

A Study of Essential Oil Content of Cinnamomum Tamala (Tejpata)

Mohammed Jamil¹ Dr. Kaniz Sohana² Dr. Md. Shahjahan³

Abstract: *Cinnamomum Tamala*¹ leaf (Tejpata) is a popular spice of Bangladesh. Steam distillation of Tejpata gave 1-2% essential oil. The oil showed specific gravity of 1.002 at 32 °C and refractive index of 1.517 at 29 °C. It also showed an acid value of 5.3%; aldehyde value of 38.43%; ester value of 64.56%; phenol content of 78%; and alcohol value of 47.59%. The GC-MS analysis (Tejpata oil) showed that the major components of the oil were Eugenol (50.64%), α -phellandrene (5.97%) and γ -elemene (5.75%).

INTRODUCTION

Generally Tejpata plants grow in the sub-Himalayan tract in Khasia, Jainta hills in India. It also grows abundantly in the forest of Chittagong hill tracts-Bandarban and Syhlet in Bangladesh. The Tejpata leaves are popular as a spice in Bangladesh for its pleasant aromatic odor. Its characteristic pleasant aromatic odor is due to the essential oil present in it. Like many spices, it has been reported that the Tejpata leaf has significant physiological activities and in some rural areas of Bangladesh. It is used as a medicine in the treatment of various diseases. For the better evaluation of the Tejpata essential oil, it is necessary to know its complete composition.

MATERIALS AND METHODS

The leaf was collected from Christian Missionaries School at Zindabaha area of Dhaka City. The collected leaves were washed thoroughly by water to remove dust and thus it was ready for steam distillation. The plant materials were sufficiently matured. Grinding of the samples was carried out in a Cyclotec. C machine with a 0.5mm screen.

Dry matter, moisture and ash contents of the sample were determined using standard procedures². The crude protein contents (Nx6.25) of

¹ Zonal Sales Manager, Maple Int. Ltd. Bangladesh.

² Assistant Professor, UITS.

³ Professor, UITS.

A Study of Essential Oil Content of Cinnamomum Tamala (Tejpata)

Tejpata leaf was calculated from the elemental Nitrogen analysis³. The results are provided in Table-1. The essential oil of the Tejpata was extracted by steam distillation according to scheme-1. The various chemical investigations of the essential oil such as acid value^{4,5}, aldehyde value^{4,6}, phenol content^{6,7}, ester value⁷ and alcohol value⁷ were done using standard procedures³. The results are summarized in table-2.

The chemical composition of the oil was determined by GC-MS analysis using GC-MS Electron Impact (EI) method on GC 17A Gas chromatograph (Shimadzu, Japan) coupled to a GC-MS-QP 5050A Mass spectrometer (Shimadzu), [Fused silica capillary column 30 m x 0.25 mm id, coated with DB-1 (J & W), 0.25 m film thickness, and searched library NIST 107 lis, Shimadzu Corporation].

RESULTS AND DISCUSSION

The specific gravity of the extracted oil was 1.00 at 32 °C, whereas "The Wealth of India"¹ records a specific gravity of 1.01 at 25 °C which is quite similar to our results. The refractive index was found to be 1.51 at 29 °C which is similar to that found by B. L. Bradu *et.al.*⁸ (sample from local market) and also with that of N. Misra *et.al.*⁹ and "The Wealth of India".

The experimental acid value of Tejpata leaf oil was found to be 5.316 whereas N. Misra *et.al.*⁹ found a value of 5.6 and B. L. Bradu *et.al.*⁸ found it to be 4.3-4.9 both of which are similar to ours. It indicates that the essential oil of Tejpata has a smaller free acid value. Aldehyde value of the oil was found to be 38.43 which is comparable with those of Bradu *et.al.*⁸. (38.43%) and "The Wealth of India" vol-II (38.4% and 49.5%). The ester value of this oil was determined to be 46.56% whereas B. L. Bradu *et.al.*⁸. had found a value of 45.0-49.0%. The ester value in the "The wealth of India vol-II" is 45.49% found in the Tejpata leaf collected from Jogindar Nagar region of India. Our leaves contained 78% Eugenol which is quite similar to the value in "The Wealth of India" (vol-II, 179). The alcohol value of this oil was found to be 47.59%.

The components of the essential oil were identified by tlc and finally by GC-MS method. The GC-MS analysis was done to ensure better identification and quantification of different constituents of essential oil. The percentages of various components were determined from their peak

areas. In this investigation, 73 peaks were found for 62 compounds. The major components of Tejpata oil were found to be Eugenol (50.64%), α -phellandrene (5.97%) and γ -elemene (5.75%).

Table 1: Composition of the Tejpata leaf (%)

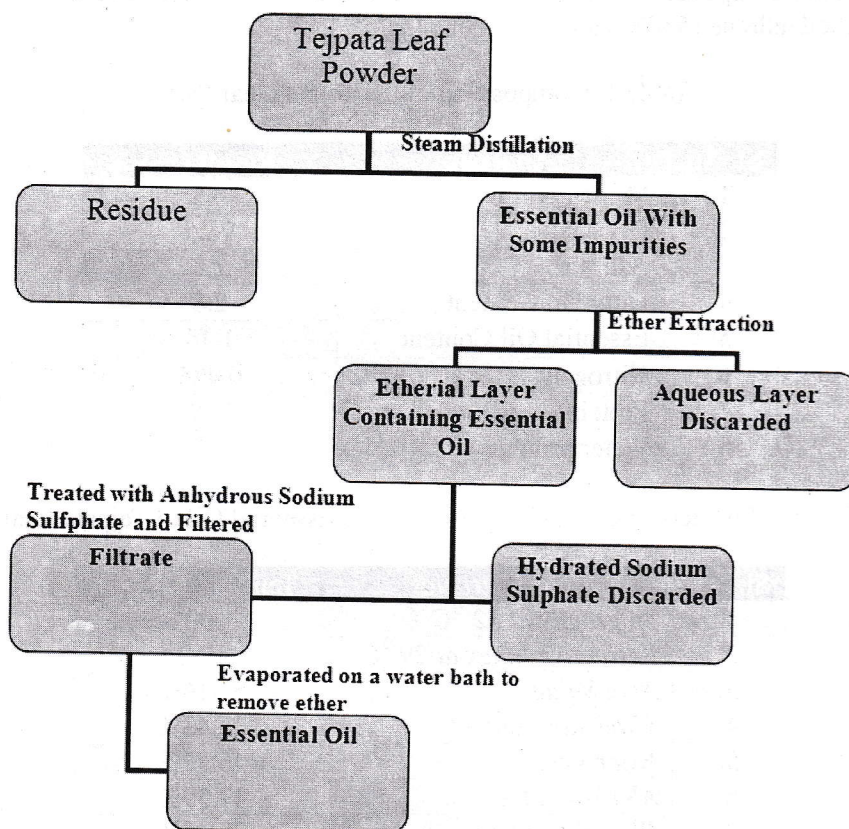
Sl. No.	Analysis	Result (%)
1.	Moisture	3.5
2.	Dry Matter	96.5
3.	Ash	2.8
4.	Fatty Oil Content	2.8
5.	Essential Oil Content	1.14
6.	Nitrogen	0.425
7.	Protein	2.76
8.	Water Soluble	63.23

Table 2: Physico-Chemical Properties of the Essential Oil of Tejpata Leaf

Sl. No.	Characteristics	Tejpata Leaf Oil
1.	<i>Sp gravity at 32 °C</i>	1.002
2.	<i>Refractive Index at 29 °C</i>	1.52
3.	<i>Acid Value</i>	5.316%
4.	<i>Aldehyde Content</i>	38.43%
5.	<i>Ester Value</i>	46.52%
6.	<i>Alcohol Value</i>	47.59%
7.	<i>Phenol Content</i>	78.00%

A Study of Essential Oil Content of Cinnamomum Tamala (Tejpata)

Scheme-1



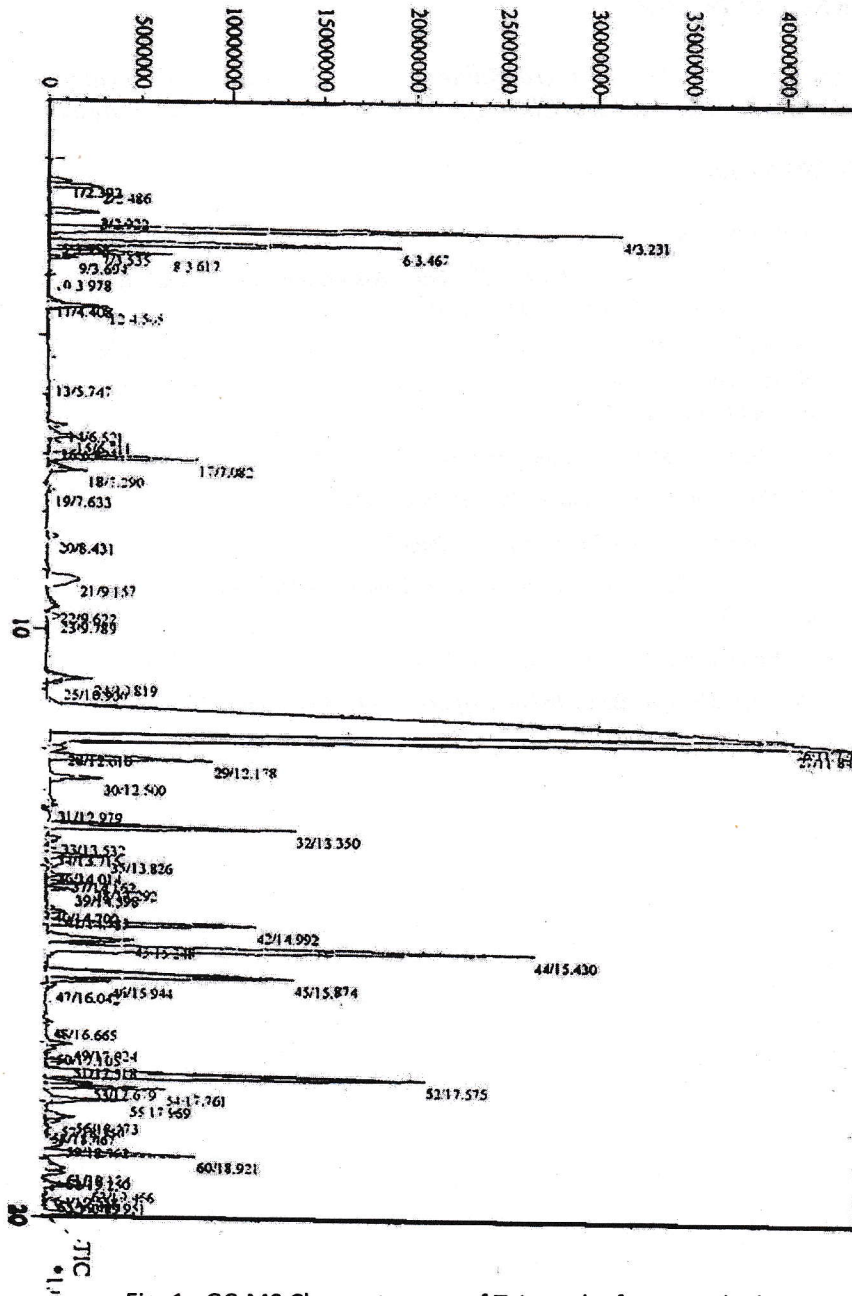


Fig. 1. GC-MS Chromatogram of Tejpata leaf essential oil

A Study of Essential Oil Content of Cinnamomum Tamala (Tejpata)

ACKNOWLEDGEMENT

Authors acknowledge their gratefulness to Mr. Jasimuddin Chowdhury, PSO, BCSIR; Laboratories, Chittagong for his help in GC-MS analysis.

REFERENCES

- [1]. *The Wealth of India* Vol-II, Raw Materials, Page 179-180
- [2]. *Official Methods of Analysis*. 12th Edn. Association of Official Analytical Chemists(AOAC), Washington D.C., (1975)
- [3]. A. Sattar and M. Fazlul Huq, , Studies on the utilization of Casterol Cake Part-1 – Isolation and Evaluation of Proteins. *Bangladesh Journal of Scientific and Industrial Research*, 1977 Vol-VII (1-2):6-12
- [4]. British Standard Methods of the Analysis of Oils and Fats 1958, B.S.684
- [5]. R. K. Das: *Industrial Chemistry, Part-II*, Page 145-282
- [6]. S. N. Mahindru, *Indian Plant Perfumes*, Page73.
- [7]. S. C. Jolly; *Official Standardized and Recommended Methods of Analysis*, 1963 Page: 79-94
- [8]. B. L. Bradu and S. N. Sobti, *Indian Perfumer* 32(4) 1988 page. 334-340
- [9]. N. Misra and Sangita Batra, *Indian Perfumer* 31(4) 1987, page. 332-334