

Research Article

Pharmacological and Toxicological Studies on Pitrashish Noni organic Fruit Juice Concentrate (Product of Pitrashish Marketing Enterprise Pvt. Ltd.)

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ABSTRACT

Objective of this study is to find the safety of "Pitrashish noni organic fruit juice concentrate" in animal model.

Plant Used in PITRASHISH Organic NONI

Garcinia Cambogia

Garcinia gummi-gutta is a subtropical species of *Garcinia* native to Indonesia. Common names *Garcinia Cambogia* (a former scientific name), as well as gambooge, brindleberry, brindall Malabar tamarind, assam vadakkan puli (northern d) and kudam puli (pot tamarind). looks like a small pumpkin and is green yellow in color.

Latin Name: *Garcinia Cambogia*

Common Names: Citrin, Gambooge, Brindal berry, Gorikapuli, Malabar Tamarind.

Synonyms: Gutta gamba.

Gummigutta. Tom Rong. Cambodia. *Garcinia Morella*,

Sanskrit Name: Vrikshamla, Kankusta

Distribution: SE Asia, West and Central Africa, India .

It is grown for its fruit in southeast Asia, coastal Karnataka/Kerala, India and west and Africa. It thrives in most moist forests.

It is one of several closely related *Garcinia* species from the plant family Guttiferae. With thin skin and deep vertical lobes, the fruit of *G. gummi-gutta* and related species range from about the size of an orange to that of a grapefruit; *G. gummi-gutta* looks more like a small yellowish, or sometimes reddish pumpkin. The color can vary considerably. When the rinds are dried cured in preparation for storage and extraction, they are dark brown or black in color.

History

In Ayurveda, it is said that the sour flavors, such as those from *Garcinia*, activate digestion. has also been considered to make foods more filling and satisfying, and has been used for many centuries with no known toxicity. This herb has been used historically in India to the treatment of various health conditions.

Chemical Constituents

Chemical constituent present are (-) Hydroxy citric Acid, (-) Hydroxy citric Acid lactone, \pm Garcinol, Isogarcinol and cyanidin -3-sambubioside.

Pharmacology

Hydroxy Citric Acid present in *Garcinia cambogia* suppresses the fatty acid synthesis, lipogenesis, food intake and induced weight loss. Invitro studies revealed inhibitions of fatty acid synthesis and is from various precursors.

Benefits & Uses

1. *Garcinia* has also been considered to make foods more filling and satisfying.
2. *Garcinia cambogia* was able to decrease the acidity and to increase the mucosal defense in gastric areas, thereby justifying its use as an antiulcerogenic agent.
3. *Garcinia* does not contain any addictive components and can be

taken without fear of addiction for extended periods of time.

4. Garcinia also contains significant amounts of Vitamin C and has been used as a heart tonic.
5. Garcinia, when taken over a period of time, has the ability to slow production of fat and help the body metabolize it more efficiently.

Aloe Vera

Aloe vera plant has been known and used for centuries for its health, beauty, medicinal and skin care properties. The name Aloe vera derives from the Arabic word "Alloeh" meaning "shining bitter substance," while "vera" in Latin means "true." 2000 years ago, the Greek scientists regarded Aloe as the universal panacea. The Egyptians called "the plant of immortality." Today, the Aloe plant has been used for various purposes in dermatology.

Plant

Botanical name of Aloe vera is *Aloe barbadensis miller*. It belongs to Asphodelaceae (Liliaceae), family and is a shrubby or arborescent, perennial, xerophytic, succulent, pea-green color plant. It grows mainly in the dry regions of Africa, Asia, Europe and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra and Tamil Nadu.

components with its properties contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, salicylic acids and amino acids.

1. Vitamins

It contains vitamins A (beta-carotene), C and E, which are antioxidants. It also contains vitamin B12, folic acid, and choline. Antioxidant neutralizes free radicals.

2. Enzymes

It contains 8 enzymes: aliiase, alkaline phosphatase, amylase, bradykinase, rboxypeptidase, catalase, cellulase, lipase, and peroxidase. Bradykinase helps to reduce excessive inflammation when applied to the skin topically, while others help in the breakdown of sugars and fats.

3. Minerals

It provides calcium, chromium, copper, selenium, magnesium, manganese, potassium, sodium and zinc. They are essential for the proper functioning of various enzyme

systems in different metabolic pathways and few are antioxidants.

4. Sugars

It provides monosaccharides (glucose & fructose) and Polysaccharides: (glucomannans/polymannose). These are derived from the mucilage layer of the plant and are known as mucopolysaccharides. The most prominent monosaccharide is mannose-6-phosphate, and the most common polysaccharides are called glucomannans [β -(1,4)-acetylated mannan]. Acemannan, a prominent glucomannan has also been found. Recently, a glycoprotein with antiallergic properties, called alprogen and novel anti-inflammatory compound, C-glucosyl chromone, has been isolated from Aloe vera gel.

5. Anthraquinones

It provides 12 anthraquinones, which are phenolic compounds traditionally known as laxatives. Aloin and emodin act as analgesics, antibacterials and antivirals.

6. Fatty acids

It provides 4 plant steroids; cholesterol, campesterol, B-sisosterol and lupeol. All these have anti-inflammatory action and lupeol also possesses antiseptic and analgesic properties.

7. Hormones

Auxins and gibberellins that help in wound healing and have anti-inflammatory action.

8. Others

It provides 20 of the 22 human required amino acids and 7 of the 8 essential amino acids. It also contains salicylic acid that possesses anti-inflammatory and antibacterial properties. Lignin, an inert substance, when included in topical preparations, enhances penetrative effect of the other ingredients into the skin. Saponins that are the soapy substances form about 3% of the gel and have cleansing and antiseptic properties.

Mechanism of actions

1. Healing properties

Glucomannan, a mannose-rich polysaccharide, and gibberellin, a growth hormone, interacts with growth factor receptors on the fibroblast, thereby stimulating its

activity and proliferation, which in turn significantly increases collagen synthesis after topical and oral Aloe vera. Aloe vera gel not only increased collagen content of the wound but also changed collagen composition (more type III) and increased the degree of collagen cross linking. Due to this, it accelerated wound contraction and increased the breaking strength of resulting scar tissue. An increased synthesis of hyaluronic acid and dermatan sulfate in the granulation tissue of a healing wound following oral or topical treatment has been reported.

2. Effects on skin exposure to UV and gamma radiation

Aloe vera gel has been reported to have a protective effect against radiation damage to the skin. Exact role is not known, but following the administration of aloe vera gel, an antioxidant protein, metallothionein, is generated in the skin, which scavenges hydroxyl radicals and prevents suppression of superoxide dismutase and glutathione peroxidase in the skin. It reduces the production and release of skin keratinocyte-derived immunosuppressive cytokines such as interleukin-10 (IL-10) and hence prevents UV-induced suppression of delayed type hypersensitivity.

3. Anti-inflammatory action

Aloe vera inhibits the cyclooxygenase pathway and reduces 3-oxo- Δ^6 -prostaglandin E₂ production from arachidonic acid. Recently, the novel anti-inflammatory compound called C-glucosyl chromone was isolated from gel extracts.

4. Effects on the immune system

Alprogen inhibit calcium influx into mast cells, thereby inhibiting the antigen-antibody-mediated release of histamine and leukotriene from mast cells. In a study on mice that had previously been implanted with murine sarcoma cells, acemannan stimulates the synthesis and release of interleukin-1 (IL-1) and tumor necrosis factor from macrophages in mice, which in turn initiated an immune attack that resulted in necrosis and regression of the cancerous cells. Several low-molecular-weight compounds are also capable of inhibiting the release of reactive

oxygen free radicals from activated human neutrophils.

5. Laxative effects

Anthraquinones present in latex are a potent laxative. It increases intestinal water content, stimulates mucus secretion and increases intestinal peristalsis.

6. Antiviral and antitumor activity

These actions may be due to indirect or direct effects. Indirect effect is due to stimulation of the immune system and direct effect is due to anthraquinones. The anthraquinone aloin inactivates various enveloped viruses such as herpes simplex, varicella zoster and influenza. In recent studies, a polysaccharide fraction has shown to inhibit the binding of benzopyrene to primary rat hepatocytes, thereby preventing the formation of potentially cancer-initiating benzopyrene-DNA adducts. An inhibition of glutathione S-transferase and an inhibition of the tumor-promoting effects of phorbol myristic acetate has also been reported which suggest a possible benefit of using Aloe gel in cancer chemoprevention.

7. Moisturizing and anti-aging effect

Mucopolysaccharides help in binding moisture into the skin. Aloe stimulates fibroblast which produces the collagen and elastin fibers making the skin more elastic and less wrinkled. It also has cohesive effects on the superficial flaking epidermal cells by sticking them together, which softens the skin. The amino acids also soften hardened skin cells and zinc acts as an astringent to tighten pores. Its moisturizing effects has also been studied in treatment of dry skin associated with occupational exposure where aloe vera gel gloves improved the skin integrity, decreases appearance of fine wrinkle and decreases erythema. It also has anti-acne effect.

8. Antiseptic effect

Aloe vera contains 6 antiseptic agents: Lupeol, salicylic acid, urea nitrogen, cinnamonic acid, phenols and sulfur. They all have inhibitory action on fungi, bacteria and viruses.

Morinda Citrifolia

Historical uses have targeted the digestive, intestinal, respiratory and immune systems. It

is particularly useful for supporting the nervous and skeletal systems, especially painful joints, and for skin health.

Morinda Citrifolia is a large shrub to medium tree varying from 3 metres to 12 metres high. It has oval shaped leaves of about 300 mm long by 150 mm wide. The white flowers occur in the leaf axils in clusters and occur in summer and autumn. They are followed by succulent fuse into a large compound structure as they ripen. The fruits are edible but have a very punget aroma when ripe, apparently to attract fruit bats which are dispersal agents for the seeds. The juice from the fruit is regarded as having a range of medicinal properties. *Morinda's* juice is high in vitamin C and there is a high demand for it as an alternative medicine for a host of illnesses.

USES

Morinda Citrifolia (NONI) Juice can increase mental clarity and attention span, as well as allow greater physical performance levels. It also benefits the following systems of the body:

Immune system: supports the immune system's natural ability to fight disease and infection.

Circulatory system, tissues, and cells: *Morinda Citrifolia* (NONI) Juice is a superior antioxidant that helps rid the body of harmful free radicals. It also increases energy levels.

Digestive system: *Morinda Citrifolia* (NONI) Juice supports proper digestion and helps you absorb e nutrients at the cellular level.

Skin and Hair

Morinda Citrifolia (NONI) Juice contains components that are specifically important to the skin and hair. It also helps carry beneficial substances to the skin.

Most commonly used to improve mental alertness, and enhance learning and academic perform ances

Toxicological studies of pitrashish noni (organic) in animals

Toxicity study

In the evaluation of the toxic characteristics of a substance, determination of acute oral toxicity is an initial step. It provides information about a number of health hazards likely to arise from short-term exposure by the oral

route. Data from an acute toxicity study may serve as a basis for classification, labeling and also in establishing a dosage regimen in sub-chronic and other studies. They also may show good therapeutic activity. Thus it helps in the determination of minimum dose, which can produce desired results in 50 % population.

In any toxicity experiment animals are treated with drugs and observed for toxic manifestations. To increase the chances of toxic manifestations the dose is chosen much higher than the therapeutic dose and for a longer duration. Drug is administered to a group of animals to get statistically reliable results. For acute toxicity study a group of animals are taken comprising of 5-10 animals in each group. Generally mice or rats are employed for the study. Sometimes dogs or monkeys are also used for this purpose. However, determination of therapeutic dose, emetic dose, and minimum symptomatic or toxic dose is greatly encouraged as these give ideas about the extent of toxic manifestations when given at a particular dose.

The animals used for the acute toxicity study are kept in identical laboratory condition at least two weeks for acclimatization to the working environment. They are fasted for 18 hours prior to drug administration. Drug is given once either orally. The dose should be such that at least three doses should cause less than 100% mortality. Now the number of deaths in each group is recorded after 24 hours and 72 hours. But here we observed that up to **2gm/kg** body weight there was no death. It can be said that **Pitrashish noni** (organic) is safe in animals.

Here we observed some toxicological parameter to establish how much safe it is. These parameters are as follow:-

Chemical Constituents of Noni (*Morinda citrifolia*)

Following is a partial list of chemical constituents isolated from noni, and their proposed or documented medicinal qualities or cultural significance. The table was assembled from the literature presented in the "Noni Bibliography" on this web site. There are reportedly numerous other compounds isolated from the noni plant that may have significant biological activity and are currently under investigation.

Noni Plant organ(s)	Compound(s)	Proposed or documented effects of compounds	Discussion & Notes
FRUIT and FRUIT JUICE	Alkaloids (xeronine)	In theory, xeronine enhances enzyme activity and protein structure	*According to some authorities, the existence and the proposed effects of the so-called alkaloid, <i>xeronine</i> , and/or the compound, <i>pre-xeronine</i> , have not been substantiated.
	Polysaccharides (glucuronic acid; galactose; arabinose; rhamose; glycosides; trisaccharide fatty acid ester)	Immuno-stimulatory; immuno-modulatory; anti-bacterial; anti-tumor; anti-cancer.	A promising area for research and a highly beneficial set of compounds.
	Scopoletin	Dilates vasculature & lowers blood pressure; anti-bacterial & anti-fungal; anti-inflammatory; analgesic; histamine-inhibiting; arthritic conditions; allergies; sleep disorders; migraine headaches; depression; Alzheimer's disease.	Potentially wide applications.
	Vitamins and Minerals: magnesium; iron; potassium; selenium; zinc; copper; sulfur; ascorbic acid (vitamin C).	The positive medical effects of the vitamins and minerals in noni juice are well documented. For any questions or medical and health concerns, consult a physician or dietician.	Noni juice is an excellent source of vitamin C.

RESULT OF TOXICITY STUDY

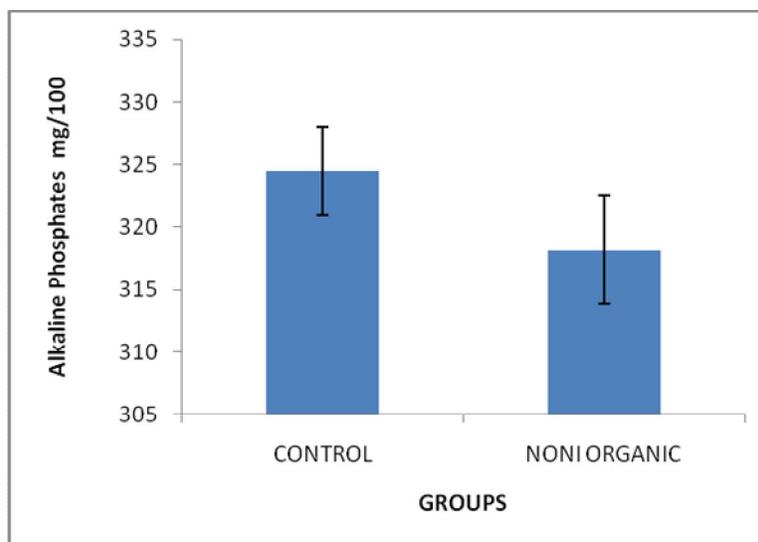
1. Liver Function Test

Determination of Alkaline Phosphates after treatment with NONI ORGANIC

Test	Control	Treated with NONI ORGANIC
Alkaline Phosphates	324.5±3.50	318.2±4.35*

No. of Animals: 20

*Statistically there is no change.

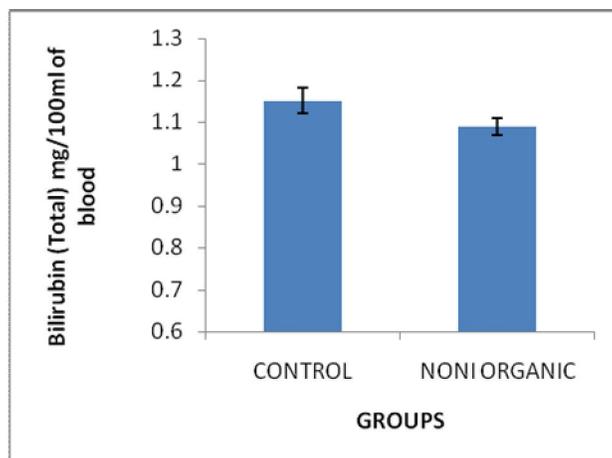


2) Determination of total Bilirubin after treatment with NONI ORGANIC

Test	Control	Treated with NONI ORGANIC
Bilirubin (Total) mg/100ml of blood	1.15±0.03	1.09±0.02*

No. of Animal: 20

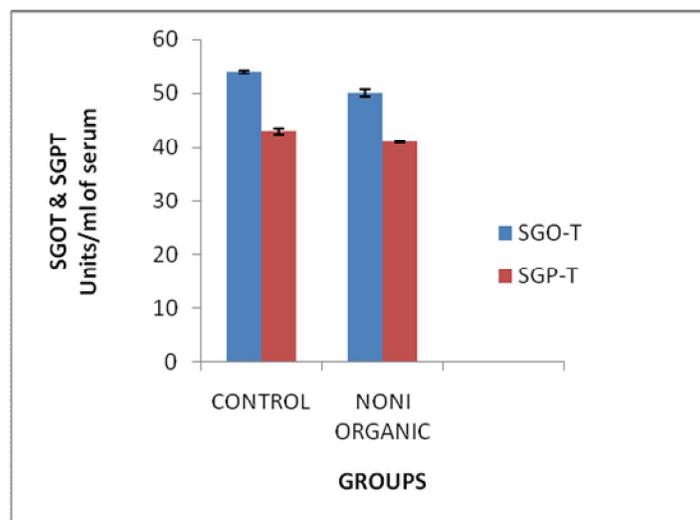
*Statistically there is no change.

**4) Determination of SGO-T & SGP-T levels after treatment with NONI ORGANIC**

Test (Units/ml of serum)	Control	Treated with NONI ORGANIC
SGO-T	54±0.35	50±0.65*
SGP-T	43±0.51	41±0.19*

No. of Animal: 20

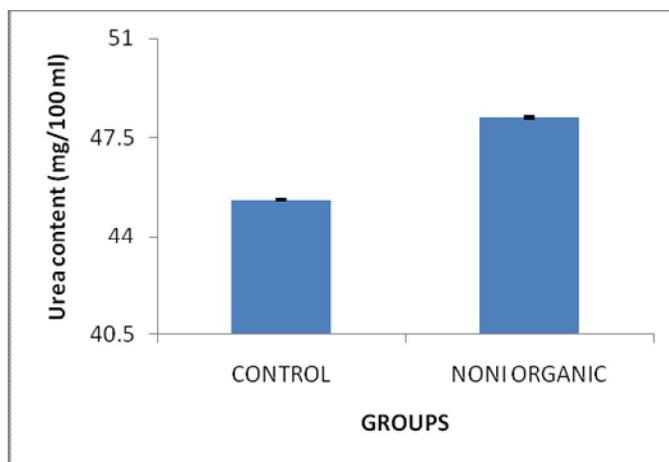
*Statistically there is no change.

**1. Kidney Function Test****Determination of Urea levels after treatment with NONI ORGANIC**

Test	Control	Treated with NONI ORGANIC
Urea mg/100 ml of blood	45.3±0.02	48.2±0.04*

No. of Animals: 20

*Statistically there is no change



CONCLUSION

Above toxicological data revealed that **Pitrashish** noni (organic) and control data are more or less same. It is clear from the toxicological studies in animal that Pitrashish organic noni is safe.

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