

# A COMPARATIVE STUDY OF VARIOUS FRUITS AS POTENTIAL SOURCE OF LYCOPENE AND THEIR MEDICINAL PROPERTIES

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## ABSTRACT

In this study, the Lycopene concentration of fruits was evaluated. Lycopene, a carotenoid is phytonutrient and a potent antioxidant which is present in many fruits and vegetables. In our study we choose red guava, watermelon, tomato, red fleshed papaya for analysis. Lycopene isolated from fruits by using benzene as solvent. Quantity of isolated Lycopene recorded in range of 4.3mg to 1.04mg/100gm .

**Keywords:** Ycopene, Fruits, Medicinal Values.

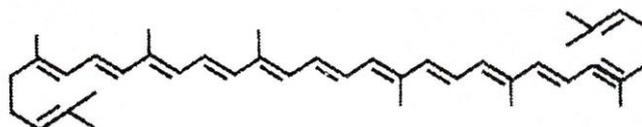
## I. INTRODUCTION

Lycopene belongs to carotenoid which is a natural pigment. It protects the body from oxidants which gives destructive effects. Recent studies shown that in comparison with beta carotene lycopene had more potential to counter free radicals[ 1] Natural products are rich sources of anti-oxidants. The protective effect has been attributed to carotenoid; it is the major class of phytochemical. Carotenoid are a family of compounds over 600 fat- soluble plant pigments which provide various colours we see in nature[2].

Fruits and vegetables are good source of natural anti-oxidants. These anti-oxidants reduce risk of cancer and heart diseases and also provide various health benefits[3]. Lycopene is synthesized by plants and microorganisms but cannot by animals so, animals get lycopene from red fruits and vegetables. In vitro studies have shown that Lycopene is able to protect lipids, DNA and proteins from oxidative damage [4]

Good amounts of lycopene contained in many natural fruits like tomato, watermelon , red pepper, papaya, guava etc. This molecule is also responsible for the red colour of these vegetables.[5]

Lycopene has a long chain structure that consists of conjugated double bonds, with open end rings. The structure lycopene is the longest of all carotenoid [ 6]



Lycopene

Many epidemiological studies showed that lycopene rich diet has beneficial effects on human health In addition, lycopene is reported to synergistically inhibit low density lipoprotein (LDL) oxidation in combination with Vitamin E[7]. In present study Lycopene isolated from guava, watermelon, tomato and papaya. Isolated Lycopene has been recorded and comparative study of quantity was done.

Lycopene is especially highly concentrated in the prostate and undoubtedly has a protective benefit to the prostate as an antioxidant. Studies have indicated that the antioxidants vitamin E, selenium, and lycopene all reduce the risk of prostate cancer. Therefore, it would seem that lycopene is extremely important in the overall role of cancer prevention in the prostate. In this study, the highest content of lycopene was observed in *Lycopersicon esculentum*. The second highest content was found in *Persea americana* followed by *Cucurbita maxima* and *Phyllanthus officinalis*. The lowest content was in *Terminalia chebula*. This finding leads to the further bulk extraction of lycopene for phyto-pharmaceutical production as supplementation for the prevention of prostate cancer in men. Tomatoes are not just repositories of lycopene, they are also rich sources of essential nutrients such as vitamin C, potassium, folic acid as well as beta-carotene [8]. As tomatoes showed the highest content of lycopene from this study, other flavonoids and phytonutrients should also be studied. Bulk production of lycopene by a well-known Phyto-pharmaceutical should also be made to be used as a supplement for the protection against cancer and other oxidative stress disorders.

## II. MATERIALS AND METHOD

We studied four different fruits guava (*Psidium guajava*), watermelon (*Citrullus lanatus*), tomato (*Solanum lycopersicum*) and papaya (*Carica papaya*). These were purchased from the local fruits and vegetable shop, ready for consumption and were transported to the laboratory, clean washed and stored in refrigerator.

## III. ISOLATION METHOD

In the laboratory weigh 100 gm. paste of each of the four fruits. We made a paste separately of guava, watermelon, tomato and papaya. 100 gm. of sample of guava taken in a 250 ml beaker. Then warm the paste and add about 30 ml of warm (40°C) benzene to it. Stir well and decant the benzene layer. Again add 30 ml warm benzene, stir & decant the benzene. This has been done about 5 times. Then distil off benzene and we got residue of Lycopene. Recrystallized residue by ether and weighed [9]. Repeat the steps with other sample of watermelon, tomato and papaya and recorded the observations. Identification test of the isolated Lycopene were performed using chemical tests.

### 3.1 Fruit - Guava

Botanical Name - *Lycopersicon esculentum* Miller.

Common Name - Amaroos

Family - Myrtaceae

Parts Used - Fruits



Guava used for different purposes: hepatoprotection, antioxidant, anti-inflammatory, antispasmodic, anti-cancer, antimicrobial, anti-hyperglycemic, analgesic, endothelial progenitor cells, anti-stomachache and anti-diarrhea.

### 3.2 Fruit Tomato

Botanical Name - *Lycopersicon esculentum* Miller.

Common Name - Tomato

Family - Solanaceae

Parts Used - Fruits



Tomatoes are a rich source of vitamins A and C and folic acid. It contain a wide array of beneficial nutrients and antioxidants, including alpha-lipoic acid, lycopene, choline, folic acid, beta-carotene and lutein.

### 3.3 Fruit Water Melon

Botanical Name - *citrullus lanatus*

Common Name - Tarbooj

Family - Cucurbitaceae

Parts Used - Fruits



Watermelon is an excellent source of Vitamin-A, which is a powerful natural anti-oxidant. And also a good source of potassium, good amount of vitamin-B6 (pyridoxine), thiamin (vitamin B-1), vitamin-C,

### 3.4 Fruit Papaya

Botanical Name – *carica papaya*

Common Name - papita

Family - caricaceae

Parts Used – Fruits



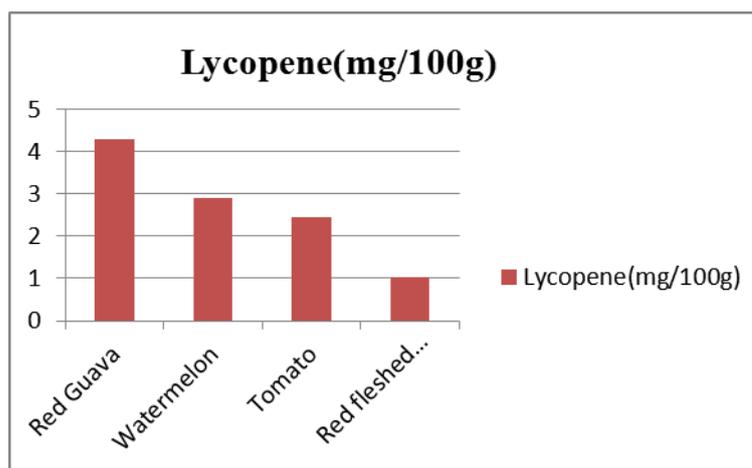
The papaya contain calories, protein, carbohydrate, fiber, ash, Ca, P, Fe, Na, K, beta-carotene equivalent, thiamine, riboflavin, niacin, and ascorbic acid. Papaya used for treating digestive problems and intestinal worms. Papain also is used to treat arthritis.

#### IV. RESULT AND DISCUSSION

Red guava showed the highest content of lycopene with 4.30mg/100gm. Second highest content of lycopene was found in watermelon with 2.90mg/100g. Third highest content was in tomato with 2.46mg/100g. The lowest content of lycopene was observed in in Red fleshed papaya with 1.04mg/100g.

**Table : Lycopene Content in Different Fruits**

| S. No. | Fruit              | Weight(g) | Lycopene(mg/100g) |
|--------|--------------------|-----------|-------------------|
| 1      | Red Guava          | 100       | 4.30              |
| 2      | Watermelon         | 100       | 2.90              |
| 3      | Tomato             | 100       | 2.46              |
| 4      | Red fleshed papaya | 100       | 1.04              |



**Lycopene Content in Different Fruits**

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