

Hypolipidemic Effect of Seed Oil of Noni (*Morinda citrifolia*)

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Morinda citrifolia, has been reported to possess different biological activities and almost all parts of this have been studied phytochemically. However there are few studies on the seeds of fruit. The objective of present study was investigated the effect to Noni Seed Oil (NSO) on serum lipid levels in normolipidemic and hyperlipidemic induced mice. We find that administration of noni oil causes a reduction in total cholesterol and triglycerides levels in both models. However hypolipidemic effect is higher when hyperlipidemia is presented.

Keywords: *Morinda citrifolia* seed oil, Atherogenic Index, Linolenic acid, hypolipidemic effect, tyloxapol.

Morinda citrifolia L. (Rubiaceae) commonly known as noni, is an evergreen tree may reach heights of 3 to 8 m tall. Its leaves range from 10 to 45 cm long and it bears tubular white flowers and a green fruit. This fruit turns yellow and then white as it ripens, has a pungent odor and contains seeds of about 3 mm in length. This plant is native to Asia, Australia and Polynesia [1]. The plant is used in the treatment of arthritis, headaches, digestive problems, diabetes mellitus, high blood pressure, and angina pectoris among others [2]. The Leaves, stem, root, fruit and seeds of noni are used in various forms such as capsules, teas, juice and oil [2,3].

Due to the great popularity of this plant many phytochemical studies have been carried out in which have reported compounds as iridoids, anthraquinones phenolics, glycosides of fatty acids and alcohols, coumarins, flavonoids, alkaloids and terpenes [4]. Regarding the biological activity of this specie, the antimicrobial effect was the first observed property [5], however other effects like antitubercular [6], hypoglycemic [7], anti-inflammatory [8], antitumor [9] and analgesic [10] have been reported.

Among these one evaluated the toxicity and nutritional value, as well as the determination of the fatty acid composition to assess if it is usable as edible vegetable oil. Seeds constitute 2.5% of the whole fruit and are considered a waste in the industrial process for making juice [3]. Although anthraquinones and fatty acids such as arachidonic and palmitoleic have been isolated from these seeds, it has not been established whether they show any biological activity [1].

Hyperlipidemic is defined as elevated lipid levels in plasma, and represent one of the factors associated with cardiovascular diseases, which are a worldwide death cause [11-13]. Treatment of dyslipidemia reduces cardiovascular events. The modern pharmacological therapy for abnormal lipids is effective but is expensive and it is associated with side-effects leading to patient incomppliance. For this reason, our work evaluates the effect of NSO on lipid levels (total cholesterol (chol), triglyceride (Tg), high density lipoprotein (chol-HDL), in normolipidemic and hyperlipidemic mice. Castelli's Atherogenic Index (AI) was calculated for determined risk factor of cardiovascular disease with noni seed oil consumed.

Table 1: Gas chromatographic retention times (Rt) and molecular weights of fatty methyl esters from NSO.

Compound	Rt (min)	M ⁺ (amu)	%
Methyl palmitate	38.5	270	9.4
Methyl palmitoleate	39.2	268	0.7
Methyl stearate	42.5	298	4.2
Methyl oleate	43.1	296	15.9
Methyl linoleate	44.2	294	67.8

Analysis of NSO

The total yield of oil for two extractions of dried seeds was 12%. GC-MS analysis of the FAME (fatty acid methyl esters) prepared by transesterification procedure indicated the presence of five fatty acids with the relative composition shown in Table 1. The FAME showed mass spectra with molecular ions at *m/z* 270, 268, 298, 296 and 294, corresponding to the retention times of 38.5, 39.2, 42.5, 43.1, 44.2 min. These times indicated the presence of palmitic (C₁₆), palmitoleic (C_{16:1}), stearic (C_{18:0}), oleic (C_{18:1})