

Gas Chromatography-Analysis, Antioxidant, Anti-Inflammatory, and Anticancer Activities of Some Extracts and Fractions of *Linum usitatissimum*

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Abstract : Context: *Linum usitatissimum* (Linn), known as Flaxseed, is one of the most important medicinal plants traditionally used for various health as nutritional purposes. Objective: Estimation of total phenolic and flavonoid contents as well as evaluate the antioxidant using α , α -diphenyl- β -picrylhydrazyl (DPPH), 2-2'azinobis (3-ethylbenzthiazoline-6-sulphonic acid (ABTS) and total antioxidant capacity (TAC) assay and investigation of anti-inflammatory by Bovine serum albumin (BSA) and anticancer activities of hepatocellular carcinoma cell line (HepG2) and breast cancer cell line (MCF7) have been applied on hexane, ethyl acetate, n-butanol and methanol extracts and also, fractions of methanol extract (hexane, ethyl acetate and n-butanol). Materials and Methods: Phenolic and flavonoid contents were detected using spectrophotometric and colorimetric assays. Antioxidant and anti-inflammatory activities were estimated in-vitro. Anticancer activity of extracts and fractions of methanolic extract were tested on (HepG2) and (MCF7). Results: Methanolic extract and its ethyl acetate fraction contain higher contents of total phenols and flavonoids. In addition, methanolic extract had higher antioxidant activity. Butanolic and ethyl acetate fractions yielded higher percent of inhibition of protein denaturation. Meanwhile, ethyl acetate fraction and methanolic extract had anticancer activity against HepG2 and MCF7 ($IC_{50}=60 \pm 0.24$ and $29.4 \pm 0.12 \mu\text{g.mL}^{-1}$) and ($IC_{50}=94.7 \pm 0.21$ and $227 \pm 0.48 \mu\text{g.mL}^{-1}$), respectively. In Gas chromatography-mass spectrometry (GC-MS) analysis, methanolic extract has 32 compounds, whereas; ethyl acetate and butanol fractions contain 40 and 36 compounds, respectively. Conclusion: Flaxseed contains totally different biologically active compounds that have been found to possess good variable activities, which can protect human body against several diseases.

Keywords : phenolic content, flavonoid content, HepG2, MCF7, hemolysis-assay, flaxseed

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