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HERBAL DENTURE CLEANSER: EXAMPLES AND RECENT DEVELOPMENTS

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ABSTRACT

Ayurveda is traditional system of medicine in India and it is also the world's oldest medicinal system. It is natural system of medicine, which is used in treatment of various diseases. Due to very less side effects, efficacious uses, easy availability, cost effectiveness. Nowadays herbal drugs used preferentially for large number of therapies. In these review paper, we are going to discuss various herbal drugs used in maintenance of oral hygiene. Oral hygiene is one of the most important part of health, which is jeopardy to maintain in ageing peoples. Candida albicans is one of the microorganism which shielded in oral cavity which causes toothache, dental decay, gum problems, cracked teeth which leads to serious Dental disorders like oral cancer. In Ayurveda, medicinal usage, there are many plants which are used to promote oral hygiene by improving dental health. Various herbal drugs have been used traditionally in various dental disorders. Some of herbal drugs Triphala, aloe, Cashew leaves, Turmeric, Clove, Guava leaves, Meswak used as dental cleanser. Since years ago, they have antibacterial and anti-candidal activity. Routine use of dental cleansers is useful to maintain oral hygiene than the mechanical methods. There are several commercially available dental cleansers but herbal drugs have high anti-candidal activity than marketed drugs and herbal drugs used in long scale because they are easily available and low prize. Developing countries due to their properties they are effective remedies in maintaining oral hygiene.

INTRODUCTION

Population of India is increasing daily. As the population is increasing needs of population is also increasing and this is affecting on health of peoples. In rural India 75% population is living and majorly elder peoples are depend on others. Because of this health issues are increasing as the factors like the size of population, high no. of aging ones, inadequate income, lack of health education, short supply of quality health needs are distressing on goal of medical team of healthy society

In these affliction situation herbal drugs plays important role due to absence of side effects, easy availability, high ability of cure and more importantly it is low cost. Dental hygiene is one of the important aspect of healthy individual. Maintenance of dental hygiene is poor in elder peoples due to lack of awareness and economical dependency of elder ones. To avoid dental problems many chemical denture cleansers are used, but it has its own side effects and it is costlier in comparison to herbal drugs with lack side effects and high cost. Artificial replacement of one or more teeth with dental structure is called dental prosthesis. If don't take proper care of tooth it gives serious health issues. There are no of microorganisms present in oral cavity but candida albican is of the most one. Intensity of candida albican presence is more in patients who have replaceable dental prosthesis. Many marketed antimicrobials present in market but ' chlorhexidine gluconate ' is a gold standard drug because of its prolonged broad spectrum of activity and plaque removing ability, but it has its own side

effects and it is economical in comparison to herbal drugs with lack side effects and cost effective.

So to make easy availability for everyone to maintain oral hygiene traditional used drugs are beneficial such as triphala, clove, cashew leaves, meswak, aloe vera, guava leaves. Triphala is used for activity against candida albican species. Cashew leaves also has same effect on candida albicans. Aloe vera shows significant activity against fungi, viruses and bacteria. World is doing great research in recent decades on essential oil which is useful for maintaining oral health which have great antimicrobial activity. Due to some personal errors such as patient's neglectful manner towards oral health, dentists ignorance for herbal ones and preference to chemical denture demanding more awareness about dental hygiene in the society.

Oral cavity diseases

Dental and oral health is a crucial part of our health. Less dental hygiene can lead to dental caries and gum disease and also connected to heart disease, cancer and diabetes. Maintaining healthy teeth and gums is long term constancy. Proper oral hygiene habits are brushing, flossing, limit on sugar intake. These habits are helpful to avoid costly dental procedures and lifelong health issues.

Symptoms of dental and oral problems:

1. Ulcers sores or tender areas in mouth.
2. Bleeding or swollen gums
3. Chronic bad breath
4. Sensitivity
5. Loose teeth
6. Gums.
7. Pain or toothache

8. Pain with chewing or biting
9. Swelling of face and Cheek
10. Cracked or broken teeth.

Types of dental and diseases:

1) **Cavities:**

It is also known as dental caries and tooth decay. Cavity is destruction of tooth are for indefinite time which causes development of small holes. Bacteria, drinking sugary drinks, fast food, acid coat to teeth and formation of plaque are the causes of cavities. Acid get land on teeth that destroy teeth coating that leads to exposure of connective tissue. Cavities not treated by time, they lead intense toothache, loss of teeth and infections.

2) **Gum disease:**

It is also known gingivitis. It is infection of gum that inflamed gums and destroys the jawbone. It occurs because of imperfect brushing and cleansing. In starting stage of gingivitis, bacteria develop in plaque, inflamed gums, bleeding occurs during brushing. Reversible bone damage occurs at early stage and gums irritated at this stage. Mild symptoms of gum disease are ignore easily. But this disease not treated in early this cause severe oral problems.

3) **Periodontitis:**

Infection leads to jaw bones. It causes inflammatory response to complete body. Loss of teeth because of periodontitis. It is very dangerous to heart and lungs. Periodontitis occurs bone destruction which bones are support to teeth. It is an avoidable disorder. It occurs because of poor oral hygiene.

Symptoms of periodontitis are gums are puffy or swollen, bleeding occur easily in gums, gums are bright red, purplish, pus occur in gums and teeth. Proper oral

hygiene improve treatment of periodontitis and reduce chances of occurs periodontitis.

4) **Cracked teeth:**

Breakdown of teeth because of mouth injury, chewing hard food, rubbing teeth at night. Crack increase in pulp, treated by root canal. If crack increase below gum line it is not treated. Causes of cracked teeth are teeth grinding, mouth blows, mouth temperature change, Hard food chewing and biting.

Types of cracked teeth are craze lines, cusp fractured, tooth split, vertical root fracture.

5) **Sensitive teeth:**

It is also known as dentin hypersensitivity. Sensitive tooth decay occurs because of attrition, abrasion and erosion of tooth. Sensitive tooth feel pain or uncomfot after eating or drinking cold or hot foods or drinks. Teeth sensitivity is common after root canal or filling which is not permanent it occurs for shorter duration after treatment.

Sensitivity also produce: Cracked teeth, Gum disease, Erosion of teeth, worn down of teeth.

Because of thinner enamel some people occurs naturally sensitivity of teeth.

6) **Oral cancer:**

Oral cancer leads to any part of mouth like gums, floor of mouth tongue, lips, cheek , hard and soft palate. It is causes because of tobacco intake, high alcohol intake, human papilloma virus (HPV) infection and smoking. Symptoms of oral cancer are swelling, lumps, On lips, gums, cheeks rough spots occurs, feeling loss, ear pain. Oral cancer is easy to treat.

But it is dangerous if not diagnosed or treated in early.

Classification of denture cleansers

Denture cleanser can be classified as:

1. According to type

- a) Creams
- b) Paste
- c) Gels and solutions
- d) Tablets

2. According to method of action:

A) Alkaline peroxides: When peroxide dissolves in water, it becomes an alkaline solution of hydrogen peroxide. Alkaline peroxide cleansers are effective for dissolving plaque because they affect the plaque matrix and are both bactericidal and fungicide. Soaking the affordant alkaline peroxide denture cleanser significantly reduced the microorganisms, especially the mutants group of streptococci and aerobes, rather than rubbing them with toothpaste.

This category of denture disinfectant includes the following:

- a) Alkaline detergents
- b) Oxidizing (bleaching) agents
- c) Hydrogen peroxide

B) Reducing solutions: Sodium hypochlorite. The action of sodium hypochlorite acts directly on the organic matrix of the plaque causing the polymer composition to dissolve. This solution is alkaline hypochlorite which effectively removes denture plaque even after short exposure. In one study, the authors noted that sodium hypochlorite showed marked bactericidal action.

C) Chlorhexidine -The mechanism of action of chlorhexidine depends on its concentration and is indicative of both bactericidal and bacteriostatic.

D) Mild dilute acids- Primarily acts on inorganic phosphates and stains.

E) Effervescent agents- Effervescent agents provide for the rapid disintegration of the product and create a mechanical cleansing action.

F) Chelating agents- This type helps to remove the tartar that has accumulated on a dental's surface.

G) Detergents- Acts by reducing the surface tension.

H) Enzymes- Enzymes act on glycoprotein, mucoprotein, and extracellular polysaccharide structures, resulting in the breakdown of macromolecules into less adhesive structures.

I) 100% vinegar- Low concentration of acetic acid were shown to be able to inhibit growth of all strains, prevent them from forming biofilms and also to eradicate mature biofilms for all isolates after three hours of exposure.

Herbal denture cleanser

1. Triphala

Biological Source: Triphala is a well recognised and revered polyherbal medicine consisting of dried fruits of the three plant species *Emblca officinalis*, *terminalia bellerica*, *Terminalia chebula*.

Family : Euphorbiaceae

Chemical constituents : It contains tannins, gallic acid, ellagic acid, chebulinic acid.

Triphala is well recognized polyherbal medicine consisting of dried fruits of the three plant species *Emblca officinalis*, *Terminalia bellerica*, *Terminalia chebula* in proportion of 1:1:1. No. of mutant streptococci in saliva has been reduced, when triphala used as a mouth wash. Due to gallic acid present in triphala it has anti-inflammatory, anti-oxidant, antimicrobial

properties. Triphala has antifungal property when it comes to use it as a denture cleanser. Tannin found in triphala has potent antifungal activity, aqueous ethyl acetate and ethanolic fraction of terminalia chebula have inhibitory action on candida.

Anticandidal action of triphala is due to presence of gallic acid. Phenolic constituents present in triphala are gallic acid, tannic acid, epicatechin, syringic acid along with ascorbic acid. Due to it is in herbal form it can preserve for long time.



Uses:

1. Triphala has been found to reduce or prevent oral plaque, oral bacteria, gum disease, cavities.
2. It may slow or prevent certain aging related diseases like cataracts, macular degeneration.
3. It may an aid in the control of type 2 diabetes.
4. It lowers body weight, body fat, total cholesterol, triglycerides, bad LDL cholesterol.
5. It treats a variety of bacterial and fungal infections.
6. It is used for growth of hair and dandruff treatment.
7. It helps in digestive problems and constipation.
8. It alleviates the inflammation.
9. It boosts the immunity and give relief from stress.
10. It is useful for oral cancer therapy.

2. **Turmeric**

Biological source: Turmeric obtained from dried rhizomes of curcuma longa L. **Family:** Zingiberaceae

Chemical constituents: Turmeric contains 3-5% of curcuminoids which includes curcumin demethoxycurcumin, bisdemethoxycurcumin (BOMC), Eugenol, dihydrocircumin, azulene, borneol, dcamphene, caprylic acid, cineol, turmerone.

Turmeric has been used as ayurvedic medicine since long years, is called as haridra. Curcumin is a principle constituent of turmeric which is gives bright yellow colour to turmeric. It repairs the stem cells of brain and help to recover stroke and Alzheimer's disease. Turmeric has vital role in cosmetics as it is used as natural remedy for making skin beautiful. It is well known for anti-inflammatory and antimicrobial properties. It is used as natural remedy for

dental care. When it is used properly it has high ability to remove plaque, bacteria and inflammation than other mouth

washes. Curcumin is responsible for preventing gingivitis or other gum disease.



Uses:-

1. It prevents tooth decay, gum disease
2. It reduces the risk of cavities.
3. To boost the immunity it is combined with milk.
4. It has antioxidant and anti-inflammatory properties.
5. It is anticancer agent.
6. It maintains the blood glucose level.
7. it is a digestive aid.
8. It decrease level of cholesterol.
9. It is traditionally used in wound healing.

3. Clove

Biological source: Clove consists of the dried flower buds of *Eugenia caryophyllus* Thumb. **Family:** Myrtaceae

Chemical constituents: Clove contains 14–21% of volatile oil. The other constituents present are the eugenol, acetyl eugenol,

gallotannic acid, and two crystalline principles; α - and β - caryophyllenes, methyl furfural, gum, resin, and fibre. Caryophyllin is odourless component and appears to be a phytosterol, whereas eugenol is a colourless liquid. Clove oil has 60–90% eugenol, which is the cause of its anesthetic and antiseptic properties. Clove is traditional natural remedy used for dental care. Due to presence of eugenol, which is natural anesthetic, it helps numb and reduce pain to ease a toothache. Clove has anti-inflammatory properties, which effective against swelling and irritation in oral area. Clove oil acts as an antiseptic which is effective against infectious bacteria. It is used in oral products to fight against cavities.



Uses:-

1. It is used as aromatic and flavouring agent
2. It relieves nausea.
3. It is beneficial in asthma.
4. It gives relief from bad breath and dental caries.
5. Clove oil is useful in joint pains as well as muscular cramps
6. Clove powder with honey is useful for acne.
7. Clove and pomegranate mix useful in diarrhoea.
8. It has carminative, antiseptic, stimulant, antiemetic, germicide activities.

4. Meswak

Biological source: It is a chewing stick prepared from the roots, twigs and stem of *Salvadora persica*. **Family:** umbelliferae

Chemical constituents: It contains chloride, fluoride, saponins, sulfur, sterols, trimethylamine, vitamin C constituents.

It is a chewing stick prepared from the roots, twigs and stems of *salvadora persica*. Since 7,000 years it is used due to its antibacterial property as a herbal drug. Significant properties of these sticks, they

are effective, inexpensiveness, common, availability and medical properties.

Meswak has antibacterial, antifungal, antiviral, anti-carcinogenic, anti-plaque properties. It has antioxidant, analgesic, anti-inflammatory effects. Meswak plant is associated with oral hygiene and therapeutic purpose. They used to control the formation and activity of dental plaque, it is also halt the further decay.

It cures tooth decay and gum disease. It is teeth cleaning twig used as natural toothbrush for teeth cleaning. Miswak twig has given better effect than toothbrush. It eliminates the bad breath by creating fragrance in mouth. They improve the sensitivity of taste buds and promote cleansing of teeth. It is effective oral hygiene tool. It has significant antimicrobial activity against both aerobic and anaerobic bacteria miswak extract is useful to inhibit *S. Sanguis*, *S. Faecalis*, *S. Mutans*. Meswak plays major role in maintenance of oral hygiene.



Role of components:

1. Silica:- remove plaque and stains on teeth
2. Salvadorine:-have antifungal effects, bactericidal
3. Tannins:- decrease gingivitis and candida albicans
4. Essential oil:- produce significant aroma

Uses:-

1. It naturally fight against tooth decay
2. It prevents the bacteria from accumulating on teeth and gums.
3. It reduces chances of gingivitis and periodontitis and keeps the gum healthy.
4. Due to their astringent properties, they are aid in digestion and metabolism.
5. It used traditionally for treatments of piles, rheumatism, skin inflammation.
6. It is used for repellent of tick and insects.
7. It is used in treatment of stomach and liver ailments and gonorrhea.

5. Cashew leaves

Biological source: cashew obtained from dried part of anacardium occidental.

Family: Anacardiaceae.

Chemical constituents: It contains phenolic compounds, flavonoids, tannins, Vitamin C, carotenoids, Cinnamic acid and organic acid.

Cashew tree is evergreen tree. Cashew tree produces cashew seeds and cashew apple pseudo fruit. The family contain 73 genera and 600 species. Cashew nut is important in food. It is eaten for healthy purpose. Cashew plant used traditionally as medicinal plant. Many parts of cashew used as medicine like seed, leaf, flower and bark. Cashew leaf is used as natural denture cleansers. Because of high amount of vitamin C and mineral salts, cashew fruit is used as catalyst in treatment of premature ageing of a skin. Cashew gum used in pharmaceuticals and substitute for gum arabic. It has antioxidant, antimicrobial, antifungal, anti-inflammatory, antidiabetic, antiviral, denture cleanser properties.

Uses:-

1. It is used to treat diabetes, weaknesses and muscular debility.
2. It is used for treating urinary scrofula, eczema, psoriasis, asthma.
3. It controls high cholesterol level in body.
4. It is used for Intestinal and stomach ailments.
5. It has use in syphilis related skin disorders.
6. It improves dental health.
7. It is used for cancer treatment.



6. Guava leaves

Biological source: Guava leaves obtained from small tropical tree or shrub of *Palisidium guajava*. **Family:** myrataceae.

Chemical constituents: It contains Phenolic compounds, isoflavonoids, gallic acid, catechin, epicatechin, rutin, naringenin, kaempferol are the chemicals present in guava. Guava leaves belongs to myrataceae. Biological source of guava is

palisidium guajava. Phenolic compounds, isoflavonoids, gallic acid, catechin, epicatechin, rutin, naringenin, kaempferol are the chemicals present in guava.

The guava leaves can be kept in contact with the teeth for some time. The Antiplaque properties of guava leaves are effective in preventing and treating oral problems.



Uses:-

1. It is used treatment of intestinal conditions diabetes and wound healing.
2. It relives menstrual pain
3. It is useful in weight loss and digestive diseases
4. It also helps in boosting immunity
5. It used in therapy of cancer

7. Aloe vera

Biological source: obtained from dried juice of leaves of Aloe Barbadensis Miller called *Caracao aloe* **Family:** Liliaceae

Chemical constituents : 75 potentially active constituents like vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acid and amino acids. Vitamins contains

vitamin A (beta-carotene), C, E, vitamin B 12, folic acid, choline. Aloe is obtained from the dried juice of leaves of Aloe barbadensis miller, known as curacao aloes.

Aloe has been used from ancient time for therapeutic effects. It is very oldest medicinal plant. It is old natural remedy used for many synthetic drug formulations, it is called as modern miracle plant.



There are 400 species of aloe vera plant in liliaceae family. Aloe vera plant has high water content ranging from 99% to 99.5%. Aloe vera used for many purposes like antimicrobial, anti-oxidant, purgative, anti-inflammatory, anticancer and used as laxative, cosmetic, anti-fungal, antiviral, antiaging. It is used in huge amount for dental care. Aloe vera is very effective as a natural cleanser.

Aloe vera gel consists of mainly of water(>98%) and polysaccharides, including pectins, cellulose, hemicellulose, glucomannan and acemannan. The latter being considered as main functional component of aloe vera gel, formed from a long chain of acetylated mannose.

Uses:-

1. Due to its soothing, moisturizing and cooling properties aloe vera often used to treat burns.
2. It is used for digestive tract and help to soothe and cure stomach ailments like irritable bowel syndrome.
3. Aloe vera is natural option for improving oral hygiene and reducing plaque
4. Use of fresh aloe on face may help clear up acne.

5. It may also help in promoting healing of anal fissures.
6. It has immuno modulating effect.
7. Aloe vera is used as a tonic for female reproductive system.
8. It gives relief from hair growth problems.
9. It also used as anti-inflammatory agent.

Drawbacks

1. Effect of herbal drugs is slow as compare to allopathic drugs, so long term requires.
2. The taste and odour of herbal drug is difficult to hide.
3. Herbal drugs availability is uncommon.
4. Long term and complex manufacturing process.
5. Ingestion of herbal drugs is harmful to children.
6. Herbal drugs injures some part of mouth.

7. Pharmacopoeia not defines particular procedure or ingredients which are used in herbal cosmetics.

8. Sometimes it produces irritation.

Discussion

Denture cleansers are easy to use, successfully clean the denture surface have bactericidal and fungicidal properties and herbal denture cleansers damage very less to teeth base. Chemical denture cleansers are easy to use. Hospitalized patients cannot brush their teeth because of diseases. Candidal and bacterial species grown because of improper cleaning of tooth which causes many infections. Several studies proves that use of denture cleansers is effective in elder peoples as they fight against the microorganism present in oral cavity. Many studies discusses positive and negatives of denture cleansers. As far the studies have been reported that there is no hampering in using chemical denture cleansers as they do not interacts with denture properties of the cleansers. There are no evidences that will show chemical cleansers used as per manufacture's directions they will be harmful.

Conclusion

Dental hygiene education to patient is necessary. It is most important to aware

patients about any new symptoms and proper guidance of denture cleansers. Denture cleansers are a part of daily life. Take patients responsibility is the main profession of dentists. Varying of dentistry is mainly affected by modernization of science technology. Principles of primary health care approach on prevention, community participation and use of appropriate technology it is the WHO commendation.

Government has been brought out National health policy in 2006 and National mission in 2012 to improbe whole spectrum of oral health by giving support to states. To enhance the science of dentistry, there is necessity to create research knowledge repository to retard duplication of research and existing knowledge utilization. Use of herbal products is beneficial to people with less access to oral hygiene and improve oral health of people. In this report we highlighted that, herbal denture cleansers are more useful, economical, naturally occurring and their side effects are less. As modernization of world is on race, in this race the use of herbal denture cleansers for oral health is the golden way for developing countries.

References