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Physico-Chemical Properties of Some Varieties of Pomegranate (*Punica granatum* L.)

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ABSTRACT

The present investigation was carried out in order to find different physico-chemical characteristics of four varieties of pomegranate (Punica granatum L.) namely Mridula, Ganesh, Bhagwa and Wonderful grown at Centre of Excellence for Fruits, The Indo-Israel Agriculture Project, Mangiana (Haryana). The study reveals that, the morphological characteristics of fruit like colour of fruit varies from yellowish to dark red and the aril colour of Mridula, Ganseh, Bhagwa and Wonderful were found to be dark red, yellowish, dark red and yellowish pink respectively. The average weight of fruit was found to be 159.85 to 320.75 g. The average aril weight, average rind weight, aril % and rind % were found to be in range of 104.45-186.54 g, 49.83-137.54 g, 53.34-65.5 % and 31.17-42.88 %. The chemical parameters of fruit determined were total soluble solid (TSS), acidity, pH and ascorbic acid. The results indicate that the TSS was highest in Ganesh (13.66°Brix) which was at par with Mridula (13°Brix) and low TSS was reported from Wonderful (9.66°Brix) cultivar. pH was lowest in Wonderful (3.43) and acidty was higehst in Wonderful (1.3%) and no difference in pH and acidity of other cultivars. There is no significant variation in the ascorbic acid content of different cultivars.

Key words: *Bhagwa, Ganesh, Mridula, Pomegranate, Wonderful*

INTRODUCTION

Pomegranate (*Punica granatum* L.) is grown in tropical and subtropical regions of the world. It is important crop for drought prone areas in India. In India, it is cultivated on a small scale covering an area of 0.13 million ha with production of 1.34 MT and productivity of 10.3 MT/ha [5]. In India, it is found from Kashmir to Kanyakumari but is cultivated commercially on large scale only in Maharashtra. Small scale plantations are also seen in Gujrat, Rajasthan, Karnataka, Tamil Nadu, Andhra Pradesh, Uttar Pradesh, Punjab and Haryana. Pomegranate varieties namely Ganesh, Bhagwa, Ruby, G-137, Arakta, Wonderful and Mridula are cultivated in India. The fruits are round, oblate or obovate in shape and vary in weight and size. The fruit skin may be thick or thin but smooth, leathery and tough with colour varying from pale yellow to crimson-red.

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Pomegranate fruit consists of three parts: the seeds, the juice and the peels which include the husk and interior network membranes. The arils inside the fruit are actually an edible portion of the fruit. The taste of the pulp varies from sweet and aromatic to sour and insipid. The seed portion of the fruit may be hard or soft but edible. The softer varieties are designated as seedless. The fruit has some medicinal value and commonly used in the India as antiviral, antifungal, antimicrobial and antibacterial agent. The present investigation was carried out to determine the variation in the physic-chemical values and morphological attributes of the locally grown pomegranate cultivars Mridula, Ganessh, Bhagwa and wonderful fruits and its juice.

Ghadge and Jadhav[2] carried out an experiment in order to find different physico-chemical characteristics of two varieties of pomegranate fruits namely Ganesh and Arakta cultivated around Lonand (Khandala) of Satara district. The study reveals that, the morphological characteristics such as colour of fruit vary from yellowish with pink patches in Ganesh and dark red for Arakta variety. The average weight of fruit found was 270.7g and 258.4g for Ganesh and Arakta cultivars. The chemical parameters of fruit determined were total soluble solid (TSS) acidity and pH. Efforts were also made to quantify the amount of reducing sugars and vitamin C contents for both varieties. The results indicate that the values are comparable in both the varieties with minor variation.

MATERIAL AND METHODS

Fruit Sampling

The fruits of pomegranate cultivars Mridula, Ganesh, Bhagwa and Wonderful were procured from Centre of Excellence for Fruits, The Indo-Israel Agriculture Project, Mangiana (Haryana) during 2015. The fruits of uniform size and nearly same colour and maturity were selected by visual observation and used for the experiment.

Morphological and Physical properties

Features like colour, weight of fruit, aril percent, rind percent waste were determined for all the varieties of pomegranate. Fruit and aril colour were observed by visual observation

Fruit chemical properties

Fruit juice was extracted from the arils by using muslin cloth and used to determine the following chemical properties. TSS and pH were determined by using hand refractometer and pH metre respectively. Titrable acidity and ascorbic acid content were determined by AOAC[1]. All the statistical analysis was carried out by using OPSTAT statistical software.

RESULTS AND DISCUSSION

The data on physical characteristic of pomegranate cultivars (Table 1) indicates that the colour of fruit of Mridula, Ganseh, Bhagwa and Wonderful were dark red, yellowish with pink patches, red and yellowish respectively. The fruit aril colour of Mridula, Ganseh, Bhagwa and Wonderful were found to be dark red, yellowish, dark red and yellowish pink respectively. The colour of fruits and aril depends on the geographical area and climatic factor of that location. Opara *et al.*[3] reported that the skin colour of pomegranate fruits varied widely among cultivar as well as the geographical area. Thirupati and Ghosh[7] evaluated ten varieties under semi arid conditions and revealed that the fruit colour of cv. Mridula was deep red.

It has been found that in Table-2, average fruit weight of Mridula, Ganseh, Bhagwa and Wonderful were 159.85, 291.5, 193.83 and 320.75g respectively. The average aril weight was 104.45, 186.54, 111.44 and 171.62g respectively for Mridula, Ganseh, Bhagwa and Wonderful. The average rind weight was 49.83, 96.08, 78.77 and 137.54g respectively for Mridula, Ganseh, Bhagwa and Wonderful. The aril and rind percent were 65.34 and 31.17 for Mridula, 63.99 and 32.96 for Ganesh, 57.29 and 40.63 for Bhagwa and 53.5 and 42.88 for Wonderful respectively.

In Table-3 the TSS was highest in Ganesh (13.66°Brix) which was at par with Mridula (13°Brix) and low TSS was reported from Wonderful (9.66°Brix) cultivar. The results of

present investigation are in accordance with the findings of Singh *et al*.[6] who reported that the Ganesh has maximum TSS. Patil *et al.*[4] also found the similar results and stated that the TSS of Ganesh was higher than that of Arakta. pH was lowest in Wonderful (3.43) and no difference in pH of other cultivars like Mridula (4.09), Ganesh (4.23) and Bhagwa (4.35). Acidity was higehst in Wonderful (1.3%) and no difference in acidity content of other cultivars like Mridula (0.56%), Ganesh (0.58%) and Bhagwa (0.55%). Wani et al. (2012) carried out an investigation and reported that the acidity was in range of 0.30 to 0.57 %. Patil *et al*.[4] found acidity in juice of cultivars Ganesh and Arakta as 0.3 and 0.35%, respectively. There is no significant variation in the ascorbic acid content of different cultivars. The ascorbic acid content ranges from 10-14 mg/100g. Wani *et al*.[8] noticed ascorbic acid content of 7.96 to 20.68 mg/100 g of fruit among different pomegranate genotypes evaluated.

Table 1: Fruits and arils colour of different variety

Variety	Colour of fruits	Colour of arils
Mridula	Dark red	Dark red
Ganesh	Yellowish with pink patches	Yellowish
Bhagwa	Red	Dark red
Wonderful	Yellowish	Yellowish pink

Table 2: Average fruit weight, aril weight, rind weight, aril % and rind % of different variety

Variety	Average fruit Wt (g)	Average aril Wt (g)	Fresh Aril %	Average rind Wt. (g)	Rind %
Mridula	159.85	104.45	65.34	49.83	31.17
Ganesh	291.5	186.54	63.99	96.08	32.96
Bhagwa	193.83	111.44	57.49	78.77	40.63
Wonderful	320.75	171.62	53.5	137.54	42.88

Table 3: TSS, pH, acidity and ascorbic acid content of different variety

Variety	TSS (°Brix)	pH	Acidity (%)	Ascorbic acid mg/100g
Mridula	13	4.09	0.56	13.81
Ganesh	13.66	4.23	0.58	10.52
Bhagwa	11	4.35	0.55	10.52
Wonderful	9.66	3.43	1.3	10.52
CD ($P \leq 0.05$)	1.22	0.45	0.17	NS


GANESH


BHAGWA


MRIDULA


WONDERFUL

CONCLUSION

There was considerable variation in four cultivars with respect to most of fruit parameters and fruit quality parameters like rind and aril colour, average fruit weight, aril weight and per cent, rind weight and per cent, TSS, pH, acidity and ascorbic acid content. The colour of fruit varies from yellowish to dark red and the aril colour of Mridula, Ganseh, Bhagwa and Wonderful were found to be dark red, yellowish, dark red and yellowish pink respectively. The average weight of fruit was found to be 159.85 to 320.75 g. The average aril weight, average rind weight, aril % and rind % were found to be in range of 104.45-186.54 g, 49.83-137.54 g, 53.34-65.5 % and 31.17-42.88 %. The chemical parameters of fruit determined were total soluble solid (TSS), acidity, pH and ascorbic acid. The results indicate that the TSS was highest in Ganesh (13.66°Brix) which was at par with Mridula (13°Brix) and low TSS was reported from Wonderful (9.66°Brix) cultivar. pH was lowest in Wonderful (3.43) and acidty was higehst in Wonderful (1.3%) and no difference in pH and acidity of other cultivars. There is no significant variation in the ascorbic acid content of different cultivars.

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REFERENCE

1. A.O.A.C. *Official Methods of Analysis*. 15th Edn. Association of Official Analytical Chemist, Washington, D.C. (2000).
2. Ghadge, K. S. and Jadhav, B. D., Physic-chemical properties, estimation of total sugars and vitamin C content of pomegranate cultivars Arkata and Ganesh: A comparative investigation. *J. Chem. Pharm. Res.* **7(8)**: 670-675 (2015).
3. Opara, L. U., Al-Ani, M. R. and Al-Shuaibi, Y. S., Physiochemical properties, vitamin C content, and antimicrobial properties of pomegranate fruit *(Punica granatum* L.). *Food and Bioprocess Technol.* **2**: 315–321 (2009).
4. Patil, P., Sayed, H.M., Joshi, A.A. and Jadhav, B.A., Comparative evaluation of physico-chemical properties of two varieties of pomegranate fruits - Ganesh and Arakta. *Afr. J. Food Sic.* **7(11)**: 428-430 (2013).
5. Saxena, M. and Gandhi, C.P., Indian horticulture database.www.nhb.gov.in (2014).
6. Singh, S., Kaushik, R.A., Saini, R.S., Kaushik, N. and Godara, R.K., Comparative performance of pomegranate varieties under rainfed conditions. *Haryana J. Hort. Sci.* **33(3&4)**: 165-166 (2004).
7. Thirupathi, N. and Ghosh, S. N., Fruit yield and quality of some pomegranate cultivars grown in laterite soil of west Bengal (India). Int. J. Trop Agric. **33(4)**: 2831-2834 (2015).
8. Wani, I.A., Bhat, M.Y., Lone, A.A., Ganaie, S.A., Dar, M.A., Hassan, G.I., Mir, M.M. and Umar, I., Screening of various pomegranates *(Punica granatum* L.) selections of Kashmir valley. *Afr. J. Agric. Res.* **7(30)**: 4324-4330 (2012).