ORIGINAL RESEARCH PAPER

Volume-8 | Issue-8 | August - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

STUDY OF MEDICINAL PLANTS OF JAMMU AND KASHMIR HAVING PROPERTIES FOR CURING SNAKEBITE

Health Science

Hasnaat Ahmad Sheikh Department of Botany, Baba Ghulam Shah Badshah University, Rajouri, J&K, India

Munazah Jan Department of Botany, Baba Ghulam Shah Badshah University, Rajouri, J&K, India

Binsha Farooq Department of Botany, Baba Ghulam Shah Badshah University, Rajouri, J&K, India

Shabnam Zehra Department of Botany, Baba Ghulam Shah Badshah University, Rajouri, J&K, India

Tahira Aslam Department of Botany, Baba Ghulam Shah Badshah University, Rajouri, J&K, India

Naseer Ahmad* Department of Botany, Baba Ghulam Shah Badshah University, Rajouri, J&K, India
*Corresponding Author

ABSTRACT

Various plants are found in India under different ecological and geographical conditions, which have broad range of medicinal properties. 1500 plant species out of 15000 plant species have been found to have medicinal properties. In Jammu and Kashmir flora there are about 3000 plant species of which about 300 plants have medicinal properties. Mortality a major cause of snakebite, is common in tropical and subtropical areas, where most perilous snakes are found and in these areas treatment is finite. Snake venoms usually cause tissue damage, which ultimately leads to death and temporary or permanent disability of the victim. A wide range of medicinal plants are used as antidote for snakebite either used as single are in combination. In India 523 medicinal plants from 122 families have been found to have antidote properties for snakebite. The present study is about the information on medicinal plants from Jammu and Kashmir which can be used for snakebite treatment.

KEYWORDS

Medicinal plants, snake bites, Venom, antidote, Ethanobotany

INTRODUCTION

Humans are dependent on plants from millions of years on plants for their needs such as clothing, medicine, food, shelter etc. World health organization has estimated that 80% of population in developing countries depends on plants for their needs. **E**thanobotanical knowledge is important for the conservation of plant wealth, sustainable use, designing strategies and for the preparation of drugs. Snakebite is a serious health problem in many Parts of the world, particularly in Asia, Africa, and Latin America. Snake bite is a medical emergency, which needs to be cured in a limited time so as the survival chances become more. According to Conservative data there occur 1.2 to 5.5 million snakebites every year worldwide, leading to 25,000 to 125,000 deaths. Approximately 10000 to 50000 deaths due to snakebites occur in India per year. The most frequently bitten sites are the lower limbs. The effects of snake envenomation are, edema, dermonecrosis, myonecrosis, tissue damage, haemorrhage, coagulation disorder, spontaneous systemic bleeding, descending paralysis, hypotension, myocardial damage, intravascular haemolysis, cardiovascular alteration etc. In snake venom the most common toxins are snake venom hyaluronidases (SVHs), snake venom serine proteinases (SVSPs), phospholipases A2 (PLA2s), acetylcholinesterase (AChE), L-amino acid oxidases (LAAOs), snake venom metalloproteinases (SVMPs) and nucleotidases. The most commonly found venomous snakes of Jammu and Kashmir are; Levantine Viper (Macrovipera lebetina,Gunas), Himalayan Pit Viper(Gloydius himalayanus), Krait(Bungarus caeruleus), Common Cobra (naja naja) etc. Most medicinal plants have neutralizing properties and antidote properties for snakebite. Certain chemical compounds such as β-sitosterol, stigmasterol isolated from medicinal plants found effective against snake venom. In Jammu and Kashmir all the cases of snakebite were found during April to November. These months provide favourable conditions to snakes to breed and grow. Various medicinal plants have been found in Jammu and Kashmir which have antidote properties for snakebite.

JAMMU AND KASHMIR

Jammu and Kashmir a northern state of India is known as the heaven on the earth. It lies in the vicinity of westernmost Himalayan Mountains and Karakorum ranges. The state harbors a vast variety of flora and fauna which make it a beautiful state for recreational activities, education and Research. It has three divisions Kashmir, Jammu and Ladakh and the total area of Jammu and Kashmir is 2, 22,236 km^2. Larger portion of the state economy depends on forests. 50.97% of forests are present in Kashmir, 45.89% in Jammu division and 3.14% in Ladakh. Jammu and Kashmir is the store house of medicinal plants which are used in Pharmaceutical industries. Jammu and Kashmir is home of about 300 medicinal plants, with most of them found in forests. There are 22 districts in Jammu and Kashmir and have numerous villages with tribal communities. There is a tremendous potential of medicinal plants in Jammu and Kashmir. The entire Himalayan belt is having this natural wealth. Since vedic age there is the use of medicinal plants in India. Gujjars, Bakarwals and Gaddis along Muslim – Hindu communities derive fibre, food, medicine, fuel and timber from plant resources. Among native communities the traditional use of medicinal plants is well known. They treat various types of diseases from plant resources.

ETHANOBOTANY

In ethno botany we study association between humans and plants. The ethno botany survey includes interaction between local native people. This survey has given tremendous knowledge about the indigenous medicinal plants which led to the discovery of various modern drugs. Medicinal plants have various types of bioactive compounds like alkaloids, phenols, terpenoids, glycosides, terpenes etc. These compounds help in treatment of ophidian envenomation. The extracts from these plants are very helpful in the treatment of various snakebites. The source of 25% of drugs is from plants throughout the world.

1. *Euphorbia hirta L.*
   Vernacular names: *A*sthma weed, Chhumen
   (District Kavrepalanchowk, Nepal) Jain and Srivastava (2005) reported that leaves of this plant can be used against snakebite. In District Kavrepalanchowk, Nepal root paste is also used externally (Malla and Chhetri, 2009).
2. *Euphorbia neriifolia.*
   Vernacular name: Kashmiri kuth,
   Root and latex are applied on a particular snake bite site mixed with pepper
3. *Tridax procumbens.*
   Vernacular name: dagad phul,
   Leaves juice is taken externally and crushed leaves are applied on the snake bite site.
4. *Verbascum Thapsus.*
   Vernacular name: Jangli tambaku,
   Whole plant is crushed and the juice is taken internally

5. *Oxalis corniculata* L.
   Vernacular name: *Khati booti*
   Some sacred groves of India, Meghalaya use leaves of this plant against snakebite (Jeeva et al., 2006).
6. *Ocimum sanctum.*
   Vernacular name: baburi
   Whole plant is used and the paste from plant is applied externally
7. *Musa paradisiaca.*
   Vernacular name: kail
   Bark is crushed and given orally
8. *Aconitum heterophyllum.*
   Vernacular name: *paewakh*
   Rhizomes are commonly used by the local people.
9. *Aconitum violacium*
   Vernacular name: metha taila
   Root paste used externally as well as internally
10. *Alstonia scholaris*
    Vernacular name : satpatra
    Paste of stem bark and root bark is applied externally and bark decoction is given orally.
11. *Allium sativum*
    Vernacular name: rohna
    Bulb paste is given orally
12. *Allium cepa*
    Vernacular name: pyiaz
    Bulb paste is applied externally
13. *Ageratum conyzoides* L
    Vernacular name: ajgandha
    leaves are used against snakebite in some sacred groves of Meghalaya, India, (Jeeva et al., 2006).
14. *Amaranthus spinosus*
    Vernacular name:- Charleere
    Juice extracted from leaves is applied externally
15. *Amaranthus viridis*
    Vernacular name:- Charleri
    Crushed whole plant is applied extarnally
16. *Acorus calamus*
    Vernacular name:- Ghorbash
    Roots are crushed and applied externally on the wounds
17. *Bombax ceiba*
    Vernacular name:-Kate savr
    Paste from leaves is applied externally.This plant is used as antidote.
    Flowers and roots are also used.
18. *Cassia fistula*
    Vernacular name:- Amaltas
    Fruit powder and Seeds are used as antidote. With *piper nigrum* root decoction is mixed and given orally and paste of stem bark is applied externally
19. *Momordica charantia*
    Vernacular name:- Karela
    Juice extracted from root and shoot is applied externally
20. *Nerium indicum*
    Vernacular name:- Gandula
    Crushed root is applied externally
21. *Rauvolfia serpentine*
    Vernacular name:- sarpagandha
    Paste of root is mixed with milk and used both externally and internally.
    Juice of leaf is used as antidote
22. *Tinospora cordifolia*
    Vernacular name:- Giloe
    Garlic paste is mixed with leaf and stem juice and used both externally and internally
23. *Withania somnifera*
    Vernacular name:- Ashwagandhi
    On the snakebite site root paste is applied.
24. *Plumbago zeylanica*
    Vernacular name:- Chitrak
    On snakebite site root paste is applied
25. *Indigofera tinctoria*
    Vernacular name:- kainth
    Leaf and root juice is used internally
26. *Brassica campestris*
    Vernacular name:- sarson
    Paste from plant parts are mixed with mustard oil and *Allium cepa* is applied externally
27. *Taraxacum officinale*
    Vernacular name:- handh
    Paste from whole plant is given orally
28. *Chrysanthemum cinerariifolium*
    Vernacular name:- Kartik posh
    Parts from whole plant used as antidote.

SNAKE, SNAKE VENOM AND CONSTITUENTS

The snake and snake venom has tremendously stimulated the mind if humans. The essence of the fascination with fair of the snake lies within the creature's venom. In various countries snakes are used for magic potions, worship and medicine. They are used as a symbol for love and hate, war and peace, life and death, health and disease, medicine etc. In many parts of the world mainly in tropical and subtropical areas of the world snake bite is a severe social, economic and medicinal challenge. Within class mammals one of the mysterious, more intense biological fluid is snake venom. Snake venom at least consists of about 25 enzymes, mixture of proteins and polypeptides. The various effects of snake venom are haemorrhage, renal damage, paralysis, tissue damage, sometimes it causes death etc. Mortality and morbidity are the secondary effects of snakebite.

TREATMENT OF SNAKEBITE

The most common treatment of snakebite is parenteral administration of sheep or horse-derived polyclonal anti-venoms which neutralize toxins. Albert Calmette developed the first antivenom called anti-ophidic serum against the Indian cobra (*Naja naja*). As the bite of snakes is variable, the treatment is also variable. Other treatments involve use of traditional and folk knowledge in snake bites. This traditional knowledge includes chewing of leaves, topical application of juice of plant leaves and paste, drinking of decoctions and plant extracts. Many Medicinal plants are used as antidotes for snakebite. Various medicinal plants have been used against snakebite in traditional and folk medicine.

TABLE 1: List of medicinal plants which can be used against snakebite

S. no	Botanical name	Family	Local name	Part used	Method of administration	References
01	***Euphorbia hirta***	Euphorbiaceae	Asthama weed	Whole plant	Latex is used orally	1,2,3,8, 32
02	***Euphorbia neriifolia***	Euphorbiaceae	Kashmiri kuth	Root	Latex application on the particular bite part mixed with pepper	4,5,6,8
03	***Tridax procumbens***	Asteraceae	Dagad Ful	Leaves	Crushed leaves juice is applied on the snakebite site and juice is also taken orally mixed with water	7,8,12
04	***Verbascum Thapsus***	Scrophulariaceae	Jangli tambaku	Whole plant	Juice mixed with whole plant is given	13,14
05	***Oxalis corniculata***	Oxalidaceae	Kaitka	Whole plant	Juice extracted from whole plant is taken orally and applied on the bite.	9,10,15,16, 17,34
06	***Ocimum sanctum***	Lamiaceae	Baburi	whole plant root, Leaf,	Paste of leaf	8,18,2
07	***Musa paradisiaca***	Musaceae	kail	skin bark Bark, stem	Stem bark is crushed and given orally	8,2
08	***Aconitum violacium***	Ranunculaceae	Mitha telia	root	Root paste used externally as well as internally	20,8,9
09	***Aconitum heterophyllum***	Ranunculaceae	paewakh	root	Root paste used externally	8,10

10	***Alstonia scholaris***	Apocynaceae	satpatra	bark, leaves	Paste of stem bark and root bark is applied externally and bark decoction is given orally.	21,8
11	***Allium sativum***	Liliaceae	rohna	Bulbs	Bulb paste is given orally	22,8
12	***Allium cepa***	Liliaceae	Pyiaz	bulbs	Bulb paste is applied externally	,8,10
13	***Ageratum conyzoides***	Asteraceae	Ajgandha	Leaves	Paste of leaf applied externally	10,23
14	***Amaranthus spinosus***	Amaranthaceae	Charleree	Whole plant	Leaf paste applied externally on snake bite wound	23,24,8
15	***Amaranthus viridis***	Amaranthaceae	Charleri	Stem and leaf	Paste from leaf and stem is applied externally	8,25
16	***Acorus calamus***	Araceae	Ghorbach	rhizome	Rhizome paste is applied externally as well as given orally	2,8,24
17	***Bombax ceiba***	Bombaceae	Kate savar	Bark, root, flower	Root leaf and flower paste is applied externally	26,27,8
18	***Cassia fistula***	Caesalpiniaceae	Amaltash,	Fruit, flower, seed, root, bark	With *piper nigrum* root decoction is mixed and given orally and paste of stem bark is applied externally	28,29
19	***Momordica charantia***	Cucurbitaceae	Karela	Whole plant	Juice extracted from root and shoot is applied externally	8,2
20	***Nerium indicum***	Apocynaceae	Gandula	Bark, root, leaf	Crushed root is applied externally	26,30
21	***Rauvolfia serpentina***	Apocyanaceae	sarpagandha	Root and leaf	Paste of root is mixed with milk and used both externally and internally. Juice of leaf is used as antidote	2,8,22
22	***Tinospora cordifolia***	Menispermaceae	Giloe	Root, stem, leaf	Garlic paste is mixed with leaf and stem juice and used both externally and internally	29,2,30
23	***Withania somnifera***	Solanaceae	Ashwagandhi	root	On the snakebite site root paste is applied	10
24	***Capsicum annuum***	Solanaceae	mirch	Fruit	NA	10
25	***Cynodon dactylon***	Poaceaea	Dhoob, dobu	Whole plant	NA	10
26	***Plumbago zeylanica***	Plumbaginaceae	Chitrak	Root	On snakebite site root paste is applied	28,31
27	***Indigofera tinctoria***	Fabaceae	kainth	leaf	Leaf and root juice is used internally	10
28	***Brassica campestris***	Brassicaceae	sarson	Whole plant	Paste from plant parts are mixed with mustard oil and *Allium cepa* is applied externally	10
29	***Taraxacum officinale***	Asteraceae	handh	Whole plant	Paste from whole plant is given orally	10
30	***Chrysanthemum cinerariifolium***	Asteraceae	Kartik posh	Whole plant	Parts from whole plant used as antidote.	10

DISCUSSION

Medicinal plants are the valuable gifts of nature. Medicinal plants utilization in India have a long history in tribal and traditional history. In the present paper 20 plant families having 30 species are found in Jammu and Kashmir which are used against snakebite. Some of these plants are commonly used in various parts of Jammu and Kashmir e.g. *Euphorbia hirta, Aconitum violacium, Aconitum heterophyllum etc.* Drug discovery through ethno-botanical investigations has given much of attention towards medicinal plants. Various medicinal plants are used as antidote for snakebite and this has been proved by the extraction of various chemical compounds from these medicinal plants which have anti snakebite properties.

REFERENCES

1. Malla B and Chhetri R.B. (2009). Indigenous knowledge on ethnobotanical plants of Kavrepalanchowk district. Kathmandu Univ. J. Sc., Eng. Tech. 5(2): 96-109.
2. Samy RP, Thwin MM, Gopalakrishnakone P, Ignacimuthu S.Ethnobotanical survey of folk plants for the treatment of snakebites in Southern part of Tamilnadu, India. J Ethnopharmacol 2008;302–12.
3. Yabesh JM, Prabhu S, Vijayakumar S. An ethnobotanical study of medicinal plants used by traditional healers in silent valley of Kerala, India. J Ethnopharmacol2014;774–89.
4. Sarkhel S. Ethnobotanical survey of folklore plants used in treatment of snakebite in Paschim Medinipur district, West Bengal. Asian Pacific J Trop Biomed 2014. Vpl-4:416–20.
5. Sarkhel S. Plants used in treatment of snakebite by the tribal communities of Paschim Medinipur district, West Bengal. IntJ Pharm Life Sci 2013;vol.4:3172–7
6. C. P.Kala, "Herbal treatment for snakebites in Uttarakhand state of India," Indian Journal of Natural Products and Resources, vol.6 (2015) ;56–61.
7. Marandi RR, Britto SJ, Arulappan T. Antivenom herbalformulations used against snakebites by the Oroan tribals of Latehar, Jharkhand. World J Pharmaceutics Res 2015;4
8. Upasani VS, Beldar GV, Tatiya UA, Upasani MS, Surana JS, Patil SD; Ethnomedicinal plants used for snakebite in India: a brief overview; (2017) Integrative Medicine Research;115-127
9. Rather M.A and Baba A.S(2015); Traditional Use of Medicinal Plants in Kashmir: A Review. Research & Reviews: Journal of Biology, pg. no 26-30.
10. Abhijit D, Jitendra ND; TRADITIONAL USE OF PLANTS AGAINST SNAKEBITE IN INDIAN SUBCONTINENT: A REVIEW OF THE RECENT LITERATURE; Afr J Tradit Complement Altern Med. (2012) 9(1):153~174
11. Malathi.R, Sivakumar.D, Chandrasekar.S; MEDICINAL PLANTS FOR THE TREATMENT OF SNAKEBITES AMONG THE RURAL POPULATIONS OF INDIAN SUBCONTINENT: AN INDICATION FROM THE TRADITIONAL USE TO PHARMACOLOGICAL CONFIRMATION; Journal of Drug Delivery & Therapeutics. 2018; 8(5):62-68
12. Makhija.KI, Khamar.D; Anti-snake venom properties of medicinal plants; Scholars Research Library Der Pharmacia Lettre, 2010, 2(5): 399-411
13. Kumar N, Choyal R. Traditional phototherapy for snake bites by the local rural people of Hamirpur district in Himachal Pradesh (India). Biol Forum 2012;4:98–106.
14. Singh KK. Studies on native medicine of Jaunsari tribe of Dehradun district, Uttar Pradesh, India. Int J Pharmacogn1997;35:105–10.
15. Saklani A, Jain SK. Ethno botanical observations on plants used in North-eastern India. Int J Crude Drug Res1989;27:65–73.
16. Singh EA, Kamble SY, Bipinraj NK, Jagtap SD. Medicinal plants used by the Thakar tribes of Raigad district, Maharashtra for the treatment of snake-bite and scorpion-bite. Int J Phytother Res 2012;2:26–35
17. Neogi B, Prasad MN, Rao RR. Ethnobotany of some weeds ofKhasi and Garo hills, Meghalaya, North-eastern India. EconBot 1989;43:471–9
18. Khan AV, Ahmed QU, Khan MW, Khan AA. Herbal cure for poisons and poisonous bites from Western Uttar Pradesh, India. Asian Pacific J Trop Dis 2014;4:S116–20
19. Negi VS, Maikhuri RK, Phondani PC, Rawat LS. An inventory of indigenous knowledge and cultivation practices of medicinal plants in Govind Pashu Vihar Wildlife Sanctuary, Central Himalaya, India. Int J Biodivers Sci Ecosyst Serv Manage2010;6:96–105
20. Mathur A, Joshi H. Ethno botanical studies of the Tarai region of Kumaun, Uttarakhand, India. Ethnobot Res Appl2013;11:174–203
21. Sarkhel S. Plants used in treatment of snakebite by the tribal communities of Paschim Medinipur district, West Bengal. IntJ Pharm Life Sci 2013;4:3172–7
22. Krishna MB, Mythili S, Kumar KS, Ravinder B, Murali T. Ethno botanical survey of medicinal plants in Khammam District, Andhra Pradesh, India. Int J Appl Biol Pharm Technol2011;2:366–70
23. Selvanayagam ZE, Gnanavendhan SG, Balakrishna K, RaoRB. Antisnake venom botanicals from ethno medicine. JHerbs Spices Med Plants 1995;2:45–100
24. Vashistha BD, Kaur M. Floristic and ethno botanical survey of Ambala District, Haryana. Int J Pharm Bio Sci 2013;4:353–60
25. Lal HS, Singh S. Study of plant biodiversity of Hazaribagdistrict Jharkhand India and its medicinal uses. Biosci Disc2012;3:91–6
26. Ravindran KC, Venkatesan K, Balakrishnan V, ChellappanKP, Balasubramanian T. Ethnomedicinal studies of Pichavaram mangroves of East coast, Tamil Nadu. Indian JTradit Know 2005;4:409–11
27. Jeetendra S, Kumar AD. Ethno medicinal plants used by tribal communities for the treatment of snakebite in West Nimar, MP, India. ISCA J Biol Sci 2012;1:77–9
28. Bhat P, Hegde G, Hegde GR. Ethno medicinal practices indifferent communities of Uttar Kannada district of Karnataka for treatment of wounds. J Ethnopharmacol2012;143:501–14
29. Singh EA, Kamble SY, Bipinraj NK, Jagtap SD. Medicinal plants used by the Thakar tribes of Raigad district, Maharashtra for the treatment of snake-bite and scorpion-bite. Int J Phytother Res 2012;2:26–35
30. Sarkhel S. Ethno botanical survey of folklore plants used in treatment of snakebite in Paschim Medinipur district, West Bengal. Asian Pacific J Trop Biomed 2014;4:416–20
31. Sen S, Chakraborty R, De B, Devanna N. An ethnobotanical survey of medicinal plants used by ethnic people in Westland South district of Tripura, India. J For Res 2011;22:417–26
32. Gopi.K, Renu.k, wishwanath SB, Jayaraman.G; Protective effect of Euphorbia hirta and its components against snake venom induced lethality; Journal of Ethno pharmacology (2015); 465-475

33. Malla B and Chhetri R.B. (2009). Indigenous knowledge on ethnobotanical plants of Kavrepalanchowk district Kathmandu Univ. J. Sc., Eng. Tech. 5(2): 96-109.
34. Jeeva, S., Mishra, B.P., Venugopal, N., Kharlukhi, L. and Laloo, R.C. (2006b). Traditional knowledge and biodiversity conservation in the sacred groves of Meghalaya. Ind. J. Trad. Knowl. 5(4): 562-568.