



Cineole rich clone in *Eucalyptus tereticornis* of pharmaceutical importance

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Abstract

Twenty five best performing clones of *Eucalyptus tereticornis* were planted in July 1998 at Nagaroor nursery of IWST, Bangalore. By chemical examination of the leaves obtained from three year old trees for their oil content and chemical constituents, it was found that the leaf sample from one particular clone (C-4) contained 2.8 - 2.9 percent of oil and 82- 84.1 percent of cineole. Considering the remarkable adaptability, rapid growth of *E.tereticornis* and wide applications of cineole-rich Eucalyptus oil in pharmaceutical products - the reported clone would be of special interest both for propagation and utility in the pharmaceutical field.

Key words: Cineole, *Eucalyptus tereticornis*, Eucalyptus oil, cineole-rich eucalyptus clone.

1. Introduction

Eucalyptus is a versatile tree adapted to a variety of edaphic and climatic conditions. It flourishes from coastal areas to those situated at an altitude of 200 m. In India about 170 species/ varieties/ provenances of Eucalyptus have been tried of which *E. tereticornis* (Mysore gum) proved superior in its adaptation, fast growth and having potential to survive under a wide variety of ecological factors.

The essential oil (2-3 percent) obtained from the leaves of *E. tereticornis* contains cineole <40%, Pinenes 10%, Limonene 12%, Phellandrene etc., Because of this diverse composition (i.e. not having any one constituent as dominant in the

oil), the *E. tereticornis* oil is not commercially exploited yet.[2-6]

Medicinal quality of the oil is mainly derived from the leaves of *E. globulus* containing cineole as the dominant constituent (not less than 70 percent) and it finds diverse utility in the pharmaceutical industry as antibacterial, antiseptic, expectorant and in nasal sprays, gargles, inhalers, lozenges, deodorants etc. However, oil obtained from few clones of *E.tereticornis* contain cineole upto 72 percent [1]. In the current study, leaves from three year old trees raised from 25 best performing clones of *E. tereticornis* have been analysed for oil and

Table-1
Percentage of oil and Cineole content in 25 clones
of *Eucalyptus tereticornis*

Clone No.	Oil content (%)	Cineole (%)
C-1	1.0694	31.404
C-3	1.3483	61.425
C-4	2.919	84.173
C-6	1.9931	51.178
C-7	1.2353	20.124
C-8	1.6362	64.94
C-10**	1.8665	68.707
C-27	2.3462	56.499
C-71	1.7216	61.871
C-83**	2.5142	68.525
C-84	1.1633	14.715
C-99	0.8521	21.87
C-105	1.1576	24.259
C-115	1.4782	32.185
C-116	1.3732	28.804
C-122	0.921	21.91
C-123	1.0962	25.684
C-128	1.0311	8.386
C-130	1.1674	41.34
C-138	1.4803	42.089
C-152	1.6314	35.64
C-258	1.6397	62.383
C-273	1.4223	42.089
C-285	1.1199	35.64
C-286**	1.3284	71.49

* Sample of high oil /cineole content (2.919 and 84.173 percent cineole content.).

** Sample of good yielder of cineole (68.525 - 71.49 percent)

cineole content. Leaf samples were collected in different seasons of the year.

2. Materials and methods

Twenty-five clones of *E. tereticornis* were planted in Nagroor by this Institute during July 1998. Leaves from these three year old plants were air dried and hydro distilled in Clevenger's apparatus. Oil content was estimated. Composition of the oil in respect of cineole content (using authentic compound of cineole) was determined by GC (AIMIL NUCON 5500 GC, using FID Detector & Reoplax -400 column). The oil percentage and cineole content of 25 samples are presented in table.1 .

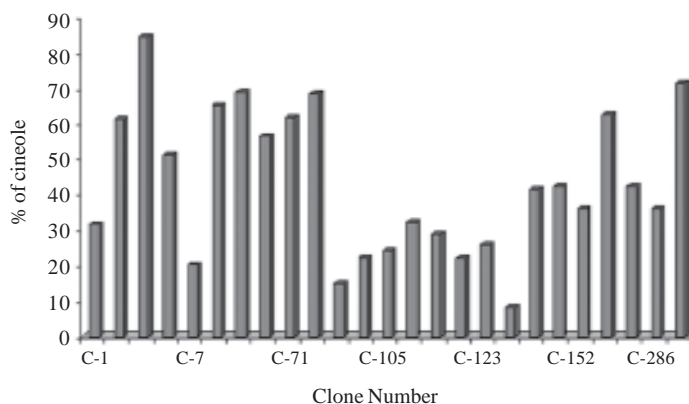
3. Results

Results of the analysis presented in Table-1 indicate that out of 25 plants raised from different clones, leaf sample in respect of clone no. C-4 has yielded 2.919 % oil and 84.173 percent of cineole. Besides this, clones C-10, C-83 and C-286 were found to be good yielders of cineole (68.525 - 71.49 %), but oil content in these was found to be lower (fig-1). Samples collected during different seasons of the year did not show significant variation in cineole and oil content.

4. Discussion

High cineole yield upto 84 percent in *E. tereticornis* oil has not been reported earlier. Considering the remarkable adaptability and fast growth of *E. tereticornis* unlike other species like *E. globulus*, *E. citriodora* etc which need some specific altitudes for their profuse growth, reported cineole rich clone in the present study would be of good utility in pharmaceutical industry.

Fig.1.
Cineole content of twenty-five clones of *Eucalyptus tereticornis*



References

1. Theagarajan KS, Rao PS. (1970) *Eucalyptus hybrid - a new source of cineole*, Ind For, 96 (5): 347-349.
2. James A Duke. (1983) *Eucalyptus tereticornis, Hand book of energy crops*. Purdue University, Center for new crops and plants products: USA.
3. Boland DJ. (1991) *Eucalyptus leaf oils use, chemistry, distillation and marketing*. Inkata Press: Melbourne, Sydney; (ALNAP data base ref ID 10965).
4. Bhalla HKL. (1997) *Indian Eucalyptus and their oils*, Timb Dev Ass of India, FRI: Dehra Dun.
5. Dagne E, Bisrat D, Almayeha M worku T. (2000) *J. Ess. oil Res.* 17, 467-470.
6. Zafar Iqbal, Imtiaz Hussain, A.Hussain and M.Yasin Ashraf. (2003) *Pak. J. Bot.* 35(5), 843-852.