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Traditional Use of Herbs in Treating Urinary Disorders Among Indigenous Peoples of North America

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Introduction: Indigenous Peoples historically created medicinal treatments derived from plants native to their environments. This review explores the herbs employed by different tribes across North America for treating presumed Urinary Tract Infections (UTIs) signs and symptoms, such as burning, frequency, urgency, and incontinence. Antibiotics are the standard treatment for UTIs. The increase in microbial resistance prompts the exploration of alternative therapies. This review identifies these herbs to investigate whether they could be a potential alternative to antibiotics in modern medicine.

Sources and Methods: Field notes, species descriptions, illustrations, and primary North American Indigenous Peoples' phenological observations were reviewed for the herbs used to treat and prevent UTI symptoms in various tribal communities. Additionally, the geographic distribution of the herbs and the tribes was researched.

Results: Wild mint (*Mentha arvensis*), was used by the Cherokee, Ojibwa, and Cree tribes. Bearberry (*Arctostaphylos uva-ursi*) grows throughout North America, was used by the Cree, Innu, Inuit tribes of Northeastern Canada, and contains arbutin, which has antiseptic and diuretic properties. The Iroquois, Micmac, Wampanoag, and Algonquin-speaking tribes, which spanned across Canada, used cranberry (*Vaccinium macrocarpon*) to treat irritative urinary symptoms. Like cranberries, mossberries (*Vaccinium oxycoccos*) are found on low shrubs in northern, cold regions and were used by Inuit and Cree tribes. Algonquin-speaking tribes used Goldenrod (*Solidago spp.*) as the leaves and flowers have diuretic properties. The Eastern Cherokee used a mix of herbs that included *Solidago odora* for urinary problems.

Conclusions: Indigenous People of North America employed a variety of herbs and berries to manage irritative urinary symptoms that may have been indicative of a UTI. Many of these natural remedies have since been discovered to contain compounds with proven antibacterial, antiseptic, and diuretic qualities. Exploring herbal therapeutics as alternatives to antibiotics is a promising avenue, especially given the rise in antibiotic resistance.

Key Words: Indigenous Peoples, Herbal Therapy, Urinary Symptoms

The Indigenous people of North America have a rich tradition of medicinal herb use, drawing on natural resources available in their diverse environment. While there are variations from tribe to tribe, some methods of treatment are universal. Common modalities include prayer, chanting, music, herbalism, counseling, and ceremony. This manuscript explores the traditional use of herbs in treating the signs and symptoms of urinary disorders among various indigenous North American tribes, with a focus on five key herbs: Wild Mint (*Mentha arvensis*), Bearberry (*Arctostaphylos uva-ursi*), Cranberry (*Vaccinium macrocarpon*), Mossberry (*Vaccinium oxycoccos*), and Goldenrod (*Solidago spp.*). By examining the growth patterns, indications, and clinical documentation of these herbs, we aim to achieve a deeper understanding of the sophisticated and culturally rich practices of indigenous medicine. The management with herbal remedies preceded the treatment of urinary symptoms with antibiotics and remain a viable option for adjunctive treatment.(1)

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SOURCES AND METHODS

To investigate the use of herbal remedies by indigenous peoples across North America for treating urinary symptoms, a comprehensive review of field notes in rare books, species descriptions, illustrations, and primary observations recorded by North American Indigenous Peoples in tribal literature was conducted. This study focused on the medicinal plants used by various tribes, analyzing their properties and traditional applications.

RESULTS

This section is organized by the most used herbs, highlighting their utilization by indigenous tribes across North America for the treatment of various urinary tract signs and symptoms that may be consistent with the present-day diagnosis of a urinary tract infection (UTI) (Tables 1 and 2). Understanding the locations and migration patterns of these tribes is essential, as it directly correlates to the natural habitats of the herbs and their usage patterns discussed in this paper. Indigenous tribes distinguished between plants such as mint and bearberry through careful observation of key characteristics, including appearance, taste, smell, texture, and color. These sensory cues—along with knowledge passed down through oral tradition and hands-on experience—served as reliable methods for plant identification. Traits like leaf shape, growth pattern, and habitat were also used to differentiate species. While this differs from modern taxonomic classification, it was highly effective within its cultural and ecological context.

Geographic Distribution and Migration Patterns of Indigenous Tribes

The Indigenous tribes mentioned in this study are distributed across various regions in North America. The Cherokee primarily resided in the southeastern United States, particularly in areas that are now Georgia, Tennessee, and North Carolina.(2) The Ojibwa and Cree tribes were predominantly located in the northern United States and Canada, spanning from the Great Lakes region to the plains of Manitoba and Saskatchewan (Figure 1).(3) The Innu and Inuit tribes of Canada inhabited regions in northeastern Quebec and Labrador, and the Arctic regions, respectively. (4) The Iroquois Confederacy, including tribes like the Mohawk, Onondaga, and Seneca, were primarily located in the northeastern United States, especially New York.(5) The Micmac and Wampanoag tribes were situated in the northeastern United States and eastern Canada, particularly in present-day Nova Scotia and

Figure 1. Nearly 50 nations of indigenous peoples spanned the 4,000 mile Canadian American continent with as many as 12 distinct languages,. The Cree spoke a form of Algonquian and had a particulalry sophisticated ethno-botanical tradition and plant-based medicine tailored to their subarctic and prarire environs. (By courtesy of Encyclopædia Britannica, Inc. Copyright 2014, used with permission).

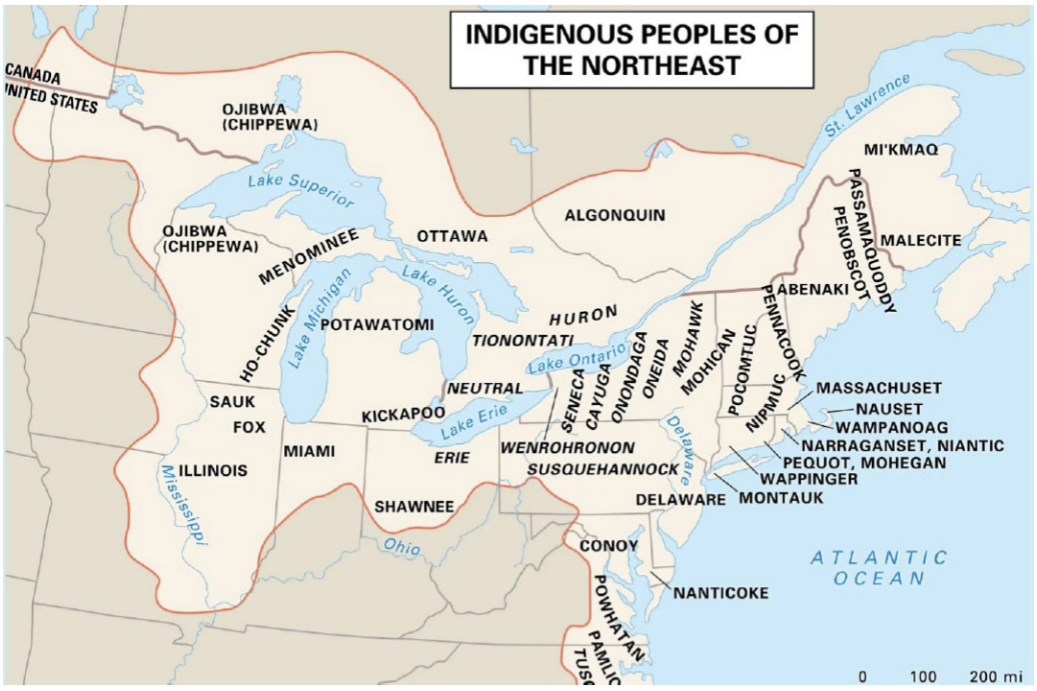

Figure 2. Many modern pharmacological discoveries, including aspirin and berberine-based therapies, have roots in the traditional plant-based medicine of Algonquian and Iroquoian peoples of the Northeast, drawn from trees, roots,and medicinal herbs unique to the region. Beyond compounds, their holistic emphasis on balance, diet, and communal care presaged contemporary approaches to preventive and integrative medicine.(By courtesy of Encyclopædia Britannica, Inc. Copyright 2002, used with permission)

Massachusetts (Figure 2).(6) The Algonquin-speaking tribes were spread across the northeastern United States and southeastern Canada.(7)

Migration patterns of these tribes were influenced by various factors, including climatic changes, territorial conflicts, and European colonization. For example, the Cherokee were forcibly relocated to Oklahoma during the Trail of Tears in the 1830s, while the Ojibwa and Cree gradually moved westward due to European settlement and fur trading pressures.(8,9) Maps illustrating the historical and contemporary locations of these tribes provide a visual understanding of their distribution and migration patterns (Figure 1 and 2).(10, 11)

Growth Patterns of Wild Mint (Mentha arvensis)

Wild Mint thrives in moist environments, such as the banks of rivers and streams, wetlands, and damp meadows. It is widely distributed across North America, aligning well with the territories traditionally inhabited by the Cherokee, Ojibwa, and Cree, who used Wild Mint as medicine (Figure 3),(10, 12). The overlapping presence of wild mint in these regions highlights its significance and availability as a natural remedy in these indigenous communities.(13)

Use and Documentation of Wild Mint

The Cherokee, Ojibwa, and Cree, along with Algonquin, and tribes throughout the landscape of present-day California used wild mint to make teas and to treat various urinary, gastrointestinal, and respiratory ailments.(13) Wild Mint tea was used to relieve the discomfort associated with urinary disorders through its diuretic properties, soothe stomachaches, aid digestion, and alleviate symptoms of colds and coughs. According to the historical medical records of a Cherokee physician, "Mint grows in great abundance in most parts of America, on the banks of streams and in wetlands. It has a strong aromatic smell, and a warm, rough, bitter taste. It possesses properties like those of the peppermint but in a smaller degree. It may be used in decoction, oil, or essence...The spearmint is said by some to be an efficacious remedy for suppression of urine."(14) The Ojibwa and Cree tribes similarly utilized the leaves of Wild Mint for their antimicrobial and diuretic properties,

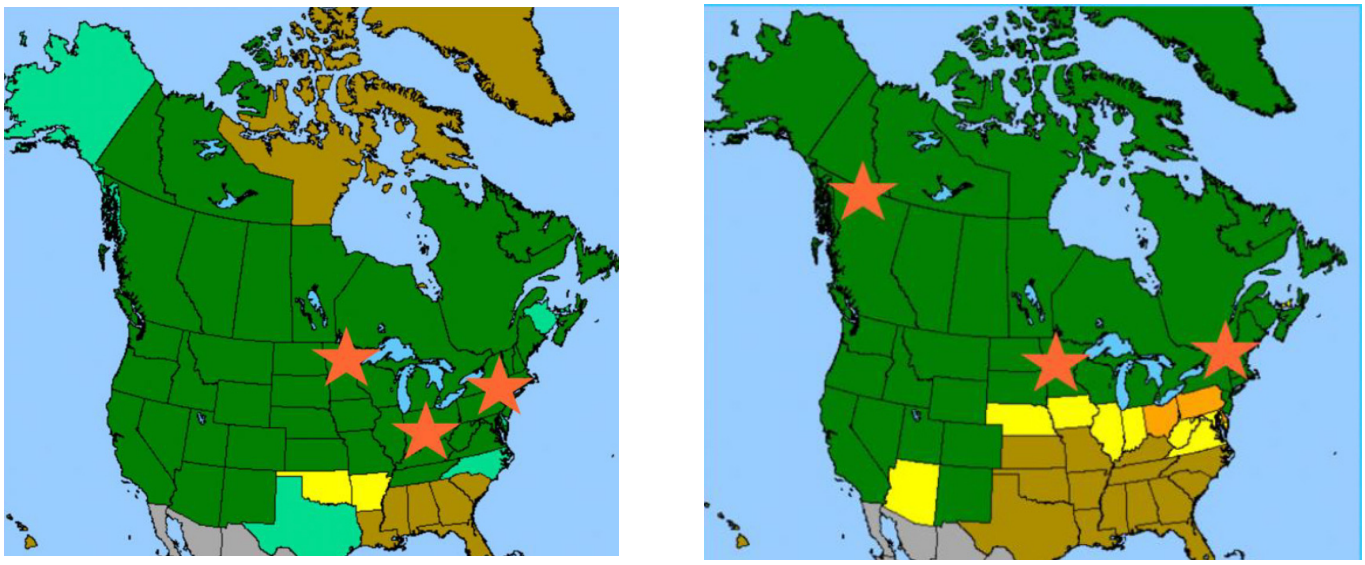

Figure 3. (Left) Growth patterns of Wild Mint (*Mentha arvensis*), where the species grew natively highlighted by green, and the geographic locations of the Cherokee, Ojibwa, and Cree tribes, indicated by orange stars, respectively. (Right) Native growth pattern of Bearberry and the geographic locations of the Cree, Innu, and Inuit peopels (left to right, orange stars, respectively).

making it a versatile remedy for urinary disorders and other health problems.(15)

Growth Patterns of Bearberry (Arctosyaphylos iva-ursi)

Bearberry is a low-growing evergreen shrub found in the northern regions of North America. It thrives in dry, sandy soils and open woodlands, well-aligned with the regions inhabited by the habitats of the Cree, Innu, and Inuit tribes (Figure 3). This plant is well-adapted to cold climates and is often found in boreal forests and tundra regions. Bearberry's ability to grow in nutrient-poor soils and its tolerance for cold temperatures made it a resilient and accessible plant for indigenous communities in these areas.(16)

Use and Documentation of Bearberry

The Cree and Innu tribes used Bearberry leaves to prepare teas and poultices.(17) The antiseptic and diuretic properties of arbutin, found in Bearberry leaves, make it effective for treating urinary disorders and documented UTIs.(18) The Inuit used Bearberry similarly, brewing it into a tea that promotes urination and flushes out bacteria from the urinary tract. Additionally, Bearberry was used for other ailments, including kidney stones. Bearberry has a long history of medicinal use. According to the Health Library at Mount Sinai, "Uva ursi (*Arctostaphylos uva ursi)*, also known as bearberry (because bears like eating the fruit), has been used medicinally since the 2nd century... Native Americans used it as a remedy for urinary tract infections."(19) This highlights the longstanding significance of Bearberry in traditional medicine and its specific application for urinary symptoms.

Growth Patterns of Cranberry (Vaccinium macrocarpon)and Mossberry (Vaccinium oxycoccos)

Cranberry is a native North American shrub that grows in bogs and wetlands, particularly in the northeastern regions where the Iroquois, Micmac, Wampanoag, and Algonquin-speaking tribes resided. This plant thrives in acidic, peat-rich soils and requires a steady supply of water which makes the wetland habitats ideal for its growth (Figure 4 left).(12) Cranberry plants have long, trailing vines and produce small, red berries that are harvested in the fall. (20-23)

Mossberry, also known as the small cranberry, is found in the northern regions and cold climates of North America. They thrive in bogs and wetlands, similar to its relative, the larger cranberry. This plant is well-suited to the harsh conditions of the Arctic and sub-Arctic regions, where it grows close to the ground and spreads through a network of trailing vines (Figure 4 right). Mossberry plants prefer acidic, nutrient-poor soils and are commonly found in peat bogs and wet meadows.(20)

Use and Documentation of Cranberry and Mossberry

The Iroquois used cranberry and mossberry to prevent and treat urinary disorders, and possibly UTIs, by potentially inhibiting bacteria from adhering to the urinary tract lining.(24) The Micmac and Wampanoag tribes also utilized cranberry, making it a staple in their medicinal toolkit. The Algonquin-speaking tribes documented the use of cranberry in traditional remedies, highlighting its efficacy in preventing recurrent urinary

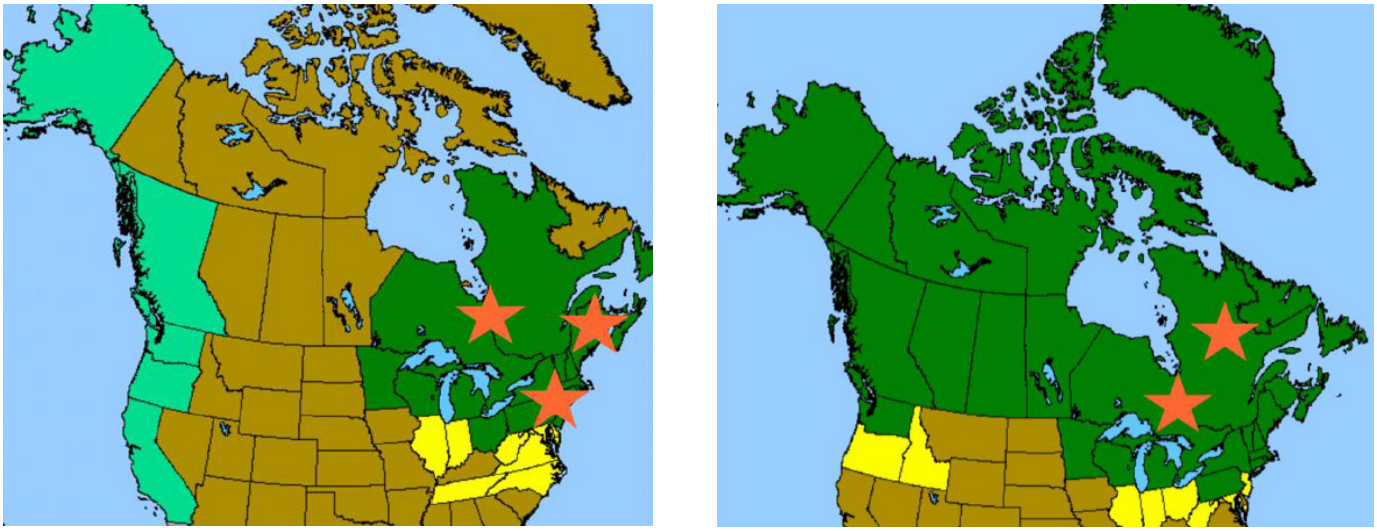

Figure 4. (Left) Native growth pattern of cranberry (*Vaccinium macrocarpon*) used extensively by the Iroquois, Micmac, and Wampanoag Algonquin speaking tribes (left to right orange stars, respectively). (Right) Native growth pattern of Mossberry (*Vaccinium oxycoccus*) (green), used extensively by the Cree and Aloconguin speaking tribe (left and right orange stars, respectively).

disorders consistent with UTIs.(25)

A notable insight into the historical and nutritional significance of cranberries is provided by the gastronomist Jessica Loyer (University of Adelaide), who states, "The cranberry provides an ideal case study for historicizing the construction of the superfoods trend and examining its relationship to hegemonic nutrition because it has a history of human use as a healthful food in North America dating to pre-colonial times."(24) This highlights the cranberry's long-standing role in both Indigenous medicine and nutrition, underscoring its continued relevance in modern health contexts (Figure 5).

Growth Patterns of Goldenrod (Solidago spp.)

Goldenrod is a genus of flowering plants found in meadows, prairies, and open woodlands across North America. It thrives in well-drained soils and full sunlight, making it a common sight in disturbed areas such as roadsides and fields. Goldenrod is characterized by its tall, slender stems and clusters of bright yellow flowers that bloom in late summer and early fall. The plant's adaptability to a range of soil types and conditions makes it widely accessible to many indigenous tribes.

Use and Documentation of Goldenrod

The leaves and flowers of Goldenrod were utilized for their diuretic properties and potentially play a role in the mechanical excretion of bacteria from the urinary tract. The Eastern Cherokee mixed Solidago odora with other herbs to treat urinary problems. The herbs utilized by both the Cherokee and the Ojibwa tribes are listed in Table 1 and Table 2. Historically, "goldenrod (Solidago canadensis or Solidago virgaurea) has been used on the skin to heal wounds. The name Solidago means 'to make whole'."(19) Research indicates that *Solidago virgaurea* extract exhibits significant antibacterial and anti-inflammatory properties, making it effective in treating UTIs. Wojnicz et al. found that the extract limits the survival of bacteria and reduces biofilm formation, which is crucial in managing chronic and recurring UTIs.(26) This highlights Goldenrod's potential as a complementary treatment in combination with antibiotics to enhance the therapeutic outcomes for the treatment of UTIs. Goldenrod has been widely used by Indigenous groups across North America. According to Moerman in Ethnobotany in Native North America, there are 19 species of goldenrod used by Indigenous groups.(16) The diverse usage of Goldenrod underscores the plant's importance in traditional medicine and its versatile healing properties.

DISCUSSION

The traditional medicinal practices of Indigenous tribes in North America are a testament to their deep understanding of the natural world and its healing properties. Descriptions of urinary symptoms by Indigenous groups were typically framed in holistic views of the body. Symptoms such as painful urination, difficulty voiding, or frequent urination were described in terms reflecting imbalance, heat, and inflammation. Remedies were chosen based on observed efficacy and traditional knowledge passed orally through generations. The use of specific plants was often tied to their perceived properties—such as cooling, cleansing, or diuretic effects—and their ability to restore balance.(16) The use of Wild Mint, Bearberry, Cranberry, Mossberry, and

Figure 5. Native American Ho-Chunk men and women harvesting wild cranberries (Vaccinium macrocarpon) near Black River Falls, Wisconsin, circa 1900. For the Ho-Chunk and other Native nations of the Upper Midwest, cranberries were not only a seasonal food source but also held importance in trade and traditional medicine. (Photograph by Charles Van Schaick, courtesy, Wisconsin Historical Society)

Goldenrod in treating urinary symptoms demonstrates the sophisticated knowledge these communities had in addressing health issues using available natural resources.

The findings from this study underscore the need for integrating traditional Indigenous knowledge with modern medical practices. The documented long-term use of these herbs in treating urinary symptoms provides a foundation for developing alternative and complementary therapies to antibiotics, especially in the face of increasing antibiotic resistance.

By understanding and respecting the traditional uses of these herbs, contemporary medicine can explore sustainable and holistic approaches to treating UTIs. This integration requires a multidisciplinary effort, combining ethnobotany, pharmacology, and clinical research to validate and standardize these traditional remedies. This review not only honors the legacy of Indigenous medicine but also paves the way for innovative treatments in the face of global health challenges.

CONCLUSION

This manuscript reviews the use of herbs by the Indigenous People of North America to treat urinary tract infections and disorders in the pre-antibiotic era. The historical use of these herbal remedies highlights the extensive knowledge and application of natural medicine in indigenous cultures, offering valuable insights for contemporary healthcare practices.

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Herb	Uses	Implementation
White Snake Root (Pool Root)	Gravel, diseases of the urinary organs, fever	Used in decoction or tincture form. The root is stimulant, tonic, and diuretic with a warm, aromatic taste.
Skervish (Frost-Root)	Gravel, diseases of the urinary organs, incontinence, suppression of urine, inflammation of the kidneys, and gout	Employed fresh or dry in decoction, infusion, tincture, extract, or oil form. The plant is astringent, diuretic, and sudorific.
Horse-Mint	Weak bowels and stomach, diuretic for urinary discharge, promotes perspiration	Leaves and top used in a decoction.
Strawberry (*Frigaria*)	Diseases of the kidneys and bladder, suppression of urine, jaundice, and scurvy	Fruit is used, but vine can be used when fruit is unavailable.
Tobacco (*Nicotian Tobacum*)	Diuretic, emetic, cathartic, antispasmodic, sudorific, expectorant, anthelmintic	Leaves steeped in vinegar or warm water for external application, tincture for internal use.
Rush (Cah-no-yah)	Gravel, incontinence	Decoction of the rush is diuretic and safe for consumption in large quantities.
Smart Weed (Oo-ne-ta-we-tag-tse-ker)	Gravel, suppression of urine, strangury (painful discharge of urine)	Decoction thickened with wheat bran or cornmeal used as a poultice.
Indian Hemp (Cah-ter-lah-tah)	Pox, incontinence, uterine obstructions, rheumatism, asthma, coughs	Root infusion taken in gill doses every three to four hours.
Flax Seed	Gravel, burning in making water, violent colds, coughs, diseases of the lungs	Flax seed tea or syrup made with honey.
Sumach (Black and White)	Clap, strangury (painful discharges of urine), gleet, ulcerated bladder	Decoction of the root, berries used as a tonic.
Silk Weed (*Asclepias Syriaca*)	Sexually transmitted infection, incontinence, gravel	Root used in decoction, tonic for laxative purposes.
White Elder (*Sambicus Niger*)	Incontinence, urinary issues, mild ailments in children	Inner bark used in decoction or tincture form, flowers for mild ailments.
Pumpkin (*Cucurbita Pepo*)	Gravel, incontinence	Decoction of seeds, oil from seeds.
Queen of the Meadow (*Spergula Ulmaria*)	Diseases of the urinary organs, incontinence, gout, rheumatism	Root used in strong decoction.
Parsley (*Apium Petroselium*)	Inflammation of the kidneys and bladder, suppression of urine, incontinence, female obstructions	Top and root used in decoction.
Cat-Tongue (We-sek-kah-char)	Diseases of the kidneys and bladder, suppressed urine, gravel	Root used in strong decoction.
Twin Leaf (*Jeffersonia Odorata*)	Incontinence, suppression of urine, gravel, sores, ulcers	Used in tea, decoction, tincture, or syrup form.
Wild Potato (*Convolvulus Panduratus*)	Incontinence, gravel, suppression of urine, coughs, asthma, consumption	Root used in decoction or powder form.
Clap Weed (Oo-stee-cah-ne-quah-le-skee)	Sexually transmitted infection	Root used in decoction or tincture form or chewed.

Table 1 (part 1). List of the herbs commonly used by the Cherokee, along with their specific uses and methods of implementation as documented extensively in *The Cherokee Physician, or Indian Guide to Health*, as Given by Richard Foreman, a Cherokee doctor.

Herb	Uses	Implementation
Poor Robbin's Plantain	Suppressions of urine, gravelly complaints, spitting of blood, epilepsy	Leaves used in decoction.
Highland Big-Leaf (Oo-kah-to-ge-a-quah)	Sexually transmitted infection, gravel, diseases of the urinary organs	Root used in decoction, tonic in spirits.
Southern Yaupon	Incontinence, gravelly complaints	Leaves used in decoction, toasted for tea.
Burdock (*Arctium Lappa*)	Sexually transmitted infection, mercurial complaints, rheumatism, gravel, scurvy	Roots or seeds used in decoction, root in spirits for bitters.
Wild Rats Bane (Winter Green)	Incontinence, diseases of the urinary organs, rheumatism, scrofula, cancers, ulcers	Decoction or bitters, stewed in lard for skin conditions.
Piney Weed (No-tse-e-yau-stee)	Sexually transmitted infection, bites of copper head or rattlesnake	Decoction taken internally, bruised herb applied externally.
Rattle-Snakes' Master (E-nah-le-up-loh-skoch-la-nur-wa-tee)	Snake bites, stimulant, diaphoretic	Mucilage in leaves.
Wild Mercury	Incontinence, gravel, pox	Root used in decoction.

Table 1 (continued). List of the herbs commonly used by the Cherokee, along with their specific uses and methods of implementation as documented extensively in *The Cherokee Physician, or Indian Guide to Health*, as Given by Richard Foreman, a Cherokee doctor.

Herb	Uses	Implementation
Bush Honeysuckle (*Diervilla lonicera Mill.*)	Urinary remedy, diuretic, and to relieve itching	The root is used together with other plants like Ground Pine to create the most valued urinary remedy among the Flambeau Ojibwa.
Common Burdock (*Arctium minus Bernb.*)	Dissolving urinary deposits, diaphoretic, diuretic, alterative, aperient, and depurative	The root is used as one of the ingredients in a medicine for pain in the stomach. It is also used externally as a salve or wash for various skin conditions.
Joe-Pye Weed (*Eupatorium purpureum L.*)	Chronic urinary disorders, diuretic, stimulant, astringent, and tonic	A strong solution of the root is used to wash a papoose until the age of six to strengthen him. It is also used in the treatment of gout, rheumatism, and hematuria.
Prince's Pine (*Chimaphila umbellata [L.] Nutt.*)	Diuretic, stimulant of the genitourinary tract mucous membrane, renal incontinence, scrofulous conditions, chronic ulcers, and skin lesions	Used as a tea for treating stomach troubles and employed both internally and as an embrocation.
Tamarack (*Larix laricina* [DuRoi] Koch)	Chronic inflammation of the urinary passages, chronic bronchitis with profuse expectoration, and phases of hemorrhage	The dried leaves are used as an inhalant and fumigator.
Wood Nettle (*Laportea canadensis* [L.] Gaud.)	Diuretic properties, cures various urinary ailments	The root is used to make a medicinal tea.

Table 2. Urinary Herbs Used by the Ojibwa. List of the herbs commonly used by the Ojibwa for urinary ailments, including their specific uses and methods of implementation as documented extensively in the Bulletin of the Public Museum of the City of Milwaukee, Vol. 4, No. 3, Pp. 327-525, Plates 46-77, May 2, 1932, *Ethnobotany of the Ojibwe Indians* by Smith HH.

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DECLARATION OF COMPETING INTEREST

The authors declare that there are no competing interests. All contributions were made in good faith and without external influence beyond those acknowledged in the manuscript.

STATEMENT ON USE OF GENERATIVE ARTIFICIAL INTELLIGENCE

The authors affirm that no generative artificial intelligence (AI) tools (e.g., large-language models) were used in the writing, analysis, or figure preparation for this manuscript.