Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(3): 2413-2415
Received: 21-03-2019
Accepted: 25-04-2019

MK Sharma
Division of Fruit Science, SKUAST-K, Shalimar, Srinagar, Jammu & Kashmir, India

KM Bhat
Division of Fruit Science, SKUAST-K, Shalimar, Srinagar, Jammu & Kashmir, India

MA Mir
Division of Fruit Science, SKUAST-K, Shalimar, Srinagar, Jammu & Kashmir, India

Amit Kumar
Division of Fruit Science, SKUAST-K, Shalimar, Srinagar, Jammu & Kashmir, India

Correspondence
MK Sharma
Division of Fruit Science, SKUAST-K, Shalimar, Srinagar, Jammu & Kashmir, India

Fruit physico-chemical characteristics of some Chinese sandy pear selections

MK Sharma, KM Bhat, MA Mir and Amit Kumar

Abstract
A survey was carried out to collect different Chinese Sandy pear selections in parts of District Budgam in Jammu and Kashmir State based on fruit quality characteristics. In total twelve selections were made. Fruit weight ranged from 50.47 g to 115.57 g in different selections. However fruit length ranged from 44.70 mm -70.64 mm and fruit breadth ranged from 47.80-59.16 mm. Fruit TSS in different selections ranged from 9.20% to 13.23% and fruit acidity ranged from 0.12 to 0.26 %. Fruit total sugars content in different selections ranged from 6.90 % to 9.80 %.

Keywords: pear, chinese sandy pear, selections, fruit quality

Introduction
Pear is one of the important temperate fruit grown all over the world. Pear fruits are excellent source of carbohydrates, sugars and dietary fibre (Blattny, 2003) [5]. In India pear is grown in temperate as well as to some extent in sub-tropical climates. In India, it is grown in an area of 42 thousand hectares with a production of 3.10 lac MT. The main pear growing states in India are Jammu and Kashmir, Himachal Pradesh and Uttarakhand. In Jammu and Kashmir state pear is grown in an area of 14244 hectares with a production of 89458 MT (Anonymous, 2018) [2]. Among different varieties of pear, Chinese sandy pears are grown in North Western Himalayan region including Jammu and Kashmir, Himachal Pradesh and Uttrakhand. However maximum area under cultivation of Chinese sandy pear exist in Kashmir region of Jammu and Kashmir state where it is locally known as Kashmiri Nakh. In this region, wide variability exists in this variety for fruit quality. As genetic variation is indispensable for effective management and use of genetic resources, conservation of genetic resources is important to meet the demand for future food security and the introduction of improved exotic cultivars may result in the complete elimination of locally cultivated varieties in years to come. Therefore, different pear selections were made to assess their fruit quality characters for future conservation.

Material and Methods
The survey was carried out in some parts of District Budgam of Jammu and Kashmir state. Twelve selections were made and their fruit physico-chemical characteristics were recorded. For recording fruit weight, ten randomly selected fruits of each selection was taken on top pan balance and the average fruit weight was expressed in grams (g). The length of ten randomly selected fruits from each selection was measured with the help of digital Vernier calliper. Fruit length was measured between calyx and styles end and the average were expressed in cm. The breadth of ten randomly selected fruits from each selection was measured with the help of digital Vernier calliper and the average was expressed in cm. Fruit TSS was recorded on hand refractometer as per the procedure given by Rangana (1995) [13]. Per cent titrable acidity (as per cent maleic acid) was determined by titrating known volume of juice against 0.1 N NaOH solution, using phenolphthalein as an indicator (A.O.A.C., 2000) [3]. Fruit total sugars were estimated by Lane and Eynon's method as suggested by Rangana (1995) [13]. The data generated was subjected to statistical as per the procedures described by Cochran and Cox (1963) [7].

Results and Discussion
Data presented in Table 1 reveal that fruit weight ranged from 50.47 g to 115.57 g in different selections, thus showing wide variability with respect to fruit weight. Highest fruit weight was recorded in selection 8 (115.57 g) followed by selection 9 (110.56 g) and selection 2 (102.97 g). However minimum fruit weight was recorded in selection 7 (50.47 g). Variation in fruit

weight in different selections may be due to genetic factors involving their phylogenic behaviour as the mechanisms of fruit development are influenced by cultural and genetic factors (Cowan *et al.*, 2001 and Harada *et al.*, 2005) [8, 11]. Similar findings were also made by Bhat (2012) [4], Sandhu *et al.* (1994) [14] and Nath and Rai (2000) [12] who also observed variability in pear fruit weight.

Fruit size including fruit length and fruit breadth is an important parameter for marketing as well as selection of superior genotypes for pears (Gillaspy *et al.*, 1993, Westwood and Blaney, 1963) [10, 17]. Fruit length in the present study ranged from 44.70 mm -70.64 mm and fruit breadth ranged from 47.80-59.16 mm. Selection 8 had more fruit length (70.64 mm) followed by selection 9 (65.06 mm) and selection 2 (63.05 mm). However minimum fruit length was recorded in selection 7 (44.70 mm). Fruit breadth was highest in selection 8 (59.16 mm) closely followed by selection 9 (58.03 mm) and selection 2 (57.99 mm). However lowest fruit breadth was recorded in selection 7 (47.80 mm). Higher fruit size under present investigation might be the inherent ability of a genotype to utilize the available resources efficiently to attain a certain fruit size (Stanley *et al.*, 2000) [15]. Variation in fruit size in different pear selections/cultivars had also been recorded by Ahmed (2008) [1] and Bhat (2012) [4].

Data presented in Table 1 show a great variability in fruit TSS, acidity and total sugars content in different pear selections. Fruit TSS in different selections ranged from 9.20% to 13.23%. Maximum TSS (13.23 %) was recorded in Selection 7 followed by selection 8 (12.57 %) and selection 9 (12.00 %). However minimum TSS (9.20 %) was recorded in selection 2. Fruit acidity ranged from 0.12 to 0.26 % in different pear selections. Lowest fruit acidity was recorded in selection 7 (0.12%) however highest fruit acidity was recorded in selection 2 (0.26%). The variation in fruit acidity may be due to different rates of conversion of organic acids into soluble sugars by different selections. Fruit TSS and acidity are influenced by environmental factors such as temperature, light, rainfall/supply of water and locations (Ahmed, 2008, Wang, 1982) [1, 16]. Variability in fruit TSS and acidity are also reported by Elgar *et al.* (1997) [9] and Bhat (2012) [4] in pear.

The data with regard to fruit total sugars content recorded in the present study revealed a great variability between different pear selections. Fruit total sugars content in different selections ranged from 6.90 % to 9.80 %. Highest total sugars content was recorded in selection 7 (9.80 %) followed by selection 10 (9.27 %) and selection 8 (9.13 %). However minimum total sugars content (6.90 %) was recorded in selection 12. As sugar is an important component of fruits it correlates with sweetness and is basic ingredient of fruit quality. Similar results were obtained by Ahmed (2008) [1] and Chen *et al.* (2007) [6] in different pear cultivars/selections.

Table 1: Fruit physico-chemical characteristics of some Chinese Sandy pear selections

Selection	Fruit weight (g)	Fruit length (mm)	Fruit breadth (mm)	TSS (%)	Acidity (%)	Total sugars (%)
1	59.32	56.64	48.42	10.80	0.16	8.17
2	102.97	63.05	57.99	9.20	0.26	7.23
3	95.34	59.63	56.88	10.17	0.15	7.57
4	80.37	58.05	54.57	9.53	0.25	7.40
5	82.28	51.86	54.07	11.60	0.14	8.67
6	88.07	54.94	57.53	10.97	0.16	8.13
7	50.47	44.70	47.80	13.23	0.12	9.80
8	115.57	70.64	59.16	12.57	0.22	9.13
9	110.56	65.06	58.03	12.00	0.19	8.96
10	63.06	53.92	49.80	11.93	0.19.	9.27
11	96.98	60.88	57.60	11.20	0.15	8.90
12	71.14	58.95	52.86	9.23	0.19	6.90
$CD_{(0.05)}$	26.14	10.91	4.97	1.50	0.04	0.50

References

1. Ahmed M. Biodiversity in pears (*Pyrus spp.*): Characterization and conservation of germplasm from Azad Jammu and Kashmir. Ph. D. thesis submitted to Department of Horticulture, University College of Agriculture, Bahauddin Zakariya University, Multan, 2008.
2. Anonymous. District wise/kind wise area and production of major horticultural crops in Jammu & Kashmir state for year 2017-18, 2018.
3. AOAC. Official Methods of Analysis, 15th edition. Association of Official Analytical Chemists, Washington, DC, U.S.A., 2000.
4. Bhat ZA. Molecular characterization and hybridization studies in pear. Ph. D. Thesis submitted to Division of Pomology, Punjab Agriculture University, Ludhiana, 2012.
5. Blattny C. Pears. In: Encyclopedia of Food Sciences and Nutrition (Eds. Caballero, B., Trugo, L.C. and Finglas, P.M.). Academic Press, London, 2003, 4428-4433.
6. Chen J, Wang Z, Wu J, Wang Q, Hu X. Chemical compositional characterization of eight pear cultivars grown in China. Food Chemistry. 2007; 104:268-275.
7. Cochran WG, Cox GM. Experimental designs. 2nd Edition. John Wiley and sons, New York. 1963, 615.
8. Cowan AK, Cripps RF, Richings EW, Taylor NJ. Fruit size: towards an understanding of the metabolic control of fruit growth using avocado as a model system. Physiologia Plantarum. 2001; 111:127-136.
9. Elgar HJ, Watkins CB, Murray SH, Gunson FA. Quality of 'Buerre Bosc' and 'Doyenne du Comice' pears in relation to harvest date and storage period. Postharvest Biology and Technology. 1997; 10:29-37.
10. Gillaspy G, David H, Grussem W. Fruits: a developmental perspective. The Plant Cell. 1993; 5:1439-1451.
11. Harada T, Kurahashi W, Yanai M, Wakasa Y, Satoh T. Involvement of cell proliferation and cell enlargement in increasing the fruit size of *Malus* species. Scientia Horticulturae. 2005; 105:447-456.

12. Nath V, Rai M. Cultivating pears in Netarhat area of Chota Nagpur plateau. Indian Horticulture. 2000; 45(3):25-27.
13. Rangana S. Handbook of analysis and quality control for fruit and vegetable products. 3rd edition. Tata McGraw Hill publishing Co., Ltd., New Delhi, 1995.
14. Sandhu AS, Singh R, Dhillon WS, Minhas PPS, Sharma KK, Grewal GPS. New promising pear selection for Punjab. Acta Horticulturae. 1994; 376:39-45.
15. Stanley CJ, Tustin DS, Lupton GB, McArthney S, Cashmore WM, De Silva HN. Towards understanding the role of temperature in apple fruit growth responses in three geographical regions within New Zealand. Journal of Horticultural Science and Biotechnology. 2000; 5:413-422.
16. Wang CY. Pear fruit maturity, harvesting, storage and ripening. In: *The Pear* (Eds. Zwet, T. and Childers, N.F.). Horticultural Publisher, Gainesville. 1982, 431-443.
17. Westwood MN, Blaney LT. Non-climatic factors affecting the shape of apple fruits. Nature. 1963; 200:802-803.