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ETHNOBOTANICAL, PHYTOCHEMICAL and FLORISTIC SCREENING OF SELECTED SPECIES OF FAMILY LAMIACEAE DISTRICT MIRPUR, AJ&K

Sumaira Thind[1*], Iqbal Hussain[1], Khizar Hayat Bhatti[3], Sadaf Zahid[2], Abida Parveen[1]

[1]*Department of Botany, Hafiz Hayat Campus, University of Gujrat, Pakistan*

[2]*Department of Botany,Mirpur University of Science and Technology (MUST), Mirpur-10250 (AJK), Pakistan*

[3]*Department of Botany, GC University Faisalabad, Pakistan*

Corresponding Author Email: sumairaqj@yahoo.com

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ABSTRACT

In this floristic, ethnobotanical study and phytochemical screening of some species of lamiaceae of District, Mirpur, Azad Jammu and Kashmir, only three species of family lamiaceae *Mentha spicata*, *Mentha longifolia* and *Ocimum basilicum* were found, collected and studied. The floristic study of these species has revealed that the members of family lamiaceae are not native to District Mirpur. The three found species are cultivated by the local people for different domestic uses. The study shows that species of lamiaceae collected from the field are Perennial herbs, their life form diversity is Hemi-cryptophyte and their leaf size diversity is Microphylls. The Ethnobotanical study of the species of lamiaceae found in District, Mirpur showed that these plant species are highly popular among the local people of Mirpur, they are used by the local people on daily basis in food, dishes, home remedies and many ailments. UV index, Direct matrix ranking (DMR) and Probability ranking (PR) of the ethnobotanical uses of these species showed that Mentha spicata has (0.79) UV index and highest ranking of (DMR and PR) in ethnobotanical uses followed by the other two species. Phytochemical screening of leaves of Mentha spicata has confirmed the presence of many phytochemicals like Alkaloids, Phenols, Tannins, Flavonoids, Steroids and Sterols. The phytochemical test with chloroform as solvent for extraction gave maximum positive results with a ratio of 10:3 of positive and negative result as compared to the other solvent methanol used for the extraction.

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INTRODUCTION

Floristic study describes all the plant species present within a specific geographical area. Some progressive and large-scale floristic projects involve development of keys, precise descriptions, and exemplification of the plants, while some may construct a simple list of plant species found in an area. Floristic research is essential for the long-term conservation of biodiversity and ecosystem management. Pakistan's natural and biological resources are diversified due to the country's diverse climate and topography. It is critical to minimise habitat loss, discover locally resistant and endangered species, identify effective therapeutic plants, and perform floristic studies in order to conserve this variety (Rahman *et al.*, 2007).

Indigenous plants are researched in ethnobotany to see how people in a particular culture and place use them. Researchers in ethnobotany study how plants are used in various cultures for various purposes such as food, shelter, medicine, and clothing, as well as hunting and other non-secular pastimes. Richard Evans Schultes, dubbed the "founder of ethnobotany," explains, "Ethnobotany is basically the study of plants used by various communities around the world" (Kandell, 2001; Kochhar *et al*., 2016). Since Schultes' time, ethnobotany has progressed from gathering ethnobotanical data to applying it to modern culture, particularly in pharmaceuticals. Ethnobotany is confronted with a slew of intellectual property and benefit distribution challenges that must be addressed immediately. Botany, or the study of plants, is the foundation of ethnobotany. People's quest to understand about therapeutic plants fueled the development of botany. Both sciences have been interwoven for as long as either has existed. A substantial majority of today's medications are made from plants. The study of medicinal and hazardous plants, as well as the compounds they generate, is known as pharmacognosy. In the past, pharmacologists conducting drug research needed to understand the natural plant world, and physicians were trained in herbal medicine. Chemosynthetic medications, on the other hand, progressively displaced plants as the primary source of therapy in developed countries as medicine and drug research progressed. Plant-based research was not abandoned, and plants were still used as a starting point for the synthesis of numerous medications, but the focus shifted to the laboratory. Medicinal herbs are still the principal treatment for illness in a growing number of areas, according to industry. By definition, ethnobotany is interdisciplinary. Ethnobotanists can learn more about how tropical forest reserves should be handled during a

moment of acute environmental stress thanks to this interdisciplinary approach. Unfortunately, we are now facing the threat of losing our rain forests due to human impacts altering the ecological stability of these delicate ecosystems.

Phytochemicals are the chemicals produced during plant genesis (Breslin, 2017)."Phytochemicals (from Greek phyto, meaning "plant") are chemicals generated by plants during primary or secondary metabolism" (Sasidharan *et al*., 2011) (Harborne *et al*., 1999). They normally have physiological activity in the plant and plays an important part in growth of plant or protection against competition, infectious agent, or predation (Sasidharan *et al*., 2011). Phytochemicals are basically considered as testing compounds more willingly than vital nutrients because confirmation of their viable health consequences has not been settled yet. Polyphenols, which comprise phenolic acids, flavonoids, and stilbenes/lignans, are a key class of phytochemicals now being investigated. Flavonoids include anthocyanins, flavones, flavanones, isoflavones, and flavanols. Additionally, flavanols are classified into catechin, epicatechin, and proanthocyanidin to provide a full picture of their biological activity (Heneman and Zidenberg-Cherr, 2008). Over 25,000 unique plant components have been identified as containing phytochemicals, including fruits, vegetables, seeds, legumes, and lentils (to name a few). Phytochemists begin their studies by isolating and extracting phytochemicals from plants, as well as analysing their structure in model systems such as cell/tissue cultures and artificially produced trials utilising lab animals. It is tough to untangle individual chemicals, define their usually intricate structures, and determine which phytochemical is fully responsible for a certain biotic activity in certain regions (Sasidharan *et al*., 2011). Phytochemical screening involves the extraction, screening, and definition of medicinally active chemicals found in plants. These chemical classes of substances include alkaloids, flavonoids, carotenoids, tannins, antioxidants, and phenolic compounds (Altemimi *et al*., 2017).

The Lamiaceae or Lamiales (mint genus) is a flowering plant family. The family original name was Labiatae, which came from the fact that many flowers have petals that are joined into an upper and lower lip (Raja, 2012). Lamiaceae is sixth largest angiospermic family consist of 230 genera and more than 7000 species (Harley *et al*., 2004), Salvia (900 species), Scutellaria (360 species), Stachys (300 species), Plectranthus (300 species), Hyptis (280 species), Teucrium (250 species), Vitex (250 species), Thymus (220 species), and Nepeta are the largest Lamiaceae genera (200 species). Clerodendrum's species count was projected to

have decreased from over 400 in the early 2000s to around 150 by 2010 (Raymond *et al*., 2004; Yuan *et al*., 2010).

AREA OF STUDY

The Dina Tehsil links Mirpur City, which is 459 metres above sea level, to the important Peshawar-Lahore Grand Trunk Road. Mirpur District is divided into two sub-districts: Mirpur and Dadyal, with Mirpur City serving as the administrative headquarters. Mirpur, the capital of Azad Kashmir, is located on the banks of the Indus River. The creation of the new city in the late 1960s established the groundwork for the development of New Mirpur, which is located on the Mangla Lake waterfront. The level of the lake's surface water recedes enough during the winter months for anyone to drive to the old Mirpur in a vehicle and see what's left of the city's ruins (Old Mirpur). A Sikh gurdwara and a Hindu Mandir, both likely dedicated to the "Mangla Mata," as well as shrines to Syed Abdul Karim and Meeran Shah Ghazi, may be seen (Mangla mother goddess). Homes, wells, and cemeteries have all been discovered.

Location

New Mirpur City is a very beautiful small city situated in Azad Kashmir, Pakistan. It is a very fascinating city, where current life is coordinated with established religious code of conduct, here modern European affiliated member stays together with the society residents they practice Islamic traditions, where haste, professional life accompanies steady customary Muslim life. Mirpur is a commercial city, with some very good educational institution and a lot of historical structures, basically of religious importance.

To study the floral diversity of some selected species of lamiaceae in District Mirpur, Azad Jammu and Kashmir. To study the ethnobotanical uses of the plant species of lamiaceae in the area. To preserve the local and cultural knowledge of plants. Identification of different phytochemicals present in Mentha spicata with the help of different phytochemical tests. To prove the accuracy of the results with the help of statistical tools.

MATERIALS AND METHODS

Apparatus

Beakers, Glass containers, Test tubes, Test tube rack, Test tube holder, Pipette, measuring cylinder, Dropper, Stirrer, Whatman’s filter paper, Burner, Match box, Tripod stand, Wire gauze, Cotton, Soxhlet apparatus

Chemicals and Reagents

Methanol, Chloroform, Mayer's reagent, Ninhydrins reagent, Benedict's solution, Dragendroff's reagent, Biuret solution, Fehling's solution, Acetic acid, Ferric chloride, Conc.H_2SO_4, NaOH, Copper sulphate, Lead acetate, HCl.

Field Survey for Floristic Study

A floristic field survey was conducted on different areas of District, Mirpur, Azad Jammu and Kashmir such as Fazal Chowk, Sangot C-4, Thothal E-1, Ban Khurman, Kalyal, Chitar Pari and New City (Stauffer *et al*., 2017).

Plant Collection

Plants of lamiaceae were collected from the field. The specimens were pressed, dried and pasted on standard herbarium sheets and labelled accordingly. The plants that were collected from the field were: *Mentha spicata* (Spearmint), *Mentha longifolia* (Jangli Podina), *Ocimum basilicum* (Sweet basil) (Chaudhary *et al*., 2012)

Field Survey for Ethnobotanical Study

Few field trips in spring-summer season were performed in order to collect information about the ethnobotanical uses of plants of lamiaceae family by the local people from March to July, 2021. The areas of study were Fazal Chowk, Sangot C-4, Thothal E-1, Ban Khurman, Kalyal, Chitar Pari and New City, District Mirpur, Azad Jammu and Kashmir, Pakistan.

Plant Collection for Ethnobotanical study

Herbarium sheets were used to maintain and paste plant specimens that had been collected, dried, preserved, and pasted on them (Nasir and Ali, 2001). (Nasir and Ali, 2001). Medicinal plant voucher specimens were obtained, processed, and identified in triplicate utilising voucher specimens.

Data Collection for Ethnobotanical Study

For the documentation of folk traditional knowledge questionnaire and open interview method was used. The interviews were carried out from local people and knowledgeable persons (Hakims, Women and Men). About 32 informants have been interviewed including 2 Hakims and 30 indigenous people (Men and Women). The three species of family lamiaceae

found in District Mirpur, Azad Jammu and Kashmir, Pakistan were arranged by their nomenclature, vernacular name, family, location, habit, part used and their ethnobotanical uses MS Excel, Use value index (UV), Probability ranking (PR) and Direct Matrix Ranking (DMR) are used as tools for the statistical analysis (Samreen *et al*., 2016)

PHYTOCHEMICAL SCREENING OF *Mentha spicata*

Plant Material Collection

For phytochemical screening the fresh leaves of Menthaspicata were collected from the field. The leaves were air dried on room temperature 28°-30°C for 3 weeks. The dried leaves were then grounded in to fine powder form. The powder was then stored in a glass container for further (Kaur *et al*., 2015).

Preparation of Plant Extract using Soxhlet Apparatus

Two types of solvent are used for the preparation of plant extract one has polarity and the other is non-polar.

Extract Preparation in Methanol

A thick filter paper and a thimble were used to deposit the dried plant material in the main chamber of the soxhlet device, which weighed 250 grammes. Cotton was inserted into the apparatus and linked to the condenser to maintain it airtight. The extractor was placed on top of a flask that contained 500 mL of Methanol as the solvent. To warm up the solvent, a burner was utilised. After ascending the distillation arm, the condensed solvent vapours returned to the chamber containing the dried plant material. The chamber filled up with the solvent containing the desired compounds of the plant material in it. When the chamber filled with the solvent it automatically came back to the flask by the side arm ‘siphon’. After a few cycles of distillation, the apparatus was removed from the heat. The solvent still present in the chamber was filtered out in to the extract and was stored for the further screening test.

Extract Preparation in Chloroform

The preparation of plant extract with chloroform as solvent was also done by soxhlet apparatus. The amount of dried plant material was 250 gms and 500 ml of solvent chloroform was taken. The process was same as mentioned above. The extracts prepared were stored in air tight closed containers.

Test for Carbohydrates

Fehling's test

Two (2) ml of plant extract was taken in a test tube and 5 ml of Fehling's solution was added and boiled. 2 ml of plant extract was taken in a test tube and 5 ml of Benedict's solution was added and boiled.

Test for Alkaloids

Mayer's test

In 2 gms of plant sample, 1- 2 drops of Mayer's reagent were added.

Dragendroff's test

1n 2 ml of plant extract 2-3 drops of Dragendroff's reagent was added

Test for Proteins and Amino acids

Biuret test

In 2 ml of plant extract added 2ml of 40% aqueous NaOH solution and few drops of 1% Copper sulphate.

Ninhydrins test

In 2ml of plant extract added few drops of freshly prepared 0.2% Ninhydrins reagent. Heat it on burner.

Test for Phenols & Tannins

Lead acetate test

In 2 ml of plant extract added 5 ml of 1% lead acetate solution.

Ferric Chloride test

In 2 ml of plant extract added 1 ml of 5% ferric chloride solution.

Sodium Hydroxide test

In 2 ml of plant extract added 1 ml of 20% .H_(2) SO_4and few drops of aqueous NaOH.

Test for Glycoside

In 1 ml of plant extract added 2 ml of acetic acid, few drops of Ferric Chloride and 1 ml of conc. H_(2) SO_4.

Test for Flavanoids

HCl test

In 2 ml of plant extract add 1 ml if NaOH, 1 ml of conc.H_(2) SO_4.

Lead acetate test

In 2 ml of plant extract add 2-3 drops of lead acetate solution.

Test for Steroids and Sterols

Salkowiski's test

In 2 ml of plant extract add 1 ml of chloroform and 2 ml of conc.H_2 SO_4.

RESULTS

FLORISTIC STUDY OF SOME SELECTED SPECIES OF LAMIACEAE

Systematic Position of lamiaceae (Bentham and Hooker 1862-83)

Division: Phanerogams

Sub-division: Angiosperms

Class: Dicotyledons

Sub-class: Gamopetalle

Series: Bicarpellatae

Order: Lamiales

Family: Lamiaceae/Labiatae

4.1.1.2 Morphological characters of lamiaceae

Habit

Plants are mostly aromatic herbs or rarely shrubs (Leonotis, Pogostemon).

Root

Tap, branched, rarely adventitious (mint)

Stem

Aerial, Herbaceous; quadrangular; glandular hairs are present. sometimes underground suckers (Mint).

Leaves

Petiolate; opposite and decussate; simple; without stipulate, venation reticulate, hairy with aromatic smell

Inflorescence

Verticillaster bears a pair of condensed dichasial cymes in each node. Complete; hermaphrodite; hypogynous; pedicellate; bracteate, zygomorphic, and occasionally actinomorphic (Mint).

Calyx

4 or 5 sepals; gamosepalous fused: tubular or funnel shaped, sometimes two lipped or bilabiate.

Corolla

4 or 5 petals; gamopetalous; forms bilabiate (two lips), upper lip has two notches and lower lips has three notches

Androecium

Typically, only 4 stamens; didynamous (2+2); epipetalous; basifixed.

Gynoecium

Axile placentation; style gynobasic (arising from the base of the ovary); bicarpellary; syncarpous; superior ovary; tetralocula due to the formation of a false septum; axile placentation; axile placentation; axile placentation; axile placentation; axile placentation; axile placentation; axile placentation; axile placen Fruits: Schizocarpic foods include carcerulus, achenes, and nutlets.

Seed

Non-Endospermic

Pollination

By Insect

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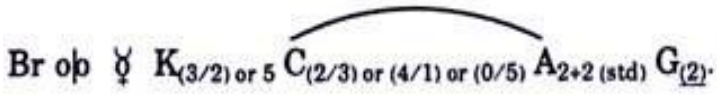
Floral formula

The formula followed to; (Pandey, 2010; Stussy, 1990 and Sharma, 1993).



Life span diversity

Annual plants

A plant that usually germinates, flower and dies in one year is known as an annual plant. If a plant is prevented from setting seed, then they will live longer than a year Some seedless plant that do not flower are also considered as annuals. (Ednard *et al.*, 2002)

Biennial plants

A plant that completes its lifecycle in two years is known as a biennial plant. The plant grows leaves, stems and roots (vegetative structures) in the first year; then it remains dormant for the colder months. The biennial plant becomes much longer in the next spring/summer. The plant then produces flower, fruits, seeds and then it dies. (Salisbury and Ross,1985).

Perennial plants

A plant that bears leaves and flowers every year is known as perennial plants.

Life form Diversity (Raunkiær System 1904)

Raunkiær's life-form scheme has been reviewed and amended by several authors (Muller-Dombois, 1974), (Shimwell, 1971), but the main structure is still the same. Raunkiær's life-form system may be useful in researching the transformations of ecosystems and the origin of some groups of plant feeding animals (Volovnik, 2013).

Leaf size classes

Plant leaves are classified by their size using terms like megaphyll, macrophyll, mesophyll, microphyll, nanophyll, and leptophyll. Christen C. Raunkiær created this classification in 1934. Whitten (1996), Whitten (1997), Whitten (1998), Whitten (1998), Whitten (1998), Whitten (1998), Whitten (1998), Whitten (1998), Whitten (1998), Whitten (1998) Certain authors simplified the system and added new terms to the vocabulary, such as notophyll, to make it more climate-specific (Webb, 1959), picophyll, platyphyll (Van der Maarel, 2012), and subleptophyll (Ingrouille, 2012).

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RESULT AND DISCUSSION

Table 1: Plant Species and Voucher No., Vernacular name, Location, Habit, Life span diversity, Life form diversity, Leaf size classes

Sr No.	Plant Species and Voucher No.	Vernacular name	Location	Habitat	Life span diversity	Life form diversity	Leaf size classes
1	*Mentha spicata* MUH -1087	Spearmint	Fazal Chowk	Herb	Perennial	Hemicryptophyte	Microphylls
2	*Mentha longifolia* MUH-1088	Jangli Podina	New City Mirpur	Herb	Perennial	Hemicryptophyte	Microphylls
3	*Ocimum basilicum* MUH -1089	Sweet Basil	Sector C-4	Herb	Perennial	Hemicryptophyte	Microphylls

ETHNOBITANICAL STUDY OF SOME SELECTED SPECIES OF LAMIACEAE

Table 2: Plant Species, Vernacular name, Family, Location, Habit, Part used, Ethnobotanical uses

Sr No.	Plant species	Vernacular name	Location, Habit	Part used	Ethnobotanical uses
1.	*Mentha spicata*	Spearmint	Fazal Chowk, Herb	Leaves/Whole Plant	As a flavouring agent, cured or raw leaves are used in salads and prepared meals. Meals are flavoured with "Chutni," a mint sauce. It's found in chewing gum, ice cream, and soft drinks. "Kehwaa," or spearmint tea, is a traditional Indian herbal remedy made from fresh or dried

					spearmint leaves. It can be used to treat fevers, headaches, gastrointestinal troubles, and other mild illnesses. It is antiemetic, antispasmodic, carminative, and stomachic, thus mixing it with an egg and a little sugar will help with menstrual cramps. As an ointment, macerated stems are put on bruises. Its essential oil is also found in a variety of soaps, shampoos, body washes, and toothpastes, as well as air fresheners and deodorants. It will repel rodents like mice if it has a strong scent. Many people cultivate it in their home gardens as an ornamental plant.
2.	*Mentha longifolia*	Jangli Podina	New City, Herb	Leaves/Whole Plant	Wild mint is used in many dishes as it is delicious in taste and is used in salads and vegetable dishes. Mostly leaves are used, usually to make a tea “Kehwaa” that is used for coughs, colds, stomach cramps, asthma, intestinal gas, indigestion and headaches. It is externally used to treat minor bruises and swollen glands. It has a strong smell that can help to ward mosquitoes away.

3.	*Ocimum basilicum*	Sweet Basil	Sector C-4,Herb	Leaves and seeds	It adds a particular flavor to salads, pasta, pizza, and other dishes. It is also added in tea to give it an aroma that is unique to Sweet Basil. Its seeds are added to sherbets, falooda and smoothies for flavor and benefits. Medicinally it is useful for stomach spasms, loss of appetite, intestinal gas, kidney diseases, fluid retention, head colds, warts, and worm infections. Insect and snake bites are treated with it as well. It is widely planted in house for its perfume and decorative purposes

Use value Index

The use-value (UV) index was used to calculate the citation of plants during interviews, where U is the sum of the total number of use citations by all informants for a given species, divided by the total number of informants (ns).

$$UVc = \Sigma U_{is}/ns$$

Table 3: Use value index (UV) of some selected species of lamiaceae with their ethnobotanical uses from total score of 32 informants from District Mirpur, AJ&K.

Sr No.	Plant species	ΣUis (Sum of all citation)	Ns (Total number of informants)	UVc = ΣUis/ns
1	Mentha spicata	27	32	0.79
2	Mentha longifolia	21	32	0.61
3	Ocimum basilicum	19	32	0.55

Probability Ranking (PR)

Table 4: Probability Ranking (PR) of some selected species of lamiaceae with their ethnobotanical uses from total score of 32 informants from District Mirpur, AJ&K.

Plant Species	***Mentha spicata***	***Mentha longifolia***	***Ocimum basilicum***
Edible uses	10	8	7
Medicinal uses	9	9	8
Essential Oil uses	6	3	2
Other uses	2	1	2
Total	27	21	19
%age	40%	31.3%	28.3%
Rank	1st	2nd	3rd

Table 5: Direct Matrix Ranking (DMR) of some selected species of lamiaceae, their ethnobotanical uses use citation (recipes) (from 32 informants) from District Mirpur.

Plant Species	***Mentha spicata***	***Mentha longifolia***	***Ocimum basilicum***
Edible uses	10	8	7
Medicinal uses	9	9	8
Essential Oil uses	6	3	2
Other uses	2	1	2
Total	27	21	19
Rank	1st	2nd	3rd

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PHYTOCHEMICAL SCREENING OF *Mentha spicata*

Table 6: Phytochemical test name and that phytochemical, results with methanol

Sr. No.	Phytochemical test name and that phytochemical	Methanol	Chloroform
1.	Fehling's test (For Carbohydrate)	-	+
2.	Benedict's test (For Carbohydrate)	-	+
3.	Mayer'stest (ForCarbohydrate)	-	+
4.	Dragendroff'stest (ForCarbohydrate)	-	+
5.	Biuret'stest (For Proteins and amino acids)	-	+
6.	Ninhydrins test (For protein and amino acids)	-	-
7.	Lead acetate test (For Phenols andTannins)	+	-
8.	Ferric Chloride test (For Phenols and Tannins)	+	-
9.	NaOHtest (ForPhenolsandTannins)	-	+
10.	Glycosidetest	-	+
11.	HCltest (ForFlavonoids)	-	+
12.	Leadacetate (ForFlavonoids)	+	+
13.	Salkowiski'stest (ForSteroidsandSterols)	-	+

Test for Carbohydrates

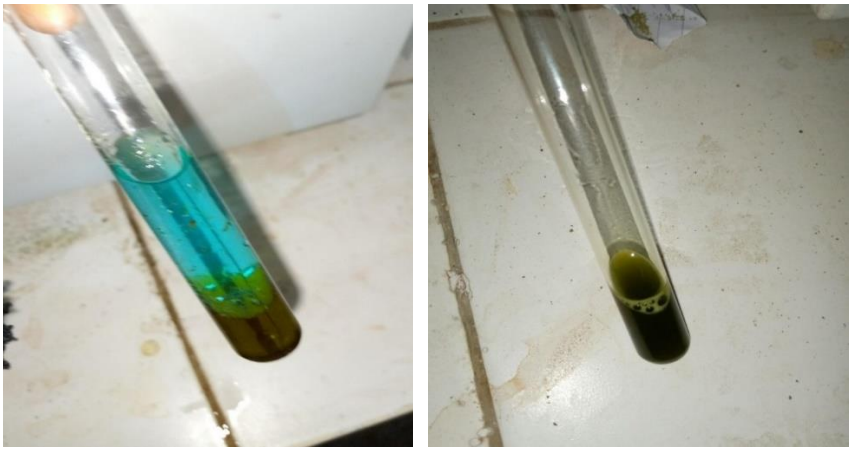
1. **Fehling's test**

Result: Yellow or red precipitate.

Figure 1: Fehling's test from methanol and chloroform test

2. **Benedict's test**

Result: Red or yellow precipitate.



Test for Alkaloids

1. **Mayer's test**

Result: White creamy precipitate.

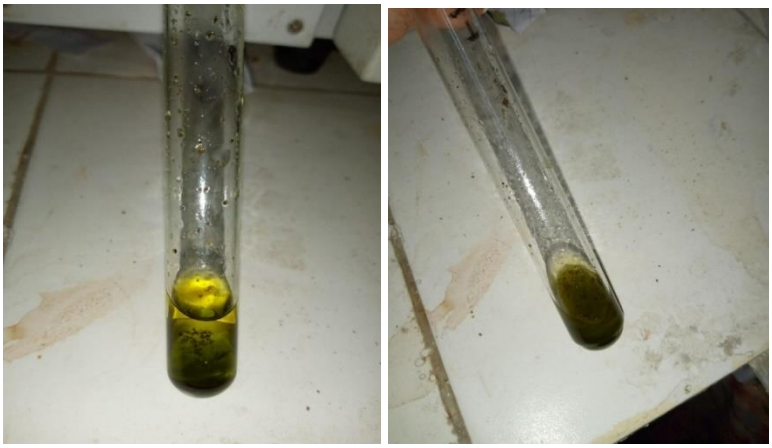


Figure 3: Mayer's test from methanol and chloroform extract

2. **Dragendroff's test**

Result: Orange or red precipitate.

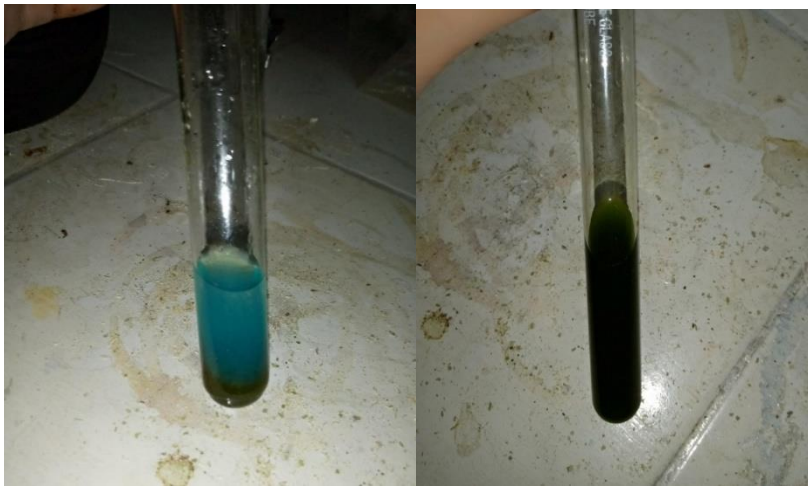


Figure 4: Dragendroff's test from Methanol and chloroform extract.

Test for Proteins and Amino acids

1. **Biuret test**

Result: Violet color formation.

Figure 5: Biuret test from methanol and chloroform extract.

1. **Ninhydrins test**

Results: Purple color formation.

Figure 6: Ninhydrins test from methanol andfrom chloroform extract.

Test for Phenols & Tannins

1. **Lead acetate test**

Results: Formation of precipitate.

Figure 7: Lead acetate test from methanol and chloroform extract

2. Ferric Chloride test

Results: Dark bluish black color formation.

Figure 8: Ferric Chloride test from methanol and chloroform extract.

3. Sodium Hydroxide test

Results: Blue color of filtrate.

Figure 9: NaOH test from methanol and chloroform extract

Test for Glycoside

Results: Violet color ring formation at the top of the liquid in test tube.

Figure 10: Glycoside test from methanol and chloroform extract

Test for Flavanoids

1. **HCl test**

Results: Yellow color formation that decolorizes on the addition.

Figure 11: HCl test from methanol and chloroform extract

2. **Lead acetate test**

Results: Yellow color formation.

Figure 12: Lead acetate test from methanol and chloroform extract

Test for Steroids and Sterols

1. **Salkowiski's test**

Results: Upper layer turn red and lower layer turn yellow with green florescence.

Figure 13: Salkowiski's test from methanol and chloroform extract

DISCUSSION

The present study has informed that the family lamiaceae is not native to District Mirpur and is cultivated by the local people. The plant species present in this area are Mentha spicata (Spearmint), Mentha longifolia (Jangli Podina), Ocimum basilicum (Sweet Basil) are perennial herbs, hemicryptophytes and have Microphylls leaf size diversity.

The ethnobotanical study of family lamiaceae has proved that these found species of lamiaceae have a great edible, medicinal and ornamental value for the people of District Mirpur. UV index (0.79), PR and DMR ranking has shown that Mentha spicata is under great biotic pressure and preferably used by the local people of Mirpur in their daily life.

The phytochemical screening (Qualitative analysis) of Mentha spicata, gives many positive and negative results. These tests proved the presence of many phytochemicals in Mentha spicata.

The tests having positive results proved the presence of phytochemicals Carbohydrates, Alkaloids, Phenols, Tannins, Glycosides, Flavonoids, Steroids and Sterols.

Methanol extract of plant material mostly gave negative results (10 negative and 3 positive results), while the Chloroform extract of plant material gave maximum positive results (10 positive and 3 negative result).

CONCLUSION

Floristic study of lamiaceae in District, Mirpur has shown that the species are not native to area only three species of the family lamiaceae are cultivated in this area. The discussed three species of lamiaceae *Mentha spicata*, *Mentha longifolia* and *Ocimum basilicum* are perennial, hemicryptophytes and microphylls. Ethnobotanical study of lamiaceae has shown the indigenous uses of the plants of lamiaceae family. The study shows that the plants species of lamiaceae cultivated in District, Mirpur is used by the local people for various purposes. It shows their use in food, medicines, essential oils and their other uses as well. Use value Index, Probability Ranking and Direct matrix ranking of the species and their uses shows that *Mentha spicata* (Spearmint) has the 0.78 UV index value and highest rank in DMR and PR. It shows that *Mentha spicata* is under great biotic pressure and preferably uses by the local people of Mirpur, Azad Jammu and Kashmir followed by *Mentha longifolia* and *Ocimum basilicum*. Phytochemical screening of *Mentha spicata* proves the presence of different phytochemicals like Alkaloids, Phenols, Tannins, Glycosides, Flavonoids, Steroids and Sterols. The phytochemical tests have ratio of 10:3 for positive and negative tests in chloroform making it more suitable for phytochemicals screening using qualitative analysis. If the cultivation of the other species of lamiaceae is promoted in Mirpur then the people can easily study their floral character, ethnobotanical uses and the phytochemicals present in them.

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