

## NOTE

**Analysis of the Oil from the Seeds of *Sesbania aegyptiaca* Poir**

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The fixed oil from the seeds of *Sesbania aegyptiaca* Poir has been analyzed for its analytical characteristics and fatty acid composition. The seeds contain 6.2% greenish yellow oil. The GLC analysis has revealed the presence of fatty acids, viz., palmitic (9.8%), stearic (18.2%), lignoceric (2.6%), oleic (25.8%), linoleic (37.4%) and linolenic (11.5%). The unsaponifiable matter (4.0%) of the oil consists of  $\alpha$ -amyrin,  $\beta$ -sitosterol and lupeol.

**Key Words:** *Sesbania aegyptiaca*, Leguminosae, Fatty acids.

*Sesbania aegyptiaca* Poir<sup>1-4</sup> (N.O. Leguminosae) is commonly known as "Jayati" in Hindi. It is a useful medicinal plant which is employed in the indigenous system of medicine and found throughout India and Ceylon (Srilanka). It is well known for its medicinal properties and used for the treatment of various ailments such as diarrhoea, chronic ulcers, small pox, eruptions, itching of the skin, fevers, diabetes, leucoderma, cough, biliousness, inflammations and tuberculous glands<sup>5</sup>.

The present communication deals with the analysis of various analytical characteristics and fatty acid composition of the seeds oil of *Sesbania aegyptiaca* Poir.

The seeds were procured from M/s Sidh Seeds Sales Corporation, Dehradun (U.P.) and authenticated by the Department of Botany, Dr. H.S. Gour Vishwavidyalaya, Sagar, India.

Cleaned and air dried seeds (2.5 kg) were crushed and extracted with petroleum ether (60–80°C) in a soxhlet extractor for 80 h. The extract was dried over anhydrous sodium sulphate and after removal of the solvent, oil was obtained in 6.2% yield (greenish yellow). The analytical characteristics of the oil determined by the standard methods are given in Table-1.

The oil obtained from the petroleum ether (60–80°C) extract was saponified by a solution of KOH /H<sub>2</sub>SO<sub>4</sub> in 95% alcohol (500 mL) by boiling under reflux for 4 h and the excess of alcohol distilled off. The soap formed was cooled and dissolved in water. The unsaponified matter was separated by shaking (soap solution) continuously with ether in a separating funnel. The solvent was distilled off when a yellow coloured compound was obtained.

TABLE-1  
ANALYTICAL CHARACTERISTICS OF SEEDS OIL OF  
*SESBANIA AEGYPTIACA* POIR

S. No.	Characteristics	Value
1.	Colour	Greenish yellow oil
2.	Yield (%)	6.2
3.	Specific gravity at 30°C	0.9220
4.	Refractive index at 30°C	1.4925
5.	Iodine value	105.8
6.	Acid value	3.2
7.	Saponification value	194.5
8.	Unsaponifiable matter (%)	4.0

The mixed fatty acids were separated into solid and liquid fatty acid by Twitchells lead salt alcohol process<sup>6</sup> as modified by Hilditch and co-workers<sup>7</sup>. Various analytical characteristics of solid and liquid fatty acids were determined and found to have the following contents.

TABLE-2

S.No.	Fraction	Yield (%)	Acid value	Sap. value	Iodine value
1.	Solid	72.8	3.1	220.45	3.8
2.	Liquid	21.5	4.3	196.20	112.6

The solid and liquid fatty acids were chromatographed by paper chromatography<sup>8</sup> on Whatman No. 1 filter paper in different solvent systems: (i) 75% ethanol, (ii) methanol : acetic acid : petroleum ether (80 : 1 : 7) by ascending and descending chromatographic technique. The observation and results are recorded in Table-3.

TABLE-3  
R<sub>f</sub> VALUE OF FATTY ACIDS AND THEIR COMPOSITION IN SEED OIL

Fatty acids	Solvent system I		Solvent system II		Composition of fatty acids (%)
	Recorded R <sub>1</sub>	Found R <sub>1</sub>	Recorded R <sub>2</sub>	Found R <sub>2</sub>	
Palmitic acid	0.39	0.38	0.35	0.33	9.8
Stearic acid	0.28	0.26	0.25	0.25	18.2
Lignoceric acid	—	0.32	—	0.41	2.6
Oleic acid	0.46	0.45	0.62	0.60	25.8
Linoleic acid	0.40	0.38	0.82	0.81	37.4
Linolenic acid	0.45	0.44	—	0.72	11.5

#### Quantitative Estimation of Fatty Acid by GLC

The quantitative analysis of the fatty acid was done by GLC techniques using their methyl esters. The mixed fatty acids were converted into their methyl ester<sup>9</sup> and analyzed by GLC. Varian vista 6000 model gas chromatograph was used under the following conditions:

1. Column temperature (°C)	182
2. Injection port (°C)	300
3. Detector (°C)	300
4. Carrier gas	N <sub>2</sub>
5. Rate of flow	110 mL/min
6. Chart speed	10''/h
7. Attenuation	5 × 100

The methyl esters were identified by co-GLC with authentic samples and their quantitative analysis was done by calculating the various signal areas.

Unsaponifiable matter consists of  $\alpha$ -amyrin,  $\alpha$ -sitosterol and lupeol. These compounds have identified with the help of GLC technique and IR spectroscopy.

Table-3 shows the seeds oil of *Sesbania aegyptiaca* to consist of the following fatty acids: palmitic acid (9.8%), Stearic acid (18.2%), lignoceric acid (2.6%), oleic acid (25.8%), linoleic acid (37.4%) and linolenic acid (11.5%), while earlier workers have reported low percentage of these fatty acids. The major component fatty acids of this seeds oil are linoleic, oleic and stearic. It is low in unsaponifiable content. The unsaponifiable matter (4.0%) of the oil consists of  $\alpha$ -amyrin,  $\beta$ -sitosterol and lupeol first time.

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