Section: Research Paper

MASS SPECTROMETRIC ANALYSIS PHYTOACTIVE COMPOUNDS AND PHARMACOLOGICAL ACTIVITY *MELOCHIA CORCHORIFOLIA*

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ABSTRACT

Melochia corchorifolia, a widespread weed found in many tropical and subtropical regions, is a member of the Sterculiaceae family. A medicinal plant called Melochia corchorifolia is used in conventional folk medicine to treat a wide range of medical conditions. Water and methanol extracts of the leaf have been shown in several studies to have antibacterial, antifungal, cytotoxic effects, and anticancer activities.The powdered dry leaves were extracted with ethanol using the Soxhlet equipment. On the ethanolic extract, the phytochemical analysis was performed using conventional methods. Phytoconstituents such phenols, alkaloids, and flavonoids were detected by the analysis. The spectroscopic technique, including GC-MS, have been used to characterize phytoconstituents bioactive molecules.Furthermore, the research was aimed at assessing the Anthelmintic behavior of ethanol extract of *Melochia corchorifolia* leaves against *Pheretimaposthuma*Indian earthworms, with the result showing that 300 mg/ml proved to be very active by paralyzing and killing the earthworms in a shorter time, followed by Antidiabetic activity in inhibition assay for -amylase activity was evaluated using Melochia corchorifolia leaves showed maximum inhibition of the enzyme with the highest value of 87.10% seen at 100mg/ml.Research findings show that an ethanol extract of the Melochia corchorifolia leaf contains powerful bioactive phytocompounds that might be converted into new Anthelmintic and Antidiabetic properties.

Keywords: *Melochia corchorifolia, Pheretimaposthuma*, phytochemical analysis, GC-MS Anthelmintic activity, Antidiabetic activity.

INTRODUCTION

Plants were employed as a significant medical source in human culture and civilization in the Egyptian, Assyrian, Chinese, and Indian valleys. Ancient Humans of the period used medicinal related plants for various maladies [1, 2]. The health benefits, ease of accessibility, and affordability of plant-derived medicines make them very popular. Herbal medicines can be made from the entire plant or largely from the roots, leaves, bark, seeds, and flowers of plants [2, 3]. The components of bioactive compounds found in medicinal plants cause the human body to engage in specific physiological processes. The tannins, saponins, alkaloids, terpenoids, flavonoids, essential oils, and phenolic chemicals make up the bioactive phytochemical components. Other such natural chemicals provided the basis for modern therapeutics [4,5]. The Sterculiaceae family includes the genus Melochia corchorifolia, which has both great medical value and commercial significance. The plant *Melochia corchorifolia*, popularly known as chocolate weed, is a common weed that grows on farms. It was identified as being an excellent source of fibre [6,7].Conventionally, Leaves have long been used for many different types of traditional medicines. It has been used to relieve headaches, chest discomfort, stomach swelling, and ulcers. The pharmacological effects of the plant's leaves included anthelmintic, diuretic, anti-cancer, and anti-urolithic action. The plant also exhibited hepatoprotective, antioxidant, antibacterial, and anti-hepatocellular activity [8, 9, and 10].

EXPERIMENITAL

Extraction of plant material

The plant, *M. corchorifolia* L., was found growing in the Reserve Forest region between Vandalur and Thiruporur in the Kanchipuram Dt. Prof. P. Jayaraman, Ph.D., Director of the Institute of Herbal Botany, Plant Anatomy Research Center Chennai, validated and taxonomically recognized the plant.To get rid of the chlorophyll content, the leaves were washed and dried in the shade for 15 days. With a mechanical blender, the dried leaves were ground into a fine powder. 100g of dried powdered leaves were extracted using the soxhlet technique with ethanol as the solvent. The extract was then dried by distilling the solvents in a rotating vacuum evaporator after extraction [11].

Phytochemical analysis

Melochia chorchorifolia ethanol extract was tested for phytochemical composition using a conventional procedure [12].

Flavonoid and Phenol Content Determination aerial parts

The phenol content of an ethanol leaves extract of Melochia chorchorifolia was evaluated using the Folin-Ciocalteu test with Gallic acid as the reference solution. According to the technique, 10.0 ml of plant extract and 2.0 ml of distilled water were mixed. After 10 minutes, 0.6 ml of

Folin-reagent Ciocalteu's (FCR) and 1.6 ml of freshly prepared 20% sodium carbonate were added. The sample's absorbance at 320 nm in relation to the blank was measured using a spectrophotometer [13, 14].The aluminum chloride assay and quercetin as a reference were used to determine the flavonoid content of the ethanol extract of *Melochia chorchorifolia* leaves. The test sample was prepared using 2 ml, 5 ml of water, 0.30 ml of 5% sodium nitrite, and then 0.3 ml of 10% aluminum chloride. It was then incubated at room temperature for 5 minutes. Using a spectrophotometer, the absorbance of the sample was determined in comparison to the blank at around 520 nm [15].

Anthelmintic assay

Pheretimaposthuma Indian earthworms, which are around 4 cm long and 0.2–0.3 cm wide. This organism was chosen for its anthelmintic activity because of its physiological and anatomical similarities to human intestinal roundworm parasites. Prior to testing, the earthworms were washed in ordinary saline [16]. Using conventional methods, the anthelmintic test was completed with very slight modifications. During the anthelmintic tests, the test sample plant extract was made at concentrations of 25, 50, 100, 200, and 300 mg/ml, added to distilled water, and then boiled for 10 minutes. The mixture was then filtered to collect the supernatant. In a petri dish containing leaf extract, adult Indian earthworms *Pheretimaposthuma*of almost comparable size were individually inserted. With normal saline water serving as the control, Thiabendazolewas employed as a reference standard at the concentrations of 25 mg/ml and 50 mg/ml. The mortality of the worms was noted along with the findings of paralysis [17, 18].

Antidiabetic assay

The 1-4,-D-Glucan-Glucanohydrolase enzyme and the dialysis membrane are utilized in the inhibition assay method. 500 l of the plant extract solution and 500 µl of a sodium phosphate buffer solution containing 0.5 mg/ml of amylase were incubated at 25 °C for 10 min. Following pre-incubation, 500 µl of a 1% starch solution were added to each tube at the proper intervals in a solution of 0.02 M sodium phosphate buffer [19, 20]. The reaction mixture was heated to 25°C for l minutes, then it was incubated there for another 5 minutes before being cooled to room temperature. The reaction solution was diluted by adding around 10ml of distilled water, and the absorbance was calculated to be 540 nm [21].

GC-MS

The GC-MS is tested and run on a Clarus 500 Perkin Elmer gas chromatography equipped with an Elite-5 capillary column (30 nm 0.25 mm ID 0.25 mm df) with EI mode (5 percent phenyl 95 percent dimethyl polysiloxane) [22, 23].

RESULTS

Phytochemicals and Phenol, Flavonoid content analysis

Melochia corchorifolia ethanol extract of leaves reveal the phytoconstituents indicated the presence of alkaloids, flavonoids, and phenols in addition to the absence of polypeptides and coumarins. (Table-1 and Figure 1)

The existence of secondary metabolites with high phenol and flavonoid content, the antioxidant and antibacterial capabilities listed in (Table- 2) are promising present. Due to their redox characteristics, phenolic substances have the ability to serve as antioxidants. The total phenolic content might be a starting point for assessing antioxidant activity since their hydroxyl groups make it possible to scavenge free radicals. The antioxidant activity of flavonoids, which include flavones and flavanols, which are secondary plant metabolites, depends on the availability of free OH groups.

Table-1 phytochemical constituents

Phytochemicals	*Melochia* corchorifoliaEthanol extracts-Presence	Biological Activities
Polypeptides	-	Antiviral
Flavonoid	+	Antimicrobial
Alkaloids	+	Antimicrobial
Phenols	+	Antimicrobial
Coumarins	-	Antiviral

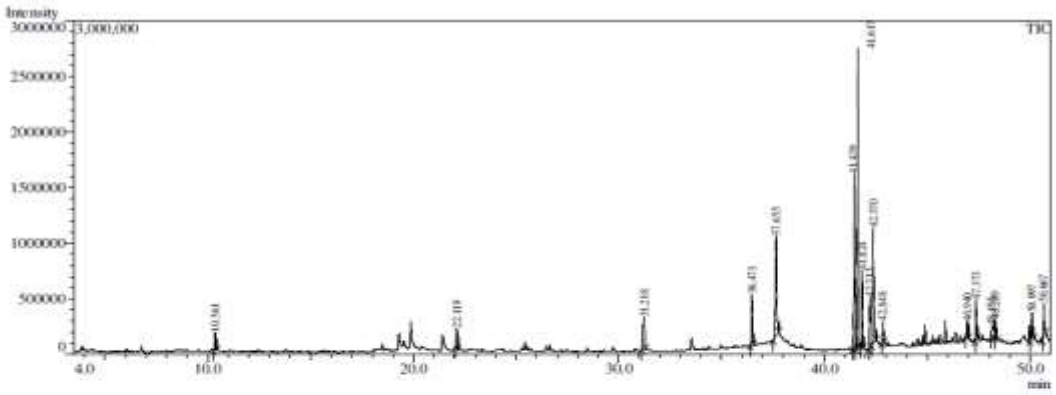
Fig. 1. Result for phytochemical analysis of *Melochia corchorifolia*ethanol extracts

Table- 2 Total content phenol and flavonoid ethanol extract leaves *Melochia corchorifolia*

Melochia corchorifolia parts	Phenol	Flavonoid
Aerial parts	60.25	70.12

GC-MS spectral analysis

The ethanol leaves extract of *Melochia chorchorifolia* evaluated by spectroscopy to detect various phytoconstituents of biological active compounds showed in Fig.2 with the reference to Mass Spectral library NIST 17 and Wiley 8 databases.



Peak Report TIC

Peak#	R.Time	Area	Area%	Name
1	10.361	535421	1.51	2,3-DIHYDRO-BENZOFURAN
2	22.119	747672	2.10	2(3H)-Benzoxazolone
3	31.218	1371469	3.86	6-Methoxy-2-benzoxazolinone
4	36.471	1623657	4.57	Hexadecanoic acid, methyl ester
5	37.655	4876147	13.71	n-Hexadecanoic acid
6	41.439	4444084	12.50	9,12-Octadecadienoic acid (Z,Z)-, methyl est
7	41.617	7926574	22.29	9-Octadecenoic acid, methyl ester, (E)-
8	41.824	1858819	5.23	PHYTOL ISOMER
9	42.213	1961973	5.52	Heptadecanoic acid, 16-methyl-, methyl este
10	42.370	4355881	12.25	9,12,15-Octadecatrienoic acid, (Z,Z,Z)-
11	42.848	560136	1.58	Octadecanoic acid
12	46.940	567285	1.60	Vitamin E
13	47.373	947715	2.67	Hexadecanoic acid, 2-hydroxy-1-(hydroxym
14	48.155	672517	1.89	STIGMAST-5-EN-3-OL, (3.BETA.,24S)-
15	48.289	928241	2.61	.gamma.-Sitosterol
16	50.097	929275	2.61	n-Propyl 9,12,15-octadecatrienoate
17	50.667	1248237	3.51	Testosteron-nitrate
		35555103	100.00	

Fig. 2. Phytocomponents bioactivity molecules detected

Anthelmintic activity

The Earth worms treated with an ethanol extract of *Melochia chorchorifolia* leaves at a concentration of 100 mg/ml acquired less time to become paralyzed at 60 min and to die at 80

min. By measuring the time of earth worm paralysis at 17 min and the time of earth worm death at 25 minutes, the ethanol extract of *Melochia chorchorifolia* leaves at a concentration of 300 mg/ml revealed to be more effective. (Table-3 and Fig.3)

Table-3 Anthelmintic activity - ethanol leaves extract of *Melochia chorchorifolia*

Treatment	Concentration(mg/ml)	Time in minutes	
		Paralysis	Death
Saline-Control	-	-	-
Standard- Thiabendazole	25	15	20
	50	19	38
Melochia chorchorifolia ethanol Extracts	100	60	81
	200	40	59
	300	15	20

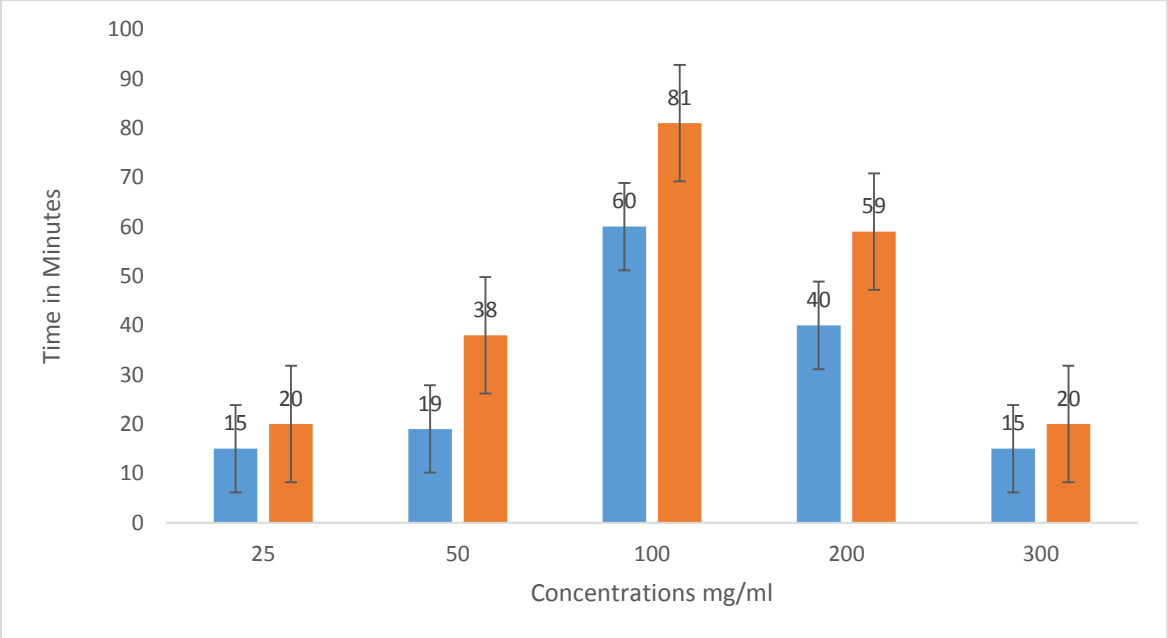


Fig.3. Anthelmintic activity - ethanol leaves extract of *Melochia chorchorifolia*

Antidiabetic α-amylase assay

The outcomes of the DNSA assay analysis are depicted in (Fig. 4 and Table-4). At all dosages level, *Melochia corchorifolia* ethanol extract showed strong enzyme inhibition, with the greatest value being found at a concentration of 100 mg/ml.

Table 4Antidiabetic- Inhibition of α-amylase

Concentrations (mg/ml)	*Melochiacorchorifolia* Leaves ethanol extracts %
25	75.04
50	78.66
75	82.50
100	87.10

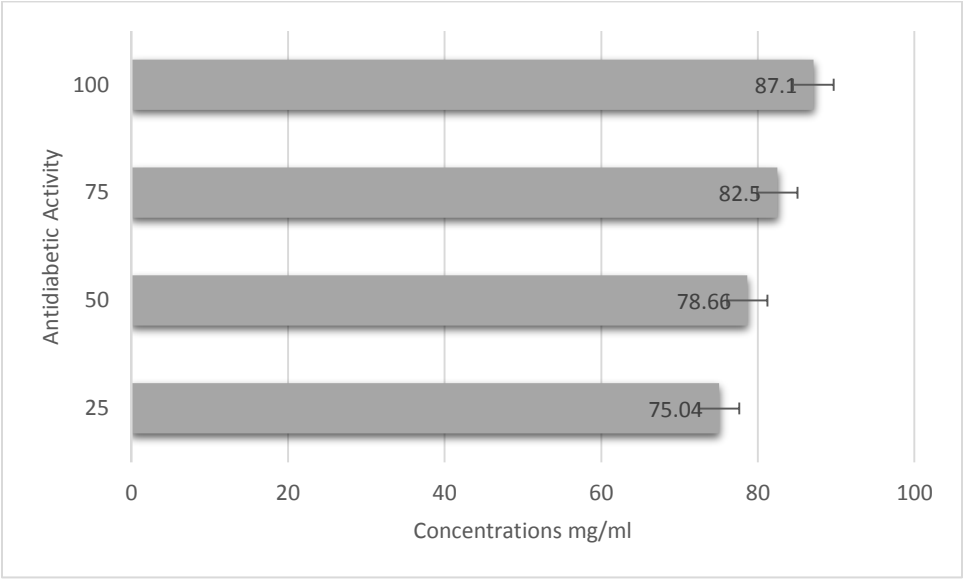


Fig. 3. Antidiabetic activity

CONCLUSION

The phytochemical screening *Melochiacorchorifolia*leavesethanol extract revealed the abundance of secondary metabolites such as phenols, flavonoids and alkaloids. Quantitative analysis of total phenol and flavonoid concentrations showed that they had strong antibacterial and antioxidant properties, 58.45 mg and 60.14 mg, respectively. GC-MS results revealed that active functional groups and bioactive compounds present in the leaves of ethanol extracts. Furthermore, it showed a significant inhibitorySimilarly, noticed Anthelmintic activity of *Melochia corchorifolia* ethanol extractagainst *Pheritimaposthuma*, at a dosage of 300 mg/ml, the paralysis of the earthworms took place 15 min after exposure, and the earthworms died 20 min later. Excellent characteristics were disclosed by the Antidiabetic inhibitory effect up to 87.10% inhibition of α-amylase it reduces diabetic insulin resistance. According to the aforementioned findings, Melochia corchorifolia leaves ethanol extract shown secondary metabolites in phytochemical screening and active effect on Anthelmintic and Antidiabetic. Subsequent investigations extracted the substance from the medicinal plant's leaves using spectrum analysis,

and they then tested its biological activity to determine its effectiveness. From the overall scenario, it is concluded that as the plants studied, found to rich in phytochemicals, are full of pharmacological and medicinal significance From the overall scenario, it is concluded that as the plants studied, found to rich in phytochemicals, are full of pharmacological and medicinal signific

CONFLICTS OF INTEREST

The authors have no competing interests.

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