



# Popular Kheti

Volume -6, Issue-2 (April-June), 2018

Available online at [www.popularkheti.com](http://www.popularkheti.com)

© 2018 popularkheti.com

eISSN: 2321-0001

## Litchi: Queen of Fruit

**Pradeep Kumar Vishwakarma\*, Prashant K. Nimbolkar, Sunil Kumar, Nandkishor M. Kanade and Subhash Chader**

Ph. D. Scholars, ICAR – Indian Institute of Horticultural Research,  
Bengaluru (Karnataka) - 560089, India

\*Email of corresponding author: [pradeepkumar5953@gmail.com](mailto:pradeepkumar5953@gmail.com)

Litchi (*Litchi chinensis* Sonn.) is an important fruit crop of subtropical region belonging to Sapindaceae family. It is widely grown in China, India, Israel, Australia, Thailand, Taiwan, Vietnam, parts of Africa and South America. China is the largest producer of litchi in the world. In India, it was introduced in the 18<sup>th</sup> century. Litchi contains several vitamins and minerals in its tasty and delicious aril which is beneficial to diabetic patient.

### Introduction

Litchi is mainly cultivated in Bihar (largest producer), West Bengal, Tripura, Uttar Pradesh, Punjab and Haryana in India. In litchi, maturity commences in May – June although off season (December end) litchi is also produced under open condition in Coorg district of Karnataka, which fetches higher price in the local and export market. Litchi is largely preferred as table fruit in worldwide. It has delicious aromatic pulp with sweet and acidic taste. Anthocyanin pigments found in litchi is responsible for red colour of litchi pericarp. Several types of anthocyanins are found i.e. cyanidin-3-rutinoside, cyanindin-3-glucoside, cyaniding-3-galactoside, malvadin-3-acetylglucoside and pelargonidin-3-glycoside have been reported from pericarp out of which cyaniding-3-rutinoside is the major anthocyanin pigment found in litchi pericarp (Duan *et al.*, 2007). It is said that litchi gives relief from coughing and has an important effect on gastralgia, tumors and enlargement of the glands. Whereas, in China it is believed that excessive consumption of raw / immature litchi fruit causing nosebleed and fever. But in India, it is powdered and administered in intestinal troubles and root, bark and flowers decoction is used for ailments of throat. It is also canned as “Litchi Nut” having export potential worldwide. Litchi fruit contains 60% juice, 8% rag, 19% seed and 13% skin. It has total soluble solids 15.90 to 20.10 °Brix. The consumption of litchi will give 2-4% dietary reference intake for P, K, Mg, Fe, Zn, and Mn and 22% for Cu. Litchi fruits mainly produce energy in the form of carbohydrate (16.53g). Nutritional content in litchi provides 66 kcal energy, 0.83g protein, 0.44g fat, no cholesterol, 1.3g dietary fibers, it contains vitamins 14µg folate, 0.603mg niacin, 7.1mg choline, 0.10mg pyridoxine, 0.65mg riboflavin, etc. It also contains polyphenols more than grape, which is more beneficial for the heart.



Litchi Fruit



Ackee Fruit



Longan Fruit



Rambutan Fruit

### Fruits from Sapindaceae Family

#### Health Benefits

Litchi is an amazing fruit for consumption having anticancer property, promote cardiovascular health, improve digestion, prevent cataract, act against influenza, aid weight loss, regulate blood circulation, prevent blood vessel rupture, anti-inflammatory agents, provide instant energy, protect from herpes virus, strengthen immunity, regulate blood pressure, provide stronger bones and prevent anemia. The fully ripe fruit of litchi is preferred for table purpose. One should not consume immature fruit of soapberry family because it contains a toxic substance, which is hazardous effect on health and can malnourish children. Hypoglycemia is an undefined disease in young children and caused many children's death in Muzaffarpur district of Bihar. Many scientists from India and USA reported that consumption of litchi fruit in afternoon which leads to skipping of evening meal and dinner resulted into lowering down of blood glucose level in night and acute encephalopathy (Brain disease, damage or malfunction/mental disorder) that promotes seizures, coma and causes death in many cases. Young children have limited glycogen reserve. Hypoglycin A or methylene cyclopropylglycine (MCPG), which are naturally present in litchi fruit that makes favorable condition for decreasing the glucose level in body of children. Hypoglycine rich fruit of ackee, a relative of lychee, can induce a dose dependent toxic hypoglycemic encephalopathy in poorly nourished children (Nath *et al.*, 2016). The toxins block enzymes involved in normal glucose metabolism, which leads to toxic hypoglycemic syndrome. The syndrome best known from Jamaica, where ackee (*Blighi asapida*) fruit is widely eaten, and occurs in 2 to 10 years old children, who develop metabolic acidosis and cause a toxic hypoglycemia encephalopathy (Jamaican vomiting sickness in children). Heavy consumption of litchi and other fruits of sapindaceae family *i.e.* rambutan (*Nephelium lappaceum*) and longan (*Dimocarpus longan*) causes this toxic disorder in children. Hypoglycemia suffered children, healthy individuals rapidly antagonize insulin action on glucose and lipid metabolism, but the effects on protein metabolism are unclear. Because amino acids are an important substrate for gluconeogenesis and a fuel alternative to glucose for oxidation, hypoglycemia antagonizes the hypoaminoacidemic and the antiproteolytic effects of insulin and changes the *de novo* synthesis of glutamine (a gluconeogenic amino acid) in body of children.

Glucose is an obligate metabolic fuel for the brain under physiological conditions. Because the brain cannot synthesize glucose, maintenance of brain function requires a virtually continuous supply of glucose from the circulation. In normal situation redundant glucose counter-regulatory mechanisms effectively prevent or rapidly correct hypoglycemia. When hypoglycemia happens, a decrease in insulin secretion is the first response. Other hormones including glucagon and epinephrine are also secreted promptly after falling plasma glucose levels and both induce a rapid increase in glucose production. Hypoglycemia typically arises when abnormalities in the mechanisms involved in glucose homeostasis is existed. The frequent bouts of hypoglycemia further reduce the sympathoadrenal glycemic threshold to a lower plasma glucose level particularly in patients with an intensive regulation of diabetes. The combination of glucagon absence and the attenuated epinephrine response causes the clinical syndrome of defective glucose counter-regulation, a syndrome that has been shown to increase the risk of severe hypoglycemia by 25- fold or even higher during strict treatment compared to when a normal epinephrine responses is presented. Decreased in epinephrine response to hypoglycemia is a marker of an attenuated autonomic neural response that causes the clinical syndrome of hypoglycemia unawareness, a situation that in turn could increases the risk of severe hypoglycemia development.

### **Symptoms of Hypoglycemia**

The diseases hypoglycemia occurred, when the blood sugar level is 70 milligrams per deciliter (mg/dl) or lower. Each person with diabetes may have different symptoms of hypoglycemia it includes confusion, dizziness, feeling shaky, hunger, headaches, irritability, pounding heart, racing pulse, pale skin, trembling, weakness, anxiety and without treatment, might be get more severe symptoms including poor coordination, poor concentration, numbness in mouth and tongue, passing out, nightmares or bad dreams, stomach discomfort begins several hours after eating the unripe fruit (Cryer, 1999). Vomiting begins suddenly, the person may experience sweating, rapid breathing, rapid heartbeat, headache, numbness, tingling, and weakness, a disturbed mental state may develop. A second about of vomiting sometimes occurs and seizures and coma may follow this vomiting. An amino acid is found in the fruit of many members of the sapindaceae family, which includes the litchi, rambutan, longan and ackee. During the many scientific research, urine samples showed that two-thirds of the ill children showed evidence of exposure to toxins found in litchi seeds, found in higher levels in unripe fruits. Due to these toxins glucose synthesis is severely decreased and leading to ultimately low blood sugar level and brain inflammation in the affected children of Muzaffarpur, Bihar.

### **Way to Mitigate Hypoglycemia**

In presence of hypoglycin, glucose synthesis in children body is severely impaired due to presence of hypoglycin, which lowers down the blood sugar and resulting encephalopathy. The litchi fruit, if eaten by malnourished children on an empty stomach, is more likely to suffer from hypoglycemia. The solution to this problem is to warn the children by their parents about side effects of eating the fruit in an empty stomach and to ensure that the children get a good evening meal. The parents only afford to provide the meal for balance of glucose level in the body of children. The scientists also recommended that children taken to a hospital after being poisoned receive rapid glucose correction. Unripe litchi as well as ackees fruits seems to be dangerous only under certain conditions. Both fruits can be interesting additions to the diet but need to be treated with respect.

People with hypoglycemic toxicity and do not know their blood sugar is dropping. In this condition blood sugar can drop without any noticing. Without immediate treatment, you can faint, experience a seizure, or even go into a coma. Very low blood sugar is a medical emergency. If someone has diabetes and they are experiencing mild to moderate symptoms, have them eat or drink 15 grams of easily digestible carbohydrates i. e. half a cup of juice or regular soda, 1 tablespoon of honey, 4 or 5 saltine crackers, 3 or 4 pieces of hard candy or glucose tablets, 1 tablespoon of sugar. One of them any immediately take for doing balance of blood glucose level. In severe case such as unconsciousness, it's important to administer a medication called glucagon and contact emergency services immediately. People who are at risk for low blood sugar should talk to their doctor about getting a prescription for glucagon. You should never give an unconscious person anything by mouth, as it could cause them to choke.

Litchi fruit contains no cholesterol so it is very good source of energy for those people who is suffering from diabetes (Kuchinski, 1999). Contains hypoglycemic acid, which is responsible for low blood sugar level so it can be beneficial fruit for adults who are severely suffered from diabetes. So, we cannot neglect to taste the queen of fruit.

### References

- Cryer PE (1999). Symptoms of hypoglycemia, thresholds for their occurrence, and hypoglycemia unawareness. *Endocrinology and metabolism clinics of North America*, 28(3), 495-500.
- Duan X, Jiang Y, Su X, Zhang Z and Shi J (2007). Antioxidant properties of anthocyanins extracted from litchi (*Litchi chinensis*Sonn.) fruit pericarp tissues in relation to their role in the pericarp browning. *Food Chemistry*, 101(4), 1365-1371.
- Kuchinski LM (1999). Controlling diabetes naturally with Chinese medicine. Blue Poppy Enterprises, Inc.
- Nath V, Sharma S and Barman K (2016). Acute encephalitis syndrome and its alleged litchi (*Litchi chinensis*) connection—A review and status. *The Indian Journal of Agricultural Sciences*, 86(3).