

A Comparative Study of in Vitro Lipoxygenase Inhibition and DPPH (1, 1-Diphenyl-2-Picrylhydrazyl) Free Radical Scavenging Activity of *Silybum marianum* and [*Notobasis syriaca* (L.) Cass.] Fruits and *Linum usitatissimum* Seeds

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ABSTRACT

Silybum marianum and *Notobasis Syriaca* belong to the most widespread thorny plants in the Middle East, the Mediterranean, and large areas of Asia. Both plants are derived from the Asteraceae family, while Flax seed (*Linum usitatissimum* L.) is belong to the family of Linaceae.

The aim of this study was to compare the scavenging activity of free radicals, and to evaluate the anti-inflammatory activity of the fruit in vitro compared with flax seed. Methanol and ethanol extracts were prepared and the activity of scavenging free radicals was studied using DPPH, and the anti-inflammatory activity was investigated in-vitro using soybean lipoxygenase, in comparison with quercetin and Lignin as standards.

The fruit extract from *Notobasis Syriaca* has the highest capacity to scavenge free radical DPPH ($IC_{50}=22.1 \mu\text{g/ml}$), and it has higher ability to inhibit soybean lipoxygenase in-vitro ($IC_{50}= 2.7 \mu\text{g/ml}$) than fruit extract from *Silybum marianum* ($IC_{50}= 9.8 \mu\text{g/ml}$). This study showed that *Silybum marianum* and *Notobasis Syriaca* have a high ability to scavenge free radicals; and that both plants possess anti-inflammatory properties, while the scavenging potential of free radicals expressed in terms of IC_{50} ($\mu\text{g/ml}$) of flax seed showed extraction with a mixture of equal volumes of diethyl ether and ethyl acetate after direct acid hydrolysis exhibited higher antioxidant capacity ($IC_{50}=22.257\pm 0.095 \mu\text{g/ml}$). The median inhibitory concentration (IC_{50}) was calculated according to the LOX enzyme inhibitory method. The IC_{50} value of a mixture of equal volumes of diethyl ether and ethyl acetate after direct acid hydrolysis extract of flaxseeds is $73.689\pm 0.585 \mu\text{g/ml}$.

As final conclusion it was found that flax seed extract has the highest anti-inflammatory activity.

Keywords: Lignans, antioxidant, flax seeds, *Silybum marianum*, *Notobasis Syriaca* DPPH, lipoxygenase inhibitory activity.