

Potential Plant Resource for Oral Health, Kozhikode, Mukkam.

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Abstract

Dental/oral sicknesses are one of the major public health problems globally.

The software of natural drug treatments for the supervisor of oral illnesses are considered as a powerful alternative to synthetic compound because of their lower aspect effect. The present study was carried out to document the indigenous traditional knowledge of medicinal plants used for dental problems, in Mukkam village (Kurinjipara, koompara), Calicut which revealed the ethno medicinal information of 23 plant species belonging to 14 families and of the total 23 species documented. A number of plants parts are used in the form of chewing sticks in various parts of world that help in clearing the buccal cavity. These days a number of plants are used to prepare plant-based tooth pastes and gels, since plant contains chemical constituents which are active against microbes. The present investigation brought out some popular and frequently used medicinal description utilized by the Mukkam people for dental problems.

Key words: Dental, medicinal plants, Kerala

1. Introduction

Oral Conditions and problems are the main worldwide health complications that will affect roughly 3.5 billion people in the world due to their habitual and progressive nature. Utmost oral conditions can be treated in their early stages and are largely preventable. With the adding urbanization and changes in life, substantially in developing countries frequency of oral conditions continues to increase. The poor access to oral health care installations in the community, having food and potables high in sugar, and inadequate exposure to fluoride in toothpaste or water force will be the reasons behind the increase in oral complaint. The most common oral conditions that include clinical conditions affecting mouth and teeth are periodontal conditions, dental caries (tooth decay) etc.

1.1 Oral Hygiene and its Importance

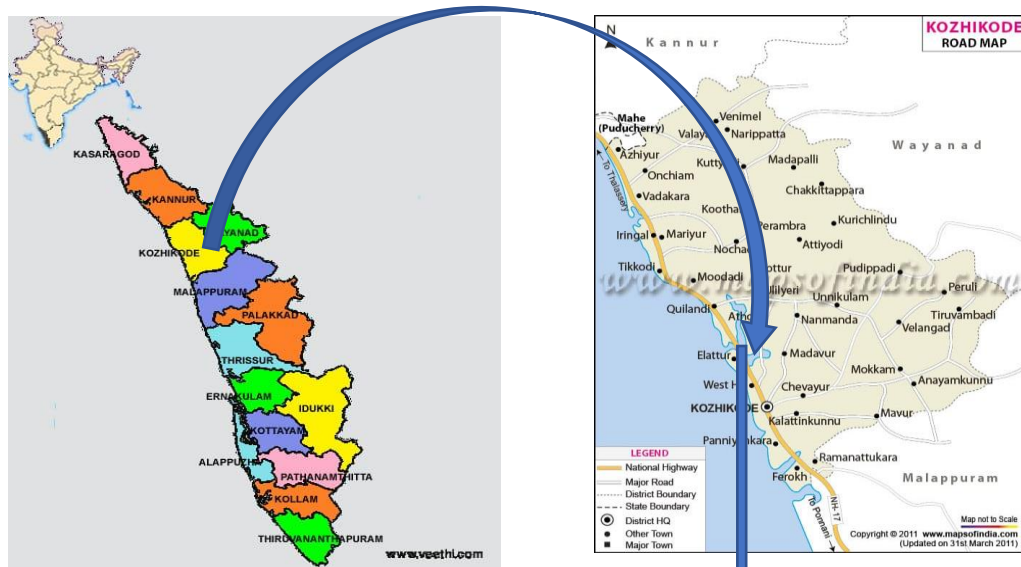
Oral hygiene refers to the act of keeping the teeth clean to help dental problems, utmost generally dental depressions, gingivitis and bad breath. There are also oral pathologic conditions in which good oral hygiene is demanded for healing and regeneration of the oral apkins. These forms included gingivitis, periodontitis, and dental trauma. The health of our teeth and mouth are linked to overall health and wellbeing in number of the way. The capability to suck and swallow our food is essential for carrying the nutrients we need for good health. Incremental from the impact on nutritional status, poor dental health can also negatively affect speech and tone- regard

1.2 Role of plants in oral care

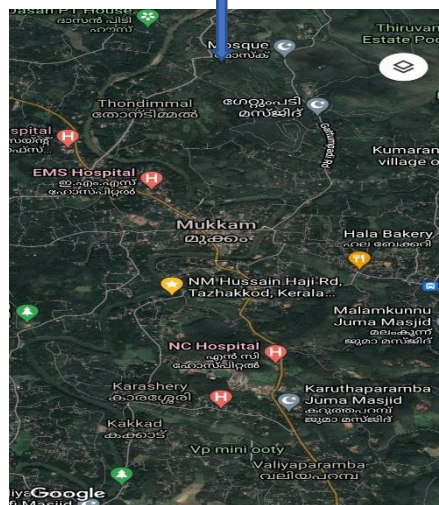
Due to destructive results of chemical based remedies using plant life and plant-based products emerged out as an exceptional opportunity. Medicinal flora has been used as traditional treatments for several human sicknesses for lots of years and in lots of components of the arena. In rural regions of the developing nations, they continue to be used as the primary supply of drugs. Some of flowers are used as chewing sticks in various elements of world which help in cleansing the buccal cavity. nowadays some of flowers are used to put together plant based totally tooth pastes and gels, on the grounds that plant includes chemical ingredients that are lively towards microbes. There are many essential oils that shape a vital constituent of toothpastes, instance oils of Eucalyptus, tea tree, clove, cinnamon etc.

2. Materials and Methods

Kozhikode city is 410 kilo meters north of the state capital Thiruvananthapuram. It is located at approximately 11.25°N 75.77°E, in that the season of rain is during the South West Monsoon, which sets in the June first week and extends up to the September. Extensive field trips have to be organized between August and September in the Calicut Mukkam region based on a formal interview schedule prepared for the purpose villages have to be randomly selected for the study (Mukkam, Kurinjipara, Koompara.) The information on medicinal plants for dental problems was collected by with old-age men. The plant species have to be identified with help of floras. Details have to be collected. Plants have to be grouped according to their families. The collected plants have to be pressed to make herbariums



2.1 Study Area



2.2 Collection of medicinal plants

Plants have to be collected from different villages which possess a variety of medicinal properties to cure dental problems which are commonly seen on our roadsides. They have to be classified according to their family, habit, parts used. Most commonly used herbs and shrubs have to be focused on. Care should be taken while the collection of every plant before documentation.

2.3 Identification of medicinal properties

The plants have to be identified. The parts of the plant to dental problems are noted. By the data obtained from villagers, the plants have to be described and classified.

2.4 Herbarium preparation

The plants have to be collected from different villages herbaceous plants have to be collected as a whole including roots. Collected in polythene bags. To avoid infections the specimen have to be poisoned immediately after Collection. They have to be later pressed in between sheets of blotting paper. After drying, specimens are mounted on sheets of standard size and they are labelled.

2.5 Preparation of data

The collected plants have to be recorded according to their habit, habitat ecology, morphology, parts used. Every Plant was presented with photos for easy identification and recognition. The plants have to be classified according to their families in alphabetical order herbariums have to be presented along with the final project.

3. Result and Discussion

The present study was carried out to document the indigenous traditional knowledge of medicinal plants used for dental problems, in Mukkam village, Calicut which reveal the ethno medicinal information of 23 plant species belonging to 14 families and of the total 23 species documented.

The most medicinally important plant species for dental issues were observed in Lamiaceae and Asteraceae (3 species each) followed by Piperaceae and Zingiberaceae and myrtaceae (2 species each), Acanthaceae, Anacardiaceae, Myrtaceae, Cucurbitaceae, Phyllanthaceae, Myristicaceae, Fabaceae, Rutaceae, Lauraceae, Apocynaceae, combretaceae with one species each (Figure:1). Similar studies were reported by Amith *et al.*, (2016) in Calicut Kerala.

3.1 Table Data

Sl. No	BINOMIAL	VERNACULAR NAME	FAMILY	HABIT	USEFUL PART	USES
1	<i>Acmella</i>	Acmella	Asteraceae	Herb	Flower	Flower is crushed and applying on the teeth will reduce the toothache

2	<i>Acmella oleraceae</i> (L.) R.K.Jansen	Toothache palnt	Asteraceae	Herb	Flowers	Flowers are crushed and applied on the site of toothache
3	<i>Calotropis procera</i> (Aiton) W.T.Aiton	Calotropis	Apocynaceae	Shrub	Latex	The latex of the plant is directly used for toothache.
4	<i>Cinnamomum verum</i> J.Presl	Cinnamon	Lauraceae	Tree	Bark	Cinnamon mixed with honey can be of great use for trating toothache.
5	<i>Citrus limon</i> (L.) Osbeck	Lemon	Rutaceae	Tree	Fruit	Juice of the fruit is applying on teeth will reduce the toothache.
6	<i>Curcuma longa</i> L.	Turmeric	Zingiberaceae	Perennial herb	Rhizome	It is an important ingredient for mouth washes, teeth whitening treatments. Rhizome of the turmeric is crushed and applying on the teeth will reduce the toothache It helps to remove plaque bacteria. It reduce the risk of cavities. It has anti-inflammatory and anti-microbial properties
7	<i>Emilia sonchifolia</i> (L.) DC. Ex Wight	Emilia	Asteraceae	Herb	Leaves	Juice of leaves is applied to treat toothache.
8	<i>Justicia procumbens</i> L.	Water willow	Acanthaceae	Herb	Leaves	Leaves are boiled with gingelly oil applied for toothache
9	<i>Leucas aspera</i> (Willd.) Link	Tumba	Lamiaceae	Herb	Leaves	Chewing the leaves will reduce the toothache

10	<i>Mangifera indica</i> L.	Mango	Anacardiaceae	Tree	Leaves	Mango leaf is widely used for cleaning teeth. Crushing mango leaves and placing it on teeth will reduce the pain.
11	<i>Mimosa pudica</i> L.	Touch me not plant	Fabaceae	Herb	Leaves	Decoction of whole plant used to gargle for toothache. Dried leaf powder is used as tooth powder for scouring teeth, gum inflammation.
12	<i>Mukia maderasapata</i> (L.) M.Roem.	Cucumis maderasapatanus	Cucurbitaceae	Climber	Root	Root is chewed for about to relieve toothache. Decoction of root is used for relieve toothache.
13	<i>Myristica fragrans</i> Houtt.	Nutmeg	Myristicaceae	Tree	Fruits	Seed of the nutmeg is crushed and is used for toothache.
14	<i>Ocimum sanctum</i> Linn	Tulsi	Lamiaceae	Herb	Leaves	Dried leaves of <i>Ocimum sanctum</i> are powdered and used to brush the teeth. Leaves of <i>Ocimum sanctum</i> are used for toothache
15	<i>Phyllanthus niruri</i> L.	Gale of wind	Phyllanthaceae	Herb	Leaves	Chew the leaves or take the juice of the leaves for toothache. Leaves are used for mouth ulcers.
16	<i>Piper longum</i> L.	Tippali	Piperaceae	Climber	Fruits	Rubbing a paste of Tippali powder along with honey on the gums and teeth reduces pain and inflammation in the

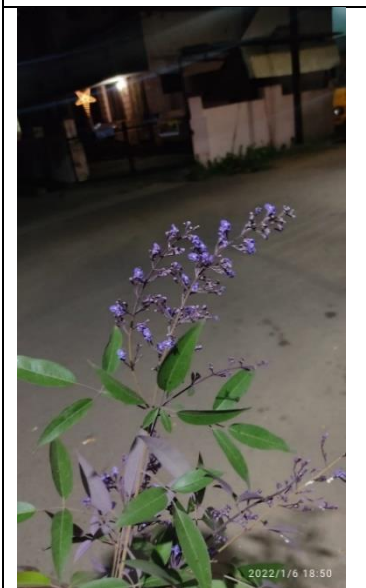
						teeth due to its Kapha balancing nature.
17	<i>Piper nigrum</i> L.	Pepper	piperaceae	Climber	Fruit	The powder of the fruit is applying on the teeth will reduce the toothache.
18	<i>Psidium guajava</i> L.	Guava	Myrtaceae	Tree	Leaves	Leaves are chewed to get relief from toothache. Add guava leaves in water and let it boil for 10 mints, gargle with this will reduce the toothache.
19	<i>Vitex negundo</i> L.	Horseshoe vitex	Lamiaceae	Tree	Leaves	Chew the leaves or take the juice of the leaves for toothache
20	<i>Zingiber officinale</i> Roscoe	Zinger	Zingiberaceae	Perennial herb	Rhizome	It help to reduce the oral bacteria that lead to cavities and to gum diseaeses. Rhizome of the plant will reduce toothache.
21	<i>Azadirachta indica</i>	Neem	Meliaceae	Tree	Leaves	To reduce the toothache boil a bunch of neem leaves in enough water till it reduces to 1/4th of the original volume to reduce toothache. Neem twigs are used as oral deodorant, toothache reliever and for cleaning of teeth. Even chewing neem leaves can bring forth multiple dental and oral benefits

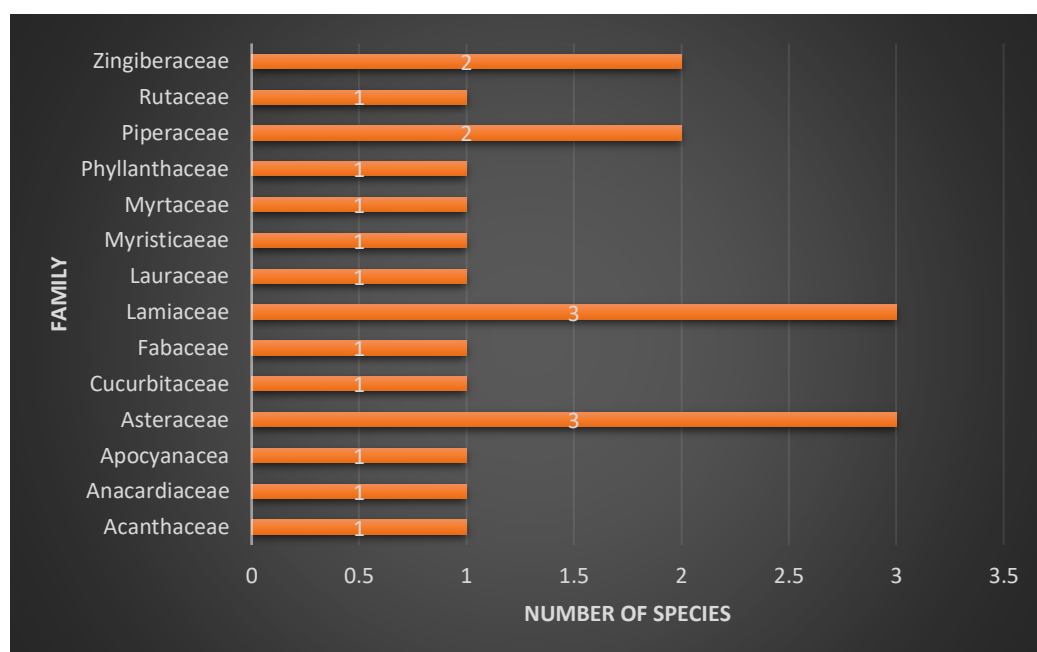
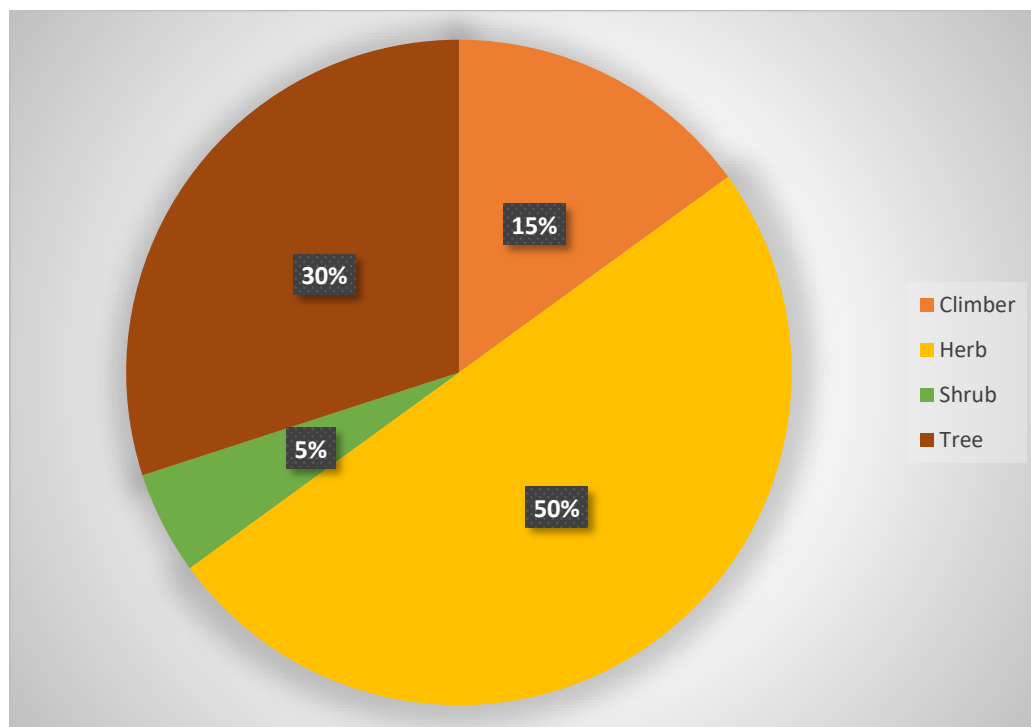
22	<i>Syzygium aromaticum</i>	Clove	Myrtaceae	Tree	unopened flower buds	Using a whole clove put it directly onto the tooth causing pain. With your mouth closed, hold it between your upper and lower teeth. Make a paste out of ground cloves and add a few drops of olive oil. Apply this paste directly on to the tooth. Clove oil, this is the simplest method for pain relief.
23	<i>Terminalia chebula</i>	Kadukkai	Combretaceae	Tree	Fruit	Mix terminalia powder, turmeric powder, salt and a little of water and use it to get rid of yellowing of teeth.

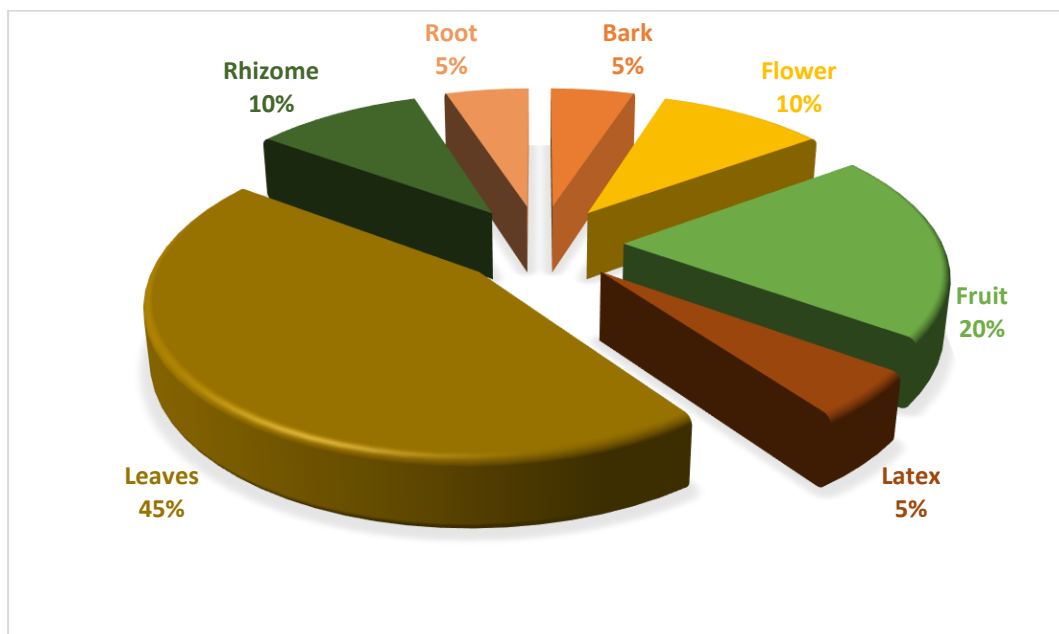
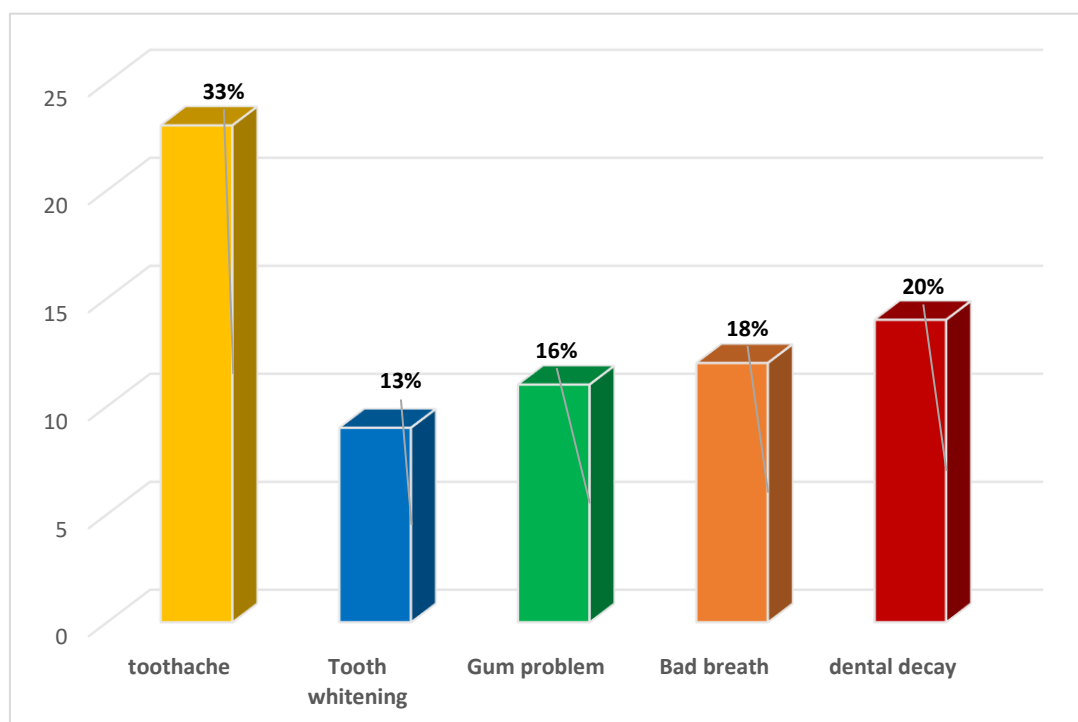
3.2 Plate 1: Medicinal Plants Used for Dental Problems

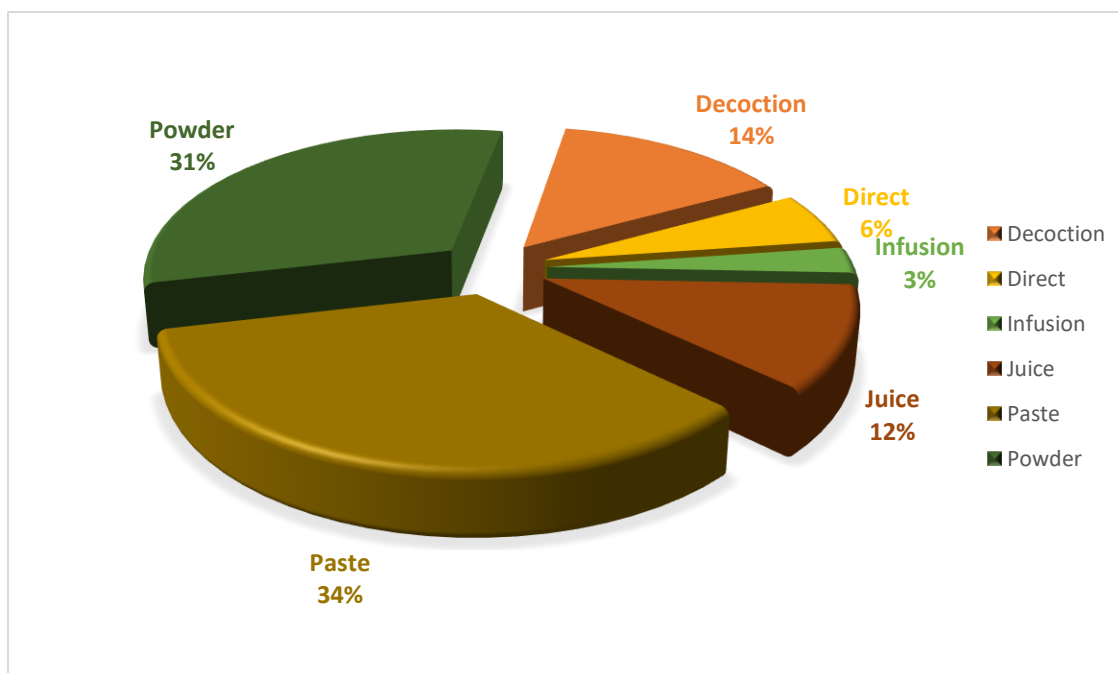
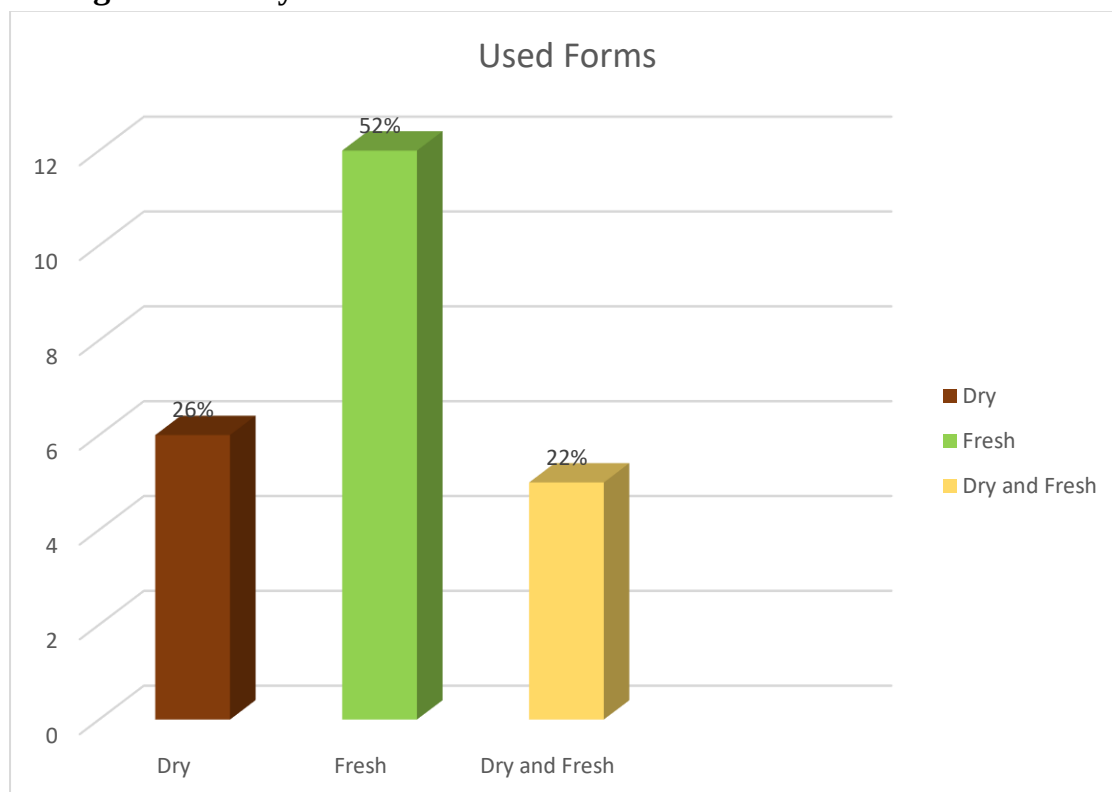


*Acmella radicans**Acmella oleraceae**Mukia maderasapatana**Justicia procumbens**Phyllanthus niruri**Ocimum sanctum**Zingiber officinale**Myristica fragrans**Piper nigrum*

*Psidium guajava L.**Citrus limon**Leucas aspera**Piper longum**Calotropis gigantea**Cinnamomum verum**Vitex negundo**Mangifera indica**Terminalia chebula*

3.3 Figure 1: Enumeration of Medicinal Plants Based on Family**3.4 Figure 2:**
Distribution of Medicinal Plants Based on Habit.

3.5 Figure 3: Analysis of Plant Parts Used for the Preparation of Medicine**3.6 Figure 4: Plants used for different dental problems**

3.7 Figure 5: analysis of mode of preparation of drugs**3.8 Figure 6: Analysis of Plants Used Forms**

4. Conclusion

The present study was carried out to document the indigenous traditional knowledge of medicinal plants used for dental problems, in Mukkam village, Calicut which reveal the ethno medicinal information of 23 plant species belonging to 14 families and of the total 23 species documented. The residence of remote areas mostly depends on traditional knowledge of medicinal plants to cure different oral or dental issues, it is revealed that the Mukkam village is rich in medicinal plants diversity which are used to treat different dental problems from simple to complicated disease. Many studies have been carried out in Calicut district but still there are further place which are still waiting for the proper documentation and acceptance in the pharmacological evaluation.

The most medicinally important plant species for dental issues were observed in Lamiaceae and Asteraceae (3 species each) followed by Piperaceae and Zingiberaceae, myrtaceae (3 species each), Acanthaceae, Anacardiaceae, Myrtaceae, Cucurbitaceae, Phyllanthaceae, Myristicaceae, Fabaceae, Rutaceae, Lauraceae, Apocynaceae, combretaceae with one species each.

Analysis of habit diversity of these medicinal plants revealed that herbs are dominant with 44%, followed by trees (39%), climbers (13%), shrubs (4%) [Fig 2]

In the present study frequently used were guava leaves and zinger, Guava leaves provide quick and short-term relief for toothache. Select the young leaves and chew. The juice of the leaf acts on the aching area and relieves pain. It can be used as a mouthwash by adding salt to a solution boiled in boiling water. And can use ginger to reduce toothache, chew a small piece of fresh and peeled ginger until you are relieved. Instead, boil fresh peeled ginger for 10-20 minutes and make fresh ginger tea, cool and drink.

In this various parts used for oral hygiene leaves (44%) were the most preferred plant part followed by fruit (22%) and flower (13%) and rhizome (9% each), then root, bark, latex (4% each) [Fig 3]. The informants use the whole plant or different plant parts (leaves, fruits, flower, rhizome) to treat dental problems. Leaves and fruits were reported to be the most commonly used plant parts, with root, bark and latex being the least used plant parts.

Among the drug formulation paste (34%) were commonly used followed by powder (31%), decoction (14%), juice (12%) direct (6%) and infusion (3%) [Fig 5]. From the data preparation of paste for the treatment of ailments is a common practice among the people in this area. The paste was done by grinding the fresh or dried plant parts by mixing with water or oil. The decoction was obtained by boiling the plant part in water until the volume of the water reduced to minimum or the required amount. Herbal remedies are considered the oldest form of healthcare known to mankind on this earth.

The present investigation brought out some popular and frequently used medicinal description utilized by the Mukkam people for dental problems.

Our natural treasures of these types of hills and villages are booned with herbal medicines which promote health to man. Hence, it's our bound duty to protect and conserve them for the sustenance of biodiversity.

5. Acknowledgment

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6. References

1. Agarwal P, Nagesh L, Muralikrishnan. Evaluation of the antimicrobial activity of various concentrations of Tulsi (*Ocimum sanctum*) extract against *Streptococcus mutans*: An in vitro study. *Indian J Dent Res* 2010;21:357-9.
2. Agbor, M.A.; Naidoo, S. Ethnomedicinal plants used by traditional healers to treat oral health problems in Cameroon. *Evid.-Based Complement. Altern. Med.* 2015, 2015, 649832. [CrossRef] [PubMed]
3. Anushya, P., Priya, A. J., & Arivarasu, L. (2020). ROLE OF HERBAL MEDICINE IN DENTAL HEALTH-A DETAILED REVIEW. *European Journal of Molecular & Clinical Medicine*, 7(1), 2185-2196.
4. Chandra Shekar, B. R. *et al.*, (2015) 'Herbal extracts in oral health care - A review of the current scenario and its future needs', *Pharmacognosy reviews*, 9(18), pp. 87–92
5. Chang, A. M. *et al.*, (2020) 'An Ayurvedic herbal extract inhibits oral epithelial cell IL-8 responses to host and bacterial agonists', *BMC complementary medicine and therapies*, 20(1), p. 62.
6. George D, Bhat SS, Antony B. Comparative evaluation of the antimicrobial efficacy of *Aloe vera* tooth gel and two popular commercial tooth pastes: An in vitro study. *Gen Dent* 2009;57:238-41.
7. James, S.L.; Abate, D.; Abate, K.H.; Abay, S.M.; Abbafati, C.; Abbasi, N.; Abbastabar, H.; Abd-Allah, F.; Abdela, J.; Abdelalim, A.; *et al.*, Global, regional, and national incidence, prevalence, and years lived with disability for 354 Diseases and Injuries for 195 countries and territories, 1990-2017: A systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018, 392, 1789–1858. [CrossRef]
8. Kumar, M., Prakash, S., Kumari, N., Pundir, A., Punia, S., Saurabh, V., ... & Mekhemar, M. (2021). Beneficial role of antioxidant secondary metabolites from medicinal plants in maintaining oral health. *Antioxidants*, 10(7), 1061.
9. Kumar, P. (2014). Ethno medicinal plants used for oral health care in India. *Justicia*, 6, 7.
10. Manjunath BC, Praveen K, Chandrashekar BR, Rani RM, Bhalla A. Peridontal infections: A risk factor for various systemic diseases. *Natl Med J India* 2011;24:214-9.
11. Martínez, C.C.; Gómez, M.D.; Oh, M.S. Use of traditional herbal medicine as an alternative in dental treatment in Mexican dentistry: A review. *Pharm. Biol.* 2017, 55, 1992–1998. [CrossRef].
12. Megersa, M., Jima, T. T., & Goro, K. K. (2019). The use of medicinal plants for the treatment of toothache in Ethiopia. *Evidence-Based Complementary and Alternative Medicine*, 2019.
13. Nagarajappa R, Batra M, Sharda AJ, Asawa K, Sanadhya S, Daryani H, *et al.* Antimicrobial effect of *Jasminum grandiflorum* L. and *Hibiscus rosa-sinensis* L. Extracts against pathogenic oral microorganisms - An in vitro comparative study. *Oral Health Prev Dent* 2013. [Epub ahead of print].

14. Nayak, N. *et al.*, (2019) 'Evaluation of a mouthrinse containing guava leaf extract as part of comprehensive oral care regimen- a randomized placebo-controlled clinical trial', *BMC complementary and alternative medicine*, 19(1), p. 327
15. Petersen PE. The World Oral Health Report 2003: Continuous improvement of oral health in the 21st century- -the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol* 2003;31(Suppl 1):3-23.
16. Petti, S.; Glendor, U.; Andersson, L. World traumatic dental injury prevalence and incidence, a meta-analysis—One billion living people have had traumatic dental injuries. *Dent. Traumatol.* 2018, 34, 71–86. [CrossRef] Agbor, M.A.; Naidoo, S. Ethnomedicinal plants used by traditional healers to treat oral health problems in Cameroon. *Evid.-Based Complement. Altern. Med.* 2015, 2015, 649832. [CrossRef] [PubMed]
17. Prashant GM, Chandu GN, Murulikrishna KS, Shafiulla MD. The effect of mango and neem extract on four organisms causing dental caries: *Streptococcus mutans*, *Streptococcus salivarius*, *Streptococcus mitis*, and *Streptococcus sanguis*: An in vitro study. *Indian J Dent Res* 2007;18:148-51
18. Prashant GM, Chandu GN, Murulikrishna KS, Shafiulla MD. The effect of mango and neem extract on four organisms causing dental caries: *Streptococcus mutans*, *Streptococcus salivarius*, *Streptococcus mitis*, and *Streptococcus sanguis*: An in vitro study. *Indian J Dent Res* 2007;18:148-51.
19. Sener, B.; Kiliç, M. Herbal extracts used in dental disorders. *J. Sci. Tech. Res.* 2019, 19, 14107–14111. [CrossRef]
20. Sheiham A. Oral health, general health and quality of life. *Bull World Health Organ* 2005;83:644-5.