WORLD JOURNAL OF PHARMACEUTICAL RESEARCH

Volume 1, Issue 2,332-339. Research Article ISSN 2277 – 7105

PHARMACOGNOSTIC STUDIES OF *BARLERIA MONTANA* DUN. LEAVES

***Shanaz Banu[1], Arunachalam.G[2], Jayaveeera K.N[3], Josephine Leno Jenita[1], Ayesha Siddiqua[1]**

[1]Dayananda Sagar College of Pharmacy, Shavige Malleswara Hills, Bangalore.

[2]PGP College of Pharmaceutical sciences and Research Institute, Namakkal, TamilNadu.

[3]Jawaharlal Nehru Technological University, Anantapur, Andhra Pradesh.

Article Received on
25 March 2012,

Revised on 10 April 2012,

Accepted on 22 April 2012

***Correspondence for Author:**

*** Shanaz Banu**

Dayananda Sagar College of Pharmacy, Shavige Malleswara Hills, Bangalore, India.

shanaz2906@gmail.com

ABSTRACT

An attempt has been made to highlight the leaves of *Barleria montana* (BM) through the pharmacognostic studies. The preliminary phytochemical analysis has also been performed on the powdered leaves. The presence of multicellular covering trichomes, xylem vessels with pitted and spiral thickenings, and anomocytic stomata are seen in the transverse section and powder characteristics of BM leaves and can be used as anatomical markers. Preliminary phytochemical analysis indicated the presence of phytosterols, phenolics, alkaloids, terpenoids, tannins and flavonoids present in the methanolic extract of BM. Physico-chemical parameters like ash value, extractive value and moisture content were estimated inorder to enable the identification of the drug in a convenient manner.

Key words: *Barleria montana*, pharmacognostic evaluation, phytochemical, physico-chemical.

INTRODUCTION

Herbal drugs play an important role in health care programs especially in developing countries. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants and considers all plant parts to be potential sources of medicinal substances. However a key obstacle, which has hindered the acceptance of the alternative medicines in the

developed countries, is the lack of documentation and stringent quality control. There is a need for documentation of research work carried out on traditional medicines. With this backdrop, it becomes extremely important to make an effort towards standardization of the plant material to be used as a medicine. The process of standardization can be achieved by stepwise pharmacognostic studies. These studies help in identification and authentication of the plant material. Correct identification and quality assurance of the starting materials is an essential prerequisite to ensure reproducible quality of herbal medicine which will contribute to its safety and efficacy. Simple pharmacognostic techniques used in standardization of plant material include its morphological, anatomical and phytochemical characteristics.

*Barleria montana, (*Synonym *Barleria purpurea)* commonly known as Mountain Barleria is one of the species in the genus Barleria belonging to the family Acanthaceae (Ruellia family). Mountain Barleria is an erect herb found in the mountains of Western Ghats. Traditionally it has been used for centuries for treating wounds, diabetes and for its hepatoprotective activity. However, available literature revealed that no pharmacognostic study has been carried out on the plant, hence the present investigation was undertaken.

The objective of the present study is therefore an attempt to evaluate various pharmacognostic standards like macroscopy and microscopy of leaves (transverse section and powder microscopy), physico-chemical parameters like moisture content, ash value, extractive value and preliminary phytochemical analysis.

MATERIAL AND METHODS

The first step in standardization of herbal drugs is the correct identification of plant, macroscopic and microscopic characters. The plant was authenticated by Dr. Madhavachetty, Prof of Botany, Tirupati, Andhra Pradesh.

Preparation of plant extract

Fresh leaves of BM were collected, washed under running tap water and blotted dry for further study. A detailed macroscopical and microscopical study of the leaves and leaf powder was carried out. The anatomical section (transverse section) and powder of the leaves were examined microscopically using the compound microscope. It was evaluated and photographed (10X, 45X). The leaves were air dried, ground into coarse powder, defatted

with petroleum ether, extracted with hexane, ethyl acetate, methanol and water, evaporated to dryness and then subjected to phytochemical determination and used for further analysis.

Methanolic extract of BM was further used for Ash values determination to evaluate quality and purity of the crude drug that contains inorganic radicals like phosphates, carbonates, potassium, magnesium and calcium. The determination of various extractive values of powdered leaves such as water soluble extractive value, alcohol soluble extractive value, total ash content, water soluble ash content and acid insoluble ash content were carried out according to the methods described by Mukherjee. Preliminary phytochemical analysis of leaves was carried out by using the methods as described in Khandelwal.

RESULTS

Morphology:

Shape : Ovate to lanceolate
Size : 08-12 cm. x 6-12.5 cm.
Margin : Entire
Apex : Acute
Venation : Palmate
Surface : glabrous
Colour : Dark green adaxially, light green abaxially
Taste : Bitter
Odour : Characteristic

Microscopy

Transverse section of leaf through midrib(A) shows epidermis in surface view and lamina in transverse view showed following characteristics. Leaf has single layer of epidermis on both the surface(B). Upper epidermis is covered by thin cuticle. Both the epidermis showed anomocytic stomata(C). Multicelllular covering trichomes are abundant on both the epidermis(D). Transverse view of lamina showed single layer of closely packed palisade cells below upper epidermis(E), spongy mesophyll and few vascular strands(F). Midrib showed 5-7 layered thick walled closely packed collenchyma cells(G) on both the surfaces.
Physico-chemical parameters are tabulated in Table No. 2
Phytochemical screening of different extracts are been represented in Table No.3

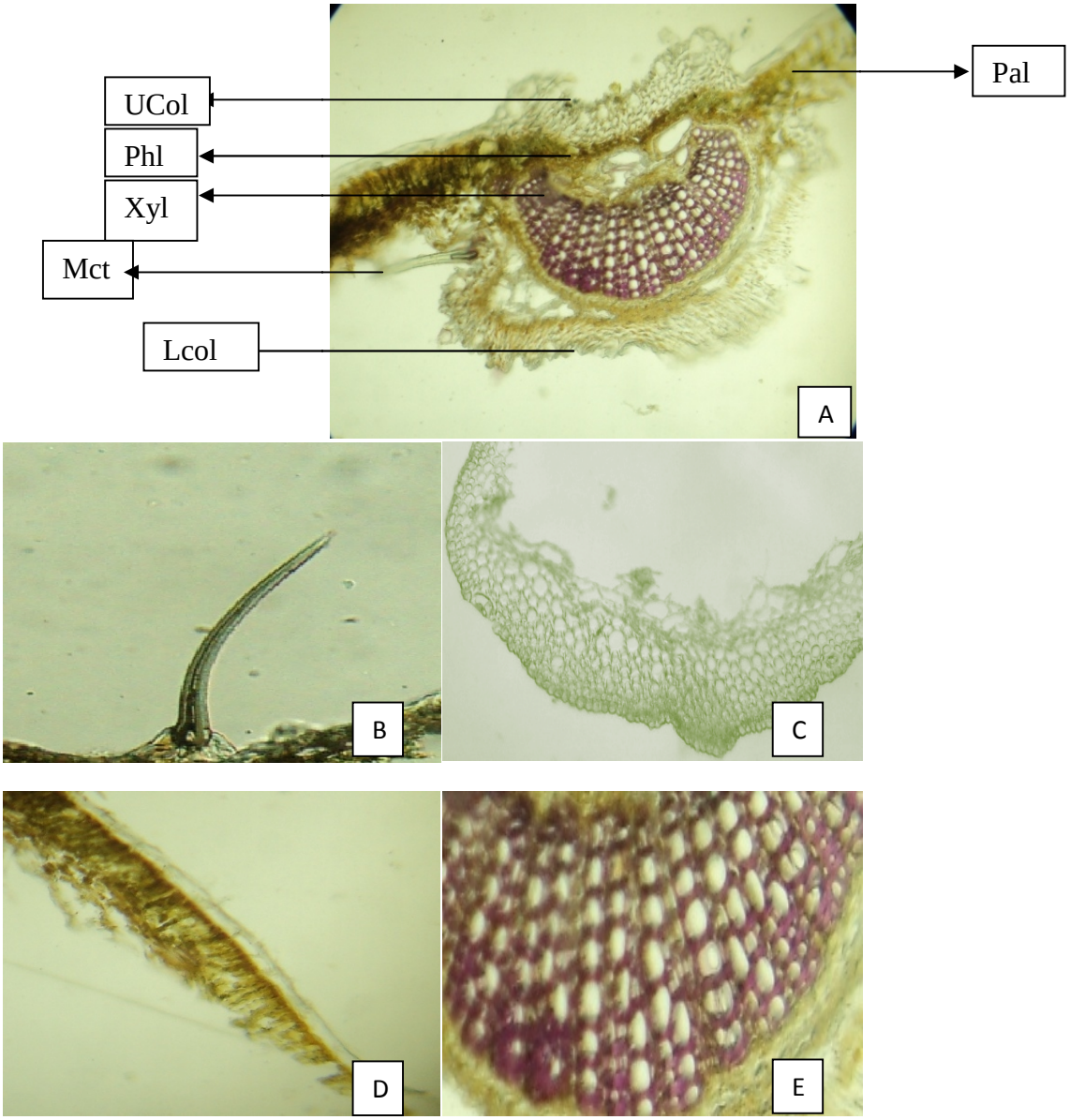

Fig: 1. T. S of Leaf through Midrib (10 x)

A: Transverse section of leaf showing multicellular; Phl: Phloem; McT & B: multicellular covering trichomes; Lcol & C: Lower collenchymas; Pal & D: Palisade cells; Xyl &E:Xylem vessels.

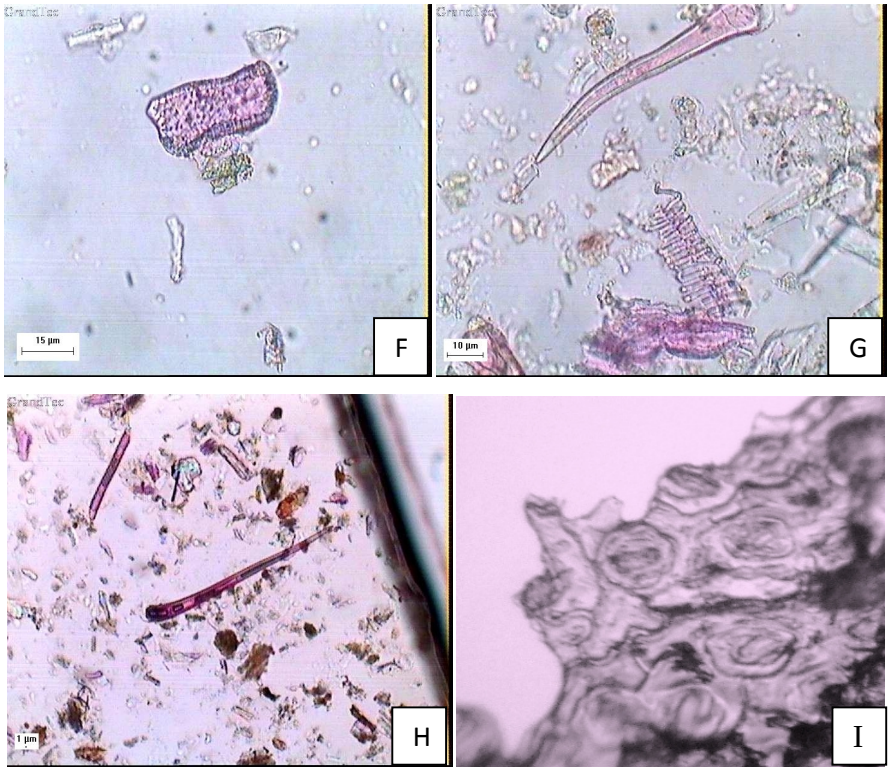

Fig 2: Powder microscopy of *Barleria montana* leaves

F: Xylem vessels with pitted thickenings; G: Xylem vessels with spiral thickenings and multicellular covering trichomes; H: Multicellular covering trichome; I: Anomocytic stomata with wavy epidermal cells.

TABLE 1: Physical nature of different extracts of *Barleria montana* leaves

Sl.No.	Extracts	Extract values	Physical nature of extract (consistency)	Colour
1	Hexane extract	8.4%	Sticky	Dark green
2	Ethyl acetate extract	7.5%	Semi solid	Brownish green colour
3	Methanol extract	10.6%	Thick and sticky	Dark brownish green
4	Water extract	8.9%	Semi solid	Brownish

TABLE 2: Physico-chemical parameters of *Barleria montana* leaves.

Moisture	Ash Value				Extractive Values (E.V)	
	Total ash	Acid insoluble ash	Water Soluble ash	Sulphated ash	Water soluble E.V	Alcohol soluble E.V
9%	12.33%	2.33%	4.32%	2.8%	10.6%	8.9%

TABLE 3: Phytochemical screening of *Barleria montana* leaves

Phytoconstituents	Methanolic extract of *Barleria montana*
Phytosterols	+ve
Phenolic compounds	+ve
Alkaloids	+ve
Flavanoids	+ve
Terpenoids	-ve
Carbohydrates	-ve
Proteins and aminoacids	-ve

DISCUSSION

The pharmacognostic standards for the leaves of *Barleria montana* are laid down for the first time in this study. Morphological and anatomical studies of the leaf will enable to identify the crude drug. The information obtained from preliminary phytochemical screening will be useful in finding out the genuity of the drug. Ash values, extractive values can be used as reliable aid for detecting adulteration. These simple but reliable standards will be useful to a lay person in using the drug as a home remedy. Also the manufacturers can utilize them for identification and selection of the raw material for drug production.

CONCLUSION

Microscopic analysis and qualitative parameters were carried out on the plant in order to establish appropriate data that can be used in identifying crude drugs particularly those supplied in powder form. These are the standard pharmacognostic parameters that can be used to differentiate closely related plant species or varieties with similar constituents or pharmacological activities.

ACKNOWLEDGEMENT

The authors are thankful to the Principal and management, Dayanandasagar college of pharmacy, for their immense support in carrying out the research work.

REFERENCES

1. Jegede I. A., Ibrahim, J. A. and Kunle O.F. Phytochemical and pharmacognostic studies of the leaf and stem-bark of *Anthocleista vogelii* (Planch). J. of Med Pla Res, 2011; 5(26): 6136-6139.
2. Ravichandra V D, Padmaa M Paarakh. Pharmacognostic And Phytochemical investigation on leaves of *Ficus Hispid*. Int J Pharm Pharm Sci, 2011; 3(2): 131-134.
3. Dahanukar, S. A., Kulkarni, R. A. and Rege,N. N. Pharmacology of medicinal plants and natural productsInd. J Pharmacol, 2000; (32): 81-118.
4. Anonymous. Macroscopic and Microscopic examination: Quality Control Methods for Medicinal Plant Materials, WHO, Geneva, 1998.
5. Johanson, D.A.O. Plant Microtechnique, Mc. Grew Hill Book Co., New York, 1940.
6. Anonymous. The Ayurvedic Pharmacopoeia of India, Government of India, Ministery of Health & Family Welfare, Published by The Controller of Publications, Civil Lines, NewDelhi, Vol.I , 2001.
7. Brain, K.R. and Turner, T.D. Practical evaluation of Phytopharmaceuticals, Wright Scientechnica, Bristol , 1975.
8. Karnick, C.R. Pharmacopoeial standards of herbal plants. Sri Saguru publication, 1994; 2:124.
9. Khandelwal, K.R., Practical Pharmacognosy Nirali Prakashan, 5th ed.1998.
10. Kokate, C.K., Practical Pharmacognosy. Vallabh Prakashan, Delhi: 1999.
11. Kokate, C.K., Purohit, A.P. and Gokhale, S.B., Pharmacognosy, Nirali Prakashan, XII ed.1999.

12. Merina, B. Natural Product Radiance. 3:2004, pp 349-350.
13. Wallis, T.E., Practical Pharmacognosy, J. & A. Churchill Ltd., London, (Vth Ed.), 1984.
14. Mukherjee,P.K. Quality control of herbal drugs. Buisness Horizons Pharmaceutical publishers, 1st ed., 2002; 186-191.