

Animal-Based Remedies in Indian Traditional Medicine and the Indian Knowledge System: Therapeutic Roles, Conservation Issues, and Research Perspectives

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Abstract

Traditional medical systems across the world have long relied on animal-derived substances, yet their role in Indian ethnomedicine stands out for its diversity, antiquity, and cultural integration. Ayurveda, Siddha, Unani, and numerous tribal traditions have historically incorporated products such as milk, ghee, honey, shells, venoms, fats, and animal bones for treating a wide spectrum of human ailments. This review synthesizes ethnobiological and pharmacological literature on zootherapeutic practices in India, with a focus on species diversity, therapeutic scope, conservation challenges, and research gaps. Surveys indicate the documented use of **over 109 animal species** for nearly **270 medicinal purposes**, with mammals, invertebrates, and birds being most frequently employed. Disorders commonly addressed include respiratory illnesses, musculoskeletal pain, digestive disturbances, and skin diseases.

Keywords: Zootherapy; Ayurveda; Siddha; Ethnozoology; Traditional medicine; Animal-based remedies; Conservation; IUCN; CITES; Irula Snake-Catchers' Cooperative; Biodiversity ethics; India

Introduction

Ayurveda, Siddha, Unani, and other indigenous healing practices of traditional Indian medicine have, for centuries, utilized animal parts and products in medicines for human disease. Such practices, deeply rooted in spirituality and culture, are now subject to debate on the grounds of ethicality and conservation (Chakravorty et al., 2011; Beauty Without Cruelty – India, 2020).

Traditional medicine remains an indispensable component of global healthcare, providing accessible, affordable, and culturally rooted healing systems to billions of people. According to the World Health Organization (WHO, 2003), nearly 80% of the global population relies primarily on traditional remedies, most of which are derived from plants and animals. Among these, zootherapy—the use of animals, their parts, or their products for medicinal purposes—represents an important yet often overlooked dimension of ethnomedicine. From the utilization of bear bile in Chinese medicine to the consumption of armadillo meat in Latin America, animal-based healing traditions are found in nearly every culture (Alves & Rosa, 2007).

India holds a particularly rich and diverse legacy of zootherapeutic practices, deeply embedded in its major traditional medical systems—**Ayurveda, Siddha, Unani, and tribal medicine**. Historical texts such as the **Charaka Samhita** and **Sushruta Samhita** contain references to animal-derived products including milk, urine, fats, bones, and venoms, prescribing their use in conditions ranging from respiratory disorders to skin diseases. Tribal communities across the country have also preserved unique ethnozoological traditions, many of which are transmitted orally across generations (Chakravorty et al., 2011).

Yet, this heritage is increasingly subject to debate. On one hand, animal-based remedies reflect **centuries of empirical observation**, cultural identity, and spiritual symbolism. On the other, concerns are mounting regarding **animal welfare, unsustainable harvesting, and biodiversity loss**. Studies reveal that a significant proportion of species used in Indian zotherapy are threatened, raising urgent questions about the compatibility of these practices with contemporary conservation priorities (BWC India, 2020).

In modern biomedical discourse, another challenge emerges: the **limited pharmacological validation** of many zootherapeutic practices. While substances like honey and cow urine have demonstrated antimicrobial and antioxidant properties under laboratory conditions, the majority of traditional remedies remain untested in systematic clinical trials. This research gap underscores the need to critically examine zotherapy not merely as cultural practice but also as a potential **source of novel therapeutic agents**.

Against this backdrop, the present review seeks to provide a comprehensive understanding of **zootherapeutic practices in Indian traditional medicine**. It explores the breadth of species and remedies employed, discusses **ethical and ecological implications**, examines **case studies of sustainable practices**, and identifies research gaps that could guide future policy and scientific inquiry. By doing so, it attempts to strike a balance between **preserving cultural heritage** and **ensuring ethical, sustainable, and scientifically validated healthcare solutions**.

Indian Zootherapeutic Practices from Vedas:

1. Matsya (Fish) – As a source of strength

From Charaka Samhitā, Sūtrasthāna 27/91:

“Matsya-māṃsaṃ balyaṃ snigdhaṃ guru-rasāyanaṃ smṛtam |
Pitta-kaphakṛt āsyasthaṃ vṛṣyaṃ vātapraśamanaṃ ||”

Meaning: Fish meat is strengthening, unctuous, heavy, rejuvenative, aphrodisiac, increases Pitta and Kapha, causes coating in the mouth, and pacifies Vāta.

2. Go-dugdha (Cow's milk) – As a Rasāyana

From Suśruta Samhitā, Sūtrasthāna 45/112:

“Kṣīraṃ śītaṃ madhuraṃ snigdhaṃ śukralaṃ jīvanīyaṃ |
Tṛṣṇā-dāha-prasamanaṃ vṛṣyaṃ balyaṃ rasāyanaṃ ||”

Meaning: Cow's milk is cooling, sweet, unctuous, semen-promoting, life-giving, relieves thirst and burning, aphrodisiac, strengthening, and rejuvenative.

3. Ajā-dugdha (Goat's milk) – For respiratory disorders

From Aṣṭāṅga Hrdaya, Sūtrasthāna 5/33:

**“Ajā-dugdhaṃ laghu śītaṃ kaphapittaharaṃ param |
Kāsa-śvāsa-haraṃ śreṣṭhaṃ raktapitta-nivāraṇam ||”**

Meaning: Goat's milk is light, cooling, alleviates Kapha and Pitta, highly effective in cough and asthma, and prevents bleeding disorders.

1. Milk (Kṣīra) as Healing

Atharvaveda 1.12.1

“Gāvo bhavantu no hite, kṣīreṇa pṛthivīm imām |
Rayim samardhayantī naḥ, śam no bhavantu bhesajam ||”

Meaning:

Cows are beneficial to us; with their milk they nourish the earth, may they bestow upon us prosperity and act as medicine (bhesajam).

2. Honey (Madhu) as Medicine

Atharvaveda 8.2.9

“Madhvādhi te rajaso dhārayāmi, madhvā pratīcī diśo mādayantu |
Madhvārṇavaḥ pṛthivīm viśvato bhūt, madhu mā no vanaspatīr juṣantām ||”

Meaning:

With honey I anoint you; let the directions gladden with honey; may the oceans and the earth be filled with honey; let the plants be sweet (medicinal) to us.

(Madhu in Vedic context = both honey & a metaphor for health-giving sweetness).

3. Ghee (Ghṛta) as Healing Substance

R̥gveda 1.187.10

“Ghṛtaṃ ghṛtena juhota svāhā, ghṛtasyāhutiḥ pra jayetām samiddhā |
Ghṛtena devāḥ santu medhitāso, ghṛtaṃ no agne vīhi jātavedah ||”

Meaning:

Offer ghee with ghee in oblation; may ghee bring prosperity; gods are strengthened by ghee, and ghee is life-giving (used as medicine & ritual purifier).

4. Go-dhūli (Dust from cow's hooves) as Protective Medicine

Atharvaveda 2.26.2

“Yā gāvo gocaranti no, yā gāvo naḥ samīdhire |
Tāsām rajo 'smān avatu, viṣād amīvato jagat ||”

Meaning:

The dust raised by cows as they move protects us from poison and disease (amīvā = illness).

5. Use of Animal Fat & Marrow in Healing

Atharvaveda 6.103.1

“Asthibhir māṃsair medasā majjabhis ca, tvacā raktena śirasaḥ samantāt |
Rogān sarvān apahantu śīrṣaṇā, yathā sukhī syāmamṛtāya jātaḥ ||”

Meaning:

With bones, flesh, fat, marrow, skin, and blood—may the head be protected from all diseases, so that one may live long and healthy.

Extent of Zootherapeutic Practices in India

Ethnozoological research highlights that animal-based remedies continue to form a vital part of India's traditional medical systems, despite the increasing dominance of plant-based formulations. A comprehensive survey carried out between **2000 and 2007** documented the medicinal use of **109 different animal species for 270 therapeutic purposes** (Chakravorty et al., 2011). These species are drawn from a broad taxonomic range, reflecting the diversity of India's fauna and the ingenuity of indigenous knowledge systems in adapting available biological resources for healthcare.

The taxonomic distribution of these medicinal animals is as follows:

- **Mammals:** 44 species (40%)
- **Invertebrates:** 24 species (22%)
- **Birds:** 18 species (17%)
- **Reptiles:** 12 species (11%)
- **Fish:** 9 species (8%)
- **Amphibians:** 2 species (2%)

The dominance of mammals and invertebrates in these practices is not surprising, since these groups are more accessible to rural communities and yield a variety of by-products such as milk, honey, fat, and

secretions. Birds and reptiles, though less represented, often hold symbolic or ritual value in addition to medicinal utility.

The remedies derived from these animals are employed to treat a wide range of ailments. The most frequently targeted health problems are **respiratory conditions** (asthma, cough, tuberculosis: 18.5%), followed by **rheumatic and musculoskeletal pains** (12.9%) and **digestive disorders** (9.9%). Other conditions include dermatological infections, infertility, fever, and chronic wounds, demonstrating the wide applicability of zootherapy across systems of the body.

Table: Animal Parts Used in Indian Traditional Medicine and Their Reported Uses

Animal / Group	Part Used	Medicinal Use	Reference (Author, Year)
Cow (<i>Bos indicus</i>)	Milk, ghee, urine, dung, curd (Panchagavya)	Liver disorders, fever, cancer, purification rituals	Jain (2016); Chakravorty et al. (2011)
Goat (<i>Capra hircus</i>)	Milk, urine	Asthma, tuberculosis, paralysis, skin diseases	Chakravorty et al. (2011)
Elephant (<i>Elephas maximus</i>)	Tusks, teeth	Pimples, conjunctivitis	Chakravorty et al. (2011)
Musk Deer (<i>Moschus moschiferus</i>)	Musk gland secretion	Expectorant, cardiac tonic, aphrodisiac, anti-inflammatory	Alves & Rosa (2007); Chakravorty et al. (2011)
Hare / Rabbit (<i>Lepus</i> sp.)	Blood, meat	Asthma, menstrual disorders, fever	Chakravorty et al. (2011)
Wild Boar / Pig (<i>Sus scrofa</i>)	Fat	Rheumatic pain, paralysis, burns	Raj et al. (2022)
Tiger (<i>Panthera tigris</i>)	Fat	Rheumatism, body ache, rickets	Chakravorty et al. (2011)
Leopard (<i>Panthera pardus</i>)	Meat	Virility, strength	Chakravorty et al. (2011)
Monkey (<i>Macaca</i> sp.)	Flesh	Rheumatism, asthma, anemia	Raj et al. (2022)
Honey Bee (<i>Apis</i> sp.)	Honey	Cough, cold, immunity, eye ailments	Jain (2016); Chakravorty et al. (2011)
Termites (<i>Odontotermes</i> sp.)	Whole insect	Asthma	Chakravorty et al. (2011)
Scorpion (<i>Buthidae</i> sp.)	Oil extract	Wound healing	Raj et al. (2022)

Animal / Group	Part Used	Medicinal Use	Reference (Author, Year)
Leech (<i>Hirudinaria granulosa</i>)	Entire animal (applied directly)	Arthritis, varicose veins, circulatory disorders	Alves & Rosa (2007)
Earthworm (<i>Pheretima</i> sp.)	Whole body	Malaria prevention, piles, arthritis	Chakravorty et al. (2011)
Indian Peafowl (<i>Pavo cristatus</i>)	Legs, feathers	Ear infection, infertility	Chakravorty et al. (2011)
Pigeon (<i>Columba livia</i>)	Blood, meat, feather soup	Paralysis	Raj et al. (2022)
House Sparrow (<i>Passer domesticus</i>)	Fecal matter	Infant constipation	Chakravorty et al. (2011)
Hard-shelled Turtle (<i>Trionyx</i> sp.)	Ash of carapace	Cough, asthma, tuberculosis	Chakravorty et al. (2011)
Snake (<i>Naja</i> sp., others)	Meat, venom	Leprosy, leucoderma, sciatica, eyesight	Whitaker & Captain (2004); Raj et al. (2022)
Garden Lizard (<i>Calotes</i> sp.)	Oil extract from whole animal	Wound healing	Chakravorty et al. (2011)
Clams, Oysters (<i>Bivalvia</i> sp.)	Ash of shells	Weakness, acne	Chakravorty et al. (2011)
Pearl, Coral	Powder/ash	Diarrhea, renal disorders, epilepsy, leprosy	Jain (2016); Chakravorty et al. (2011)
Fish (various)	Vertebrae, meat	Urine blockage, eyesight	Raj et al. (2022)

These examples, though selective, highlight the richness and diversity of India's animal-based medical practices. They also underline the **intersection of utility, symbolism, and cultural belief**, which shapes the persistence of these remedies in communities even today.

Case Studies

Irula Snake-Catchers' Cooperative (Tamil Nadu)

The Irula Snake-Catchers' Industrial Cooperative Society, established in 1978, represents one of the most successful examples of combining indigenous knowledge with modern healthcare needs and conservation priorities. The Irula community of Tamil Nadu, traditionally skilled in snake catching, faced declining livelihoods when wildlife protection laws restricted hunting practices. Rather than allowing this knowledge to vanish, the cooperative was formed with government and conservationist support to harness their expertise for a socially valuable purpose—the extraction of snake venom for antivenom production. Today, the cooperative supplies nearly 80% of India's antivenom requirement, directly contributing to the treatment of thousands of snakebite cases annually (Whitaker & Captain, 2004). Importantly, the process

follows conservation ethics: the snakes are captured, venom is extracted under controlled conditions, and the animals are released back into the wild. This cycle allows for both sustainable venom harvesting and biodiversity conservation, while simultaneously preserving traditional occupational skills. The Irula model has been internationally recognized as a pioneering example of how indigenous practices can be adapted to modern needs without compromising wildlife welfare.

Tiruppur Ethnozoological Survey

A more recent case comes from Tiruppur district, Tamil Nadu (2017–2020), where researchers documented the use of 28 animal species for medicinal purposes among local communities (Raj et al., 2022). The ailments addressed included skin infections, hemorrhoids, respiratory diseases, and genitourinary problems. This study illustrates the continued relevance of traditional zootherapeutic knowledge, despite pressures from modernization, urbanization, and the availability of allopathic medicine.

Notably, the Tiruppur survey emphasized how traditional knowledge persists in rural populations due to its affordability, accessibility, and cultural acceptance. Such documentation also plays a vital role in preventing the loss of orally transmitted indigenous wisdom. By recording these practices, researchers provide a foundation for potential future pharmacological studies, while also highlighting the need to balance cultural preservation with conservation priorities.

Together, these case studies illustrate the dual realities of Indian zotherapy: it can serve as a bridge between tradition and modern science when implemented sustainably (Irula Cooperative), yet also continues to survive in localized forms where it faces threats from globalization and biodiversity decline (Tiruppur survey).

Scientific Validation and Research Gaps

While ethnobiological surveys across India provide a rich catalog of animal-based remedies, a critical limitation lies in the lack of systematic pharmacological and clinical validation. Much of the current knowledge is descriptive, based on questionnaires, interviews, and ethnographic observations. Although valuable, such data cannot establish the safety, efficacy, or biochemical mechanisms of zootherapeutic treatments.

A few examples demonstrate partial validation. Honey, widely used in Ayurveda and tribal medicine, has been confirmed through laboratory studies to possess antimicrobial, wound-healing, and antioxidant properties. Similarly, cow urine has shown some antimicrobial activity and immunomodulatory effects in experimental settings (Jain, 2016). Yet, these represent only a fraction of the hundreds of remedies in practice. Substances such as snake venom, believed traditionally to alleviate chronic pain or leprosy, may hold pharmacological promise, but require rigorous toxicological testing, compound isolation, and clinical trials before therapeutic applications can be confirmed.

Future research should therefore focus on:

1. Identifying and isolating bioactive compounds in animal-derived remedies.
2. Evaluating pharmacological safety and efficacy through laboratory studies and controlled clinical trials.
3. Exploring synthetic or plant-based alternatives to reduce dependency on conservation-sensitive species.

4. Integrating ethnozoological knowledge into national biodiversity and wildlife policies, ensuring that traditional practices are respected but not at the cost of endangered fauna.

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