

ASSESSMENT OF VITAMINS, FLAVONOIDS AND PHENOLIC-COMPOUNDS BY HPLC IN THE FRUIT OF *ELAEOCARPUS OBLONGUS*

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ABSTRACT

Background: *Elaeocarpus oblongus* wildy grown tree Western-Ghats, the ethnic peoples of the Nilgris district of Tamilnadu state, India are used the fruits for curative purpose. Fruits are edible; they were extremely cheapest resource for the control of rheumatism and body ache. Fruit containing seed is a kind of Rudraksha according Hindu mythology. Native peoples of Nilgiris district knew about the medicinal and nutritional values of the fruit. **Objective:** The current study indented to estimate the fat and water soluble vitamins, phenolics and flavanoids contents in the fruit pulp of *Elaeocarpus oblongus* (Elaeocarpaceae) by using HPLC methods. Qian H, Sheng M. (1998), suggested HPLC methods for analysing the nutritive values of natural products. **Results:** The results shown the vitamins A, D3 and E and K identified. Of these, A (Retinol Acetate) 1.817 mg/ gm, occurred in higher concentration followed by Vitamin K. 0.748 mg/ gm, Alpha -Tocopherol (E) 0.033 mg/ gm, Cholecalciferol, Vitamin (D3) 0.008 mg/ gm was found comparatively small level. B complex vitamins detected were niacin, pyridoxine, thiamine, and riboflavin. Amongst these, the highest quantity of water-soluble vitamins in the fruit pulp were Thiamine 0.334, followed by Riboflavin 0.012, Pyridoxine 0.007, and Niacin 0.002 mgs/gms respectively. Among the Phenolic acids, Gallic acid content was found more in amount 0.288 mg/ gm, followed by Ferulic-acid 0.009 mg/ gm, Caffeic acid 0.001 mg/ gm, Quercetin the plant flavanoid present in fruit pulp was 0.012 mg/gm, while all other flavonoids Rutin was 0.005 mg/ gm, are also in detectable amount. **Conclusion:** All these essential nutrients have played an important role in the day to day life of every human. The current study will be planned to be carried out GCMS analysis of fruit extracts, and Anti-nociceptive activity as well.

KEYWORDS: Vikki, Bikki, *Elaeocarpus oblongus*, Vitamins, HPLC, Rudraksha, Flavanoids.**1. INTRODUCTION**

Elaeocarpus oblongus dispersed in the "Western-Ghats" at a height of 6,000 feet. The tribes of the Nilgiris district Todas, Kurumbas, Kothas, Irulas, Kattanaikes are usually used these fruits for healing purpose. During the survey, current studies have found that the fruits were very cheapest resource for the management of rheumatism and body pain. Various ancient tribes were using this fruit for the healing of leprosy, pneumonia, rheumatism, ulcers, piles, and dropsy. Journals shown very few biological studies had done so far on leaf, stem, and stem bark.¹ Since the fruits are safe to eat and essential seasonal food commodity (May to August) in the Nilgiris district of Western Ghats, the berries had widely traded in the native bazaar of Ooty, Coonur and Kothagiri towns in Nilgiris district, Tamilnadu State, India. Tribes, folk village peoples, mostly eat the fruit and monkeys during the fruit season comprised summer and rainy. The small vendor has collected and selling the fruits in the market.^[1]

A chemical nature of the *Elaeocarpus* species more or less usually enclosed both Myricetin and Gallic acid.

Elaeocarpus oblongus leaves have Mearnsetin (Flavonoid) 00.015% and Myricetin, 00.19% Flavonoid. The qualitative chemical test report illustrated the existence of sugars of Glucose, Fructose in fruit. Phenolic compounds, Tannin, Flavonoids, Saponins, Sterols, and fatty acids were the secondary metabolites in the fruit.^[1]

Researchers investigated the various part of the plant such as leaf, stem, and stem bark of *Elaeocarpus oblongus* extracts biologically. It was reported that the LD₅₀ of the leaf, stem and stem bark was 464, 1000, 175 milligram /kilogram in that order. None of the pharmacological activities perceived among stem and stem-bark extracts. Only leaf demonstrated action on respiration. Qualitative chemical tests showed the occurrence of Glucose, Fructose, Flavanoids and Tannins and Sterols and Phenolic compounds and fatty acids in the fruit. The amount of elements ($\mu\text{g/g}$) in the fruit pulp powder was estimated by elemental analysis. Atomic absorption spectroscopy analysis revealed the presence of Mn-53.5 and Zn - 46.2 were the chief contents and Pd- 14.3, Cu- 7.5 and Cr- 4.9 were small contents.^[1] The

current study indented to estimate the vitamins, phenolics and flavanoids contents in the fruit pulp of *Elaeocarpus oblongus* (Elaeocarpacea) by using HPLC methods. Qian H, Sheng M. (1998), suggested most suitable HPLC methods for analysing the natural products.^[2]

Phytochemical evaluation used for quality evaluation of plants. The plants possess aromatic components as well as flavan molecular exhibited various biological effects.^[3] HPLC analytic contrivance is a quick and dependable mode access to the identification of plant phenolics. The device is engaged in regular scrutiny of chemical moiety derived from vegetative-source along with chemically-made preparations of pharmaceutical manufacturers addition to mass medicated formulations and given superiority guarantee substantiation of associated with phytomedicines.^[4]

Fat-soluble vitamins, are vital nutrients to normal body metabolism, they are crucial to animal development, skeletal growth and vision improvement, reproduction and to enhance the immunity. Many methods for vitamins assay had established, such as chemical analysis, colorimetry, molecular fluorometry, and gas chromatographic procedure, high performance liquid chromatographic (HPLC) procedure and microbiology process. In all these methods, the HPLC method mainly frequently used for its added advantages, for instance, supreme sensitivity, excellent reproducibility, simple process, and concurrent determination of a variety of vitamins. For fat-soluble vitamins assay, the HPLC procedures are the highly suitable method.^[4]

2. MATERIALS AND METHODS^[4]

2.1. Collection and preparation of fruit pulp *Elaeocarpus oblongus* for HPLC analysis

The gathered fruits have arranged in order to remove damaged ones and they separated based on the state of ripeness, the similarity in shape and size. The fruits were then washed, weighed, and sliced to remove the fruit pulp from the harden seed portion. The pulp was shade dried for 5 days. The dried pulp was finally grounded, pulverized to pass through 250 μ m sieve. Afterwards, samples packaged in polyethylene bags and kept in a refrigerator at 4°C for future use.

2.2. Vitamins analysis of fruit pulps of *Elaeocarpus oblongus* Gartn., (Elaeocarpacea)

2.2.1. Fat Soluble Vitamin - A, D3, E and K - Standard Preparation

Standard solutions (10mg/ml) of Fat-soluble vitamins - A, D, E, and K purchased from Sigma Company. Ten milligrams of genuine amines dissolved in 1.00 milliliter of methanol.

2.2.2. Sample Preparation

One gram of dried fruit pulp powder of *Elaeocarpus oblongus* has taken. 5 ml of Hexane added to it and blended vigorously for 10 minutes. The upper hexane

layer taken in small test tubes and evaporates off to dryness. The residue attained had dispersed in 50 μ l of 95% methanol (Mobile Phase: A-Water; B- Methanol).

2.2.3. Water soluble Vitamin - B - Standard Preparation

Standards of water-soluble vitamins - Niacin, Pyridoxine, Thiamine, and Riboflavin purchased from Sigma Company. 10.00 milligram, quality-vitamins suspended into 10.00 ml methanol. From this, 100 μ l was taken and made up to 10 ml volume with methanol. Later, it' injected into the HPLC.

2.2.4. Sample Preparation

500 mg of dried fruit pulp powder of *Elaeocarpus oblongus* was taken and 10 ml of mobile phase A (1 gm of KH₂PO₄, 1 gm of Acetonitrile blended with 1000 ml of demineralised water) was added. And set aside in sonicator for 30 minutes at 40°C and made up to the volume 100 ml. Put 1gm of potassium dihydrogen phosphate and 500 milligram Acetonitrile made able to 1-litre Methanol resultant mixture used a Mobile phase "B".

2.3. HPLC analysis of flavanoids and Phenols

2.3.1. Preparation of Standards

Standard stock solutions of Caffeic Acid, Gallic Acid, Ferulic Acid, and Rutin and Quercetin, Flavonoids were dispersed with wooden-alcohol in various dilutions (2.0, 4.0, 6.0, 8.0, 10.00 μ g/ml) and filtered through the use of efficient Millipore-filter.

2.3.2. Sampling arrangement

2 g of fruit coarsely dried pulp powder has macerated in a fifty millilitre of ethyl-alcohol (ninety-five percentage) was extracted at 80.00 kilo-hertz using an 'ultrasonic' mechanism for thirty-minute (two times) at 45 °C. The resultant extract has collected, filtered, and dried out on fifty °Celsius underneath condensed force. Shrivelled solubilised matter dispersed within 100mL. Movable liquids filtered using 0.45-mm covering colander and extracts introduced to "HPLC."

2.4. INSTRUMENTATION

2.4.1. For Fat-Soluble Vitamins - A, D, E, K

"Shimadzu-Class, VPV6.13SP2" HPLC device had employed towards analysis of fat and water-soluble vitamins. This instrument is having a certain specification of analysed fat-soluble vitamins that is as follows. Pillar 04.6 \times 75.00 mm "Phenomenex" C-18, 03.50 μ m; moving segments (A) H₂O, (B) Wood-alcohol, Rise by zero minute- ninety percentage 'B' on twenty minutes- hundred percentage. B-Column clean by twenty-one min. 90% B; pour speed 0.0 ml/min.; UV-finder changeable wavelength tracer 210-nm, standard-drug compartment, column-partition hotness 20°C; discontinue moment 21-minutes placement duration 05.00 minute; insertion quantity five μ l of lipid saturated vitamins. Detectors coupled with workstation in support of numbers dealing out.

2.4.2. For water dissolved “Vitamins”

Features of Analytical Colum C18; the functioning state hold dual rise, transportable Solvent A (20%)–0.05M-KH₂PO₄ dispersed with “acidic-water”, Solvent-B (80%) – Acetonitrile. Pumps (Binary boost) Injection volume –5 µl; Flow rate was 0.70 mL/min; B. Conc: 0.4, B. Curve: 0.0, Pressure maximum 400KGF/cm². P. Min: 0.0 kgf/cm²; Coloum wash hold at 19.00 minutes-time 60.00% B-at 120.00 seconds 00.6 % ‘B, CTO-10ASvp; Temperature: 40°C; UV detector-variable wavelength detector UV-SPD10 Avp -285 nm was used; Lamp: D2, Polarity: +, Wavelength Ch 1: 190 nm, Wavelength Ch 2: 370 nm. Analyser attached to the central processing unit for statistics dealing out.

2.4.3. Valuation of Flavonoids contents

“Shimadzu”-spd10atvp clasp ultra-violet/visible analyser, solvent force creator lc-10-atvp, scl10a - tools administer, and sample injector holds twenty micro-liters, graph line estimated by class-yp software. “C”18 turns round stage pilaster used at 25.00°C. Mixture of liquids as transit segment contains hydro-vinegar combinations 25.00:1.00 v: v, in stage B-organic liquid methyl-alcohol had passed via column headed for getting purified components. The dual pitch solvent force created. Deuterium lantern given light source and its divergence was seen as dextro +.rotation.

2.5. Estimation of totality of Phenolics

1.00 gram fruit pulp coarse powder macerated by five millilitres eighty percent Et-OH followed by strained by using “Whatmann” No.1.0 filter paper, subsequently deposit was continually percolated similar solvent up to marc became colourless. Ethanol extract separated and concentrated. Total phenolic contents found with Folin-ciocalteu reagent by employing “Gallic-acid” was a benchmark phenolic component. Intensity of entire phenol composition measured by means of mg of ‘Gallic-acid’ equal to the number of grams of the sample. Almost entire findings detected by the aid of triplicate.^[5]

2.5.1. Procedure

Weigh exactly 0.5-1.0 gm of the fruit pulp was grounded in tenfold quantity of “Ethyl-alcohol”. Rotate this

content on 10000.00 rotations per minute in any case twenty minutes to collect upper saturated solution by decantation. Maceration of Marc again in 2nd times by aid of alcohol, spin the contents towards getting supernatant. Distil off the menstrum, ensuing extract suspended in five mL pure H₂O. Take range of solution from 0.2 to 2 ml into test tubes. By addition of water make the volume in each tube to reach 3 ml. Besides to it mix 0.5 millilitres of “folinciocalteu” mixtures.^[6]

Later than 03 minutes, include 2.0 millilitres of 20.00 % w/v sodium bi-carbonate liquid every hose, mix satisfactorily, put all containers in water bath for one minute, cooled, later estimate absorption with 650.00 nm alongside plain. Make normal arc graph via a range of Gallic acid concentrates. Coloured might be formed during heating for 1h. State domino effect related to Gallic acid or any other phenol equally used as standard. The amount of total phenol is projected with standard-graph to detect clear-cut quantities of phenolic-component in substance to be analysed that expresses milligram of “phenolic”/ hundred grams of the substance.^[6]

3. RESULTS

3.1. Presence of fat-soluble vitamins in the fruit pulp of *Elaeocarpus Oblongus*

HPLC chromatogram of the fat -soluble vitamins in *Elaeocarpus oblongus* (Figure 1.) and Table 1 showed four peaks corresponding to the four vitamins identified. Their retention time, peak area, height, and concentration had given in Table 6. The presence of four peaks corresponds to the vitamins A, D3 and E and K identified. Of these, A (Retinol Acetate) 1.817 mg/ gm, occurred in higher concentration followed by Vitamin K. 0.748 mg/ gm, Alpha -Tocopherol (E) 0.033 mg/ gm, Cholecalciferol, Vitamin (D3) 0.008 mg/ gm was found comparatively small level. All these fat soluble vitamins are essential nutrients which play an important role in the day to day life of every human.

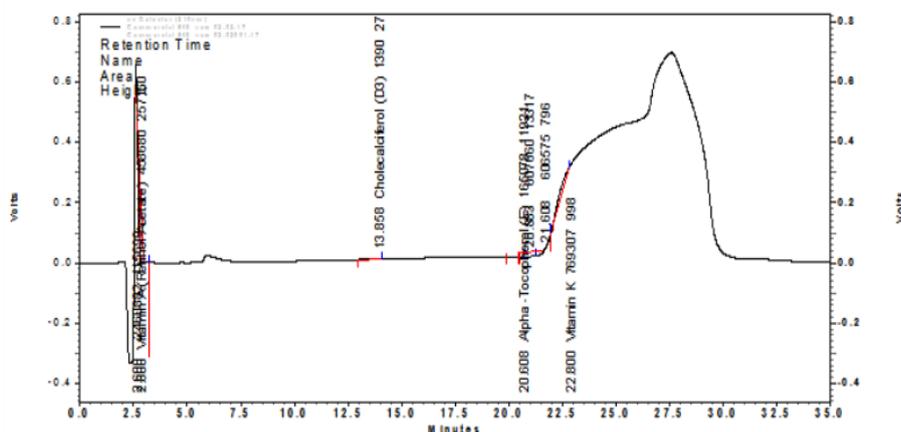


Fig.1. HPLC chromatogram of fat soluble vitamins in fruit pulp extracts of *E. oblongus*.

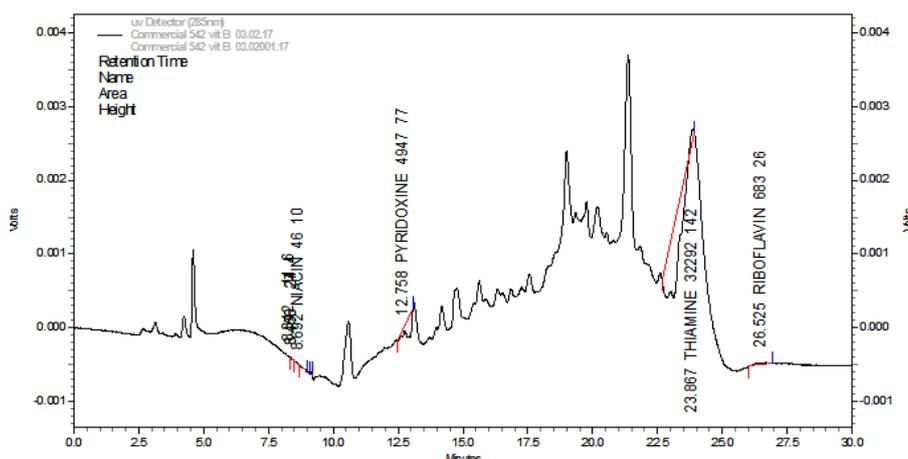
Table 1: HPLC analysis shown contents of fat soluble vitamins in the *E. oblongus* fruit pulp extract.

Sr. No.	Retention Time	Area	Height	Concentration (mg/ gm)	Name
1	2.800	458680	257160	1.817	Vitamin A (Retinol Acetate)
2	13.858	1390	27	0.008	Cholecalciferol (D3)
3	20.608	165078	11921	0.033	Alpha -Tocopherol (E)
4	22.800	769307	998	0.748	Vitamin K

3.2. Presence of water-soluble vitamins in the fruit pulp of *Elaeocarpus Oblongus*

Tables 2, and Figure 2, have shown the facts on HP-LC-testing of water-solubilised vitamin-samples. B complex vitamins detected were niacin, pyridoxine, thiamine, and

riboflavin. Amongst these, the highest quantity of water-soluble vitamins in the fruit pulp are Thiamine 0.334, followed by Riboflavin 0.012, Pyridoxine 0.007, and Niacin 0.002 mgs/gms respectively.

**Fig.2. HPLC chromatogram of water soluble vitamins in fruit pulp extracts of *E. oblongus*.****Table 2: HPLC analysis showed the contents of water-soluble vitamins in the *E. oblongus* fruit pulp extract.**

Sr.No	Retention Time	Area	Height	Concentration (mg/gm)	Name*
1	8.692	46	10	0.002	Niacin
2	12.758	4947	77	0.007	Pyridoxine
3	23.867	32292	142	0.334	Thiamine
4	26.525	683	26	0.012	Riboflavin

3.3. HPLC analysis of Phenolics and Flavanoids contents in fruit pulp of *Elaeocarpus oblongus*

Aroma-acids, rutin, quercetin applied as markers as principles.phenol-molecular possess in every test solutions had found by equivalent pinnacle of "Retention time (Rt)" of sample versus standard. The amount of each phenolic acid is expressed as mg/g. Table 3 and Figure 3 reveals the upshot of berry nutrients on *E.*

oblongus fruit sample of methanol extract. Among the Phenolic acids, gallic acid content was found more in amount 0.288 mg/ gm, followed by Ferulic-acid 00.009, Caffeic acid 00.001 Quercetin the plant flavanoid present in fruit pulp was 0.012 mg/gm, while all other flavonoids Rutin was 0.005 mg/ gm, are also in detectable amount. Total phenol content in the fruit powder has estimated that contains 126 mg / 100gm Gallic Acid equivalent.

Table 3: HPLC analysis has shown contents of Phenolics and flavanoids in the *E. oblongus* fruit pulp extract.

Sr.No.	RT	"Area"	Elevation	Concentrations- mgs in gms	Name*
1	05.550	1635231	38615	0.288	Gallic acid
2	09.483	1572	118	0.001	Caffeic acid
3	10.867	21959	33	0.005	Rutin
4	12.033	16438	49	0.012	Quercetin
	23.258	15060	972	0.009	Ferulic acid

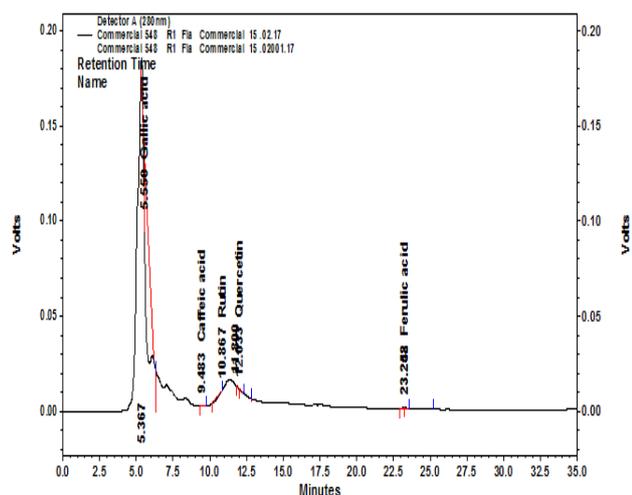


Fig.3.HPLC chromatogram of Phenolics and Flavanoids in fruit pulp extracts of *E. oblongus*.

4. DISCUSSION

There is hundreds and thousands of plant molecules had percolated to the separate active bimolecular source, its chemical and molecular properties were identified and their biological and pharmacological action was studied by using animal models. Till now the majority of the traditionally used plants had not investigated, fully as of lack of aboriginal knowledge of medicinal plants. The current studies have documented tribal familiarity over the therapeutic significance of the remedial foliages; in addition, this study brought new information on hindered plants from the study area that would be facilitated to find the new herbal-based molecules by researchers from the herbal sources in near future.

In the current study, the concentration of riboflavin was found in the fruit, indicative of that value added foodstuff made out of *Elaeocarpus oblongus* might be used as a complement in those affected by growth retardation, reproductive abnormalities or diminished RBC synthesis. Vitamin A prevents night blindness and is necessary for the regular performance of the body epithelia. Vitamin K is vital for blood clotting and Vitamin D acting a vital role by performing on target organ like bones, kidneys, intestinal mucosa, support the bones and avoid Osteomalacia, guard against Alzheimer's and Parkinson's illness.^[7]

Vitamins are a fundamental group of food compounds that have to be given to the human body in adequate quantity. They maintain metabolism processes and develop the effectiveness of proteins and enzymes. Vitamins are provided in ending form or as provitamins that are consequently altered into vitamins. The chief sources of vitamins are fruits, vegetables, meats, and fish. Vitamins are categorized into two groups depend on their solubility. The fat-soluble vitamins A, D3, E, and K are non-polar, hydrophobic components that are isoprene derivatives. They are absorbed by the human life form also with fat and can be stored in liver, kidneys, and fat

tissue. Fat soluble vitamins execute necessary roles in the regulation of height, calcium and phosphorus absorption, and the progress and functionality of bones. They also proceed as anticoagulants.^[8]

The water-soluble vitamin group contains vitamin C (ascorbic acid), B1 (thiamine), B2 (riboflavin), B3 (nicotinamide), B5 (pantothenic acid), B6 (pyridoxine), B9 (folic acid), and B12 (cyanocobalamin). They have different chemical structures since they characterize acid, pyrimidine and imidazole derivatives as well as acid amides. They are accountable for the appropriate performance of the nervous and respiratory systems, synthesis of nucleic and fatty acids, and creation of red blood cells. Be deficient in or deficiency of vitamins in consumed food can show the way to deficit states and illness.^[8]

An extensively used analytical method for the determination of vitamins in food and diet supplements is chromatography, especially high-performance liquid chromatography (HPLC). HPLC is described by high resolution and selectivity, short time of analysis, and capability to connect with other techniques. Literature records permit the choice of a chromatographic procedure that enables the determination of vitamins in food samples with sufficient concentration levels with the use of gradient and isocratic systems.^[8]

Organic acids are natural components in fruits and vegetables. The nature and concentration of the organic acids in fruits are of interest as of their significant influence on the organoleptic properties and steadiness of fruit juices. The presence of organic acids and their concentration in fruits and vegetables was based on the criteria such as species, soil and stress circumstances to which the fruits were grown. Organic acids are also used widely as food additives in the manufacture of beverages, fruit and vegetable drinks and juices.^[9]

It has been reported that over 60% go down in vitamins have been seen owing to storage of vegetables and fruits. Vitamin content also depends on the rate of maturity of fruits and vegetables, as to harvest the crop before maturity is a common practice of farmers to get economical benefits, while some studies have also recommended the HPLC methods less well-suited for vitamin finding than other essays, so assessment of vitamin determination methods is recommended.^[10]

The flavanoids are a huge family of polyphenolic components synthesized by plants and structurally derived from the parent substance flavones. Flavanoids possess in berries and leafy vegetal are expected to provide significant therapeutic benefits such as Anti-oxidant activity. Much of the studies have recommended that flavonoids like rutin, kaempferol, quercetin, apigenin etc. are well-known for its anti-inflammatory, anti-allergic, anti-thrombotic, hepatoprotective, anti-spasmodic and anticancer properties.^[11]

The high content of Vitamin D3 (75 µg/gm) present in *Elaeocarpus oblongus* is put forward of its significance as a nutritive diet in the absorption of calcium in the intestine and development of bones. Vitamin B1/thiamine, is chief as it assists the body cells to change carbohydrates into energy. It is also crucial for the performance of the heart, muscles, and nervous system. The inadequacy of thiamine can leave one fatigue and weakness. Vitamin B2 or riboflavin is significant for body growth, reproduction, and red cell creation. It also helps in liberate energy from carbohydrates.^[5]

Plant phenolics have a tendency to mount up under such positions ahead of surplus carbons exceeding at some point facilitated the production of phenylalanine; it was gathered because of stopping protein synthesis. These internal balances involved in the gathering of aromatics-amines resultant Nitro-groupings shortage that partisan of 1°metabolics. The presence of phenolics, flavanoids, and vitamins present in this fruit strongly indicate it can be used in the nutraceutical industries to make effective anti-oxidant and nutrient health supplements.^[5]

Ferulic acid is a natural phenol recommended to have direct antitumour activity against breast and liver cancer in animal and *invitro* screening. It also efficiently hunts harmful radicals and represses radiation provoked oxidative reaction serving as a significant antioxidant. "Gallic-acid" generally used in the pharmaceutical industry, possesses major antioxidant activity and may guard the liver from the damaging effects of free radicals that are created as a result of a variety of metabolic progressions in the body. Ointments for psoriasis and external haemorrhoids hold gallic acid.^[7] Interestingly the tribe of Nilgiris district of Western Ghats widely has taken this fruit for treating leprosy.

Caffeic acid is an antioxidant demonstrating anti-ischemia reperfusion, anti-thrombosis, anti-hypertension, anti-fibrosis, antiviral and antitumour possessions. Rutin and quercetin display anti-inflammatory, anti hepatotoxic, antiulcer, anti allergic, antioxidant, anti diabetic, antiviral and help to diminish low density lipoprotein and give defence mechanism against cardiovascular mortality. Isoquercitrin has confirmed a dose-dependent defensive effect against oxidative endothelial injury. It has also been revealed to care for venular endothelium from inflammatory products liberated by activating blood platelets and polymorphonuclear granulocytes. Both Quercetin and Isoquercitrin inhibits glucosidase. Isoquercitrin act against lipid peroxidation and oxidative stress. Isoquercitrin controls blood glucose and lipids levels and improves the function of pancreatic islets. Isoquercitrin helps in treating type 2- diabetes mellitus.^[7]

Some workers have explored the special effects of natural flavonoids. Flavonoids can be metabolite from several parts of the plant and the therapeutic values of these plants depend on the bioactive plant chemical

compositions that create specific physiological effects of the human being. A few studies proposed that flavonoids may be helpful in the management of many impaired circumstances. It has been found that flavonoids have antioxidant and free radical scavenging action and competent of both put off and get rid of the effects of reactive oxygen species. Gallic acid has anti-inflammatory, antimutagenic, anticancer and antioxidant activity, antifungal, antiviral and antibacterial properties.^[3]

Gallic acid supposed to be Polyphenolic composed, a chief ingredient of citron fruity. The preclinical investigation has shown that gooseberry heals numerous diseases in humankind. Gallic acid was found to demonstrate cytotoxicity towards cancer cells without disturbing healthy cells. Gallic acid is acting as a remote astringent during interior haemorrhage. It has been set up very valuable in uterine, pulmonary and nephritic haemorrhages. It also gives beneficiary effect in albuminuria and diabetes. It is a most recognized matrix-metalloproteinase inhibitor. "Ferulic-acid" used to prevent thrombosis illness, reduces LDL levels, and amplifies spermatozoa capability. At present extensively use in foodstuffs, beautifying products manufacturing.^[3]

5. CONCLUSION

The fruits of *E oblongus* contain essential nutrients that are more popular seasonal fruit among the peoples of Western Ghats of Nilgris district, Tamilnadu, India. The HPLC studies carried out with the fruit extracts revealed a considerable amount of fat soluble and water soluble vitamins and phenolics and flavonoid possession which confirmed their traditional medicinal potential of this fruit. The phenolic or flavonoid components were used as primary ingredients in plant based pharmaceutical preparations such as Gallic acid (GA) is used to cure albuminuria, psoriasis, diabetes and external haemorrhoids. Caffeic acid (CA) is a capable compound for dermal illness. Rutin (RU) is a significant compound to avoid blood clots, heart attacks and strokes. Quercetin (QU) is a potent bronchodilator; in addition, it acts against allergic or inflammatory mediators in the body and it prevents cancer cells in human beings. Ferulic acid (FA) holds antitumour property against breast and liver cancer. This study planning to extended to perform various biological screening of isolated components of the fruit.

6. Conflict of Interests

The author declares that there is no conflict of interests in this study.

7. ACKNOWLEDGEMENTS

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