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USE OF GUAVA IN ORAL HEALTH

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Abstract : Plants have been utilised for medicinal and therapeutic purposes for thousands of years. One plant with a huge variety of medical benefits is Psidium guajava. It has long been recognised for its anti-inflammation, antibacterial, antioxidant, antidiarrheal, and antimutagenic qualities. Despite its vast biological applications, little is known about its therapeutic impact in the management of periodontal disease. Therefore, this review aims to emphasise the depth of information regarding P. guajava's use in the treatment of oral health care.

Keywords :Guaijaverin , Psidium guajava ,gingivitis , periodontits .amtiplaque and quercetin

INTRODUCTION

Dentistry is the area of medicine that deals with the identification, avoidance, and treatment of conditions affecting the teeth, gums, and other facial and oral structures. Dental specialists also handle a range of medically related issues in collaboration with medical and allied health professionals. include temporomandibular dysfunction (TMD)-related headaches and vehicle symptoms, orofacial injuries, head and neck malignancies, obstructive sleep apnea, and oral and jaw diseases.One of the most prevalent disorders in people is oral disease. Oral illnesses continue to be a neglected area of global health despite the significant social and financial costs they impose. "A state of being free from mouth and facial pain, oral and throat cancer, oral infections and sores, periodontal disease, and dental caries" is how oral health is defined.

Because oral disorders can cause severe functional limits, discomfort, and suffering that impede and handicap people, they have a substantial influence on their quality of life on a physical, psychological, or social level.The main goal has always been to prevent biofilm from adhering to the tooth surface.various periodontal treatment programmes. However, the incidence of gingivitis suggests that self-performed oral hygiene procedures are inadequate and that further support is necessary for mechanical control of plaque. The widespread usage of herbal products reflects their effectiveness as a supplemental and alternative medicine.
Plant extracts and other types of medical treatments have reemerged and grown in popularity in recent years. Various natural products such as curcuma zedoaria ,calendula, aloevera and other.

ORAL HEALTH

Although dental health and general health are interdependent, sustaining oral health is undoubtedly challenging. It is vital to be aware of a few components of oral health in order to attain it. For overall health and a high quality of life, oral health is crucial.
Oral health, as defined by the World Health Organization (2012), is the absence of mouth and facial pain, oral infections and sores, and oral and other disorders that restrict a person's ability to bite, chew, smile, communicate, and maintain their psychosocial well-being. Most adults already have tooth decay, and 15 to 20% of middle-aged adults have serious gum disease. Inadequate care for teeth, gums, bite, and jaws can have negative repercussions..

HISTORY

Long ago, the advantages of herbal medicines were well known. They have been applied in illness circumstances and for medical and health promotion purposes. It is a common misconception that herbal medications have no adverse effects, are less expensiveand are accessible locally. In Indian medical systems, the use of herbs and herbal mixtures is more prevalent. To get the maximum therapeutic benefit and to broaden the market reach, quality monitoring of the marketed herbs and herbal formulations is crucial. Standards for natural drugs are crucial. For the purpose of comparing the quality of herbal medications, reference standards—specifically the botanical and phytochemical reference substances from the Indian Pharmacopoeia—are necessary. Providing Indian Pharmacopoeia Reference Substances to the public has been started by the Indian Pharmacopoeia Commission**.**

DESCRIPTION

Common names: guava, guayaba, goiaba, perala, pichi, posh, enand.

Synonym: Apple guava, lemon guava, cherry guava.

It is found in kingdom: plantae

Division: Magnoliophyta

Class: Magnoliopsida

Subclass: Rosidae

Order: Myrtales

Family: Myrtaceae Subfamily: Myrtoideae Genus: Psidium and species: guajava, It is a small tree which grows up to 20 feet in height. Leaves are opposite, oblong, three to seven inches in length, with prominent veins below. Flowers are of white color and about one inch in diameter. Fruits of P. guajava (hereafter referred to as guava) are round ovoid to pear shape. It is thin shelled with many seeds embedded in a firm pulp or thick shelled with few seeds or a thin shell with many seeds embedded in a strong pulp.

GUAVA'S COMPONENTS

Guava Leaves:

Destroys microorganisms and those consuming guava leaves at home while fighting ailments.Tannins, catechol, and pyragallol are the chemical components, together with the essential oil.The antibacterial and anti-inflammatory properties of guava leaves can relieve toothaches. It is also claimed that the juice from guava leaves can treat mouth ulcers and inflamed gums.

Fruit:

Fruit May Aid in Blood Sugar Level Reduction.Might Improve Heart Health.Could aid in the relief of painful menstrual symptoms.Could Be Good for Your Digestive System May Promote Weight Loss; Might Have Cancer-Preventive Effect. Might Aid in Increasing Immunity. Consuming guavas could benefit your skin.

Seed:

Guava peels and seeds contain a lot of natural nutrients such as vitamin C.Vitamin A. magnesium, iron, potassium, phosphorus, calcium, thiamine.Have diabetes and skin problemsanti-cancer, anti-inflammatory, and systemic effects. Digestion, improve.

BENEFITS (USING GUAVA LEAF EXTRACTION FOR ORAL CARE):

- It is a chemical free
- No side effects
- Freshnes breaths
- Removes particles
- Prevents plaque
- Build-up
- Reduces cavities
- Kill microorganisms

GENERAL METHOD OF EXTRACTION

To remove dirt and shadow, guava leaves were washed under running water. dried for 3–4 weeks at room temperature. With the aid of a mechanical grinder and a 40-mesh sieve, the dried plant components were ground into a coarse powder. The powder was then put through cold maceration extraction using ethanol, methanol, and water to provide the appropriate extracts for the attendees. 100 g of dried guava leaf powder from each batch was macerated for 24 hours at room temperature with periodic shaking in 500 ml of ethanol, methanol, and water in a separate conical flask. Using a straightforward filtration process, the mixture was fliterated after 24 hours, and the fliterated were collected in different vessels. The solvent was taken out of the mixture to yield the extract.

GEOGRAPHICAL DISTRIBUTION:

Guava is a fruit that has spread throughout the tropics and subtropics and may have originated in tropical America or Asia. In the West Indies and the Old World Tropics, it has become naturalised. Guava may grow in a variety of different environmental settings. Many nations (mostly those in the Pacific Islands and on the Pacific rim) have reported it to be an invasive weed (CABI, 2013). Guava can be found in often disturbed habitats or open areas like savannah's shrub transitional zones (Orwa et al., 2009). It can create dense thickets with more than 100 trees per ha in some locations, which can lead to pasture abandonment and land degradation (CABI, 2013; Orwa et al., 2009). No current global data exist for
there are no current figures for guava output worldwide. In 2012–2013, India produced more than 3 million t of guava. India (21 million t), China (4 million t), Kenya (2.7 million t), Thailand (2.6 million t), and Indonesia (2.3 million t) were the top producers of mango and guava (Tiwari, 2013).The guava plant has a wide range of uses. It can be found in the tropics from sea level to an altitude of 1500–2000 m, but it thrives below 800-1000 m. Although it can grow in temperatures between 15 and 45 °C, guavas do best where annual average temperatures range from 23 to 28 °C. It thrives in areas where wintertime nighttime lows are 10°C. Trees that are quiet withstand slight frosts. In regions with yearly rainfall ranging from 1000 to 2000mm, guavas grow. For the best fruit production, rain should fall throughout the year in an even distribution. Rainfall during fruit ripening, however, results in the fruit losing flavour and breaking open. One of the most drought-resistant tropical fruit crops is the guava. It can grow on a variety of soil types as long as they are somewhat well-drained. Guava is tolerant of shade and acidic soils (Ecocrop. 2015;CABI, 2013; Orwa et al., 2009).

EVALUATION PARAMETER:

1. Physical parameter:

Such as colour, odur and consistency were checked visually.

a) Colour: The colour of the formulation was checked by visual inspection.
b) Consistency: The consistency of formulation by applying on skin.
c) Odour: The odur of the formulation was checked by mixing the gel in thewater and observing the smell.

The pH ofgel formulation were determined by using digital pH meter. Take Igm of gel and dissolve in 10 ml of distilled water and keep apart for two hrs. Then the measurement of pH of formulation was done by dipping the glass electrode completely into gel system 3 times and average value are reported.

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2. Ph measurement

With the aid of a digital pH metre, the pH of gel composition was established.Dissolve one gramme of gel in ten millilitres of distilled water, then separate the mixture for two hours. The glass electrode was then thoroughly dipped into the gel system three times to test the pH of the formulation, and the average readings are given.

3 Homogeneity

After the gels had been placed in the Container, ocular inspection was used to check each manufactured gel formulation for homogeneity. They were examined for the presence of aggregates and how they appeared.

4.Viscosity

At 25°C, the viscosity of the created gel was measured using a Brookfield viscometer and spindle number I. The gels rotated quickly.The equivalent dial reading was recorded for each speed of 0.3, 0.6, and 1.5 motations per minute. Then,multiplying the dial reading with a factor listed in the Brookfield Viscometer catalogues, the viscosities of the produced gels were determined.

5.Spreadability:

Spreadability is measured by the time it takes for two slides to spread out in seconds.

a gel-based slip of paper is inserted between the slides at certainload.

It is preferable if two slides can be separated in less time.

spreadability. The formulas = MxL/T are used to calculate spreadability.

M = weight of the tide to the top slide

length of the glass slides

T is the duration it took to separate the slides.

6. Extrudability

Standard collapsible bottles with caps were filled with the manufactured gel , and the ends were crimped shut to seal them.
The filled tubes' weight was measured, and they were sandwiched.and fastened between two glass slides.After placing a 500g weight over the slides, the cover was taken off to allow for extrusion. The amount of gel that was extruded was gathered and weighed. Calculating the percentage gel allowed researchers to determine extrudability (>90% extrudability is outstanding, >80% extrudability is good, and 70% extrudability is decent).

7.Clarity:

Visual inspection was used to assess each batch's clarity.

8. Gel toughness:

The amount of time in seconds needed for a weight to pierce the gel was used to gauge its strength. On top of a 5gm formulation of gel, a 3.5gm weight was inserted. The time in seconds needed for weight to penetrate 0.5 cm of gel was reported to determine the gel's strength.
7.9 A stability analysis
Stability tests were run to see how the environment or storage conditions affected formulation. The accelerated stability condition for the optimised formulation was maintained at a temperature of 25 °C. The put sample was removed after 1, 2, and 3 months, and its physical appearance, pH, viscosity, spreadability, extrudability, and gel strength were all evaluated.

ACTIVITIES OF GUAVA LEAF EXTRACTS IN THE BIOLOGY

Antioxidant, hypoglycemic, anticancer, and other biological activity are just a few of the biological properties of guava leaf extracts' constituents. Additionally, sulfated GLP has been found to have greater biological activity, such as antioxidant, antibacterial, and anticancer properties, than its unsulfated counterpart. The next subsections provide information on the GL extract's beneficial bioactivities.

1. Cancer/tumor-fighting capacity:

Cancer is a complex health condition that can be recognised by an increase in cell proliferation or a decrease that results in apoptosis. Several external and internal variables that contribute to the excessive generation of reactive oxygen species can cause it (ROS). DNA or

RNA single- or double-strand breaks, base mutations, chromosomal breakage and reorganisation, DNA cross-linkage, and nucleic acid synthesis can all occur from this. degradation, lipid peroxidation-induced cell membrane integrity damage, and tumour development. Triterpenoids, sesquiterpenes, tannins, psiguadials, volatile oils, flavonoids, benzophenone glycosides, and other quinones are all abundant in GLS. Psiguadial D and C inhibit protein tyrosine phosphatase IB and human hepatoma cells (HepG2), respectively (PTPIB).

2.Antidiabetic Activity:

About 10% of the world's population has a blood glucose metabolic abnormality called hyperglycemia, which is mostly defined by diabetes, a serious chronic disease. It is either the case that there is not enough Type 1 diabetes is characterised by the secretion of insulin from pancreatic islet B-cells or by the inability of cells to respond to the released insulin (type 2 diabetes). According to the International Diabetes Federation (IDF), there were 451 million cases of diabetes mellitus worldwide in 2017, which led to 5 million deaths. By 2045, it is expected that there will be 693 million cases of diabetes worldwide. Long-term hyperglycemia increases the generation of ROS and dyslipidemia, which results in serious cellular damage and problems.GLS are frequently used in etnomedicine to treat diabetes. Numerous studies have noted the anti-diabetic properties of flavonoids and GIS polysaccharides The function of GL extract's guaijaverin and avicularin flavonoids was significantly improved. diabetic mice's hepatocyte morphology and pancreatic islet B-cells

3.Antioxidant Activity.
Since it serves as a terminal electron acceptor during the respiration process, which is the main source of energy production, oxygen is a crucial ingredient for aerobes. However, the body's inflammatory diseases, ischemic diseases, neurological disorders, hemochromatosis, emphysema, acquired immunodeficiency syndrome, and many other diseases are brought on by free radicals produced during metabolic processes. The antioxidant functions of GLS are brought about by the presence of phenolic substances such gallic acid, pyrocatechol, taxifolin, ellagic acid, ferulic acid, and a number of others. Seven main flavonoids were detected in GL extracts using high-performance liquid chromatography, including quercetin, hesperetin, While other bioactive substances, including kaempfertin, isoquinoline, and corilaginoline alkaloids, were also discovered, they included kaempferol, quercitrin, rutin, catchin, and apigenin. The majority of these molecules are in charge of giving GLS its antioxidant effects.Numerous studies have demonstrated the importance of antioxidant molecules from GLS in reducing the negative effects of free radicals. A DPPH experiment revealed that essential oils isolated from GLS had a modest antioxidant effect, with an IC50 value of 460.37 1.33 g/mL.

4. Antidiarrhea Activity:

Diarrhea is currently one of the main contributing factors to death in children between the ages of 0 and 5 years. There have been efforts to find novel medications with few negative effects on the body's other organs. underdeveloped countries, n order to create new medications with minimal side effects, effort has been paid to identifying novel phytochemicals derived from medicinal plants. The majority of pharmaceutical industries are working to develop new medications with the potential to treat this disease. Synthetic medications that have a variety of negative effects on the human body, including constipation, intestinal obstruction, the production of bronchospasm, and vomiting, are available for the treatment of diarrhoea . Focus should be placed on identifying and isolating powerful bioactive components from medicinal plants in order to counteract these negative effects. As numerous experts have noted, GLs are thought to have antidiarrheal effects. In Wistar rats, Mazumdar et al. described the antidiarrheal act ivity of ethanolic isolates of GLS.The Author found that a dose of extracts at 750 and 500 mg/kg concentrations had potential as an antidiarrheal in rats fed castor oil.

5.Antimicrobial Activity

Current major concerns include the emergence of novel disease-causing strains and microbial resistance to conventional antibiotics. The prevalence of systemic microbial infections, which include septicemia, uti, meningitis, pneumonia, and gastritis, affects the entire body and is a major cause of mortality worldwide. Pathogens include Staphylococcus, Shigella, Salmonella, Bacillus, Escherichia coli, Clostridium, and Pseudomonas are mostly responsible for food-borne illnesses. Bioactive substances originating from plants are potential sources of antimicrobials. These substances work by inhibiting the growth, destruction, and lysis of microbial cell walls, preventing the creation of biofilms, suppressing DNA replication and transcription, preventing the generation of adenosine triphosphate (ATP), and suppressing bacterial growth Toxins and reactive oxygen species production (ROS). GLS are known to have antibacterial effects because to the inclusion of many organic and inorganic antioxidants and anti-inflammatory substances. With regard to Pseudomonas aeruginosa, Escherichia coli, Streptococcus faecalis, Staphylococcus aureus, and Bacillus subtilis, GL essential oils exhibit potent antibacterial activities. Studies also point to their antiproliferative and antioxidant properties.

PHYSICOCHEMICAL CHARACTERISTICS OF PSIDIUM GUAJAVA
Several indigenous medical systems use the well-known traditional medicinal herb psidiumguajava. Due to their high dietary fibre content, the fruits are sometimes included as super fruits. dietary minerals such potassium, copper, and manganese, as well as the vitamins A and C, folic acid, etc. A single common guava (P. guajava) fruit provides around four times as much vitamin C as an orange and has a generally broad, low-calorie profile of vital elements (Hassimotto et al., 2005). Since a very long time ago, these components of Psidiumguajava L. have allowed it to be used traditionally for the treatment of many different illnesses. Recent ethnopharmacological investigations revealed that Psidiumguajava is used to treat a variety of ailments around the world. a multitude of illnesses, including analgesic and antipyretic properties, anti-inflammatory, for diabetes, hypertension, chronic wounds, and so forth (Gutierrez et al., 2008). The leaves, fruits, bark, and roots of the plant are the parts that are most frequently used. But occasionally, the entire plant is utilised for a variety of medical applications.

CONCLUSION

In the perception that they are safer and have fewer adverse effects than synthetic medications, natural therapies are more acceptable. The demand for herbal formulations is rising today on the global market. Establishing a guava leaf extract herbal oral gel is a very good effort. The results of this investigation showed that the produced herbal gel formulation had significant therapeutic efficacy and was a good delivery system for drugs at a reasonable cost but unquestionably with tremendous potential. The results demonstrated that a new herbal gel formulation with strong antifungal and anti-inflammatory activity had been created as a result of the combination of dosage forms. Therefore, it is secure and suitable for oral treatment.

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