

Nutraceutical Mangosteen Composition

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to nutraceutical compositions derived from the fruit of the *Garcinia mangostana* L. plant, otherwise known as the mangosteen plant. More particularly, the present invention relates to nutraceutical compositions comprising a mixture of the pulp and pericarp of the mangosteen fruit.

2. Background and Related Art

The mangosteen tree (*Garcinia mangostana* L.) was named after the French explorer Laurent Garcin (1683-1751) and has been cultivated for a considerable time in tropical areas of the world. The tree is presumed to have originated in South-east Asia or Indonesia and has largely remained indigenous to the Malay Peninsula, Myanmar, Thailand, Cambodia, Vietnam, the Sunda Islands, and the Moluccas. Although the mangosteen fruit is highly praised as one of the best tasting of all tropical fruits, it is considered a minor tropical fruit, and the mangosteen tree has largely piqued purely botanical interests over the years.

The mangosteen tree is a slow-growing, smooth evergreen tree that ranges from 5 to 25 meters in height with a flaking black bark that contains a yellow, resinous latex. The mangosteen tree bears fruit when 6 to 20 years old, depending on location, and can continue to yield fruit for up to 100 years. The mangosteen fruit ripens to a dark reddish-violet to black-violet color and is normally smooth or marked with brownish scars. The pericarp, or rind, of the mangosteen fruit is thick, tough, and exudes a bitter yellowish resin. Only about 25 to 30% of the mangosteen fruit consists of the edible pulp or aril, with the remainder comprising the tough, bitter pericarp. Each mangosteen fruit usually varies in weight from 75 to 120 grams and normally contains 2 to 3 well-developed seeds.

Over the years, the mangosteen plant has been used in a number of different ways. The timber is used for cabinets, building materials, fencing and furniture. The pericarp, containing pectin, tannins, resins and a yellow latex, is

used in tanning and dyeing leather black. The fruit pulp is mostly used as a dessert, but can also be canned or made into preserves. However, when removing the fruit pulp from the rind, care must be taken to prevent the tannins and resins of the cut pericarp from contacting the fruit pulp. The mangosteen rind, leaves and bark have also been used as ingredients in folk medicine in areas where the plant grows indigenously. The thick mangosteen rind is used for treating catarrh, cystitis, diarrhea, dysentery, eczema, fever, intestinal ailments, itch, and skin ailments. The mangosteen leaves are used by some natives in teas and other decoctions for diarrhea, dysentery, fever, and thrush. It is also known that concoctions of mangosteen bark can be used for genitourinary afflictions and stomatosis.

Some of the medicinal properties of the *Garcinia mangostana* L. plant have been the subject of pharmacological and clinical studies. These studies have isolated chemical constituents in the mangosteen leaves, wood, pericarp and seed aril, which were found to contain the following biologically active compounds, among others: 1,6-dihydroxy-3-methoxy-2-(3-methyl-2-butenyl) xanthone, 1,5,8-trihydroxy-3-methoxy-2-(3-methyl-2-butenyl) xanthone, maclurin, 1,3,6,7-tetrahydroxy xanthone, 1,3,6,7-tetrahydroxy xanthone-O- β -D-glucoside, chrysanthemin, cyaniding-3-O- β -D-sophoroside, 8-deoxygartanin, 1,5-dihydroxy-2-isopentenyl-3-methoxy xanthone, 1,7-dihydroxy-2-isopentenyl-3-methoxy xanthone, 5,9-dihydroxy-8-methoxy-2,2-dimethyl-7-(3-methylbut-2-enyl)-2(H), 6(H)-pyrano-(3,2,6)-xanthen-6-one, fructose, garcinone A,B,C, D and E, gartanin, glucose, cis-hex-3-enyl acetate, 3-isomangostin, 3-isomangostin hydrate, 1-isomangostin, 1-isomangostin hydrate, kolanone, mangostin, β -mangostin, α -mangostin, mangostin-3,6-di-O-gulcoside, normangostin, sucrose, tannins, BR-xanthone-A, BR-xanthone-B, calabaxanthone demethylcalabaxanthone, 2-(γ,γ -dimethylallyl)-1,7-dihydroxy-3-methoxyxanthone, 2,8-bis-(γ,γ -dimethylallyl)-1,3,7-trihydroxyxanthone, 1,3,5,8-tetrahydroxy-2,4-diprenylxanthone, and mangostanol. Many of these chemical constituents are xanthenes, which are biologically active compounds that are receiving increasing interest in pharmacological studies for a variety of health benefits.

However, despite the pharmacological benefits of individual xanthone compounds and the native medicinal uses of the bark, leaves and rind of the

mangosteen plant in South-east Asia and Indonesia, a nutraceutical composition containing the holistic benefits of the entire mangosteen fruit, including the fruit pulp and pericarp, is not known. In fact, it is recognized that when preparing the fruit pulp for consumption, care should be taken to separate from the delicious
5 inner fruit pulp the outer pericarp with its resins and tannins, which are traditionally used to treat and stain leathers.

There exists a need in the nutritional arts for a nutraceutical composition that offers the health benefits of the entire mangosteen fruit, including the pulp and the pericarp. There also exists a need for a nutraceutical composition rich in
10 natural xanthenes for treating a variety of human ailments and conditions in an efficacious manner. Further, there is a need in the art for a natural xanthone product that is economical to manufacture.

SUMMARY OF THE INVENTION

Disclosed are nutraceutical compositions derived from the fruit of the *Garcinia mangostana* L., or mangosteen plant. More particularly, the disclosed are efficacious nutraceutical compositions rich in natural xanthenes that include the pulp and the pericarp of the mangosteen fruit. These compositions preferably comprise a mixture of mangosteen fruit pulp and pericarp with selected juice concentrates. Also disclosed are methods of preparing nutraceutical compositions of *Garcinia mangostana* L. plant that may yield efficacious health supplements rich in natural xanthenes. Further, the methods of preparing the mangosteen nutraceutical compositions can be economical to operate.

In a first aspect, there is provided a nutraceutical beverage, comprising: pericarp from fruit of a *Garcinia mangostana* L. tree; a first juice from fruit of a *Garcinia mangostana* L. tree; and at least one second juice selected from the group consisting of fruit juice and vegetable juice.

In a second aspect, there is provided a nutraceutical beverage, comprising: pericarp from fruit of a *Garcinia mangostana* L. tree; a first juice from fruit of a *Garcinia mangostana* L. tree; and a second juice, comprising at least one of apple juice; blueberry juice; cherry juice; cranberry juice; grape juice; pear juice; pear puree; raspberry juice; and strawberry juice.

In a third aspect, there is provided a nutraceutical composition, comprising: pericarp from fruit of a *Garcinia mangostana* L. tree; and at least one fruit or vegetable juice other than mangosteen juice combined with said pericarp into a nutraceutical composition.

In a fourth aspect, there is provided a method of preparing a nutraceutical composition, comprising: processing fruit pulp from a *Garcinia mangostana* L. tree; processing pericarp from a *Garcinia mangostana* L. tree; providing at least one fruit or vegetable juice other than mangosteen juice; and combining said

In a fifth aspect, there is provided a method of preparing a nutraceutical composition, comprising: grinding fruit pulp from a *Garcinia mangostana* L. tree; grinding pericarp from a *Garcinia mangostana* L. tree; providing at least one juice concentrate other than mangosteen juice concentrate; and combining said ground fruit pulp, said ground pericarp and said at least one juice concentrate other than mangosteen juice concentrate into a mixture.

In a sixth aspect, there is provided a method for preparing a nutraceutical beverage, comprising: grinding whole pericarp from a *Garcinia mangostana* L. tree to form ground whole pericarp; providing at least one fruit or vegetable juice other than mangosteen juice; mixing said ground whole pericarp with said at least one fruit or vegetable juice other than mangosteen juice to form a liquid pericarp mixture; and bottling said liquid pericarp mixture.

In an example embodiment, there is provided a nutraceutical composition that contributes to general human wellness and good health through a novel mixture of the pericarp and pulp of the fruit of the *Garcinia mangostana* L. plant. The effectiveness of this mixture may be heightened through the addition of selected juice concentrates in varying amounts.

Another example embodiment provides a nutraceutical composition that offers the holistic benefits of the entire mangosteen fruit and is an efficacious source of natural xanthone compounds.

An additional example embodiment provides an antimicrobial and anti-inflammatory composition containing a therapeutic amount of natural xanthenes derived from the *Garcinia mangostana* L. plant.

A further object example embodiment provides a xanthone-rich natural product with antioxidative properties.

Another example embodiment provides a nutraceutical composition of the *Garcinia mangostana* L. plant with beneficial antibacterial action.

An additional example embodiment provides a process for preparing nutraceutical compositions of the *Garcinia mangostana* L. plant yielding the holistic benefits of the unique combination of mangosteen fruit pulp and pericarp, either alone or with complementary and enhancing juice concentrates.

Yet another example embodiment provides an economical process for manufacturing nutraceutical compositions of the entire fruit of the *Garcinia mangostana* L. plant.

The foregoing and other disclosed example embodiments, advantages and characterizing features will become apparent from the following description of certain illustrative embodiments disclosed.

While the methods and processes disclosed may have been proven to be particularly useful in the area of nutritional health supplements, those skilled in the art can appreciate that the methods and processes can be used in a variety of different applications and in a variety of different areas of manufacture to satisfy a wide-ranging variety of pharmaceutical and medicinal needs.

The above-described features and advantages of the present invention, as well as additional features and advantages, will be set forth or will become more fully apparent in the description that follows and in the appended claims. The novel features which are considered characteristic of this invention are set forth in the attached claims. Furthermore, the features and advantages of the invention may be learned by the practice of the invention, or will be obvious to one skilled in the art from the description, as set forth hereinafter.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to nutraceutical compositions derived from the *Garcinia mangostana* L. plant, otherwise known as the mangosteen plant. In particular, the compositions of the invention described herein uniquely provide
5 natural xanthone compounds through the combination of the pulp and pericarp of the mangosteen fruit, along with selected juice and other phytochemical ingredients. The invention also relates to processes for manufacturing the nutraceutical compositions described herein in an economical manner.

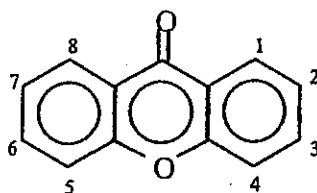
It is understood that the terminology used herein is used for the purpose of
10 describing particular embodiments only, and is not intended to limit the scope of the present invention. It is also understood that, as used herein and in the appended claims, the singular forms "a," "an," and "the" include plural reference, unless the context clearly dictates otherwise. In the disclosure and in the claims, the term "nutraceutical" shall refer to "any compounds or chemicals that can
15 provide dietary or health benefits when consumed by humans or animals."

Unless defined otherwise, all technical and scientific terms used herein have the same meanings as commonly understood by one of ordinary skill in the art to which this invention belongs. Preferred methods, compositions, and materials of the present invention are described herein, although any methods and
20 materials similar or equivalent to those described herein can be used in the practice or testing of the present invention. All references cited herein are incorporated by reference in their entirety.

The *Garcinia mangostana* L. plant, or mangosteen plant, is known for a variety of uses in the areas to which it is indigenous. For example, there are a
25 number of folk medicines in South-east Asia and Indonesia that employ various decoctions of the leaves, root, and bark of the mangosteen plant, as well as of the pericarp of the mangosteen fruit. For example, according to the literature, the thick mangosteen pericarp can be used as an astringent or in various decoctions for treating catarrh, cystitis, diarrhea, dysentery, eczema, fever, intestinal
30 ailments, itch, and skin ailments. Other medicinal uses of the leaves, root and bark would be known to one of skill in the art. Also, the outer pericarp of the mangosteen fruit, which contains pectins, tannins, resins and a yellow latex, is used for treating and staining leather black.

In contrast to the thick outer pericarp, the edible inner pulp of the mangosteen fruit is widely regarded for its exquisite taste. The inner pulp of a single mangosteen fruit usually consists of four to eight juicy, white-colored segments. When preparing the white pulp segments for consumption, care must
5 be taken so as to not stain the pulp segments with the resins and tannins and other matter that oozes out of the cut outer pericarp. The need to keep the delicious white pulp separate from the dark purple, staining, bitter pericarp has long been known to those familiar with the mangosteen fruit.

Xanthenes are biologically active plant phenols that naturally occur in a
10 restricted group of plants. The general structure of a xanthone is:



From a biosynthetic standpoint, they are related to the flavonoids, being formed by the condensation of a phenylpropanoid precursor with two instead of three malonyl coenzyme A units. Xanthenes possess significant pharmacological
15 properties, including antidepressant, antitubercular, antimicrobial, antiviral, anti-inflammatory, cardiogenic, antileukaemic, antitumor, antiulcer, antihepatotoxic, antiallergenic, and antirhinoviral activities and actions.

Pharmacological and botanical researchers have discovered that the medicinal properties of the mangosteen pericarp can be attributed to natural
20 xanthenes contained in the rind. The unrelated plant families Gentianaceae and Guttiferaceae are largely where naturally occurring hydroxanthenes and their methyl ethers are found. The *Garcinia mangostana* L. plant, which contains a large number of naturally occurring xanthenes, belongs within the Guttiferaceae family of plants.

Recent research has shown that the γ -mangostin compound, a natural
25 xanthone found in the *Garcinia mangostana* L. plant, inhibits type A and type B monoamine oxidases as well as cyclooxygenase and prostaglandin E_2 synthesis. (Nakatani et al., 63 Biochemical Pharmacology 73-79 (2002)). Under normal conditions in the brain, the levels of prostaglandin E_2 (PGE_2) are very low or
30 even undetectable. However, during episodes of tissue inflammation, multiple

sclerosis, and AIDS-related dementia, PGE₂ levels rise, and can affect the activities of neurons, glial, and endothelial cells. High levels of PGE₂ also affect microglia/macrophage and lymphocyte functions. It is widely understood that the generation of prostaglandins is associated with inflammation, pain and fever.

- 5 Cyclooxygenase is the rate-limiting enzyme in prostaglandin production. There are two isoforms of cyclooxygenase (COX), constitutive (COX-1) and inducible (COX-2), which is expressed in response to inflammation stimuli. The xanthone γ -mangostin is found to directly inhibit activity of both COX isoforms as well as PGE₂ synthesis, which makes this xanthone desirable in the treatment of
- 10 inflammatory conditions as well as symptoms of fever and pain. The nutraceutical compositions of the present invention offer therapeutic amounts of important xanthones, including γ -mangostin, from a natural source to provide increased health and general wellness in humans.

- In the present invention, it has been discovered that a mixture of the
- 15 mangosteen pericarp and fruit pulp in a single nutraceutical composition yields surprising health benefits. The efficacy of this xanthone-rich mixture of mangosteen pericarp and pulp is enhanced through the addition of selected juice and phytochemical ingredients, which are believed to synergistically react with the natural xanthone compounds. In a preferred embodiment of the invention, the
- 20 mixture of mangosteen fruit pulp and pericarp is complemented by the addition of one or more juice concentrates selected from the group consisting of alfalfa juice concentrate, apple juice concentrate, apricot juice concentrate, banana juice concentrate, blueberry juice concentrate, cantaloupe juice concentrate, carrot juice concentrate, celery juice concentrate, cherry juice concentrate, cranberry
- 25 juice concentrate, grape juice concentrate, grapefruit juice concentrate, green barley juice concentrate, green lettuce juice concentrate, kale juice concentrate, kiwi fruit juice concentrate, orange juice concentrate, papaya juice concentrate, parsley juice concentrate, pear juice concentrate, pear puree, pineapple juice concentrate, prune juice concentrate, raspberry juice concentrate, spinach juice
- 30 concentrate, strawberry juice concentrate and tomato juice concentrate.

The nutraceutical compositions of the present invention deliver therapeutic amounts of natural xanthone compounds derived from the mangosteen fruit pulp and pericarp mixture. In one embodiment of the present invention, the mixture of mangosteen fruit pulp and pericarp is present in an

amount ranging from between 3 and 50%, preferably between 5 and 25%, and most preferably between 10 and 20% of the total weight of mangosteen mixture and selected juice concentrates. In another embodiment of the invention, the nutraceutical composition comprising mangosteen fruit pulp and pericarp is formulated for oral administration. However, the present compositions can be delivered in any form known in the art, such as tablets, capsules, dispersions, solutions, suspensions, transdermal delivery systems, etc. If the mangosteen pericarp and fruit pulp mixture is complemented with selected juice concentrates, then a liquid beverage is a convenient delivery form, but other delivery forms are equally efficacious and would simply require the use of powders or other equivalent forms of the juice concentrates. Tablets or capsule forms of the present nutraceutical compositions can be prepared and coated by methods known to those of ordinary skill in the art. When the nutraceutical compositions of the present invention are presented in liquid beverage form, the ratio of water to mangosteen mixture and selected juice concentrates can be 1:1, preferably 3:1 and most preferably 4:1.

The nutraceutical compositions of the present invention can be produced through large-scale, economical operations. In one embodiment of the invented process, whole fruit from the *Garcinia mangostana* L. plant is picked and transported to a production facility. The fresh fruit can kept at ambient air temperatures during transportation or it can be frozen, depending on need. The entire mangosteen fruit, including the fruit pulp and pericarp, is then ground into a pulp and pericarp mixture using commercial grinding or mixing equipment. The resulting mixture of mangosteen fruit pulp and pericarp can then be further processed through the addition of one or more of the selected juice concentrates listed above. In preferred embodiments of the beverage form of the invention, the selected juice concentrates and water are then added to the mixture in accordance with the amounts, ranges and ratios specified above. The liquid nutraceutical compositions can then be treated, bottled or packaged for distribution to consumers using a variety of methods known to those of ordinary skill in the art, such as pasteurization, flash pasteurization, sterilization, UHT sterilization, pressure sealing, freezing, freeze drying, irradiating, etc. Dehydrated and other forms of the nutraceutical compositions can also be prepared using standard techniques.

The effectiveness in improving general health and wellness of the nutraceutical mangosteen compositions described herein is demonstrated from the following clinical examples, which are listed for illustrative purposes only and are not meant to be limiting instances of therapeutic use. A therapeutic
5 composition of the mangosteen fruit pulp and pericarp mixture was prepared according to the embodiments described herein. Each subject ingested 3 ounces of the beverage daily for a three week period. The following qualitative results were obtained:

Example 1

10 The subject was a 62-year-old female suffering from chronic back pain, nausea and chronic vertigo. Prior to the study, the pack pain was treated with oral doses of morphine three times a day. After a regiment of the mangosteen nutraceutical composition, the subject experienced improved energy, less nausea and a decrease in the vertigo symptoms.

15 Example 2

The subject was a 56-year-old male suffering from chronic obstructive pulmonary disease, muscle aches, fatigue and dysthemia. After a regiment of the mangosteen nutraceutical composition, the subject experienced improvement in mood, energy and muscle aches in the shoulders and back.

20 Example 3

The subject was a 55-year-old male suffering from irritable bowel syndrome. After a regiment of the mangosteen nutraceutical composition, the subject experienced regularization of bowel movements.

Example 4

25 The subject was a 30-year-old male suffering from chronic neck pain, familial hyperlipidemia, fatigue and insomnia. After a regiment of the mangosteen nutraceutical composition, the subject experienced improved energy and a decrease in low-density lipoproteins.

Example 5

30 The subject was a 52-year-old male suffering from hypokelemia, fatigue and weight gain. After a regiment of the mangosteen nutraceutical composition, the subject experienced improved energy and a normalization of potassium levels.

Example 6

The subject was a 63-year-old female suffering from degenerative arthritis, C-difficile colitis, fatigue, decreased appetite hypokeleemia, and numbness of the fingers and toes. After a regiment of the mangosteen
5 nutraceutical composition, the subject experienced improvement in colitis, reduction of pain in wrists and hands and a normalization of potassium levels.

Example 7

The subject was a 66-year-old male suffering from a severe allergy reaction causing desquamation of palms, fingers, soles of feet and the inside of
10 the mouth and esophagus. After a regiment of the mangosteen nutraceutical composition, the subject was completely cured.

Example 8

The subject was a 57-year-old male suffering from malaise, muscle aches, hepatitis, glomerionephritis, diabetes and hyperlipidemia. After a regiment of the
15 mangosteen nutraceutical composition, the subject experienced a 30-point decrease in low-density lipoproteins, a 10-point increase in high-density lipoproteins, improved energy, a 14-pound weight loss and the malaise was eliminated.

Example 9

The subject was a 30-year-old male suffering from a chronic dermal rash.
20 After a regiment of the mangosteen nutraceutical composition, the rash was completely eliminated.

Example 10

The subject was a 25-year-old female suffering from low energy levels.
25 After a regiment of the mangosteen nutraceutical composition, the subject experienced increased energy.

Example 11

The subject was a 28-year-old female suffering from extreme fatigue and depression. After a regiment of the mangosteen nutraceutical composition, the
30 subject experienced a significant increase in energy.

Example 12

The subject was a 26-year-old female suffering from irritable bowel syndrome. After a regiment of the mangosteen nutraceutical composition, the

subject experienced a decrease in cramping and stool frequency and increased energy.

Example 13

5 The subject was a 32-year-old male marathon runner and iron man competitor. After a regiment of the mangosteen nutraceutical composition, the subject experienced increased energy levels.

Example 14

10 The subject was a 70-year-old female suffering from severe arthritis. After a regiment of the mangosteen nutraceutical composition, the subject experienced complete elimination of arthritic symptoms and increased energy.

The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than
15 by the foregoing description. All changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope.

Claim 1. A nutraceutical beverage, comprising:

pericarp from fruit of a *Garcinia mangostana* L. tree;

a first juice from fruit of a *Garcinia mangostana* L. tree; and

at least one second juice selected from the group consisting of fruit juice and

5 vegetable juice.

Claim 2. The nutraceutical beverage of claim 1, wherein said at least one second juice comprises fruit juice.

Claim 3. The nutraceutical beverage of claim 2, wherein said fruit juice is comprised of at least one of apple juice, apricot juice, banana juice, blueberry juice, 10 cantaloupe juice, cherry juice, cranberry juice, grape juice, grapefruit juice, kiwi fruit juice, orange juice, papaya juice, pear juice, pear puree, pineapple juice, prune juice, raspberry juice and strawberry juice.

Claim 4. The nutraceutical beverage of claim 1, wherein said at least one second juice comprises vegetable juice.

15 Claim 5. The nutraceutical beverage of claim 4, wherein said vegetable juice is comprised of at least one of alfalfa juice, carrot juice, celery juice, green barley juice, green lettuce juice, kale juice, parsley juice, spinach juice and tomato juice.

Claim 6. The nutraceutical beverage of claim 1, wherein said pericarp 20 from fruit of a *Garcinia mangostana* L. tree is processed from whole fruit pericarp.

Claim 7. The nutraceutical beverage of claim 6, wherein said pericarp comprises ground pericarp.

Claim 8. The nutraceutical beverage of claim 6, wherein said pericarp

comprises powdered pericarp.

Claim 9. The nutraceutical beverage of claim 2 and claim 3, wherein said fruit juice comprises juice from concentrate.

Claim 10. The nutraceutical beverage of claim 4 and claim 5, wherein said
5 vegetable juice comprises juice from concentrate.

Claim 11. The nutraceutical beverage of claim 1, wherein said second juice comprises juice from concentrate.

Claim 12. The nutraceutical beverage of claim 11, wherein said juice from concentrate is comprised of at least one of apple juice, blueberry juice, cherry juice,
10 cranberry juice, grape juice, pear juice, pear puree, raspberry juice and strawberry juice.

Claim 13. The nutraceutical beverage of claim 11, wherein said juice from concentrate is comprised of at least one of blueberry juice, cherry juice, cranberry juice, grape juice and pear juice.

15 Claim 14. The nutraceutical beverage of claim 6, claim 7 and claim 8 wherein said second juice is comprised of juice from concentrate.

Claim 15. The nutraceutical beverage of claim 11, wherein a percentage by weight of said pericarp from fruit of a *Garcinia mangostana* L. tree and said juice from fruit of a *Garcinia mangostana* L. tree is approximately 3% to 50% of a total
20 weight of said pericarp from fruit of a *Garcinia mangostana* L. tree, said juice from fruit of a *Garcinia mangostana* L. tree and said juice from concentrate.

Claim 16. The nutraceutical beverage of claim 11, wherein a percentage by weight of said pericarp from fruit of a *Garcinia mangostana* L. tree and said juice

from fruit of a *Garcinia mangostana* L. tree is approximately 5% to 25% of a total weight of said pericarp from fruit of a *Garcinia mangostana* L. tree, said juice from fruit of a *Garcinia mangostana* L. tree and said juice from concentrate.

Claim 17. The nutraceutical beverage of claim 11, wherein a percentage by
5 weight of said pericarp from fruit of a *Garcinia mangostana* L. tree and said juice from fruit of a *Garcinia mangostana* L. tree is approximately 10% to 20% of a total weight of said pericarp from fruit of a *Garcinia mangostana* L. tree, said juice from fruit of a *Garcinia mangostana* L. tree and said juice from concentrate.

Claim 18. The nutraceutical beverage of claim 11, wherein a ratio of water
10 to said pericarp from fruit of a *Garcinia mangostana* L. tree, said juice from fruit of a *Garcinia mangostana* L. tree and said juice from concentrate is approximately 1:1.

Claim 19. The nutraceutical beverage of claim 11, wherein a ratio of water to said pericarp from fruit of a *Garcinia mangostana* L. tree, said juice from fruit of a *Garcinia mangostana* L. tree and said juice from concentrate is approximately 3:1.

15 Claim 20. The nutraceutical beverage of claim 11, wherein a ratio of water to said pericarp from fruit of a *Garcinia mangostana* L. tree, said juice from fruit of a *Garcinia mangostana* L. tree and said juice from concentrate is approximately 4:1.

Claim 21. A nutraceutical beverage, comprising:
pericarp from fruit of a *Garcinia mangostana* L. tree;
20 a first juice from fruit of a *Garcinia mangostana* L. tree; and
a second juice, comprising at least one of apple juice; blueberry juice; cherry juice; cranberry juice; grape juice; pear juice; pear puree; raspberry juice; and strawberry juice.

Claim 22. The nutraceutical beverage of claim 21, wherein said second juice comprises juice from concentrate.

Claim 23. The nutraceutical beverage of claim 22, wherein a percentage by weight of said pericarp and said first juice is approximately 3% to 50% of a total weight of said pericarp, said first juice and said second juice.

Claim 24. The nutraceutical beverage of claim 22, wherein a percentage by weight of said pericarp and said first juice is approximately 5% to 25% of a total weight of said pericarp, said first juice and said second juice.

Claim 25. The nutraceutical beverage of claim 22, wherein a percentage by weight of said pericarp and said first juice is approximately 10% to 20% of a total weight of said pericarp, said first juice and said second juice.

Claim 26. The nutraceutical beverage of claim 22, wherein a ratio of water to said pericarp, said first juice and said second juice is approximately 1:1.

Claim 27. The nutraceutical beverage of claim 22, wherein a ratio of water to said pericarp, said first juice and said second juice is approximately 3:1.

Claim 28. The nutraceutical beverage of claim 22, wherein a ratio of water to said pericarp, said first juice and said second juice is approximately 4:1.

Claim 29. A nutraceutical composition, comprising:
pericarp from fruit of a *Garcinia mangostana* L. tree; and
at least one fruit or vegetable juice other than mangosteen juice combined with said pericarp into a nutraceutical composition.

Claim 30. The nutraceutical composition of claim 29, wherein said at least one juice comprises fruit juice.

Claim 31. The nutraceutical composition of claim 30, wherein said fruit juice is comprised of at least one of apple juice, blueberry juice, cherry juice, cranberry juice, grape juice, pear juice, pear puree, raspberry juice and strawberry juice.

5 Claim 32. The nutraceutical composition of claim 29, wherein said at least one juice comprises vegetable juice.

Claim 33. The nutraceutical composition of claim 32, wherein said vegetable juice is comprised of at least one of alfalfa juice, carrot juice, celery juice, green barley juice, green lettuce juice, kale juice, parsley juice, spinach juice and
10 tomato juice.

Claim 34. The nutraceutical composition of claim 29, further comprising processed fruit pulp from fruit of a *Garcinia mangostana* L. tree.

Claim 35. The nutraceutical composition of claim 29, wherein said at least one juice comprises juice from concentrate.

15 Claim 36. The nutraceutical composition of claim 29, wherein said at least one juice comprises a juice powder.

Claim 37. The nutraceutical composition of claim 29, wherein said nutraceutical composition comprises a syrup.

Claim 38. The nutraceutical composition of claim 29, wherein said
20 nutraceutical composition comprises a powdered drink mix.

Claim 39. The nutraceutical composition of claim 29, wherein said nutraceutical composition comprises a tablet.

Claim 40. The nutraceutical composition of claim 29, wherein said

nutraceutical composition comprises a capsule.

Claim 41. The nutraceutical composition of claim 29, wherein the percentage by weight of said pericarp and said juice is approximately 3% to 50% of the total weight of said nutraceutical composition.

5 Claim 42. The nutraceutical composition of claim 29, wherein the percentage by weight of said pericarp and said juice is approximately 5% to 25% of the total weight of said nutraceutical composition.

 Claim 43. The nutraceutical composition of claim 29, wherein the percentage by weight of said pericarp and said juice is approximately 10% to 20%
10 of the total weight of said nutraceutical composition.

 Claim 44. A method of preparing a nutraceutical composition, comprising:
processing fruit pulp from a *Garcinia mangostana* L. tree;
processing pericarp from a *Garcinia mangostana* L. tree;
providing at least one fruit or vegetable juice other than mangosteen juice; and
15 combining said processed fruit pulp, said processed pericarp and said at least one
fruit or vegetable juice into a mixture.

 Claim 45. The method of claim 44, wherein said providing comprises providing fruit juice.

 Claim 46. The method of claim 45, wherein said providing comprises
20 providing at least one of apple juice, apricot juice, banana juice, blueberry juice, cantaloupe juice, cherry juice, cranberry juice, grape juice, grapefruit juice, kiwi fruit juice, orange juice, papaya juice, pear juice, pear puree, pineapple juice, prune juice, raspberry juice and strawberry juice.

Claim 47. The method of claim 44, wherein said providing comprises providing vegetable juice.

Claim 48. The method of claim 47, wherein said providing comprises providing at least one of alfalfa juice, carrot juice, celery juice, green barley juice,
5 green lettuce juice, kale juice, parsley juice, spinach juice and tomato juice.

Claim 49. The method of claim 44 further comprising flash pasteurizing said mixture.

Claim 50. The method of claim 44, wherein said providing comprises providing a fruit or vegetable juice concentrate.

10 Claim 51. The method of claim 50, further comprising providing a percentage by weight of said processed fruit pulp and said processed pericarp in an amount of approximately 3% to 50% of a total weight of said processed fruit pulp, said processed pericarp and said juice concentrate.

Claim 52. The method of claim 50, further comprising providing a
15 percentage by weight of said processed fruit pulp and said processed pericarp in an amount of approximately 5% to 25% of the total weight of said processed fruit pulp, said processed pericarp and said juice concentrate.

Claim 53. The method of claim 50, further comprising providing a percentage by weight of said processed fruit pulp and said processed pericarp in an
20 amount of approximately 10% to 20% of the total weight of said processed fruit pulp, said processed pericarp and said juice concentrate.

Claim 54. The method of claim 50, further comprising providing a ratio of water to said processed fruit pulp, said processed pericarp and said juice concentrate.

of approximately 1:1.

Claim 55. The method of claim 50, further comprising providing a ratio of water to said processed fruit pulp, said processed pericarp and said juice concentrate of approximately 3:1.

5 Claim 56. The method of claim 50, further comprising providing a ratio of water to said processed fruit pulp, said processed pericarp and said juice concentrate of approximately 4:1.

Claim 57. The method of claim 44, further comprising forming said mixture into a syrup.

10 Claim 58. The method of claim 44, further comprising forming said mixture into a powdered drink mix.

Claim 59. The method of claim 44, further comprising forming said mixture into a tablet.

15 Claim 60. The method of claim 44, further comprising forming said mixture into a capsule.

Claim 61. The method of claim 44, further comprising forming said mixture into a beverage.

20 Claim 62. A method of preparing a nutraceutical composition, comprising:
grinding fruit pulp from a *Garcinia mangostana* L. tree;
grinding pericarp from a *Garcinia mangostana* L. tree;
providing at least one juice concentrate other than mangosteen juice concentrate;
and

combining said ground fruit pulp, said ground pericarp and said at least one juice concentrate other than mangosteen juice concentrate into a mixture.

Claim 63. The method of claim 62, wherein said providing comprises providing fruit juice concentrate.

5 Claim 64. The method of claim 63, wherein said providing comprises providing at least one of apple juice concentrate, apricot juice concentrate, banana juice concentrate, blueberry juice concentrate, cantaloupe juice concentrate, cherry juice concentrate, cranberry juice concentrate, grape juice concentrate, grapefruit juice concentrate, kiwi fruit juice concentrate, orange juice concentrate, papaya
10 juice concentrate, pear juice concentrate, pear puree concentrate, pineapple juice concentrate, prune juice concentrate, raspberry juice concentrate and strawberry juice concentrate.

Claim 65. The method of claim 62, wherein said providing comprises providing vegetable juice concentrate.

15 Claim 66. The method of claim 65, wherein said providing comprises providing at least one of alfalfa juice concentrate, carrot juice concentrate, celery juice concentrate, green barley juice concentrate, green lettuce juice concentrate, kale juice concentrate, parsley juice concentrate, spinach juice concentrate and tomato juice concentrate.

20 Claim 67. The method of claim 62, further comprising providing a percentage by weight of said ground fruit pulp and said ground pericarp in an amount of approximately 3 to 50% of said mixture.

Claim 68. The method of claim 62, further comprising providing a

percentage by weight of said ground fruit pulp and said ground pericarp in an amount of approximately 5 to 25% of said mixture.

Claim 69. The method of claim 62, further comprising providing a percentage by weight of said ground fruit pulp and said ground pericarp in an
5 amount of approximately 10 to 20% of said mixture.

Claim 70. The method of claim 62, further comprising providing a ratio of water to said ground fruit pulp, said ground pericarp and said at least one juice concentrate other than mangosteen juice concentrate of approximately 1:1.

Claim 71. The method of claim 62, further comprising providing a ratio of
10 water to said ground fruit pulp, said ground pericarp and said at least one juice concentrate other than mangosteen juice concentrate of approximately 3:1.

Claim 72. The method of claim 62, further comprising providing a ratio of water to said ground fruit pulp, said ground pericarp and said at least one juice concentrate other than mangosteen juice concentrate of approximately 4:1.

15 Claim 73. A method for preparing a nutraceutical beverage, comprising:
grinding whole pericarp from a *Garcinia mangostana* L. tree to form ground whole pericarp;

providing at least one fruit or vegetable juice other than mangosteen juice;

mixing said ground whole pericarp with said at least one fruit or vegetable juice

20 other than mangosteen juice to form a liquid pericarp mixture; and

bottling said liquid pericarp mixture.

Claim 74. The method of claim 73, further comprising pasteurizing said liquid pericarp mixture before said bottling step.

Claim 75. The method of claim 73, further comprising providing a ratio of water to said liquid pericarp mixture of approximately 1:1.

Claim 76. The method of claim 73, further comprising providing a ratio of water to said liquid pericarp mixture of approximately 3:1.

5 Claim 77. The method of claim 73, further comprising providing a ratio of water to said liquid pericarp mixture of approximately 4:1.

Claim 78. The method of claim 73, wherein said providing comprises providing fruit juice.

10 Claim 79. The method of claim 78, wherein said providing comprises providing at least one of apple juice, apricot juice, banana juice, blueberry juice, cantaloupe juice, cherry juice, cranberry juice, grape juice, grapefruit juice, kiwi fruit juice, orange juice, papaya juice, pear juice, pear puree, pineapple juice, prune juice, raspberry juice and strawberry juice.

15 Claim 80. The method of claim 73, wherein said providing comprises providing vegetable juice.

Claim 81. The method of claim 80, wherein said providing comprises providing at least one of alfalfa juice, carrot juice, celery juice, green barley juice, green lettuce juice, kale juice, parsley juice, spinach juice and tomato juice.