

Flower Essential oil of *Wrightia tinctoria* (Roxb.) R.Br. GC-MS Analysis and Odour evaluation.

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Abstract:

Wrightia tinctoria (Roxb.) R.Br. belongs to family Apocynaceae is found in Western Ghats of India and is popular for its fragrant flowers and leaves oil. Extraction of essential oil from flowers was standardized by soxhlet extraction with ethanol. Essential oil extracted from flowers was also subjected to GC-MS analysis. The major components identified by soxhlet method were Phenol, 4-ethyl-2-methoxy (1.75), 3-Pyrimidinecarboxylic acid (1.69), 2, 5, 7-Nonatrien-4-one (0.91), 3-methyl-3-butanoic acid (11.52), 3, 6-Dioxo-2, 7-Disilanone-4,5-dicarboxylic acid (0.84), 2, 2, 7,7-tetra methyl-dimethyl ester (1.05), Diethyl phthalate (0.96). The major components identified in flowers by soxhlet technology were 15-methyl, methyl ester (40.90), Hexadecanoic acid (20.12) and Propanoic acid, 2-mercapto (15.40). The essential oils extracted from *Wrightia tinctoria* (Roxb.) R.Br. were also subjected to olfactory evaluation.

Keywords: Apocynaceae, soxhlet extraction, ethanol extract, olfactory evaluation.

1. Introduction:

India is rich source of aromatic and medicinal plants (1). It possesses a rich and diverse variety of plant resources to meet the growing demand for plant-based drugs, perfumery and flavor items. Aromatic plants are great demand due to their unique properties. Aromatic plants and medicinal plants is one of fastest growing sector in the world. Growing demand for herbal products in the recent led to the high in global market.

Maharashtra has been considered as a wellspring of valuable aromatic plant species. Aromatic plants include a large group of economically important plants that provide basic raw materials for medicines, perfumes, flavors and cosmetics. During the last decades there has been a renewed interest in recognising plants as a source of drugs, perfumes and cosmetics which may be due to little or no side effects associated with their application and user friendly and environment friendly products [2].

Wrightia tinctoria R.Br. (Apocyanaceae) is a small to medium-size deciduous tree. The Flowers is white in color and one of the important fragrant tree species, 1-5 cm long, arranged in lax dichasial cymes (5 cm long) [3]. It is known by common name as “Indrajav”. It has got very important place traditional healing and also is widely recognized medicinal plant. The medicinal value of this plant for the treatment of a large number of human ailments is mentioned in Ayurveda, Siddha, Unani and folk medicine [4].

No standard extraction protocol of essential oil for flowers of *Wrightia tinctoria* R.Br. has been reported till date. The aim of this study was to standardized protocol of extraction of flowers essential oil of *Wrightia tinctoria* R.Br. and incorporate the oil in different cosmetic products.



Figure. 1: Flowers of *Wrightia tinctoria* (Roxb) R.Br.

2. Materials and Methods:

Plant material:

The fresh flowers of *Wrightia tinctoria* R.Br. were collected from Khopoli region of Khalapur district of Maharashtra, India.

Extraction of essential oil:

Various methods of extraction of essential oil from flowers of *Wrightia tinctoria* R.Br. were tried viz., hydrodistillation, Soxhlet extraction with ethanol and n-hexane and cold maceration method using n-hexane. Flowers (300gms in 500ml ethanol) were used for soxhlet. The setups were left without disturbance. Essential oil was recovered by evaporating the solvent.

Essential oil recovery:

Volatile oil was recovered by completely evaporating ethanol from the solvent obtained above using rotary vacuum evaporator.

GC-MS:

Analysis was carried out on Agilent 5975C inert mass selective detector (MSD) with triple axis detector, directly coupled to a HP 7890A gas chromatograph. A 30 m × 0.25 mm × 0.25 micron fused silica HP-5ms column was employed. The column oven temperature was programmed from 80°C (after 3min) to 250°C at 2.5 °C/min. The injector was maintained at 280 °C respectively. Electron ionization mass spectra were acquired over the mass range 40 - 550 Da.

Odour Evaluation:

The essential oils extracted from *Wrightia tinctoria* R.Br. flowers were also subjected to olfactory evaluation.

3. Results and Discussion:

Extraction of essential oil:

The flowers were collected from Khopoli region of Raigad District. Soxhlet extraction method was used to extract essential oil from flowers. The hydrodistillation method was found to be unsuitable, as there was no essential oil extracted from the flowers.

In soxhlet extraction method, ethanol and n-hexane were used for extraction of essential oil. Ethanol extract was found to be better than n-hexane extract.

Ethanol, mineral oil and n-hexane were used for extraction of flower essential oil. In ethanol soxhlet, oil extracted had similar odour profile to that of natural flower. Mineral oil and n-hexane had hindered the natural smell. Hence most suitable method was soxhlet extraction with ethanol.

GC-MS Analysis:

GC-MS Analysis of *Wrightia tinctoria* flower oil.

Essential oil was extracted by using ethanol and subjected as GCMS analysis. The major components identified by GCMS method were Phenol, 4-ethyl-2-methoxy (1.75%), 3-Pyrimidinecarboxylic acid (1.69%), Propanoic acid, 2-mercapto (15.40%), 2, 5, 7-Nonatrien-4-one (0.97%), Pentadecanoic acid, ethyl ester (3.90%), Styrene (0.98%), 3-furanyl (0.91%), 3-methyl-3-butanoic acid (11.52%), Hexadecanoic acid (20.12%), 15-methyl, methyl ester (40.90%) 3, 6-Dioxa-2, 7-Disilanone-4,5-dicarboxylic acid (0.84%), 2, 2, 7,7-tetra methyl- dimethyl ester (1.05%), Diethyl phthalate (0.96%).

Chemical compounds have been identified and quantified from the flower essential oil of *Wrightia tinctoria* by GC-MS analysis (Table 1).

Table 1: GC-MS analysis of *Wrightia tinctoria*. R.Br.

Compound Name	Percentage (%) Soxhlet Extraction
Phenol, 4-ethyl-2-methoxy	1.75
3-Pyrimidinecarboxylic acid	1.69
Propanoic acid, 2-mercapto	15.40
2, 5, 7-Nonatrien-4-one	0.91
3-methyl-3-butanoic acid	11.52
Hexadecanoic acid	20.12
15-methyl, methyl ester	40.90

3, 6-Dioxa-2, 7-Disilanone-4,5-dicarboxylic acid	0.84
2, 2, 7,7-tetra methyl- dimethyl ester	1.05
Diethyl phthalate	0.96

Odour Evaluation:

Wrightia tinctoria. R.Br flower essential oil was also subjected to odour evaluation.

Table2: Odour Profile of Wrightia tinctoria. R.Br.

White Floral
Stale
Green
Sweet
Oily
Spicy

On the composition of the notes it was observed that the soxhlet extraction extract of flower oil gave white floral, stale, green, sweet, oily and spicy notes in the background (Table 2).

4. Conclusion:

The soxhlet extraction by ethanol was the suitable method for extraction of essential oils of Wrightia tinctoria R.Br. The essential oil components were analyzed by GC-MS. The oil was subjected to odour evaluation. Essential oil from flowers of Wrightia tinctoria R.Br will be subject further for incorporation in cosmetics.

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