

Research Paper :

## Isolation of Geraniol content from various essential oils

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### ABSTRACT

Geraniol is a highly valuable aroma chemical and having extensive use in perfumery and flavour compounds. There are three sources to isolate this aroma chemical. Palmarosa oil *Cymbopogon martini* commonly known 'Rosha' or russa is the main source of geraniol (80 - 95%) and Jamrosa oil contains 80-89%. Another source of geraniol is *Cymbopogon winterianus* (Java citronella oil), which contains 40-45% including citronellol. This paper reports the processing of these essential oils to the recovery of geraniol content and find out the comparative study in respect of yield and cost economics.

**Key words :** Palmarosa oil, *Cymbopogon martini*, Citromella oil, Jamrosa oil, Essential oil

**P**almarosa *Cymbopogon martini* commonly known 'Rosha' or 'Russa' is a multi harvest perennial aromatic grass. The colorless to pale (greenish) yellow essential oil obtained on distillation from the flowering tops and foliage of the herb has great commercial value in high-grade perfumery. This oil is very rich in geraniol (80-95%). The total annual world production of palmarosa oil is estimated to be 200 tones<sup>1</sup>. Out of this, India shares for major world production 70-80 tones. India remained a major exporter of palmarosa oil to the world market.

Citronella oil is one of the industrially important essential oil obtained from different species of *Cymbopogon* belonging to family Graminae. The essential oil is volatile oil produced by steam, or water distillation of whole plant. The vapours are condensed to yield a water condensate and oil that can be separated off, usually by gravity. It is classified in trade into two types: Ceylon citronella oil, which is extracted from *Cymbopogon nardus* and java citronella oil, obtained from *Cymbopogon winterianus*. The main difference between these two oils is the proportion of geraniol and citronellal. The java type oil generally is considered to be of superior quality to the Ceylon oil. The high proportion of geraniol and citronellal in java citronella oil makes it an important source of various derivatives like Citronellol, citronellyl nitrile and hydroxycitronellal, which are extensively used in compounding high-grade perfumes. The Ceylon type citronella oil, which contains relatively low citronellal, is mainly used in cheaper products rather than for the production of derivatives.

The world consumption of citronella oil has amounted to several thousand tons annually due to the most important source of geraniol and citronellal. In 1997, the

world production of citronella oil is estimated at 5000 tons, valued at about 19 million US\$. Most citronella oil is java citronella oil; production of Ceylon citronella oil is restricted to Sri Lanka and Nepal. Citronella oil is regarded as one of the twenty most important essential oil. It had a world production of 2830 tons in 1993, valued at US\$10.8 million (Lawrence, 1993) and 3500 tons in 2005, valued at US\$ 15.0 million.

An Interspecific hybrid between *Cymbopogon nardus* var. confertiflorus and *Cymbopogon jwarancusa* was adequately evaluated and subsequently released as var. RRL-82 (jamrosa) providing an additional rich source of geraniol (Sobti *et al.*, 1981). Jamrosa contains about 80-89% geraniol content.

Due to high potential of geraniol in fragrance, flavour and essential oil industries, this study has been taken up for the production as well as cost economics of geraniol. In this study, first, saponification (hydrolysis) of the oil is carried out by using aqueous alkali solution and then fractionated the saponified oil under high vacuum. Actually, Fractionation is a process in which the oil is redistilled in vacuum so individual components, or fractions, are separated out as they evaporate one after the other. This is possible because fractions or constituent has its own rate of volatility based on time and temperature.

### MATERIALS AND METHODS

The essential oils for the experiment are collected from the manufacturers and analysed by Gas Liquid Chromatograph to find out the percentage of geraniol content. The Hewlett Packard 5890 series II gas chromatograph is used and equipped with flame ionization