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Research Paper

Evaluation of Physico-Chemical, Phytochemical, Minerals and Antimicrobial Properties from Selected Edible Fruits

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Abstract: *Fruit play a vital role in human nutrition, by supplying the necessary growth factors essential for maintaining normal health. In nature various types of plant and fruits are available these fruits are important for living things, the fruits containing organic and inorganic matter are present organic matter contains lipid, carbohydrates, vitamin C, protein, fats etc. The present investigation deals with evaluation of physic-chemical property, phytochemical analysis and antimicrobial activity. Analyses of fruit were carried out using Atomic Absorption Spectroscopy (AAS). The inorganic elements such as sodium, potassium, calcium, etc. these elements are major nutrients. Micronutrients such as magnesium, zinc, manganese, copper, iron etc. are essential nutrients for living organisms. The unripe species of all the fruits tend to have higher ascorbic acid content as shown in the results obtained, with sweet orange and lemon having almost twice the level of ascorbic acid than lime These elements are analyzed by various analytical techniques such as UV visible spectrophotometer, flame photometry and atomic absorptions spectrophotometry. Man has kept these commodities in his diet to provide variety, taste, interest, aesthetic appeal and to meet certain nutritional requirements world.*

Keywords: Fruits Phytochemical analysis, Mineral Analysis Biophysical and Biochemical analysis of fruit, Antimicrobial property.

Introduction

The word fruit is derived from the Latin word "fructus" – to enjoy the produce. In botanical terms, fruit is defined as "a ripened ovary" while in horticultural science it is described as "the plant product, which is edible on ripening". Fruit has also been defined as "the tissues which support the ovules and whose development is dependent on the events occurring in the ovules" Also from the nomadic age to the present day civilized life, man has used fruits as a food. In nature various types of plant and fruits are available these fruits are important for living things. Many hundreds of fruits, including fleshy fruits, are commercially valuable as human food, eaten fresh and as jams, marmalade and other preserves. Fruits are also used in manufactured foods (e.g., cakes, cookies, ice cream, muffins, beverages) such as fruit juices (e.g wood apple, tamarind, amla, fig) or alcoholic beverages (e.g. brandy, fruit beer, or wine), Fruits are also used for gift giving, e.g. in the form of Fruit Baskets and Fruit Bouquets[1-9]. Fruits are important part of human diet. They are commercially important and nutritionally indispensable food commodity. Man has kept these commodities in his diet to provide variety, taste, interest, aesthetic appeal and to meet certain nutritional requirements. Fruits are edible products of the perennial higher plants with high water content, soft texture, and sweet, sour. Also because of their exotic flavor and taste, considerable attention is paid in different parts of the world. The Fruit are consumed by man, mainly because of their organoleptic and chemical property. They play a vital role in human nutrition, by supplying the necessary growth factors essential for maintaining normal health. Fruits along

with vegetables are termed as 'Protective foods'. They are rich sources of vitamins (A, B complex and C) and minerals (calcium, iron and phosphorus) in diets to keep human health in good state. The fruits containing organic and inorganic matter are present. Organic matter contains lipid, carbohydrates, vitamin C, protein, fats etc .The inorganic matter contains inorganic elements such as sodium, potassium, calcium, etc. these elements are major nutrients. Micronutrients such as Magnesium Zinc, manganese, Copper, Iron etc. are essential nutrients for living organisms.

Wood-apple (***Limonia acidissima)***

Limonia acidissima a tropical fruit belonging to the family Rutaceae, which can be consumed either in raw or ripe form *Limonia acidissima* is a large tree growing to 9 meters (30 ft) tall, with rough, spiny bark. The fruit is a berry 5–9 cm diameter, and may be sweet or sour. It has a very hard rind which can be difficult to crack open, and contains sticky brown pulp and small white seeds. Syrups, drinks, jellies and jams can be prepared from its sticky pulp *L. acidissima* Linn fruits have greater ability to prevent various chronic diseases Wood-apple is useful in preventing and curing scurvy and in relieving flatulence[12].

Citrus aurantiifolia

The *(Citrus aurantiifolia*) is with a globose (spherical shaped) fruit, 2.5–5 cm in diameter (1–2 in), that is yellow when ripe but usually picked green commercially. It is smaller and seedier, with a higher acidity, a stronger aroma, and a thinner rind, than that of the Persian lime (*Citrus latifolia*). It is valued for its unique flavor compared to other limes, with the Key lime usually having a sweeter and bitter flavor. The name comes from its association with the Florida Keys, where it is best known as the flavoring ingredient in Key lime pie. It is also known as West Indian lime. The nutritive value of citrus is having 126 KJ (30 Kcal) energy. Different minerals like calcium, iron, magnesium, manganese, phosphorous, potassium and sodium. Vitamins like B1, B2, B3 B5 B9 and vitamin C[7].

Terminalia bellirica

Terminalia bellirica, known as "Bahera". The leaves are about 15 cm long and crowded toward the ends of the branches. Two varieties of *T. belerica* are found in India, one with nearly globular fruit, 1/2 to 3/4 inch in diameter, the other with ovate and much larger fruit. The tree grows up to a height of 60 to 80 feet, the trunk is straight with dark brown color, leaves are around three to eight inches long, broad, oval in shape and grow in bunches at the tip of the branches. The flowers are white or yellow in color, the stems are around three to six inches long, the flowers growing on upper part and lower part. The Baheda fruit is a seed like fruit and looks striped and somewhat like pentagon in shape after drying. Behada a medicinal tree is grown all over the country especially in the lower hilly areas. Behada is said to be most effective on kapha and beneficial for eyes & eye diseases, increases hair, cures soreness of throat, nose problems, purifies blood, throat diseases, cough, heart disease, anemia, jaundice[1].

Ficus carica

Ficus carica is a gynodioecious (functionally dioecious), deciduous tree or large shrub, growing to a height of 7–10 meters (23–33 ft), with smooth white bark. Its fragrant leaves are 12–25 cm long and 10–18 cm across, and deeply lobed with three or five lobes. The complex inflorescence consists of a hollow fleshy structure called the syconium, which is lined with numerous unisexual flowers. The flower itself is not visible from outside the syconium. It is a hollow-ended stem containing many flowers. The fruit is 3–5 cm long, with a green skin, sometimes ripening towards purple or brown. *Ficus carica* has milky sap (laticifer). The species has become naturalized in scattered locations in Asia can be eaten fresh or dried, and used in jam-making. The widely produced fig new ton or fig roll is a biscuit (cookie) with a filling made from figs. Fresh figs are around from August through to early October[9].

Phyllanthus emblica

The tree is small to medium in size, reaching 1–8 m (3 ft 3 in–26 ft 3 in) in height. The branch lets aren't glabrous or finely pubescent, 10–20 cm (3.9–7.9 in) long, usually deciduous; the leaves are simple, sub-sessile and closely set along branch lets, light green, resembling pinnate leaves. The flowers are greenish-yellow. The fruit is nearly spherical, light greenish yellow, quite smooth and hard on appearance, with six vertical stripes or furrows. The amla fruit is eaten raw or cooked into various dishes. Although these fruits are reputed to contain high amounts of ascorbic acid (vitamin C), up to 445 mg per 100 gm.

Ziziphus jujuba

It is a small deciduous tree or shrub reaching a height of 5–12 meters, usually with thorny branches. The leaves are shiny-green, ovate-acute, 2–7 centimeters wide and 1–3 centimeters broad, with three conspicuous veins at the base, and a finely toothed margin. The flowers are small, 5 millimeters wide, with five inconspicuous yellowish-green petals. The fruit is an edible oval drupe 1.5–3 centimeters deep; when immature it is smooth-green, looking like a small date. The freshly harvested as well as the candied dried fruit are often eaten as a snack, or with coffee. Jujuba fruit is made into juice and jujube vinegar. They are used for making pickles in west Bengal. While fresh jujuba plentiful in vitamins and fiber, dry, red ripe

berries high in calories, rather concentrated sources of vitamins and minerals.

Tamarindus indica

Tamarind is a very large tree with long, heavy drooping branches, and dense foliage. Completely grown-up tree might reach up to 80 feet in height. During each season, the tree bears curved fruit pods in abundance covering all over its branches. Each pod has hard outer shell encasing deep brown soft pulp enveloping around 2-10 hard dark-brown seeds. Its pulp and seeds held together by extensive fiber network. The tree is among the large tropical trees belonging to the family of Fabaceae. Tamarind is a fruit with a distinctive sweet and sour taste. Used in cuisines from around the world, this delicious pod-like fruit is a nutritional powerhouse with an abundance of health benefits. Tamarind trees are cultivated in abundance in Africa and Asia and South America. Although raw tamarind is edible, it has an unusual sour taste which makes you change your facial expression every time you take a bite. Ripe tamarind pods or mature pods when cracked open have a brown or brownish-black colored fruit which contain hard black seeds. The brown flesh of the fruit is juicy and acidic and has a sweet-tangy flavor. Aside from being used in world cuisine, Tamarind fruit is hugely popular because of its health benefits and medicinal benefits. Leaves, bark, seeds, and flowers of tamarind too have medicinal uses. Tamarind trees grow up to 40-80 meters depending on soil condition and weather condition. A mature tree is capable of producing between 175- 250kg tamarind fruit per year. Flowers and leaves of tamarind are edible and have a delicious

Ficus racemosa

Ficus racemosa is a species of plant in the family Moraceae. Popularly known as the, Cluster Fig Tree, Indian Fig Tree.This is native South-East Asia. *F. racemosa* can grow over 40 feet tall and 20 to 40feet wide. The tree is medium to moderate sized deciduous. The rich green foliage provides a good shade. The leaves are dark green, 7.5-10 cm long, glabrous; receptacles small sub globose or piriform, in large clusters from old nodes of main trunk. The fruits receptacles are 2-5 cm in diameter, pyriform, in large clusters, arising from main trunk or large branches. The fruits resemble the figs and are green when raw, turning orange, dull reddish or dark crimson on ripening. The fruit of *F. racemosa* is 3/4inch to 2 inches long, circular and grows directly on the trunk. The seeds are tiny, innumerable and grain-like. Outer surface of the bark consists of easily removable translucent flakes grayish to rusty[9].

Material and Methods

All glass wares used in the study were of Borosil made. Prior to use the glass wares were rinsed with chromic acid. Then washed with tap water & further rinsed with double distilled water was used from hat progeny model 5 SD/E Distillation Assembly. Petri-plates, conical flask, measuring cylinder, beaker, slides, cover slips etc were utilized, Crucible with lid, Oven, Balance weight, Desiccator, Autoclave, laminar air flow cabinet, incubator, compound stereo binocular microscope, electronic top balance, dissecting microscope.

Chemicals

NaCl (sodium chloride), KCl (Potassium chloride), $CaCl_2.2H_2O$ (Calcium Chloride Dihydrate), $CuSo_4.5H_2O$ (Copper(II) sulfate pentahydrate), $FeSo_4.7H_2O$ (Ferrous sulfate heptahydrate), chloroform., Distilled water, Oxalic acid 4%, Dye Solution: (weight 42 mg sodium bicarbonate into a small volume of distilled water. Dissolve 52 mg 2,6dichloro phenol indophenol in it and make up to 200 ml distilled water).stock standard solution: (Dissolve 100 mg ascorbic acid in 100 ml of 4% oxalic acid solution in a standard flask(1mg/ml).),Working standard Dilute 10 ml of the stock solution to 100 ml with 4% oxalic acid. The concentration of working standard is 100 ug/ml), dinitrosalicylic Acid Reagent Solution: Mix 100 ml of 5% (w/v) 3,5 dinitrosalicylic acid in 2 M NaOH with 250 ml of 60% (w/v) sodium potassium tartarate and make the total volume up to 500 ml with distilled water. Standard glucose solution .Solution A:9 Prepare 100ml 2% Sodium carbonate Solution in distilled water). Solution B (prepare 100ml 0.5% Copper sulphate in 1%Sodium potassium tartrate) Reagent C (Protein reagent: mix 50ml of solution A with 1 ml of solution B.S).

Sample Collection

Eight fresh fruits were purchased from local market in Loni market city. Before the extraction procedure, all the samples were thoroughly cleaned using deionized water to remove any adhering contaminants if present.

Method

A) Analysis of Physical Parameter

The Standard Methods of the Association of Official Analytical Chemists, AOAC methods, 939.13 and 966.18 were used for the determination of ascorbic acid in the fruit juice[14]. Analysis of Flame Emission Spectroscopy and Atomic Absorption Spectrophotometry[5] according to standard protocol we can estimate different physical parameter such Sodium, Potassium, Copper, Iron calcium content are estimated[21].

B) Biophysical Parameter Analysis

Moisture content

The moisture content is determine by standard protocol and it will be discuss in result Difference in weight determines the moisture content[12,21].

Ash content

According to the method 100g of each sample was weighed in a silica crucible. The crucible was heated in a muffle furnace for about 3-5 hrs at 600 C. It was cooled in desiccators and weighed to completion of ashing. To ensure completion of ashing, it was heated again in the furnace for ½ an hour more, cooled and weighed. This was repeated consequently till the weight become constant weight of ash. The ash content was calculated by[12,13] the following formula:

Ash % = weight of ashed sample /weight of sample taken × 100

Ash content was analyzed by AOAC method Ref. 942.05

C) Biochemical parameter Estimation

Estimation of Carbohydrate

The carbohydrate are estimated by DNSA method by standard protocol The concentrations of reducing sugars and non-reducing sugars were determined by the dinitrosalicylic acid method[15] we can estimate sugar content and that detailed discuss in results.

Estimation of Protein

Macro method was used for the estimation of crude protein content[12,22]**.** Grind 2g of sample fresh fruit and dry powder in a pestle and mortar with 10ml of distilled water and centrifuge 4000rpm for 10mins. Then 1ml of supernatant was made upto 100ml with distilled water. The amount of protein was estimated by the method of Lowry *et al* using BSA as the standard[23].

Estimation of Lipid

The lipid Confirmatory test are determine by lipid spot test that is determine by physical test in which we take dry paper do not wet them it give spot of fruit extract from conclude C.T. of lipid and detailed discuss in result and conclusion. Taken a 1gm powdered sample and add to it 4 ml chloroform. Dissolve all samples properly. Then spot the mixture in whatsmann filter paper no. 41 by using dropper. Identified the lipids present in the sample.

Estimation of Ascorbic acid

The Ascorbic acid estimation method that is by volumetric analysis the ascorbic acid content in these fruits and vegetables were determined by volumetric method[2, 3,4,7].

D) Secondary metabolite

Preliminary qualitative phytochemical analysis of all the extracts was carried out by employing standard c onventional protocols [1,9,16,22].

E) Antimicrobial Activity

The antimicrobial activity is carried out with help standard protocol antimicrobial activity is calculated Antibacterial activity was assessed using agar well diffusion method against three gram positive bacteria (*Staphylococcus aureus, Staphylococcus epidermidis*, *Bacillus subtilis*) and a gram negative bacterium (*Proteus mirabilis*). Wells were punched on to the seeded nutrient agar plates with the help of 1ml micro pipette tips (6 mm diameter). 100 µl of the samples were added into the wells under strict aseptic conditions and all the plates were incubated at 37 °C overnight. Antimicrobial activity was determined by measuring the diameter of zone of inhibition and the mean values were calculated[12].

Results and Discussion

A) Analysis of Physical Parameter

The analysis of different minerals concentrations in methanolic extracts of fruit from loni , Maharashtra was determined using atomic absorption spectroscopy (AAS) and results obtained were tabulated in Table 1 Showing Analysis of component like Sodium (Na), Pottasium (K),Calcium (Ca), Copper (Cu), Iron (Fe). In all observation of analysis and graph we get following results.

Sodium (Na)

The fruits samples are analyzed by flame photometry and conclude that the *Tamarindus indica* having maximum concentration of sodium i.e 11 mg/ 100gm and on the other hand side minimum concentration of sodium is *Citrus aurantiifolia* i.e 6 mg/ 100gm.

Pottasium (K)

The fruits sample are analyzed by flame photometry and conclude that the *Limonia acidissima* having maximum concentration of potassium i.e 42 mg/ 100gm and on the other hand side minimum concentration of potassium is *Citrus aurantiifolia* i.e 22 mg/ 100gm.

Calcium (Ca)

The fruits sample are analyzed by flame photometry and conclude that the *Ziziphus jujuba* having maximum concentration of Calcium i.e 21.5 mg/ 100gm and on the other hand side minimum concentration of Calcium is *Ficus carica* i.e13.5 mg/ 100gm.

Copper (Cu)

The fruits sample are analyzed by flame photometry and conclude that the *Ziziphus jujuba* having maximum concentration of copper i.e 6.6 mg/ 100gm and on the other hand side minimum concentration of copper is *Limonia acidissima* i.e. 5.8 mg/100gm.

Iron (Fe)

The fruits sample are analyzed by flame photometry and conclude that the *Citrus aurantiifolia* having maximum concentration of iron i.e 6.4 mg/100gm and

on the other hand side minimum concentration of iron is *Ficus carica* i.e 4.4 mg/100gm.

Table 1: Analysis of Flame Emission Spectroscopy and Atomic Absorption Spectrophotometry

S. No.	Sample name	Flame Emission Spectroscopy (mg/100 gm)			Atomic Absorption Spectrophotometry (mg/100 gm)	
		Na	K	Ca	Cu	Fe
1	*Limonia acidissima*	8	42	16.5	5.8	5.2
2	*Citrus aurantiifolia*	6	22	17.5	6.2	6.4
3	*Terminalia bellirica*	8	28.5	14	6	4.6
4	*Ficus carica*	7.4	34	13.5	5.6	4.4
5	*Phyllanthus emlica*	6.5	23.5	18.5	6.2	5
6	*Ziziphus jujuba*	8	36.5	21.5	6.6	5.6
7	*Tamarindus indica*	11	37	20.5	6.2	4.6
8	*Ficus racemosa*	8	24	15.5	6.2	4.6

2) Moisture Content

The moisture content is determine by standard method Difference in weight determines the moisture content[12, 21]. In following Table 2 we can see different types of fruit moisture content. The out of eight fruit Analysis in following figure 8. In *Ficus carica* high amount of moisture content are about 63.1% and other hand side lowest amount of moisture content in *Terminalia bellirica* is about 8%.

3) Ash Content

As content determine by standard method[12,13]. In Table 3 Analysis of different fruit Ash Content In the Ash content graphical Analysis Shown in the figure 9 In *Ziziphus jijuba* high amount of Ash content 51.4% and other hand side minimum ash content present in *Citrus aurantiifolia is* above 18.3%.

Table 2: Analysis of Moisture Content Eight Fruit

S. No.	Sample name	Wt. of empty crucible + lid (M1)	Wt. crucible + sample before drying (M2)	Wt. crucible + sample after drying (M3)	Moisture content
1	*Limonia acidissima*	47.849	48.849	48.666	17.94
2	*Citrus aurantiifolia*	56.160	57.160	57.061	9.9
3	*Terminalia bellirica*	49.644	50.644	50.564	8
4	*Ficus carica*	47.935	48.935	48.304	63.1
5	*Phyllanthus emlica*	47.492	48.492	48.387	10.5
6	*Ziziphus jujuba*	31.307	32.307	32.170	13.7
7	*Tamarindus indica*	36.522	37.522	37.371	15.1
8	*Ficus racemosa*	33.469	34.469	34.368	10.1

Table 3: Analysis of Ash Content of Fruit

S. No.	Sample name	Initial wt of sample	Final wt. of sample	% of ash content
1	*Limonia acidissima*	1	0.195	19.5
2	*Citrus aurantiifolia*	1	0.183	18.3
3	*Terminalia bellirica*	1	0.191	19.1
4	*Ficus carica*	1	0.405	40.5
5	*Phyllanthus emlica*	1	0.181	18.1
6	*Ziziphus jujuba*	1	0.506	50.6
7	*Tamarindus indica*	1	0.407	40.7
8	*Ficus racemosa*	1	0.278	27.8

Table 4: Analysis of carbohydrate estimation of different fruit

S. No.	Sample name	Sugar content
1	*Limonia acidissima*	**0.059**
2	*Citrus aurantiifolia*	**0.024**
3	*Terminalia bellirica*	**0.037**
4	*Ficus carica*	**0.065**
5	*Phyllanthus emlica*	**0.082**
6	*Ziziphus jujuba*	**0.092**
7	*Tamarindus indica*	**0.064**
8	*Ficus racemosa*	**0.096**

Table 5: Estimation of protein of different fruit

S. No	Sample name	Protein content
1	*Limonia acidissima*	0.044
2	*Citrus aurantiifolia*	0.066
3	*Terminalia bellirica*	0.084
4	*Ficus carica*	0.022
5	*Phyllanthus emlica*	0.056
6	*Ziziphus jujuba*	0.020
7	*Tamarindus indica*	0.54
8	*Ficus racemosa*	0.082

Table 6: Analysis of Ascorbic acid of different fruit

S. No.	Sample name	Burette Reading	Average Ascorbic Acid Concentration (mg/100mL))
1	*Limonia acidissima*	0.5	28.5
2	*Citrus aurantiifolia*	1.0	57.1
3	*Terminalia bellirica*	1.2	68.5
4	*Ficus carica*	0.6	34.2
5	*Phyllanthus emlica*	1.6	91.3
6	*Ziziphus jujuba*	1.3	74.20
7	*Tamarindus indica*	0.8	45.6
8	*Ficus racemosa*	0.6	34.2

Table 7: Analysis of secondary metabolite in different fruit

S. No.	Secondary metabolite	Wood apple	Citrus	Behada	Fig	Amla	Ber	Tamarindus	Ficus
1	Steroids	-	-	-	-	-	+	-	-
2	Tarpenoids	-	-	-	-	-	-	-	-
3	Tannins	-	+	+	-	+	+	-	-
4	Saponins	+	++	-	+	+	+	-	-
5	Alkaloids	++	+++	-	+	+	+	+	++
6	Phlobatanin	-	-	-	-	-	-	-	-
7	Quinone	-	-	-	-	+	-	+	-
8	Glycosides	-	-	-	-	+	-	+	-
9	Flavonoids	+	++	+	+	-	+	-	++
10	phenolic compound	+ + +	+	+	+	+	+	+	+

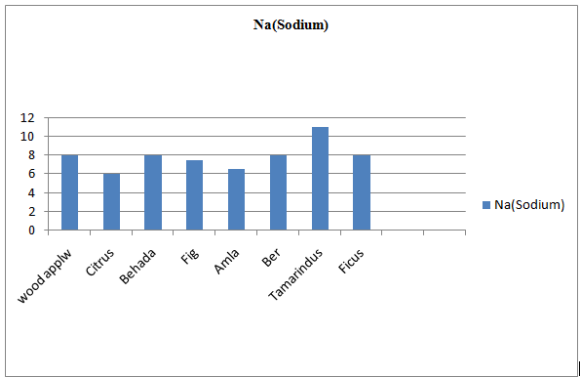


Figure 1: Analysis of Sodium

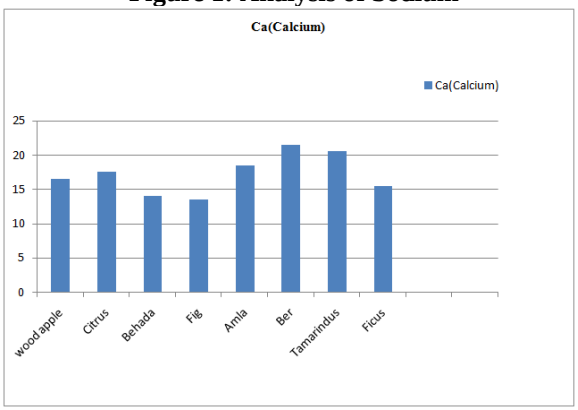


Figure 2: Analysis of Calcium

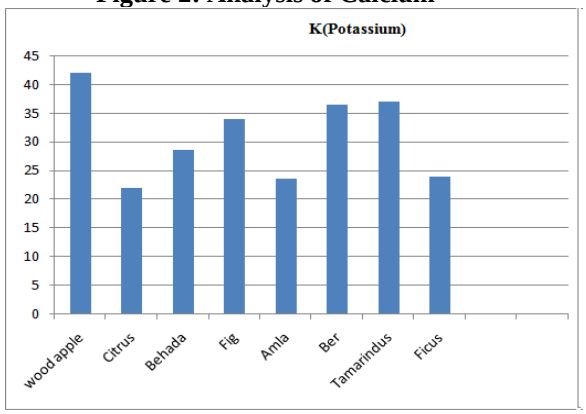


Figure 3: Analysis of Potassium

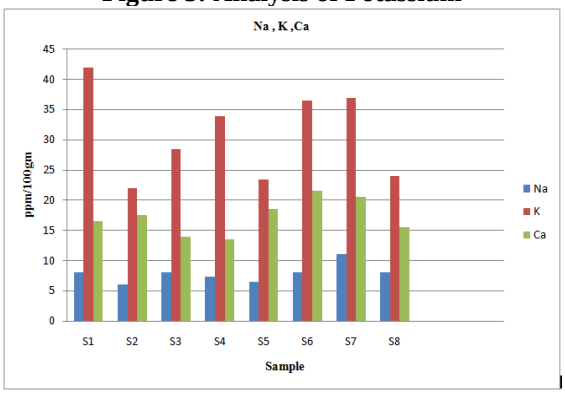


Figure 4: Analysis on the comparison Sodium, Calcium Potassium

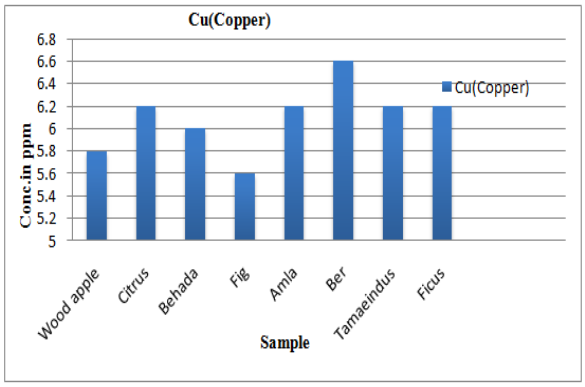


Figure 5: Analysis of Copper

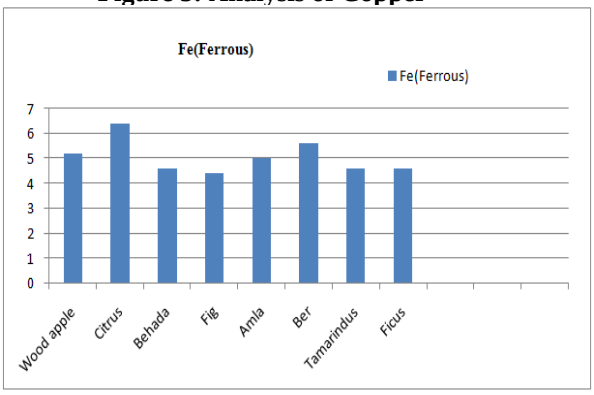


Figure 6: Analysis of Iron

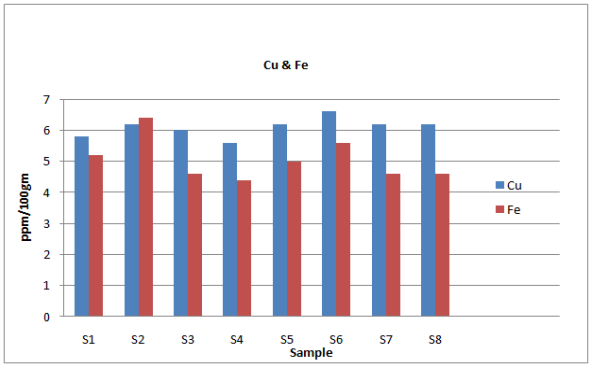


Figure 7: Analysis on the Camparision of Copper, Iron

(S1- *Limonia acidissima*, S2-*Citrus aurantiifolia*, S3-*Terminalia bellirica*, S4-*Ficus carica*, S5-*Phyllanthus emlica*, S6-*Ziziphus jujuba*, S7-*Tamarindus indica*, S8-*Ficus racemosa*)

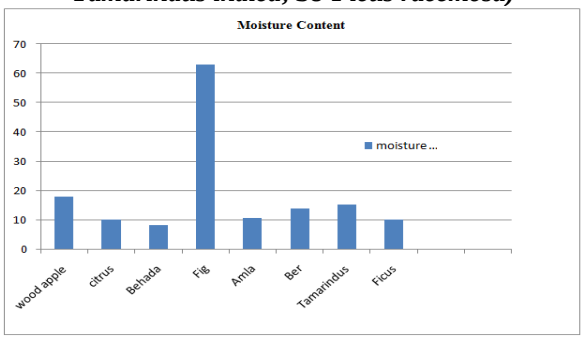


Figure 8: Graphical Analysis of Moisture content

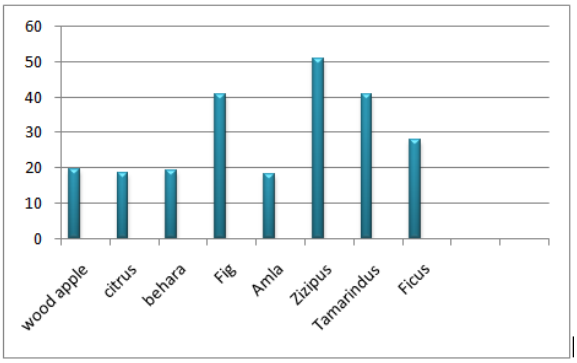


Figure 9: Graphical Analysis of Fruit Ash content

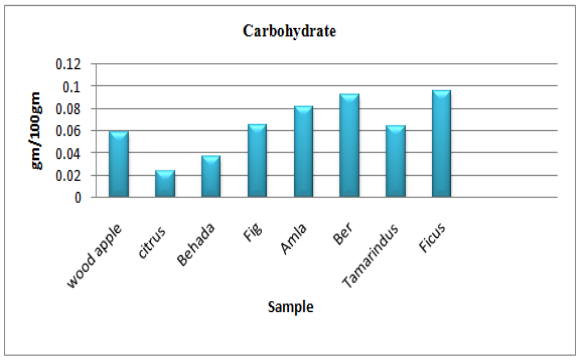


Figure 10: Graphical analysis of fruit

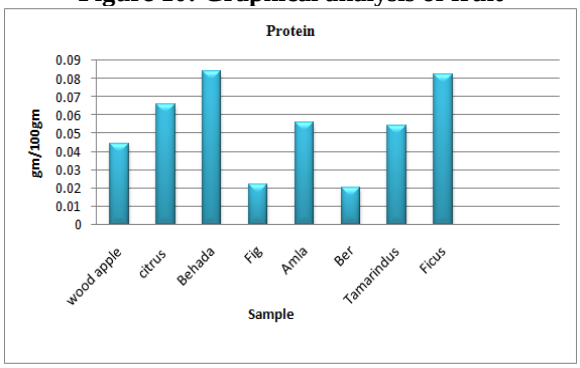


Figure 11: Protein Analysis of Different fruit

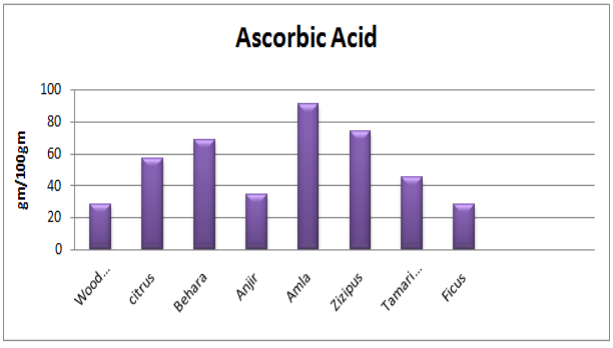


Figure 12: Analysis of Ascorbic acid of fruit

B) Bio-Chemical parameter:

Estimation of carbohydrates (DNSA Method)

The carbohydrates determine by DNSA method and result found that the higher concentration of reducing sugar present in fruit *Ficus racemosa* is about 0.096 gm while minimum sugar *Citrus aurantiifolia* in 0.024 gm in the Table 4 there different fruit reducing sugar content are given that are estimated by standard protocol on the basis of Table 4 we draw graphical analysis of Carbohydrate estimation in figure 10.

Estimation of Protein (Folin's Lowry Method)

The protein is determine by Folin's Lowry Method in table 5 there protein analysis of different fruit on that basis we can conclude that the higher concentration of protein present in *Terminalia bellirica* is about 0.084 gm while lowest in the *Ficus carica* 0.022gm All of protein analysis are explain figure 11 of different fruit.

Lipid analysis

The lipid analysis are carried out of by standard method lipids spot test in which following are lipid spot photograph in fruit lipid are present in following Table 5 enlisted in which fruit lipid are present.

Estimation of Ascorbic Acid

The ascorbic acid estimation are carried out by standard protocol with help of that ascorbic acid analysis are done. in the table 6 there ascorbic acid analysis are carried out of eight fruit in which amla having highest ascorbic acid The higher amount of ascorbic acid are present in Amla is about 91.3 (mg/100 gm), while lowest ascorbic acid in the *Limonia acidissima* 28.5(mg/100 gm), compared other fruit sample with help of table 6 we can draw graphical analysis of ascorbic acid in figure 12.

Qualitative analysis of secondary metabolite

In table 7 analysis phytochemical and secondary metabolites are given.

1)In wood apple present saponins, Alkaloid, Flavonoids, Phenolic comp.

2)Citrus sample present a Tannins, Saponins, Alkaloids, Flavonoids, Phenolic comp.

3)Behada sample present Tannins, Flavonoids, Phenolic comp.

4)Fig:- saponins, Alkaloids, flavonoids, phenolic comp are present.

5)Amla:-Tannins, saponins, Alkaloids, quinone, glycosides, phenol comp

6)Ber:-steriods, tannins, saponins, alkaloids.

7)Tamarind:-alkaloids, quinone, glycosiode, phenolic comp.

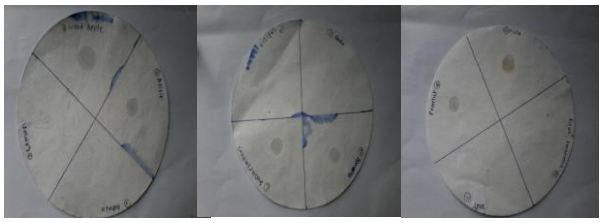
8)Ficus:-alkaloids, flavonoids, phenolic compound.

C) Antimicrobial property

1. Antibacterial property of given food sample

The antimicrobial activity is carried out by standard protocol and that result we can explain with help of photographs and overall fruit antimicrobial analysis result are given in table 8. In Starr media use for *Xanthmonas axanopodas* punicae is control by the *Limonia acidissima* (wood apple) Zone of inhibition is 0.5mm and *Citrus aurantiifolia* (Citrus) zone of

inhibition is also 1mm. Bacteria are also control by Strepto-mycin zone of inhibition is 8mm



Wood apple, Citrus, Behada, Anjir **Amla, Ber** **Tamarind, Ficus**

Figure 13: Lipid analysis result

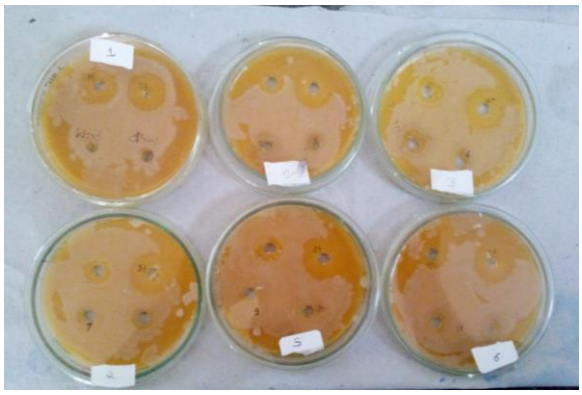


Figure 14: Antimicrobial activity result

Conclusion

The Composition and nutritional quality of fruit is dependent on environment and variety of fruit. Overall analysis of different edible eight fruit suggested that Tamarindus have high concentration sodium, Limonia having higher concentration of potassium, Ziziphus having higher concentration of Calcium. The analysis by AAS we conclude that *Ziziphus* has higher concentration of Copper and Citrus having higher concentration of Ferrous. The moisture content Ficus was high amount of moisture content. The highest carbohydrate (sugar) content in the Ficus while highest protein is concluded is in Terminalia. By Ascorbic acid analysis, we can conclude that in which amla. The lipid analysis we can conclude that wood apple, fig, cashew, almond, pista, peanut Lipid are present. Qualitative analysis of secondary analysis indicate that all fruit content secondary metabolite wood apple and citrus shows the antimicrobial activity .all analysis conclude that fruit different minerals and Nutritive biochemical content which are beneficial to health and fruit edible .

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