

Traditional oral care medicinal plants survey of Tamil Nadu

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Abstract

An oral care medicinal plants survey was conducted in different districts of Tamil Nadu during the period of 2000-2004. A total of 114 plants species, distributed among 97 genera belonging to 51 families were recorded. Most of the plants are used to relieve toothache (29.82%), as toothbrush (25.43%), mouthwash/gargle (16.66%), against common dental diseases (14.03%), mouth related stomatitis/ulcer/gingivitis (12.28%) and gum bleeding/disorders (10.53%). In the present paper these plants are arranged in alphabetical order with their scientific name, family, local name, part used and existing/surveyed uses.

Key words: Oral hygiene, Dental disease, Ethnobotany, Toothbrush, Toothache, Medicinal plants, Tamil Nadu.

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are the 2 hotspots in India and the country is represented by 400 different tribes and other ethnic groups with about 67.8 million total population⁴. Tamil Nadu is situated on the eastern side of the Indian peninsula (North latitude between 8°5' and 13°35' - East Longitude between 76°15' and 80°20'). The state has 30 districts and includes 37 tribal communities. They are distributed in various districts. The tribal and rural population of India in general and Tamil Nadu in particular is highly dependent on natural cure for meeting their healthcare needs. They are found to be the repository of accumulated experience and knowledge of indigenous vegetation. This attracted the attention of several researchers and plant scientists who directed vigorous research towards the rediscovery of several medicinal plants and there was a spurt of scientific literature.

Recently, considerable attention has been paid to utilize eco-friendly and bio-friendly plant based products for the prevention and cure of different human diseases. It is documented that 80% of the world's population has faith in traditional medicine, particularly plant drugs for their primary healthcare⁵. It is generally estimated that over 6000 plants in India are in use in traditional, folk and herbal medicine, representing about 75% of the medicinal needs of the third world

Introduction

Keeping the mouth clean dates back ancient civilization. The development of toothpaste began as long ago as 300/500 B.C. in China and India. According to Chinese history, a learned man, Huang-Ti, studied the care of teeth and claimed that different types of pain felt in the mouth could be cured by sticking gold and silver needles in to different parts of the jaw and gum. These reports support the importance and development of dental cleanliness. First attempts at tooth cleaning included using abrasives such as crushed bone, crushed egg and Oyster shells, which were used to clean debris from teeth. Tooth powders were the first noticeable advance and were made up of elements like powdered charcoal, powdered bark and some flavouring agents, applied to teeth using a simple stick^{1, 2}.

Most of the people living in urban or suburb area use toothpastes, massage gels and mouth rinses which contain synthetic substances such as antimicrobially active benzydamine hydrochloride {1-benzyl- [3-(dimethylamino) propoxyl]-1H-indazole}, cetylpyridinium chloride, chlorhexidine digluconate [1,6-di (4'-chlorophenyldiguanido) hexane digluconate], triclosan (5-chloro-2,2,4-dichlorophenoxy) phenol and zinc chloride or stannous fluoride³. However, still village people use the plant or plant parts like seed/fruits, leaves, stem, bark and gum as tooth brush, oral gargle and mouth washes for oral hygiene.

India is one of the 12-megadiversity countries in the world and has 17,000 flowering plants. Of the designed 25 hotspots in the world, the Eastern Himalaya and the Western Ghats

countries⁶. For the awareness of medicinal potential of plants especially for oral care a survey was conducted in Tamil Nadu villages and information collected is presented in this paper.

Methodology

The survey was conducted during the period of 2000-2004 mainly in the Madurai, Dindigul, Sivagangai,

Thiruchirappalli, Theni and Viruthunagar districts of Tamil Nadu. The information was collected from different ethnic groups, villagers, traditional healers/vaidyas who use the plants for oral hygiene. From time to time various reports have been published by the author on plants used for different purposes⁷⁻¹³. Present paper deals with useful plants for oral care. A literature survey was also carried out for

cross checking/compilation of existing information on the oral care plants of Tamil Nadu¹⁴⁻¹⁶. The specimens were identified with the help of local floras¹⁷⁻²² and in the enumeration plants are arranged in alphabetical order with their scientific names, family, local name, part used and uses (Tables 1-4).

Table 1 : Plants used as toothbrush or dentifrice to cure various dental problems

S. No.	Botanical name	Family	Vernacular name	Part(s) used	Uses /Curative practices
1.	<i>Abrus precatorius</i> Linn.	Fabaceae	Kundumani	Leaves	Dentifrice, strengthening the gum and teeth
2.	<i>Acacia arabica</i> Willd.	Mimosaceae	Karuvaelam	Gum, bark, fruit, young stem	Gargle for toothache, gum disorders, toothbrush
3.	<i>Acacia farnesiana</i> (Linn.) Willd.	-do-	Peekaruvil	Bark, leaf, fruit, gum	Gingivitis, dentifrice
4.	<i>Achyranthes aspera</i> Linn.	Amaranthaceae	Nayaruvil	Root	Gum disorders, toothbrush
5.	<i>Alangium salviifolium</i> Wang.	Alangiaceae	Alangi	Young stem	Toothbrush, foetid smell
6.	<i>Anacyclus pyrethrum</i> DC.	Asteraceae	Akkirakaram	Root	Used in tooth powder
7.	<i>Anisomeles malabarica</i> (Linn.) R. Br.	Lamiaceae	Peyameratti	Leaves	Fever accompanying teething in children
8.	<i>Annona squamosa</i> Linn.	Annonaceae	Sitaphal	Young stem, leaves	Toothbrush, toothache
9.	<i>Areca catechu</i> Linn.	Arecaceae	Pakku	Nuts	Dentifrice
10.	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Vepamaram	Fresh tender leaves or twigs	Pyorrhoea, toothbrush
11.	<i>Bambusa arundinacea</i> Willd.	Poaceae	Moongil	Young stem	Toothbrush
12.	<i>Borassus flabellifer</i> Linn.	Arecaceae	Panai	Root, young rachis	Toothache, toothbrush
13.	<i>Cajanus cajan</i> (Linn.) Millsp.	Fabaceae	Thuvarai	Leaf, seeds, young stem	Gingivitis, stomatitis, toothbrush
14.	<i>Calotropis gigantea</i> (Linn.) R.Br. ex Ait.	Asclepiadaceae	Arukku	Fresh root	Toothbrush, toothache
15.	<i>Carmona microphylla</i> G. Don	Ehretiaceae	Kattuvettilai, Kuruvingi	Leaves	Foetid breath, dentifrice
16.	<i>Cassia auriculata</i> Linn.	Caesalpinaceae	Aavarai	Young stem	Toothbrush
17.	<i>Cocos nucifera</i> Linn.	Arecaceae	Thenmai	Branch of spadix	Foetid breath, toothbrush
18.	<i>Commiphora myrrha</i> (Nees) Engl.	Burseraceae	Velaippapolam	Gum	Gargle for spongy gum, ulcerated sore throat, dentifrice in caries of the teeth
19.	<i>Cyperus rotundus</i> Linn.	Cyperaceae	Korai kizhangu	Bulb	Mouth wash, gum diseases, tooth powder
20.	<i>Ficus benghalensis</i> Linn.	Moraceae	Aalamarum	Bark, leaf, flower, latex, adventitious root	Dental and gum disorders, toothbrush

S. No.	Botanical name	Family	Vernacular name	Part(s) used	Uses /Curative practices
21.	<i>Ficus retusa</i> Linn.	Moraceae	<i>Kallichai</i>	Adventitious root	Decayed or aching tooth, toothbrush
22.	<i>Hibiscus rosa-sinensis</i> Linn.	Malvaceae	<i>Semparuthi</i>	Young stem	Toothbrush
23.	<i>Jatropha curcas</i> Linn.	Euphorbiaceae	<i>Kattamanakku</i>	Young stem, latex	Toothbrush, foetid smell, mouth ulcer
24.	<i>Jatropha gossypifolia</i> Linn.	-do-	<i>Athalai</i>	Young stem, latex	Toothbrush, foetid smell, mouth ulcer
25.	<i>Kirganelia reticulata</i> Baill.	-do-	<i>Karunelli</i>	Leaves, stem	Bleeding gum, toothbrush
26.	<i>Mentha arvensis</i> Linn.	Lamiaceae	<i>Pudina</i>	Whole plant	Toothache, mouthwash, dentifrice
27.	<i>Merremia tridentata</i> (Linn.) Hallier f.	Convolvulaceae	<i>Mudiyar-koonthal</i>	Root	Toothache, dentifrice
28.	<i>Mimusops elengi</i> Linn.	Sapotaceae	<i>Mahila</i>	Bark, fruit, seed	Dental diseases, dentifrice
29.	<i>Monochoria vaginalis</i> C. Presl.	Pontederiaceae	<i>Karunkuvalai</i>	Leaves	Toothache, dentifrice
30.	<i>Myrica esculenta</i> Buch.-Ham. ex D. Don	Myricaceae	<i>Marudam</i>	Bark	Toothache, dentifrice
31.	<i>Peltophorum pterocarpum</i> Backer ex K. Heyne	Caesalpiniaceae	<i>Perungondrai</i>	Bark	Dentifrice
32.	<i>Phoenix sylvestris</i> Roxb.	Arecaceae	<i>Paerichu</i>	Root, young rachis	Toothache, toothbrush
33.	<i>Pongamia pinnata</i> Pierre	Fabaceae	<i>Pongam</i>	Root, bark	Strengthening the gums, dentifrice
34.	<i>Psidium guajava</i> Linn.	Myrtaceae	<i>Koyya</i>	Fruit, bark, leaf	Bleeding gum, mouthwash, dentifrice
35.	<i>Solanum surattense</i> Burm. f.	Solanaceae	<i>Kandankathari</i>	Seed	Gum disorders, tooth pain, dentifrice
36.	<i>Streblus asper</i> Lour.	Moraceae	<i>Pirayam</i>	Bark, leaf, exudates	Dental diseases, dentifrice
37.	<i>Syzygium aromaticum</i> (Linn.) Merrill & Perry	Myrtaceae	<i>Kirambu</i>	Essential oil, flower bud	Caries cavities, dentifrice
38.	<i>Tamarindus indica</i> Linn.	Caesalpiniaceae	<i>Puli</i>	Fruits, young stem, bark	Gargle in throat infection, dentifrice, toothbrush
39.	<i>Terminalia arjuna</i> Wight & Arn.	Combretaceae	<i>Venmaruthu</i>	Bark	Tooth pain, dentifrice
40.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	-do-	<i>Thandrikai</i>	Fruit	Gargle for toothache, sore throat, gum bleedings, dentifrice
41.	<i>Terminalia catappa</i> Linn.	-do-	<i>Nattuvadum</i>	Fruits, bark	Tooth pain, dentifrice
42.	<i>Toddalia aculeata</i> Pers.	Rutaceae	<i>Milagaranai</i>	Stem	Clean the plaque, gum disorders, toothbrush
43.	<i>Wrightia tinctoria</i> R. Br.	Apocynaceae	<i>Vetpalai</i>	Leaves, young stem	Toothache, toothbrush

Table 2: Plants used for mouth wash/gargle

S. No.	Botanical name	Family	Vernacular name	Part(s) used	Uses/Curative practices
1.	<i>Bauhinia tomentosa</i> Linn.	Caesalpiniaceae	<i>Iruvaji</i>	Root bark	Gargle
2.	<i>Cassia javanica</i> Linn.	-do-	<i>Kondrai</i>	Young leaves	Foetid smell of mouth
3.	<i>Caesalpinia pulcherrima</i> (Linn.) Sw.	-do-	<i>Mayilkondrai</i>	Seed	Mouth wash
4.	<i>Ficus racemosa</i> Linn.	Moraceae	<i>Atti</i>	Latex, bark	Gargle for sore throat

S. No.	Botanical name	Family	Vernacular name	Part(s) used	Uses/Curative practices
5.	<i>Ficus religiosa</i> Linn.	Moraceae	Arasamaram	Various parts	Mouth sore, gargle in salivation
6.	<i>Hedyotis diffusa</i> Willd.	Rubiaceae	Impural	Herb	Mouthwash, toothache
7.	<i>Laurus camphora</i> Linn.	Lauraceae	Karpooram	Camphor	Mouthwash, toothache
8.	<i>Mangifera indica</i> Linn.	Anacardiaceae	Maamarum	Bark	Gargle for mouth ulcer, foetid smell
9.	<i>Origanum vulgare</i> Linn.	Lamiaceae	Maruzhu	Whole plant	Mouthwash, toothache
10.	<i>Phoenix pusilla</i> Gaertn.	Arecaceae	Ichamaram	Fruits	Gargle for foetid breath
11.	<i>Scoparia dulcis</i> Linn.	Scrophulariaceae	Sarkaraivembu	Leaves	Gargle for toothache
12.	<i>Syzygium malaccense</i> (Linn.) Merrill & Perry	Myrtaceae	Malay apple	Leaves	Mouthwash, cracked tongue

Table 3 : Plants used to cure the specific disorders of teeth and gum

S. No.	Botanical name	Family	Vernacular name	Part(s) used	Uses/Curative practices
1.	<i>Acalypha indica</i> Linn.	Euphorbiaceae	Koppaimeni	Whole plant	Gingivitis, gum bleedings
2.	<i>Amorphophallus sylvaticus</i> (Roxb.) Kunth	Araceae	Seenai	Fruit, seed	Toothache
3.	<i>Arabidopsis thaliana</i> (Linn.) Heyne	Brassicaceae	Kuthiraipul	Whole plant	Used for sores in mouth
4.	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Balamaram	Root, gum	Toothache
5.	<i>Barleria prionitis</i> Linn.	Acanthaceae	Shemmuli	Leaves	Toothache
6.	<i>Canscora diffusa</i> (Vahl.) R. Br.	Gentianaceae	-	Whole plant	Stomatitis (Inflammation of the mouth and redness)
7.	<i>Cinnamomum verum</i> J. Presl.	Lauraceae	Ilavangam	Bark	Toothache
8.	<i>Cleome chelidonii</i> Linn. f.	Cleomaceae	Perunaikaduku	Whole plant	Gingivitis
9.	<i>Coccinia grandis</i> (Linn.) Voigt.	Cucurbitaceae	Kovai	Root, stem, leaf, fruit	Stomatitis
10.	<i>Coscinium fenestratum</i> Colebr.	Menispermaceae	Maramanjil	Root, stem, fruit	Stomatitis
11.	<i>Diospyros racemosa</i> Roxb.	Ebenaceae	Karunthuvarai	Gum	Toothache
12.	<i>Elephantopus scaber</i> Linn.	Asteraceae	Anashovadi	Root	Toothache
13.	<i>Erythrina variegata</i> Linn.	Fabaceae	Kalyanamurungai	Bark, leaf, flower, seed	Stomatitis
14.	<i>Ficus carica</i> Linn.	Moraceae	Shimeatti	Roasted fig	Poultice for gumboil
15.	<i>Glossogyne bidens</i> (Retz.) Alston.	Asteraceae	-	Root	Toothache
16.	<i>Gymnema sylvestre</i> R. Br.	Asclepiadaceae	Shirukurinja	Root, leaf	Stomatitis
17.	<i>Hygrophila quadrivalvis</i> Nees	Acanthaceae	Neermulli	Leaves	Toothache
18.	<i>Jasminum ritchiei</i> C. B. Clarke	Oleaceae	Karumullai	Leaves	Toothache
19.	<i>Ludwigia prostrata</i> Roxb.	Onagraceae	-	Leaves	Toothache
20.	<i>Luffa cylindrica</i> M. Roem.	Cucurbitaceae	Mozhukupirkankai	Leaf, flower, fruit	Dental diseases
21.	<i>Majorana hortensis</i> Moench.	Lamiaceae	Maru	Essential oil, herb	Toothache
22.	<i>Melothria maderaspatana</i> (Linn.) Cogn.	Cucurbitaceae	Musumusukai	Leaves, root	Toothache
23.	<i>Morinda citrifolia</i> Linn.	Rubiaceae	Nuna	Leaves, fruits	Used for spongy gum, throat complaints
24.	<i>Nepeta cataria</i> Linn.	Lamiaceae	-	Leaves	Toothache

S. No.	Botanical name	Family	Vernacular name	Part(s) used	Uses/Curative practices
25.	<i>Nicotiana tabacum</i> Linn.	Solanaceae	<i>Pukaiyilai</i>	Leaves	Toothache
26.	<i>Nopalea cochenillifera</i> (Linn.) Salm - Dyck.	Cactaceae	<i>Puchikallai</i>	Mucilaginous joint	Toothache
27.	<i>Nypa fruticans</i> Wurbm.	Arecaceae	-	Root, leaves	Toothache
28.	<i>Osbeckia crinita</i> Benth.	Melastomataceae	-	Leaves	Toothache
29.	<i>Phyllanthus multiflorus</i> Willd.	Euphorbiaceae	<i>Neerpoolan</i>	Leaves	Bleeding gums
30.	<i>Piper betle</i> Linn.	Piperaceae	<i>Vettilai</i>	Leaves	Foetid smell of mouth, gum bleeding
31.	<i>Plantago major</i> Linn.	Plantaginaceae	<i>Ishappukol</i>	Whole plant	Toothache, gum bleeding
32.	<i>Portulaca oleracea</i> Linn.	Portulacaceae	<i>Paruppukeerai</i>	Herb	Ulceration of mouth
33.	<i>Salvia officinalis</i> Linn.	Lamiaceae	-	Essential oil	Gingivitis
34.	<i>Solanum aculeatissimum</i> Jacq.	Solanaceae	<i>Palvalipoondu</i>	Root	Toothache
35.	<i>Solanum nigrum</i> Linn.	-do-	<i>Manathakali</i>	Leaves, fruits	Mouth ulcer
36.	<i>Spilanthes calva</i> DC.	Asteraceae	<i>Palvalipoondu</i>	Flower	Paralysis of tongue, tooth ache
37.	<i>Symplocos racemosa</i> Roxb.	Symplocaceae	<i>Velli-lethi</i>	Bark	Bleeding gums, stomatitis
38.	<i>Tabernaemontana divaricata</i> R. Br. ex Roem. & Scult.	Apocynaceae	<i>Nandiyavattam</i>	Root	Toothache
39.	<i>Tabernaemontana heyneana</i> Wall.	-do-	<i>Kundalampalai</i>	Root	Toothache
40.	<i>Tephrosia purpurea</i> (Linn.) Pers.	Fabaceae	<i>Kollingi</i>	Whole plant	Gingivitis
41.	<i>Terminalia chebula</i> Retz.	Combretaceae	<i>Kadukai</i>	Fruit	Gargle for toothache, sore mouth, spongy and ulcerated gums
42.	<i>Vernonia cinerea</i> Less.	Asteraceae	<i>Mukuttipundu</i>	Whole plant	Stomatitis
43.	<i>Vitex altissima</i> Linn. f.	Verbenaceae	<i>Mailaadi</i>	Fruit	Stomatitis
44.	<i>Xanthium strumarium</i> Linn.	Asteraceae	<i>Maruloomatham</i>	Young bud	Toothache
45.	<i>Ximenia americana</i> Linn.	Olcaceae	<i>Chiru-illanthai</i>	Root	Gum trouble
46.	<i>Zanthoxylum limonella</i> (Dennst.) Alston	Rutaceae	<i>Verasinghan pattai</i>	Bark	Toothache

Table 4: Plants used for common dental disorders

S. No.	Botanical name	Family	Vernacular name	Part(s) used
1.	<i>Achras zapota</i> Linn.	Sapotaceae	<i>Sapota</i>	Gum from bark
2.	<i>Albizia lebbek</i> Benth.	Mimosaceae	<i>Vaagai</i>	Root, bark, leaf, seed, resin
3.	<i>Argemone mexicana</i> Linn.	Papaveraceae	<i>Bramdand</i>	Whole plant
4.	<i>Cordia obliqua</i> Willd.	Boraginaceae	<i>Virusam</i>	Bark, leaf, fruit, seed
5.	<i>Croton tiglium</i> Linn.	Euphorbiaceae	<i>Nervalam</i>	Root, leaf, seed
6.	<i>Eclipta prostrata</i> Linn.	Asteraceae	<i>Karisalai</i>	Whole plant
7.	<i>Holarrhena antidysenterica</i> Wall.	Apocynaceae	<i>Kudasappalai</i>	Root, bark, seed
8.	<i>Lannea coromandelica</i> (Houtt.) Merrill	Anacardiaceae	<i>Othiyamaram</i>	Root, bark, leaf, gum
9.	<i>Ligustrum indicum</i> (Lour.) Merrill	Oleaceae	-	Stem
10.	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	<i>Vengai</i>	Stem, bark, leaf, gum
11.	<i>Solanum anguivi</i> Lam.	Solanaceae	<i>Karimulli</i>	Whole plant
12.	<i>Soymida febrifuga</i> Juss.	Meliaceae	<i>Semmaram</i>	Bark
13.	<i>Trichosanthes nervifolia</i> Linn.	Cucurbitaceae	<i>Kambuppudalai</i>	Fruit



Monochoria vaginalis



Annona squamosa



Argemone mexicana



Solanum surattense



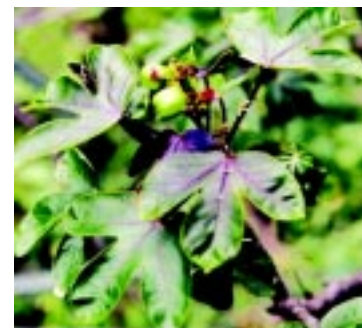
Alangium salviifolium



Cassia javanica



Terminalia bellirica



Jatropha gossypifolia

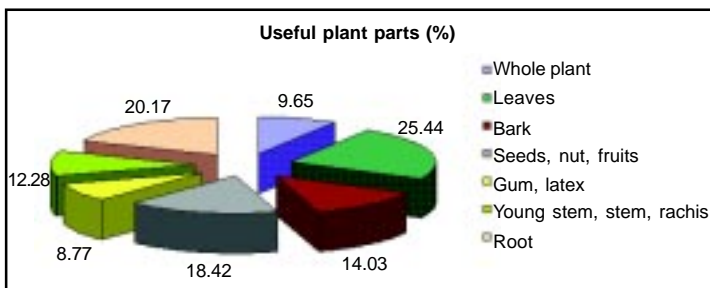


Fig. 1 : Useful parts of oral care plants of Tamil Nadu



Caesalpinia pulcherrima



Anacyclus pyrethrum

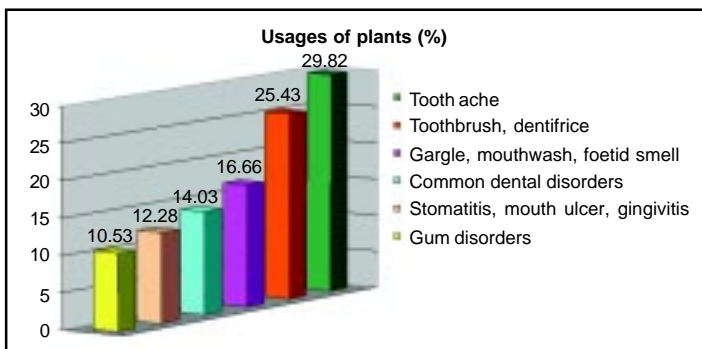


Fig. 2 : Usages of traditional oral care plants of Tamil Nadu



Hygrophila quadrivalvis

Results and Discussion

A total of 114 species of oral care medicinal plants, distributed among 97 genera belonging to 51 families were recorded. Among the families, most of the species were belonging to Asteraceae and Lamiaceae (7 spp. each), followed by Euphorbiaceae, Caesalpiniaceae, Fabaceae, Arecaceae (6 spp. each), Solanaceae (5 spp.), Combretaceae, Cucurbitaceae, Apocynaceae (4 spp. each), Mimosaceae, Myrtaceae (3 spp. each), Sapotaceae, Meliaceae, Acanthaceae, Asclepiadaceae, Lauraceae, Rubiaceae, Oleaceae, Rutaceae and Anacardiaceae (2 spp. each). Remaining 29 families were represented by single species each (Tables 1-4).

Among the reported plants, leaves were the dominant part in oral care uses (25.44%), followed by root (20.17%), seed/nut/fruits (18.42%), bark (14.03%), young stem/stem/rachis (12.28%), whole plant (9.65%) and gum/latex (8.77%) (Fig.1). Among the utilization, most of the plants were used to relieve from toothache (29.82%) followed by, used as dentifrice/toothbrush (25.43%), mouthwash/gargle (16.66%), against common dental diseases (14.03%), mouth related stomatitis/ulcer/gingivitis (12.28%) and gum bleeding/disorders (10.53%) (Fig. 2). The mode of utilization of these plants is either in the form of gargle of the decoction of the plant part(s), powder of dried material or toothbrush.

Conclusion

Present report is a result of exhaustive survey on traditional uses of plants for oral/dental care and it revealed that there is a wide usage of oral care plants by village people/ethnic group of

Tamil Nadu. The information collected about the usage/methodology cannot be claimed to be fully correct. Hence, detailed pharmacological, chemical and clinical investigations should be made to confirm their medicinal properties. However, among the reported plants, some are already explored and used in manufacturing several oral hygiene products.

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