

International Journal of Scientific Research and Reviews

A Review of Selected Medicinal Plants of Manipur Used in Traditional Healing Practices

Longjam Usharani¹, Aribam Palinchandra Sharma², Kshetrimayum Kishan³, Longjam Karuna Devi⁴, Santosh Keisam⁵, Ng Archana⁶ and Oinam Premila Chanu^{7*}

^{1,2,3,4,5,7}Advanced Level Institutional Biotech Hub, Modern College, Imphal-795010, India.

⁶Regional Institute of Medical Sciences, Imphal-795004, India

⁷Department of Zoology, Modern College, Imphal-795010, India, opchanu@gmail.com, 9436027154

ABSTRACT

Different ethnic groups of Manipur have their own traditional medicine system using locally available plants. The versatile application of plant derive substances have been of recent focus as the phytochemicals are potential target for new drug development with greater efficacy and minimum toxicity. The present study provides baseline information of three important medicinal plants of Manipur- *Mimosa pudica*, *Melothria perpusilla* and *Phlogacanthus jenkinsii* C.B.Clarke along with their applications in common ailments.

KEYWORDS: Phytochemical, Manipur, *Mimosa pudica*, *Melothria perpusilla*, *Phlogacanthus jenkinsii* C.B.Clarke

***Corresponding author**

Oinam Premila Chanu

Associate Professor, Department of Zoology,

Modern College Imphal-795010

Email: opchanu@gmail.com, Phone: +91 9436027154

INTRODUCTION

Manipur, a state in Northeast India (23.83°N and 25.68°N latitude and 93.03°E and 94.78°E longitude) is rich in biodiversity and falls under the Indo- Burma biodiversity hotspot region. Various ethnic groups of this region have their own traditional knowledge of using medicinal plants to treat various health problems. These plants contain various phytochemical constituents which are present in leaves, bark, fruits or roots that possess strong antioxidant property or anti-hepatotoxic activity. However, the knowledge concerning ethno medicine is scattered and not properly documented. In the modern method of drug discovery and development, many plant products are evaluated based on their traditional medicinal uses. For the effective treatment of various diseases, there is a need to discover new drugs with greater efficacy and less toxicity. In this pursuit, researchers are focusing on phytochemicals which possess curative and prophylactic properties against various diseases as a potential source for new drug molecules. As per the WHO estimate, about three quarters of the world's population currently use herbs and other traditional medicines to cure various diseases. Globally, more than 20,000 species of medicinal plants are identified and listed by the WHO¹. The present review discusses the therapeutic potential of three major medicinal plants of Manipur (*Mimosa pudica*, local name- Kangphal ekaithabi; *Melothria perpusilla*, local name- Lam thabi and *Phlogacanthus jenkinsii* C.B. Clarke, local name- Nongmangkha asinba) which are commonly used in the treatment of common ailments.

***Mimosa pudica* (Family: Leguminosae)**

It is a creeping annual or perennial herb often grown for its curiosity value, as the compound leaves fold inward and drooped when touched and reopens within minutes (Fig 1). The plant is native in tropical America and naturalized nearly all through the tropical and subtropical parts of India. This plant invites attention of the researchers worldwide for its pharmacological activities such as anti-hyperglycemic, anti-cancer, anti-convulsant, cytotoxic properties^{2, 3, 4, 5}. Different chemical and biological studies have been carried out on this plant^{6, 7, 8, 9, 10}. The root extract of the *Mimosa pudica* contain antisnake venom compound which neutralises the toxic enzymes of the venom *in-vitro* and it antagonizes the lethality and myotoxicity of cobra venom in *in-vivo*¹¹.

In the traditional medicine system, the fresh root/ leaf of this plant are prepared as a decoction with water and used for treating urinary complaints and uterine pains after childbirth. In the Ayurvedic

and Unani system of medicine, this plant has been used in diseases arising from tainted blood and bile, bilious fever, piles, jaundice, leprosy, ulcers, small pox. It is also useful in the treatment of sore gum



Fig 1.*Mimosa pudica*

and is used as a blood purifier¹². The juice from the crushed leaves is used for the treatment of sinus, sores, piles, boils, jaundice and for local application in glandular swellings and hydrocele^{13, 14, 15, 16}. The leaf extract imparts hepatoprotection by ameliorating oxidative stress and liver damage in alcohol fed mice. Its methanol extract also possess significant hepatoprotective activity against CCl₄ induced liver injury in rat^{17, 18}. The wound healing studies on roots of *Mimosa pudica* indicate that the phenols constituents/tannins play an important role in wound healing process¹⁹. It was proposed that the high content of tannins in the roots of this plant may be responsible for wound healing activity; probably due to its astringent property²⁰. The mucilage from the seed is composed of D-xylose and D-glucuronic acid. L-mimosine, isolated from the leaves and stem of this plant contain a rare amino acid which inhibits folate metabolism and deoxyribinucleotide metabolism in different cell line proliferation^{21, 22}. The plant extract component mimosine is studied in cell cycle regulation of protein expression and suppression of tumor growth in nude mice²³.

***Melothria perpusilla* (Family: Cucurbitaceae)**

It is a perennial climber with heart shaped leaves and distant spiny teeth on the margins (Fig 2). The flowers are small and white while the fruits look like miniature watermelons and taste like cucumber. It is found in the wild habitat, usually at the periphery of grazing grounds and road side. Its leaf shoot is boiled in water with equal proportion of *Mimosa pudica* and mixed with molasses for extract preparation. The whole plant or shoot is crushed with water for preparing decoction and is regarded as one of the best traditional medication for the treatment of jaundice. It is also used for

treatment of kidney infection, fever and diarrhoea^{13, 14, 15, 16}. Methanolic extract yielded flavonol glycosides.



Fig 2.*Melothriaperpusilla*

Phytochemical investigation of *Melothriaperpusilla* extracts revealed the presence of flavonoids, tannins and steroids that have a role in ameliorating hepatic damage by anti-oxidant mechanisms²⁴. This plant contains two sterols– ergosta-7, 22-dien-3b, 5a, 6b- triol and 3-0-b-D-glucopyranosyl-ergosta-7, 22 – dien-5a, 6b- diol²⁵. Ethyl acetate extract of this plant produced a significant reduction of blood glucose level. It is used for the treatment of hyperglycaemia, probably by inhibiting gluconeogenesis²⁶.

***Phlogacanthus jenkinsii* C.B. Clarke (Family: Acanthaceae)**

It is a dense shrub with stout quadrangular and glabrous branches. The upper portion of the stem is puberulous and the lower portions are woody. The nodes are swollen and flat. The leaves of *Phlogacanthus* are opposite decussate, glabrous and acuminate at both ends (Fig 3). It grows as wild and occasionally cultivated in home gardens. The leaves are crushed for decoction and used in treating cough and fever, spleen and liver diseases.

The high tannic acid content shows the high disease resistance as an anti-nutrition and anti-carcinogenic property²⁷. The presence of trace elements at specific value shows insulin potentiating factor and the phenolic properties against oxidative stress²⁸. Several plants of this genus have been used in traditional medicine system for treating fever, cough, chronic bronchitis, asthma and rheumatics and also used as an antiseptic, anti allergic and as insecticide^{29, 30}. It is also used to treat diseases of spleen and liver due to its antioxidant and anti-inflammatory properties in this plant³¹.



Fig 3. *Phlogacanthusjenkinsii* C.B. Clarke

FUTURE PROSPECTS

Traditional herbal medicine plays an important role in the healthcare system of Manipur. The seindigenous healers have their own traditional knowledge of using plants as medicines, which should be preserved and scientifically validated.

ACKNOWLEDGEMENT

The authors are thankful to DBT, New Delhi, India for the financial assistance of the present study to the Advanced Level Biotech Hub, Modern College, Manipur.

REFERENCES

1. Panday MM, Rastogi S, Rawat AKS. Indian Herbal drug for general health care on over view. Int.J.Atl.Med. 2008; 6(1):1-10.
2. Umamaheswari S, Mainzen PPS. Anti-hyperglycaemic effect of 'Ilogen-Excel', an ayurvedic herbal formulation in streptozotocin-induced diabetes mellitus. Acta Pol Pharm. 2007;64(1):53-61.
3. Parmar F, Kushawaha N, Hyacinth H, George LB. In vitro antioxidant and anticancer activity of *Mimosa pudicalinn* extract and l-mimosine on lymphoma daudi cells. Int j pharm pharm Sci. 2015;7(12):100-104.

4. Bum EN, Dawack DL, Schmutz M, Rakotonirina A, Rakotonirina SV, Portet C, Jeker A, Olpe H-P, Herrling P. Anticonvulsant activity of *Mimosa pudica* Decoction. *Fitoterapia*. 2004; 75; 309-331.
5. Chowdhury SA, Islam J, RahamanMd M, RahmanMd M, Rumzhum, NN, Sultana R., NazmaPM. Cytotoxicity, Antimicrobial and Antioxidant Studies of the Different Plant Parts of *Mimosa Pudica*. *S. J. Pharm. Sci.* 2008; 1(1&2): 80-84.
6. Genest S, Kerr C, Shah A, Rahman MM, Saif-E-Naser EMM, Nigam P, Nahar L, Sarker SD. Comparative bioactivity studies on two *Mimosas* species. *Bol. LatinoamCaribe. Plant Med Aromaticus*. 2008; 7(1): 38-43.
7. Yuan K, Jia A, Lu JL, Zhu JX. Structural identification of new C-glycosylflavones from *Mimosa pudica*. *Chin J An Chem*. 2007; 35: 739-742.
8. Balakrishnan N, Bhasker VH, Jayakar B, Sangameswaran B. Antibacterial activity of *Mimosa pudica*, *Aeglemarmelos* and *Sidacordifolia*. *Pharmacog Mag*. 2006; 2(7): 198-199.
9. Dinda B, Gosh B, Arima S, Sato N, Harigaya Y. Steroids and terpenoids from *Mimosa pudica* roots. *J Indian Chem. Soc.* 2006; 83: 1044-1046.
10. Kirk LF, Moller MV, Christensen J, Steak D, Ekpe P, Jaroszewski KW. A 5- deoxyflavonol derivatives in *Mimosa pudica*. *BiochemSystematics Ecol*. 2003; 31: 103-105
11. Mahanta M, Mukherjee AK. Neutralisation of lethality, myotoxicity and toxic enzymes of *Najakaouthia* venom by *Mimosa pudica* root extracts. *Journal of Ethno pharmacology*. 2001; 75: 55-60.
12. Ghani A. Medicinal Plants of Bangladesh, 2nd Ed. The Asiatic Society of Bangladesh, Dhaka. 2003; 302-303.
13. Devi KY, Devi MD and Singh PK. Survey of medicinal plants in Bishnupur District Manipur North Eastern India. *International Journal of Applied Research*. 2017; 3 (4):462 – 471.
14. DeviTh I, DeviKh U and Singh EJ. International; Wild Medicinal Plants in the Hill of Manipur, India. A traditional therapeutic potential. *Journal of Scientific and Research Publications*. 2015; 5(6).
15. Singh H B, Singh R S and Sandhu JS. Herbal Medicine of Manipur. 1st edition. Daya Publishing House. Delhi, India. 2003.

16. Asem TM. Traditional Medicinal Knowledge in North Eastern Region of India: A Case Study of their health Care practices among the Meetei Maiba healers of Thoubal District, Manipur. International Journal of Interdisciplinary and Multidisciplinary Studies. 2017; 4(2):105-111.
17. Kumar GS, Ghanshyam DG. Hepato protective and antioxidant activity of methanolic extract of flowers of *Nerium oleander* against CCl₄-induced liver injury in rats. Asian Pac J Trop Med.2012; 5 (9):677-685.
18. Rajendran R, Hemalatha S, Akasakalai K, MadhuKrishna CH, Sohil B, Vittal and Sundaram MR,.Hepatoprotective activity of *Mimosa pudica*leaves against Carbontetrachloride induced toxicity. Journal of Natural Products. 2009; 2:116-122.
19. Muthusamy SK, Kirubanandan S,Sripriya, Sehgal PK. Triphala promotes healing of infected full-thickness dermal wound. Journal of Surgical Research. 2008; 144: 94–101.
20. Dnyaneshwar DK, Rahul YM, Mandar BK, Minakshi NN,Prachi CM, Chhaya HG.Evaluation of wound healing activity of root of *Mimosa pudica*. Journal of Ethnopharmacology. 2009; 124:311–315.
21. Oppenheim EW, Nasrallah IM, Mastri MG, Stover PJ. Mimosine is a cell specific antagonist of folate metabolism. J Biol Chem.2000; 275(16):19268-19274.
22. Gilbert DM, Neilson A, Miyazawa H, D pamphlis ML, Burhans WC, Mimosine arrests DNA synthesis at replication forks by inhibiting deoxyribonucleotide metabolism. J BiolChem.1995; 270(16):9597-9606.
23. Chang HC, Weng CF, Yen MH, Chuang LY, Hung WC. Modulation of cell cycle regulation protein expression and suppression of tumor growth by mimosine in nude mice.Int j Oncol.2000; 17: 659-65.
24. Yengkhom NS, Ngangom G, Kholi SM, Moirangthem RS, Rajkumari BD. Hepato protective effect of aqueous extract of *Melothria perpusilla* against carbon tetrachloride induced liver injury in albino rats. Int J Res Med Sci. 2017; 5(3):806-810.
25. Singh T S, Singh C S. A concise book of medicinal plants of Manipur. 1st Edition. Manipur Science and Technology Council. Imphal, India. 2012.
26. Shailendra VJS, Ngangom G, Akham SD, Sanjenbam RD. Effect of ethyl acetate extract of *Melothria perpusilla* on dexamethasone induced hyperglycemia in albino rats. J Basic ClinPharmacol. 2017; 6(3):807-810.

27. Aberoum and A and Deokole S. Studies on some nutritional values of some wild edible plants from Iran and India. Pak J Nutri. 2009; 8(1):26-31.
 28. Kaur C and Kapoor HC. Antioxidants in fruits and vegetables- the millenium's health. Int J Food Sci Technol. 2001; 36:707-725.
 29. Dutta B, Sarma J and Borthakur SK. Diversity and Ethno botany of the Genus *Phlogacanthus* Neesin Assam, India. Int. J. Life. Sci. Scienti. Res.2016; 2(4): 472-477.
 30. Phurailatpam AK, Singh SR, Chanu TM, Ngangbam P. *Phlogacanthus* - An important medicinal plant of North East India. A review. 2014; 9(26):2068-2072.
 31. Laitonjam WS, Yumnam R, Asem SD and Wangkheirakpam SD. Evaluation and comparative study of biochemical, trace elements nad antioxidant activity of *Phlogacanthus pubinervius* T. Anderson and *Phlogacanthus jenkinsii* C.B. Clarke leaves. Indian Journal of Natural Products and Resource. 2013; 4 (1):67-72.
-