



Assessment of fruit and seed morphometric variation in *chrysophyllum roxburghii* in Kodagu, central Western Ghats

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Abstract

Chrysophyllum roxburghii G. Don is an important tropical wild edible fruit species known to have ethno medicinal properties. The present study was carried out to assess the variation in different fruit morphometric traits across the different location in Kodagu, Central Western Ghats. Fruit bearing trees were selected from five different location in Kodagu and fruit parameters such as fruit width, fruit length, fruit weight, pulp weight, seed weight, number of seeds etc were recorded. It was found that, all the fruit parameters were significantly higher in Appanagala location which is relatively a higher rain fall area among the other four locations. Hence, Rainfall could be an important driver in fruit parameters in the present investigation.

Keywords: *chrysophyllum roxburghii*, fruit morphometric traits, locations

Introduction

Since from ancient times edible wild fruits played a very vital part in supplementing the diet of the people. Although the use of wild fruits has recently decreased, many people in rural areas still use them extensively as a supplement to their basic food requirement, some are preserved for use during periods of scarcity, they are sometime sold in the urban market and are then in competition with exotic fruits. *Chrysophyllum roxburghii* is one such important tropical fruit species. *Chrysophyllum roxburghii* G. Don (Syn. *C. lanceolatum* (Bl.) DC.) belongs to the family Sapotaceae. It is commonly called Indian star apple and it is a tree growing up to 15 meters height. It is one of the canopy trees in evergreen forests. It is commonly found in Western Ghats of India and Sri Lanka. The branches are horizontal, leaves are coriaceous, glossy, elliptic, oblong, apex acuminate and nerves numerous. Flowering occurs in April-May and the flowers are greenish white in color and are numerous in axillary fascicles. Seed is a berry ^[3,4]. The seeds are used in a formulation to treat pneumonia at Sivasagar district of Assam ^[1]. The ripe fruits are considered edible and tribal people of Anamalais of Western Ghats, India consume these fruits ^[5]. In Mizoram, the plant is locally called Thei pabuan and the ripen fruits are eaten by people of Mizoram ^[6]. The fruit is shown to contain an appreciable quantity of minerals and amino acids ^[2] The fruits are locally being consumed as raw after ripening. It is also being used as one of the best deworming agent. The present investigation is an attempt look at the variation in fruit morphometric traits. Based this data one can identify the best trees and further tree improvement activities can be taken up.

Methodology

This study was carried out along natural distribution range of *Chry*

sophyllum roxburghii in Kodagu district, Central part of Western Ghats. The existing provenances of the species for the study was selected based on the preliminary survey. To assess the variation for a tree fruits characteristics in *Chrysophyllum roxburghii*, (Fig.3) three candidate trees were selected in each location randomly, For each tree, the following observations were recorded:

Fruit morphological parameters such as Fruit length (mm), Fruit diameter (mm), Fruit weight (g), Number of seeds per fruit, Fresh pulp weight (g), Dry pulp weight (g), Fresh seed weight (g) and Dry seed weight (g)

Results and Discussion

Fruits were collected from Five different location. In each location 10 trees were identified and fruits were collected from each of these trees. The fruit morphometric characters were recorded and the data was subjected to the statistical analysis. The results showed that, highest fruit width was recorded in Appangala (AP) followed by Perur (PER) and least was in Mugatagere (MUG) and Hudur (HU). The fruit width was moderate in B Shettigere (BS) (Fig. 2a). A similar trend was noticed for Fruit length (Fig 2b), fruit weight (fig 2c) and seed weight (Fig. 2e) also. Fruit pulp parameters was also followed a similar trend except B Shettigere, where the fruit pulp weight was least (Fig. 2d). Interestingly in Appangala region the number of seeds were low compared to other locations (Fig. 2f). From the statistical analysis also it is very clear that all the fruit parameters except the number of seeds were significantly different from each location (Table 1). Among the five locations, all the fruit parameters were significantly higher in Appangala location and least in Mugatagere. This could be attributed the higher rain fall in these areas compared to Mugatagere.

Tables and Figures



Fig 1: Measurement of fruit morphometric parameters

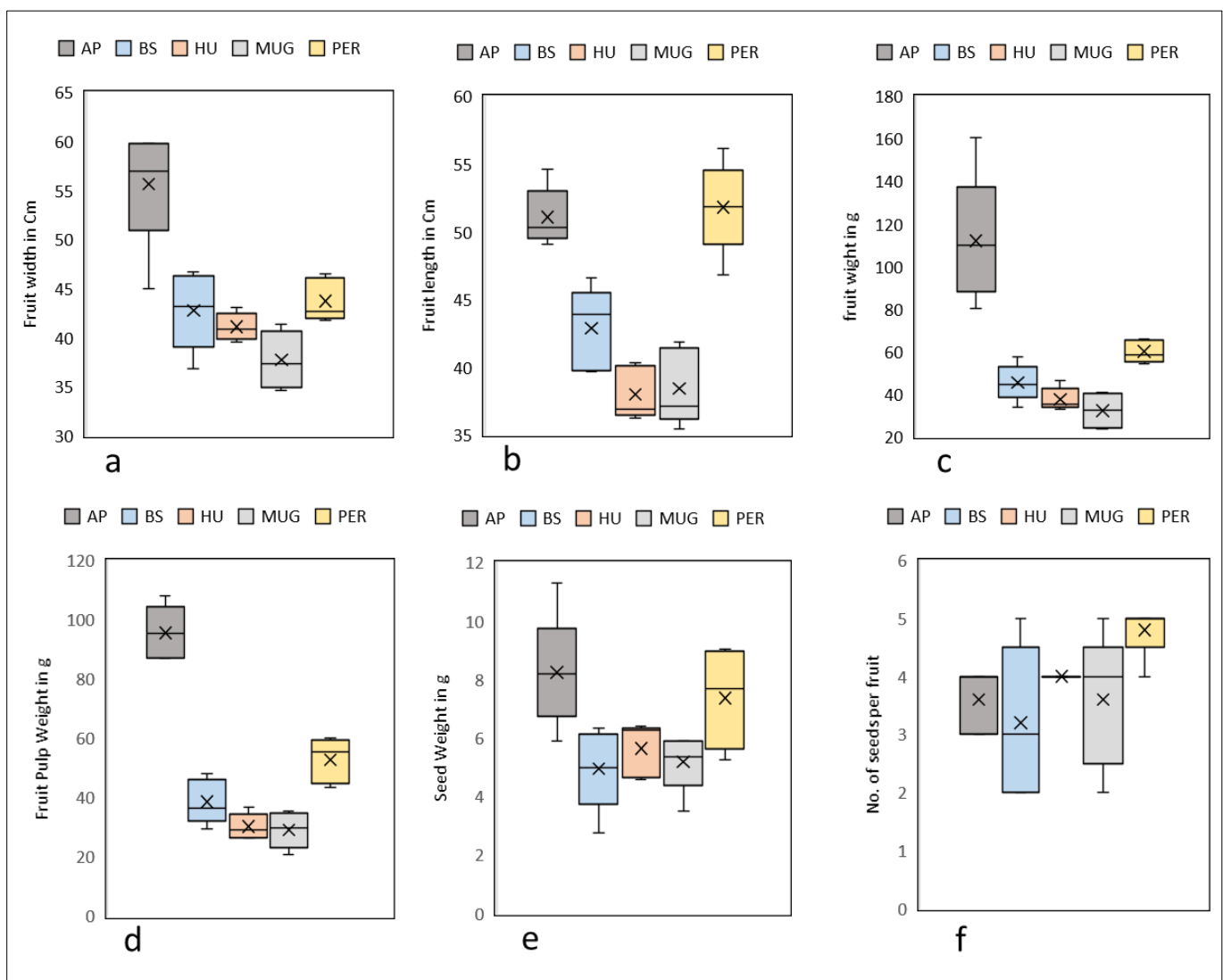


Fig 2: Variation in different fruit parameters across the different locations viz., Fruit width (a), Fruit length (b), Fruit weight (c), Fruit pulp weight (d), Seed weight (e) and No. seeds per fruit (f)



Fig 3: Variation in fruit traits across the locations

Table 1: Variation in different fruit parameters and their level of significance

location	Fruit Width (cm)	Fruit Length (cm)	Fruit Weight (gm)	Fruit Pulp Weight (gm)	Fruit Seed Weight (gm)	No. of seeds (nos)
Appangala	55.68 ^a	51.08 ^a	112.18 ^a	95.68 ^a	8.24 ^a	3.60
B Shettigeri	42.75 ^b	42.88 ^b	45.41 ^{bc}	38.658 ^c	4.95 ^{bc}	3.20
Hudikeri	41.09 ^{bc}	38.01 ^c	37.55 ^c	30.21 ^{cd}	5.65 ^c	4.00
Mugatagere	37.72 ^c	38.45 ^c	32.13 ^c	29.08 ^d	5.18 ^c	3.60
Perur	43.73 ^b	51.81 ^a	59.94 ^b	52.80 ^b	7.37 ^{ab}	4.80
Average	44.20	44.45	57.44	49.29	6.28	3.84
SED	2.41	1.72	9.39	4.49	0.92	NS
CD (0.05)	5.03	3.58	19.60	9.36	1.91	NS
CV (%)	8.60	6.11	25.86	14.40	23.07	NS

References

1. Acharyya BK, Sharma HK. Folklore medicinal plants of Mahmora area, Sivasagar district, Assam. *Indian Journal of Traditional Knowledge*. 2004; 3(4):365-372.
2. Barthakur NN, Arnold NP. A chemical analysis of the Indian star apple (*Chrysophyllum roxburghii*) fruit. *Journal of Food Composition and Analysis*. 1991; 4(4):354-359.
3. Chandrika UG, Jansz ER, Warnasuriya ND. Identification and HPLC quantification of carotenoids of the fruit pulp of *Chrysophyllum roxburghii*. *Journal of National Foundation Sri Lanka*. 2005; 33(2):93-98.
4. Ramaswamy SN, Rao RM, Govindappa DA. Flora of Shimoga district, Karnataka. Prasaranga University of Mysore, Mysore, 2001, 340.
5. Ramachandran VS. Wild edible plants of the Anamalais, Coimbatore district, western Ghats, Tamil Nadu. *Indian Journal of Traditional Knowledge*. 2007; 6(1):173-176.
6. Kar A, Bora D, Borthakur SK, Goswami NK, Saharia D. Wild edible plant resources used by the Mizos of Mizoram, India. *Kathmandu University Journal of Science, Engineering and Technology*. 2013; 9(1):106-126.