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Ethno medicinal plants used for oral health care in India

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ABSTRACT

Scientific investigation of medicinal plants is essential because of their contribution to healthcare. It is also necessary to document the information about the knowledge of traditional medicines before it is lost permanently. Various ethno botanical studies have been reported to expose the knowledge from the various tribal's of India. In such a way the aim of the present review is to document the ethno medicinal plants and practices followed for oral health and diseases and to suggest that the traditional knowledge should be integrated with modern dental care practices to formulate their sustainable utilization. The review indicated that, there are plenty of medicinal plants to treat a wide spectrum of oral ailments. This study concluded that even though the accessibility of Western medicine for simple and complicated diseases is available, many people still continue to depend on medicinal plants for dental infections.

Keywords: Dental, ethno medicine, India, medicinal plants.

1. Introduction

Oral hygiene is an integral part of general health of a person. Oral disease can significantly affect the general well-being of a person by causing considerable pain and discomfort, thus affecting quality of life. The World Health Organization (WHO), 1978 has estimated that 80% of the populations of developing countries rely on traditional medicines, mostly plant drugs, for their primary health care needs ^[1]. The use of traditional medicines and medicinal plants in most developing countries as therapeutic agents for the maintenance of good health has been widely observed ^[2]. In India 65 % of the population relies on ethno medicine which is the only source of their primary health care needs ^[3]. India is one of the twelve mega-biodiversity countries of the world having rich vegetation with a wide variety of plants with medicinal value. Over 550 tribal communities are covered under 227 ethnic groups residing in about 5000 villages of India in different forests and vegetation types ^[4]. In many countries, scientific investigations of medicinal plants have been initiated because of their contribution to healthcare. It is also necessary to collect the information about the knowledge of traditional medicines, preserved in tribal and rural communities of various parts of India before it is lost permanently. Recently various ethno botanical studies have been reported to expose the knowledge from the various tribal's of India. Documenting the indigenous knowledge through ethno botanical studies is important for the conservation of biological resources as well as their sustainable utilization. In such a way the aim of the present review is to document the ethno medicinal plants and practices followed for oral health and diseases and to suggest that the traditional knowledge should be integrated with modern dental care practices to formulate their sustainable utilization.

2. Methodology

The literature search was performed between July 2010 to May 2013 using literature databases, including online catalogues of relevant institutions and e-journal consortia. Databases were chosen according to their topic (e.g. ethnology, agro forestry, ethno botany and agriculture), geographical covering in English. Abstracts; extracted from the databases; were selected based on topic and geographical covering. Literature was downloaded as PDF-document from the Internet and obtained directly from authors. Literature comprising information without a clear source; be it primary data or other literature; was rejected. A search for additional literature; found in reference lists of collected publications (snowball principle) continued until May 2013.

3. Results and Discussion

In the present review 120 species of plants from 46 families have been recorded which are being potentially exploited by the Indian population for oral health care as shown in Table 1.

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Majority of these plant species are used as natural tooth brush. Certain trees are used for management of gum bleeding, tooth ache, sores in mouth and bad breath. Stem, Young Twigs, Leaves, Bark, Fruit, Spines, Seeds and latex are the parts of trees being exploited for oral health care. Plant-based traditional knowledge has become a recognized tool in search for new sources of drugs; it is clear that these herbal medicines can offer a platform for further research in dentistry. During the last few decades there has

been an increasing interest in the study of medicinal plants and their traditional use in different parts of the world. Present literature documentation reveals that medicinal plants continue to play a major role in oral healthcare needs of Indian population. Hence there is an urgent need to conserve the biodiversity as well as the traditional knowledge by proper documentation and for further research in dentistry.

Table 1: List of botanical names of Ethno Medicinal Plants and their use towards oral health care from various parts of India

S. No	Family name	Botanical name	Dental uses	Reference
1	Acanthaceae	<i>Achyranthes aspera</i> .	Stem used as toothbrush, ash of the plant is used as tooth powder; to relieve pyorrhea and toothache.	[5]
		<i>Barleria prionitis</i> . L.	Root, Leaves are chewed to relieve from tooth decay.	[6,7]
		<i>Justicia diffusa</i> L.	Leaves are boiled with gingelly oil applied for tooth ache.	[6,8]
2	Achariaceae	<i>Gynocardia odorata</i>	leaves are used for tooth decay	[9]
3	Agavaceae	<i>Agave americana</i> L.	whole plant -toothache	[10]
		<i>Agave sisalana</i> Peer. Ex.Eng	Leaf juice applied with honey on tongue.	[11]
4	Amaranthaceae	<i>Achyranthes aspera</i> L	Roots are used as a brush to relieve pain and clean the teeth.	[5, 12, 13]
		<i>Amaranthus viridis</i> L.	Toothache	[10]
5	Anacardiaceae	<i>Buchanania lanzan</i> Spreng.	Gum is used to cure tooth ache	[5]
		<i>Mangifera indica</i> L.	Toothbrush of small stem is used to cure toothache; latex is applied to relieve gingivitis.	[5, 7]
		<i>Rhus parviflora</i> Roxb.	Cleaning teeth.	[7]
6	Apiaceae	<i>Cuminum cyminum</i> L.	Seeds are chewed together with a little sugar in aphthous ulcers in mouth.	[15]
		<i>Ferula asafoetida</i> Linn.	Root extract is used as tooth ache.	[16]
7	Apocynaceae	<i>Plumeria obtuse</i> L.	Latex is used as a mouth wash, and used to cure mouth ulcer	[17]
		<i>Plumeria acutifolia</i> .	Latex used for Mouth ulcer	[18]
		<i>Tabernaemontana divaricate</i> (L)R.Br.	Latex applied to prevent cavity formation	[19]
		<i>Thevetia peruviana</i> (Pers)	Latex is put in cavities to cure tooth ache.	[7]
		<i>Wrightia tinctoria</i> (Roxb.) R. Br.	Leaf paste is applied on aching teeth to get relief from toothache.	[20]
8	Asclepidaceae	<i>Calotropis</i> L.	Paste of root is applied as tooth paste tooth brush to cure toothache Ash of root is used to remove pus from gums.	[5]
9	Asteraceae	<i>Achillea millefolium</i> Linn.	Leaves Chewed to relieve tooth ache , mouth freshener	[22]
		<i>Ageratum conyzoides</i> L.	Leaves used for Mouth ulcer	[11]
		<i>Caesulia axillaris</i> Roxb.	Roots are chewed to cure mouth ulcers.	[7]
		<i>Centipeda minima</i> (L)A,Br.f.	Plant paste used for tooth decay	[7]
		<i>Dicoma tomentosa</i>	Root and branch is used as tooth brush.	[23]
		<i>Elephantopus scaber</i> L.	Root paste with pepper powder used as toothpaste.	[24]
		<i>Emilia sonchifolia</i> (L.)DC.	Juice of leaves is applied to treat toothache.	[5]
		<i>Saussurea costus</i>	Tuber decoction used for tooth ache	[25]
		<i>Spilanthes acmella</i> Murr.	Flowers are crushed and applied on the site of toothache	[26]

		<i>Spilanthes clava DC.</i>	Root and flower head is chewed to relieve tooth ache.	[5]
			Flower head is chewed and kept in mouth to relieve tooth ache	[13]
		<i>Spilanthes paniculata</i>	Root and Leaves is chewed and the juice thus obtained is swallowed to check tooth ache.	[15] [27]
10	Boraginaceae	<i>Arnebia euchroma</i>	Roots used for Tooth ache	[28]
		<i>Ehretia laevis Roxb.</i>	Young branches are used tooth brush.	[29]
11	Burseraceae	<i>Bombax ceiba L.</i>	Bark used for toothache	[12]
		<i>Canarium bengalense Roxb</i>	Latex is used in the treatment of wounds and gum infection.	[13]
12	Caesalpiniaceae	<i>Bauhinia Variegata L.</i>	Twigs used as toothbrush and toothache.	[17]
		<i>Cassia javanica. L.</i>	Young leaves munched to stop bad breath.	[13]
		<i>Cassia occidentalis L.</i>	Root paste kept on affected teeth daily once (before going to bed), for until cure.	[24]
		<i>Cassia tora Linn</i>	Leaf decoction given for children with teething	[23]
		<i>Tamarindus indica</i>	Bark powder used as tooth powder.	[30]
13	Caricaceae	<i>Carica papaya L.</i>	Latex is used to cure tooth ache and mouth ulcer.	[7]
14	Cleomaceae	<i>Cleistanthus collinus</i>	Leaves are used for tooth-ache	[12]
15	Clusiaceae	<i>Cajanus cajan (L.)</i>	Fruit used for tooth-ache	[12]
16	Cucurbitaceae	<i>Mukia maderaspatana</i>	Decoction of root is used to relief of tooth ache	[31]
		<i>Mukia maderaspatana</i>	Root is chewed for about to relieve toothache.	[5]
17	Elaeagnaceae	<i>Hippophae salicifolia</i>	Roots are chewed for foul smell.	[5]
18	Euphorbiaceae	<i>Acalypha indica L.</i>	Decoction of the herb in used as a cure for tooth	[31]
		<i>Emblica officinalis</i>	Twig worn into neck to cure tooth ache.	[33]
		<i>Jatropha curcas L.</i>	Fresh stems are used as toothbrush	[16, 31]
		<i>Jatropha gossypifolia</i>	Twigs are used as tooth brush.	[7]
		<i>Jatropha glandulifera Rox</i>	Latex is used for Toothache, Gum infection.	[18]
		<i>Jatropha villosa Wight</i>	Latex used to cure mouth ulcer.	[20]
		<i>Phyllanthus emblica</i>	Fruits is used as mouth freshener and for tooth decay.	[34, 35]
		<i>Phyllanthus niruri</i>	leaves are used for mouth ulcer	[30]
		<i>Ricinus communis L.</i>	Cotyledon is fried in mustard oil and the smoke is emitted by this process is inhaled for tooth ache	[5]
19.	Fabaceae	<i>Abrus precatorius L.</i>	Leaves are chewed to get relief from tooth ache.	[8, 21]
		<i>Crotalaria retusa L.</i>	whole plant for mouth ulcer Stomatitis	[26]
		<i>Desmodium gangeticum (Linn.) DC.</i>	Roots are chewed for about to cure toothache.	[5]
		<i>Desmodium triflorum L.</i>	Whole plant chewed for tooth ache.	[7]
		<i>Desmodium velutinum (Willd.) DC.</i>	young branches chewed for tooth ache	[29]
		<i>Indigofera aspalathoides L.F.</i>	Powdered root is to treat tooth decay.	[8]
		<i>Pongamia pinnata (Linn.) Pierre.</i>	Tender leaf twigs are chewed to cure toothache.	[5]
20	Labiataeae	<i>Anisomeles malabarica (L.) R.Br. ex Sims</i>	young leaves used to treat dysentery for children when a time of teeth growing	[37]

21	Lamiaceae	<i>Lavandula bipinnata(L)</i>	Leaf paste is applied on gums for toothache.	[38]
		<i>Lucas aspera Sprong.</i>	Leaf is used for Toothache, Gum infection	[18]
		<i>Ocimum basilicum L</i>	Leaves chewed to induce saliva secretion, keeps mouth fresh	[17]
22	Liliaceae	<i>Asparagus racemosus Willd. var.</i>	Root powder is used for Swelling in mouth:	[29]
23	Linaceae	<i>Hugonia mystax L</i>	Root is used for tooth-ache	[12]
24	Lythraceae	<i>Lawsonia alba Lamk.</i>	Bark of stem is used to cure toothache.	[5]
		<i>Lawsonia inermis Linn.</i>	The fresh leaves are ground and gargled to treat mouth ulcer	[11, 26]
25	Malvaceae	<i>Abutilon indicum</i>	Juice is taken orally to treat dental problems	[39]
		<i>Gossypium herbaceum L.</i>	Burned seed powder/ash is use for tooth ache	[40]
26	Melastomaceae	<i>Melastoma malabathrium .L.</i>	Root used for Toothache	[27]
27	Meliaceae	<i>Azadirachta indica (A.Juss).,</i>	Tender twigs used as tooth brush. Flowers for mouth infections and bleeding of gums.	[30, 39, 41]
28	Mimosaceae	<i>Acacia arabica. (lamk)Willd.</i>	Bark is used for Gum diseases and mouth ulcer.	[42]
		<i>Acacia leucophloea (Roxb.) Willd.</i>	Stem bark decoction gargled daily twice.	[24]
		<i>Acacia nilotia willd.</i>	Young Twigs Used as tooth brush.	[21, 43]
		<i>Albizia lebbbeck (L.) Willd.,</i>	Dried bark used as tooth powder.	[41]
		<i>Albizia amara (Roxb.)</i>	Leaves, Bark, Fruit are used for mouth ulcer	[44]
29	Moraceae	<i>Artocarpus heterophyllus Linn,</i>	Ash of rind spines is used for tongue ulcer	[45]
		<i>Ficus bengalensis L.</i>	Prop root is used as toothbrush. Fresh latex of plant is applied to treat the bleeding and swelling of gums.	[42, 46]
		<i>Ficus religiosa L.</i>	Tender leaf twigs are chewed to cure toothache.	[5]
		<i>Ficus virens</i>	Decoction is used as moth gargle for mouth ulcers.	[7]
30	Moringaceae	<i>Moringa oleifera</i>	Cooked flower boiled and inhaled.	[30]
31	Myrtaceae	<i>Psidium guajava (L)Bat.</i>	Leaves are chewed to get relief from mouth blisters	[47]
		<i>Syzygium cumini. L.</i>	Bark decoction Mouth wash	[42]
32	Papilionaceae	<i>Indigofera Linn</i>	Chewed to relieve mouth ulcer	[38]
		<i>Sesbania grandiflora</i>	Boiled leaf is used for mouth ulcer.	[30]
33	Perplocaceae	<i>Hemidesmus indicus(L)</i>	Root paste is applied for mouth ulcer	[34]
34	Piperaceae	<i>Pedaliium murex L</i>	Leaf tooth-ache	[7]
		<i>Piper betle Linn.</i>	Leaves are used for foul smell in the mouth, strengthens the teeth	[28]
35	Plantaginaceae	<i>Plantago major. L.</i>	Leaf extract for tooth ache, Gum bleeding	[19]
36	Poaceae	<i>Desmostachya bipinnata (L.) Stapf.</i>	Root powder boiled applied to cure toothache and swelling of gums.	[5]
		<i>Thysanolaena maxima(Roxb)</i>	Root decoction is used for mouth sore.	[32]
37	Rhamnaceae	<i>Ziziphus mauritina Lam.</i>	Steam of boiling Plant is used as mouth freshener.	[34]
38	Rosaceae	<i>Potentilla fulgens wall, ex. hk.f.</i>	Root, leaves Decotion for Tooth ache and gum diseases.	[14]
		<i>Potentilla lineate</i>	Root paste used for the infected teeth.	[25]

39	Rubiaceae	<i>Borreria articularis (L. f.)</i>	Whole plants are boiled and the vapors are inhaled to get relief from toothache	[49]
		<i>Haldina cordifolia (Roxb.)</i>	Tooth is brushed with young branches.	[29]
		<i>Rubia cordifolia .L.</i>	leaf paste is applied on swollen gums	[34]
40	Rutaceae	<i>Glycosmis pentaphylla Corr.</i>	Leaves, Seed for Tooth ache	[50]
		<i>Murraya paniculata (L.)</i>	Stem to cure toothache.	[5]
		<i>Toddalia asiatica (L.)</i>	Stem is used as tooth powder and to treat toothache.	[51, 53]
41	Sapotaceae	<i>Zanthoxylum alatum</i>	Seeds are chewed to relief from tooth problem	[47]
		<i>Madhuca longifolia</i>	Small stem is used as toothbrush,.	[5]
42	Scrophullariaceae	<i>Mimusops elengi Linn.</i>	Fruit and Bark juice used as gargle for apthae and gum diseases	[11, 52]
43	Smilaceace	<i>Scoparia dulcis L.</i>	Whole plant is used as Gargle for tooth ache.	[7]
44	Solanaceae	<i>Smilax Zeylanica L.</i>	Stems used as tooth brush	[7]
		<i>Datura stramonium</i>	A paste is prepared from the seeds applied for tooth ache.	[25]
		<i>Hyoscyamus niger Linn</i>	Smoke of the seed kept in mouth for tooth ache.	[52]
		<i>Solanum erianthum D.Don</i>	boiled with water and the vapor is inhaled once or twice a week through mouth	[51]
		<i>Solanum ferox. L.</i>	Dried seeds, flower are kept in mouth during tooth decay	[53]
		<i>Solanum khasianum</i>	Seeds are used for Toothache	[7]
		<i>Solanum nigrum L.</i>	Fresh leaves are cooked mouth ulcer. Leaves and fruits are chewed and swallowed to cure mouth ulcer	[54, 55]
		<i>Solanum surattense Burm. F</i>	Dried fruit smoke to reduce toothache..	[6, 17, 18]
		<i>Solanum torvum</i>	Seeds are used for Toothache	[27]
		<i>Solanum virginianum L.</i>	Fruit is dried, burnt to ash and applied in the caries teeth.	[5, 7, 15]
45	Verbenaceae	<i>Solanum xanthocarpum Burm.</i>	Dried or fresh fruits are kept in fire and the smoke is inhaled through mouth to treat toothache	[56]
		<i>Lantana camara L</i>	Stem is used as tooth brush for sparkling bright tooth	[15]
46	Vitaceae	<i>Semecarpus anacardium.</i>	leaf is used for Tooth-ache	[12]
		<i>Ampelocissus latifolia (Roxb).</i>	Tender leaf juice to cure toothache.	[7]

4. Conclusion

The review indicated that, there are plenty of medicinal plants to treat a wide spectrum of oral ailments. Earlier studies on traditional medicinal plants also revealed that the economically backward local and tribal people of India prefer folk medicine due to low cost and sometimes it is a part of their social life and culture. This study concluded that even though the accessibility of Western medicine for simple and complicated diseases is available, many people still continue to depend on medicinal plants for tooth infections. Due to lack of interest among the younger generation there is a possibility of losing this wealth of knowledge in the near future. It thus becomes necessary to acquire and preserve this traditional system of medicine by proper documentation and identification of specimens.

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