

Effect of high boilers adulterants in *Mentha arvensis* oil

AJAI KUMAR

Accepted : February, 2008

Correspondence to:

AJAI KUMAR

Department of Advanced
Instrumentation Facility/
University Science
Instrumentation Centre,
Jawaharlal Nehru
University, NEW DELHI
(INDIA)

ABSTRACT

An experiment was conducted to see the effect of Di-ethyl phthalate (DEP) over the physical properties such as Optical rotation, specific gravity, refractive index, solubility and composition of the essential oil of *Mentha arvensis* oil.

Key words : Boilers, *Mentha arvensis* oil, Di-ethyl phthalate (DEP)

Mentha is a perennial aromatic herbs belonging to the family Labiatae (Lamiaceae), distributed mostly in temperate and sub-temperate region of the world. This crop was introduced in India in 1952 from Japan and cultivation was attempted in Jammu by Tarai tracts of Uttar Pradesh. *Mentha arvensis* Linn. is commonly called as Japanese mint or Com mint. Currently this crop is grown as a source of natural menthol. (Kattimani *et al.*, 2000).

It is the most important commercial essential oil-bearing plant from the standpoint of worldwide production, with peppermint, spearmint and cornmint essences being the most valued for their use in the food, cosmetic and pharmaceutical industries. Menthol content in Japanese mint is used in prescription of cold remedies, cough drops, dentifrices, mouth washes, cosmetics, scenting, cigarettes, flavouring to tobacco, chewing pan etc. (Gupta, 1995).

Singh *et al.*, 1994 reported variation in congealing points of the essential oil with respect to change in l-menthol content as worked out and linear association among various oil component characters was studied in two varieties of *Mentha arvensis*.

In 1999, Kahol *et al.* studied the effect of the design parameters on the efficiency of *Mentha arvensis* oil/water separator.

In the present work an attempt has been made to find the effect of high volatile adulterant on physical properties and composition of *Mentha arvensis* oil.

MATERIALS AND METHODS

Plant material and oil isolation:

The oil was obtained by the hydro distillation of *Mentha arvensis* procured from Chaundisi, (Uttar Pradesh). The yield of oil was 0.75 % (v/w).

Gas Chromatography:

Physical analysis of the adulterated oil was carried out by the NABL, accredited Laboratory of FFDC, Kannauj using calibrated instruments.

GC analysis of the oils was performed on Hewlett Packard (HP) 5890 GC. Nitrogen gas was used as a carrier at 10 psi inlet pressure with FID and Carbowax20m Column (30m x 0.25 mm i.d., film thickness 0.25µm). Injector and detector temperatures were 250°C and 270°C, respectively. Column temperature was programmed from 50°C to 230°C at 4.5°C/min. with hold time of 4 min. and 10 min. respectively. The components of the mint oils were identified using the reference standard by comparing the retention time at a constant GLC programming including integration parameters.

RESULTS AND DISCUSSION

In all the Tables (1 to 8) similar conditions are seen. The value of l-menthol decreases in adulterated oil in comparison to original oil. The physical properties (refractive index, specific gravity and solubility in alcohol etc.) of mint oil due to adulteration are changed. The refractive index is increased if the oil is adulterated with DEP. In similar way, the specific gravity is also increased. Whereas the optical rotation of the adulterated oil is

Table 1 : Study of physical properties having optical rotation value as $\sim 35^{\circ}$

Types of Samples of mint oil	Optical rotation at RT	Refractive index at 25°C	Specific gravity at 25°C	Solubility in 70 % alcohol at 27°C
Original oil	-35.048	1.4584	0.9010	Soluble
10%DEP Mix oil	-32.635	1.4608	0.9202	„
20%DEP Mix oil	-28.040	1.4624	0.9426	„
30 %DEP Mix oil	-24.357	1.4684	0.9666	„