

## COMPARATIVE ANALYSIS OF ASCORBIC ACID CONCENTRATION IN GUAVA VARIETIES COLLECTED FROM FOUR DIFFERENT TEHSILS OF DISTRICT BHAKKAR

**\*Abdul Ghani<sup>1</sup>, Tahira Hameed<sup>1</sup>, Mujahid Hussain<sup>1</sup>, Muhammad Ikram<sup>1</sup>, Muhammad Imran<sup>1</sup>,  
Muhammad Farooq<sup>1</sup> and Noor Muhammad<sup>2</sup>**

<sup>1</sup>Department of Botany, University of Sargodha, Sargodha, Punjab, Pakistan

<sup>2</sup>Ayub Agriculture Research Institute Faisalabad

\*Author for Correspondence

### ABSTRACT

The present study was conducted to evaluate Ascorbic acid concentration in guava varieties collected from four tehsils of District Bhakkar. Both varieties have good source of minerals and ascorbic acid contents but Hong Kong variety contains a large amount of ascorbic acid i.e. Vitamin C. Fluctuations in Ascorbic acid concentration in two guava varieties may be due to environmental changes. Results shows that highest concentration of Ascorbic acid was determined in Hong Kong variety of guava collected from tehsil Bhakkar which is 234.56 mg/100g. While lowest amount of Ascorbic acid concentration was found in Ruby X Supreme variety of guava collected from tehsil Mankera which is 114.6 mg/100g.

**Keywords:** Ascorbic Acid, Guava Varieties, District Bhakkar

### INTRODUCTION

Vitamin C, famously known as ascorbic acid, is a precious diet constituent due to its antioxidant properties as well as curative activities. It helps in formation of connective tissues i.e. teeth, blood vessels, bones and imparts a crucial role as an antioxidant which work as body defense system and work against the reactive oxygen species and free radicals that cause damage to tissues and in this way they prevent the tissue damage (Okiei *et al.*, 2009). Also used in the treatment of many diseases like anemia, common cold, scurvy, hemorrhagic disorders, wound healing and also sterility. Animals and plants obtain vitamin C from fruits and vegetables (Okiei *et al.*, 2009). Guava fruit is a rich source of vitamin C (Moreno *et al.*, 2014).

The *Psidium* genus that is a member of Myrtaceae family contains almost 120 -150 species. *Psidium guajava* L., is native to tropical America, extensively dispersed throughout the tropic and subtropical areas, and produced fruits twice in a year. Guava fruits can be oval, round, or pear-shaped, 3cm to 10cm in their diameter.

Peel of the ripe fruit color is yellow-orange, and color of its flesh can be white, pink and yellow relying on the variety (Moreno *et al.*, 2014). In Punjab province after citrus and mango cultivation guava annual yield is 446.0 thousand tonnes on an area of 49.4 thousand hectare (Muhammad *et al.*, 2010). As compared to other nutrients, guava is wealthier source of vitamin C than ber, citrus and apple. Guava is 100% edible fruit which is known as “apple of poor” used as a table fruit and also in jams, jelly in processing industries due to its low cost, easily available and highly nutritious (Archana and Siddiqui, 2004). It's vital role in reducing nutritive disorders which are due to insufficiency of vitamin C in humans (Muhammad *et al.*, 2010).

Many researchers have investigated the nutritional quality of guava fruit under various modified atmospheric conditions. The current study was conducted to evaluate the proximate constitution of guava fruit in four different tehsils of district Bhakkar. These tehsils are: Bhakkar, Darya khan, Kalor Kot and Mankera. Bhakkar is a district of Punjab province and known as “Region of Thal” due to extreme weather conditions.

Soil of District Bhakkar is loamy sandy. Dina *et al.*, (2014) investigated the physicochemical characteristics and nutritional value of white and pink guava varieties (*Psidium guajava* L.) that were grown in Sudan.

## Research Article

Results elaborated that ascorbic acid concentration in white and pink varieties were 250.77mg/100g and 190.69 mg/100g respectively. Javaria *et al.*, (2012) investigated the levels of vitamin C, an antioxidant potential at three different ripening stages (un-ripe, semi-ripe and fully-ripe) of guava (*Psidium guajava* L.) fruit that were gathered from three different geographical locations of Pakistan (Islamabad, Faisalabad and Bhakkar).

The amount of vitamin C in guava fruits differed as: Faisalabad (136.4–247.9 mg/100 g), Islamabad (89.7–149.7 mg/100 g) and Bhakkar (73.1–129.5 mg/100 g). The outcome of experiment depicted that different phases of maturity and geographical places had serious effects on Vitamin C concentration in guava fruit. Alok *et al.*, (2011) also observed vitamin C in guava that was 330.77 mg/100g.

## MATERIALS AND METHODS

### Sample Collection

The four Tehsils of District Bhakkar were selected for the purpose of sample collection. Fruits of two guava varieties (Ruby x supreme and Hong Kong) were collected from all four Tehsils (Bhakkar, Darya Khan, Mankera and Kalor Kot) for analysis. Each sample comprised over two replicates. Each sample was randomly handpicked, wrapped in a specific brown envelop and labeled.

### Determination of Ascorbic Acid

Guava fruit extracts for ascorbic acid determination were received by uniformly mixing three grams of guava tissue (peel and flesh) in 20 ml cool solution of 3% (w/v) oxalic acid, and 8% glacial acetic acid (v/v) in water until homogeneous persistence was obtained by using the Ultra-Turrax homogenizer. The homogenous mixture was then centrifuged at 15,000 rpm for 10 minutes at 4°C. The supernatant was found back and calculated for vitamin C at the same time.

By using the 2, 6-dichlorophenol-indophenol titration method the Ascorbic acid content was determined. A standard solution (1 mg/ml) of L-ascorbic acid was formed. By examining resemblances with the standard of L-ascorbic acid solution, the amount of ascorbic acid was calculated and expressed it as mg/100 g of fresh weight.

## RESULTS AND DISCUSSION

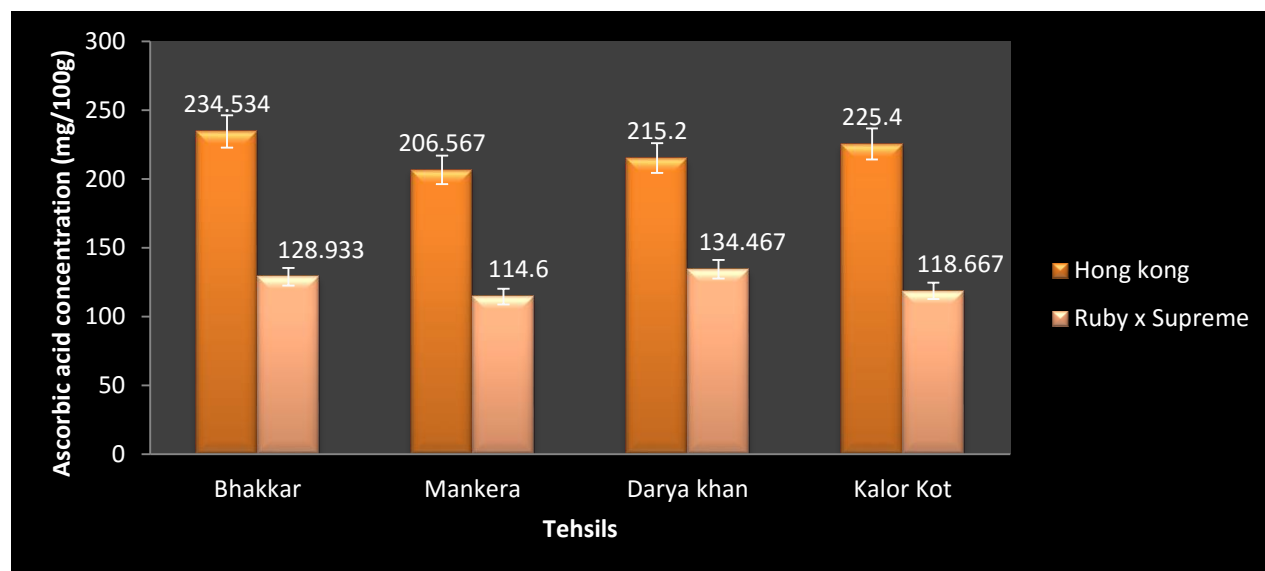
Ascorbic acid contents in two varieties of guava fruits varied significantly by all selected four tehsils of District Bhakkar. Mean range of ascorbic acid concentration in Hong Kong variety in various tehsils was 206.56-234.53 mg/100g.

The highest ascorbic acid concentration of Hong Kong was observed in tehsil Bhakkar, where it was 234.53 mg/100g and lowest was in Mankera, that was 206.56 mg/100g. While mean range of ascorbic acid concentration in Ruby X Supreme variety in various tehsils was 114.6-134.46 mg/100g. Opposite trend regarding ascorbic acid concentration were seen in Ruby X Supreme as compared to Hong Kong. Highest ascorbic acid concentration of Ruby X Supreme was observed in tehsil Darya Khan that are 134.46 mg/100g and lowest was observed in tehsil Mankera that are 114.6 mg/100g. Overall, the highest value of ascorbic acid was found in Hong Kong variety of guava in tehsil Bhakkar (234.46 mg/100g). The observation during present study is greater than the values observed by Dina *et al.*, (2014).

**Table 1: Ascorbic acid content (mg/100g)**

Varieties	Tehsils			
	Bhakkar	Mankera	Darya Khan	Kalor Kot
Hong Kong	234.56±1.21	206.567±6.44	215.2±3.16	225.4±0.57
Ruby X Supreme	128.933±1.76	114.6±0.91	134.467±1.77	118.667±6.33

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**Figure:** Graphical representation of Ascorbic acid content

## Conclusion

Fluctuations in Ascorbic acid concentration in two guava varieties may be due to environmental changes. Results showed that highest concentration of Ascorbic acid was determined in Hong Kong variety of guava collected from tehsil Bhakkar which is 234.56 mg/100g. While lowest amounts of Ascorbic acid were found in Ruby X Supreme variety of guava collected from tehsil Mankera which is 114.6 mg/100g.

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