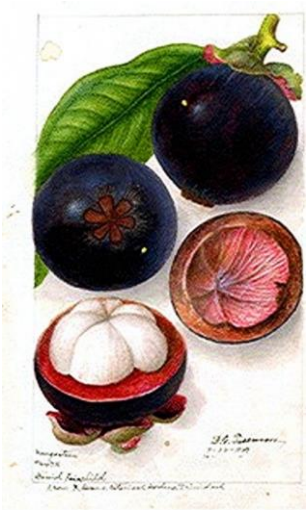
# Superfoods Fact Sheet
# Mangosteen
# (Garcinia Mangostana)



**Parts used:** Pericarb and Fruit

Used both as a food and a traditional medicine, mangosteen is a tropical fruit originating from southeast Asia.
The mangosteen fruit consists of 3 major parts: The pericarp or rind, the pulp which is known for being one of the tastiest fruits in the world and the seeds.

## Historic and Traditional Uses

Mangosteen received its Latin name from the 18th century explorer, physician and botanist Laurent Garcin. He wrote 'One may eat a great deal of this fruit without any inconvenience, and it is the only one which sick people may be allowed to eat without any scruple. It is very wholesome, refreshing and more cordial than strawberry.'

The mangosteen rind, leaves and bark have been used as folk medicine for thousands of years – in fact records regarding its medicinal use can be traced back to the Ming Dynasty (1386-1644 AD). The thick mangosteen rind has been and is used for treating catarrh, cystitis, diarrhea, dysentery, eczema, fever, intestinal ailments, pruritis and other skin ailments. The mangosteen leaves are also used by some natives in teas and for diarrhea, dysentery, fever, and thrush. It is also known that concentrates of mangosteen bark can be used for genito-urinary afflictions and stomatosis.

It is most commonly used as a tea, made by grinding the rind and boiling in water, but the ground rind powder is also used topically for skin disorders.

More recently Queen Victoria was introduced to the benefits of this exotic fruit and it became a firm favourite of hers.

## Health Benefits

Modern science is just beginning to catch up with what traditional healers around the world have known for centuries – that mangosteen has many amazing health benefits. Mangosteen will inevitably benefit the whole body, but studies so far have found it particularly effective in reducing inflammation, protecting the heart and preventing many different types of cancer, including breast cancer, liver cancer and leukaemia.

### AntiCancer

Scientific studies suggest that mangosteen has strong anti-proliferation, potent anti-oxidant and induction of apoptosis properties and therefore has great potential for cancer prevention.[1]

### Cardiovascular

Current research also suggests that xanthones may have a beneficial effect on cardiovascular disease, including blood pressure, thrombosis, ischemic heart disease and atherosclerosis, as well as having vasorelaxant properties.[2]

### Anti-Bacterial, Anti-Viral, Anti-Fungal

Mangosteen has also shown itself to be highly supportive of the immune system and laboratory studies have demonstrated an inhibitory action against bacterial organisms such as mycobacterium tuberculosis, salmonella typhi and staphylococcous aureus (MRSA).[3] In addition xanthones have been tested against three common fungi and showed the capacity to inhibit their growth.

The anti-viral capabilities of xanthones were put to the test by the National University of Singapore. An ethanol extract of Mangosteen has shown itself to have potent inhibitory activity against the HIV-1 protease[4], causing the virus to remain immature and incapable of infection.

Mangosteen has an antibiotic effect and is believed to be useful for conditions such as meningitis, cystitis, pneumonia and respiratory infections amongst others. Traditional practitioners believe mangosteen will benefit any type of human infection.

### Anti-Inflammatory

Researchers from India used mangosteen pericarb to investigate the effects on inflammation within the

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[1] [1] J Ethnopharmacol. 2004 Jan 90 (1): 161-6 Antip-proliferation, antioxidation and induction of apoptosis by Garcinia mangostana on SKBR3 human breast cancer cell line. J Nat Prod 2003 Aug 55 (8): 1124-7 Induction of apoptosis by xanthones from mangosteen in human leukemia cell lines. Molecular Pharmacology Jun 24 2004 Gamma-mangostin inhibits IkappaB kinase activity with and decreases lipopolysaccharide-induced cyclooxygenanase-2 gene expression in C6 rat glioma cells. Biochem Pharmacol. 2002 Jan 1 63(1):73-9 Inhibition of cyclooxygenase and prostaglandin E2 synthesis by gamma-mangostin.

[2] Cardiovascular Drug Reviews 2004 22(2): 91-102 Pharmacological effects of xanthones as cardiovascular protective agents. Biochem Pharmacol 2002 Jan 1 63(1): 73-9. Free Radical Res 1995 August 23 (2): 175-84 Mangostin inhibits the oxidative modification of human low density lipoprotein

[3] J Nat Prod 1997 May 60 (5): 519-24 Evaluation of the antifungal activity of natural xanthones from Garcinia mangostana and their synthetic derivatives. J Med Assoc Thai. 1997 Sept 80 supp1:S149-54 Immunopharmacological activity of polysaccharide from the pericarb of mangosteen garcinia: phagocytic intracellular killing activities. J Pharmacol 1996 48 (8): 861-865 Antibacterial activity of xanthones from guttifereous plants against methicillin-resistant staphylococcous aureus.

[4] Planta Med 1996 Aug 62(4): 381-2 Active constituents against HIV-1 protease from Mangosteen

body and results showed suppression of acute and chronic inflammation. Further research showed also that two of the serious and common side-effects of anti-inflammatory drugs ie. interference with blood clotting and stomach ulcers, were absent with use of xanthones as an anti-inflammatory.[5]

Other benefits ascribed to manogsteen, but awaiting validation through scientific studies include antidepressant effects, treatment of digestive disorders aiding arthritis, Alzheimers and gout.

Topical use can treat external wounds, skin conditions such as eczema, and acne.

## Nutritional Value

The primary active constituents of mangosteen are called xanthones. Xanthones are polyphenolic compounds which are structurally similar to bioflavinoids. They are rare in nature, occurring in only two plant families.

There are around 210 naturally occurring xanthones that have so far been identified, and around 40 of these have been found in mangosteen. Xanthones are antioxidant compounds and the Oxygen Radical Absorption Capacity or ORAC test for mangosteen has found that it juice can neutralise up to 20 - 30 times more free radicals than other natural fruit juices.

Mangosteen is unusual in that this unique antioxidant content is found mainly in the pericarb, or rind.

Xanthones in laboratory *vitro* (test tube)studies have been shown to have several benefits including being anti-convulsive, anti-inflammatory, anti-cancer, anti-bacterial, anti-fungal, anti-viral, anti-histamine and anti-allergenic. No studies have so far been carried out to prove the same effect when taken orally.

Other beneficial compounds include polysaccharides, sterols, Proanthocyanidins and catechins, all of which add to the fruits beneficial effects and many of which are highly antioxidant. Mangosteen is unusual in that its unique antioxidant content is found mainly in the pericarb, or rind.

Other nutrients include:

| | **per 100 gm** |
|---|---|
| Folates | 31 ug |
| Niacin (B3) | 286 mcg |

[5] Arch Int Pahrmacodyn Ther. 1979 239 (2): 257-269 Pharmacological Logical Profile of Mangosteen and its derivatives

| | |
|---|---|
| Pantothenic acid(B5) | 32 mcg |
| pyridoxine(B6) | 41 mcg |
| riboflavin (B2) | 54 mcg |
| Thiamin (B1) | 54 mcg |
| Vit A | 35 iu |
| VIt C | 7.2 mg |
| Sodium | 7 mg |
| Potassium | 48 mg |
| Calcium | 5.49 mg |
| Copper | 69 mcg |
| Magnesium | 13.9 mg |
| Iron | .17 mg |
| Manganese | .10 mg |
| Zinc | 012 mg |
| Phosphorus | 9.21 mg |
| Carotene –a | 1 ug |
| Carotene- b | 16 ug |
| cryptoxanthin –B | 9 ug |

(Source: USDA National Nutrient Database)