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ETHNOZOOLOGICAL KNOWLEDGE OF THE *HMAR* COMMUNITY OF ASSAM: ANIMAL-BASED TRADITIONAL MEDICINES AND THEIR USES

INBUON SL[1], KALITA P[2], KIRANMAI C[3] AND REDDY PVB[1*]

1: Department of Life Sciences & Bioinformatics, Assam University, Diphu Campus, Diphu, Karbi Anglong, Assam, India

2: Department of Zoology, Eastern Karbi Anglong College, Sarihajan, Karbi Anglong, Assam, India

3: Department of Biotechnology, Vikrama Simhapuri University, Nellore, Andhra Pradesh, India

***Corresponding Author: Dr. P. Vijaya Bhaskar Reddy: E Mail:** vpichili@gmail.com; pvb.reddy@aus.ac.in

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ABSTRACT

Traditional medicine remains a cornerstone of healthcare in many communities, particularly in regions with limited access to modern medicinal advances and fear to adopt scientific medicine. This study documents the ethnomedicinal practices of the *Hmar* community in Assam, focusing on the use of animal-derived products. Field surveys and interviews with elderly community members revealed the therapeutic use of 37 animal species across mammals, birds, reptiles, molluscs, arthropods, and domesticated animals. Various parts and products-including meat, fat, gall bladder, blood, urine, scales, and body hair are used after processing by sun-drying, roasting, grinding, or oil extraction, and administered orally or topically. These remedies addressed a wide range of ailments, including digestive disorders, fever, malaria, fractures, joint pains, and skin infections. The findings highlight the community's ecological knowledge, cultural significance of animal-based therapies, and ongoing reliance on traditional remedies despite the availability of modern medicine. Moreover, the use of endangered species underscores the need for sustainable practices and conservation awareness. Preserving this knowledge offers valuable insights for future research into bioactive compounds, integrative healthcare, and sustainable resource management.

Keywords: *Hmar* community, ethnomedicine, zootherapy, traditional knowledge

1. INTRODUCTION

Traditional medicine continues to play a vital role in global healthcare, with the World Health Organization (1993) estimating that nearly 80% of the world's population relies primarily on remedies derived from plants and animals. Ingredients sourced from wildlife are not only central to traditional practices but are also increasingly utilized in modern pharmaceuticals and herbal preparations **[1]**. Therapeutic use of animals, known as zootherapy, encompasses medicines derived from animal parts, metabolic products, or associated materials such as nests and cocoons **[2]**. Since ancient times, natural compounds have contributed significantly to human health, with animals serving as therapeutic resources in healing, rituals, and cultural practices across continents **[3, 4]**. In India, animal-based remedies occupy an important position, with 15-20% of Ayurvedic medicines and nearly 200 Unani drugs derived from animal sources **[5, 6]**.

However, the use of animals in medicine carries ecological, cultural, economic, and sanitary implications that require careful documentation and analysis **[7]**. Northeast India represents a particularly significant context, being both culturally diverse, biologically rich, and predominantly inhabited by hill tribes of Mongoloid origin **[8]**. Among these groups, the *Hmar* community of Assam demonstrates a distinctive body of ethnomedicinal knowledge, particularly concerning animal-derived remedies, which warrants systematic study. The *Hmar* are a scheduled tribe primarily residing in Manipur, Mizoram, Assam, and Meghalaya, with their apex body recently reaffirming their identity as part of the broader Mizo group. Historically, the *Hmar* were forest dwellers and hunters, a lifestyle that facilitated the development of medicinal practices using animals and plants. Beyond therapeutic uses, animals were also incorporated into religious rituals and sacrificial offerings. The practice of using animal-derived medicines has been transmitted orally across generations, with methods adapted and refined over time. Although the introduction of modern medicine and the decline of certain wildlife species have led to the loss of certain practices, a significant portion of the *Hmar* community continues to employ traditional methods, often reporting positive outcomes.

The present study aims to document the knowledge and practices of animal-based traditional medicines among the *Hmar* community residing in Assam, including the identification of animal species and their parts or products used for therapeutic purposes. It further seeks to examine the methods of extraction, preparation, application, and storage of these remedies,

and emphasizes the importance of preserving and recording such traditional knowledge for future research and sustainable use.

2. METHODOLOGY

Survey was conducted in Diphu (Karbi Anglong district) and Haflong (Dima Hasao district). In both towns, elderly members of the *Hmar* community were interviewed to collect information on animal-based medicines, including the species used, preparation and storage methods, and their applications in treating various ailments.

3. RESULTS

The present study explores a total of 37 different animal species irrespective of a diverse classes and phyla extensively used for the traditional medicinal system of *Hmar* community. These data include 16 mammals, 5 birds, 5 reptiles, 2 molluscs, 3 arthropods and a variety of 6 domesticated animals **(Figure 1)**.

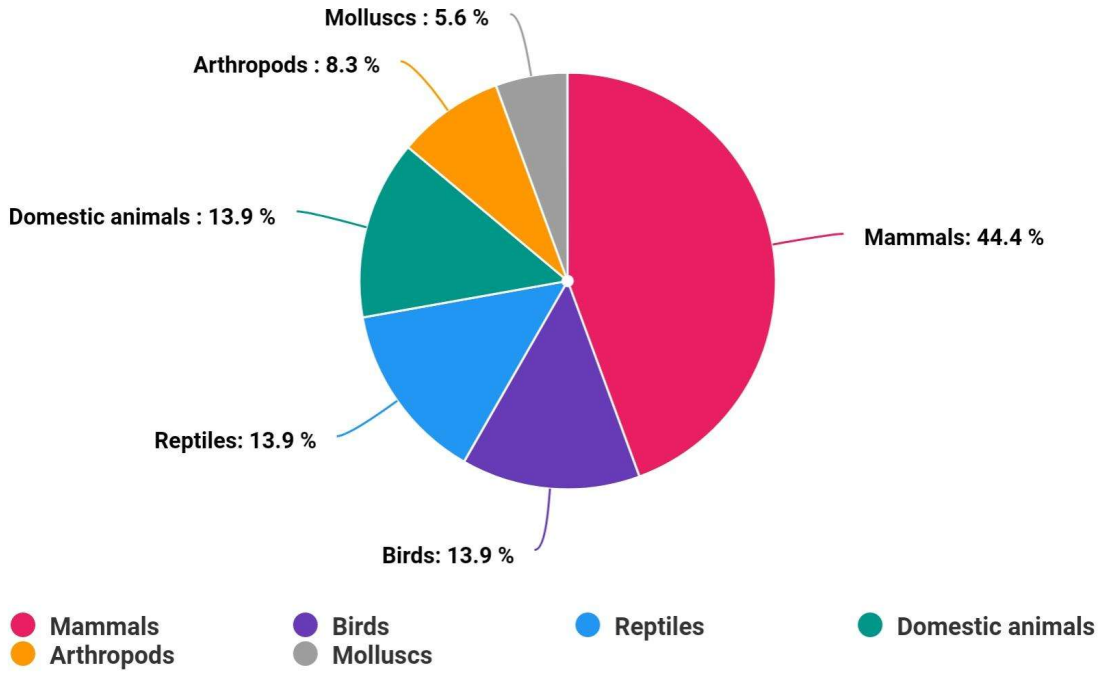

Figure 1: Pie Chart representing proportion of different animal groups used in traditional medicine by the *Hmar* community in Assam. Mammals constitute the largest share (44.4%), followed by birds, reptiles, and domestic animals (each 13.9%), arthropods (8.3%), and molluscs (5.6%)

Traditionally, various animal parts and products such as meat, fat, gall bladder, blood, urine, scales, and body hair are used in different forms (sun- or fire-dried, roasted, ground, or extracted as oil) against a range of ailments including digestive disorders, fever, cough, malaria, fractures, joint pains, and skin infections. Preparations were administered orally, applied topically, or used in rituals, reflecting diverse and sophisticated ethnozoological knowledge **(Figure 2)**.



Figure 2: Animal-derived products traditionally used in ethnomedicine by the *Hmar* community: A- Indian Pangolin's Scales; B- Fermented Pig's Lard; C- Slow Loris' Body hair, D- Porcupine's spike; E- Porcupine's Dried Stomach; F- Bear's Gall bladder

3.1 Mammals

Among the 16 mammalian species documented **(Table 1)**, commonly used animals included the Indian porcupine (*Hystrix indica*), Hoolock gibbon, Bengal slow loris, Asiatic black bear, Bengal tiger, Indian elephant, and pangolin (*Manis crassicaudata*). Different parts such as stomach, spike, meat, gall bladder, fat, tusk, tail hair, urine, and secretion from glands were used. Products were used as medicine after sun- or fire-drying, roasting, grinding, oil extraction, or mixing with herbs, and applied either orally or topically. These preparations were used to treat conditions including digestive disorders, malaria, high fever, toothache, splinters, fractures, asthma, and skin infections **(Table 1)**.

Table 1: Mammals used in *Hmar* traditional medicine. The table lists the local name (LN), common name (CN), and scientific name (SN) of each animal, along with the parts/products utilized, mode of preparation or storage, directions for use, and the associated ailments treated. LN=Local name, CN = Common name, SN = Scientific name, TB=Tuberculosis

S. No	Name	Parts/products used	Mode of Preparation or storage	Directions for use	Diseases/ailments treated
1.	LN- Saku CN- Indian Porcupine SN- *Hystrix indica*	Stomach	Sun or fire dried	Taken as a pill in small amounts (size of a rice grain), fresh or dried.	Digestion, diarrhea, dysentery, high fever, delivery problems.
				Ground, mixed with herbs and taken.	Asthma
				Moistened with water and pasted on toothache.	Toothache
		Spike	Natural form.	Roasted, ground and taken.	Tonsil.
		Meat with intestine	Sun or fire dried.	Cooked and consumed.	Malaria.

2.	**LN- Saha SN- *Hoolock gibbon***	**Gall bladder.**	**Sun or fire dried.**	**Taken as a pill in small amounts.**	**Fever, stomach ache, TB, food, poisoning and headache**
		Blood	**Mixed with strong local wine and bottled.**	**Taken as a syrup in small amounts (5ml).**	**Headache, TB, post-delivery (immunity).**
		Canine teeth	**Natural form.**	**Roasted, ground and pasted on toothache.**	**Toothache**
		Meat	**Sun or fire dried.**	**Cooked or roasted and consumed**	**Delivery problems.**
3.	**LN- Mittungkak CN- Bengal Slow loris SN- *Nycticebusbengalensis***	**Body hair**	**Natural form**	**Applied directly on infected area.**	**Fresh cuts (stops bleeding)**
4.	**LN- Bui CN- Assam mole shrew SN-*Anourosorex assamensis***	**Intestine**	**Sun or fire dried.**	**Taken as a pill in small amounts, fresh or dried.**	**High blood pressure.**
		Fat	**Oil is extracted and bottled.**	**Applied on infected areas.**	**Splinters.**
5.	**LN- Savom CN- Asiatic Black Bear SN- *Ursus thibetanus***	**Gall bladder**	**Sun or fire dried**	**Taken as a pill in small amounts, fresh or dried.**	**High fever, stomach ache, food poisoning.**
6.	**LN- Sakei CN- Bengal Tiger SN- *Panthera tigris tigris***	**Canine teeth**	**Natural form**	**Roasted, ground and applied on infected areas.**	**Toothache, poisonous cuts and bites, and fractures.**
7.	**LN- Sihal CN- Bengal Fox SN- *Vulpes bengalensis***	**Gall bladder**	**Sun or fire dried.**	**Taken as a pill in small amounts, fresh or dried.**	**Malaria.**
		Meat	**Sun or fire dried.**	**cooked or dried raw.**	**TB and cough.**
8.	**LN- Sasen CN- Red Serow SN- *Capricornis rubidus***	**Tongue**	**Sun or fire dried.**	**Soaked in water, and water applied on joints.**	**Fractures and joint pains.**
		Fresh urine in the bladder	**Bottled.**	**Taken orally in small amounts.**	**Kidney stones.**
				Applied on infected areas.	**Ear infection.**
		Hoof	**Natural form.**	**Cleaned, scraped off and powder taken orally.**	**Pain in peeing.**
		Secretion of the glands between toes of each hoof.	**Bottled.**	**Applied directly on infected areas.**	**Fractures and joint pains.**
9.	**LN- Saphu CN- Indian Pangolin SN- *Manis crassicaudata***	**Scales**	**Natural form**	**Roasted, ground and applied on anus.**	**Haemorrhoids.**
		Meat	**Sun or fire dried.**	**Cooked and consumed**	**Cold, stuffy chest.**
10.	**LN- Saphivok CN- Hog Badger SN- *Arctonyxalbogularis***	**Fat**	**Oil extracted and bottled.**	**Applied as an ointment on infected areas.**	**Skin rashes, burns caused internally.**
			Natural form.	**Boiled and consumed**	**Cancer.**
11.	**LN- Simtir CN- Asian house shrew SN- *Suncus murinus***	**Meat**	**Sun or fire dried.**	**Cooked or roasted and consumed.**	**Kidney and bladder stones.**

12.	LN- Sakhi CN-Small spotted deer SN- *Axis axis*	Fresh urine	Bottled.	Applied directly on infected area.	Ear infections.
13.	LN- Sai CN- Indian Elephant SN- *Elephas maximus indicus*	Tusk	Natural form	Powder is scraped off and applied on infected areas.	Splinters
		Tail hair	Natural form	Used to pick toothache.	Toothache
14.	LN- Zawng CN- Monkey	Gall bladder	Sun or fire dried.	Taken as a pill in small amounts, fresh or dried.	Malaria
		Meat	Sun or fire dried.	Ground and mixed with herbs and consumed raw.	Asthma
15.	LN- Satui CN- Smooth coated otter SN- *Lutrogale perspicillata*	Body hair	Natural form	Applied directly on infected areas.	Small cuts
16.	LN- Vahlup CN- Red Giant Flying Squirrel SN- *Petaurista petaurista*	Fresh urine	Bottled	Taken orally in small amounts	Kidney and bladder stones.

3.2 Birds:

A total of 5 avian species **(Table 2)** were recorded, including the Wreathed Hornbill, Hoopoe, House Sparrow, Blue Whistling Thrush, and Greater Coucal. Commonly used parts included fat, meat, blood, and claw secretions. Preparations involved sun- or fire-drying, oil extraction, or bottling. Birds were used to address ailments such as skin rashes, wounds, kidney and bladder stones, asthma, and delivery-related issues.

Table 2: Birds used in Hmar traditional medicine

S. No	Name	Parts/products used	Mode of Preparation or storage	Directions for use	Diseases/ailments treated
1.	LN- Kawlhawk CN- Wreathed Hornbill SN- *Rhyticeros undulatus*	Fat	Oil is extracted and bottled.	Applied as an ointment on infected areas.	Skin rashes and wounds.
				Taken orally within a month of delivery.	Delivery problems.
2.	LN- Vakhawhri CN- Hoopoe SN- *Upupa epops*	Meat and Blood	Sun or fire dried.	Cooked or roasted	Kidney and bladder stones.
3.	LN-Chawngzawng CN- House Sparrow SN- *Passer domesticus*	Meat	Sun or fire dried.	Ground and pasted on infected areas.	Ear infection.
4.	CN- Blue Whistling Thrush SN- *Myophonus caeruleus*	Meat	Sun or fire dried.	Cooked	Food poisoning.
5.	LN- Lalruong a sehnawt CN- Greater Coucal SN- *Centropus sinensis*	Meat	Sun or fire dried.	Fresh boiled meat or consumed dried raw.	Asthma
		Secretion of the claws	Bottled	Applied as an ointment on infected areas.	Swollen joint pains.

3.3 Reptiles

The study recorded 5 reptilian species **(Table 3)**, such as the Indian Python, Bengal Monitor Lizard, House Gecko, Tortoise, and Green Pit Viper. Parts used included meat, fat, gall bladder, and shell. Methods of preparation included drying, roasting, oil extraction, and grinding. Reptiles were employed to treat burns, high fever, diarrhea, cough, asthma, jaundice, and wounds.

Table 3: Reptiles used in Hmar traditional medicine

S. No	Name	Parts/products used	Mode of Preparation or storage	Directions for use	Diseases/ailments treated
1.	LN- Rulpui CN- Indian Python SN- *Python molurus*	Fat	Oil is extracted and bottled.	Applied as an ointment on infected areas.	Burns caused by fire. Leaves wound scar-less.
		Meat	Sun or fire dried.	Cooked or roasted	High fever.
		Gall bladder	Sun or fire dried.	Taken as a pill in small amounts.	diarrhea, dysentery, high fever and cough, food poisoning and delivery problems.
			Fresh specimen is mixed with clay and made into pallets.	Pallets dissolved in water, sedimented and decantated, and then drank.	
2.	LN- Tangkawng CN- Bengal Monitor Lizard SN- *Varanus bengalensis*	Gall bladder	Sun or fire dried.	Taken as a pill in small amounts, fresh or dried.	Diarrhea, dysentery, cough and fever.
		Fat	Oil is extracted and bottled.	Applied as an ointment on infected areas.	Burns and splinters.
		Meat	Sun or fire dried.	Ground and fed to poultry.	Bird flu.
3.	LN- Chalru CN- Common House Gecko SN- *Hemidactylus frenatus*	Meat	Sun or fire dried.	Ground, mixed with some syrup and taken orally in small amounts.	Asthma
4.	LN- Satel CN- Tortoise	Shell	Natural form	Roasted, ground and applied on infected areas.	Burns caused by fire.
5.	LN- Rul inhna CN- Green pit viper SN- *Trimeresurusalbolabris*	Gall bladder	Sun or fire dried.	Taken as a pill in small amounts, fresh or dried.	Asthma
		Meat	Sun or fire dried.	Roasted	Jaundice

3.4 Molluscs

Two molluscan species were utilized **(Table 4)**: snails and slugs. Whole bodies or body excluding the shell were applied or consumed to treat malaria, poisonous bites, and rashes. Preparation methods included sun- or fire-drying or using fresh specimens directly on affected areas.

Table 4: Molluscs used in Hmar traditional medicine

S. No	Name of the Animal	Parts/products used	Mode of Preparation or Storage	Directions for use	Diseases/ailments treated
1.	LN- Chengkawl CN- Snails	Whole body excluding the shell.	Sun or fire dried.	Roasted	Malaria
2.	LN- Hnapkawng CN- Slugs	Whole fresh body.	Natural form.	Whole body is attached to infected areas.	Poisonous bites and rashes caused by allergic reactions.

3.5 Arthropods

Three arthropods were recorded **(Table 5)**: crab, honey bee, and bed bug. Parts used included whole body, honey, wax, and sting. Preparations involved oil extraction, bottling, crushing, or direct application. These were used to treat jaundice, burns, diarrhea, eye soreness, joint pains, and malaria.

Table 5: Arthropods used in Hmar traditional medicine

S. No	Name of the animal	Parts/products used	Mode of Preparation or storage	Directions for use	Diseases/ailments treated
1.	LN- Ai CN- Crab SN- *Brachyura*	Whole body	Natural form	Ground and drank	Jaundice
				Ground, cooked with banana flower and consumed	
2.	LN- Bee CN- Honey bee SN- *Apis*	1.Honey	Taken out from the comb and bottled.	Applied directly on infected areas.	Burns caused by fire.
				Mixed with herbs and taken orally.	diarrhea.
		2.Wax	Natural form	Made into pallets and rubbed around infected areas.	Eye sore, joint pains.
		3.Sting	NA	The bee is made to sting infected area.	Joint pains.
3.	LN- Khum fat CN- Bed bug SN- *Cimicidae*	Whole body	Natural form	Smashed and applied on infected areas	Swollen lymph nodes
				Consumed alive	Malaria

3.6 Domesticated Animals

Six domesticated animals were recorded **(Table 6)**, including fowl, goat, dog, cow, and pig. Parts such as meat, blood, leg, bone, and fat were used. Preparations included sun- or fire-drying, boiling, or fermentation. These were employed to manage conditions such as weak immunity, dysentery, tuberculosis, rashes, splinters, and skin problems.

Table 6: Domesticated animals used in Hmar traditional medicine

S. No	Name of the animal	Parts/products used	Mode of Preparation or Storage	Directions for use	Diseases/ailments treated
1.	LN- Ar CN- Fowl SN- *Gallus domesticus*	Meat	Sun or fire dried.	Boiled, fresh or dried.	Weak immune system.
				Ground and pasted on infected areas.	Splinters.
2.	LN- Kel CN- Goat SN- *Capra hircus*	Leg	Sun or fire dried.	Boiled and soup drank, fresh or dried.	Dysentery.
3.	LN- Ui CN- Dog SN- *Canis*	1.Fresh blood	NA	Fresh blood taken orally in small amounts.	TB
				Blood is left to cool down, and top layer is pasted on infected areas.	Small cuts
		2.Meat	Sun or fire dried.	Cooked and consumed, fresh or dried.	TB

4.	**LN- Bawng CN- Cow SN- *Bos taurus***	**Meat**	**Sun or fire dried.**	**Cooked and consumed, fresh or dried.**	**Weak immune systems.**
		Bone	**Natural form.**	**Boiled and soup drank.**	**TB and weak immune systems.**
5.	**LN- Vawk CN- Pig SN- *Susdomesticus***	**Fat**	**Natural form**	**Boiled**	**Heavy dysentery.**
			Fermented and bottled.	**Applied as an ointment on infected areas.**	**Rashes and itchy skin caused by poisonous plants, and splinters.**

4. DISCUSSION

Among the 37 animal species documented in the present study, the mammalian species dominates the traditional medicine system of *Hmar* community followed by birds, reptiles, molluscs, and arthropods. This predominance of mammals likely reflects their availability in the local habitat and the greater medicinal potential of their body parts compared to smaller organisms like birds or reptiles. Altogether, 59 distinct animal parts or products were identified, with fat, gall bladder, and meat being the most commonly used. Other parts such as teeth, bones, hair, scales, and coverings were used less frequently, though in some cases they also served cultural roles as ornaments, ritual objects, or protective charms. Domestic species were not only valued as food sources but also contributed medicinally, while pets like dogs and cats gradually acquired therapeutic significance within traditional practices.

The present study highlights the rich ethnomedicinal knowledge of the *Hmar* community, in their use of animal-derived products to treat a wide range of ailments. This demonstrates a deep understanding of the local fauna and their therapeutic potential. For example, python fat is applied to burns, echoing its use among tribes in Kerala to relieve body pains and rheumatism **[9]**. The Indian porcupine (*Hystrix indica*) is used for digestive issues, asthma, toothache, tonsil problems, and malaria. Comparable practices have been documented among other tribes like *Nyishi* and *Galo* for tuberculosis, consumption of as dried stomach, boiled flesh in areas of Southern India, while the *Ao Nagasand Monpa* tribes utilize the intestine, gallbladder, and bile **[9-12]**.

Similarly, the Wreathed Hornbill (*Rhyticeros undulatus*) fat is used by the *Hmar* for skin rashes, wounds, and orally before delivery to aid childbirth, while in Kerala it is applied for body pains and among *Nyishi* and *Galo* communities the cooked flesh is used to relieve rheumatic discomfort **[9, 10]**. The Bengal Monitor Lizard (*Varanus bengalensis*) is another versatile species: the dried gall bladder is taken for gastrointestinal complaints, the fat is applied topically for burns and splinters,

and the dried meat is used to protect poultry from disease. Across other regions, monitor lizard flesh is used to treat cough and fever, while the fat is applied to relieve joint and rheumatic pain **[9-13]**.

Other mammals, such as the Red Giant Flying Squirrel (*Petaurista petaurista*) and pig (*Sus domesticus*), also feature prominently in Hmar remedies. The squirrel's urine is taken orally to treat kidney and bladder stones, whereas the Ao tribe of Nagaland uses its cooked intestine as an antidote for poisoning **[11]**. Pig fat is consumed for severe dysentery and applied topically for rashes, itching, and splinters, while in Nagaland it is also used to alleviate body pain, rheumatism, burns, and snake bites **[11]**.

These reports reveal that the *Hmar* community's use of animal-based remedies is not an isolated practice but part of a broader network of ethnomedicinal knowledge shared across many tribal groups in India. Despite differences in ecology and culture, communities often converge on similar uses of fat, flesh, or internal organs to treat comparable ailments, reflecting a continuity of indigenous wisdom shaped by close interaction with nature and sustained through oral traditions passed down by elders and healers. Such practices remain culturally significant and medically relevant, especially in remote areas where modern healthcare is limited. However, the reliance on endangered or protected species also raises important conservation concerns, underscoring the need to strike a balance between safeguarding cultural traditions and protecting wildlife.

5. CONCLUSION

The use of animal-based traditional medicines by *Hmar* community reflects a rich blend of cultural heritage, ecological knowledge, and practical healthcare. Preserving and documenting these practices is essential not only for safeguarding cultural identity but also for exploring potential bioactive compounds and promoting sustainable use of natural resources.

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