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FATTY ACID COMPOSITION OF *MELIA AZEDARACH* SEED OIL (BAKAIN)

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Fatty acid composition of the Bakain seed has been investigated. It was found to contain palmitic (6.93%), stearic (2.98%), oleic (8.2%) and linoleic (82.05%) acids. Possibility of its commercial exploitation has been discussed.

INTRODUCTION

Melia azedarach Linn, belongs to Meliaceae family and is commonly known as 'bakain' or 'drek.' The bakain tree is commonly grown in the Indo-Pakistan subcontinent as an ornamental shade tree. It also grows wild at altitudes between 2000–3000 ft above sea level. The various parts of the tree are reputed to have the same therapeutic values as those of nim tree [1]. In the Punjab its seeds are prescribed in reheumatism. The bakain fruit has been analysed and it is known that the seed contains fixed oil (30%) [1].

Konovalov *et al.* [2] also confirm the domination of linoleic acid in the oil of *M. azedarach,* however, it has been claimed that the longer fruits have higher percentage of unsaturation whereas the smaller ones have lower percentage of unsaturated fatty acids. Eckey [3] reviews the literature up to about 1950 in which it has been shown that the China berry *(M. azedarach)* contains mostly linoleic and oleic acids. It is also mentioned that the oil has been used in India for soap making. More recently Kaplan [4] reports the chemical composition of the African variety of *M. azedarach* in which GLC of the fatty acid ester has been reported. It is also known that the fruit of *M. azedarach* is poisonous [4]. This work deals with the detailed analysis of the oil from seeds of the fruit of *Melia azedarach,* harvested in Pakistan. The fruit used in this paper was completely mature fruits of the species found predominatly in the Punjab.

EXPERIMENTAL

The bakain seeds were ground in pestle and mortar and extracted in a Soxhlet extractor with hexane. Removal of the solvent and drying over anhydrous sodium sulphate gave a pale yellow oil (30%). With an iodine value 136.50. The physicochemical properties of the oil determined by standard methods [5, 6] are: Refrective index 1.428, saponification value 269.20, iodine value 136.50, peroxide value 8.80, specific grevity 0.89, and acid value 1.20.

The methyl esters [7] of the fatty acids were prepared directly from the oil with methanol, acetyl chloride and benzene. GLC of the esters after drying over sodium sulphate in petroleum ether was done on a Pye Unicam 104 Series using a glass column 1.5 mx4 mm packed with 20% DEGS on diatomite (80–100) mesh. Column temperature was maintained at 180° and nitrogen gas was used as the carrier gas. Detection was made by flame ionisation detector.

DISCUSSION

The fatty acid composition of the bakain seed oil

Table 1. Some linoleic acid-rich oil seeds.

Taxonomic name	Local name	Linoleic acid contents (%)	Ref
Oilseeds of Importance			
Helianthus annuus	Sunflower	44.2–75.4	8
Carthamus tinctorius	Safflower	72.9–79.0	3
Nicotina tabacum	Tambakoo	60–77.3	15
Papaver somniferum	Khashkhash	62.2–73.0	8
Oilseeds of Minor Importance			
Salvia spinosa	Kanucha	89.5	13
Ocimum pilosum	Tukhm-i-Rehan	89.8	13
Morus alab	Shahtut	84.06	14

reveals that it contains linoleic acid as a major component alongwith palmitic (C-16, 6.93%), stearic (C-18, 2-98%), oleic (C-18:1, 8.02%), and linoleic (C-18:2 82.05%) acids. Some previously reported linoleic acid-rich seed oils [6, 8] are given in Table 1.

It can be seen that the bakain seed oil falls amongst the top-three-highly-rich linoleic acid containing oil seeds. Nutritive and medicinal values of linoleic acid in vegetable oils have been discussed elsewhere [9–12].

However, there are a number of factors which may affect the commercial exploitation of the bakain seeds as a source of linoleic acids. Firstly the difficulty of collecting seeds which can be overcome by the cooperation of forest department of the provinces as an average bakain tree gives about a maund of dry fruit during season (March–April). Secondly the low percentage of seed in the whole fruit (6.80%). It has been found that linoleic acid separates essily from the bakain seed oil thus the seeds can be a good source of linoleic acid.

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