

Research Article

Earthworm Use in Medicine as an Expression of Indigenous Practices

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Abstract

Earthworms have been used medicinally for millennia across multiple cultures. Their therapeutic use is deeply rooted in Indigenous knowledge systems, where healing practices are grounded in relationships with land, animals, and ecological processes. This manuscript synthesizes evidence on the Indigenous origins of earthworm-based remedies, situating them within broader traditions of Indigenous medicine and contemporary biomedical interest. Recognizing these origins is essential for ethical scholarship, cultural respect, and the responsible integration of traditional knowledge into modern health frameworks.

Introduction

Indigenous medical systems incorporate natural materials—including plants, minerals, and animals—into healing practices that emphasize spiritual, emotional, physical, and ecological balance [1–3]. Within these relational worldviews, earthworms have long been recognized as organisms with therapeutic potential. Their use predates Western biomedical frameworks and reflects deep ecological knowledge grounded in observation and intergenerational transmission [4–6].

Indigenous medicine and the use of natural materials

Indigenous epistemologies and relationality

Indigenous knowledge systems are rooted in relationality, where humans, animals, plants, waters, and soils exist in reciprocal relationships. Knowledge is generated through long-term observation, ceremony, and land-based practice. Medicines are understood as living beings, and harvesting is conducted with respect and ethical responsibility [1,3].

Diversity of indigenous healing modalities

Indigenous healing practices include plant, animal, and mineral-based medicines; hands-on therapies; energetic and ceremonial practices; and community-based healing models [1]. These modalities remain central to Indigenous wellness frameworks and are increasingly recognized within contemporary health systems.

More Information

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Earthworms in traditional medicine

Earthworms have been used in traditional medicine for at least 2,300 years, with documented applications in India, China, Japan, Vietnam, and Korea [4,7].

South asian indigenous systems

In Ayurveda, earthworm extracts (bhūmi chikitsā) were used for 1) inflammation, 2) fever, 3) wound healing, and 4) humoral imbalance [7].

East Asian indigenous systems

In Traditional Chinese Medicine, earthworms (Di Long; 帝龍 or 蚯蚓地魔) were used to treat convulsions, asthma, hypertension, and joint inflammation [4,6].

Amazonian and Southeast Asian indigenous knowledge

Indigenous groups in the Amazon basin and Southeast Asia use earthworm-based poultices and decoctions for wound healing, infection control, and fever reduction [4]. Japanese Kampo medicine and Vietnamese traditional medicine contain similar uses.

Ecological observation as knowledge production

Indigenous healers recognized earthworms' regenerative abilities and antimicrobial resilience long before modern science identified the biochemical compounds responsible. This reflects sophisticated empirical knowledge grounded in ecological observation.

Biomedical interest in earthworm-derived therapies

Modern biomedical research has validated several traditional claims. Earthworms possess antimicrobial peptides, immunologically active compounds such as lysenin and lumbrokinase, and anti-inflammatory and regenerative enzymes [7-10]. These findings have renewed scientific interest in earthworms as models for innate immunity, wound healing, and drug discovery.

Colonial suppression of indigenous medicine

Colonial authorities across North America, Asia, Africa, and Oceania systematically suppressed Indigenous healing practices. Policies criminalized ceremonies, delegitimized Indigenous knowledge, and imposed Western biomedical systems. In Canada, the *Indian Act* R.S.C., 1985, c.I-5 and residential schools disrupted knowledge transmission and targeted healers [11]. Similar suppression occurred under British rule in India, where Ayurvedic and Siddha practitioners were marginalized [12-14]. Earthworm-based remedies, like many Indigenous practices, survived through community resilience and intergenerational protection (Figure 1).

This infographic illustrates the cultural and ecological foundations of earthworm-based medicine within Indigenous healing systems. Four thematic quadrants—Indigenous

Origins, Traditional Uses, Colonial Impact, and Bioethical Issues—surround a central earthworm, highlighting its antimicrobial properties and symbolic healing role. The visual emphasizes the continuity of traditional knowledge and its relevance to contemporary biomedical inquiry.

Intellectual property, bioprospecting, and ethical concerns

Bioprospecting risks

As biomedical interest in earthworm-derived compounds grows, concerns arise regarding the extraction of biological materials or knowledge without permission, compensation, or recognition.

Knowledge appropriation

Indigenous knowledge is frequently cited in biomedical literature without naming the communities that developed it.

Indigenous governance

Ethical research requires community consent, benefit sharing agreements, recognition of Indigenous intellectual property, and protection of sacred knowledge. Earthworm-derived therapies illustrate the need for frameworks that respect Indigenous sovereignty.

Clinical relevance for nursing practice

For nursing professionals, understanding Indigenous healing systems—including lesser-known modalities such as earthworm-based remedies—supports culturally safe care. Key implications include:

Cultural safety: Nurses must recognize Indigenous medicines as legitimate knowledge systems rather than “alternative” or “unscientific” practices.

Holistic assessment: Awareness of traditional remedies helps nurses conduct culturally informed assessments and avoid misinterpreting patient practices.

Therapeutic relationships: Respecting Indigenous knowledge strengthens trust, which is essential for effective care in Indigenous communities.

Integrative care: Nurses increasingly work in settings where Indigenous and Western health systems intersect; familiarity with traditional medicines supports collaborative care planning.

Ethical awareness: Nurses should understand the risks of bioprospecting and knowledge appropriation to advocate for Indigenous intellectual property rights.

This knowledge enhances clinical competence, supports reconciliation in healthcare, and aligns with nursing commitments to equity and cultural humility (Figure 2).



Figure 1: Indigenous Knowledge and Earthworm Medicine
This infographic illustrates the cultural and ecological foundations of earthworm-based medicine within Indigenous healing systems. Four thematic quadrants—Indigenous Origins, Traditional Uses, Colonial Impact, and Bioethical Issues—surround a central earthworm, highlighting its antimicrobial properties and symbolic healing role. The visual emphasizes the continuity of traditional knowledge and its relevance to contemporary biomedical inquiry.

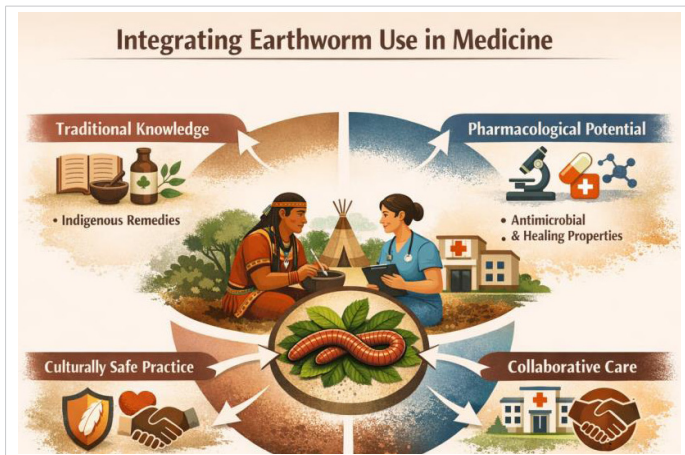


Figure 2: Integrating Earthworm Use in Clinical Practice
This visual depicts the collaborative potential between Indigenous healers and nursing professionals. Four quadrants—Traditional Knowledge, Pharmacological Potential, Culturally Safe Practice, and Collaborative Care—encircle a central image of an Indigenous healer and nurse. The graphic emphasizes the importance of cultural safety, respect for traditional remedies, and the integration of Indigenous knowledge into nursing care.

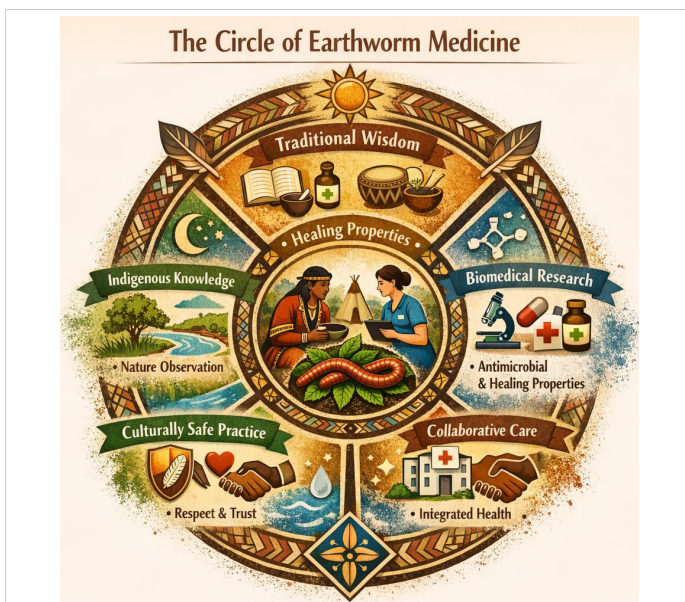


Figure 3: The Circle of Earthworm Medicine (Mandala Style)
This mandala-style graphic represents the cyclical and interconnected nature of Indigenous earthworm medicine. Concentric rings highlight Healing Properties, Indigenous Knowledge, Ecological Insight, Biomedical Research, and Nursing Practice. Cardinal symbols and cultural motifs frame the image, reinforcing the holistic worldview that underpins traditional healing. The visual serves as a symbolic synthesis of science, tradition, and care.

Contemporary integration of indigenous knowledge

Health systems increasingly recognize the value of Indigenous knowledge. Integration efforts emphasize cultural safety, Indigenous governance, respect for ceremony, and community-based models of care [1–3]. Earthworm-based remedies demonstrate how Indigenous ecological knowledge can inform contemporary health practices when approached ethically (Figure 3 above).

This mandala-style graphic represents the cyclical and interconnected nature of Indigenous earthworm medicine. Concentric rings highlight Healing Properties, Indigenous Knowledge, Ecological Insight, Biomedical Research, and Nursing Practice. Cardinal symbols and cultural motifs frame the image, reinforcing the holistic worldview that underpins traditional healing. The visual serves as a symbolic synthesis of science, tradition, and care.

Conclusion

Earthworm use in medicine is firmly rooted in Indigenous practices across multiple cultures. These traditions reflect deep ecological knowledge and holistic approaches to health. Contemporary biomedical research continues to explore earthworms' pharmacological potential, often confirming insights long held within Indigenous healing systems. Ethical integration requires recognition of Indigenous origins, respect for intellectual property, and culturally safe approaches to knowledge translation.

Author contributions

Conceptualization: JWR; Manuscript drafting: JWR & WMR; Literature synthesis: JWR; Critical revisions: JWR & WMR; Final approval: JWR & WMR

Ethics statement

This manuscript is a narrative synthesis and does not involve human participants, animals, or identifiable personal data. No ethics approval was required.

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