WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 9, Issue 4, 385-402. Review Article ISSN 2277– 7105

LITCHI CHINENSIS AS A FUNCTIONAL SOURCE OF PHYTOCHEMICAL NATURALLY DYNAMIC CONSTITUENTS IN VARIOUS PIECES OF LYCHEE: A RUN DOWN AND DESCRIPTION OF PHARMACOLOGICAL ACTIVITIES INCLUDING HYPOGLYCAEMIC ENCEPHALOPATHY AND REVIEW OF PATENTS

Jahnavi Pinnamaneni[1], Sambamoorthy U.[2] and Pushpavalli Thota[3]*

[1]NRI College of Pharmacy, Pothavarappadu(v), Agiripalli(m), Krishna(D.t), Andhra Pradesh, India.

[2]Assistant Professor, Nri College of Pharmacy, Pothavarappadu(v), Agiripalli(m), Krishna(D.t), India.

[3]NRI College of Pharmacy, Pothavarappadu(v), Agiripalli(m), Krishna(D.t), India.

Article Received on
30 Jan. 2020,
Revised on 20 Feb. 2020,
Accepted on 10 March 2020,
DOI: 10.20959/wjpr20204-17076

***Corresponding Author**
Thota Pushpavalli
NRI College of Pharmacy, Pothavarappadu(v), Agiripalli(m), Krishna(D.t), India.

ABSTRACT

Litchi is a sub – tropical organic product which has a place with the family Sapindaceae. The natural product comprises of various significant concoction constituents which is valuable in different pharmacological properties. Because of its natural exercises, the organic product is getting progressively known and merits consideration for its consumable part, the mash, yet additionally for its strip and seed that contain beneficial substances with cell reinforcement, malignant growth preventive, antimicrobial, and hostile to inflammatory capacities. In spite of the fact that writing exhibits the natural movement of Litchi segments in diminishing tumor cell suitability in vitro or in vivo models, information about the biochemical systems answerable for these impacts are very fragmentary. This audit specifically portrays, in a far-reaching examination, the antitumor properties of the various pieces of Litchi and features the principle biochemical instruments involved. Though it contains numerous valuable properties, it is unsafe to under sustained youngsters which causes hypoglycemic encephalopathy which is talked about beneath.

KEYWORDS: Lychee, Pharmacological activities, Hypoglycemic encephalopathy.

INTRODUCTION[1]

Litchi is a sub-tropical organic product having a place with the family Sapindaceae and it's taxonomical name is Litchi Chinensis. The Litchi or Lychee (Litchi chinensis sonn.) is the most significant sub-tropical evergreen tree and has a place with the Soapberry family Sapindaceae and sub-family Nephelaceae which has 125 genere and almost 1000 species. The family, Litchi, has two species, Litchi philippinensis and Litchi Chinensis, typically known as Pearl of India. Litchi organic product is celebrated for its incredible quality, trademark wonderful flavor and for appealing red shading. The Litchi in its long history has been granted numerous unmistakable distinctions. Chinese have since a long time ago thought of it as their most one of a kind blessing natural product. The soonest monograph on any plant subject arrangements with the litchi. Martinia (1655) called the litchi "The King of Fruits". It comprises of different concoction constituents which engaged with different pharmacological activities. The primary pharmacological activities incorporate Anti-Cancer movement, Anti-Diabetic action. Yet, diminished glucose levels is harmful to undernourished individuals. The treatment for this hypoglycemic encephalopathy is examined:

TAXONOMICALCLASSIFICATION[2]

Realm: Plantae.

Sub-Kingdom: Tracheobionta. Division: Mangoliphyla.

Class: Mangoliopisada. Sub-Class: Rosidae.

Request: Sapindales. Family: Sapindaceae. Qualities: Litchi.

MORPHOLOGICAL DESCRIPTION[3,4]

Litchi Chinensis is an evergreen tree which becomes up to at the very least 15m tall and at times it likewise grows up to 28 meters. The leaves are 5 to 8 inches in length and the pamphlets are orchestrated on either side of stem[pinnate] and are having 4 to 8 exchange leaves which are elliptic- elongated and lanceolate, suddenly pointed. Litchi leaves have an attribute of repulsing water which is like Lauraceae family, subsequently the leaves are called as Laurohyll (or) Lauroid leaves, this was embraced due to converged advancement. It is Gray-Black in hued and branches are caramel red in shading. The shade of the blossoms is White (or) yellow (or) green which has a trademark odour. Inflorescence is terminal with a lot number of racemes and develops in bunches of at least 10 and are running from 3, 9 to 15.7 inches long. It is beefy organic product which develops in 80-112 days relying on atmosphere area and cultivator.

Natural product are vary fit as a fiddle from round to ovoid to heart formed and upto 5cm long and 4 cm wide gauging around 20 grams. The youthful organic products are meager and green in shading and having intense skin. Matured organic products are red(or)pinkish red in shading and smooth and secured with sharp bugling structures [protubances] which are unpleasant in nature. The external layer of the organic product unpalatable and can be stripped effectively to expose[visible] and eatable white carnal integument having flower smell and sweet odour. Integument encompasses dim dark colored unappetizing seed which is 1-3.3 cm long and 1.2 cm wide.

Cultivation and collection Of Litchi Fruit[5]

Litchi is originated in southern china in the places of **kwongdung** and **fekein**. It was spread to India through Burma and first cultivated in Bengal in India during the end of 17th century and beginning of 18th century.

Table: Cultivation of lychee in different countries.[6]

Country	Cultivators
Australia	Kwai May Pink, Tai So, Souey Tung, Fay Zee Siu, Salathiel, Wai Chee
Bangladesh	Bombai, Muzaffarpur, Bedana, China 3
Brazil	Bengal
China	Early: Sanyuehong, Baitangying
	Mid: Dazao, Heiye, Baila, Feizixiao and Shuidong, Tianyan, Chenzi

	Late: Xiangli, Guiwei, Noumici, Huaizhi, Xuehuaizi, Lanzhu, Bobaitangbo, Yuanhong,
Florida, USA	Mauritius and Brewster
India	Bihar/Jharkhand: Deshi, Purbi, China, Kasba, Bedana, Early Bedana, Late Bedana, Dehra Rose, Shahi, Manragi, Maclean, Longia, Kaselia and Swarna Rupa, Ajhauli, Green, Mandraji, Rose Scented
	Uttar Pradesh/Uttrakhand/Himachal Pradesh: Early Large Red, Early Bedana, Late Large Red, Rose Scented, Late Bedana, Calcuttia, Extra Early, Gulabi, Pickling, Khatti, Dehra Dun, Piyazi
	West Bengal/Assam:Bombai, Ellaichi Early, China, Deshi, Purbi and Kasba, Kalyani Selection
	Haryana/Punjab: Early Seedless, Late Seedless, Seedless-1 and Seedless-2, Calcuttia, Muzaffarpur
	Chhattisgarh: Sarguja-1, Sarguja-2
Indonesia	Local Selections
Nepal	Mujafpuri, Raja Saheb, Dehradun, Calcuttia, China
Philippines	Sinco, Tai So, Ulpb Red
South Africa	Mauritius, Mclean Red
Thailand	Tai So, Chacapat, Wai Chee, Haak Yip, Khom
Vietnam	Thieuthauhha

Favorable Conditions for Yielding (or) Production of Litchi crop[7,8]

Soil: Well depleted loamy soil wealthy in natural issue and pH ought to be in the middle of 5-7 is required for better yielding.

Temperature

The reasonable atmosphere for developing litchi is sub-tropical atmosphere. The temperature ought to be either high (or) unreasonably low for raising the litchi crop. It ought not surpass 40 degree centigrade in summer and underneath 0 C in winter. Below jack ice temperatures are required for commencement of litchi bloom. The temperature throughout the mid-year is in the middle of 26-32C and the temperature throughout the winter season is in the middle of 6-14C. Overwhelming precipitation may impact the blooming as it confine the fertilization.

Method of Propagation

Litchi is for the most part proliferated through air layering technique. Seed proliferation can likewise be utilized however it requires some investment for the developing. The air layering is done for the most part in the rainstorm season. The litchi can likewise be engendered through sexual spread and furthermore through seed proliferation.

Air Layering

Right now, year old twig was chosen and a strip was cutted at a profundity of about 2cm wide from twig. Carefulness ought to be taken while evacuating the cambium tissue. A clammy sphagnum mass is put around the cutting part and spread it with polyethylene sheet. The covering of polyethylene sheet helps in foreseeing the loss of dampness. Following a month and a half, roots are shaped which are seen through the polyethylene sheet. The established branch is expelled from the parent branch and are planted in the nursery.

Seed Propagation

As the litchi is described by layer adolescent period, so seed engendering is typically not followed. As the seeds are having lesser suitability, they should be planted inside 4-14 days from the time of reaping the natural products. Seeds are planted in media containing soil, sand, peat, natural issue, vermiculite and need assurance against the light of germination. Weeding ought to be completed every now and again during the youthful phase of the plant. The land is furrowed much of the time first in the long stretch of October and second in the period of June (or) July. Inter-editing can likewise be followed so as to give assurance to the more youthful plants and it additionally improves the physical state of the dirt.

Collecting

Gathering is generally done in the long stretch of May (or) June. The assortment of natural products is done when they are in pink shading (or) completely matured for neighborhood places. For separation puts the natural products are gathered in the phase of going to red shading. Fruits are gathered either exclusively (or) by cutting bundles.

Nutritional values[9]

Lychee organic product is depicted as an enormous seeded drupe, with semi-straightforward aril (tissue) which is palatable and slim corky pericarp (skin). The organic products are expended new. Additionally, numerous items like squash, canned lychee, syrup, genial, jam, jam, juice and so on are likewise accessible in advertise. It tends to be utilized as dried or dried out (lychee nuts) or utilized in sorbets and frozen yogurts.[14,15] Based on assortment and atmosphere the natural product contains 60% juice, 8% cloth, 19% seed and 13% skin. Aside from proteins, fats, sugars, minerals, stringy issue, calcium, phosphorus, iron and carotene the organic product is likewise plentiful in nutrient B1, riboflavin and nutrient C. Lychees have low substance of sodium and soaked fat. The natural products contains proteins (0.83g), fats (0.44g), starches (sugars-15.23g, dietaryfiber-1.3g), minerals (Calcium-5 mg, Iron-0.13 mg,

Magnesium-10 g, Manganese-0.055 mg, Phosphorus-31 mg, Potassium-171 mg, Sodium-1 mg, Zinc-0.07 mg), fibrous matter and carotene. The organic products are likewise advanced with nutrient (Thiamine (B10 - 0.011 mg, Riboflavin (B20-0.065 mg, Vitamin B6-0.1 mg, Niacin (B3)- 0.603 mg, Vitamin C71.5 mg), Folate (B9)- 14 µg. Litchi contains less amount of lipid and sodium 10, 11.

Active Constituents in The Litchi Fruit

Volatile components and fatty acids[10]

A sum of 96 unstable parts were recognized in nine litchi cultivars from southern China of which 43 were distinguished (Wu et al., 2009). Geraniol, cis-rose oxide, linalool, β-citronellol, α-terpineol, p- cymene, ethanol, 3-methyl-3-buten-1-ol, 1-hexanol,3-methyl-2-buteno1-ol,(E)- 2-hexen-1-ol, 1- octen-3-ol, 2-ethyl-1-hexanol, 1-octanol, p,α-dimethylstyrene, ethylacetate, and 3-tert-butyl-4- hydroxyanisole were the basic unstable parts in all cultivars.1-Octen-3-ol, cis-rose oxide, trans-rose oxide, and geraniol were the segments with thehighest OAVs in many cultivars. announced the nearness of 51 odouractive mixes in litchi natural product. In addition, eight unstable sulfur parts, hydrogen sulfide, diethyl disulfide, dimethyl sulfide, 2-acetyl-2-thiazoline, 2,4-dithiopentane, 2-methyl thiazole, methional, and dimethyl trisulfide were recognized in all examples (Mahattanatawee et al., 2007). Twenty-five mixes were distinguished in the free and glycosidically-bound unpredictable portions offresh clear litchi juice utilizing an Amberlite XAD-2 section, including one ester, 14 alcohols, fouracids, two aldehydes, two ketones, and two terpenes. The major volatilecompounds found in the free part (2907 mg/Kg) were acetoin (30.1%), geraniol (15.6%), 3methyl-2-buten-1-ol (15.3%), octanoic corrosive (7.28%), 2-phenylethanol (4.91%), cis-ocimene(4.32%), and butyric corrosive (3.40%). Geraniol (73.7%) and geranial (7.95%) were the majorvolatile mixes in the bound portion (1576 mg/kg). In smell assessment, the bound division 11 was scentless while the free unpredictable part demonstrated a crisp fruity, litchi like fragrance. The smell portions of entire organic product mash and leaves of litchi were investigated by slim gaschromatography-mass spectrometry. In excess of 100 parts were recognized, including monoterpenes, sesquiterpenes, alcohols, esters, alkenes, acids, aldehyde, and others (Wang et al., 2013; Li et al., 2009; Wu et al., 2009; Lee et al., 2008; Sivakumar et al., 2008; Ong and Acree, 1998). Gaydou et al. (1993) announced that the unsaturated fat piece of litchi seed lipids consistedof palmitic corrosive (12%), oleic corrosive (27%), linoleic corrosive (11%), and CPFAs (42%). The CPFAsfraction was seen as comprised of dihydrosterculic corrosive (37%), cis-7-

8methylenehexadecanoic corrosive (4%), cis-5,6-methylenetetradecanoic corrosive (0.4%), and cis-3-4methylenedodecanoic corrosive (0.1%). Raw litchi comprises of 82% of water, 17% carbohydrates, 1% proteins and contains immaterial fat.

PHYTOCHEMISTRY[11]

Leaves: Leaves consists of alkaloids, flavonoids, tannins, terpenoids, saponin, and steroids etc. like flavonoids

- Epicatechin, procyanidin A2, and procyanidin B2. These are responsible for the anti-diabetic, anti-cancer, anti-oxidant, free radical scavenging activity and shows hypoglycemic activity.

Fruits: Flavanol (flavanol -3-ol) rich litchi fruit extract is a mixture of oligomerized polyphenols and also prosperous in Flavanol monomers, dimers and trimmers which are shown suppress inflammation, 5- hydroxymethyl-2furfurolaldehyde (5- HMF), benzyl alcohol, hydro benzoin, and (+) – catechin.

Seeds: Seeds contain various flavonoid, saponin, glycoside like eucocyanidin, cyanidin glycoside and malvidin glycoside.

Pericarp: Pericarp contains Epicatechin, dehydrodiepicatechin A, methyl shikimate, ethyl shikimate, isolariciresinol, kaempferol, proanthocyanidin A1, A2, rutin**.**

Flowers: It has Anti-oxidants, Anti-inflammatory, Cardio-vascular, Analgesic, Anti-lipase activity**.**

Pharmacological properties[12]

Various naturally dynamic constituents are available in various pieces of lychee (leaves, blossom, organic product, pericarp, seed). These mixes are accounted for to show a few pharmacological exercises.

Leaves Anti-oxidant movement: The cancer prevention agent capability of natural and fluid concentrates of leaves of the plant was explored by utilizing ABTS (2,2'- azinobis 3-ethylbenzothiazoline-6-sulpohonic corrosive), FRAP (ferric lessening cell reinforcement power), DPPH (2.2'- diphenyl-1-picrylhydrazil), TPC (all out phenolic content) and the all-out cell reinforcement action examines. 1-butanol, Methanol, fluid, and ethyl acetic acid derivation concentrate of leaves display solid peroxyl radical searching movement,

subsequently demonstrating its solid enemy of oxidant potential.

Pain relieving and mitigating action: Analgesic and calming action of hydro-liquor concentrate of leaves was assessed by utilizing acidic corrosive instigated squirming test, hot plate technique in mice and carrageenan-actuated paw edema model in rodents individually. Oral organization of the concentrate showed a solid mitigating movement and following 4 hours of organization most extreme impact was watched.

Hepatoprotective action: The defensive impact of lychee leaf remove on paracetamol-instigated liver harm was exhibited by watching the impact of concentrate on different serum biochemical parameters including SGPT (serum glutamate-pyruvate transaminase), SALP (serum soluble phosphatase), SGOT (serum glutamate-oxaloacetate transaminase) and liver biochemical parameters.

Blossom Anti-oxidant action: Acetone concentrate of lychee blossoms showed solid DPPH radical rummaging movement and furthermore restrain the oxidation of LDL (low thickness lipoprotein) consequently speaking to their noteworthy enemy of oxidant potential. This was the primary endeavor to assess the counter oxidant capability of lychee blossom.

Cardiovascular movement: Aqueous concentrate of lychee bloom is a wellspring of flavonoids, phenols and tannins. Bloom separate raise the TEAC (trolox comparable cancer prevention agent limit) of the serum and hence diminishes the peroxidation of serum lipid in elevated cholesterol male hamsters. Right now blossom remove speaks to noteworthy cardiovascular movement.

Cyto-harmfulness: Cyotoxic impact of CH3)2CO concentrate of lychee blossom was assessed by utilizing lead and cadmium prompted hepatoxicity and TGF-b1 (changing development factor b1) interceded enactment of hepatic cells. CH3)2CO remove diminishes the peroxidation and lipids and fracture of DNA and consequently displayed a noteworthy cytotoxic movement.

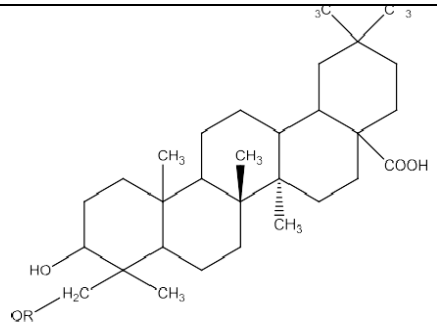
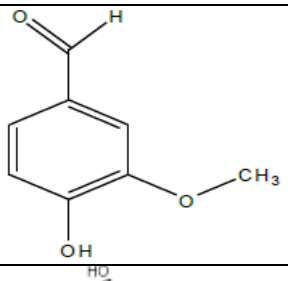
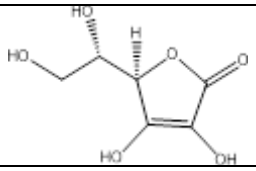
Hostile to lipase movement: Number of phytochemicals which incorporates flavonoids, tannins, anthocyanins and proanthocyanins were accounted for in watery concentrate of lychee blossom. Hypercaloric diet-prompted rodents were utilized to examine the counter lipase action and it was accounted for that watery concentrate effectively decreased the size of liver, epididymal and fat tissues of rodent model consequently show great enemy of lipase

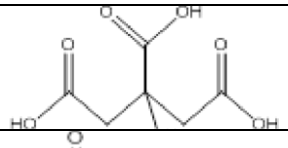
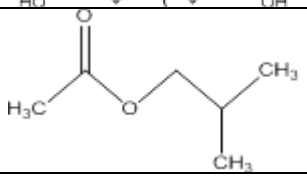
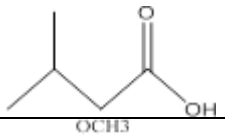
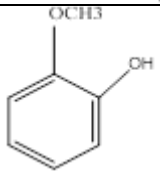
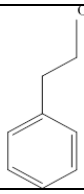
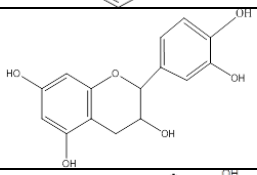
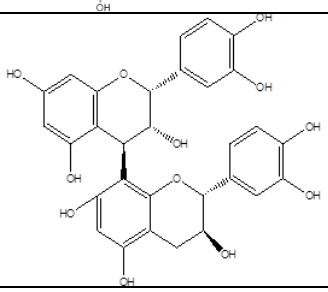
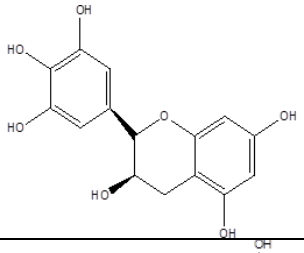
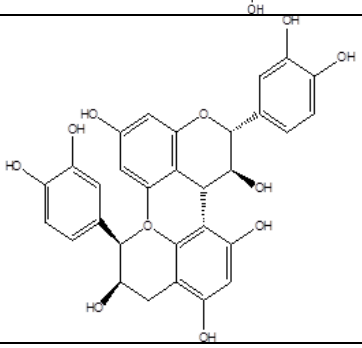
movement.

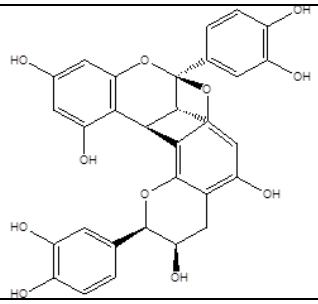
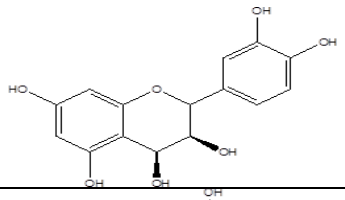
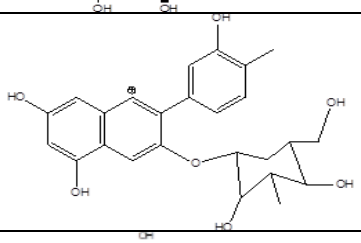
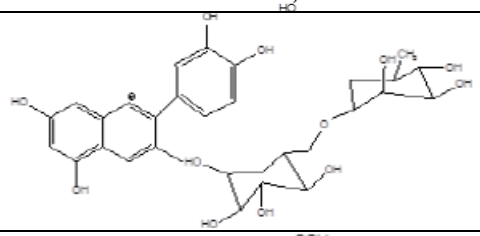
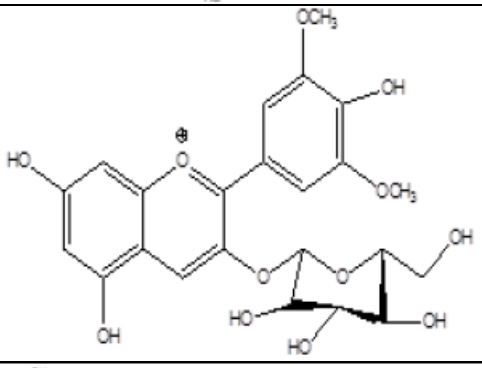
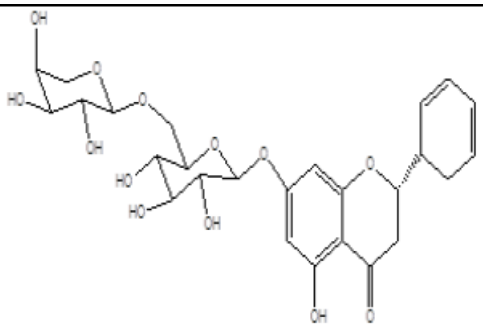
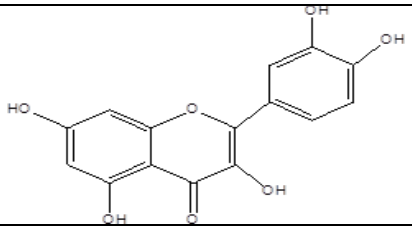
Pericarp Anti-oxidant movement: The cancer prevention agent capability of lychee skin is very much characterized. Lychee skin contains numerous dynamic constituents which speaks to free radical rummaging movement these are glutathione, ascorbic corrosive, polysaccharides, carotenoids, flavonoids (flavonols and anthocyanins) and phenolic acids. It has been accounted for that procyanidin B2, epicatechin, epigallocatechin and procyanidin B4 are the main flavonoids in organic product skin. Two flavonoids that are anthocyanins and procyanidins are the significant mixes which contribute most extreme to cell reinforcement movement. Various kinds of flavonoids additionally vary in their cancer prevention agent potential. It has likewise been accounted for that skin of juvenile organic product has an a lot more grounded cell reinforcement potential as contrast with develop natural product.

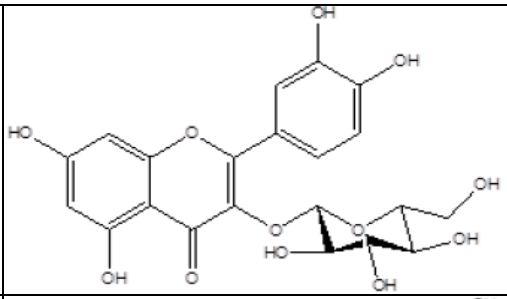
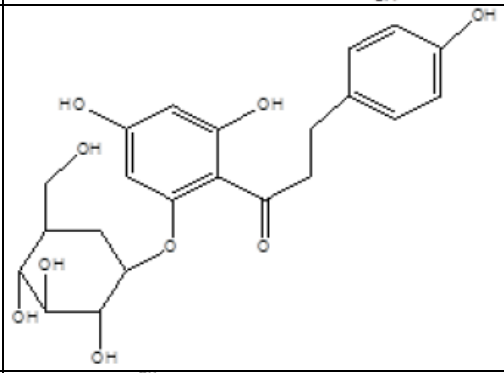
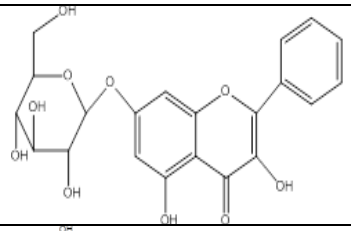
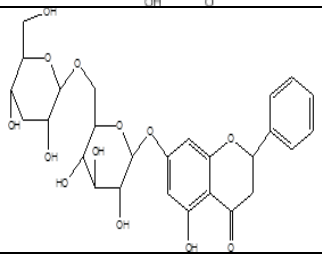
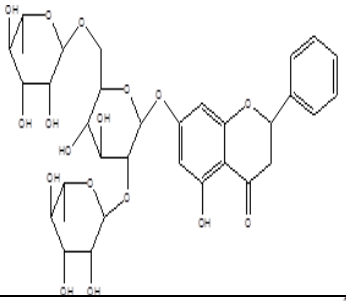
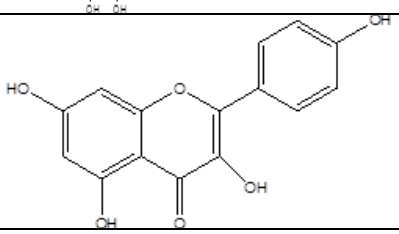
Hostile to malignancy movement: Lychee pericarp is rich wellspring of insoluble fiber (40% dry weight), which restrain rectum disease, diabetes and hemorrhoids. Watery concentrate of lychee skin altogether repressed the development of malignant growth cells (human hepatoma cells) in vitro and stifled the improvement of disease cells in mice with liver disease.

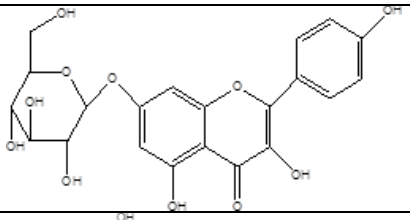
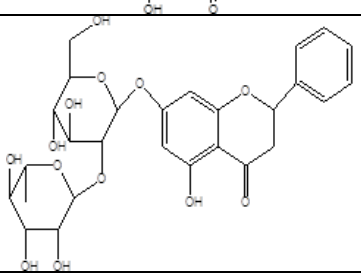
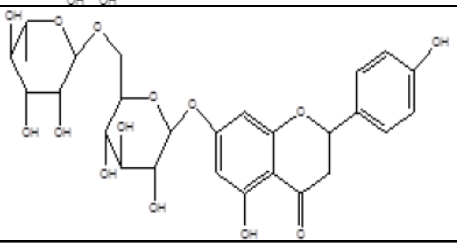
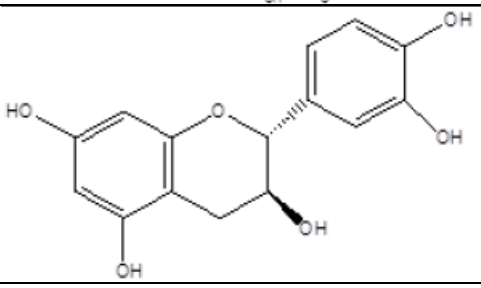
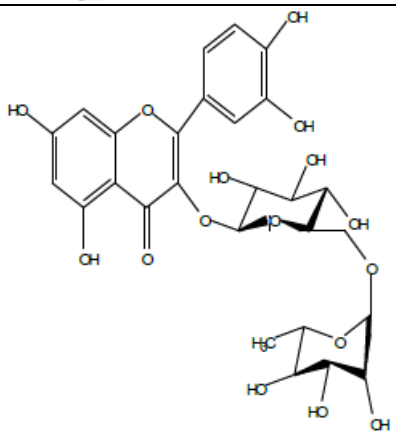
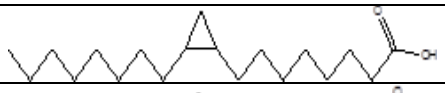
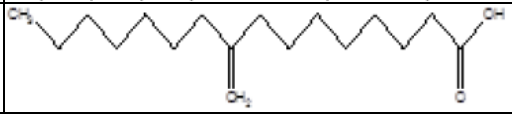
The pharmacological action and structure of the mixes are arranged below.[13]

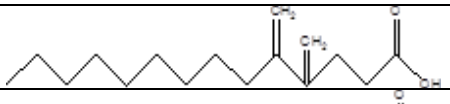
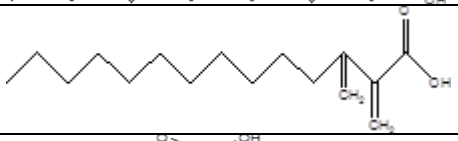
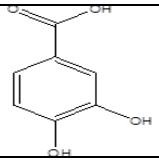
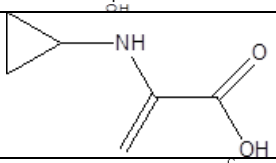
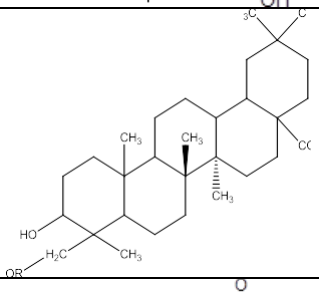
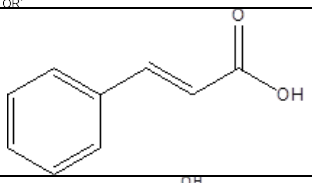
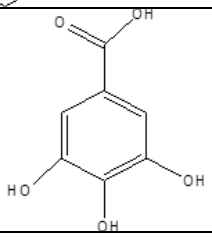
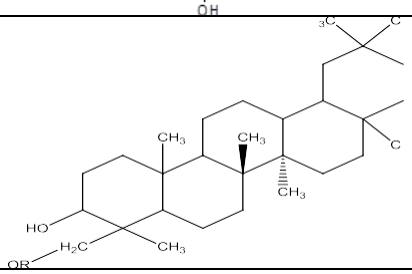
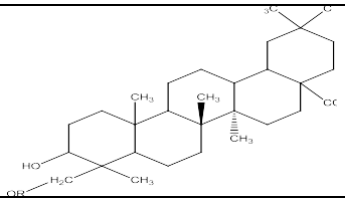
S.NO	Name of active principle	Structure	Pharmacological activity
1.	Glycosides		Cholesterol decrease. Against oxidant. diminish malignant growth chance. resistance promoter.
2	Phenol aldehydes		Anti-oxidant, anti- bacterial.
	Flavonoids: Ascorbic acid.		Development and fix of tissues.

	Citric acid		Against bacterial, hostile to contagious, against oxidant.
	Iso-butyl acetate		Against bacterial
	Iso-valeric acid		Against bacterial
	Guaiacol		Against microbial movement.
	2-phenyl ethanol		Against tyrosinase, Hostile to microbial.
	Epicatechin		Hostile to oxidant, Charge radical searching movement, lessen glucose level, hostile to diabetic, against malignant growth.
	procyannidinB2		Hostile to oxidant movement, forestall malignancies.
	Epigallocatechgain.		Chemo prrention and hostile to malignancy exercises
	procyannidinB4		Anti-oxidant property, hindrance of multiplication and enlistment of apoptosis in disease cells.

	procyannidinA2		Prevents hyperglycemia and type-2 diabetes.
	Leucocyanidin		Secure stomach lining.
	Cyandin-3-O-glu.		Free radical searching action.
	Cyandin-3-O-rut		Free radical searching action and against platelet collecting action.
	Malvadin-3-acetyl-O- gluoenin.		Against oxidant property.
	(2S)-pinocembrin-7-O-(6”- O-α-L-artabinosyl-β-D-glucopyranoside.		Against diabetic property.
	Quercetin.		Supports ordinary respiratory wellbeing, bolster cardiovascular wellbeing, advances adjusted circulatory strain offers security against stress and offers dietary

	Quercetin 3-O-glucoside.		help.
	Phlorhizin.		Hostile to oxidant, against diabetic.
	Pino-cembrin-7-O-glucoside.		Hostile to oxidant movement used to treat ischemia. Neuro-degenerative illnesses and cardio-vascular issues.
	Pinocembrin-7-O-[(6”-O-β-Dglucopyranoside)-β-D-glucopyranoside		Hostile to oxidant.
	Pinocembrin-7-O[(2”,6”-di- O-α-L-rhamnopyranosyl)-β-Dglocopyranoside		Hostile to oxidant.
	Kaempferol		Hostile to oxidant.

	Kaempferol-7-O-β-Dglucopyranoside.		Hostile to oxidant.
	Onychin		Hostile to oxidant.
	Nairutin		Hostile to oxidant.
	Catchein		Hostile to oxidant.
	Rutin		Anti-oxidant; causes the body to use nutrient c and produce collagen; mends conditions, for example, hemorrhoids and hypertension and diminishes cholesterol levels.
4.	Fatty acids: Palmitic acid.		Blood lipid decreasing movement.
	Linoleic acid.		Anti-oxidant, Anti- carcinogenic.
	Dihydrosterculic acid		Anti-disease, hostile to tumor.
	8-methylenehexadecanoic acid.		Hostile to bacterial.

	Cis-5,6methylenetetradecanoic acid.		Hostile to bacterial.
	Cis-3,4methylenedodecanoic acid		Hostile to bacterial.
	Protocatechic acid		Hostile to disease, against oxidant
5.	AMINO-ACID α-methylenecyclopropylglycine		Posses hypoglycemic movement
6	Anthocyanins Cyanidin glycoside		Anti-oxidant, anti- aging.
7.	Phenolic acids: Trans-cinnamic acid		Anti-oxidant, anti- tumor, anti-inflammatory.
	Gallic acid		Anti-oxidant, anti- tumor, anti-inflammatory.
	Chlorogenic acid		Anti-oxidant; blood pressure lowering effect; laxative effect.
	Caffeic acid(3,4-dihydroxy cinnamic acid)		Anti-oxidant; anti- hypertension; anti- thrombosis; anti- fibrosis, anti-virus and anti-tumour

Remedial Uses of Litchi[14]

Litchi contains layer amounts of enemies of oxidants and phytonutrients like flavonoids, nutrient c, poly phenols and proanthocyanin's. Free radicals framed because of different

conditions will prompts the out- break of malignancy. The counter oxidants present in the litchi natural product will checks on free radicals which produce malignancy. Due to the exis lipoproteins and ptence of gelatin, fiber and water, it invalidates the assault of colon. Litchi likewise turns away the bosom, prostate and liver malignant growth improvement. The magnesium and phosphorous present in the litchi organic product is a wellspring of bone improvement. The enemies of oxidants present in litchi organic product likewise helps in diminishing the low thickness lipoproteins and forestall the assault heart related issues, circulatory strain and stroke. It is a decent sunscreen operator as it forests all the UV-beams and furthermore helps in weight reduction. The fiber and gelatin additionally help in the issue of obstruction by upgrading the free development of bowl. Due to a lot of enemies of oxidants it additionally goes about as against maturing specialist. It additionally helps in forestall if asthma assault.

Bothersome Affects Due to Over Consumption of Litchi[15]

Due to nearness of Epicatechin and ProcyanidnA2, Phlorhizn, α-methyl cyclopropylglycine, the litchi organic product goes about as hostile to diabetic natural product. Yet, there is an issue due to over- utilization of litchi-natural product, there is a difference in change of blood glucose levels Litchi organic product ought not be devoured by pregnant and bosom encouraging ladies. The purpose for this isn't known. As the litchi organic product more measure of nutrient – c which shields from free- radical development, making our safe framework, however there is an issue due to over utilization of litchi natural product which makes invulnerable framework progressively dynamic and expands the auto-insusceptible illnesses like numerous sclerosis, rheumatoid joint inflammation.

HYPOGLYCEMIC ENCEPHALOPATHY[16,17,18]

Mostly the children falling ill are from families camping in crop field to harvest the fruits. These children tend to collect and eat the fruits that have fallen on the ground. The constituents of the fruit contain pulp and seed. Not only the seed, the pulp also contain an abnormal amino acid hypo glycine-A (or) methylene cyclopropyl glycine which is naturally occurring fruit-based toxin. This toxin causes Hypoglycemic encephalopathy. This is seen peak in June. During this period litchi is harvested. By breaking the metabolism of glucose in the body i.e., drastically drops the blood sugar levels leads to hypoglycemia. The blood glucose level in the brain decreases leads to drowsiness, disorientation, and unconsciousness. The blood glucose levels are decreases because of the liver inadequate supply of glucose

need. So, the alternative pathway of glucose synthesis is turned off. The litchi toxin blocks the fatty acid conversion to glucose in the body by releasing the amino acids which are toxic to brain cells. So, this because brain cells to swell resulting in brain edema. That result children may suffer convulsions deepening coma and even death. The syndrome is characterized by an acute fever. It is not shown in all children, some children have high fever (or) mild and also causes inflammation of brain. The syndrome is mainly seen in under nutrition children, after eating the fruit, they do not take meal and gone to sleep with empty stomach and in next early hours of morning shown the symptoms like vomiting, convulsion and semi-consciousness.

Treatment of the Hypoglycemic Encephalopathy caused by Litchi[19]

Hypoglycemic encephalopathy is treated completely by infusing 10% of dextrose within 4 hours after the symptoms appeared. 10% dextrose helps in recovering the normal blood glucose levels and also helps in termination of amino acid production that are toxic to the brain cells by preventing the conversion of fatty acid into glucose. Infusion of 3% saline solution along with dextrose infusion reduces the inflammation in the brain cells. 5% dextrose solution can also be used, but it also helps in recovering the normal blood glucose levels, but amino acid production is not terminated. Within four hours of symptoms if the treatment was not started then the patients will die.

PATENTS[20,21,22]

Patent no	title of patent	Type of delivery system	Major invention
CN1043 36165A	Canned litchi in syrrup and its making method	Liquid dosage form	The invention relates to a canned litchi in syrup, and its making method. The canned litchi in syrup reserves the original taste of litchis, and has spleen invigorating, liver benefiting, blood nourishing, heart benefiting, qi rectifying and pain-relieving effects.
CN102860476A	Instant litchi chinensis powder and preparation method there of	Solid dosage form	The invention discloses instant litchi Chinensis powder and a preparation method thereof. The instant litchi Chinensis powder
			prepared through the method is directly drinkable or can be prepared to be granules, powder preparation, tablets, capsules or drinks together with one or a plurality of medically acceptable carriers.
CN106260468A	A kind of samara oil chewing gum and preparationd method thereof	Solid dosage form	The form that samara oil is made chewing gum is just agreed with mutually with the samara oil edible way advised, the nutritional labelling of samara oil can be absorbed to greatest extent, and chewing gum is as a kind of fashion.

CONCLUSION

The various bits of litchi natural product contain key bioactive intensifies that record for the Phytochemical impacts depicted in the present audit. Decontaminating these operators may

speak to a significant advance in Phyto-pharmacotherapy, which can have a high effect in oncology. In any case, the natural movement of litchi parts has been for the most part examined as assessment of cytotoxicity in vitro models. Thusly, the information on the biochemical components basic the hostile to proliferative/demise impacts of litchi parts in tumor cells speaks to a significant reason for anticancer translational examinations. The information of biochemical components also presents that litchi causes hypoglycemic encephalopathy can be treated by using 10% dextrose solution within 4hrs from the sign of symptoms.

REFERENCES

1. Dr.Indu Mehta(Litchi-The Queen of Fruits) IOSR Journal Of Humanities And Social Science(IOSR-JHSS) Volume 22, Issue 8, Ver.9 (August. 2017) PP21-25.
2. Sabrin R.M. Ibahim and Gamal A. Mohamed, (Litchi chinensis: medical uses, phytochemistry, and pharmacology), Journal of Ethnopharmacology, http://dx.doi.org/10.1016/j.jep.2015.08.054.
3. Eswar kumar Kilari and Swathi putta – (Biological and Phytopharmacological descriptions of Litchi chinensis, Pharmacognosy). Rev., 2016, Jan-Jun; 10(19): 60-65. doi-10.4103/0973- 7847.176548.
4. Deirde M.Holcroft Hetonglin et al. Harvesting and storage. In: C.Menzel and G.K. Waite, Litchi and Longan. Pg: 292.
5. Arun Vincent kisku, Subhash.C.P et al [Advances in Litchi Biotechnology: Achievements and Oppurtunities] Springer Nature Singapore, DOI-10.1007/978-981-10-3644-6_14, Chapter-14[14.4] pg no: 371.
6. POOJA TAAK and BHUPENDRA KOUL –[Phytochemistry and pharmacological properties of Lychee (Litchi chinensissonn)]. JOURNEL OF CHEMICAL AND PHARMACEUTICAL RESEARCH, 2016; 8(10): 35-48.
7. WWW.fao.org/3/ac684e/ac684e08.htm.
8. Christopher M.Menzel. Plant nutrition and fertilizationa. In: C.Menzel and G.K.Waite. Litchi and Logan, pg: 230-231.
9. Vivek Srivastava, Babita Viswakarma et al (A Phytopharmacological Review of Litchi chinensis) Int. J. pharm. Sa Rev., 51(1) July-August. Article no: 10, pg: 58-65.
10. Sabrin R.M. Ibahim and Gamal A. Mohamed, (Litchi chinensis: medical uses, phytochemistry, and pharmacology), Journal of Ethnopharmacology, http://dx.doi.org/10.1016/j.jep.2015.08.054.

11. Vivek Srivastava, Babita Viswakarma et al (A Phytopharmacological Review of Litchi chinensis) Int. J. pharm. Sa Rev 51(1) July-August. Article no:10, pg: 58-65.
12. POOJA TAAK and BHUPENDRA KOUL –[Phytochemistry and pharmacological properties of Lychee (Litchi chinensissonn)]. JOURNEL OF CHEMICAL AND PHARMACEUTICAL RESEARCH, 2016; 8(10): 35-48.
13. POOJA TAAK and BHUPENDRA KOUL –[Phytochemistry and pharmacological properties of Lychee (Litchi chinensissonn)]. JOURNEL OF CHEMICAL AND PHARMACEUTICAL RESEARCH, 2016; 8(10): 35-48.
14. Vivek Srivastava, Babita Viswakarma et al (A Phytopharmacological Review of Litchi chinensis) Int. J. pharm. Sa Rev 51(1) July-August. Article no: 10, pg: 58-65.
15. https://www.webmd.com/vitamins/ai/ingredientmono-1508/lychee
16. Deep Dutta, Deepak Khandelwal, Sanjay Karla[Litchi-related Hypoglycemia: A Public health challenge, an endocrine opportunity] Indian Journal of Endocrinology and Metabolism,2019; 23(3): 380-381.
17. Vijay N Yewalo [Misery of Mystery of Muzaffarpur]. Indian Academy of Pediatrics, Agust-15, 2014; 51: 605.
18. Shrivastava A, Kumar A, Thomas JD, Laserson KF, Bhushan G, et al. Association of acute toxic encephalopathy with litchi consumption in an outbreak in Muzaffarpur, India, 2014: A case- control study. Lancet Glob Health, 2017 Jan 30; pii: S2214-109X (17)30035. Doi:10.1016/S2214- 109X(17)30035-9.
19. Das M, Asthana S, Singh SP et al. [Litchi fruit contains Methylene cyclopropyl-glycine] CURRENT SCIENCE, 2015; 109: 2195-2197.
20. Chen Mengwei, CN Patent, CN104336165A, 2015.
21. Deng Yuanyuan, zhang Mingei, Tang Xiaojun, Liu Lei, et al. CN Patent, CN102860476A, 2013.
22. Si Hongjuan. CN Patent, CN106260468A, 2017.