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# Ethnomedicinal Plants used for Oral Health Care in Shekhawati Region of Rajasthan, India

# **Research Article**

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#### Abstract

Oral hygiene is essential to general health and quality of life. Medicinal plants are widely used by traditional practitioners in the maintenance of oral hygiene. The primary objective of this study is to present a database on indigenous knowledge on medicinal plants used for oral care among the local traditional healers of Shekhawati region of Rajasthan. A survey was carried out during the period 2019-20 and information regarding the different types of plants used in oral care, mode of administration was collected through interactions with rural and traditional healers of the region. The study enumerated 27 plant species belonging to 24 genera and 19 families. The various plant parts were twigs, roots, leaves, seeds, latex and sometimes whole plants used in oral healthcare. In spite of the modernization process, the rural folk and the tribal of this region still hold on their traditional faith and depend on indigenous plants for their various ailments but young generation are reluctant for this wealth of knowledge. Therefore, it is necessary to preserve this indigenous knowledge by proper documentation and to record information for future investigation and potential development of new drugs. The study emphasizes the need for the clinical evaluation of these plant species for their therapeutic use.

Keywords: Dental caries; Oral disease; Peridontal; Pyorrhoea; Shekhawati

# Introduction

Oral hygiene is vital to an individual's overall health and wellbeing.Oral diseases are one of the major public health problems around the world. The most prevalent and consequential oral diseases globally are dental caries, periodontal diseases, oral and pharyngeal cancers [1-2]. The Global Burden of Disease Study 2017 estimated that oral diseases affect nearly 3.5 billion people worldwide, with caries of permanent teeth being the most common condition[3] Scientific reports in the past decade signal an alarming increase in the global prevalence of dental caries in children and adults, primary and permanent teeth, as well as coronal and root surfaces. Dental care and hygiene of oral cavity is an integral part of health and when it is neglected, it results in different types of oral problems [4]. Oral disorders significantly affected person by causing pain and discomfort and thereby affecting quality of life. Dental calamites are threats to the oral health and it influences individuals, society and increases personal expense of their treatment. Dental diseases are mainly caused by bacterial infections, food habits and ignorance in life style [5].

In India, medicinal plants are used from thousands of years as traditional medicine to maintain oral health and hygiene. The use of *Azadirachta indica, Acacia nilotica*, Salvadora persica in dental health care has been reported by several workers [6-8]. Different parts of plants are used for periodontal diseases, cleaning teeth, preventing dental caries or mucosal diseases. Various studies have shown that rural folk in different parts of India use stem, leaves and fibers of some plants for dental care like toothache, tooth decay, pyorrhoea, foul smell and as tooth brush for cleaning teeth [9].

In Rajasthan, the folk and rural people depend on plant resources for their primary oral health care needs. The common traditional practice is the use of plant parts specially tender twigs or chewing

sticks of *Azadirachta indica* and *Acacia nilotica* instead of plasticbristle brushes to massage the gums and clean the teeth [10]. Though, several ethnomedicinal studies have been carried out in different parts of Rajasthan but the documentation of traditional medicine for the treatment of oral diseases has never been done in a systematic manner in Shekhawati region of Rajasthan. Therefore, the present study was planned to explore and document the diversity of therapeutic flora and the remedies used traditionally in treating oral ailments by the folk people of this area.

#### **Materials and Methods**

Rajasthan is well known for its biodiversity richness of diverse cultural mosaic. The state is located in the North western part of India (Figure 1). It can be segregated in several specific regions. Shekhawati is one such significant region, located in the north-east part of Rajasthan. It is a historical region and covers Aravalli hilly region, semi-arid transitional plains and desert area. The Shekhawati region consists of mainly two districts Sikar (7,742 km) and Jhunjhunu (5,928 km), which are situated between 27°21' to 28°12' north latitude and 74°44' to 75°25' east longitudes respectively. Leaving a few hilly spot like Lohargal, Harsh←nath, Khetri, Babai, Manasa Mata and Shakambhari, the region is largely semi-arid or arid. The climate of this area is harsh and extreme. Scorching hot summers to chilling colds is the specialty of this region. Temperature reaches at 48-500 C during the summer season and the mercury falls up to 40 C during the winter. Annual rainfall is 23 inches falling largely in the months of July-October. Apart from monsoon season, relative humidity is terribly low and categorizing the climate as hot dry. Dust storms and sandstorms are very common in this area.

An ethnomedicinal survey was conducted in Shekhawati region of Rajasthan during 2019-20 to document the utilization of indigenous plants in oral health and treating tooth and gum disorders. The Sikar and Jhunjhunu districts are inhabited by different tribes Gurjar, Meena, Rebari, Nat, Sansi, Banwariya, Kalbeliya etc. The interviews were conducted with tribal people, Ayurvedic vaidyas and knowledgeable individuals, ranging in age between 25 and 70 years old. The healers were chosen randomly among those living in the different villages of Shekhawati region. Tribal and folk people were asked for various traditional uses of plant in dental care (Figure 2). The conversations were performed in the local "marwari" language and the information was directly translated and written in English. A questionnaire was prepared before the survey of the study area (Table 2). While collecting data special care was taken to select remote areas, which were inaccessible to medical institute and where use of such traditional plant as medicine has been continuing till date. The information recorded during the survey included the names and ages of the informants, local names of utilized plants, plant parts used, mode of administration and ailments treated. The gathered data was verified by repeated queries with different local herbalists, more specifically, the vaidyas and hakims. The collected data are arranged alphabetically of their scientific names followed by local name, family, parts used, medicinal use and mode of preparation and administration. The plants used in oral healthcare are enumerated in Table 1. Photographs of some plants reported from the study area are shown in Figure 5 (A-I).

#### **Results and Discussion**

Nature has gifted Shekhawati region of Rajasthan with rich diversity of medicinal plants. The traditional healers of this region are having a commendable knowledge of the medicinal value of plants those grow around them [11]. The present investigation comprises 27 plant species belonging to 24 genera and 19 families which are traditionally used for oral health and hygiene by local inhabitants of this area. For each species scientific name, family, local name, part used, method of preparation, administration and ailment treatment has been provided. Fabaceae and Moraceae were the most commonly used family for oral health care. The most commonly utilized part of the plant was leaves (30%) and shoot (27%) followed by roots(16%), fruits (11%), bark(5%), latex (3%), seed (3%) and whole plant(3%) are used in the form of paste, juice, latex, powder and smoke (Figure 3).

The present study reveals that the rural tribal people are well versed with the nature and natural resources around them. These people in order to get rid of various oral problems like dental caries, tooth decay and pyorrhea depend on plant products. It was observed during the survey, that the people still prefer chewing sticks of various plants in maintaining oral hygiene. Generally, the fresh tender sticks locally known as datun are widely used for brushing the teeth. In villages across Shekhawati region it was a common site to see people chewing a stick of Azadirachta indica or Neem datum (Figure 4), which turns into a brush like stick that works as natural floss. Generally, thin and flexible twigs are used. One end of these sticks is chewed until the twig shreds into bristles which was then used to clean the teeth and massage the gums. Chewing sticks of Acacia nilotica (babool) are used to prevent gingivitis. Roots and tender twigs of Salvadora oleoides and S. persica are also used as chewing sticks. S. persica is commonly known as Miswak tree and have been used for centuries to improve dental health and to promote oral hygiene. Its importance has been mentioned in the Holy Quran. The World Health Organization has also recommended and encouraged the use of miswak as an effective



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Figure 2: An interview with folk people.



Figure 4: A tribal women brushing teeth with Neem stick.

tool for oral hygiene [12].Young stem of *Jatropha gossypifolia* is used as toothbrush to heal bleeding gums and gum boils. Leaves of *Abrus pecatorius*, *Cordia myxa*, *Mangifera indica* and *Psidium guajava* are chewed and decoction is applied in treating oral ailments. Roots, bark, fruits and seeds are the other parts of plants being exploited for oral health care. *Achyranthes aspera*, *Barleria prionitis*, *Tephrosia prurpurea* are the other important plants used by the local people for cleaning the teeth. The inhalation of smoke of fruits of *Solanum indicum* and *Solanum surattense* kills the germs.

The use of medicinal plants has a long history in dental practice,



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S.N	Botanical Name	Local name	Family	Part used	Ethnomedicinal uses for oral care
1	Abrus precatorius L.	Chirmi, Ratti	Fabaceae	Leaf	A paste of leaves is applied to strengthening the gum and teeth.
2	Acacia nilotica (L.) Willd.	Desi kikar	Fabaceae	Shoot, Bark	Twigs are used as toothbrush to remove plaque and prevent cavity formation. Bark is used for gum diseases.
3	Achyranthes aspera L.	Modokato Apamarg	Amaranthaceae	Root, Whole Plant	Roots are used as toothbrush to relieve pain and clean the teeth. Whole plant ash is used as tooth powder in pyorrhoea and toothache.
4	Azadirachta indica A.Juss.	Neem	Meliaceae	Shoot, Bark	Tender twigs are used as a toothbrush. Bark powder is used to massage gums.
5	Balanites aegyptiaca Del.	Hingot	Zygophyllaceae	Shoot	Branches are used as tooth brush.
6	Barleria prionitis L.	PiyabansaBajradanti	Acanthaceae	Root, Leaf	Roots and leaves are chewed to relieve from tooth decay.
7	Carica papaya L.	Papita	Caricaceae	Leaf	Leaf pulp is used to cure toothache and mouth ulcer.
8	Citrullus colocynthis (L.) Schrad.	Tumba	Cucurbitaceae	Root	Root paste is applied on infected teeth.
9	Cordia myxa L.	Gundi	Ehretiaceae	Leaf, Fruit	Leaves and fruits are useful in oral ulcers.
10	Cyperus rotundus L.	Moth	Cyperaceae	Tuber	Tubers are used in gum diseases.
11	Emblica officinalis Gaertn.	Anwla	Euphorbiaceae	Fruit	Fruits are used to treat bleeding gums and oral ulcers
12	Ficus benghalensis L.	Bargad	Moraceae	Root, Latex	Roots are used as toothbrush. Fresh latex is applied to treat the bleeding and swelling of gums.
13	Ficus religiosa L.	Peepal	Moraceae	Shoot	Tender leaf twigs are chewed to cure toothache.
14	Jatropha gossypifolia L.	Ratanjoti	Euphorbiaceae	Shoot	The tender twigs are chewed as mouth cleanser.
15	Lawsoniainermis L.	Mehndi	Lythraceae	Leaf	Fresh leaves are ground and gargled to treat mouth ulcers.
16	Mangifera indica L.	Aam	Anacardiaceae	Shoot, Leaf	Twigs are used as toothbrush. Crushed young leaves alleviate toothache
17	Moringa oleifera Lamk.	Sejna	Moringaceae	Leaf, Seed	Dried leaves and seeds are used to treat tooth infection or canker sore.
18	Morus albaL.	Sahtoot	Moraceae	Leaf	Leaves are chewed to get relief from toothache.
19	Ocimum sanctum L.	Tulsi	Lamiaceae	Leaf	Leaves are chewed to induce saliva secretion keeps mouth fresh. Also cure ulcers and infections of mouth.
20	Psidium guajava L.	Amrood	Myrtaceae	Leaf	Tender leaves are chewed to get relief from the mouth blisters.
21	Salvadora oleoides Decne.	Jal, Pilu	Salvadoraceae	Root, Shoot	Roots and tender shoots are used for cleaning tooth
22	Salvadora persica L.	Jal, Meswak	Salvadoraceae	Root, Shoot	Roots and tender shoots are used as tooth brushes for oral hygiene and to treat gum inflammation
23	Solanum indicum L.	Tindra	Solanaceae	Fruit	Fruits are burnt on fire and the teeth are exposed to the smoke once a day to get relief from toothache.
24	Solanum surattense Burm. f.	Pasargteli, Kantkari	Solanaceae	Fruit	Smoke of dried fruit powder is kept inside mouth to relieve dental caries.
25	Syzygiumcumini (L.) Skeels	Jamun	Myrtaceae	Shoot	Teeth are brushed with tender twigs once a daily to cure dental caries.
26	<i>Tephrosia purpurea</i> (L.) Pers.	Bansa	Fabaceae	Shoot	Tender shoots are used as tooth brushes
27	Zizyphus mauritiana Lamk.	Jhari	Rhamnaceae	Leaf	Leaf decoction is gargled once a daily to cure oral wounds

Table 1: Ethnomedicinal plants used as remedy for oral health problems in Shekhawati region of Rajasthan

Table 2: Questionnaire used for survey of medicinal plants used in oral health care.

and they have long been used worldwide [13-14]. The studies conducted in different parts of India and Rajasthan also support the findings of the present work [10,15-18]. Some of the medicinal plants reported during the present study were reported for biological activities and bioactive constituents responsible for their therapeutic properties [19-20] which justify and validate the usages of these species for medicinal purposes in the study area.

#### Conclusion

Oral health and general health are closely related and should be considered holistically. Information gathered from the Shekhawati, Rajasthan indicates that rural and tribal people of this area possess good knowledge of herbal plants and still rely on traditional indigenous medicines to treat dental caries and oral health problems. Due to lack of interest among the younger generation there is a possibility of losing this wealth of knowledge in the near future. Plant-based traditional knowledge has become a recognized tool in search for new sources of drug. The main advantages of using herbal medicine are easy availability, cost-effectiveness, increased time period and low toxicity. The information generated from the present

study needs to be evaluated for proper biochemical analysis, level of toxicity, phytochemical investigation, extraction and isolation along with few clinical trials for their therapeutic use. Hence the study emphasizes that these herbal medicines can offer a platform for further research in dentistry.

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