



(10) Publication No: **IN202641075507 A1**

(22) Date of Filing: 18-06-2026

(43) Publication Date: 26-06-2026

Journal No: 26/2026

(19) Intellectual Property Office, India

(12) INDIAN PATENT APPLICATION

(54) Title: **Madras thorn-based oral-care chewing gum composition**

(51) International Classification: A61K 36/28, A61Q 11/00, A23G 4/06, A61K 36/537 A23G 4/00 (21) Application No: 202641075507 (31) Priority Document No: -- (32) Priority Date: -- (86) International Application No: -- Filing Date: -- (87) International Publication No: -- (61) Patent of Addition to Application No: -- Filing Date: -- (62) Divisional to Application No: -- Filing Date: --	(71) Name of Applicant(s): Jss Academy Of Higher Education And Research, (72) Name of Inventor(s): 1. Dr. Navya Raj. M. P 2. Spoorthi Nagesh 3. Dr. Chandan. D 4. Dr. Chandan. S 5. Dr. K P Mahesh
--	--

(57) Abstract:

MADRAS THORN-BASED ORAL-CARE CHEWING GUM COMPOSITION. The invention relates to a Madras thorn-based oral-care chewing gum composition for athletes and active users exposed to acidic beverages. The composition comprises Madras thorn seed extract, at least one remineralisation agent, Echinacea, sage extract and Vitamin C. The Madras thorn seed extract, also known as Pithecellobium dulce seed extract, provides natural antimicrobial oral-health support. The remineralisation agent supports enamel protection and strengthening. Echinacea and sage extract support the reduction of gum inflammation and protection against periodontal disease. Vitamin C supports collagen formation and gingival tissue repair. The composition is configured as a portable chewing gum delivery system for supporting enamel protection, cavity prevention, gum-health support, oral hygiene and natural whitening in athletes exposed to acidic sports drinks, dehydration, mouth breathing and high-intensity training conditions. The composition may also be provided as chewing gum tablets, pellets, oral dissolvable strips, lozenges, dental chewing tablets or powder sachets for oral rinse preparation. [FIG. 1]

FORM-2
THE PATENTS ACT, 1970
(39 of 1970)
&
The Patent Rules, 2003
COMPLETE SPECIFICATION
(See section 10 & rules 13)

1. TITLE OF THE INVENTION

MADRAS THORN-BASED ORAL-CARE CHEWING GUM COMPOSITION

2. APPLICANT (S)

**A. NAME: JSS ACADEMY OF HIGHER EDUCATION AND
RESEARCH**

B. NATIONALITY: INDIAN

C. ADDRESS:

JSS Medical Institutions Campus
Sri Shivarathreeshwara Nagara
Mysuru – 570 015
Karnataka
INDIA

3. PREAMBLE TO THE DESCRIPTION

The following specification particularly describes the invention and the manner in which it is to be performed.

4. DESCRIPTION

MADRAS THORN-BASED ORAL-CARE CHEWING GUM COMPOSITION

5

TECHNICAL FIELD

10 **001.** Embodiments are related to oral-care compositions for use within the oral cavity. Embodiments are also related to preparations for care of teeth, enamel, gums and oral hygiene. Embodiments are further related to chewable oral-care compositions configured for the delivery of natural oral-health supporting components. Embodiments are additionally related to plant-based oral-care formulations. Embodiments are particularly related to a Madras thorn-based chewing gum composition for enamel protection, cavity prevention, gum-health support and oral hygiene maintenance in athletes.

15 **002.** Embodiments are related to functional chewing gum compositions intended for users exposed to acidic beverages, dehydration, mouth breathing and high-intensity physical activity. Embodiments are also related to sports dentistry-oriented oral-care products. Embodiments are further related to compositions combining enamel remineralisation support, antimicrobial support, whitening support and gum-health support in a portable chewable delivery form. Embodiments are additionally related to athlete-focused oral health nutraceutical compositions. Embodiments are particularly related to chewing gum compositions containing Madras thorn seed extract in combination with natural oral-health supporting ingredients.

25 **003.** Embodiments are related to substance compositions capable of being used as food-based oral-care products. Embodiments are also related to

compositions produced by manufacture in a chewable gum form. Embodiments are further related to synergistic oral-care formulations in which botanical and natural components operate together for maintaining oral hygiene. Embodiments are additionally related to alternative oral delivery formats, including chewing gum tablets, pellets, oral dissolvable strips, mouth-dissolving lozenges, functional dental chewing tablets and powder sachets for oral rinse preparation. Embodiments are particularly related to a portable athlete-specific oral-care formulation for protecting enamel during sports activity.

BACKGROUND OF THE INVENTION

004. Oral-care products such as fluoride toothpastes, mouthwashes, sugar-free chewing gums, remineralisation preparations and whitening products are generally used for cavity prevention, saliva stimulation, enamel support and stain removal. However, athletes and physically active individuals are exposed to oral conditions that differ from ordinary daily oral-care situations. Acidic sports drinks, mouth breathing, dehydration and high-intensity training conditions may accelerate enamel damage and cavity formation. Conventional products such as toothpaste and mouthwash are generally used at fixed times and are not always convenient during sports activities. Conventional sugar-free chewing gums may stimulate saliva, but they are not specifically arranged as athlete-focused enamel protection and repair formulations containing Madras thorn-based natural oral-health support.

005. The existing technical landscape includes disclosures relating to dental remineralisation, anti-demineralisation, chewable dental-care delivery and erosion protection. US 20220110837 discloses a therapeutic composition for arresting, preventing and reversing dental disease in a candy or confectionery-type oral delivery format. CA 2502084 and US 20060135407 disclose phosphoprotein preparations for bioactive metal ion delivery and teeth remineralisation. WO/2007/090242 discloses fluoride compositions and methods for dental mineralisation, while WO/2016/101041 discloses mineralisation fluoride compositions for tooth surfaces and hypomineralised lesions. WO/2021/110923 and US 20220387269 disclose personal dental-care products for preventing demineralisation in chewable forms such as chewing gum, soft chew, toffee, gelatin gum, chewy candy, chew toy or lozenge. IN 202217016588 is relevant in the Indian context as a personal dental-care product for preventing demineralisation. WO/2009/101115 discloses use of cationic surfactants for protection against tooth erosion caused by acids in food products and drinks, including chewing gum and lozenge-type products. US 20250170034 discloses a composition for tooth whitening or improving dentin hypersensitivity comprising polyphosphate.

006. Non-patent literature also indicates that dietary acids, beverage habits, saliva and calcium-based protection are known considerations in dental erosion. Literature concerning dietary acids and habits on dental erosion in adolescents identifies acid exposure as a contributor to erosion. Literature on prevention of erosive tooth wear discusses nutritional and patient-related risk

factors. Literature concerning the role of calcium in prevention of erosive tooth wear shows that calcium-based approaches have been considered. Literature relating to casein-derived products identifies enamel remineralisation support, while literature on saliva and dental erosion and chewing gum effects on enamel and dentine shows that saliva-mediated protection and chewing gum-related oral effects were known in the field.

007. The foregoing indicates that enamel remineralisation, demineralisation prevention, chewing gum delivery, acid erosion control, whitening support and general oral-care compositions are known in different forms. However, such known products do not provide a specific natural chewing gum formulation developed for athletes and active users exposed to acidic sports drinks, dehydration, mouth breathing and high-intensity sports conditions. They also do not disclose a Madras thorn seed extract-based chewing gum composition combined with Echinacea, sage extract, Vitamin C and remineralisation support for simultaneously addressing enamel protection, cavity prevention, gum-health support and whitening in a portable sports-use format. The problem, therefore, lies in the absence of an athlete-specific natural chewing gum delivery system that supports multiple oral-care needs during or around sports activity. Based on the foregoing, a need therefore exists for a Madras thorn-based oral-care chewing gum composition configured for athlete-focused enamel protection, remineralisation support, cavity prevention, gum-health support and oral hygiene maintenance.

SUMMARY OF THE INVENTION

008. An object of the invention is to provide an athlete-specific oral-care chewing gum composition that addresses dental erosion risks associated with acidic sports drinks, mouth breathing, dehydration and high-intensity training conditions. The object is directed to a portable chewable product that can be used by athletes and active users in a convenient form, rather than relying only on conventional oral-care products such as toothpaste or mouthwash.

009. Another object of the invention is to provide a chewing gum composition comprising Madras thorn, also known as Pithecellobium dulce, seed extract as a natural enamel-protective and antimicrobial component. The object is to incorporate Madras thorn in a chewing gum format so that the composition supports enamel protection and oral hygiene while being suitable for use as a sports dentistry-oriented oral-care product.

010. Another object of the invention is to provide an oral-care formulation that combines enamel remineralisation support, antimicrobial support, whitening support and gum-health support within a single portable chewing gum delivery system. The object is to provide a formulation in which Madras thorn, remineralisation agents, Echinacea, sage extract and Vitamin C are arranged for supporting enamel, preventing cavities, reducing gum inflammation, supporting gingival healing and maintaining oral hygiene.

011. Another object of the invention is to provide a natural, plant-based formulation that offers higher user compliance compared with conventional oral-care products requiring brushing, rinsing or separate application. This

object is particularly relevant for athletes, fitness enthusiasts, active adults and individuals exposed to acidic beverages, who may require a portable preventive oral-care solution during or around sports activities.

012. Another object of the invention is to provide the composition in different oral delivery formats while retaining the same oral-health supporting formulation concept. The invention may be developed as functional chewing gum tablets or pellets, oral dissolvable strips, mouth-dissolving lozenges, functional dental chewing tablets, or powder sachets capable of being mixed with water to form an oral rinse for dental protection and oral health support.

013. The invention provides a Madras thorn-based oral-care chewing gum composition for athletes. The composition is directed to enamel protection, remineralisation support, cavity prevention, gum-health support and oral hygiene maintenance in users exposed to acidic sports drinks, dehydration, mouth breathing and high-intensity training conditions. The composition is provided in a chewing gum format so that the product remains portable and convenient during sports-related use.

014. The composition comprises Madras thorn, also known as *Pithecellobium dulce*, seed extract as a principal natural oral-health supporting component. The Madras thorn seed extract is included for its antimicrobial properties that help control harmful oral bacteria. The composition further comprises remineralisation agents and natural compounds for protecting enamel, preventing cavities, supporting gum health and assisting in natural whitening.

015. The composition further comprises Echinacea, sage extract and Vitamin C.

Echinacea and sage extract are included for reducing gum inflammation and protecting against periodontal disease. Vitamin C is included for supporting collagen formation and promoting gingival tissue repair. These components operate in the chewing gum composition to support gum healing and overall oral health.

016. The chewing gum format provides a portable delivery system for the composition. In use, the chewing gum is placed in the oral cavity and chewed so that the gum composition acts as an oral delivery medium for the natural oral-health supporting components. The product is directed to athletes, fitness enthusiasts, active adults and individuals exposed to acidic beverages, particularly users within the age group of 15–30 years.

017. The invention may also be provided in alternative oral delivery forms, including functional chewing gum tablets or pellets, oral dissolvable strips, mouth-dissolving lozenges and functional dental chewing tablets. The formulation may also be prepared as a powder sachet that can be mixed with water to form an oral rinse for dental protection and oral health support.

BRIEF DESCRIPTION OF DRAWINGS

018. FIG. 1 illustrates a flowchart representing the sequential functional stages of a Madras thorn-based oral-care chewing gum composition. The flowchart shows an athlete or active user exposed to acidic sports drinks, mouth breathing, dehydration and high-intensity training conditions at step 101; selection of an athlete-specific oral-care chewing gum formulation at step 102;

incorporation of Madras thorn seed extract, at least one remineralisation agent, Echinacea, sage extract and Vitamin C at step 103; processing of the incorporated formulation components into a chewing gum delivery form at step 104; encapsulation or packaging of the chewing gum composition in a portable form at step 105; chewing of the formulation within the oral cavity at step 106; contact of the formulation with enamel and gums at step 107; and support for enamel protection, cavity prevention, gum health, oral hygiene and natural whitening at step 108.

DETAILED DESCRIPTION

019. The invention relates to a Madras thorn-based oral-care chewing gum composition configured for use by athletes and active users exposed to sports-related oral conditions. The composition is formulated as a chewable oral-care delivery system for supporting enamel protection, cavity prevention, gum-health maintenance, oral hygiene and natural whitening. The composition is particularly directed to users exposed to acidic sports drinks, mouth breathing, dehydration and high-intensity training conditions, which may accelerate enamel damage and cavity formation.

020. As illustrated in FIG. 1, step 101 represents an athlete or active user exposed to acidic sports drinks, mouth breathing, dehydration and high-intensity training conditions. These conditions represent the user-specific oral-care environment addressed by the invention. Acidic sports drinks may contribute to enamel erosion, while mouth breathing and dehydration during physical activity may reduce ordinary oral moisture conditions. The invention is

therefore directed to a portable chewing gum-based formulation suitable for athletes and active users requiring oral-care support during or around sports activity.

021. Step 102 represents selection of an athlete-specific oral-care chewing gum formulation. The selected formulation is not a conventional sugar-free chewing gum intended only for saliva stimulation. Instead, the formulation is directed to a chewing gum composition containing natural and remineralisation-supporting components for enamel protection, cavity prevention, gum-health support and oral hygiene. The chewing gum format provides a convenient delivery form for users who may not be able to use toothpaste, mouthwash or other conventional oral-care products during sports activity.

022. Step 103 represents incorporation of the formulation components. The composition comprises Madras thorn seed extract, at least one remineralisation agent, Echinacea, sage extract and Vitamin C. The Madras thorn seed extract is preferably Pithecellobium dulce seed extract. In one disclosed form, Madras thorn is present in an amount of 600 mg. The Madras thorn seed extract is incorporated as a natural enamel-protective and antimicrobial oral-care component. The antimicrobial property of the Madras thorn seed extract helps control harmful oral bacteria, thereby supporting oral hygiene and cavity prevention.

023. The at least one remineralisation agent incorporated at step 103 is provided for supporting enamel strength and enamel repair. The remineralisation agent forms part of the oral-care functionality of the chewing gum composition and

is directed to enamel protection in users exposed to acidic sports drinks and other sports-related oral stress conditions. The composition therefore provides enamel-supporting functionality in a chewable format.

024. Echinacea and sage extract incorporated at step 103 are provided as gum-health supporting components. Echinacea and sage extract help reduce gum inflammation and support protection against periodontal disease. Vitamin C incorporated in the composition supports collagen formation and promotes gingival tissue repair. The combination of Echinacea, sage extract and Vitamin C therefore supports gingival health, gum healing and overall oral health.

025. Step 104 represents processing of the incorporated components into a chewing gum delivery form. In this stage, the Madras thorn seed extract, remineralisation agent, Echinacea, sage extract and Vitamin C are arranged in a chewable gum matrix. The chewing gum delivery form enables the composition to remain within the oral cavity during chewing and allows the formulation to contact tooth enamel and gum surfaces. The chewing gum delivery form is therefore suitable for portable oral administration by athletes and active users.

026. Step 105 represents encapsulation or packaging of the chewing gum composition in a portable form. The chewing gum composition may be provided as chewing gum pieces in a portable packaged form suitable for use before, during or after sports activity. The portable packaged form supports convenient handling and use by athletes, fitness enthusiasts, active adults and individuals exposed to acidic beverages.

027. Step 106 represents chewing of the formulation within the oral cavity.

During use, the chewing gum composition is placed in the oral cavity and chewed by the user. The chewing action allows the composition to remain in oral residence and enables the formulation components to interact with the oral environment. The chewing gum format provides a convenient mode of delivery for the oral-care composition.

028. Step 107 represents contact of the formulation with enamel and gums.

During chewing, the composition contacts the tooth enamel and gingival tissues. The Madras thorn seed extract provides antimicrobial oral-health support by helping control harmful oral bacteria. The remineralisation agent supports enamel strength and enamel repair. Echinacea and sage extract support reduction of gum inflammation and protection against periodontal disease. Vitamin C supports collagen formation and gingival tissue repair.

029. Step 108 represents support for enamel protection, cavity prevention, gum

health, oral hygiene and natural whitening. The functional outcome of the composition is achieved by the combined presence of Madras thorn seed extract, the remineralisation agent, Echinacea, sage extract and Vitamin C in the chewing gum delivery form. The composition is therefore directed to a multi-functional oral-care chewing gum for athletes and active users exposed to acidic beverages and sports-related oral stress conditions.

030. The composition may be provided in a sugar-free form. The sugar-free character of the composition supports the oral-care purpose of the invention and makes the formulation suitable for athletes and active users seeking a

functional oral-care chewing gum. The composition is preferably provided in a portable packaged chewing gum form suitable for use in connection with sports activity.

031. In addition to the chewing gum form, the composition may be provided in alternative oral-care delivery forms. Such alternative forms include functional chewing gum tablets, chewing gum pellets, oral dissolvable strips, mouth-dissolving lozenges and functional dental chewing tablets. The composition may also be provided as a powder sachet capable of being mixed with water to form an oral rinse. These alternative forms retain the same disclosed oral-care formulation concept based on Madras thorn seed extract, remineralisation support, Echinacea, sage extract and Vitamin C.

032. The invention is therefore directed to a manufactured oral-care composition in a chewable delivery format. The invention is not directed to a machine, apparatus or method of treatment. The composition is a formulation in which the disclosed ingredients are incorporated for supporting enamel protection, cavity prevention, gum-health maintenance, oral hygiene and natural whitening in athletes and active users.

033.

5. CLAIMS

I/We Claim:

1. A Madras thorn-based oral-care chewing gum composition comprising Madras thorn seed extract, at least one remineralisation agent, Echinacea, sage extract and Vitamin C, wherein the Madras thorn seed extract, the at least one remineralisation agent, Echinacea, sage extract and Vitamin C are incorporated in a chewable gum delivery matrix configured for oral administration to support enamel protection, cavity prevention, gum-health maintenance and oral hygiene in athletes exposed to acidic sports drinks, dehydration, mouth breathing and high-intensity training conditions.

2. The composition as claimed in claim 1, wherein the Madras thorn seed extract comprises *Pithecellobium dulce* seed extract.

3. The composition as claimed in claim 1, wherein the Madras thorn seed extract is present in an amount of about 600 mg.

4. The composition as claimed in claim 1, wherein the Madras thorn seed extract is incorporated as a natural antimicrobial oral-care component for controlling harmful oral bacteria during chewing of the composition.

5. The composition as claimed in claim 1, wherein the at least one remineralisation agent is incorporated for supporting enamel strength and enamel repair during oral residence of the chewing gum composition.

6. The composition as claimed in claim 1, wherein Echinacea and sage extract are incorporated as gum-health supporting components for reducing gum inflammation and supporting protection against periodontal disease.

7. The composition as claimed in claim 1, wherein Vitamin C is incorporated as a gingival-supporting component for supporting collagen formation and promoting gingival tissue repair.

8. The composition as claimed in claim 1, wherein the chewing gum composition is sugar-free.

9. The composition as claimed in claim 1, wherein the chewing gum composition is provided in a portable packaged form suitable for use before, during or after sports activity.

10. An oral-care product comprising the composition as claimed in claim 1, wherein the oral-care product is provided in a form selected from functional chewing gum tablets, chewing gum pellets, oral dissolvable strips, mouth-dissolving lozenges, functional dental chewing tablets, and powder sachets mixable with water to form an oral rinse.

HARIPRASAD KS

PATENT AGENT (IN/PA-3636)

6. SIGNATURE WITH DATE

17.06.2026

7. ABSTRACT

MADRAS THORN-BASED ORAL-CARE CHEWING GUM

COMPOSITION. The invention relates to a Madras thorn-based oral-care

chewing gum composition for athletes and active users exposed to acidic

5 beverages. The composition comprises Madras thorn seed extract, at least one

remineralisation agent, Echinacea, sage extract and Vitamin C. The Madras thorn

seed extract, also known as Pithecellobium dulce seed extract, provides natural

antimicrobial oral-health support. The remineralisation agent supports enamel

protection and strengthening. Echinacea and sage extract support the reduction of

10 gum inflammation and protection against periodontal disease. Vitamin C supports

collagen formation and gingival tissue repair. The composition is configured as a

portable chewing gum delivery system for supporting enamel protection, cavity

prevention, gum-health support, oral hygiene and natural whitening in athletes

exposed to acidic sports drinks, dehydration, mouth breathing and high-intensity

15 training conditions. The composition may also be provided as chewing gum

tablets, pellets, oral dissolvable strips, lozenges, dental chewing tablets or powder

sachets for oral rinse preparation. **[FIG. 1]**