International Journal of Multidisciplinary Research And Studies

Available online at https://ijmras.com/

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND STUDIES
ISSN: 2640 7272
Volume:03; Issue:04 (2020)

A STUDY OF THE USE OF THE MEDICINAL PLANTS IN TRADITIONAL MEDICINE AND THEIR EFFICACY

SANGEETA PRABHASKAR
M.Phil., Roll No. 140112, Session: 2014-15
Department of Botany, B.R.A. Bihar University, Muzaffarpur, India
Sangeeta1976prabhakar@gmail.com

ABSTRACT

This is especially true in the developing nations of the world. In developing countries, a significant number of sick people utilize both contemporary medicine and traditional medicine in their treatment. Traditional medicines are typically less expensive than their contemporary counterparts, and they are most likely the only natural cures that are both readily available and easily accessible in the rural and isolated populations of poor nations. People who live in rural areas are more likely to take traditional medicines due to their close proximity to traditional healers and the fact that traditional healers understand both the rural residents' culture and the environment in which they live as well as their patients. The pace at which medicinal plants are used across the world has been rising steadily over the past few centuries, particularly in less developed nations. This may largely be ascribed to the fact that medicinal plants are easily accessible, valued and acknowledged by a diverse range of societies, and thought to be free of risk while also being very effective. The estimated prevalence of the usage of medicinal herbs around the globe currently falls somewhere between the ranges of 50 and 95%.

Keywords: Plants, Traditional, Medicine, Nations, Populati

INTRODUCTION

Medicinal plants have long been an essential source of both curative and preventative medical therapeutic preparations for human beings. Additionally, medicinal plants have been employed as a source for the extraction of significant bioactive chemicals. It is believed that over 80 percent of the world's entire population relies on traditional medicine and goods for their healthcare requirements, particularly in third world countries. This is especially true in the developing nations of the world. In developing countries, a significant number of sick people utilize both contemporary medicine and traditional medicine in their treatment. Traditional medicines are typically less expensive than their contemporary counterparts, and they are most likely the only natural cures that are both readily available and easily accessible in the rural and isolated populations of poor nations.

THERAPEUTIC EFFICACY OF PHYTOCHEMICALS

80% of the world's population, according to universal statistics, relies primarily on ethnobotanical remedies and herbal medicine, such as analgesic: morphine; codeine; antineoplastic: camptothecin, taxol, antidiabetic: allicin, antimalarial, artemisinin, quinine; cardiac depressant: quinidine; anti-inflammatory: colchicines; antidiabetic: allicin; and for brain functions Kamboj (2000). (2000). The quality and amount of an active component, which is often a secondary metabolite, will fluctuate from one region of a plant to another depending on where it was grown. Vishwanathan and Basavaraju (2010). There are two distinct categories of plant metabolites: primary and secondary. Primary metabolites are found in all living cells and play an important role in the processes of growth and development. Some examples of primary metabolites are amino acids, proteins, sugar, nucleic acids, and polysaccharides. Secondary metabolites are formed from the basic metabolic pathways, but they do not contribute to the development of the organism. Due to the fact that secondary metabolites have been demonstrated to have a variety of impacts on biological systems, it is frequently utilized as a traditional medicine. Hussein and El-Anssary (2018). Terpenoids, alkaloids, and phenolics are the three categories that make up the plant metabolite classification system.

HISTORY OF USE OF TRADITIONAL HERBAL MEDICINES

According to the dictionary, the term "traditional" usage of herbal medicines connotes a significant amount of historical use, and this is undeniably the case for many of the items that

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

are marketed as "traditional herbal medicines." Traditional practitioners and the assortment of medicinal plants that they have at their disposal are the primary means by which a sizeable percentage of the population in many developing nations obtains the medical attention that they require. Despite the fact that contemporary medicine may coexist with such ancient practise, herbal remedies have frequently kept their appeal for historical and cultural reasons. These kinds of items are becoming more readily available in the commercial market, particularly in nations that have developed economies. In today's contemporary environment, certain components of remedies are frequently sold for applications that have no precedent in the conventional medical practises from which they originated.

THE ROLE OF HERBAL MEDICINES IN TRADITIONAL HEALING

Herbal remedies were the first kind of therapy used in pharmacology, which dates back many centuries (Schulz et al., 2001). Herbal remedies were frequently incorporated into the practise of traditional folk medicine in many parts of the world. The following is a quick overview of some of these practises, which provides instances of the diverse array of significant medicinal methods from throughout the world that made use of herbs for the aforementioned goal.

Traditional Chinese medicine

Since ancient times, the Chinese people have turned to traditional Chinese medicine for their health needs. Botanical materials are the principal source of medicines, despite the fact that animal and mineral components have also been utilised. About 500 remedies out of the more than 12,000 employed by traditional healers are considered standard practise (Li, 2000). Only after undergoing some sort of processing, such as, for instance, stir-frying or soaking in vinegar or wine, do botanical goods find their way into human consumption. In medical practise, a conventional diagnosis could be followed by the recommendation of a complicated and frequently personalised treatment plan. There is still a significant demand for traditional Chinese medicine in China. Traditional medicines are used by more than half of the population on a regular basis, with the largest rate of usage occurring in rural regions. There are over 5000 traditional medicines that may be purchased in China; this segment of the market represents roughly 20% of the total Chinese pharmaceutical market (Li, 2000).

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

Japanese traditional medicine

The ancient medical practises of Japan were heavily influenced by China, which is where many herbal treatments originated. The earliest pharmacopoeia of Japanese traditional medicine was compiled in the ninth century, and it included classifications of native Japanese herbs (Saito, 2000).

Indian traditional medicine

Ayurveda is a form of alternative medicine that has been around for close to 5,000 years and is most often practised in India. In the prevention and treatment of disease, it emphasises the body, mind, and spirit in addition to dietary changes and the use of herbal treatments (Morgan, 2002).

INTRODUCTION OF TRADITIONAL HERBAL MEDICINES INTO EUROPE, THE USA AND OTHER DEVELOPED COUNTRIES

Specifically in Europe and North America, where herbal products have been incorporated into so-called 'alternative,' 'complementary,' 'holistic,' or 'integrative' medical systems, there has been a resurgence of interest in herbal medicines (Tyler, 2000). This interest was sparked by the desire to capture the wisdom of traditional healing systems. In the latter half of the twentieth century, a growing interest in self-care led in an immense surge in popularity of traditional therapeutic techniques, including the use of herbal medicines; this has been particularly true in the United States of America. Consumers have reported having positive attitudes towards these products, in large part due to the fact that they believe these products to be of a 'natural' rather than a'synthetic' origin, they believe that such products are more likely to be safe than are drugs, they are considered to be a part of a healthy lifestyle, and they can help avoid unnecessary contact with conventional 'western' medicine.

MEDICINAL PLANT

Any plant that, in one or more of its organs, has chemicals that may be used for therapeutic purposes or which are precursors for the production of effective medications is considered to be a medical plant. Medicinal plants can be found all over the world. This description makes it easy to differentiate between plants that are considered medicinal but which have not yet been submitted to a comprehensive scientific research and plants that have therapeutic capabilities and ingredients that have been established scientifically. Traditional medicine makes use of a variety of herbs, and this practise dates back many years. Although there may

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

not be adequate scientific data (such as double-blind trials, for example) to establish their usefulness, there are several that do appear to be effective. These plants ought to meet the criteria for therapeutic herbs. Whole plants or portions of plants that have therapeutic characteristics are referred to as "crude pharmaceuticals of natural or biological origin" when discussed by pharmacists and pharmacologists. This word can refer to either naturally occurring or biologically produced substances. In light of the objectives of this presentation, a definition of medicinal plants has to take into account the following (Sofowora 2008; Evans, 2008):

1. plants or plant parts used medicinally in galenical preparations (such as decoctions, infusions, etc.), such as cascara bark;

2. plants used for extraction of pure substances either for direct medicinal use or for the hemi-synthesis of medicinal compounds (such as the hemi-synthesis of sex hormones from diosgenin obtained from Dioscorea yams);

3. food, spice, and perfumery plants used medicinally, such Examples of this include ergot, which is caused by a fungus called Claviceps purpurea that grows on rye, and Streptomyces griseus. Other examples include plants that are used to extract pure substances either for direct medicinal use or for the hemi-synthesis of medicinal compounds (for example, the hemi-synthesis of sex hormones from diosgenin obtained from Dioscorea yams); plants that are used in the production of Examples of this include ergot, which is caused by Claviceps purpurea growing on rye, and Streptomyces griseus; and

4. fibre plants, such as cotton, flax, and jute, which are utilised in the creation of surgical dressings.

A SOURCE OF PHYTOTHERAPEUTIC MODALITY IN RESOURCE-CONSTRAINED HEALTH CARE SETTINGS

Since the beginning of time, people have relied on nature to provide for their fundamental requirements, including the manufacture of food, housing, clothes, and modes of transportation, as well as tastes, scents, fertilisers, and, last but not least, medicines. Plants have been the foundation of many sophisticated traditional medical systems that have been

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

practised for thousands of years and continue to give humans with new treatments. These systems of medicine continue to supply humankind with new cures. The information that early people had regarding the exploitation of plants for medicinal purposes was acquired over the course of many years via careful observations, experience, and the use of trial and error.

OBJECTIVE

1. To Study On The Use Of The Medicinal Plants In Traditional Medicine And Their Efficacy
2. To Study On The Role Of Herbal Medicines In Traditional Healing

LITERATURE REVIEW

Nushrath Roshana is 2018. Background: Traditional medicine has been practised for a long time, and it continues to meet the health requirements of the community. It also offers health care in the form of preventative therapy and rejuvenation. Poisonous snake bites are a leading cause of death and morbidity across the world, including in Sri Lanka, and have become a major public health concern in recent years. Traditional medicine practitioners make extensive use of the therapeutic plants that are readily available in the area. Because of this, they require care paid to this facet. The major objective of this research was to conduct a literature review on the essential qualities of medicinal plants that are traditionally employed in the treatment of snake bites. In Traditional Chinese Medicine (TCM), these plants are used to treat snake bites.

Lia Aileen Marasigan Palileo-Villanueva 2022. Background: TCAM, which stands for traditional, complementary, and alternative medicine, is employed in the treatment of a wide variety of illnesses. TCAM usage is especially widespread among people of lower socioeconomic class in low- and middle-income countries (LMICs), where it is prevalent overall. This study examines the prevalence and characteristics of TCAM use for hypertension, its determinants, and its association with hypertension management outcomes and wellbeing among low-income adults in two Southeast Asian countries that are at different levels of economic and health system development. These countries are Malaysia and the Philippines.

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

Jahan Sowkat 2022. Ethnopharmacological significance The condition known as peptic ulcer disease (PUD) is at the top of the list of the most common digestive issues found in people all over the world. The use of non-steroidal anti-inflammatory medicines for an extended period of time, an infection caused by a pathogenic strain of Helicobacter pylori, an imbalance between gastrointestinal regulatory components, and pathological hyperacidity are key contributors to the formation of peptic ulcers. It is fairly commonplace for synthetic medications belonging to a variety of pharmacological groups to be readily available, but it is not always the case that such substances are sufficient to ensure full recovery.

Nazmul Qais 2022. Abstract Ethnopharmacological significance The condition known as peptic ulcer disease (PUD) is at the top of the list of the most common digestive issues found in people all over the world. The use of non-steroidal anti-inflammatory medicines for an extended period of time, an infection caused by a pathogenic strain of Helicobacter pylori, an imbalance between gastrointestinal regulatory components, and pathological hyperacidity are key contributors to the formation of peptic ulcers. It is fairly commonplace for synthetic medications belonging to a variety of pharmacological groups to be readily available, but it is not always the case that such substances are sufficient to ensure full recovery.

Ahmad Al sarayreh 2022. Background Wound care is one of the key issues for patients with diabetes about their health. Because the commonly used medications have a number of adverse effects, there is an increasing demand for novel natural sources of therapies. The components and procedures The purpose of this research was to determine the extent to which a methanolic extract of the leaves of Globularia arabica and Malva sylvestris, as well as the fruits of Rhus coriaria, might promote the healing of wounds.

MATERIALS AND METHODS

The rural inhabitants of the Marathwada region provided the researchers with information on the therapeutic properties of a selection of plants, which was used to guide the collection of those plants throughout the years 2010 and 2011. In addition, the information was compared with other documented usage for the purpose of validation by Naik (1998), Grewal (2000), Kirtikar and Basu (1975 and 1991).The plant samples that were gathered were later identified with the assistance of floras written by Naik (1979); Naik et al., (1998); Singh and Kartekeyan (2001); and Yadav and Sardesai (2002). The Botanical Survey of India in Pune

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

confirmed the identity of the plants that were identified. Herbarium of the Department of Botany at Dnyanopasak College in Parbhani is where the voucher specimens were placed for safekeeping.

RESULTS

PERGULARIA DAEMIA (LINN.) CHIOV.

Macroscopical characters

a) Organoleptic characters

Colour: Dark green

Odour: Characteristic

Taste: Astringent

Texture: Leathery

Shape: Obovate

Microscopical characters

b) Epidermal cell complex

Amphistomatic and reticulate veining may be found on the leaf of the Pergularia daemia plant. The epidermal cells that make up the uppermost layer of the skin have straight-curved walls and are shaped like polygons. The lower epidermal cells have irregularly shaped and sinuous walls, and their distribution is unequal. The cells that make up the top and lower epidermis are smooth. 1040–1045 is the epidermal cell frequency of the top surface, and 1490–1504 is the epidermal cell frequency of the lower surface (Table 4.1).

Table 4. 1: Epidermal cell characteristics of Pergularia daemia leaf

Sr. No.	**Character**	**Surfaces**	**Observation**
1	Shapes	Upper	Polygonal

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

		Lower	Uneven
2	Sides	Upper	Straight-curved
		Lower	Sinuous
3	Surfaces	Upper	Smooth
		Lower	Smooth
4	ECF mm^2	Upper	1040-1045
		Lower	1490-1504

c) Stomatal complex

The leaf is amphistomatic and has anisocytic stomata, which means that there are three subsidiary cells present around the guard cell, with one of these cells being significantly smaller than the other two. The stomatal index ranges from 1.88 to 2.33, and the number of stomata on the top surface is between 20 and 25 per mm2 (Fig. 4.5). The stomatal index ranges from 17.43 to 18.03, and the stomatal frequency of the lower surface is between 320 and 331 per mm2 (Figure 4.6). (Table 4.2).

d) Trichomes

Trichomes are found on both surfaces, and those trichomes are multicellular and unbranched. However, the trichomes that are found on the top surface are multicellular, uniseriate, and branched. The bottom of the trichome is anchored to the epidermal cells, and its body projects in an upward direction (Fig. 4.3 and 4.4).

Anatomical analysis

a) Anatomy of stem

The round shape may be seen on the stem of the Pergularia daemia plant. It is composed of the single layer of epidermis, which has closely packed parenchyma cells, and it is from these cells that the multicellular trichomes are extended outwardly. Below the epidermis is a multilayered cortex that is composed of the following: 2-3 layers of compactly arranged

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

collenchymatous cells forms the hypodermis, followed by 4-5 layers of compactly arranged parenchyma cells with numerous conjoint, collateral, and open vascular bundles arranged in a ring. At the centre of the multilayered cortex is a large parenchymatous pith that contains large intercellular spaces (Fig. 4.1).

b) Anatomy of leaf

In terms of anatomy, it reveals the epidermis to be a single layer, with projecting trichomes that can be either unicellular or multicellular. Below the top epidermis, there are 1-2 layers of compactly organised columnar palisade parenchyma cells. Just above the lower epidermis, the spongy parenchymatous cells have intercellular gaps and form the spongy mesophyll. Additionally, there is only one layer in the lower epidermis. In the area of the midrib, the midrib has a structure that is curled on the bottom side. On the top side of the midrib, you'll find collenchymatous cells, and on the bottom side, you'll find ground tissue, also known as parenchyma. It possesses the central collateral as well as the closed vascular bundle, which consists of upper xylem and lower phloem (Fig. 4.2).

c) Vessel elements

Variation may be seen in the vessels of the secondary xylem; around sixty percent of the vessels have scalariform thickening, which has the appearance of a ladder. On one side of the narrow vessel, the end walls have many scalariform perforation plates, and the end walls on the other side have transverse or oblique tail like shapes. The vessels with scalariform multiple perforation plates have a width that ranges from about 3.53 nm to 3.70 nm, and their length ranges from approximately 10.13 nm to 10.16 nm. The remaining forty percent of the arteries are found to contain spiral thickenings. The end wall plate is transverse and has several perforation plates. Its width is around 2.45 nm, and its length is approximately 10.76 nm (Fig. 4.7 and 4.8).

Quantitative microscopy of leaf

The stomatal index of the top surface of the leaf, as determined by quantitative microscopy, ranges from 1.88 to 2.33, whereas the index of the bottom surface ranges from around 17.43 to 18.03. The palisade ratio is somewhere between 6 and 7. The number of vein islets is around 9-11, and the number of vein terminations is 13-15. (Table 4.2).

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

Table 4. 2: Quantitative characteristics of Pergularia daemia leaf

Sr. No.	**Parameter**	**Surface**	**Range**
1	Stomatal frequency	Upper	20-25
		Lower	320-331
2	Stomatal index	Upper	1.88-2.33
		Lower	17.43-18.03
3	Palisade ratio		6-7
4	Vein islet number		9-11
5	Vein-let termination number		13-15

Qualitative phytochemical analysis of Pergularia daemia

The preliminary phytochemical screening of leaf extract of Pergularia daemia reveals the presence of alkaloids in all extracts with the exception of the ethanol extract; flavonoids and saponins are present in petroleum ether, ethanol, and distilled water extracts but are absent in methanol and acetone leaf extract; the tannins are present in all extracts with the exception of the petroleum ether extract. While carbohydrates, terpenoids, and amino acids were discovered in each and every leaf extract that was analysed, The root extract indicates the presence of alkaloids in all of the extracts, with the exception of the extract made with distilled water. Flavonoids are also found in all of the extracts, with the exception of the root extract made using petroleum ether. The only extracts of the root that contain saponins are those made with ethanol and water that has been distilled. Tannins, polysaccharides, terpenoids, and amino acids are all components that may be found in root extracts in their whole forms (Table 4.3).

Table 4. 3: Preliminary and phytochemical screening of Pergularia daemia leaf and root

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

Sr. No.	Plant part	Extract	Alkaloids	Flavonoids	Saponins	Tannins	Carbohydrates	Terpenoids	Amino Acids
1	**LEAF**	Pet. ether	+	+	+	-	+	+	+
		Ethanol	-	+	+	+	+	+	+
		Methanol	+	-	-	+	+	+	+
		Acetone	+	-	-	+	+	+	+
		Dist. water	+	+	+	+	+	+	+
2	**ROOT**	Pet. Ether	+	-	-	+	+	+	+
		Ethanol	+	+	+	+	+	+	+
		Methanol	+	+	-	+	+	+	+
		Acetone	+	+	-	+	+	+	+
		Dist. water	-	+	+	+	+	+	+

Detection of inorganic constituents in Pergularia daemia

The phytochemical examination of the leaf and root ash of Pergularia daemia for the identification of inorganic contents revealed the presence of calcium, magnesium, sodium, potassium, and iron in the leaf ash. The root ash did not contain any of these inorganic constituents. In the root ash, there is a presence of sodium and potassium but a lack of calcium, magnesium, and iron (Table 4.4).

Table 4. 4: Inorganic constituents of Pergularia daemia leaf and root

Sr. No.	Inorganic constituents	Leaf	Root
1	Calcium	+	-

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

2	Magnesium	+	-
3	Sodium	+	+
4	Potassium	+	+
5	Iron	+	-

Physicochemical analysis

The physicochemical examination of the medication made from the leaves of the Pergularia daemia plant reveals that they contain 8.79% moisture. The acid insoluble ash makes up 11.1% of the overall ash content of the leaf, while the water soluble ash accounts for 12.5% of the total. The total ash content of the leaf is 24.1% of the dry weight. The extractive values of the leaf in alcohol are 23.2%, while the extractive values in water-soluble solvents are 35.2%. The root of the Pergularia daemia plant has a moisture level of 1.57 percent. The acid insoluble ash makes up 4.8% of the total ash in root, while the water soluble ash accounts for 5.3% of the total ash. The overall ash percentage is 10.4% of the root's dry weight. The extractive values of root in alcohol are 8.8%, and the extractive values in water-soluble form are 7.2%. (Table 4.5).

Table 4. 5: Physicochemical analysis of leaves and root drug in Pergularia daemia

Plant part	**Parameter**	**Observation**
LEAF	Moisture content	8.79%
	Total ash	24.1%
	Acid insoluble ash	11.1%
	Water soluble ash	12.5%
	Alcohol soluble extractives	23.2%
	Water soluble extractives	35.2%

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

ROOT	Moisture content	1.57%
	Total ash	10.4%
	Acid insoluble ash	4.8%
	Water soluble ash	5.3%
	Alcohol soluble extractives	8.8%
	Water soluble extractives	7.2%

CASCABELA THEVETIA (L.) LIPPOLD

Macroscopical studies

a) Organoleptic characters

Colour: Dark green

Odour: Characteristic

Taste: Pungent

Texture: Smooth

Shape: Lanceolate

Microscopical characters

a) Epidermal cell complex

Hypostomatic and reticulate veining may be found on the leaf of the Cascabela thevetia plant. Isodiametric and irregular in form, the epidermal cells that cover both surfaces of a Cascabela thevetia leaf have the same dimensions. Epidermal cells on both the top and the lower surface have side walls that have waves in them. Both of the epidermal cells have smooth surfaces on their outermost layers. The frequency of epidermal cells on the top surface is 1225-1235, whereas the frequency on the lower surface is 1610-1623. (Table 4.6).

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

Table 4. 6 : Epidermal cell characteristics of Cascabela thevetia leaf

Sr. No.	Character	Surfaces	Observation
1	Shapes	Upper	Uneven
		Lower	Uneven
2	Sides	Upper	Wavy
		Lower	Wavy
3	Surfaces	Upper	Smooth
		Lower	Smooth
4	ECF mm^2	Upper	1225-1235
		Lower	1610-1623

b) Stomatal complex

The stomata are exclusively found on the underside of the leaf and are of the anisocytic type. They are encircled on all sides by three secondary cells that are irregular in form (Fig. 4.12). Stomata are not present on the top surface (Fig. 4.11). Stomatal index and stomatal frequency of the top surface are both zero. Stomatal frequency is measured in terms of mm2 of surface area. Stomatal index ranges from 12.54 to 12.60, and the stomatal frequency of the bottom surface is between 231 and 234 per mm2 (Table 4.7).

c) Trichomes

The trichomes are absent on both the surfaces of leaf of Cascabela thevetia.

Anatomical analysis

a) Anatomy of stem

Histological examination of the stem of Cascabela thevetia reveals the existence of a single

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

layer of epidermis that is coated with a thin layer of waxy cuticle. The cells of the epidermis are placed closely together and there are no intercellular gaps between them. Below the epidermis, there is a phellogen layer that has three to four layers and is also made up of closely organised parenchymatous cells. Inside of the phellogen layer was a continuation of the multi-layered cortex. Below the cortex, there is a huge vascular cylinder that is conjoint, collateral, circular, and present. This cylinder contains the phloem components on the outer side of the cambium ring, and the xylem elements on the inner side of the cambium ring. Meta-xylem is located on the outer side of the xylem, whereas proto-xylem components are located on the inner side of the xylem. Large, closely packed bundles of parenchymatous pith cover the portion of the stem that is located in the stem's middle (Fig. 4.9).

b) Anatomy of leaf

The histological structure of the leaf of Cascabela thevetia reveals the presence of a single-layered top and lower epidermis that is covered by a thin cuticle. The epidermal cells that make up the lamina are organised in a compact manner and have a tubular form. The layer of mesophyll that lies under the top epidermis is known as the mesophyll, and it is composed of two distinct kinds of tissues: a single layer of palisade cells and 5–6 layers of spongy parenchyma tissues. At the lower surface of the midrib, there is a pattern of collenchyma cells that looks like an upside-down U, and just below the top epidermis, there is a pattern of collenchyma cells that looks like a curved line. In the middle of the midrib, there is a collateral vascular bundle that is open, and it is from this bundle that the xylems emerge that face downward toward the lower epidermis. There are additional crystals of the rosette type seen in the lamina and the midrib area (Fig. 4.10).

c) Vessels elements

The vessel components that make up the secondary xylem have thickenings that are helical to scalariform in shape. Both transverse end wall plates include a scalariform perforated plate. The vessel has an average length of around 329 millimetres and an average diameter of about 24.59 millimetres (Fig. 4.13 and 4.14).

Quantitative microscopy of Cascabela thevetia leaf

The stomatal index of the upper surface of a Cascabela thevetia leaf is shown to be zero by

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

quantitative microscopy, whereas the stomatal index of the bottom surface ranges from 12.54 to 12.60. The ratio of the palisade is between 5 and 6. The number of vein islets is between 10 and 13, while the number of vein let terminations is between 20 and 24.

Table 4. 7: Quantitative characteristics of Cascabela thevetia leaf

Sr. No.	**Parameter**	**Surface**	**Range**
1	Stomatal frequency	Upper	0
		Lower	231-234
2	Stomatal index	Upper	0
		Lower	12.54-12.60
3	Palisade ratio	-	5-6
4	Vein islet number	-	10-13
5	Vein-let termination number	-	20-24

CONCLUSION

Herbal medicine was anticipated to play a significant role in the healthcare system during the beginning of the twentieth century because antibiotics and analgesics were not readily available. Herbal therapy rapidly lost its prominence as a result of the advent of the allopathic system of medicine, and patients were more interested in the rapid therapeutic effects of synthetic medications. Recently, it has come to light that synthetic medications can cause negative effects, while at the same time, herbal medicine has experienced a surge in popularity. Ethnomedicinal research has shown that the rural residents and traditional healers in various parts of the Marathwada region have been using plants from the families Asclepiadaceae (Pergularia daemia), Apocynaceae (Wrightia tinctoria), (Cascabela thevetia), Sapindaceae (Cardiospermum halicacabum), and Meliaceae (Soymida febrifuga It is the presence of secondary metabolites, often known as phytochemicals, in a plant that is

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

responsible for its therapeutic qualities. Because of this, it is considered very necessary to test the chosen plants' phytochemical and pharmacognostic properties to determine whether or not they are effective against germs.

REFERENCE

1. Aleykutty, S. S., Thushara B. S. and Bindu A. R., (2013), Antioxidant activity, a phenolic and flavonoid content of Wrightia tinctoria leaves. Journal of Pharma. Search. Vol. 8 (3):

2. Annadurai, A., Elangovan V., Velmurugan S. and Ravikumar R., (2013). Preliminary phytochemical screening and antibacterial activity Cardiospermum halicacabum L. Advances in Applied Science Research, Vol. 4 (5):

3. Attarde, D. L., Chaudhari B. J., Kale S. S., Bhamber R. S. and Pal S. C., (2010), Pharmacognostical studies on leaflets of Soymida febrifuga Adr. Juss. Family: Meliaceae, Journal of Pharmcy Research, Vol. 3 (10):

4. Barthlott, W., (1981). Epidermal and seed surface characters of plants. Systematic applicability and evolutionary aspects, Nordic. J. Bot. 1:

5. Bhaskar, V. H. and Balkrishnan N., (2010). Pharmacognostic studies on Pergularia daemia roots. Informa Healthcare. Vol. 48 (4):

6. Bigoniya, P., Singh C. S. and Shukla A., (2011). Pharmacognostical and physicochemical standardization of ethnopharmacologically important seeds of Lepidium sativum Linn. and Wrightia tinctoria R. Br. Indian Journal of Natural Products and Resources. Vol. 2 (4):

7. Blois, M. S., (1958). Antioxidant determinations by the use of a stable free radical. Nature. 181:

8. Chandak, Raman R., Ipper G. Balaji and Subhash J. Devdhe., (2010). Preliminary

Sangeeta Prabhakar *, *University Department of Botany: B.R.A. Bihar University, Muzaffarpur. India*

phytochemical investigation of extract of leaves of Pergularia daemia Linn. IJPSR. Vol. 1 (1):

9. Daniel, H., (1991). Methods in plant biochemistry and Economic botany. Kalyani Publication, New Delhi.

10. Deepan, T., Alekhya V., Saravana umar P. and Dhanaraju M. D., (2012).

11. Phytochemical and Antimicrobial studies on the leaves extracts of Cardiospermum helicacabum Linn. Advances in Biological Research.

12. Doss, A. and S. P. Anand., (2013). Evaluation of antioxidant activity of Hygrophila auriculata (Schumach) Heine and Pergularia daemia Linn. Wudpecker Journal of Medicinal plants. Vol. 2 (4):