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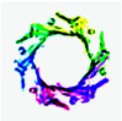

PHYTOCHEMICAL AND PHYSIOCHEMICAL SCREENING OF *PONGAMIA PINNATA* SEEDS

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Abstract- *Pongamia pinnata* (Family *Fabaceae*) popularly known as Karanja in hindi, Indian been in English. The *Pongamia pinnata* seeds oil was extracted through sohxlet and its components were identified through gas chromatography; physicochemical analysis of oil indicates the acid value (2.3), Iodine value (113), Saponification value (186), Viscosity (40.27), fatty acid composition was estimated through GC and it shows the presence Stearic acid, Palmitic acid, Arachidic acid, oleic acid and Linoleic acid respectively.
Key words: *Pongamia pinnata* Physicochemical, Viscosity, Chromatography, Fatty acids.

INTRODUCTION

India is endowed with rich wealth of medicinal plants; It recognizes more than 2500 plant species which have medicinal value. *Pongamia pinnata* locally known as karanja is a mangrove plant belonging to genus pongamia and family Fabaceae (Chopra et al., 1958). It is medium sized glabrous evergreen tree with short bole attaining height of around 18-20meter and its habitat is in the littoral region of south east Asia, Australia, [2,3] and widely distributed in India, Pakistan, Bangladesh, Philippine and Australia (Ali, 1980., Ghani, 1998., and Kirtikar, 1994). The leaves are soft, shiny burgundy in summer and mature to a glossy deep green as the season progress. Small cluster of flowers blossom on branches throughout the year, maturing into a brown pods. The leaves are good sources of green mature and being leguminous, they enrich the soil with nitrogen (Kumar et al., 2007). It is predominantly cultivated through seeds and genetic diversity has been conserved through storage of seeds, the most common conventional and economical method (Robert 1972 and Hong, 1996). Seeds are elliptical, reniform, compressed reddish brown, fairly hard and 2-3cm long (Kumar et al., 2007). The seed contains 30-54% of oil, which has been identified as a good source for bio-fuel and has medicinal value. Seed oil has been used in bronchitis, chronic fever, hypertension, whooping cough, chronic skin diseases, leprosy, piles, diabetics and ulcers (Ghani, 1998., Kirtikar, 1994). Oil of *Pongamia pinnata* is used in Indian ayurvedic herbal medicine and cosmetic preparations (Barkiet al., 2007, Kapoor. 2001, Wagh et al., 2007). Its constituents have been studied by Sharmeel et al.(1996) and Kiran et al.(1998) and its antimicrobial activities have also been investigated by Simon et al.(2002) and Wagh et al.(2007). *Pongamia pinnata* found in Bidar and Gulbarga has studied for it fatty acid composition. We have designed this study to investigate the physiochemical properties, fatty acid composition and elemental analysis of seeds of *Pongamia pinnata*.

MATERIALS AND METHODS

Collection of sample and Sohxlet extraction

Seeds of *Pongamia pinnata* were collected from Bidar and Gulbarga local area. 5Kg seeds were ground and shade dried for 10-15 days. The dried powder was subjected to Sohxlet apparatus using n-hexane solvent. After eight hours of reflux the oil was extracted and solvent was separated under vacuum. Separated oil was dried over anhydrous sodium sulfate and yield was calculated.

Chromatographic analysis

The seed oil was saponified with alcoholic potash and extracted with diethyl ether to remove the non-saponifiable matter. Fatty acids were then generated from the soap by acidification, fallowed by extraction with petroleum ether. This extract were washed properly 3-4 times with water and dried over anhydrous sulphate (AOAC, 2003). Methyl esters were prepared by using of the methanol and boron tri-fluoride (Kumar et al., 1978). The gas chromatography analysis was carried out with GC-14A fitted with flame ionizer and data processor. A PEG capillary column with

temperature of 150-200°C. The detector temperature was maintained at 230-300°C respectively. Flow nitrogen gas 20ml/min at split ratio of 1:50. The identification of components was based on their retention time as compared those obtained from methyl esters of known fatty acids analyzed under the same condition.

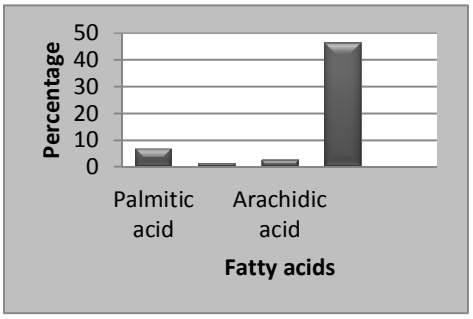

Fig. 1- Fatty acid composition of *Pongamia pinnata* seed oil

Thin layer Chromatography

Mono, Di and Tri Glycerides in the oil have determined by Thin layer chromatography. TLC plates (20X20cm) plates of 0.25mm thickness were prepared, in this silica gel was used as an adsorbent. Glycerides were fractionated by using the solvent system hexane: ether: acetic acid (80:20:2, v/v). The different components of lipids were identified by comparing their Rf values with the standards and then verified by using specific spraying reagents (Javed et al., 2000).

For the quantitative determination of lipids were streaked on 5 TKC plates coated with 0.5mm silica gel. After development the bands were located and scrapped after spraying the plates with o.2% of 2,7-dichlorofluroscein solution and view under UV light. The scraped bands were extracted with chloroform methanol mixture (2:1, v/v) separately. The solvent was removed under reduced pressure and the respective lipids were weighed and quantified.

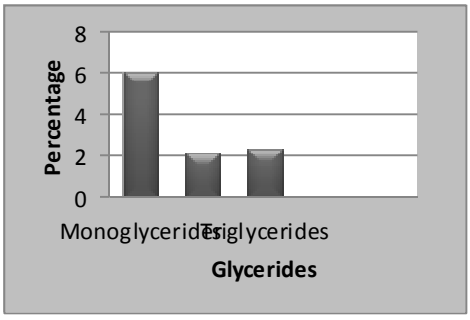

Fig. 2- Percentage of Glycerides in the seed oil of *Pongamia pinnata*

Physicochemical analysis of the seed oil for iodine value, Saponification value, viscosity, flash point and ash content has performed according to the standard methods of AOAC, 1998.

Table 1- physicochemical analysis of Pongamia pinnata seed oil

Sl.No	Parameter	Result
1	Iodine value	113
2	Saponification value	186
3	Acid value	2.3
4	Viscosity	40.27
5	Flash point	182
6	Ash content	2.6

RESULT AND CONCLUSION

Oil extraction was carried out by sohxlet extraction method as per the direction of standard procedure of AOAC. Hexane was used as extracting solvent seeds. Seeds were soaked into hexane and extraction carried out for eight hours. The solvent was evaporated under vacuum and pure oil was dried over sodium sulfate. It was thick acrid smell having yield 32.2%.

Methyl esters of this oil were studied in GLC and compared with standard available. Fatty acids like Palmitic acid 6.8%, Stearic acid 1.3%, Arachidic acid 2.56%, Oleic acid 46.43% and Linoleic acid18.2% were found. Oleic acid was in maximum concentration and it was more compared to the other fatty acids.

Physicochemical analysis were carried out and it was given Iodine value 113, Saponification value186, Acid value 2.3, Viscosity 40.27, Flash point 182, Ash content 2.6 were found.

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