



Original Research Article

## An Allometric Growth Estimation of Japanese Persimmon (*Diospyros kaki* L.f.) Collected from District Gilgit, Gilgit-Baltistan, Pakistan

Sakina Abbas<sup>1</sup>, Tika Khan<sup>1,2\*</sup> and Shamsheer Ali<sup>3</sup>

<sup>1</sup>Department of Biological Sciences, Karakoram International University, Gilgit-Baltistan, Pakistan

<sup>2</sup>Integrated Mountain Area Research Centre, Karakoram International University, Gilgit, Pakistan

<sup>3</sup>Chemistry Department, Karakoram International University, Gilgit-Baltistan, Pakistan

\*Corresponding author.

### Abstract

Japanese persimmon is commonly grown in Gilgit city and adjacent warm areas of Gilgit-Baltistan. This fruit is available from October to December but people use throughout the year by drying it. It is highly medicinal and improve eye health, reduce aging, anti-cancer, improve digestion, boost immune system, lower cholesterol, increase metabolism, strengthen bones, boost cognitive function, lower blood pressure, and take care of skin. Specimens (fruits) were collected from two different sub-divisions of district Gilgit. Present allometric growth estimation study revealed that mean weight of fruit in 165.358 g (Jalalabad valley, 162.408 g; Gilgit city 168.308 g). Similarly, mean fruit diameter is 21.155 cm (Jalalabad, 21.29 cm; Gilgit, 21.155 cm). Furthermore, mean weight gain per day 0.916 g (Jalalabad, 0.90 g; Gilgit, 0.916 g). Whereas, mean diameter increase per day 0.1175 cm (Jalalabad, 0.1183 cm; Gilgit, 0.1167 cm). Percentage mean weight gain by fruit is 781.7495 % (Jalalabad, 762.799 %; Gilgit, 800.7%) and percentage mean diameter increase by fruit is 12.8345 % (Jalalabad, 13.10%; Gilgit, 12.569%).

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### Introduction

Japanese persimmon is commonly grown in Gilgit city and adjacent warm areas of Gilgit-Baltistan. It is commonly known in local language "Hermit". In Pakistan, persimmon is exclusively found in Gilgit-Baltistan and Swat Valley. They grow rapidly, and face unpredictable climates. Persimmons are also known for their resistance to diseases and pests. They tolerate a wide range of temperature from 28°C to -8°C. Local peoples use their barriers (fruit) for food purpose and stem is used as burning fuel. This fruit is available from October to December but people used this fruit throughout the year

by drying it. There are many medicinal importance's of persimmon like improve eye health, reduce aging, anti-cancer, improve digestion, boost immune system, lower cholesterol, increase metabolism, strengthen bones, boost cognitive function, lower blood pressure, and take care of skin.

Persimmon is a tree with edible fruits. It is found in Northern area of Pakistan and in swat valley. They grow rapidly, and face unpredictable climates. Persimmons can tolerate and adapt to a wide range of climates. It is found Japan, China, Korea, Burma and Nepal (Morton, 1987).

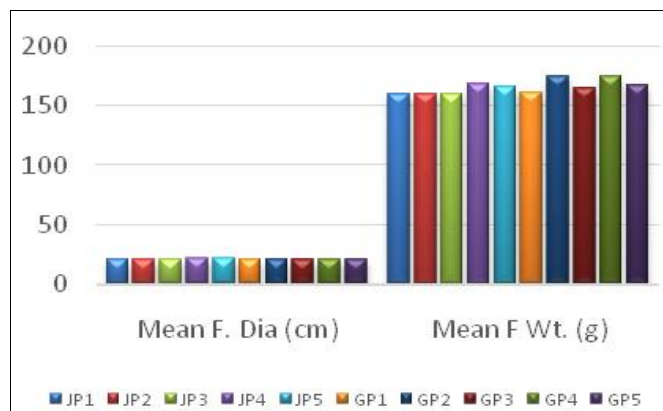


**Fig. 1:** Persimmon tree with fruit in Gilgit. In set, fruit shown exclusively.

The persimmon (sometimes spelled persimmon) is the edible fruit of genus *Diospyros*. *Diospyros* belongs to the family Ebenaceae. The most widely cultivated species is Japanese persimmon, *Diospyros kaki* (Morton, 1987).

Plant grows up to 24 meter with short branched slender trunk and form round top canopy. Roots are thick, fleshy and stoloniferous (Anonymous, 2016). Stem is covered by dark brown bark with bitter taste.

Flowering occurs in the month of May and June. Staminate flowers borne in two to three-flowered cymes with white flowers. Fruit with average diameter from 1.5 to 9 cm (0.59 to 3.54 in) and color vary from light yellow-orange to dark orange. Similarly vary in shape spherical, acron and pumpkin (Carley and Martin, 2007).



**Fig. 2:** Comparative mean of fruit diameter (cm) and weight (g).

Calyx attached to the fruit after harvesting, but can be removed easily after ripening. High glucose content is present in ripe fruit. The protein content is low, but it has a balanced protein profile. Persimmon fruits have various medicinal and chemical uses. Its sweet, delicious flesh is packed with several health promoting nutrients such as vitamins, minerals, Dietary Fiber, Sugar, Carbohydrates, sterols and anti-oxidants vital for optimum health. (Anonymous, 2016).

An immature persimmon is bitter in taste because of the presence of tannin (Zhou et al., 2011). The persimmon plant is mature within 7-8 years and gives fruits. It grows well in loamy soil and light and sandy soil isn't suitable. It tolerates heavy clay soil if there is proper drainage. Suitable soil pH is 6.0 to 6.5.

They adapt well and are able to fit in many landscapes. Persimmon has problems surviving because of pests like are maybugs, ants, white flies, and mites. These pests can be control by pesticides. Persimmon allergy is very low however unripe can cause bezoars. They cause irritable bowel syndrome if it consume unripe because it contain high FODMAPs.

### Materials and methods

Plant leaves and fruits were collected for the present study from the field in Jalalabad valley and Gilgit. Fruits specimens were collected from different parts of Jalalabad valley and Gilgit, place them in separate plastic bags. Fruits were collected by using scissors and hand picking. Most of measurements are done in KIU water quality lab by using electronic balance and measuring scale is used to measure the diameter of fruit.

### Results and discussion

During the present study persimmon plant species and fruits specimen is documented and collected fruits from 5 different sites of the Jalalabad and 5 different sites in Gilgit. After measurement many results found which is given as average weight of fruit in Jalalabad is 162.408 and Gilgit is 168.308 and averages of both are 165.358. Average diameter of Jalalabad is 21.29 and Gilgit is 21.155 and averages of both are 21.155 (Fig. 2). Average weight gain per day in Jalalabad is 0.90, Gilgit is 0.916 and averages of both are 0.916. Average diameter increase per day in Jalalabad is 0.1183, Gilgit is 0.1167 and averages of both are 0.1175. Percentage

average weight gain by fruit in Jalalabad is 762.799%, Gilgit is 800.7% and averages of both are 781.7495. Percentage average diameter increase by fruit in Jalalabad is 13.10%, Gilgit is 12.569% and averages of both are 12.8345.

The aim of above research is to find allometric ratio of fruit weight and diameter of fruit in Jalalabad and Gilgit which is 168.30: 21.29 and 165.358: 21.155 respectively. Researches revealed that the average diameter of Jalalabad and Gilgit are nearly same because both are located in same geological location having same climatic factors. While average weights of Jalalabad fruits is greater than Gilgit. It is suggested for Gilgit farmers to harvest that species of persimmon which is grown in Jalalabad. So they can get more food and earn more money.

From different researches and observation, found a result that if plants are cultivated in slight muddy, moderate water, moderate temperature and slight acid soil is available then the persimmon fruit grow well and give healthy fruits. This is necessary for healthy life because it is source of energy (carbohydrates, dietary fibers, sugar, proteins) it also contains chemical compounds which act as anti-cancer, efficient immune system, anti-oxidant, potassium (vasodilatation), anti-aging (vitamin A, beta-carotene, lutein, lycopene, and cryptoxanthins).

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#### Conflict of interest statement

Authors declare that they have no conflict of interest.

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I would like to dedicate this work for my beloved parents for their endless sacrifices and love. 1<sup>st</sup> author is student of BS (Horns.) Biological Sciences at Karakoram International University, Gilgit-Baltistan, Pakistan. This research paper is part of semester research executed during 2016.

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