

# Citrus fruits in health care with a special reference to the uses of tribal people of Tripura

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## Abstract

*Citrus* fruits are available worldwide and famous also because of their fresh flavor and juiciness. *Citrus* fruits have various health-benefiting properties due to the presence of some important bioactive components such as vitamin C, folic acid, carotenoid, flavonoids, pectin, which are mainly helping to prevent and cure some disease such as cancer, lipid-lowering, and cardiovascular disease. The present work indicates about the health benefits of some local *Citrus* fruits used by the tribal people of Tripura, India and the impact thereof.

**Key words:** *Citrus* fruits, health, tribal, Tripura

## INTRODUCTION

Tripura is a small hilly state situated in the north-eastern region of India. The location of Tripura is at 22°56'–24°32' latitude and 91°10'–92°21' longitude. The total geographical area of Tripura is 10,491 sq km of which 60% covered by forest and remaining 40% is available for cultivation. More than 75% of the population of this state either directly or indirectly depends on agriculture. The state weather is characterized by warm and humid subtropical climate with six distinct seasons. Tripura receives an average rainfall of 2065 mm. The monsoon breaks in May–June.<sup>[1]</sup> The people of Tripura are nature loving. Tripura is one of the most hot spots for bio-diversity in India, where number of ethnic groups of people use/practice traditional health care and also they utilize different types of local *Citrus* fruits, i.e., orange, sweet lemon, grapefruit, tamarind, hog-plum, Indian gooseberry, star fruit, star gooseberry, jujube fruit, langsat, etc.

## MATERIALS AND METHODS

In search of the fact and impact of *Citrus* fruits in daily use by the tribal people of Tripura, an intensive survey has been carried out through out a year 2023 covering all different twelve months. Uses of *Citrus* fruits for therapeutic

purposes were also recorded as narrated by the interviewed tribal people of Tripura. Further, the utilization of *Citrus* fruits and the purpose of uses are correlated with the available data reported till date obtained upon an intensive literature survey. The report/observation in details is presented in Table 1.

## DISCUSSION

*Citrus* fruits are rich in vitamin C, folic acid, carotenoid, flavonoids, pectin, etc., that they help to keep our immune system strong and also help to keep skin bright, smooth, and elastic, which are observed in case of the tribal people of Tripura irrespective to the male and female. *Citrus* fruits are also well known for their nutritional and other health beneficial properties and by using some local *Citrus* fruits, the tribal people of Tripura can also cure themselves from various disorders because these *Citrus* fruits have different pharmacological activities due to the presence of various phytochemicals in them, recorded in Table 2. They consume generally following local *Citrus* fruits – orange,

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Table 1: Some local *Citrus* fruit using by tribal people of Tripura for their daily healthcare practice

S. No.	Name of Fruits	Common name	Scientific name/ Family	Nutritional Constituents	Pharmacological Activity	Health Benefits	References
1.	Orange	Common name: Orange Kokborok Name: Komla. Bengali Name: Komala	Scientific name: <i>Citrus sinensis</i> . Family: Rutaceae	Vitamin C and folate, Calcium, potassium, thiamine	Antibacterial activity, antioxidant activity, hypocholesteremic activity, protective of UV activity, anti-obesity activity	Boosts the body's immune system to protect against microorganism also helps to forms blood vessels, muscles, collagen in body.	[9,10]
2.	Sweet lemon	Common name: Mosambi Kokborok Name: Moosambi. Bengali Name: Mosambi	Scientific name: <i>Citrus limetta</i> Family: Rutaceae.	Vitamin C, Iron, Calcium, potassium, phosphorous, magnesium, riboflavin, thiamine, niacin	Antibacterial and antifungal activities, antioxidant activity, antihyperglycemic activity	Eating Sweet lemon regularly averts risk of cancer, keeps heart healthy and soothes the intestinal lining.	[10,11]
3.	Grapefruit	Common name: Chakotra Kokborok Name: Jamwra. Bengali Name: Jambura	Scientific name: <i>Citrusxparadisi</i> . Family: Rutaceae	Vitamin C and A, Iron, potassium, phosphorus, fiber, folate.	Hypoglycemic effect, hypolipidemic effects	Reduce risk of type 2 diabetes, can help to prevent constipation, can help to prevent colorectal cancer	[12]
4.	Tamarind	Common name: Imli. Kokborok Name: Thentwrwi. Bengali Name: Tetul.	Scientific name: <i>Tamarindus indica</i> L. Family: Fabaceae.	Vitamin C, and B especially thiamine and folate. Potassium.	Antioxidant activity, antimicrobial activity, antidiabetic activity, anti-inflammatory activity, weight reducing activity, anti-emetic activity	Have antibacterial activity and helpful for wound healing, Helps to lowering bad cholesterol levels and decrease the risk of atherosclerosis	[13]
5.	Hog plum	Common name: Amra Kokborok Name: Amra. Bengali Name: Amra	Scientific name: <i>Spondias mombin</i> . L Family: Anacardiaceae.	Vitamin C, B1, B2, iron, calcium, carotene	Antioxidant activity, anti-inflammatory activity	Helps boost body immunity, fights anemia, keeps the heart healthy and aids in digestion.	[14]
6.	Indian Gooseberry	Common name: Amla Kokborok Name: Amlai. Bengali Name: Amlaki	Scientific name: <i>Embelica officinalis</i> Family: Euphorbiaceae	Vitamin C, phenols, dietary fiber.	Antioxidant activity, Diuretic, laxative, Anti-dysenteric	Boosts Immunity. Purifies Blood, Reduce blood sugar, Make skin glow, Reduces the risk of cancer, increase hair growth	[15]

(Contd...)

Table 1: (Continued)

S. No.	Name of Fruits	Common name	Scientific name/ Family	Nutritional Constituents	Pharmacological Activity	Health Benefits	References
7.	Star Fruit	Common name: Carambola Kokborok Name: Kamwranga. Bengali Name: Kamranga.	Scientific name: <i>Averrhoa carambola</i> Family: Oxalidaceae.	Vitamin C, fiber, potassium, calcium	Anti-inflammatory activity, Hypocholesterolemic effects, immune-boosting effects.	Prevent infection, Lower bad cholesterol, Treats high blood pressure, Aids weight loss.	[16]
8.	Star gooseberry	Common name: Arbarai Kokborok Name: Arbarai. Bengali Name: Arbarai.	Scientific name: <i>Phyllanthus acidus</i> Family: Phyllanthaceae.	Vitamin C, fiber, calcium, phosphorus, thiamine, riboflavin	Antioxidant, anti-inflammatory, hepatoprotective and hypoglycemic	Good for digestio, healthy skin, Treat Asthma, Treat constipation.	[17]
9.	Jujube fruit	Common name: Ber fruit. Kokborok Name: Boroi. Bengali Name: Boroi.	Scientific name: <i>Ziziphus mauritiana</i> Family: Rhamnaceae.	Vitamin C, iron, potassium, calcium, Vitamin B6.	Antioxidant, neuroprotection activity, immunity regulatory effect	Skin rejuvenation, wound healing, promoting digestion, Boost immunity and control blood sugar level.	[18]
10.	Langsat	Common name: Duku. Kokborok Name: Kusumai Bengali Name: Lotka.	Scientific name: <i>Lansium domesticum</i> Family: Meliaceae.	Ascorbic acid, riboflavin, fiber, phosphorous, thaimine	Antimalarial activity, anti-aging, wound healing, anti-inflammatory	Improve vision health, eliminate skin problem, regulate blood sugar.	[19]

**Table 2:** Role of different component in *Citrus* fruits

S. No.	Components	Health promoting role	References
1.	Ascorbic acid (Vitamin C)	Formation of connective tissues, collagen, absorption of iron and properties of antioxidants	[20-28]
2.	Thiamin (Vitamin B1)	Heart, brain, nervous system, cofactor in gastrointestinal, muscular functions	
3.	Riboflavin (Vitamin B2)	Reduction reactions and coenzyme in oxidation	
4.	Niacin (Vitamin B3)	System metabolism, maintained circuitry system	
5.	Potassium (K)	Role in fluid system and assists in nervous system	
6.	Calcium (Ca)	It is main part in bones, teeth and major role in metabolism	
7.	Phosphorus (P)	It is involving in DNA and part of energy distributions	
8.	Magnesium (Mg)	Muscles contraction	
9.	Iron	Help in oxygen transport, DNA synthesis and electron transport.	
10.	Fibers	Lowering blood cholesterol.	
11.	Folate.	Help in red blood cell formation	
12.	Pyridoxine (Vitamin B6)	Help in normal brain development	
13.	Flavonoids	Inhibit oxidation, prevent gene mutations, oppose cancer development.	
14.	Carotenoids	Decreasing the risk of cancers and eye disease.	
15.	Pectin	Prevent colon cancer and prostate cancer.	

sweet lemon, grapefruit, tamarind, hog plum and Indian gooseberry, star fruit, star gooseberry, jujube fruit, etc. The barks of Indian gooseberry, star fruit, star gooseberry, jujube fruit, etc., also contain high level of phytochemicals which help to recover various health disorders and tribal people believe that these fruits are helpful in reducing the risk of type-2 diabetes and also can help to prevent constipation and boost the body's immune system to protect from different microbial infections.<sup>[2-8]</sup>

## CONCLUSION

Due to the presence of wide range of nutritional and active phytochemical constituents and being part of consumption by tribal people, these *Citrus* fruits especially contribute to the well-being for maximum tribal people of this state. *Citrus* fruits also contain flavonoids and other phytochemicals for which these are implicated as significant dietary component for maintaining health-care practice. All the phytochemicals present in *Citrus* fruits are not equally distributed in all type of *Citrus* fruits, thus it is advisable to take all kind of fruits. By using ethnomedicinal knowledge coming from their forefather, the tribal people of Tripura maintain their health-care practice using/consuming some local *Citrus* fruits mentioned in Table 1. Moreover, due to the presence of several phytochemicals in *Citrus* fruits, they use these to prevent several diseases such as cancer, heart diseases, and skin diseases. Therefore, more research is needed to explore

the concept of the tribal people of Tripura in regard to *Citrus* fruits. Thus, an elegance program should be adopted that to be focusing the importance of presence of the bioactive

*Citrus sinensis**Citrus limetta**Citrus x paradisi**Tamarindus indica L**Spondias mombin L**Embelica officinalis**Averrhoa carambola**Phyllanthus acidus**Ziziphus mauritiana**Lansium domesticum*

nutritional constituents in *Citrus* fruits for all communities in health-care practice.

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