

Ethnomedicinal Herbs Used in Oral Health and Hygiene in Coastal Dakshina Kannada

Maji Jose¹, Bhagya B², Manjula Shantaram³

ABSTRACT

Objectives: The present study was conducted to document the ethnomedicinal practices followed for oral health and diseases by people of Dakshina Kannada (DK) district, and to suggest that the traditional knowledge should be integrated with modern dental care practices to formulate their sustainable utilization.

Methods: An ethnomedicinal survey was conducted using specific questionnaire subsequent to personal interview to collect information from traditional healers, local inhabitants, ayurvedic practitioners and botanists on the use of medicinal plants in oral care practices.

Results: This study identified 32 species belonging to 29 genera and 20 families, commonly used by the people of DK region to maintain oral health and hygiene and as remedy for dental diseases.

Conclusion: Valuable ethnomedicinal practices are fast disappearing from rural population. New generation is ignorant of this traditional knowledge. So measures should be taken to document them and to increase the awareness among youngsters. This study will also be useful for the pharmacologists to isolate the active principles of these plants and incorporate it into the modern healthcare practices for easier and cheaper oral health treatments.

Keywords: Medicinal plants, Traditional knowledge, Oral hygiene, Oral diseases, Dakshina Kannada

¹Professor of Oral Pathology,
Yenepoya Dental College,
Yenepoya University,
Mangalore, Karnataka, India

²Lecturer of Genetics,
Department of Anatomy,
Yenepoya Medical College,
Yenepoya University,
Mangalore, Karnataka, India

³Associate Professor of Biochemistry,
Yenepoya Medical College,
Yenepoya University,
Mangalore, Karnataka, India

INTRODUCTION

Oral hygiene is an integral part of health of a person. Oral health when neglected, results in different types of oral ailments like dental caries and periodontal diseases. Oral disorders can significantly affect the general well-being of a person by causing considerable pain and discomfort, thus affecting their quality of life. Dental caries and periodontal diseases are the two common threats to oral health and are important public health problems because of their prevalence, their impact on individuals and society, and the expense of their treatment (1). Oral diseases are caused due to bacterial infections, food habits and life style.

The rich plant diversity of India is utilized by the native communities in various forms of medicine. Medicinal plants have been used for thousands of years in folk medicine for maintaining oral hygiene. Most of these herbs are alkaline with high antibacterial activity. Hence these herbs help to maintain acid-alkaline balance of the

saliva, decrease plaque/calculus formation and are less prone to periodontal diseases. It is also observed that the microorganisms found in inflamed gums are resistant to antibiotics but not to antibacterial plant extracts like neem. And unlike antibiotics, antibacterial plant extracts produced no allergy in the gingiva. One of the common traditional practices followed is use of herbal 'chewing sticks' instead of plastic-bristle brushes to maintain oral health and hygiene. The best known examples of traditional chewing sticks used are neem and meswak (2), the end of which is shredded and then used to massage the gums and clean the teeth. Various studies have shown that rural folk in different parts of Karnataka use stem, leaves and fibers of some plants for cleaning teeth, preventing and treating dental caries, gingival and periodontal diseases and other oral mucosal diseases.

Dakshina Kannada district of Karnataka, with a 60 km long coastline (12° 57' N, 70° 49' E - 14° 52' N, 74° 72' E) has a total land area of 4770 sq. km. It receives good

Contact Author

Dr. Manjula Shantaram
manjula59@gmail.com

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rainfall between June and September and has total area of 1,28,476 hectares forest which is an excellent treasure of medicinal plants (3). The rapidly vanishing awareness about traditional methods used for routine oral hygiene practices and herbal remedies for various dental diseases demand an urgent need to document this invaluable indigenous knowledge. The purpose of the study was to explore and document indigenous uses of medicinal plants in various oral hygiene practices and local remedies used traditionally in treating oral diseases by the people of Dakshina Kannada district.

MATERIALS AND METHODS

An ethnomedicinal survey was conducted between 2008 – 2009 to collect information on the medicinal plants which has been used traditionally for oral health and hygiene. About 70 local people, 4 traditional healers, 5 folk practitioners, 4 botanists and 20 elderly people were interviewed for the purpose of documentation of various medicinal plants used in oral health and against tooth and gum disorders. The ethnomedicinal investigation was done systematically using a specific questionnaire (Table 1). Interview was carried out in local language. One questionnaire was used for recording single use of a single species by a single respondent. In addition to general details on the plant parts used, the purpose for which it is used such as routine teeth cleaning, tooth decay, gum diseases, oral mucosal diseases such as stomatitis or oral aphthous ulcers were noted down. The preparations of herbal formulations, their mode of administration were also recorded. The plants documented are arranged alphabetically of their scientific names along with family followed by local name, parts used, medicinal use and mode of preparation and administration (Table 2).

RESULTS

Present study includes information on 32 species belonging to 29 genera and 20 families, traditionally being used for oral health and hygiene by local inhabitants of Dakshina Kannada (Figs. 1-6) Out of the 32 species 11 species were used for routine

oral hygiene practices (Table 3). Tender twigs of 6 species were used as 'chewing sticks'. One end of the chewing stick is chewed and shredded, which was then used to clean the teeth and massage the gums. Leaves of 3 species of plants were used for cleaning the teeth. The leaves were rolled and one end of the roll was chewed to make it soft and fibrous and used for cleaning. Alternatively whole leaves were chewed to make an infusion of the leaf extract with saliva. This mixture along with fibrous leaf material was rubbed against teeth and gum using finger for cleansing. Some locals mentioned the use of fibrous pericarp of coconut and arecanut for cleaning teeth.

Twenty five plants were mentioned by the local inhabitants as being used in treating various oral diseases. Ten species were used for tooth decay, 5 in treating gum disease and 10 for stomatitis or oral ulcers. The various parts of plants used, other ingredients used in the preparation and mode of administration are discussed in Table 2. Leaves of *Abrus precatorius*, *Acacia arabica*, *Basella alba*, *Bridelia scandens*, *Cassia alata*, *Cassia tora*, *Erythrina indica*, *Jatropha*

curcus, *Lawsonia alba*, *Mangifera indica*, *Piper beetle*, and *Psidium gujava* are chewed, extract applied or decoction used in treating oral ailments. Seeds of *Acacia catechu* and *Areca catechu* are eaten along with beetle leaves, cardamom, clove etc which has a synergistic effect in reducing bacterial load in oral cavity. Extracts or powders of fruits of *Ficus bengalensis*, *Momordica charantia* and *Terminalia chebula* are used in treating toothache and aphthous ulcers. Latex of *Calotropis gigantea* and *Jatropha gossypifolia* is applied into the aching tooth to relieve pain. Decoction of the bark of *Acacia arabica*, *Tamarindus indica*, and *Tectona grandis* is used in curing aphthous ulcer. Chewing of the flower buds of *Spilanthes paniculata*, *Myrtus caryophyllus* and decoction of *Cassia alata* flowers helps to relieve pain caused by tooth ache. Juice of young branches of *Indigofera tinctoria* and young stem of *Jatropha curcus* is used as tooth brush which heals bleeding gums and gum boils. Fresh juice of the roots of *Moringa oleifera* is used in treating dental caries.

In addition other traditional practices such as using charcoal, burnt rice bran mixed with salt, soot formed on the vessels or chimneys by burning wood are routinely

Table 1: Questionnaire used for Ethnomedicinal survey of herbs used in oral health and diseases

Name of the taluk –					
Date of survey –					
Name and address of respondent –					
Ethnic group –					
Vernacular name –					
Plant part used –					
Plant part	Routine cleaning of teeth	Tooth decay	Gum diseases	Stomatitis	Oral ulcers
Root					
Stem					
Leaf					
Flower					
Fruit					
Seed					
Other parts					
Preparation used – Poultice/ decoction/ Paste					
Method of preparation –					
Mode of administration –					
Any other comment –					

Table 2: Herbs used as remedy for various oral health problems

Taxon	Family	Local name	Part used	Medicinal use	Mode of use
<i>Abrus precatorius</i> L	Papilionaceae	Gulagangi	leaves	Aphthous stomatitis	Juice of the tender leaves is swallowed by chewing them
<i>Acacia arabica</i> Willd	Mimosaceae	Karijali	Tender leaves	Spongy gums, Sore-throat, Aphthous stomatitis, cancerous lesions	Decoction of the tender leaves is used as gargle Decoction is used as a gargle and mouth wash Burnt bark along with other components is used as tooth powder
			Bark		
<i>Acacia catechu</i> Willd	Mimosaceae	Khadira	Bark	Tooth ache	A piece of bark is placed in the cavity of aching tooth
<i>Areca catechu</i> L	Palmae	Adike	Seed	Prevents tooth decay	Chewed along with lime, betel leaf and tobacco.
<i>Basella alba</i> L	Basellaceae	Basale soppu	leaves	Aphthous ulcer	Tender leaves are washed and chewed. The extract of the leaf is retained in the mouth for some time.
<i>Bridelia scandens</i> (Roxb.) Willd	Euphorbiaceae	Gurige	leaves	Tooth decay and pain	Leaves are boiled in water with a pinch of salt and the steam is inhaled into mouth
<i>Calotropis gigantea</i> (L.) R. Br.	Asclepiadaceae	Yekkada gida	Latex	Aphthous stomatitis Tooth ache	Latex is mixed with honey and applied Latex is inserted into the carious tooth
<i>Carica papaya</i> L	Caricaceae	Parangi hannu	Juice/pulp	Ulcers and fissures of the tongue	Juice/ pulp should be applied on affected area
<i>Cassia alata</i> L	Caesalpiniaceae	Aane thagathe	Leaves and flowers	Stomatitis	Decoction of leaves and flowers is used as mouth wash
<i>Cassia tora</i> L	Caesalpiniaceae	Tagathe	Leaves	Teething problems in children	Decoction of leaves is used as gargle
<i>Erythrina variegata</i> L. var.	Papilionaceae	Hongaarae	Leaves	Tooth ache	Leaf extract is applied into aching tooth.
<i>Ficus bengalensis</i> L	Moraceae	Aalada mara	Latex Slender twigs	Tooth ache Strengthens gums and teeth	Latex to be applied on teeth and gums. Slender twigs used as tooth brush
<i>Indigofera tinctoria</i> L	Papilionaceae	Neeli	Young branches	Aphthous ulcers	Extract of young branches mixed with honey and applied
<i>Jatropha curcas</i> L	Euphorbiaceae	Dodda-haralu	Fresh stem	To strengthen gums, cure bleeding gums, boils	Fresh stem is used as tooth brush Decoction of leaves used as gargle
			Leaves		
<i>Jatropha gossypifolia</i> L	Euphorbiaceae	Bettada-haralu	Latex	Tooth ache	Latex applied into the cavity of aching tooth
<i>Lawsonia inermis</i> L	Lythraceae	Madarangi	Leaves	Ulcers of mouth	Decoction of leaves is used as gargle
<i>Mangifera indica</i> L	Anacardiaceae	Mavinamara	Leaves	Sensitivity of teeth	Tender leaves are chewed
<i>Momordica charantia</i> L	Cucurbitaceae	Hagala kayi	Fruit	Aphthae	Extract of fruit pulp is used on aphthae
<i>Moringa oleifera</i> Lam	Moringaceae	Nugge	Root bark	Dental caries	Fresh juice of the root bark is applied to the cavity of tooth
<i>Piper betle</i> L	Piperaceae	Vilayadelay	Leaves	Bad breath	Leaves are chewed along with other ingredients which are used for betel quid
<i>Psidium guajava</i> L	Myrtaceae	Perale	Leaves	Swollen gums and mouth ulcers	Decoction of leaves are applied locally
<i>Spilanthes paniculata</i> Wall. ex DC.	Asteraceae	Vana mugali	Flower heads	Tooth ache	Flower heads are chewed
<i>Syzygium aromaticum</i> (L.) Merr. & Perry	Myrtaceae	Lavanga	Flower buds	Bad breath, dry mouth, tooth ache	Flower bud should be chewed and then stuffed in to the cavity
<i>Tamarindus indica</i> L	Caesalpiniaceae	Hunase hannu	Fruit	Aphthous sores, sore throats	Gargle of tamarind water is used
<i>Tectona grandis</i> L. f.	Verbenaceae	Saaguvaani mara	Wood	Tooth ache	A piece of wood is bruised water and applied into aching tooth
<i>Terminalia chebula</i> Retz.	Combretaceae	Anilaykayi	Fruits	Aphthous ulcer	Thick paste is mixed with ghee and applied on ulcers



Fig. 1: *Jatropha curcus* L

used for regular cleaning of teeth. Local application of clove oil into the cavity of aching tooth to relieve pain, application of honey or ghee on to oral ulcers are also common practices.

DISCUSSION

The present study provides information on various traditional oral hygiene practices and herbs used for oral health and diseases. Ethnomedicinal knowledge has been built-up due to untiring efforts and personal experimentation of our ancestors. These time-tested remedies have to be documented and preserved for sustainable utilization(4).

The traditional healers are of the opinion that medicinal herbs are very effective in treating some of the oral diseases such as

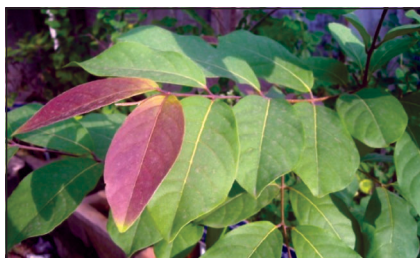


Fig. 2: *Terminalia chebula* Retz

aphthous ulcer, which do not have a specific treatment in modern medicine. Although dental caries and periodontal diseases require intervention by dental professionals for permanent cure, the information obtained in the survey disclosed that some of the herbal remedies are highly competent in relieving the associated pain and swelling.

Herbs such as *Melia azadirachta*, *Moringa pterygosperma* and *Balsamodendron mukul* are commonly being used in prevention of dental caries (5). Hebber et al (6) reported 35 plants belonging to 26 families used to treat different oral ailments like toothache, caries, periodontal diseases and aphthae by the people of Western Ghat region of Dharwad district of Karnataka. *Jatropha*



Fig. 3: *Indigofera tinctoria* L

species is widely used by Bhils of Rajasthan for routine oral hygiene practices and to treat dental caries (7). Oil of Cinnamon bark and clove bud has been reported to inhibit the growth of many oral bacteria(8).

Most of the participants of this survey were of the opinion that the traditional practices are fast disappearing and presently these are followed by only few elders in the community. The reason explained were limited availability of herbs, cumbersome procedure involved in collecting and preserving them in clean conditions and lack of interest among new generation. Moreover, people are influenced by modern amenities which are a threat to ethnobotanical knowledge. Use of high potential medicinal plants will provide easy and cheap health care facilities to tackle the increasing rate of oral diseases.

CONCLUSION

Oral diseases are one of the most important problems in public health and are on the rise in developing countries. Most of the oral diseases are caused due to bacterial infections. The antibacterial activity of



Fig. 4: *Jatropha gossypifolia* L



Fig. 5: *Spilanthes paniculata* Wall. ex DC



Fig. 6: *Bridelia scandens* (Roxb.) Willd

Table 3: Herbs used for routine cleaning of teeth

Taxon	Family	Local name	Part used
<i>Achyranthes aspera</i> L	Amaranthaceae	Uttaraneer	Root
<i>Anacardium occidentale</i> L	Anacardiaceae	Gaerumara	Twigs, Leaves
<i>Areca catechu</i> L	Palmae	Adike	Pericarp
<i>Azadirachta indica</i> A. Juss.	Meliaceae	Kahibeve	Twigs
<i>Citrus limonum</i> Risso	Rutaceae	Nimbehannu	Outer peel
<i>Cocos nucifera</i> L	Palmae	Thenginamara	Husk
<i>Ficus bengalensis</i> L	Urticaceae	Aladamara	Slender twigs
<i>Jatropha curcas</i> L	Euphorbiaceae	Kadaharalu	Twigs
<i>Jatropha gossypifolia</i> L	Euphorbiaceae	Bettadaharalu	Twigs
<i>Mangifera indica</i> L	Anacardiaceae	Mavina mara	Twigs & leaves
<i>Pongamia pinnata</i> L., Pierre	Papilionaceae	Hongemara	Leaves

medicinal plants are due to the presence of potential bioactive compounds which help to reduce bacterial load in the oral cavity and thus prevent formation of plaque, dental caries and ulcers. Use of indigenous plants in oral health and hygiene has a long history in different parts of the world. However, this knowledge is likely to vanish soon as many of these ethnophytotherapeutic remedies are followed only by a few in rural areas. New generation is ignorant of this traditional knowledge. Younger generation lack knowledge on the identification, collection, preservation and processing of the plant species for medicinal use. Therefore it is crucial to conserve these ethnocultural practices before they are lost definitively. Proper documentation of these ethnomedicinal practices helps to avoid biopiracy and also to conserve the rich traditional knowledge which was

widespread in the past. The present study also suggests for research and development of natural antibacterial compounds that are safe for the host or specific for oral pathogens. The active principles of these plants should be incorporated into modern healthcare practices for easier and cheaper oral health treatments. Thus, traditional knowledge should be integrated with modern dental care practices to formulate their sustainable utilization.

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