

# “Preliminary Phytochemical And Biochemical Analysys of Citrus Maxima, (Burm) Merr.;"

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**Abstract-** Medicinal plant includes various types of plants used in herbalism. It is the use of plants were medicinal purposes. This paper is highleted priliminary phytochemical and biochemical analysys of Citrus maxima, (Burm) Merr.; The dried leaves were powdered with the help of pulveriser. Each 15 gm. of air dried powder were taken in 50 ml of methanol, ethanol and ethyl acetate. The solvent were evaporated and the plant extract used for phytochemical analysis. The result showed that Preliminary phytochemical screening of Citrus maxima leaf revealed the presence of carbohydrate, protein, amino acid, glycosides, flavonoids, alkaloids, saponins. Among these carbohydrates, proteins, steroids, saponins are the major constituents. Biochemical analysis is based on standered method. The result shows that plant extract contains more amount of carbohydrate than the protein.

**Keywords-** Phytochemical, Biochemical, Citrus maxima

## I. INTRODUCTION

Medicinal plant includes various types of plants used in herbalism. These medicinal plants are also used as food, flavanoids, medicine or perfume. Plants have been used for medicinal purposes long before prehistoric period. Traditional system of medicine continues to be widely practiced on many accounts population rise, inadequate supply of drugs, prohibitive cost of treatments (Abdul Wadood *et al.*, 2013). The Indian sub-continent has a very rich diversity of plant species in a wide range of ecosystem. There are about 17000 species of higher plants, of which approximately 8000 species are considered medicinal and used by village communities (Singh, 2015). Recently WHO (World Health Organization) estimated that 80 percent of people worldwide on herbal medicines for some aspects of their primary health care needs. According to WHO around 21000 plant species have the potential for being used as medicinal plants. Phytochemicals generally are regarded as research compounds rather than essential nutrients because proof of their possible health effects has not been established yet (Vikranth Arya *et al.*, 2012). Plants such as fruits have a lot of biological effective compounds, that have ability to attack radical free and work as anti-natural oxidative stress such as

phenolic compounds (phenolic acids, flavonoids and tannins) make them play an important role in reducing the risk of many diseases like cancers, cardiovascular and neurological diseases (AseelKhadhimHadi-Al Ambariet *al.*, 2015).

## II. MATERIALS AND METHODS

### Study Area (Plates -1&2)

Kerala is one of the 28 states in India .Capital is Thiruvananthapuram. Kerala lies in the southern part of the India. it are bordered by states of Tamil Nadu, Karnataka. Kannur is the one of the district in Kerala .commonly the area is called Malabar. Karivellur is a small village in Kannur district. It is a pleasant climate area .mostly cultivated crop in this area is rice .it is the pollution free area.

### Plate 1- Location map



### Plate 2- Study area



**Plate 3- Habit of plant****Systematic position**

Kingdom: Plantae

Division : Eudicots

Class : Magnoliopsida

Order : Sapindales

Family: Rutaceae

Genus: Citrus

Species : *Citrus maxima*, (Burm) Merr.;

The pomelo tree is normally about 16 to 50 ft tall. Pomelo is native plant of Malaya Island and East of India. It is wide spread in China, Japan, Philippines, Indonesia, USA (Vijayalakshmi *et al.*, 2015). They are small trees with smooth, oblong to broadly lanceolate, and narrowly winged short petioled leaves. The fruit has loose skin and leathery pericarp, with a sweet sour juicy pulp which are mainly processed as juice drinks. These plants are also considered important medicinal plants. For instance, the flavonoids from Citrus exhibit *in vitro* and *in vivo* anti-inflammatory, anticancer, antioxidant, and cardiovascular protective activities (Rich Milton R. Dulay *et al.*, 2016).

Pomelo is a common citrus species in the country, thought to be the local version of grapefruit. In view of previous findings, ascertaining the high antimicrobial and antioxidant activities of a number of phytochemicals inherent in plant food like citrus and the fact that all citrus have similar complex structure regardless of cultivars, pomelo can therefore be a potential replacement for synthetic preservatives therefore providing multiple benefits to consumers by way of furthering its possible usage in the fields of medicine, therapeutics and food technology (Aimee Sheree A. Barrion *et al.*, 2014). Alcoholic extracts of the fruit also shows antidiabetic and antihyperlipidaemic potential (Bhandurage *et al.*, 2010). The essential oil of the fruit shows *in vitro* activity against *Staphylococcus aureus* and *Escherichia coli* (Oydepoet *et al.*, 2012).

**Collection of the sample**

For the present study plant sample is selected at Karivellur to find out the “phytochemical and biochemical analysis”. The leaves of *Citrus maxima* were cleaned to remove adhering dust and then dried under shade. The dried leaves were powdered with the help of pulveriser. The powdered sample was stored in air tight container used for further studies. The data were then processed in tables and chart.

**Preparation of plant extract**

15 g the plant powder was subjected to 100 ml of ethanol, methanol, and ethyl acetate were extracted separately using shaker system for 48 hours and this was used for further analysis.

**Plant extracts (Plate- 4)****Preliminary phytochemical analysis**

The phytochemical screening of ethanol, methanol and ethyl acetate extract of *Citrus maxima* analysed by standard methods and shown various phytochemical constituents such as Carbohydrate, protein, amino acid, steroids, glycosides, flavonoids, alkaloids, tannins, saponins, terpenoids

**Biochemical analysis**

The biochemical analysis of Carbohydrate and Starch were analysed by Anthrone method (Hedge, J.E. and Hofreiter, B.T 1962).

Protein estimation were analyzed by Lowry's method (Lowry, *et al.*, 1951).

### III. RESULTS AND DISCUSSION

The phytochemicals derived from plant extract serve as a prototype to develop less toxic and more effective medicines in controlling the growth of the microorganisms. The present study is done phytochemical screening in extract of ethanol, methanol and ethyl acetate. The present study of qualitative phytochemical analysis of ethanolic extract of *Citrus maxima* leaf were represented in the Table-1. Preliminary phytochemical screening of *Citrus maxima* leaf revealed the presence of carbohydrate, protein, amino acid, glycosides, flavonoids, alkaloids, saponins. Among that carbohydrate, protein and saponins are the major constituents.

The present study of qualitative phytochemical analysis of methanolic extract of *Citrus maxima* leaf were represented in the Table -2. Here carbohydrate, protein, amino acid, steroids, glycosides, alkaloids, tannins, terpenoids. Among that carbohydrate and protein are the major constituents. The present study of qualitative phytochemical analysis of extract of ethyl acetate in *Citrus maxima* leaf was represented in the Table -3. Here carbohydrates, proteins, amino acids, steroids, glycosides, flavonoids, alkaloids, saponins. Among these carbohydrates, proteins, steroids, saponins are the major constituents.

Similar studies have been reported by Ashwin Raj Kumar, *et al.*, (2012) in the present investigation different Citrus species have been used and were subjected to phytochemical analysis. Here used two solvents methanol and ethanol for the analysis of *Citrus maxima* leaf. The present study reveals phytochemicals that are, alkaloids, carbohydrates, and glycosides are present in the ethanolic extract. Carbohydrates are one of the most important components in many foods. Carbohydrate may be present as isolated molecules or they may be physically associated or chemically bound to other molecules. Some carbohydrates are digestible by humans therefore provide an important source of energy. Carbohydrate also contributes to the sweetness, appearance and textural characteristic of many foods. Starch is the most common form of carbohydrate and typically found in staple grains like rice, wheat and corn. Healthy high starch foods include whole grains, whole grain bread, whole grain pasta, minimally processed vegetables and beans. Most green plants use starch as their energy store.

Proteins are important constituents of food form a number of different reasons. They are a major source of energy as well as containing essential amino acids such as lysine which are essential to human health, but which body cannot synthesis. Carbohydrates are hydrates of carbon. They contain carbon hydrogen and oxygen in the ratio

1:2:1. Nutritive value of a protein is based on two factors namely amino acid composition and digestibility. The plant study deals with Biochemical analysis to identify the amount of carbohydrate and protein content present in *Citrus maxima* leaf. It revealed that 14 mg of carbohydrate 12.6 mg of starch and 10 mg of protein present in the plant (Table-4).

Table: 1 Qualitative analysis of phytochemicals present in the ethanolic extract of *Citrus maxima* leaf

S.No	Types of compounds	Ethanolic extract
1	Carbohydrate	++
2	Protein	++
3	Amino acids	+
4	Steroids	-
5	Glycosides	+
6	Flavonoids	+
7	Alkaloids	+
8	Tannins	-
9	Saponins	++
10	Terpenoids	-

(++ indicates strongly present, + indicate moderately present, and – indicates absent)

Table: 2 Qualitative analysis of phytochemical present in the Methanolic extract of *Citrus maxima* leaf

S.No	Types of compounds	Methanolic extract
1	Carbohydrate	++
2	Protein	++
3	Amino acids	+
4	Steroids	+
5	Glycosides	+
6	Flavonoids	-
7	Alkaloids	+
8	Tannins	+
9	Saponins	-
10	Terpenoids	+

(++ indicates strongly present, + indicate moderately present, and – indicates absent)

Table: 3 Qualitative analysis of phytochemicals present in the ethyl acetate extract of *Citrus maxima* leaf

S.No	Types of compounds	Ethanollic extract
1	Carbohydrate	++
2	Protein	++
3	Amino acid	+
4	Steroids	++
5	Glycosides	+
6	Flavonoids	+
7	Alkaloids	+
8	Tannin	-
9	Saponins	++
10	Terpenoids	-

(++ indicates strongly present,

+ indicate moderately present, and – indicates absent)

Table: 4 Carbohydrate protein content present I *Citrus maxima* Leaf

Sample	Carbohydrate content in mg/gm	Starch content in mg/gm.	Protein content in mg/gm
<i>Citrus maxima</i> leaf	14 mg	12.6 mg	10 mg

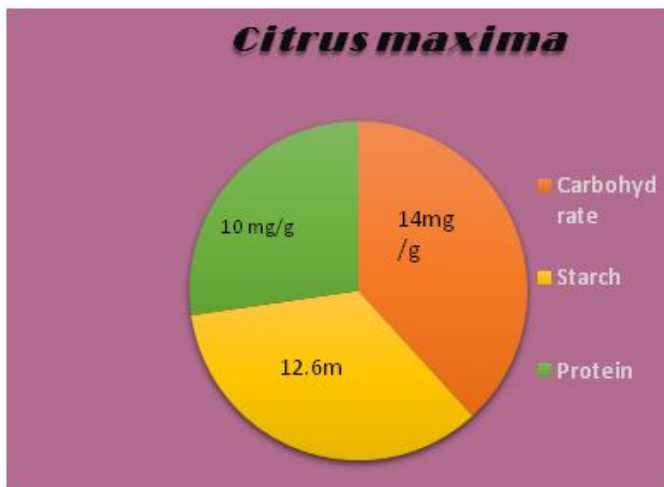


Chart 1: Carbohydrate, Starch and Protein content present in the leaf extract

## REFERENCES

[1] Abdul Wadood, Mehreen Gufran, Syed Babar Jamal, Muhammad Naeem, Ajmal Khan, Rukhsana, Ghaffar and Asnad (2013). Phytochemical analysis of medicinal

plants occurring in local area of mardan. *Biochemistry and analytical biochemistry. Biochemistry and analytical biochemistry, an open access journal*, vol 2: ISSN 2161-1009.

- [2] Aimee Sheree A. Barrion, Wilma A. Hurtada, Irene A. Papa, Teofila O. Zulayvar, Marites G. yee (2014). Phytochemical composition, antioxidant and antibacterial properties of pomelo (*Citrus maxima* (Burm.) Merr.) against *Escherichia coli* and *Salmonella typhimurium*. *Food and Nutrition science*, 5:749-758.
- [3] Aseel Kadhimi Hadi Al-Anbari and Muazaz Azeez Hasan (2015). Antioxidant activity in some citrus leaves and seed Ethanollic extracts. *International conference on Advances in Agricultural Biological and Environmental Science*, 22-23.
- [4] Ashwin Rajkumar. R, Balamurugan. P, Prasad M. P (2014). Comparative phytochemical analysis of rutaceae family (*Citrus* species) extracts. *International journal of scientific research*, 3; ISSN NO 2277-B179.
- [5] Bhandurje P, Rajarajeshwari N, Alagawadi KR, Agrawal S (2010). Antidiabetic and hyperlipaemic effects of *Citrus maxima* fruits on alloxan-induced diabetic rats. *Int J Drug Dev & Res*, 2010, 2(2), 273-278.
- [6] Hedge J.E and Hofreiter B.T. *Carbohydrate chemistry*, 17 (Eds. Whistler R.L and Be Miller J.N), Academic press, New York.
- [7] Lowry, O .H Rosebrough N.J.; Farr, A.L and Randall, R.J. (1951) *Journal of biochemistry*, Vol:193, Pp: 265
- [8] Oyedepo T A (2012). Antioxidant potential of *Citrus maxima* fruit juice in rats. *GloAdv Res J Med MedSci*, 1(5); 122-126.
- [9] Rich Milton R. Dulay & Ma .Ellenita G. De Castro (2016). Antibacterial and antioxidant activities of three citrus leaves extracts. *Der pharmalia letter*, 8(13):167-170. ISSN 0975-5071.
- [10] Singh. R (2015). Medicinal plants: A review. *Journal of plant science*, 3(1-1); 50-55. ISSN 2331-0723.
- [11] Vijayalakshmi P & Radha R (2015). An overview: *Citrus maxima*. *The journal of phytopharmacology*. 4(5):263-267.
- [12] Vikrant Arya, Narender Thakur & Kashyap C P (2012). Preliminary phytochemical analysis of the extract of psidium leaves. *Journal of pharmacognosy and phytochemistry*. Vol 1; ISSN 2278-4136.