

Ethnomedicine of Dharwad district in Karnataka, India—plants used in oral health care

S.S. Hebbar, V.H. Harsha, V. Shripathi, G.R. Hegde*

P.G. Department of Botany, Karnatak University, Dharwad 5800 03, Karnataka, India

Received 23 July 2003; received in revised form 23 April 2004; accepted 23 April 2004

Available online 28 July 2004

Abstract

The present ethnomedicine survey covers the Dharwad district of Karnataka in southern India. It was revealed that 35 plants belonging to 26 families are being used to treat different types of oral ailments like toothache, plaque and caries, pyorrhea and aphthae. Sixteen of these plants were new claims for the treatment of oral ailments not previously reported in the ethnomedicinal literature of India. *Basella alba*, *Blepharis repens*, *Capparis sepiaria*, *Oxalis corniculata* and *Ricinus communis* are used for the treatment of aphthae; *Azima tetra-cantha*, *Caesalpinia coriaria*, *Cleome gynandra*, *Gossypium herbacium*, *Leucas aspera*, *Merremia chryseides*, *Pergularia daemia*, *Prosopis juliflora* and *Solanum nigrum* are used to treat tooth ache and *Cassia hirsuta* and *Cassia tora* are used in the treatment of plaque and caries.

© 2004 Published by Elsevier Ireland Ltd.

Keywords: Ethnomedicine; Medicinal plants; Oral health care

1. Introduction

Prevention of oral diseases is easier than a cure. Proper oral care is necessary to prevent oral diseases. Knowledge about oral diseases and their causes will help to maintain proper oral health. Oral problems are related to teeth, tongue and gums. Dental plaque and caries, pyorrhea, toothache and aphthae are common oral ailments.

Dental plaque is the colourless sticky mixture of bacterial products. Dental caries is the decalcification process carried out by micro-organisms, which grow on remnants of food materials between the teeth. Decalcification, enamel and dentine decay, exposure of pulp and putrefactive decomposition are different degrees of severity. Pyorrhea is a disease of the tooth socket characterized by bleeding gums. Bleeding is due to bacterial activity, which can produce many toxins leading to softening and bleeding of the gums (Farooqi et al., 1998).

Toothaches are mainly due to bacterial infection. Aphtha is a type oral disease in which small painful erosions are formed on the mucosa. Aphthae occurs repeatedly in the

mouth of susceptible individuals. Aphthae may be related to menstruation or the intake of certain food items. The outer alveolar sulci, under the surface of the tongue or inside the lips are the usual sites of aphthae, but it may affect any part of the mouth (Lee, 1953).

In India, plant wealth is greatly exploited for its therapeutic potential and medicinal efficacy to cure various oral ailments since time immemorial. Farooqi et al. (1998) have documented 84 plants being used in oral health care. Similarly, 197 plants have been listed by Rao (2000). Karnataka, in Southern India, has the richest plant diversity especially in the Western Ghat region and documentation of ethnomedicinal plants have been carried out by various workers. *Psidium guajava*, L., *Leonotis nepetifolia*, R. Br. and *Casearia elliptica*, Willd. being used by the 'Gowlis' and *Leucas aspera*, (Willd.) Link. and *Caryota urens*, L. being used by the 'Siddis' in Uttara Kannada district is documented by Bhandary et al. (1995, 1996). Similarly Harsha et al. (2002) have reported the use of *Spilanthes acmella*, (L.) Murr. by the 'Kunbi' tribe of the same district. Dharwad is one of the 27 districts in Karnataka. This district is situated in the northern part of the state and extending between 14°17' to 15°50'N. latitude and 74°48' to 76°00'E. longitude (Fig. 1) with an annual average rainfall of 69 cm. Deciduous forests and scrub jungles are the main vegetation types in the dis-

* Corresponding author. Fax: +91 836 424614.

E-mail address: grbhadran@rediffmail.com (G.R. Hegde).

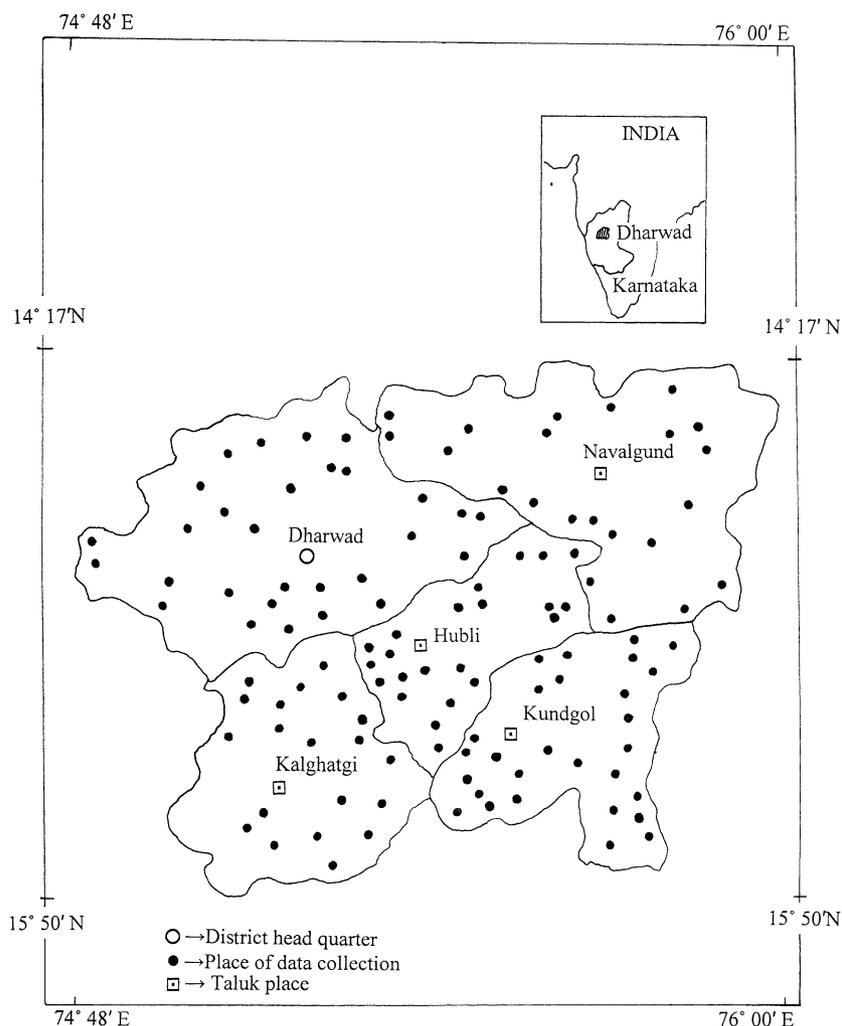


Fig. 1. Map of the study area showing the places of data collection.

tract. This district is lying adjacent to one of the biodiversity hotspots of the world, the Western Ghats. An ethnomedicine survey under taken during the last 3 years (1999–2002) in Dharwad district revealed that many herbal medicinal practitioners of Dharwad district are using a number of locally available plants in the treatment of various oral ailments. The present paper is the result of that survey.

2. Methodology

Ethnomedicine explorations of Dharwad district were undertaken during the years 1999–2002. Several field visits were made to different parts of the study area and in the survey, 245 herbal healers were contacted during different seasons of the year. Information was collected about the medicinal plants used in oral health care, the method of medicinal preparation and its administration. All the medicinal plants claimed to be of use for oral health care were collected during the flowering seasons and have been identi-

fied. Herbarium specimens of these samples are maintained in the P.G. Department of Botany, Karnatak University, Dharwad.

3. Results and discussions

Data gathered are arranged according to plant family in alphabetical order. Information about the botanical name, local name (Kannada language), herbarium number, part of the plant used, method of medicinal preparation and administration are given in Table 1. New claims are indicated by asterisk (*) marks.

The present ethnomedicine survey indicates that 35 locally available plants are being used by local herbal practitioners in the Dharwad district to treat various oral ailments. A comparison of these with the earlier works (Nadkarni, 1976; Jain, 1991; Anon., 1995; Yoganarasimhan, 1996; Farooqi et al., 1998; Rao, 2000; Kirtikar and Basu, 2001) indicated that 16 plants make new claims to the system of

Table 1
Plants used in oral healthcare

Plant	Local name (Kannada language)	Part used	Usage
Acanthaceae <i>*Blepharis repens</i> , (Vahl.) Roth. KUD/Ang./176	Hariduhachaga	Young parts	Chewing and keeping in mouth for sometime will give relief from aphthae
Amaranthaceae <i>Achyranthes aspera</i> , L. KUD/Ang./352	Uttarani, Kempu uttarani	Whole plant Stem	Dried plants are burnt to get the ash. Ash is mixed with common salt and used to massage the gum and tooth area for relief from tooth ache Stem is also used as tooth brush
Anacardiaceae <i>Mangifera indica</i> , L. KUD/Ang./253	Maavina mara	Bark	Powdered inner bark is kept in mouth for about half an hour to one hour, thrice a day to get relief from toothache
Araceae <i>Acorus calamus</i> , L. KUD/Ang./703	Baje, Naaruberu	Rhizome	Rhizome is made in to paste and applied to painful teeth and gums
Asclepiadaceae <i>Calotropis gigantea</i> , (L.) W.T.Aiton KUD/Ang./298	Kempu ekke, Kariieke	Latex Whole plant	Cotton is wetted with the latex of this plant and placed on the painful tooth area Dried plant is burnt to get ash which is used to massage the tooth and gum after brushing in the morning and evening for curing of plaque, caries and pyorrhea
<i>*Pergularia daemia</i> , (Forsk.) Chiov. KUD/Ang./487	Haalukuratigya, Isagantigya	Latex	Latex of this climber is taken on cotton and placed on affected area for relief from toothache
Basellaceae <i>*Basella alba</i> , L. KUD/Ang./292	Basale	Leaves	Leaves are masticated and kept in the mouth for sometime to get relief from aphthae
Caesalpiniaceae <i>*Caesalpinia coriaria</i> , Willd. KUD/Ang./121 <i>*Cassia hirsuta</i> , L. KUD/Ang./55 <i>*Cassia tora</i> , L. KUD/Ang./261	Muragikaayi mara, Dividivi Doddachogache Tagate, Tarotigya, Nayichogache	Fruits Seeds Seeds Seeds	Powder of the fruit is used to massage the teeth for relief from toothache Powdered seeds are used to massage the teeth and gums to protect from plaque and caries Dried seeds are fried and powdered. It is used to massage the teeth and gums to protect from plaque and caries Seeds are fried with the seeds of Doddachogache (<i>Cassia hirsuta</i> , L) and are made in to powder. Massaging of gums with this powder brings relief from pyorrhea
Capparaceae <i>*Capparis sepiaria</i> , L. KUD/Ang./241	Odeyanakanti, Ippimullu	Leaves	Dried leaves are baked and pound to a fine powder. Ash of cotton cloth is mixed with it and applied on aphthae affected area
Caricaceae <i>Carica papaya</i> , L. KUD/Ang./720	Pappaya, Parangi hannu	Latex	Latex of the unripened fruit is taken on cotton and placed on painful tooth
Cleomaceae <i>*Cleome gynandra</i> , L. KUD/Ang./174	Hallunovina gida	Leaves	The juice extracted from the leaves is dropped into the ear to get relief from toothache
Convolvulaceae <i>*Merremia chryseides</i> , Hallier.f. KUD/Ang./756	Sadagara balli	Whole plant	Decoction of the whole plant is used as a gargle for relief from toothache
Euphorbiaceae <i>Jatropha gossypifolia</i> , L. KUD/Ang./62	Chittoudala	Latex	Latex of this plant taken on cotton is placed on painful tooth

Table 1 (Continued)

Plant	Local name (Kannada language)	Part used	Usage
<i>Jatropha curcas</i> , L. KUD/Ang./307	Maraoudala, Sappoudala	Latex	Latex of the plant is applied to aphthae affected area
* <i>Ricinus communis</i> , L. KUD/Ang./266	Haralu, Oudala	Seed oil	Oil of the seed is applied to aphthae affected area
Lamiaceae			
* <i>Leucas aspera</i> , (Willd.) Link. KUD/Ang./270	Tumbekasa	Leaves	Leaves are ground with common salt, juice is extracted by filtering through fine cotton cloth and the same is dropped into the ears for relief from toothache
		Whole plant	Whole plant is powdered and used to massage the teeth and gums for plaque and caries
<i>Ocimum sanctum</i> , L. KUD/Ang./268	Tulsi	Leaves	Leaves are crushed with common salt and placed on painful tooth
Liliaceae			
<i>Allium sativum</i> , L. KUD/Ang./706	Ballulli	Bulb	Bulb is chewed for relief from toothache
Malvaceae			
* <i>Gossypium herbaceum</i> , L. KUD/Ang./742	Karihatti	Seeds	Seeds are crushed with leaves of Uttarani (<i>Achyranthes aspera</i> , L.) and common salt, and this paste is placed on painful teeth area
Meliaceae			
<i>Azadirachta indica</i> , A. Juss. KUD/Ang./547	Bevina mara	Bark	Powdered inner bark of the tree is kept in the mouth for half an hour for the relief of toothache
Mimosaceae			
<i>Acacia nilotica</i> , (L.) Delile KUD/Ang./702	Karijali	Bark	Half a tea spoon of powdered inner bark of the tree is kept in the mouth for half an hour for relief from toothache
		Bark	Decoction prepared out of inner bark is used as a gargle to stop bleeding gums caused by pyorrhea
		Bark	Inner bark of the tree is chewed and kept in the mouth for half an hour for relief from aphthae
* <i>Prosopis juliflora</i> (Sw.) DC. KUD/Ang./782	Sarakari jali	Leaves	Leaves are ground with tobacco (<i>Nicotiana tabacum</i> , L.) and lime and placed on painful tooth are for relief
Moraceae			
<i>Strelbus asper</i> , Lour. KUD/Ang./226	Mittli mara	Bark	Bark of this tree is powdered with copper sulphate and half a tea spoon of this is kept in mouth for half an hour for relief from toothache
Myrtaceae			
<i>Psidium guajava</i> , L. KUD/Ang./277	Perala gida	Young leaves	A young leaf of this plant is chewed with common salt for relief from toothache
Olacaceae			
<i>Ximenia americana</i> , L. KUD/Ang./603	Nagari gida	Root	Root paste is prepared and applied on aphthae affected area
Oxalidaceae			
* <i>Oxalis corniculata</i> , L. KUD/Ang./395	Pullampurasi, Hulichikka, Majjigetappala	Leaves	Leaves are well masticated and the juice is kept in mouth for sometime to get relief from aphthae
Papaveraceae			
<i>Argemone mexicana</i> , L. KUD/Ang./460	Golagolaki, Bobbuli	Root	Root is crushed and placed on painful tooth
Salvadoraceae			
* <i>Azima tetracantha</i> , Lamk. KUD/Ang./312	Gangi mullu, Uppi mullu	Leaves	Leaves are ground to get juice and the same is dropped into the ear. Some leaves are crushed and placed on painful tooth

Table 1 (Continued)

Plant	Local name (Kannada language)	Part used	Usage
Solanaceae			
* <i>Solanum nigrum</i> , L. KUD/Ang./403	Kakegida	Leaves	Leaves are ground and juice is extracted by filtering through cotton cloth and is used as eardrop for relief from toothache
<i>Solanum surattense</i> , Burm.f. KUD/Ang./194	Nelagulala, Habbugulala	Seeds	Seeds of the ripened fruit are placed on a red-hot iron. The fumes coming out of it are taken in the mouth and maintained for a few minutes for relief from toothache
		Fruits	Fruits are fried and made into powder. Powder is used to massage the gums, for the treatment of bleeding in pyorrhoea
<i>Solanum violaceum</i> , Ortega. KUD/Ang./145	Gulalaginju, Kadubadane	Fruits	Half a teaspoon of powdered fruit is placed on painful tooth
Verbenaceae			
<i>Vitex negundo</i> , L. KUD/Ang./301	Lakki, Karilakki, Nirgundi	Leaves	Leaves are crushed together with common salt and placed on painful tooth to get relief from toothache
Zygophyllaceae			
<i>Tribulus terrestris</i> , L. KUD/Ang./473	Neggilamullu, Channeggilu	Fruits	Fruits are baked and made in to powder with common salt. Powder is massaged into teeth and gums for relief from toothache

New claims are indicated by *.

Indian ethnomedicine. Plants like *Azadirachta indica*, *Salvadora persica*, *Acacia catechu*, *Acacia nilotica*, *Juglans regia*, *Ficus bengalensis* and *Jatropha curcas* are reported as a source for chewing sticks (Farooqi et al., 1998). *Achyranthes aspera* used in the study area is an addition to this list. The plant *Acacia nilotica* appears to be active against various bacteria found in the oral cavity. The leaves of *Ocimum sanctum* contain phenol and eugenol as essential oils, which have antiseptic and anaesthetic properties (Farooqi et al., 1998). Hence, there is scope for screening of presently recorded plants (Table 1) for active compounds having specific effects on oral diseases.

Although the causes of aphthae are not properly understood, various treatments have been described which include the administration of Vitamin B and C, tincture of iodine and camphorated phenol by means of a matchstick. In this context it is very interesting to note that *Blepharis repens*, *Basella alba*, *Capparis sepiaria*, *Jatropha curcas*, *Ricinus communis*, *Ximenia americana* and *Oxalis corniculata* have been used in the cure of aphthae (Table 1). The mechanism of action of each plant in the cure of aphthae might be different. The cure of aphthae might be due to the supplementation of Vitamin B complex or to quick healing and there by relieving of pain. The mechanism of action of these plants on aphthae is worth further investigation.

Tender leaves of *Psidium guajava* are used to clean the tongue by the 'Gowlis' tribe of Uttara Kannada (Bhandary et al., 1995), but the present study revealed that the same part of the plant is also used in treating toothache.

Claims made by the herbal healers of Dharwad on *Leucas asper* a in the treatment of plaque and caries is found to correspond with the claims made by the 'Siddis' tribe of Uttara Kannada (Bhandary et al., 1995).

Antibacterial activity of some plant species like *Acorus calamus*, *Calotropis gigantea*, *Pergularia daemia*, *Carica papaya*, *Jatropha curcas*, *Leucas aspera*, *Azadirachta indica*, *Argemone mexicana* and *Vitex negundo*, have been tested (Rao, 2000). Interestingly these plants are employed in oral health care in Dharwad district. As most of the oral diseases are due to bacterial infections, such pharmaco-chemical studies of other reported plants may lead to identifying better drugs of high potential and very specific to the treatment of oral ailments.

Acknowledgements

The authors are thankful to UGC for the financial assistance and University authorities for facilities provided.

References

- Anon., 1995. Indian Medicinal Plants—A Compendium of 500 Species, vol. 1–5. Orient Longman, Madras.
- Bhandary, M.J., Chandrashekar, K.R., Kaveriappa, K.M., 1995. Medical ethnobotany of the Siddis of Uttara Kannada district, Karnataka, India. Journal of Ethnopharmacology 47, 149–158.
- Bhandary, M.J., Chandrashekar, K.R., Kaveriappa, K.M., 1996. Ethnobotany of Gowlis of Uttara Kannada district, Karnataka. Journal of Economic and Taxonomical Botany Additional series 12, 244–249.
- Farooqi, A.H.A., Jain, S.P., Shukla, Y.N., Ansari, S.R., Kumar, S., 1998. Medicinal plants in oral health care in India. Journal of Medicinal and Aromatic Plant Sciences 20, 441–450.
- Harsha, V.H., Hebbar, S.S., Hegde, G.R., Shripathi, V., 2002. Ethnomedical knowledge of plants used by Kunabi Tribe of Karnataka in India. Fitoterapia 73, 281–287.

- Jain, S.K., 1991. Dictionary of Indian Folk Medicine and Ethnobotany. Deep Publications, New Delhi.
- Kirtikar, K.R., Basu, B.D., 2001. Indian Medicinal Plants, vol. 1–11. Oriental Enterprises, Uttaranchal.
- Lee, E.S., 1953. Mouth diseases. In: Horder, L.C. (Ed.), Encyclopedia of Medical Practice. V. Mosby Company, London, vol. 9, pp. 23.
- Nadkarni, A.K., 1976. Indian Materia Medica. Popular Prakashan Private Limited, Mumbai.
- Rao, K., 2000. Materials for the Database of Medicinal Plants. Karnataka State Council for Science and Technology, Bangalore.
- Yoganarasimhan, S.N., 1996. Medicinal Plants of India, vol. 1. Interline Publishing Private Limited, Bangalore, Karnataka.