadecadienoic acid; octadecadienoic isomer and 15,16 dihydroxy 9Z, 12Z octadecadienoic acid, 15S, 16S. The 18-carbon fatty acid structure was confirmed by nuclear magnetic resonance (NMR) spectral data. The IC_{50} value of compounds in Fraction A for anti-inflammatory activity in RAW 264.7 cell line was 434.8±0.75 µg/mL. From the analysis, it can be concluded that Fraction A can be classified under 18 carbon long chain fatty acid group based on LC MS/MS and NMR analysis. This active compound shows an inhibition towards NO activity.

Keyword: Jatropha curcas; Anti-inflammatory; C 18 fatty acids; Octadecanoic acid; IC_{50}