



Traditional oral healthcare practices followed by the Garo tribe of West Garo Hills District, Meghalaya

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Received 18 February 2020; revised 29 November 2021

Ethnomedicinal study of therapeutic healing methods of oral diseases was conducted during 2016-19 in the West Garo Hills district of Meghalaya, India. Recurrent field trips in and around different parts of West Garo Hills lead to the five most knowledgeable and available THPs (Traditional health practitioners) from whom valuable information was elicited. A pre-tested interview schedule was used to gather information from them. Information like vernacular names, common names, scientific names, family, habit, habitat, plant parts used and a comprehensive procedure for preparation of the medicines was recorded. After obtaining detailed information regarding the indigenous wild medicinal plants used wholly for healing oral diseases, an assessment was made that, 14 plant species belonging to 12 different families were found to heal the dreadful and painful disease. Out of the 14 plants having medicinal value, the most important plants used were *Curcuma longa* L., *Piper nigrum* L., *Piper longum* L. and *Mimosa pudica* L., etc. These 14 medicinal plant species are comprised of trees (five), shrubs (three), herbs (three), vines (two) and grass (one). Among the plant parts used, the leaves were the most primarily used plant part, followed by root and rhizome. The plants were either used alone or in combination with other species. The administration of these herbal medicines was mostly done orally in the form of a juice/decoction. In some cases, the juice was also used to rinse the mouth. These medicinal plants were mostly collected from nearby forests, local markets and kitchen gardens. The present paper aims for the documentation of the ever-diminishing information on the wisdom and knowledge of the Garo THPs on use of various herbs in the traditional oral healthcare system and the detailed description of the preparation and treatment procedure that were practiced by the Garo THPs in the West Garo Hills of Meghalaya.

Keywords: Dental care, Ethnomedicine, Garo tribe, Oral disease, Traditional medicine

IPC Code: Int. Cl.²²: A61K 36/00, A61K 36/185, A61K 9/00

Dental diseases are among the major health problems at a global level. The oral cavity is occupied by many microbes and many intrinsic and extrinsic elements that affect the composition, pathogenicity and metabolic activity. Oral diseases have been linked to heart disease, atherosclerosis and stroke. Ayurveda and the traditional system of Indian medicine advocate the use of plants and herbs for treating a wide spectrum of oral diseases. In ancient times, oral hygiene was maintained by using datun, such as *Azadirachta indica*, *Madhuca indica* and *Morus alba*, etc. and tooth powders and various other traditional methods as natural toothbrushes. The THPs (Traditional Health Practitioners) would suggest using different twigs as 'datuns' for different patients according to their oral problems. The advantage of using 'datuns' (Hindi) was that the juices released by

chewing it comprised of beneficial substances for other parts of the body as well. The field of dentistry has also begun to exploit herbal properties to relieve tooth pain, gum inflammation, and canker sores¹. Herbal extracts have been successfully used in dentistry as tooth cleansing and antimicrobial plaque agents. Antiseptics, antibacterial, antimicrobial, antifungal, antioxidant, antiviral, and analgesic agents derived from plants are of widespread interest in dentistry². The natives of India have rich knowledge about herbs and their uses for oral care like the use of oil extracted from mustard (*Brassica campestris* L.) seeds against gum infection; keeping burnt clove (*Syzygium aromaticum* L. in.) stops toothache, Asafoetida also relieves toothache, etc. In a recent study conducted in Pakistan, 55 plant species belonging to 34 families were reported to cure dental diseases³. The traditional herbal treatment has an edge over conventional antibiotic treatment that

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bears the limitation of low benefit to high risk as compared to herbal treatment that possesses high benefit to low-risk ratio. These days majority of the people are not impressed by products that contain dyes and artificial preservatives, and with increasing discoveries of side effects of fluoride and other components of synthetic dentifrices as well as allopathic medicines used to treat oral diseases, the world's focus is slowly and surely shifting to herbal medicine dentifrices and remedies.

Methodology

The study was carried out in the West Garo Hills district of Meghalaya during 2016-2019. West Garo Hills is divided into six rural developmental blocks namely, Dadenggri, Rongram, Dalu, Gambegre, Selsella and Tikrikilla. West Garo Hills lies between 26° and 25°20' North latitudes and 90°30' and 89°40' East longitudes and covers an area of 3,677 sq. km. The overall climatic condition is tropical and sub-tropical. The average rainfall is 3300 mm. The vegetation of West Garo Hills can be broadly classified into the flora of tropical and sub-tropical zones based on altitudes. The tropical vegetation covers are up to an elevation of about 1000 m. It embraces evergreen, semi-evergreen and deciduous forest, bamboo thickets and grassland.

Initially, several rapport-building visits were conducted in the study area to build a close relationship with the informants, i.e., the THPs, locally known as the 'Ojas' in their natural surroundings. During those visits, discussions with local THPs/Ojas, village elders, extension workers and other key informants were carried out for introducing the research activity and its purpose as well as recording information about medicinal plants being widely used by the THPs from different villages within the six blocks of West Garo Hills district. Besides surveying tribal courtyards, protected habitats near tribal dwellings and weekly markets also gave valuable insight about the types of herbal plants used by the Garos.

Selection of THP/Oja was made using snowball sampling technique wherein a chain-referral sampling technique was employed. Identification of medicinal plants being used by the Garo THP/Oja was accomplished by free listing and personal interviews of 50 THPs/Ojas. The data were collected through open-ended questionnaires and personal interviews and discussions with the THP/Ojas in their local language. The questionnaire allowed descriptive

responses on the plant prescribed, such as vernacular names, scientific names, plant parts used, mode of usage, habitat, route of administration, etc. At the beginning of every interview, a consent form was provided to every THP and the contents of the form were explained to them. Details like whether the researcher has explained the objectives of the study, if the participant was given an opportunity to ask questions, if they voluntarily agree to participate in the research study and if the information provided can be used for academic purposes, etc., were included in the consent form.

Identification of collected medicinal plants was done by comparing with the herbarium of Botanical Survey of India, Shillong for proper validation and authentication of the collected specimens, etc. The format of scientific names was written as per World Flora Online (www.worldfloraonline.org) and The Plant List (www.theplantlist.org). Diagnosis and treatment were based on a holistic view of the patient and the patient's symptoms, expressed in their own terms. Medicinal plants were processed in different ways and forms that included the whole herb, tea, syrup, ointments, rubs and tablets that contained a ground or powdered form of the medicinal plant or its dried extract. The medicinal plant materials were extracted by making a paste of the raw plant parts, powdered, long-term boiling, decoctions and hot or cold infusion of plants. There was no fixed standard for the amount of herbal extract or dosage of the quantity of herbal medicines and so it varied significantly between the THPs. There was a belief among the THPs/Ojas that herbs were inherently safe without side effects and that efficacy could be obtained over a wide range of doses. Different parts of the plants that were used for the preparation of herbal medicines were leaves, flowers, fruits, seeds, stems, barks, roots, rhizomes, tubers, bulbs, whole plant and corn/berries. In some cases, the THPs/Ojas used either single plant or a mixture of different plants and plant parts for the preparation of the herbal medicine. Some THPs recommended abstaining from certain food types for a better and speedy recovery. Since each THPs had a distinct method of oral health care practice, therefore, the information gathered was tabulated and presented separately against each THP.

Results and Discussion

In the present study, five different traditional methods of treatment of oral diseases shared by five THPs have been documented (Table 1).

Table 1 — Medicinal plants used by Garo THPs for treatment of oral ailments

Sl no.	Botanical name	Accession No. BSI, Shillong	Common name	Vernacular name	Family	Habit	Habitat	Parts used	Name and address of THP
1.	<i>Piper nigrum</i> L.	11713	Black pepper	Gulmoris	Piperaceae	Vine	Hot and humid hill slopes and semi-shaded area	Peppercorns	Theresa Marak, Lower Sangsangre
2.	<i>Piper longum</i> L.	10961	Long	Pipli	Piperaceae	Vine	Hot and humid hill slopes and semi-shaded area	Pipli corns	
3.	<i>Alstonia scholaris</i> L.	15076	Devil's tree	Sokchon	Apocynaceae	Tree	Roadside, home gardens	Flower	
4.	<i>Curcuma longa</i> L.	90569	Turmeric	Haldi	Zingiberaceae	Herb	Degraded forests and plantations	Rhizome	
5.	<i>Curcuma longa</i> L.	90569	Turmeric	Haldi	Zingiberaceae	Herb	Degraded forests and plantations	Rhizome	Jengsin Shira, Sangsangre
6.	<i>Psidium guajava</i> L.	42296	Guava	Khomperam	Myrtaceae	Tree	Roadside, partial sunlight area	Leaf	
7.	<i>Cocos nucifera</i> L.	87921	Coconut	Narikel	Arecaceae	Tree/Palm	Roadside, home gardens	Root	
8.	<i>Piper longum</i> L.	10961	Long	Pipli	Piperaceae	Vine	Hot and humid hill slopes and semi-shaded area	Pipli corns	
9.	<i>Piper nigrum</i> L.	11713	Black pepper	Gulmoris	Piperaceae	Vine	Hot and humid hill slopes and semi-shaded area	Peppercorns	
10.	<i>Phleum pratense</i> L.	16671	Timothy's grass	Gurasamsi	Poaceae	Grass	Grasslands, steppe, forest margins	Stem	Henathson Sangma, Lower Darengre
11.	<i>Vitex negundo</i> Linn.	16809	Five leaved chaste tree	Nirgandu	Verbanaceae	Shrub	Bodies of water, grassland	Bark	
12.	<i>Curcuma longa</i> L.	90569	Turmeric	Haldi	Zingiberaceae	Herb	Degraded forests and plantations	Rhizome	
13.	<i>Mimosa pudica</i> L.	10113	Touch me not	Samichip	Fabaceae	Herb	Croplands, meadows, pastures	Root	
14.	<i>Mimosa pudica</i> L.	10113	Touch me not	Samichip	Fabaceae	Herb	Croplands, meadows, pastures	Root	Kenneth A Sangma, Wadanang.
15.	<i>Clerodendrum infortunatum</i> L.	15050	Clerodendrum	Sammaki/Do.dimdim	Lamiaceae	Shrub	Degraded forest area, roadside, waste land, fields, hill slopes	Root	
16.	<i>Spilanthes acmella</i> L.	85362	Toothache plant	Wagamsam	Asteraceae	Herb	Moist localities, lakeside, marshes, weedy areas	Flower	
17.	<i>Azadirachta indica</i> A. Juss	30123	Neem	Neem	Meliaceae	Tree	Roadside, drought prone areas	Leaves	Ledit Marak, Babadam
18.	<i>Ocimum sanctum</i> L.	41471	Tulsi	Tulsi	Lamiaceae	Sub-shrub	Moist soil all over the globe	Leaves	
19.	<i>Murraya koenigii</i> (L.) Spreng	30231	Curry tree	Norsing/samkatchi	Rutaceae	Tree	Sunny areas, roadside, railway lines	Leaves	

Mrs. Theresa Marak of Lower Sangsangre village, an admired THP of Tura, practices a distinct method for treating toothache. She uses four plants viz., *Piper nigrum* L., *Piper longum* L., *Alstonia scholaris* L. and *Curcuma longa* L. Seven pepper and pipli corns are taken and ground together with four to five flowers of *A. scholaris* L. and five slices of *C. longa* L. using a mortar and pestle or a stone slab. The paste is then placed on the aching tooth for about 15 min. After which the mouth is rinsed out with warm water. This process is to be repeated twice a day after food intake. No food restrictions were suggested by her.

The treatment method practiced by Jengsin Shira of Sangsangre village, for the treatment of cavities used five medicinal plants viz., *Curcuma longa* L., *Psidium guajava* L., *Cocos nucifera* L., *Piper nigrum* L. and *Piper longum* L. Seven leaves of *P. guajava* L. and one small piece of the root of *C. nucifera* L., three slices of the rhizome of *C. longa* and five pieces of

pepper and pipli corns were all ground together in a mortar and pestle or stone slab. The paste is dissolved in half a glass of water and swished like a mouthwash for a few minutes and spit out. The process should be repeated thrice at a time for two times a day. For a full recovery chewing of betel nut should be avoided.

Mr. Henathson Sangma a prominent THP from Lower Darengre village used four plants for the treatment of cavities, viz., *Phleum pratense* L., *Vitex negundo* Linn., *Curcuma longa* L. and *Mimosa pudica* L. For this herbal concoction, a handful of *P. pratense* L., five cm of the bark of *V. negundo* Linn., two to three slices of the rhizome of *C. longa* L. and four to five roots of *M. pudica* L. are used. After thoroughly washing and removing all the dirt particles, the entire ingredients are ground in a mortar and pestle and made into a paste. The paste is then applied locally to the affected area and after half an hour, rinsed out with warm water. This process should

be done twice a day after food. No food restrictions were suggested in this treatment.

Mr. Kenneth A. Sangma, a popular health practitioner from Wadanang, used three plants viz., *Mimosa pudica* L., *Clerodendrum infortunatum* L. and *Spilanthes acmella* L. for treating cavities. Three pieces of the roots of *M. pudica* L. and *C. infortunatum* L. and seven flowers of *S. acmella* L. are collected and washed thoroughly and ground together in a mortar and pestle. A decoction is made by mixing the paste in a glass of hot water and a pinch of salt. This decoction is used to rinse the mouth three times a day.

Mr. Ledit Marak, a popular THP from Babadam village used three plants for his treatment viz., *Azadirachta indica* A. Juss., *Ocimum sanctum* Linn. and *Murraya koenigii* (L.) Spreng for treating cavities. Seven leaves from all the above-mentioned plants are made into a paste using a mortar and pestle. The paste is smeared on the affected area and kept for half an hour and then rinsed with warm water with a pinch of salt. The entire process is to be repeated two to three times depending on the severity of the illness.

The popularity of medicinal plants for oral health care have been reported by several ethnobotanists⁴⁻⁸. In the present study, it was found that 14 plants from 12 families were used for oral health care by the Garo THPs. *Curcuma longa* L. was the only plant that was used by 60% of the THP under the study, closely followed by plants like *Piper nigrum* L., *Piper longum* L. and *Mimosa pudica* Linn. Similarly, scientists around the world advocated the same plant species for the treatment of dental ailments. *S. acmella* L. was reportedly used as an anti-toothache and for oral care⁹. The use of *T. procumbens* L. against oral problems was also reported because of its anti-bacterial properties¹⁰. Due to its anti-inflammatory and anti-bacterial activities, *C. nucifera* L. had anti-bacterial and anti-inflammatory properties and hence it may be useful for toothaches and cavities¹¹. Decoction of the root of *Mimosa pudica* Linn. was used with water to gargle to reduce toothache among the local people of the Kali Gandaki and Bagmati watersheds of Nepal¹². *P. nigrum* L. and *P. longum* L. have anti-microbial, anti-bacterial and anti-inflammatory properties and were used for treatment of toothache and cavities¹³.

Although neem has been reported for its antimicrobial properties by several researchers¹⁴⁻¹⁶, it was not used by the Garo THPs. The use of the

medicinal plant species showed that the herbal medicines were obtained from trees (five), shrubs (three), herbs (three), followed by vines (two) and grass (one). According to the tabulated data, the leaf was the most commonly used plant part for preparation of the herbal medicine. All these medicinal plants were used orally in the form of juice or decoction and the pastes were applied locally in the affected area.

Conclusion

Out of the 14 plants having medicinal value, the most important plants used were *Curcuma longa*, *Piper nigrum* L., *Piper longum* L., *Mimosa pudica* Linn., etc. These 14 medicinal plant species comprised of trees (five), shrubs (three), herbs (three), vines (two) and grass (one). The plants were either used alone or mixed with other plant parts. The administration of these herbal medicines was mostly done orally in the form of a juice/decoction. In some cases, the juice was also used to rinse the mouth. Most of these plants were indigenous and grew in the wild and few were cultivated in the THP's homestead garden. These medicinal plants were mostly collected from nearby forests, local markets and kitchen gardens.

Acknowledgement

The authors are grateful to all the THPs/*Ojas* of the Garo community for sharing their valuable knowledge and cooperation. The authors are also thankful to the officials of the Department of Forest, Garo Hills Autonomous District Council, Tura; the Department of Forest and Environment (GOM), Tura and the Botanical Survey of India, Shillong for assisting in proper identification of plants.

Conflict of Interest

Authors have no conflict of interest.

Authors' Contributions

ADM: Conducted field survey, collected and compiled data and prepared draft manuscript; BM: Conceptualized and supervised the research work, analysed, prepared, edited and finalized the manuscript.

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