



Pharmacological potential of plant used in dental care: A Review

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ABSTRACT

Background & Aim: The major teeth problems associated with adults are: Plaque, Tartar, Tooth decay, Gingivitis, Periodontal disease. There is a long and venerable history of the use of plants to improve dental health and promote oral hygiene. There are a number of traditional herbal remedies for the treatment and management of diseases related to teeth, gum and oral hygiene. Good oral hygiene is necessary for the healthy teeth, gum and fresh breath. This review explains the pharmacological potential of medicinal plants used for the treatment of various dental problems.

Experimental & Results: A number of formulation and method are used in oral hygiene to prevent and cure oral diseases. But now day's number of medicinal plants plays an important role in oral hygiene.

Recommended applications/industries: This review provides recently available knowledge of plants and their part for dental science in the treatment of various disease of oral cavity.

1. Introduction

The oral cavity contains the teeth used for mastication, the gum surrounded by periodontium and alviolar bone, the root of the mouth is known as the hard plate and posterior to it is the soft plate. These and other inner tissues of the cheeks are lined with oral mucous. The tongue is a mobile muscular organ contained in the mouth, it is concerned with speech, mastication, swallowing and taste because taste buds are

present on it, the ips preventing contents in the mouth from falling out of the mouth. Since the oral cavity plays these roles with the various parts inside it, it becomes of importance to take the best care of it using the effective methods, materials and making the best use of the resources that are available for oral hygiene (Cawson, 1984a; Cawson, 1984b).

The major teeth problems associated with adults are: Plaque, Tartar, Tooth decay, Gingivitis, Periodontal disease (Muhammad and Lawal, 2010). Periodontal

diseases affect the tissues surrounding the teeth. Gums and bone supporting the teeth come under the term periodontal. Gingivitis, the mildest form of periodontal disease, is generally caused by insufficient oral hygiene. Inadequate oral hygiene can lead to plaque buildup. A variety of triggering factors like bacterial causes, dyscrasias, avitaminosis etc. cause inflamed gums leading to gingivitis. Salivary tartar has an additive effect to these causative factors in causing gingivitis (Kumar *et al.*, 2009). Plaque-induced gingivitis is one of the most frequent periodontal diseases, affecting more than 90% of the population, regardless of age, sex or race. However, the inability of the normal adult population to perform adequate tooth brushing has led to the search for chemotherapeutic agents in order to improve plaque control⁵. These chemicals, mainly Triclosan and chlorhexidine, have been used as mouth rinses or added to dentifrices to avoid plaque formation and development of gingivitis (Nogueira-Filho *et al.*, 2000; Moran *et al.*, 2001; Palomo *et al.*, 1994; Yates *et al.*, 1993). As some of these substances may have undesirable side effects, such as tooth staining and taste alteration, phytotherapeutic agents with antimicrobial and anti-inflammatory properties have been investigated (Lee *et al.*, 2004; Salgado *et al.*, 2006; Sastravaha *et al.*, 2005).

There is a long and venerable history of the use of plants to improve dental health and promote oral hygiene (Lewis and Elvin-Lewis, 1977). There are many natural ways to treat dental disease some of which even help in preventing it from occurring. There are a number of herbs that can help eliminate inflammation and infection associated with dental diseases. A Saudi Arabian study compared the effect of miswak or tooth brushing on plaque removal and dental health using a single blind, randomized, crossover design (Al-Otaibi *et al.*, 2003).

Proper oral hygiene, of course, goes a long way in treating and preventing dental problems. Tooth brushing with toothpaste is the most widely practiced form of oral hygiene in most countries (Pannuti *et al.*, 2003). Twice daily brushing has significantly declined dental caries. Dental plaque is a bio-film on the tooth surface that plays an important role in the development of caries and periodontal diseases (Moran *et al.*, 1988). While the mechanical removal of plaque on caries per se is equivocal, the maintenance of an effective plaque control program is the cornerstone of any attempt to prevent and control periodontal diseases (Jenkins *et al.*, 1990). A wide range of chemicals, mainly antimicrobial agents, have been added to toothpastes in order to produce a direct inhibitory effect on plaque formation (Pannuti *et al.*, 2003; Fine *et al.*, 2006). The list of plants used in various dental problems are listed in table 1.

2. Results

Table 1. List of plant used in various dental problems

Sr. No	Plant name (Common name)	Family	Uses	Part used	Reference
1.	<i>Abuta grandifolia</i> (Mart.) Sandwith (Abota)	Menispermaceae	Toothache	Leaves, bark, Stems & roots	Gupta, 2006
2.	<i>Acacia modesta</i> Wall. (India phulai)	Mimosaceae	Tooth clean teeth	Twig & Stem	Mahmood <i>et al.</i> , 2005; Ahmad <i>et al.</i> , 2009
3.	<i>Acacia nilotica</i> (L.) Delile (Egyptian Acacia)	Mimosoideae	Swollen gum (gingivitis)	Bark	Shekhawat and Batra, 2006
4.	<i>Acalypha indica</i> L. (Indian copperleaf)	Euphorbiaceae	Toothache	Whole plant	Siddamalla yya, 2010
5.	<i>Achyranthes aspera</i> L. (Devil's horsewhip)	Amaranthaceae	Toothache	Leaves and roots	Mahmood <i>et al.</i> , 2005; Ahmad <i>et al.</i> , 2009
6.	<i>Adansonia digitata</i> L. (Baobab)	Bombacaceae	Toothache	Bark	Dweck, 1996; Burkill, 1985
7.	<i>Alchornea cordifolia</i> Mull.Arg (Lporuru)	Euphorbiaceae	Toothache	Whole plant	Zapfack, 2001; Kayode and Omotoyibo, 2009
8.	<i>Allium sativum</i> L. (Ajo)	Liliaceae	Toothache	Bulb	Gupta, 2006
9.	<i>Aloe ferox</i> Mill. (Aloe)	Liliaceae	Toothache	Leaves	Gupta, 2006
10.	<i>Aloe vera</i> (L.) Burm.f. (Indian Aloe)	Asphodelaceae	Gingivitis & plaque	Whole plant	De Oliveira <i>et al.</i> , 2008
11.	<i>Anacardium occidentale</i> L.	Anacardiaceae	Toothache, Sore gum	Whole plant	Kayode and Omotoyibo, 2009

	(Acajuba occidentalis)					23.	<i>Capparis spinosa</i> L. (Caper bush)	Capparaceae	Toothache	Root bark	Ahmad, 2007
12.	<i>Annona senegalensis</i> Pers. (Wild custard apple)	Annonaceae	Toothache	Bark	Mabogo, 1990	24.	<i>Cassia occidentalis</i> L. (Fedegoso)	Leguminosae	Toothache	Leaves	Agbovie <i>et al.</i> , 2002
13.	<i>Argemone maxicana</i> Linn. (Mexican poppy)	Papaveraceae	Toothache and carriage	Seeds	Sikdar and Dutt, 2008	25.	<i>Cinnamomum camphora</i> L. (Camphor tree)	Lauraceae	Toothache, Teeth swelling	Leaves and branches	Gupta, 2006, Ahmad <i>et al.</i> , 2009
14.	<i>Aristolochia Guentheri</i> O.C. Schmidt (Zaragosa)	Aristolochaceae	Toothache	Stem	Gupta, 2006	26.	<i>Circumalunga</i> Linn. (Turmeric)	Zingiberaceae	Toothache, Gingivitis	Rhizomes	Chaturvedi, 2009
15.	<i>Azadirachta indica</i> A. Juss. (Neem)	Meliaceae	Toothache	Whole plant	Siddamallayya, 2010; Albandar <i>et al.</i> , 1997	27.	<i>Cleome chelidonii</i> Linn.f. (Perunaikaduku)	Cleomaceae	Gingivitis	Whole plant	Ganesan, 2008
16.	<i>Baptisia australis</i> (L.)R. Br. (Blue Wild Indigo)	Fabaceae	Toothache	Root	Indiana Medical History Museum, 2010	28.	<i>Clitoria ternatea</i> L. (Butterfly pea)	Fabaceae	Toothache	Roots	Siddamallayya, 2010
17.	<i>Blighia sapida</i> K.D.Koenig (Akee)	Sapindaceae	Mouth rashes	Whole plant	Kayode and Omotoyibo, 2009	29.	<i>Cocos nucifera</i> Linn. (Coconut palm)	Arecaceae	Toothache	Fruits	Dweck, 1996; Spoerke, 1990
18.	<i>Borassus flabillifer</i> Linn. (Panai)	Arecaceae	Toothache	Root, Young Rachis	Ganesan, 2008	30.	<i>Cornus florida</i> L. (Dogwood tree)	Cornaceae	Toothache	Stem	Indiana Medical History Museum, 2010
19.	<i>Bridelia ferruginea</i> Benth. (Kizni)	Euphorbiaceae	Mouth rashes	Whole plant	Kayode and Omotoyibo, 2009	31.	<i>Croton Menthodorus</i> Benth. (Chala)	Euphorbiaceae	Toothache	Seeds, leaves	Gupta, 2006
20.	<i>Brugmansia aurea</i> Lagerheim (Floripondio)	Solanaceae	Toothache	Flowers	Gupta, 2006	32.	<i>Datura stramonium</i> Linn. (Datura)	Solanaceae	Toothache	Roots	Sikdar and Dutt, 2008
21.	<i>Cajanus cajan</i> (Linn.) Millsp. (Thubarai)	Fabaceae	Gingivitis	Leaves, stem, seeds	Ganesan, 2008	33.	<i>Dialium guineense</i> Wild. (Velvet tamarind)	Leguminosae	Toothache	Root	Agbovie <i>et al.</i> , 2002
22.	<i>Calotropis gigantea</i> (L) R.Br. (Akon)	Asclepiadaceae	Toothache	Roots	Sikdar and Dutt, 2008	34.	<i>Ekebergia senegalensis</i> A Juss. (Cape ash)	Meliaceae	Toothache	Leaves	Agbovie <i>et al.</i> , 2002
						35.	<i>Eruca sativa</i> Miller (Rocket)	Cruciferae	Toothache	Leaves	Ahmad, 2007
						36.	<i>Erythrina lysistemon</i> Hutch.	Fabaceae	Toothache	Bark	Mabogo, 1990

37.	(Coral tree) <i>Eucalyptus globulus</i> Labill. (Blue Gum)	Myrtaceae	Gum bleeding	Whole plant	Reddy <i>et al.</i> , 2010; Nagata <i>et al.</i> , 2008; Pack, 1984	49.	<i>Jatropha curcas</i> Linn. (Arandi)	Euphorbiaceae	Pyorrhoea	Fruit	Kayode and Omotoyombo, 2009
38.	<i>Euclea divinorum</i> Hiern (Magic gwarra)	Ebenaceae	Toothache	Bark, Leaves	Hutchings, 1996	50.	<i>Juglans regia</i> Linn. (Akhrot)	Juglandaceae	Toothache	Bark	Shekhawat and Batra, 2006
39.	<i>Euclea natalensis</i> A.DC. (Large-leaved guarri)	Ebenaceae	Toothache	Leaves	Mabogo, 1990	51.	<i>Justicia adhatoda</i> L. (Malabar Nut)	Acanthaceae	Pyorrhoea	Leaves	Ahmad <i>et al.</i> , 2009
40.	<i>Eucleapsea debenus</i> E. Meyer ex A.DC. (Black ebony)	Ebenaceae	Toothache	Root	Damme, 1922	52.	<i>Kleinia longiflora</i> DC (Sambokbo ssie)	Asteraceae	Toothache	Stem	Damme, 1922
41.	<i>Fagonia cretica</i> L. (Cretan prickly clover)	Zygophyllaceae	Toothache	Whole plant	Ahmad, 2007	53.	<i>Licopersicon esculentum</i> Mill. (Tamater)	Solanaceae	Mouth rashes	Fruit	Shekhawat and Batra, 2006
42.	<i>Ferula assafoetida</i> Linn. (Heeng)	Apeaceae	Dental carries	Gum resin	Shekhawat and Batra, 2006	54.	<i>Lophira alata</i> Banks ex C.F.Gaertn (Bongossi)	Ochnaceae	Toothache	Bark	Cousins and Huffman, 2002
43.	<i>Ficus insipida</i> Willd. (Oje)	Moraceae	Toothache	Latex	Gupta, 2006	55.	<i>Mangifera indica</i> L. (Mango)	Anacardiaceae	Sore gum	Whole plant	Kayode and Omotoyombo, 2009
44.	<i>Ficus bengalensis</i> L. (Indian fig)	Moraceae	Toothache	Plant juice	Ahmad <i>et al.</i> , 2009	56.	<i>Micromeria biflora</i> Benth. (English lavender)	Labiatae	Toothache	Root	Ahmad <i>et al.</i> , 2009
45.	<i>Flacourtia flavescens</i> Wild. (Niger plum)	Flacourtiaceae	Toothache	Root	Agbovie <i>et al.</i> , 2002	57.	<i>Milicia excelsa</i> (Welw.) C.C. Berg (African-teak)	Moraceae	Toothache	Bark	Agbovie <i>et al.</i> , 2002
46.	<i>Garcinia kola</i> Heckel. (Bitter kola)	Guttiferae	Toothache	Root	Agbovie <i>et al.</i> , 2002	58.	<i>Musanga cecropioides</i> R. Br. (Umbrella tree)	Cecropiaceae	Toothache	Bark	Zapfack, 2001
47.	<i>Jasminum arborescens</i> Roxb. (Chameli)	Oleaceae	Mouth rashes	Leaves	Shekhawat and Batra, 2006	59.	<i>Myrothamnus usifolius</i> Wblw. (Resurrection bush)	Myrothamnaceae	Gum inflammation	Leaves	Damme, 1922
48.	<i>Jasminum officinale</i> L. (Jasmine)	Oleaceae	Mouth rashes	Flower	Siddamalla yya, 2010	60.	<i>Nicotiana tabacum</i> L. (Tobaco)	Solanaceae	Toothache	Leaves	Agbovie <i>et al.</i> , 2002
						61.	<i>Ocimum sanctum</i> Linn. (Tulsi)	Lamiaceae	Mouth sores	Leaves	Shekhawat and Batra, 2006

62.	<i>Ola x subscorpi dea</i> Oliv. (Akan- Brong)	Olacac eae	Tootha che	Whole plant	Kayode and Omotoynib o, 2009	(Tooth brush tree)				Al-Zeid, 2004; Almask <i>et al.</i> , 2005; Almas 2001
63.	<i>Olea ferruginea</i> Royle (Wild Olive)	Oleace ae	Tootha che	Fruits	Ahmad, 2007					Approache s towards Evaluation of Medicinal Plants prior to Clinical Trials, 2006
64.	<i>Origanum vulgare</i> L. (Oregano)	Labiata ae	Tootha che	Whole plant oil	Indiana Medical History Museum, 2010					Indiana Medical History Museum, 2010
65.	<i>Orphanther a albida</i> Schinz. (Ana tree)	Asclep iadacea e	To clean teeth	Stem	Damme, 1922					Indiana Medical History Museum, 2010
66.	<i>Palisota hirsute</i> (Thunb.) K. Schum. (Akan- Asante)	Comm elinace ae	Tootha che	Stem, leaves	Cousins and Huffman, 2002					Vogel <i>et al.</i> , 1978
67.	<i>Parinari curatellifoli a</i> Planch.Ex Benth (Cork tree)	Chryso balanc eae	Tootha che	Bark	Mabogo, 1990					Ganesan, 2008
68.	<i>Phylla dulcis</i> (Trev.) Mold (Aztec Sweet Herb)	Verben aceae	Tooth decay	Leaves	Indiana Medical History Museum, 2010					Sikdar and Dutt, 2008; Ahmad, 2007
69.	<i>Polyalthia suaveolens</i> Engl. & Diels (Annickia)	Annon aceae	Tootha che	Fruits, roots and leaves	Cousins and Huffman, 2002					Hutchings, 1996
70.	<i>Punica granatum</i> Linn. (Anar)	Puniac eae	Mouth sores	Fruit covers	Shekhawat and Batra, 2006					Agbovie <i>et al.</i> , 2002
71.	<i>Ricinus communis</i> L. (Castor bean)	Euphor biaceae	Tootha che	Seeds	Damme, 1922					Gupta, 2006
72.	<i>Saccharum officinatum</i> L. (Sugar cane)	Grami naceae	Strengt hens the teeth.	Whole plant	Ahmad <i>et al.</i> , 2009					Barnes 2007; Approache s towards Evaluation of Medicinal Plants prior
73.	<i>Salvadora Persica</i> L.	Salvad oracea e	Tooth decay	Whole plant	Ismail <i>et al.</i> , 2010; Almas and					
74.	<i>Salvia campanulat a</i> Wall. (Kokai)	Lamiac eae	Tootha che	Whole plant						
75.	<i>Salvia officinalis</i> L. (Sage)	Lamiac eae	Sore gums	Whole plant						
76.	<i>Sanguinari a canadensis</i> L. (Blood root)	Papave raceae	Tooth lose	Whole plant						
77.	<i>Scoparia dulcis</i> Linn. (Sarkaraive mbu)	Scroph ulariac eae	Tootha che	Leaves						
78.	<i>Solanum incanum</i> L. (Thorn Apple)	Solana ceae	Tootha che	Root						
79.	<i>Solanum pandurifor me</i> E.Mey. (Yellow Bitter- apple)	Solana ceae	Tootha che	Roots						
80.	<i>Spathodia campanulat a</i> Pal. (African tulip)	Bignon iaceae	Tootha che	Bark						
81.	<i>Spilanthes americana</i> Hieron (Botoncillo)	Astera ceae	Tootha che	Whole palnt						
82.	<i>Syzygium aromaticu m</i> (L.)Merr. (Clove)	Myrtac eae	Tootha che	Whole plant						

83.	<i>Vitis vinifera</i> L. (Grape vine)	Vitaceae	Tooth clean teeth	Plant ash	to Clinical Trials, 2006 Indiana Medical History Museum, 2010 Gupta, 2006
84.	<i>Xanthium spinosum</i> L. (Amor seco)	Asteraceae	Toothache	Fruits, leaves, roots	Mahmood et al., 2005
85.	<i>Zanthoxylum alatum</i> D.C. (Timur)	Rutaceae	Tooth clean teeth	Twigs	Kayode and Omotoyinbo, 2009
86.	<i>Zanthoxylum zanthoxyloides</i> (Lam.) Zeyher. (Candlewood Tree)	Rutaceae	Toothache	Whole plant	Shekhawat and Batra, 2006
87.	<i>Ziziphus mauritiana</i> Lam. (Ber)	Rhamnaceae	Dental carries	Root	

3. Conclusion

Plants contain photochemical such as alkaloids, tannins, essential oils and flavonoids which have pronounced antimicrobial activity. This underlies the use since antiquity of herbs to improve oral hygiene and prevent tooth decay, gum disease and periodontitis. The miswak or chewing stick is an underestimated tool for dental hygiene which is only beginning to be explored in controlled clinical studies. So this review helps the researcher to explore these medicinal plants for more research in the field of dental science.

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