

Extraction, Characterisation and Antibacterial Activity of *Caesalpinia bonducella* Seed Oil Using n-Hexane as Solvent

N. RAMAN* and J. MUTHUMUNIASAMY†

Department of Chemistry, VHNSN College, Virudhunagar-626 001, India

The oil is extracted from *Caesalpinia bonducella* seeds using n-hexane as solvent. It is evaluated for oil content and some physico-chemical characteristics. The oil shows antibacterial activity against the gram-negative bacteria *Pseudomonas aerogenosa*.

Oil is used for edible and also for other industrial purposes. The nature of the oil depends upon its physico-chemical properties. From the different physico-chemical properties of the oil one can suggest whether it is suitable for edible purpose or for other industrial purposes. *Caesalpinia bonducella* is one of the important medicinal plants especially in 'Ayurveda'. This plant is distributed throughout India, in the plains on waste lands and coastal areas. It is common in Bengal and South India and is often grown as a hedge plant.

Ghatak¹ isolated the oil through extraction with chloroform. Investigation on the chemical components of the kernel have failed to reveal the presence of any active principle with pharmacological action. Hypoglycaemic, anti-hyperglycaemic and hypolipidemic activities of the aqueous and 50% ethanolic extracts of the *Caesalpinia bonducella* seeds were studied in normal and streptozotocin diabetic rats by Sharma *et al.*² Ali *et al.*³ isolated four triterpenoids and two sterols for the first time from the *Caesalpinia bonducella*.

But no work has been reported on the extraction and characterisation of oil from the *Caesalpinia bonducella* seeds using n-hexane as a solvent. In the present work, a study of the extraction using n-hexane as solvent and characterisation of the oil have been proposed.

The oil content of the kernels was determined by Soxhlet apparatus using n-hexane as solvent. The *Caesalpinia bonducella* seeds were decorticated in dry condition and the kernels were separated, dried, powdered and packed in a quantitative filter paper. The filter paper packed powdered seeds was taken in the Soxhlet apparatus. Extraction of the oil was done with n-hexane as the solvent. The extract containing the oil was distilled off and the oil was dried in vacuum to remove traces of solvent vapour. The physical and chemical characteristics of this oil were determined by the standard procedures⁴. Nutrient agar was used for testing the susceptibility of micro-organisms to antibacterial agents using the disc diffusion method.

†Department of Biochemistry, VHNSN College, Virudhunagar-626 001, India.

The oil content in the kernels of *Caesalpinia bonducella* was found to be 35.7%. It is compared with some of the conventional oil seeds, viz. groundnut, coconut, sunflower and sesame⁵. The results reveal that the seeds cannot be a good source of oil to be exploited economically. The oil obtained from *Caesalpinia bonducella* was yellow in colour. The characteristics of the oil determined by standard methods are given in Table 1.

TABLE-1
CHARACTERISATION OF THE CAESALPINIA BONDULCELLA OIL

Properties	Values
Yield of oil	35.7%
Percentage of FFA	1.74
Acid value	3.48
Iodine value (Wij's method)	61.2
Saponification vlaue	205.7
Fibre content value	22.8
Percentage of nitrogen	0.53
Percentage of protein	3.30

The low iodine value of the oil indicates the presence of large amount of saturated fat and it cannot be used as a drying oil in the manufacture of paints and varnishes. The high saponification value indicates the presence of low molecular weight triglycerides and hence low molecular weight acids. Percentage free fatty acid (FFA) indicates that the oil cannot be hydrolysed and oxidised easily by the atmospheric moisture and air. Thus, it can be easily stored for a long time without hydrolysis and oxidation *i.e.*, it cannot be easily rancidised.

This oil has been screened for antibacterial activity against the gram-negative bacteria *Pseudomonas aerogenosa* using diffusion method. It is evident from the results that the oil showed antibacterial activity against the above micro-organism.

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