Essential oil of leaves of *Cinnamomum tamala* Nees. & Eberm. from North East India

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ABSTRACT

An essential oil (0.7%) having n_D^{28} = 1.4791 obtained by hydrodistillation of fresh leaves of *Cinnamomum tamala* cultivated in North Cacher Hills of North East India was examined by gas chromatography. Fourteen oil components were identified which constituted 93.44% of the oil. Linalool was the main component (60.73%), whereas eugenol and cinnamic aldehyde were detected in trace amounts (<1%). Other components of significant occurrence (3%) in the oil were α-pinene (10.54%), β–pinene (10.42%), limonene (3.21%) and camphene (3.06%).

Key words : *Cinnamomum tamala*, leaf oil composition, linalool.

Cinnamomum tamala Nees. & Eberm. (Lauraceae) is a moderate sized evergreen tree distributed in tropical and sub-tropical Himalayas up to 2000 m. It is the source of *tejpat* leaves, used extensively in India as spice and also yields an oil known as Indian cassia lignes oil (Annonymous 1950). Medicinally, its leaves are reported to be hypoglycaemic, stimulant, carminative, anti-rheumatic, anti-diarrhoeal and antidote for scorpion sting and also used in colic (Hussain *et al.* 1992).

In North East India, *C. tamala* is extensively cultivated in Khasi and North Cacher Hills for spice purposes. However, in an ethnobotanic study in the region, we observed that the odour characteristics of many of its plant population were of unusual type which were called locally as *dulchini* instead of *tejpat*. Furthermore, variations in the occurrence of major components of leaf essential oil of *C. tamala* were often reported. Eugenol was recorded to be the main component mostly occurring in leaf oil (Gulati 1982). However, cinnamic aldehyde and linalool were also reported for the same plant species growing elsewhere (Sood *et al.* 1979; Nigam & Ahmed 1990). Hence, a study was undertaken on leaves of *C. tamala* growing in the region, having unusual odour characteristics than the normal (eugenol) for a better understanding of its essential oil values from a chemotaxonomic point of view.

Leaves of *C. tamala* were collected from Mahur area (780 m) of North Cacher hills during December 1992. Voucher

specimens (RRLJ-1254) were preserved at the herbarium of Regional Research Laboratory, Jorhat. Fresh leaves were hydrodistilled in a Clevenger type apparatus for 4 h and a pale yellow oil having sweet smell was obtained in 0.7% yield (FWB). The physicochemical constants of the oil were as follows: n_D^{28} = 1.4791, d^{28} =0.9034 and [α] D^{28} =+6. Refractive index and optical rotation were measured using a Corl Zeiss 3300 g ABBE's Refrectormeter and a Optical Activity Model A1000 Automatic Digital Polarimeter, respectively. Likewise, density of the oil was determined by classical weighing method with the help of a Pycnometer. Analysis of the oil was performed using a 10% OV-101 (2 m x 1/8" id. s.s.) column coated on chromosorb W-HP 80/100 mesh in a CIC-GC equipped with FID. Nitrogen was used as carrier gas at 22 psi inlet pressure. Temperature was programmed from 80-190°C at 3° C/min with a final hold up time of 15 min. The identification of the components was done by direct comparison with authentic compounds and confirmed by peak enrichment and retention times.

Among the various components identified in the leaf essential oil of *C. tamala*, linalool was the main component and constituted 60.73% of the oil (Table 1). This is in agreement with that of a previous report on the leaf oil of *C. tamala* from Himachal Pradesh (Sood *et al.* 1979). The concentration of linalool was, however, significantly lower (50.26%) in the earlier report. Eugenol and cinnamic aldehyde were detected in trace amounts (< 1%) in the oil during the present study which were, however, reported to occur as major components in the oil of the same plant species growing elsewhere (Gulati 1982; Nigam & Ahmed 1990).

Table 1. Components of leaf essential oil of *Cinnamomum tamala*

Component	Per cent
α-Pinene	10.54
Camphene	3.06
β-Pinene	10.42
Benzaldehyde	1.40
Myrcene	0.08
Limonene	3.21
p-Cymene	0.02
α-linalool	60.73
Benzylacetate	0.11
α-terpineol	0.24
Cinnamic aldehyde	0.24
Geraniol	2.24
Linalyl acetate	0.30
Eugenol	0.85
Total	93.44

Linalool, from natural source, is a high-valued aromatic chemical (present New York market price, Rs 3900/kg) extensively used for flavour applications. The present production of this product in India is insufficient even for internal consumption and the country imports an average of 55 t of the product every year. Commercial cultivation of additional or alternative source of linalool in India, is therefore, desirable to meet the industry's demand. The present source (RRLJ-1254) being the chemotype of a well known commercial crop, may be useful to the industry in this regard.

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