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A review on medicinal plants used by various tribes of india for the treatment of snakebite

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ABSTRACT

Tribal and rural populations face various medical emergencies due to remote location. Among them snakebite is a common acute medical emergency. It is very common in district Mandsaur of Madhya Pradesh with heavy rainfall and humid climate. Present review deals with various plant species used traditionally by bhil and bhilala tribes and rural people of the district for the treatment of snakebite.

Keywords: Acute Medical Emergency, Climate, Humid, Plant, Snake Bite, Species, Tribes.

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INTRODUCTION

Traditional knowledge of medicinal plants and their use by indigenous cultures are not only useful for conservation of culture, traditions and biodiversity but also for community healthcare and drug development in the present and future (Pei, 2001) [1]. During the last few decades, interest in the study of traditional uses of medicinal plants of the world increased many fold, mainly due to several problems associated with synthetic drugs and emergence of multi-drug resistant pathogens (Chellaiah M. et al., 2006) [2]. Traditional knowledge in this regard has been conserved for generations in different tribal communities in several parts of the world and especially in Western Ghats of India which is considered as a treasure trove for such traditional medicines (Pokharkar RD et al., 2010) [3].

Snake bite is a common acute medical emergency faced by tribal and rural populations in tropical and subtropical countries with heavy rainfall and humid climate (Banerjee RN, 1978) [4]. Conservative sources estimate that the number of snakebite accidents globally reach one million, and more than 20,000 deaths annually (Chippaux JP., 1998; Warrell DA., 1996) [5, 6]. In India alone, more than 200,000 cases of snake bite are reported and estimated 35,000 to 50,000 people die each year. In Kenya, it is estimated that only 19% of the annual snake bites per 100, 000 people were potentially of venomous snakes (Bawaskar H S, 2004; Khanna KK. et al., 2005) [7, 8].

According to the Records of Dr. Shankarrao Chavan Government Medical College alone, out of 488344 total patients admitted, 5718 patients were registered for snake bite (Inamdar IF. et al., 2010) [9] and considerable number of cases may have remained unreported. Maximum cases are being reported from the rural areas where farmers are engaged in various farming activities. The modern method of snake bite treatment requires sophisticated application of anti-venoms, and these remain mostly inaccessible to rural people. In addition to the transportation difficulties, rural people are unaware about these treatments and facilities.

Folk herbal snake bite remedies are of interest since they may have recognizable therapeutic effect. Ethno-medicinal studies on tribal and rural areas of Rajasthan have been carried out by many workers like Joshi, P (1995); Singh, V & Pandey, RP (1998); Katewa, SS et al. (2001); Jain et al. (2007) [10-13]. The traditional medicines used to treat snake bite in

tribal populations where people depend mostly on forest products for their basic daily needs (Jain SK and Tarafder, 1973) [14]. Several ethnobotanical reports indicated the plants as potent anti snake venomous (Rahmatullah, M. et al., 2010) [15]. Plants are used either single or in combination, as antidotes for snake envenomation by rural population in India and in many parts of the world (Perumal Samy et al., 2008) [16].

Venomous snake bites remain an important medical problem in both developing and developed countries (Mahanta et al., 2001) [17]. Snakes have adapted to the most varied and diverse ecological conditions and have predominantly colonized the warmer, densely vegetated areas of tropics (Bellairs AD'A, 1970; Englemann WE & Obst FJ, 1984) [18, 19]. There are 222 known species of snakes in India, out of the total 3,273 species of snakes found globally. Out of these, 52 are partly or wholly venomous (Deniel, J C, 1983) [20].

Antiserum is the only therapeutic agent available throughout the world. Traditional healers use a wide range of plants to treat many ailments including snake bites. It has been observed that a group of inhabitants called Sapera's have an excellent herbal remedies for this. Besides them, some other rural physicians have also adequate knowledge of herbs in the treatment of these ailments and they whisper certain mantras during the courses of the treatment (Dwivedi, 2004) [21].

Plants are reputed to neutralize the action of snake venom, with a plethora of plants claimed to be antidotes for snakebite in folklore medicine (Kirtikar and Basu, 1975) [22]. The bitter test of some leaves and roots are also sometimes used for prognostic purposes (Al-Quran's, 2005) [23]. If the plant material tests bitter, the patient is judged free from danger, but if the materials are sweet to the taste, the patient needs urgent medical attention. Sometimes especially when a patient cannot open his/her mouth the juice of the plant is administered through nostrils or eyes, or applied liberally to the head (Anandan and Veluchamy, 1986) [24].

A strict and complete dietary schedule for swelling, nausea, pain and other effects during and after recovery is followed to promote a through cure (Whitaker, 1978) [25]. People in some areas believe that brushing the teeth daily with the stick of *Taphrosia purpuria* (Jain and Tarafder, 1963) and *Azadirachta indica* (Maheswari et al., 1986) [26, 27] will make the

body resistant against the snake venom.

As we know that snake bite is a common problem in rural and tribal area not only in India, but also globally. The ethnic and rural people of India have preserved a large number of traditional uses of medicinal plants against snake bite. No modern medical facilities available in rural and tribal area. The objective of this review is to compile the information's about the traditional use of ethno medicinal plants by tribes and traditional health healers of different states of India for the treatment of snakebite.

METHODOLOGY

Ethnobotanical surveys were conducted by the reviewed persons repeatedly in different seasons and areas of different states of India. Data were collected according to the methodology suggested by Jain and Rao (1977) [28]. Data were collected using questionnaire, interviews and discussions with local tribal people. Information on wild plants used for snakebites were collected through interviewing local informants after prior informed consent. The local informants were the specialist and non-specialist mostly above the age of 40-50 yrs. To determine the authenticity of information collected during field work, repeated verification of data from different informants in different times was done by all. Herbarium specimens were prepared by standard herbarium techniques and identified with the help of floras and herbarium of FRI, Dehradun (Hooker JD, 1872-1897; Singh V & Shetty BV, 1987-1993; Bhandari MM, 1990) [29, 30, 31].

RESULTS

1. Dwivedi et al. (2009) [32] found that 4 medicinal plants have been used for snake bite treatment by the aborigines, tribal and non-tribal people of the Malwa region of Madhya Pradesh, India.

2. Sainkhediya Jeetendra and Aske Dilip Kumar (2012) [33] reported that 26 taxa belonging to 25 genera and 16 families of flowering plants are being used by tribal communities for the treatment of snake bite in West Nimar, MP, India.

3. Kunjam et al. (2013) [34] found that the tribes of South Srguja, Chhattisgarh are using 10 plants for the treatment of snake bite. As a tradition, a particular family uses a particular variety of a plant species for the treatment of snake bite. They reported that tribes solely depend on medicinal plants for health care.

4. Anita Jain et al. (2011) [35], reported that 44 plant species are generally used to treat snake bite victims, 39 belonging to dicotyledons, while 5 species belonging to monocotyledons, practiced by some tribes (Bhil, Meena, Garasia etc.) of Rajasthan. Besides this, several myths related to snakes prevalent among the tribal and rural people of the Rajasthan area were also discussed.

5. According to N.K. Patel (2011) [36] the local health healers/tribal's of the Danta Taluka of Gujrat are using 08 plants belonging to 07 families with 09 formulations. The study also revealed that many people still continue to rely on traditional medicine for their primary healthcare.

6. Singh, et al. (2012) [37] found that 25 plant species, belonging to 23 different families are used by the Thakar tribe of Raigad District (Maharashtra) against snake bite. They found that still today the tribe continues to depend on medicinal plants for the treatment of snake bite. This wealth of traditional knowledge needs to be collected and preserved which may help to understand remedial plant metabolites for development of novel herbal medicines.

7. Thirumalai et al. (2010) [38] of Tamil Nadu reported that about 22 species of plants are being used by the local and tribal people of Vellore district for the treatment of snake bite.

8. According to Hiremath and Taranath (2010) [39] the local and tribal people of Chitradurga district, Karnataka are using 15 plants belonging to 11 families with 12 formulations (2 multiple applications and 10 single plant applications). The study revealed that roots were most frequently used (9 species), followed by leaf extract (4 species), latex and gum with one species each. They also reported that Lambanis, Hakki-Pikky etc. tribes of Chitradurga district still continue to rely on traditional medicine for their primary healthcare. Recent

trends show a decline in the number of traditional health practitioners in the region since the younger generation is not interested.

9. Khaleel Basha and Sudarsanam (2012) [40] found that 23 medicinal plants are used by Sugali tribe of Kurnool district of Andhra Pradesh as antidote for the treatment of snake bite.

10. Penchalapratap et al. (2010) [41] reported that 32 plant species belonging to 23 families are being used by the Chenchus and Sugali tribes of Chittoor district of Andhra Pradesh for the treatment of snake bite. They have been using different plant parts like leaves, fruits, flowers, seeds, stem, bark, tubers and roots as antidotes in the form of paste, powder, juice, infusion, and decoction and in crud form. These plant parts are sometimes mixed with other additives like goat milk, butter milk and urine of infants.

DISCUSSION AND CONCLUSION

Due to the growing importance of ethno-botanical studies, it is necessary to collect the informations about the knowledge of folklore medicinal plants, preserved in local communities of various parts of India. The review highlighted the role of traditional herbal medicines for the treatment of snake bite. The plants used in the treatment of snake bite are easily available, common in the area and comparatively cheaper. The method of preparation and mode of action is also simple and convenient. The tribal and non-tribal people, especially below poverty line may also afford the treatment and their personal faith and belief gave encouraging result in the treatment. Ethno-medicinal data may provide a base to start the search for new compounds related to phyto-chemistry, pharmacology and pharmacognosy. This may provide new sources of herbal drugs and help to understand the molecular basis of their activities. Therefore, attention should also be made on proper exploitation and utilization of these medicinal plants.

DECLARATION OF COMPETING INTEREST

Author declares no conflicts of interest.

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Medicinal plants and their parts used

S. no.	State	Tribes	Plants used by tribes
1	Madhya Pradesh (Malwa)	Bhil, Bhilala.	*Eclipta alba* Hassk, *Moringa oleifera* Lamk, *Rauwolfia serpentina* Benth., *Tephrosia purpurea* Pers.
2	Madhya Pradesh (West Nimar)	Bhil, Bhilala, Barela, Tadvi, Banjara, Gond, Korku, Mankor.	*Achyranthes aspera* L., *Anogeissus latifolia* Wall, *Balanites aegyptiaca* Del., *Calotropis procera* Br., *Hemidesmus indicus* Br., *Holarrhena antidysenterica* Wall., *Gymnema sylvestre* Br., *Mimosa pudica* L., *Tamarindus indica* L.
3	Chhattisgarh	Cherwa, Pondo.	*Achyranthes aspera* L., *Hemidesmus indicus* Br., *Mimosa pudica* L. *Mucuna pruriens* Dc., *Tephrosia purpurea* Pers.
4	Rajasthan	Bhil, Meena, Garasia, Sahariya, Dammar, Kathodia.	*Abrus precatorius* L., *Acacia nilotica* L., *Achyranthes aspera* L., *Anogeissus latifolia* Wall., *Butea monosperma* Lam., *Calotropis gigantean* Br., *Celastrus paniculata* Willd, *Gloriosa superba* L.
5	Gujrat		*Acacia arebica* Benth., *Achyranthes aspera* L, *Adhatoda vasica* Nees, *Aristolochia indica* L., *Calotropis gigantia* L., *Tinospora cordifolia* Miers, *Tylophora asthematica* (L.f).
6	Maharashtra	Thakar	*Aegle marmelos* Correa., *Calotropis gigantia* L., *Cuscuta reflexa* Roxb., *Gymnema sylvestre* Br., *Rauwolfia serpentina* Benth., *Tinospora cordifolia* Miers.
7	Tamil Nadu		*Achyranthes aspera* L., *Andrographis paniculata* Nees., *Azadirachta indica* Juss., *Hemidesmus indicus* Br., *Momosa pudica* L. Punica granatum L.,.
8	Karnataka	Lambanis, Hakki-Pikki, Jenukurubas, Fruligas	*Tinospora cordifolia* Miers., *Acacia arabica* Willd., *Tylophora asthmatica* (L.f), *Achyranthes aspera* L., *Aristolochia indica* L., *Calotropis gigantea* Br., *Adhatoda vasica* Nees.
9	Andhra Pradesh (Kuroonl)	Sugali	*Achyranthes aspera* L., *Bacopa monnieri* (L.), *Calotropis gigantia* L., *Helicteres isora* L., *Holarrhena pubescens* Wall., *Tylophora indica* Wt. and Arn.
10	Andhra Pradesh (Chittoor)	Chenchus, Yerukulas, sugalis or Lambadis, Yanadis or Irulas.	*Achyranthes aspera* L., *Andrographis paniculata* Nees, *Bacopa monnieri* L., *Calotropis gigantia* L., *Gymnema sylvestre* Br., *Helicteres isora* L., *Mimosa pudica* L., *Tylophora indica* Wt. and Arn., *Tinospora cordifolia* Miers.