



## RAMPHAL: AN ETHNO-MEDICINAL PLANT

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### Introduction

It is seen that most of the population of developing countries utilizes plant-based traditional medicine for their primary health care needs. Indian traditional system of medicine; Ayurveda is also based on plants. Medicines derived from plants act as first line defence of the body and help to restore the health. Extracts from different plant parts hold wide range of medicinal properties and also utilized as raw materials in herbal industry. Exploration of chemical constituents obtained from plants may provide new leads for the development of novel drug (Jamkhande and Wattamwar, 2015). *Ramphal* (*Annona reticulata* L.) is one of the traditionally important plants used for the treatment of various ailments. *Ramphal* may connote other types of fruits in the *Annona* family, such as custard apple and sweetsop. This entry, however, is specific to *Annona reticulata*, also known as bullock's heart. Other names of *ramphal* are Netted custard apple, Bullock's Heart, *Ramphal* (Hindi, Kannada, Marathi, Gujarati), Lavani, Krishnabija (Sanskrit), Ramachita (Tamil), Manilanilam (Malayalam), Nona (Bengali), Ramopholo (Oriya). An obvious difference between bullock's heart and sugar apple or soursop is the exterior—while the sugar apple has a green bumpy surface; it tends to have a smoother surface in varying colours. Some fruits are pale yellow while others are a rusty shade of pink.

*Annona reticulata* L. is a highly apparent plant in ayurvedic system of medicine for the treatment of various ailments. The plant is traditionally used for the treatment of epilepsy, dysentery, cardiac problems, worm infestation, constipation, haemorrhage, antibacterial infection, dysuria, fever, ulcer etc. It has also an anti fertility, anti tumour and abortifacient properties and kills cancer ten thousand times more than others. This plant is reputed to possess varied medicinal properties. Several research workers investigated the pharmacological activities of different parts of the plant (Biba *et al.*, 2014).

### Distribution

It is found wild and cultivated throughout India up to an altitude of 900m. It is found growing gregariously and widely in the hilly tracts, waste lands and become completely naturalized in several districts of Andhra Pradesh, Punjab, Rajasthan, Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Assam, Gujarat, Maharashtra, Karnataka, Kerala and Tamil Nadu. It is a native of South America and West Indies.

### Botanical description

A tree is about to 6m high, bark is thin and grey in colour. Leaves are simple, alternate, 3.5-8 x 1.5-4 cm, oblong-lanceolate or elliptic, obtuse or sub acute, pellucid punctate, glabrous above, glaucous and pubescent beneath when young; lateral nerves 8-11 pairs, petiole up to 2cm long. Flower bisexual, drooping, green, solitary, leaf opposed or 2-4

on short extra axillary branchlets. Fruit globose, 5-10 cm in diameter, usually with a glaucous bloom on the surface when young, yellowish-green when ripe, easily broken into large pieces; areoles well marked, pulp white, sweet. Seeds many, arilate, brownish-black, smooth or polished and hard, flowering: March – July; fruiting: August –January. Parts used: most commonly used plant parts are root, leaf, fruit, seeds, and bark (Pathak and Zaman, 2013).



**Fig. Fruits of *Ramphal***

#### **Origin of *Ramphal***

*Ramphal* originate somewhere in the Caribbean-likely the West Indies, but other contenders are Central and South America. According to the book “Origin of Cultivated Plants (1886),” bullock’s heart was spotted growing wild in Cuba, Jamaica, St. Vincent, Barbados, and Panama. Today, the fruit’s naturalized in Southeast Asia, India, Taiwan, West Africa and Australia.

#### **Ethno medicinal uses**

The root is a powerful purgative. It is used in mental depression, spinal disorders and dysentery. The leaves are suppurative, stimulant, anti spasmodic, sudorific, anthelmintic, and insecticidal, and are useful in destroying lice. Leaves made into a paste without adding water are applied to unhealthy ulcers while fresh juice to nostrils in hysteria and fainting. Ripe fruit is sweet, maturant, cooling, good tonic and sedative. It enriches the blood, increases muscular strength, and lessens, burning sensation, tendency to biliousness and vomiting. Unripe fruit is given in diarrhoea, dysentery and atonic dyspepsia. Seeds are detergent, insecticidal and abortifacient. Bark is also an astringent and tonic. It is also used traditionally uterotonic, anti-spermatogenic, anti implantation, anti fertility, anti fungal, anti platelet aggregation, abortifacient, anti ovulatory, diuretic, piscicidal, anti septic, anti conceptional, anti convulsant, spasmogenic, vermifugal, adrenergic stimulating, molluscicidal, anti headlice, analgesic, anti feedant, growth disrupting agent. Leaves show potent anti diabetic activity. Some workers isolated flavonoids from leaves. Ethanol extract of the leaves and stem is reported to have anti-cancer activity (Biba *et al.*, 2014, Pathak and Zaman, 2013).

#### **Pharmacological Studies**

1. **Antioxidant Activity:** A study was carried out on three well known species of *Annona* for the antioxidant activity. Different in vitro models were used for this study like 1, 1-diphenyl-2-picryl hydrazyl (DPPH) model, 2, 2-azinobis-(3-ethylbenzothiazoline-6-sulphonate) (ABTS) model, nitric oxide, superoxide, hydroxy radical and lipid peroxidation models. Study was found to be helpful in proving that the leaves extracts of *A. reticulata* showed better activities in quenching DPPH and superoxide radicals hence antioxidant potential of plant .

2. **Anti-Cancer Activity:** Annonaceous acetogenins are a group of constituents obtained from plants belonging to Annonaceae, having potentials of anti-neoplastic agents. Acetogenins are potent cytotoxic inhibitors of the mitochondrial NADH:ubiquinone oxidoreductase (complex I of the respiratory chain). A study shows that main five annonaceous acetogenins which are solamin, annoreticulic acid, annomonicin, squamone, and rolliniastatin are having cytotoxic activities. Acetogenins isolated from the seeds of *A. reticulata* are bullatacin, cis-/trans-isomurisolenin, cis-/trans-bullatacinone, annoreticulic acid, annoreticulic acid-9-one, cis-/trans-murisolinone and squamocin.
3. **Anthelmintic Activity:** The aqueous leaf extract has also been reported to have anthelmintic activity (Kaleem *et al.*, 2006).
4. **Inflammatory Diseases:** Nine compounds were characterized from the leaves of *A. reticulata* L, by Thang *et al.*, 2013 and their inhibitory activity on NO production was examined. The results provide a potential explanation for the use of the leaves of *A. reticulata* as an herbal medicine in the treatment of inflammatory diseases, and they may be potentially useful in developing new anti-inflammatory agents (Thang *et al.*, 2013).
5. **Analgesic and CNS depressant activity:** Bhalke and Chavan [2011] investigated that Analgesic and CNS depressant activity potency increases from ethyl acetate, methanol and petroleum ether extracts. All the extracts exhibited significant central analgesic activity in the hot plate method in mice. All the extract showed statistically significant mild to moderate central nervous system depressant activity assessed by locomotor activity assay and pentobarbitone sleeping time test.

#### **Amazing benefits of *Ramphal* leaves**

- Cure cancer more rapidly and effectively than chemotherapy
- Ten thousand times stronger than chemotherapy in fighting cancer cells
- Treating gout
- Treatments of back pain
- Natural treatments of arthritis pain-mash the leaves until it becomes smooth and apply on the affected area of the body by pain arthritis and eczema, regularly twice a day.
- Stabilizes blood sugars level in normal range
- Boost up the immune systems
- Effective in inhibiting the growth of bacteria, virus, parasites and tumour developments
- Improving stamina and facilitating quick recovery diseases
- Treatments of boils
- Get rids of lice
- Remedy for gall bladder trouble, cough and catarrh, dysentery, fever and indigestion
- Use for the treating haematuria and liver ailments
- Faster healing of wounds
- Decoction of leaf can use as compresses for inflammation and swollen feet
- It prevent leg cramps and anaemia

#### **Evidences of medicinal properties**

1. A study published in the *International Journal of Pharmacy and Pharmaceutical Sciences* (2012) found that the leaf extracts showed potent anti-ulcer activity when tested on rats.
2. A study published in the *Asian Pacific Journal of Tropical Medicine* (2012) found that leaf and bark extracts have anti-dermato phytic potential, thus having possible skin cosmetics applications.
3. According to a study appearing in the *International Journal of Research in Pharmaceutical Sciences* (2011), *ramphal* leaves possess anti-helminthic activities.
4. A report published in *Food and Chemical Toxicology* (2008) found that anonaine, a compound in the *ramphal* plant and other *Annona* species, possesses anti cancer activities and holds great potential as a nutritional supplement for cancer chemoprevention.
5. According to a study published in the *Asian Pacific Journal of Pharmaceutical and Clinical Research* (2013), *Annona reticulata* leaves possess a glucose-lowering effect, thus acting as an antidiabetic.

### Checking for Ripeness in *Ramphal*

In their unripe state, *ramphals* are hard touchy and have shiny, pale green skin. As they ripened, the fruit feels heavy for their size and grow soft. The exterior colour of ripe *ramphals* varies considerably. Some are pale yellowish brown, while others are a dusky purple. Others remain yellowish green, while some transform to a lovely crimson colour.

### Taste of Bullock's Heart (*Ramphal*)

The taste of bullock's heart differs from sugar apple in a few distinct ways first; bullock's heart is not as sugary. Secondly, *ramphal* compensates for its lack of sweetness with a smoother, buttery consistency. As an added bonus, *ramphals* have fewer seeds. Despite these similarities, most would prefer a sugar apple if given the choice.

*Ramphal's* status as a wild fruit creates great variability in its exterior colour and taste. Some *ramphals* possess a rich, sweet taste as described above, but others have an unpalatable coarse texture, insipid flavour, and at worst, an off-putting musky taste as it nears over ripening.

### Nutritional Value of Bullock's Heart (*Ramphal*)

According to the USDA nutrient database, 100g of bullock's heart contains the following values:

S. No.	Constituents	Amount	RDI (%)
Total calories: 101 kcal			
1.	Carbohydrates	25.2g	8% RDI
2.	Fibre	2.4g	10% RDI
3.	Fat	0.6g	1% RDI
4.	Saturated Fat	0.2g	1% RDI
5.	Protein	1.7g	3% RDI
6.	Vitamin A	33IU	1% RDI
7.	Vitamin C	19.2mg	32% RDI
8.	Thiamin	0.1mg	5% RDI
9.	Riboflavin	0.1mg	6% RDI
10.	Niacin	0.5mg	2% RDI
11.	Vitamin B6	0.2mg	11% RDI
12.	Pantothenic Acid	0.1mg	1% RDI
13.	Calcium	30mg	3% RDI
14.	Iron	0.7mg	4% RDI
15.	Magnesium	18mg	5% RDI
16.	Phosphorous	21mg	2% RDI
17.	Potassium	382mg	11% RDI

### Storage

It can be stored at room temperature, if they need time to soften. Once soft and ripe, the highly perishable fruits will keep only for a day or two. Storing the fruits in the refrigerator will only prolong its sweet flavor for another couple of days.

Once overripe, *ramphals* become better suited for the compost pile rather than the kitchen table: Their taste grows insipid and musky, with an unpalatable smell to match. Avoid chilling below 10<sup>0</sup>C, as this will result in blackened, less sweet fruit. It's possible to freeze *ramphal* pulp, but the taste will be subdued and duller than in its fresh state.

### Bullock's Heart Recipe Ideas and Uses

1. Make a *ramphal* milkshake by blending the pulp with nutmilk, cinnamon, and vanilla. Add a banana if desiring additional sweetness.
2. Make a raw vegan custard pie by blending *ramphal* with banana and butter fruit. Serve in a crust made of ground almonds and dates.
3. Make *ramphal* ice cream by blending the pulp and frozen bananas.

### Conclusions

Medicinal plants are valuable natural sources and regarded as potential and safe drugs. It have been playing an important role as natural drugs to alleviate human sufferings by contribution herbal medicines to the primary health care systems of rural and remote areas where more than 70% of population in India depend on folklore and traditional systems of medicines. From the pharmacognostic and phytochemical investigations, it is quite possible to set the standards of this plant as per the pharmacopeial guidelines and it will be useful for selecting the proper herb and for the research to carry out.

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