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Qualitative Phytochemical Screening and GCMS Analysis of the Leaves of *Indigofera Tinctoria*

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ABSTRACT: Aim of the present study was to carry out the phytochemical screening and GC-MS analysis of the leaves of *Indigofera tinctoria* linn. Aqueous and ethanolic extracts of the leaves were prepared by simple soxhlation process. Aqueous extract was tested qualitatively to detect the presence of phytochemicals present in it. Ethanolic extract of the leaves was subjected to Gas Chromatography Mass Spectroscopy.

KEYWORDS: *Indigofera tinctoria*, Medicinal plant, Phyto-constituents, GC-MS

I. INTRODUCTION

Indigofera tinctoria which is distributed throughout India belongs to the family of Fabacea. Various parts of this plant are used in treating different diseases related to heart, liver, skin, asthma etc., [1,2]. It is reported that *Indigofera tinctoria* also possesses sedative, antitoxic and hemostatic properties. The leaves are found useful in promoting the growth of hair [3]. Thus, the plant has a lot of medicinal properties which make it to use as a drug. Since the plant possesses immense pharmacological activity, this work reports the identification of the phyto-components present in the aqueous extract of the leaves of *Indigofera tinctoria* by qualitative phytochemical screening and identification of the compounds present in the ethanolic extract of the leaves by Gas chromatography-Mass spectrum (GC-MS) analysis.

II. MATERIALS AND METHODS

A. Plant collection

Plant leaves were obtained from Villuppuram. Leaves were washed in running tap water to remove the traces of dirt and soil particles. Then washed with distilled water and dried for around 15 days in shade. The leaves were powdered using mixer grinder and sieved to obtain the fine powder.

B. Preparation of aqueous and ethanolic extracts

All the chemicals used in the present study were of analytical grade. 25 g of the powdered leaves was subjected to simple Soxhlet extraction with double distilled water and absolute alcohol separately. The solvents used were recovered under pressure to obtain dry extracts.

C. Phytochemical screening

Qualitative phytochemical testing of the aqueous extract of the leaves of *Indigofera tinctoria* was carried out in detail as per the standard methods [4-7].

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D. GC-MS analysis of the ethanolic extract of the leaves of *Indigofera tinctoria*

Ethanolic extract of the leaves of *Indigofera tinctoria* was subjected to GC-MS analysis as described in our earlier report [8]. In brief, the analysis was carried out on Jeol spectrometer (Model: Accu TOF GCV). Split ratio was 20: 1. Column temperature program: Initial temperature 80°C for 5 min. Ramp: 10°C/min to 260°C. Again isothermal for 5 min, then ramp at 30°C/min. to 280°C, isothermal for 5 min. Solvent used was ethanol. Column used was HP5, 30 m long, 0.25 mm id and 0.25 µm film thickness. The injector temperature was 250°C, detector temperature was 280°C. Helium was used as carrier gas at 1 mL/min [8].

III. RESULTS AND DISCUSSION

A. Phytochemical screening of the aqueous extract of the leaves of *Indigofera tinctoria*

Results of qualitative phytochemical testing of the aqueous extract of the leaves of *Indigofera tinctoria* are presented in Table 1. It can be visualized from it that, the aqueous extract contains many phytoconstituents such as alkaloids, carbohydrates, reducing sugars and saponins. These results are in agreement with the literature [9].

Table 1

Results of Qualitative Phytochemical Screening of aqueous extracts of the leaves of *Indigofera tinctoria*

Sl. No.	Constituent	Test	Result	Sl. No.	Constituent	Test	Result
1	Alkaloids	Mayer's reagent test	+	5	Glycoside	Bomtrager's test	-
		Wagner's reagent test	+			Killer-Killiani test	-
		Hager's reagent test	+			Ferric chloride test	-
2	Carbohydrates	Molish's test	+	6	Tannins and Phenolic compounds	Lead acetate test	-
		Barfoed's test	+			Dilute iodine solution test	-
		Fehling's test	+			Froth test	+
3	Reducing sugars	Benedict's test	+	7	Saponins	Biuret test	-
		Alkaline reagent test	-			Ninhydrin test	-
4	Flavanoids	Lead acetate test	-	8	Proteins and Amino acids	Salwonski test	-
		Legal's test	-			Libermann and Burchard's test	-

B. GC-MS analysis

GC-MS of the ethanolic extract of the leaves of *Indigofera tinctoria* is depicted in Fig. 1. Mass spectrum of the ethanolic extract of the leaves is shown in Fig. 2. The fragmentation patterns of the mass spectra were compared with those of the known compounds stored in the National Institute of Standards and Technology (NIST) research library. In the GC-MS analysis active components were detected. The identification of phytochemicals present in the extract is based on peak area, molecular weight and molecular formula. The results are presented in Table 2.

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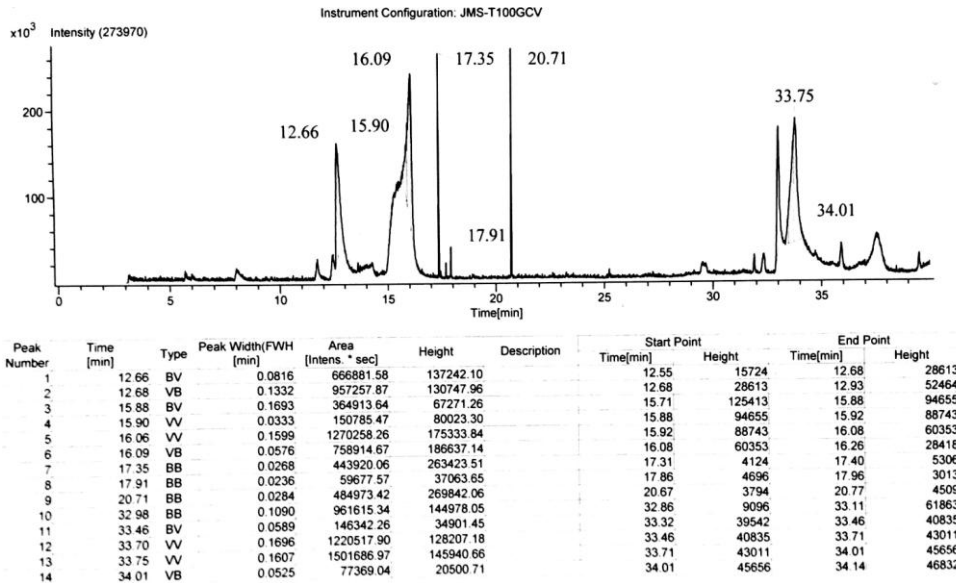


Fig. 1 GC-MS of the ethanolic extract of the leaves of *Indigofera tinctoria*

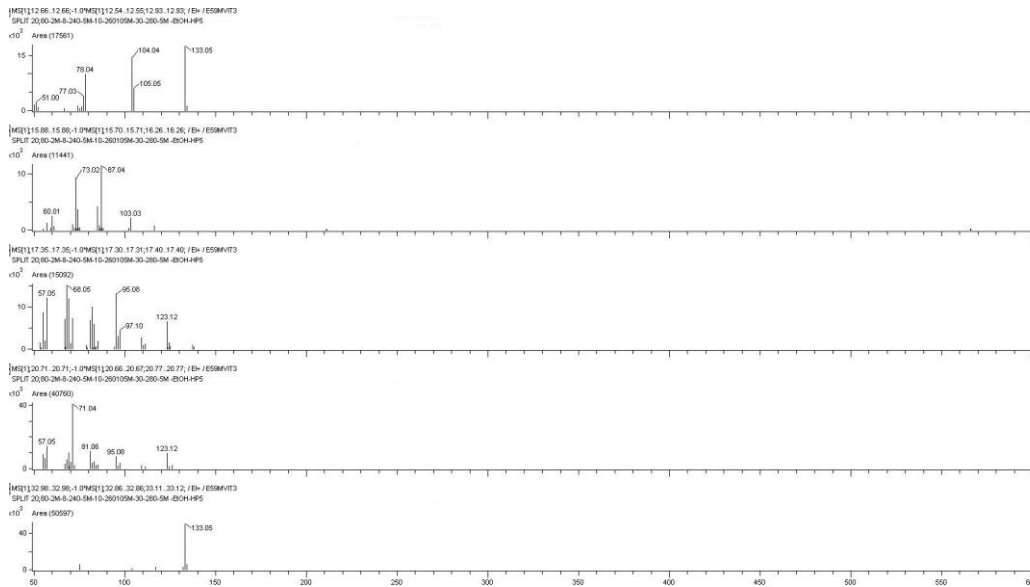


Fig. 2 Mass spectrum of the ethanolic extract of the leaves of *Indigofera tinctoria*

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Table 2

Results of GC-MS analysis of ethanolic extract of the leaves of *Indigofera tinctoria*

Sl. No.	Name of the phytochemical detected	Molecular Formula
1	2H-Indol-2-one, 1,3-dihydro-	C ₈ H ₇ NO
2	Myo-Inositol, 4-C-methyl-	C ₇ H ₁₄ O ₆
3	Myo-Inositol, 2-C-methyl-	C ₇ H ₁₄ O ₆
4	3,7,11,15-tetramethyl-2-hexadecen-1-ol	C ₂₀ H ₄₀ O
5	Pentadecanal-	C ₁₅ H ₃₀ O
6	Phytol	C ₂₀ H ₄₀ O
7	Benzoxazole, 2-methyl-	C ₈ H ₇ NO
8	1,2-Benzenediol, o- (2-bromopropionyl)-o'-(4-ethylbenzoyl)-	C ₁₈ H ₁₇ BrO ₄

IV. CONCLUSION

This work confirms the presence of many phyto-components in the aqueous extract of the leaves of *Indigofera tinctoria*. The GC-MS analysis of ethanolic extract of the leaves revealed certain medicinal active components in it. The present GC-MS work establishes the presence of many constituents in one variety. The pharmacological potential of *Indigofera tinctoria* is effective and its versatility is such that further detailed research requires to be carried out to detect the phyto-constituents present in *Indigofera tinctoria* using different solvents.

V. ACKNOWLEDGEMENT

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