



## Plants used for the treatment of snakebite among Hausa-Fulani Tribes in Tsiga District, Bakori Local Government Area Katsina State Nigeria

Musa DD<sup>1</sup>, Aliero AA<sup>2</sup>, Bashir KA<sup>3\*</sup>

<sup>1,3</sup> Department of Biological Sciences, Federal University Dutsin-ma, Katsina State, Nigeria

<sup>2</sup> Department of Biological Sciences, Usmanu Danfodiyo University Sokoto State, Nigeria

### Abstract

Traditional snakebite Healers farmers and Fulani cattle rearers in some villages in Tsiga District, Bakori local government Area Katsina State, were interviewed through the use of structured questionnaires for the various ways they manage snakebite in their livestock and among the people of their community they provided information on plants and parts used, mode of preparation and administration, habit, source and availability of medicinal plants. Field excursions were conducted along forest trails taking traditional healers as guides and voucher specimens of cited medicinal plants were collected. Result obtained showed that at least 83% of the respondents rely on the use of plants in managing snakebite on people or their livestock. Plants belonging to 12 different families were encountered. The common venomous snakes found in the study area include Black necked spiting Cobra (*Naja nigricollis*), puff adder (*Bitis arietans*), and saw scaled viper (*Echis carinatus*) polyvalent anti-snake venom is the only known therapeutic agent available throughout the world major drawback of serum therapy is its prohibitive cost and chance that victims may avail untimely medical care because of remote locations when bitten. The present article presents plants used for the treatment of snakebite randomness or the use of a variety of species in different families appear to be a feature of traditional snakebite treatments. Plants encountered can provide an alternative to the use of conventional antivenom.

**Keywords:** snakebite, hausa-fulani traditional healers, tsiga, antivenom

### Introduction

Snakebite is a serious problem affecting man and his animals all over the world, especially in Asia and Africa. Globally it has been estimation that 5 million snake bites cases occur worldwide every year, causing about 100,000 deaths <sup>[1]</sup> on an average, nearly 200,000 persons fall prey to snakebite per year in India alone and 35,000-50,000 of them die every year <sup>[2]</sup>

Venomous snakes are found throughout most of the world (including many oceans), except for a few islands, frozen environments and high altitudes <sup>[3]</sup> there are various medicinal plants which have been used against snake envenomation in folk and traditional medicines <sup>[4]</sup>. The increased preference of herbal medicine has consequently propelled the search for pharmaceutical remedies against different ailments from plants <sup>[5]</sup>. The medicines are collected from the wild and this has negatively impacted the plant resource due to unsustainable exploitation rates as well as the health of many people who cannot afford orthodox medicine [6, 7, 8]. This makes documentation, sustainable utilization as well as conservation essential

### Materials and Methods

#### Data Collection

This was a field survey targeting custodians of Traditional Medicine used in treatment of diseases. Verbal pre-informed consent was obtained from the participants before the interview.

Interviews were conducted in Hausa the local language in the area using semi-structured questionnaires

Collection of data on medicinal plants used to treat snakebites in the study area was according to a slight modification of Martin's procedure <sup>[9, 10]</sup>. Purposive sampling was used to identify 14 out of 20 villages. Permission was sought from local leaders after explaining the aim of the study who gave us the name of the first key informant while the rest of the respondents were selected by simple random sampling technique <sup>[11, 12]</sup>. A total of 36 key informants were selected with at least two from each village and an additional eight knowledgeable herbalists recommended by the community members from Tamarke, UnguwarMaimai, Shudi, Fillo, kadanyarBaushi, Barde, Maikafi, Kwanki, Sukola, Tama, Kwara, Wula, ZangonMarkeand Dokoki villages. The informants included primary collectors, vendors and traditional healers who are the custodians of indigenous knowledge on herbal medicines. Traditional healers are divided into two broad groups of herbalists who mainly use herbs while diviners also invoke ancestral spirits to guide them in their healing practice <sup>[13, 14, 15]</sup>. They provided information on plants and parts used, ailments treated, mode of preparation and administration, habit, source and availability of medicinal plants. Field excursions were conducted along forest trails taking traditional healers as guides and voucher specimens of cited medicinal plants were collected.

### Preference ranking

Preference ranking <sup>[16]</sup> of the 10 most available medicinal plant species and diseases commonly treated by each were shortlisted by the 12 key informants according to importance attached to the species as per frequency of use and effectiveness (number of days taken to healing in treating particular diseases successfully). The values assigned for each species across were summed up for all the informants to get an overall rank value. The species were then ranked in descending order with the species that had the highest total ranked first.

### Plant identification and processing of Voucher specimens

Plant identification was partly carried out in the field based on field manuals for plant identification <sup>[17, 18, 19, 20]</sup>. Voucher specimens were collected and later identified at the Ahmadu

Bello University Zaria Herbarium. Correctness of scientific names of species was also checked according to Tropicos: <http://www.tropicos.org> database accessed on 12/05/2015.

### Data analysis

Descriptive statistics using frequencies and percentages were used to summarize data using Microsoft excel 2013.

### Results and Discussion

Different plant species were studied and these plants were reported to exhibit antivenom potentials. The part of the plants to be used includes stem, leaves, seeds, root, bark and flowers. For *Lannea microcarpa*, the whole body of the plant is used as presented in Table 1 and Figure 1&2.

**Table 1:** Plants used in the treatment of snakebites among the Hausa-fulani tribals of Tsiga District

S/N	Botanical and Vernacular Names	Family Name and Habit	Part used	Method of preparation
1.	<i>Euphorbia balsamifer</i> (Aliyara)	<i>Euphorbiaceae</i> (Shrub)	Stem and Leaves	Decocted stem taken orally
2.	<i>Balanite aegyptiaca</i> (Aduwa)	<i>Balanitaceae</i> (Tree)	Leaf and Flower	Dried powdered leaves applied to incisions at site of snake bites.
3.	<i>Psidium guajava</i> (Gwaba)	<i>Myrtaceae</i> (Shrub)	Bark, Leaves,	The bark is used an infusion of the inner bark may is applied to bite site to alleviate pain.
4.	<i>Mangifera indica</i> (Mangoro)	<i>Anarcadiaceae</i> (Shrub)	Flower Leaves	Dried powdered leaves applied to incisions at site of snake bites.
5.	<i>Guiera senegalensis</i> (Sabara)	<i>Combretaceae</i> (Herb)	Leaves	Dried powdered leaves applied to incisions at site of snake bites.
6.	<i>Jatropha curcas</i> (Cinda-zugu)	<i>Euphorbiceae</i> (Shrub)	Leaves	Decocted leaves and stem are taken orally
7.	<i>Moringa oliefera</i> (Zogale)	<i>Moringaceae</i> (Shrub)	Leaves	Leaves t is boiled
8.	<i>Khaya senegalensis</i> (Madaci)	<i>Meliaceae</i> (Tree)	Leaves	The leaves are chewed
9.	<i>Diospyros mespiliformis</i> (Kanya)	<i>Ebanaceae</i> (Tree)	Seeds	The unripe seeds are pounded and taken by snakebite victims
10.	<i>Sclerocarya birrea</i> (Danya)	<i>Anarcadiaceae</i> (Shrub)	Bark	The bark is used an infusion of the inner bark may is applied to bite site to alleviate pain.
11.	<i>Lannea microcarpa</i> (Faru)	<i>Anarcadiaceae</i> (Tree)	Whole plant	Leaves decoctions are taken orally
12.	<i>Albizia chivalieri</i> (Katsari)	<i>Fabaceae</i> (Herb)	Leaves	Leaves are powdered and mix with cow milk taken orally
13.	<i>Anogeissus leiocarpus</i> (Marke)	<i>Combretaceae</i> (Tree)	Flower and Bark	The flower is used
14.	<i>Vernonia amygdalina</i> (Shuwaka)	<i>Asteraceae</i> (Shrub)	Roots, Stems and leaves	The roots are are boiled with potash and taken orally
15.	<i>Acacia albida</i> (Gawo)	<i>Fabaceae</i> (Tree)	Leaves and Bark	Leaves and bark are macerated for about 12 hour and are taken orally twice daily
16.	<i>Adansonia digitata</i> (Kuka)	<i>Bombacaceae</i> (Tree)	Leaves	Powdered form of leaves are used in treating Mucous diarrhoea, hemorrhoids
17.	<i>Annona senegalensis</i> (Gwandardaji)	<i>Annonaceae</i> (Shrub)	Leaves	the leaf extract is applied to the affected area, and macerated with red potash are taken orally
18.	<i>Azadiracta indica</i> (Dogonyaro)	<i>Meliaceae</i> (Tree)	Leaves Stems and Bark	Decoction of leaves and bark are taken orally.
19.	<i>Calatropis procera</i> (Tumfafiya)	<i>Ascepiadaceae</i> (Shrub)	Stem	The whitish juice is used
20.	<i>Senna obtusifolia</i> (Tafasa)	<i>Fabaceae</i> (Herb)	Leaves	Decoction of leaves is used
21.	<i>Parkia biglabosa</i> (Dorowa)	<i>Fabaceae</i> (Tree)	Leaves	Leaves are collected and decocted and taken orally
22.	<i>Piliostigma reticulatum</i> (Kalgo)	<i>Fabaceae</i> (Shrub)	Leaves	Decocted leaves taken orally

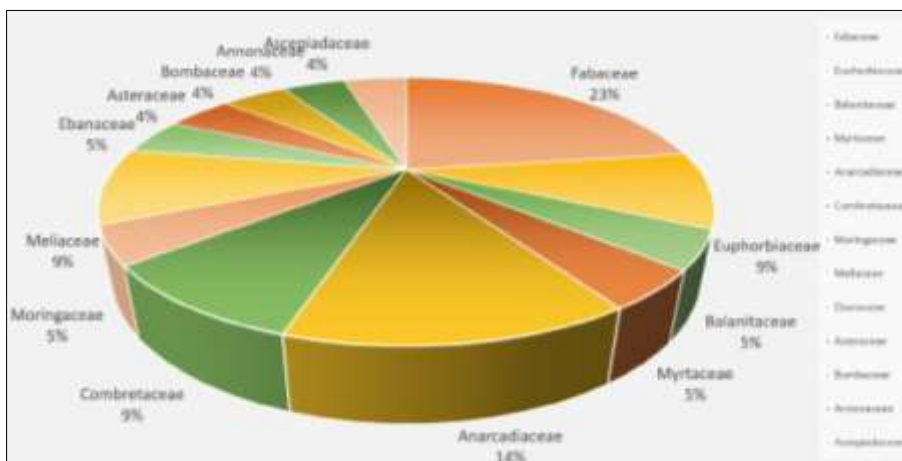


Fig 1: A pie chat showing ethno medicinal families and their percentage proportions

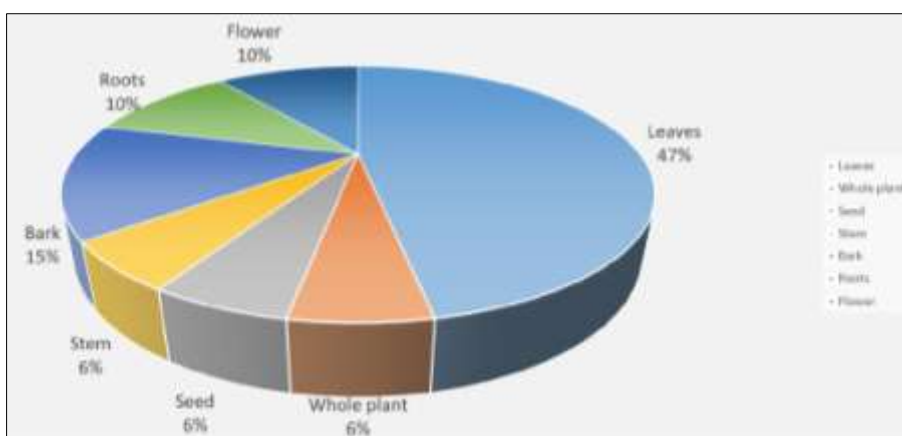


Fig 1: A pie chat showing the percentage proportions of plants use in treatment of various ailments

Plants are used either singly or in combination as antidotes for snakebite envenomation by rural populations in India and in many parts of the world since time immemorial. In modern medicine anti-venom therapy discovered by Calmette in 1894 remains as antidote for snake venom poisoning [21, 22]. There are about 250,000- 500,000 varieties of plants found worldwide, out of which about 25% are reported to have medicinal value with fewer number of studies evaluating the pharmacologically active principles against snakebites. The present paper includes information on 47 plants belonging to 12 different families used traditionally for the treatment of snakebite among the Hausa-fulani tribals of Tsga District. The herbs are commonly administered in forms like infusion, concoction, decoction, juice, extract, powder, and paste. In most of the cases, the mode of administration is oral, however, in some plants external application serves. The method of preparation and mode of action is also simple and convenient. The findings of this study are inconformity with findings of [23, 24, 25, 26, 27, 28].

**Conclusion**

The plants used by the traditional healers against snakebite have been found to possess remarkable properties. These traditional healers prefer to keep this knowledge with them for their own profit. Data is also lost without any records after passing away. These can be inferred with critical examination and observations

of ethno medicinal plants growing in surroundings.

**References**

1. Albuquerque UP. Re-examining hypothesis concerning the use and knowledge of medicinal plants: a study in catinga vegetation of NE Brazil, *Journal of ethnomedicine*, 2006.
2. Anonymous. Medicinal plants, their bioactivity, screening and evaluation. New Delhi: center for science and technology of the Non-aligned and other developing countries, 2002.
3. Bagai Y. Ethnobotanical features of alagadar (Yahyalikayseri) and its vicinity. *Journal of Systematic botany*, 2000, 7:89.
4. Bem AA, Bashir KA, Anaka TM. Relative Abundance and ethnomedicinal Uses of some Plant Species found in Federal University Dutsin-ma Permanent Site. *International Journal of Forest, Animal and Fisheries Research (IJFAF)*. 2020; 4(3):37-45.
5. Cunningham AB. Africa medicinal plants setting priorities at the interface between conservation and primary health care, *People plant working paper*, 1993.
6. Diallo D. An ethno botanical survey of herbal drugs of gourma district of Mali. *Journal of pharmaceutical biology*, 1999; 37:80-91.
7. Fabeku PO. Traditional medicine: the art, ways and practice.

- In: Odugbemi, T, editor, Outlines and pictures of medicinal plants from Nigeria. University of lagos press, 2006, p. 13-24.
8. Fasola TR, Egunyomi A. Bark extractivism and uses of some medicinal plants. Nigerian journal of botany, 2002; 15:26-30.
  9. Hamilton A. The people and plants initiative: In: GJ martin (Ed.): ethno botany a method manual, London: WWF International Chapman 7 Hall, 1995, p. 10-11.
  10. Harvey A, Jain SK. Plant products in some tribal markets of central India. Economic botany, 2000; 56:242-245.
  11. Ibrahim HN, Muazzam I, Jegede OF. Ethno medicinal Plants and methods used by gwandara tribe of sabonwuse in Niger state, Nigeria, to treat mental illness, Afr. J Trad. CAM. 2007; 4(2):211-218.
  12. Jinju M. African traditional medicine. A case study of Hausa medicinal plants and therapy Gaskia cooperation limited, Zaria. Nigeria, 1990, 16-17.
  13. Kinghorn AD. The discovery of drugs from higher plants. Biotechnology, 1994; 26:81-108.
  14. Krippner S. Models of ethno medicinal healings. Paper presented at the ethno medicine conference, Munich, Germany, April 26-27 and October 11-12, 2003.
  15. Lowe H, Payne Jackson A, Beckstrom- Sternberg SM, Duke JA. Jamaica's Ethno medicine: it's potential in the healthcare system. Canoe Press; University of West Indies, Kingston, Jamaica, 2000, 170.
  16. Maheshwari JK. Development in the Ethno botany Editorial. J econ taxon bot. 1983; 4(1):1-4.
  17. Musa DD, Anakaa TM, Bashir KA. Phytochemical analysis of crude extracts from *Annona senegalensis* and its anti-snake venom potential on albino rats. FUDMA Journal of Sciences (FJS) Maiden Edition. 2017; 1(1):139-142.
  18. Munthu C, Ayyapar M, Raja N, Ignacimuthu S. Medicinal plants used by traditional healers in Kancheepuran district of Tamil Nadu. Indian Journal Ethnomedicine, 2006; 2:43-44.
  19. Okafor JC, Ham R. Identification, utilization and conservation of medicinal plant in southeastern Nigeria. Issues in Africa biodiversity. The biodiversity of support Programme, 1999; 3:1-7.
  20. Phillipson JD, Anderson LA. Ethnopharmacology and western medicine. J Ethnopharmacol, 1989; 25:61-72.
  21. Rajadurai M. Ethno medicinal plants used by traditional healers of Pharmalai hills India. Journal of ethno medicine, 2004.
  22. Rao R. Traditional knowledge and sustainable development, key role of Ethnobiologist J Ethnobotany, 1996; 8:14-24.
  23. Sofowora A. Medicinal plants and traditional medicine in Africa. Chichester: Johnwiley and sons Ltd. New York, 1986, p.8
  24. Tripathi YC. Ethno medicinal treasure of tribal Rajasthan. J Non – timber for products. 2000; 7(1-2):77-84.
  25. Veeramuthu D. Antibacterial activity of some ethno medicinal plants used by Paliya tribe of Tamil Nadu, India. Entomology research Institute, Loyala College, 2006, 6:35.
  26. Vlietinck AJ, VandenBerghe DA. Can Ethnopharmacology Contribute to the development of anti- viral Drugs Journal of Ethnopharmacology, 1991; 32:141:153.
  27. World health organization (WHO). The promotion and development of traditional medicine. Technical report, 2006.
  28. World health organization (WHO); African traditional medicine. A frotech representative series WHO; Brazaville, 1976, 3:4.