

Ethnomedicinal Assessment of Snake Bite Treatment in District Bannu, KPK-Pakistan

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Abstract

Snake bite poisoning is a matter of great trepidation around the globe, particularly in developing countries. Every year, approximately 5 million cases of snake bite are reported resulting in 125,000 deaths worldwide. The morbidity and mortality remains un-documented in most of the rural parts as the victims are first attended by the traditional healers. Pharmacological investigations explored the use of numerous parts of the medicinal plants for antagonizing the effects of venom and purified toxins. Herbs are more common in use than shrubs and trees. The various parts used as an anti-dot against snake bite envenomation are as: leaves > roots > whole plant > flower > wood > fruit > milky juice. The current study revealed, for the first time, the use of various medicinal plants against snake bite envenomation in district Bannu and its peripheries. Though, pharmacological and chemical investigations are imperative to make confirmation of anti-venom claims about these medicinal Pakistani plants.

Key words: Snake envenomation, Ethnomedicinal, Medicinal plants, Traditional healers

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1. Introduction

Many hot and sub humid regions of the world are facing snakebites envenomation which has become an important health problem for a common man. In pastoral areas, the cases of snakebites remain unreported and due to this very reason, epidemiological data is difficult to be determined. An estimation shows the victims/year as more as five million resulting about 125,000 deaths worldwide [1]. All the developed and undeveloped countries are facing the hazards of snakebites envenomation. In some rustic areas, snakebite is an important cause of indisposition and death among adults and children. Many domestic animals are killed by snakes including puff adders (*Bitis arietans*) etc. Snakebites may result in many serious infestations [2]. Even though, snakebite is lethal, no significant efforts were made to cope with this problem by developing anti-dots, both at National and International levels [3]. In 1894, Calmette developed the treatment with anti-sera which is still under consideration by the medical community.

Snake venom, which is actually its modified saliva, is a complex mixture of chemicals and enzymes and it is of neurotoxic or haemotoxic in nature [4]. There are many limitations of the snake venom anti-sera including high price, unapproachability for the residents of rural areas, storage environments, and proper dosage & handling techniques etc [5]. Another shortcoming is the inappropriate protection against snake venom induced cell necrosis, kidney failure and hemorrhage.

Medicinal plants are known to possess pharmacologically active compounds with known inhibitory effects against snake bite envenomation. Plant's use against snake venom got attention of the researchers in recent years. Studies from different parts of the world explored the neutralization reaction of plants against snake envenomation [6,7]. In developing countries, 80% of the snake bite victims approach the traditional healers before consulting the health care professionals [8] (WHO report, 2010).

District Bannu, KPK-Pakistan was formed by the British Empire in 1861. Its total area is 1,227 km² (474 sq ml) with population about 1,073,000 in 2014. The Bannu district is positioned in the heart of the southern region, adjoining the districts of Karak in East-North, Lakki Marwat in East-South and the North and South Waziristan agencies (Fig 1). The traditional practitioners of the area use medicinal plants to combat snake bite envenomation but the use of these plants had never been reported systematically yet. This mini review documents, for the first time, the use of medicinal plants against snake bite envenomation in Bannu. In this review, 10 medicinal plants are enlisted which are used against snake envenomation in this area.

2. Data Collection

Traditional healers of various peripheries of district Bannu (Kakki, Ghoriwala, Mamash Khel, KuramGarhi, BakkaKhel, Havaid, Nizam Bazar) were visited and data was collected (December 2016 to June 2017) and compiled for systemic record. Literature was also reviewed to match and compare the obtained data with previously reported medicinal plants. Various physicians of District Head Quarter Teaching Hospital and KGN Teaching Hospital Bannu were also visited to get back their opinion regarding victim's attendance to them. Most of them confirmed that the guardians/relatives of patient approaches first to their nearby traditional practioner and then reported to hospital.

3. Medicinal plants used in District Bannu against snakebite envenomation

10 different plant species were explored to be used against snakebite envenomation. Moreover, use of different parts of the plant was also investigated and recorded. The table 1 shows these some of the medicinal plants and their usage, according to the opinion of the various local traditional practioners. Some of the plants mentioned in this study are also reported in reports of other researchers but mood of preparation and administration may differ. Fig 2 and 3 shows different plant parts used against snake bite envenomation and life forms of medicinal plants. All these plants are distributed throughout the Pakistan. Literature showed the use of all parts of the plants against snakebite. Leaves contained 35% anti-venom activity, roots 25%, whole plant 21%, flower 7%, fruit 5%, wood (Bark)5% and milky lattice 2% (Fig 2). Similarly, plants are used in numerous life forms including herbs 55%, Shrubs 31% and trees 21% (Fig 3). The current proportion indicates that the herbs play more significant role against snake bite envenomation as compared to shrubs and trees.

Medicinal plants comprise numerous bioactive composites which are known to inhibit and neutralize the action of snake venom [9]. These composites might be triterpenes, phenylpropanoid products, polyphenols, curcuminoids, coumarins, flavonoids, acids and polysaccharides etc. their isolation is already done and effects against snakebite envenomation are reported (Table 2). It is noted that a single compound do not accounts for the anti-snake venom activity rather all the existing compounds act interdependently to reflect the potential of a plant.

Recently, the author explored the promising inhibition of krait snake venom acetylcholinesterase by methanolic extract of a medicinal plant [10]. Many other important plants are still to be explored and researcher's attention is to be needed in order to isolate some of the compounds which might be helpful in the development of newer drugs against snake bite envenomation. Literature review showed that a no of medicinal plants which are grown and cultivated in Pakistan, are not scientifically screened for their anti-venom potential. Medicinal plants are supposed to be a neutralizing agent against venom of the poisonous

snakes and causes to release the venom from the receptors site. The receptors then free for action with acetylcholine and as a result, normal respiration starts back. The neutralized venom is then expelled from the body system. Medicinal plant's active compounds might play a key role in neutralizing the circulating venom. Many plants are reported whose active compounds are identified and isolated. Many plants mixtures are used as nasal inhaler to recover the snake bite victim from the coma. This mini review also explored the use of a medicated stone by some of the traditional healers against snake envenomation. The stone is directly applied on the injury site. According to their statement, the stone stick itself t the site and absorb the venom. It falls automatically after absorbing all the venom. For detoxification, the stone is dipped in milk. It is then dried and used. The author donot agree with the belief and perceptions of these healers regarding use of the medicated stone as it don't have any scientific logic.

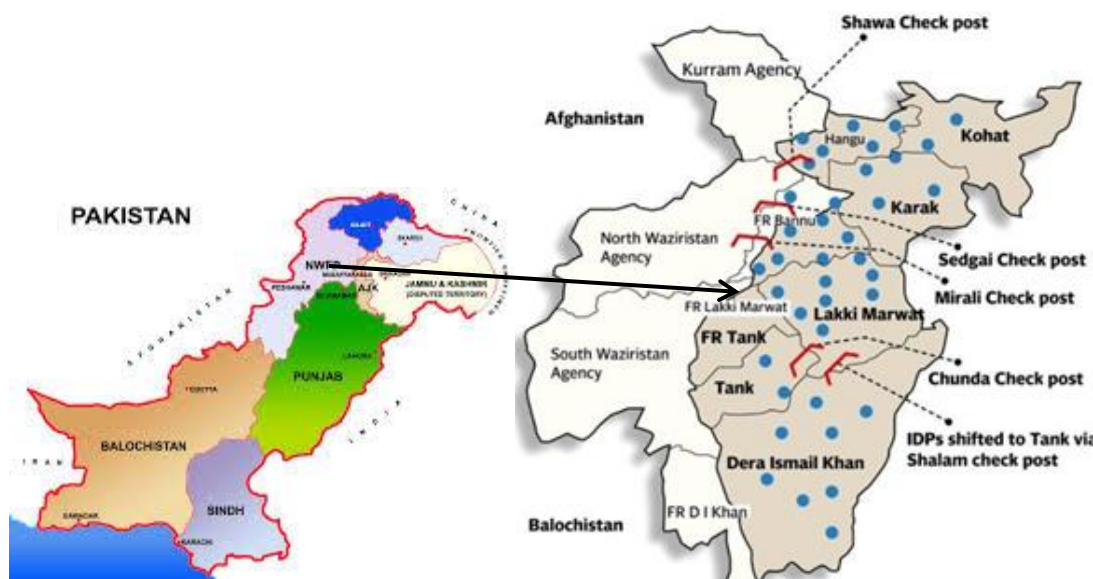


Figure 1: Map of District Bannu

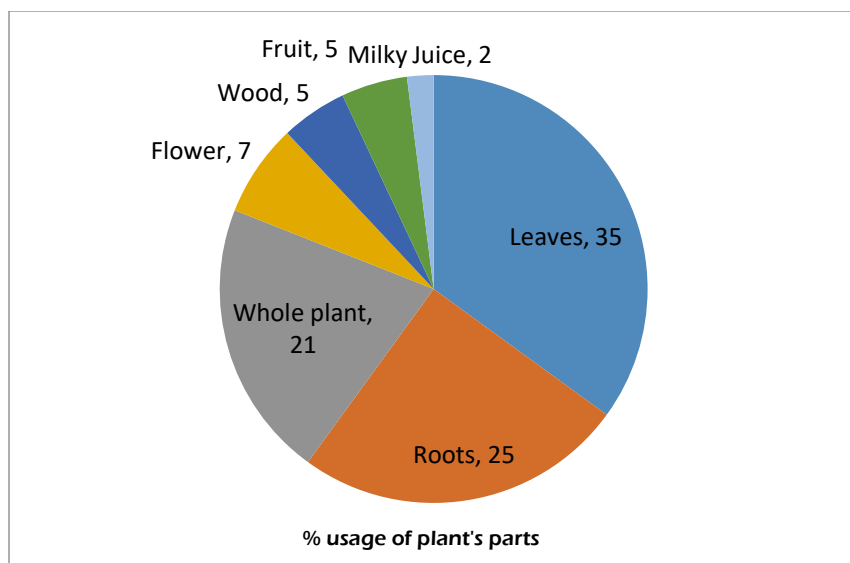


Figure 2: Plant's parts which are under consideration against snake's bite envenomation

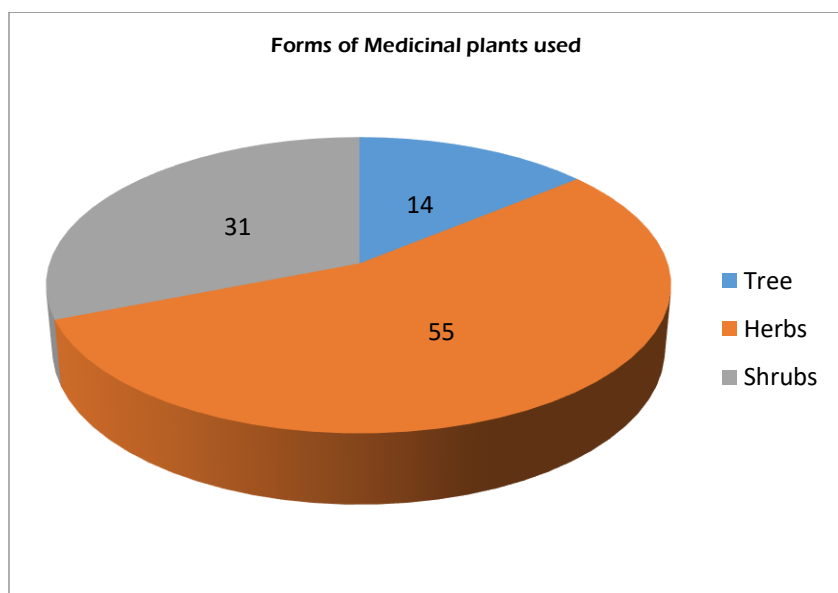


Figure 3: Parts of a plant that are used to treat snake's bite

Table 1: List of some medicinal plants and their parts used against snake's bite poisoning

Plant Specie	Family	Occurrence	Parts used
<i>Albizia lebbeck</i> (L.) Benth	Mimosaceae	Many parts including: Karachi, Punjab, Kutch, Indus dalta	All parts
<i>Ageratum houstonianum</i> Mill	Compositae	Attock, Bannu , Kohat	Leaves and inflorescence juice
<i>Cassia occidentalis</i> Linn	Caesalpinaceae	(M-2) Lahore-Islamabad Motorway, Rawalpindiand Baluchistan	Roots only
<i>Leucas capitata</i> Desf	Labiatae	National Park Islamabad, Rawalpindi, Swat, Poonch, Dir, Chitral and Lower Hazara	Whole plant

<i>Oxalis corniculata</i> Linn	Oxalidaceae	Shady places in Sind, KPK, Chitral, Hunza & Hazara	Leaves
<i>Salvadora persica</i>	Salvadoraceae	All over the Pakistan	Leaves and flowers
<i>Vicia sativa</i> L.	Papilionaceae	Rawalpindi, Kallar Kahar, Hasan Abdal, Abbottabad	Whole plant

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