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Performance of different varieties of Aonla (*Emblica officinalis* Gaertn) under hard lateritic rocky area in Konkan region of Maharashtra

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Abstract

An investigation was carried out on six varieties of Aonla (*Emblica officinalis* Gaertn) viz; NA-6, NA-7, NA-10, Krishna, Kanchan and Chakayya for yield and quality under unique hard lateritic rocky situation at Mango Research Sub-Centre, Rameshwar Tal. Deogad, Dist. Sindhudurg (M.S.). The maximum yield (17.0 q ha⁻¹ in October harvest and 33.5 q ha⁻¹ in May harvest) was registered by Kanchan variety. The annual (Cumulative and average) yield was also highest (50.5 q ha⁻¹ 50.5 q ha⁻¹, respectively.) in Kanchan variety. The seasonal variation between both the harvests was assessed and there was significant variation in the fruits parameters and yield. The deviation was observed higher in yield, T.S.S. and acidity in May harvest irrespective of variety.

Keywords: Aonla, varieties, yield, season

Introduction

Aonla (*Emblica officinalis* Gaertn) is not a commercial fruit crop in the South Konkan Coastal region of Maharashtra though it is popular for production of fruit crop (Gawankar *et al.*, 2005) [3]. However, occurrence of few local types on hill slopes, on bunds in isolation and forests warrants the scope for cultivation of this crop in this region (Keskar *et al.*, 1999) [6]. Aonla fruits are highly nutritive and possess a good medicinal values as they are rich in vitamin C (450 mg/100 g). Preparation of delicious soft drinks like Aonla sarbat, Muravala, candy pickles, hair oils and Ayurvedic health tonic chavanaprash have attracted the attention of fruit preservation industries in this region (Gawankar *et al.*, 2001) [2]. Unlike other crop aonla also has varietal wealth and varietal specification in a particular agro-climatic condition and the foremost task for commercialization of that crop in a locality or zone. Genetic variation is an important consideration for classification, utilization of germplasm resources and breeding. This process can increase both quantity and quality of fruit production (Kumar *et al.*, 2013) [8]. Though it is the crop of arid and semi-arid region of the country because of its hardy nature that makes it suitable to grow in varied agro-climatic conditions of such regions (Vijaykumar, 2014) [9].

In the recent years, the cultivation of Aonla is expanding due to its high market demand as a medicinal crop, less management cost coupled with wide adaptability in diverse agro climatic conditions. The Deogad and nearby tahashils of Sindhudurg district, part of South Konkan coastal zone having hard lateritic rocks in a specific area are popular particularly for mango production. Considering the potential of Aonla the present investigation was carried out to test the feasibility of growing different Aonla varieties in this lateritic and rocky region for yield and some quality aspects.

Materials and Methods

The present investigation was carried out at Mango Research Sub-Centre, Rameshwar, Tal. Deogad, Dist. Sindhudrg, Maharashtra state on nine years old Aonla plantation during the year 2013-14. The location comes under south Konkan coastal agroclimatic zone having unique condition as hard lateritic rocky situation. The location has hot and humid climate with the average annual rainfall is 2569.0 mm. Six varieties of Aonla viz; NA-6, NA-7, NA-10, Krishna, Kanchan and Chakayya have been planted at 6.0 m X 6.0 m spacing in randomized block design. The recommended cultural practices were carried out in the experimental block. The fertilizer dose of 100 g N, 50g P₂O₅, 50 g K₂O along with 10 kg FYM per plant were given every year. The irrigation was given from October to May months.

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The performance was evaluated in the year 2013-14. The fruiting was two times in a year, in October and in May months and the observations on average fruit weight, yield was recorded in every harvest (October, 2013 and May, 2014) for each plant. The chemical parameters were analyzed for the both the harvests. Acidity and ascorbic acid content in the fruits were estimated following standard techniques (A.O.A.C., 1990) [1]. TSS was recorded with the help of hand refractometer. The data was statically analyzed by the method described by Gomez and Gomez (1984) [5]. The seasonal variation in all the observed parameters was assessed by paired 't' test method.

Results and Discussion

The data on yield of fruits in every (October and May harvest) are presented in Table 1. It is revealed that the yield performance of different Aonla varieties as revealed that there was significant variation in the yield levels. In the October harvest, the maximum yield (17.0 q ha⁻¹) was recorded by Kanchan variety followed by Krishna. The rest of the varieties were on par with each other. The similar trend was again observed and yield of Kanchan was highest (33.5 q ha⁻¹) in May harvest and it was followed by NA-10, NA-7 varieties. The annual (Cumulative and average) yield was also maximum (50.5 q ha⁻¹) in Kanchan variety followed by NA-10, NA-7 and Krishna. Chakayya and NA-6 varieties were comparatively poor yielder. The variation in yield in different cultivars may be associated with their inherent genetic potential as well as the adaptability to specific environment. As these observations for one year, the long term experimentation is necessary to assess the yield potential in

different varieties of Aonla. These results are in conformity with the findings of Kshirsagar *et al.*, (2003) [7], and Ghosh *et al.*, (2013). Irrespective of variety, the yield levels are higher in May harvest. Kshirsagar *et al.*, (2003) [7] reported that the monsoon season harvest proved to be superior under Konkan conditions.

The seasonal variation between both the harvests was assessed (Table 2) and there was significant variation in the fruits parameters and yield. The deviation was observed higher in yield, T.S.S. and acidity in May harvest irrespective of variety. Kshirsagar *et al.* (2003) [7] also reported the seasonal variation. Gawankar *et al.* (2005) [3] suggest economic viability in cultivation of aonla crop in the Konkan region.

From the present study, it is inferred that Kanchan, NA-10, NA-7 and Krishna have shown high potential for cultivation in lateritic rocky area of south Konkan coastal zone of Maharashtra.

Table 1: Yield performance of Aonla varieties under hard lateritic rock conditions

Sr. No.	Varieties	Yield (Q ha ⁻¹)			
		October	May	Cumulative	Mean yield
1.	NA-6	6.2	14.9	21.1	10.55
2.	NA-7	8.8	24.4	33.2	16.6
3.	NA-10	9.3	28.3	37.6	18.8
4.	Krishna	11.7	18.9	30.6	15.3
5.	Kanchan	17.0	33.5	50.5	25.25
6.	Chakayya	6.2	14.3	20.5	10.25
	S.E±	0.7	1.1	1.6	0.8
	C.D. at 5%	2.2	3.4	4.9	2.4

Table 2: Seasonal variation in yield and chemical properties of Aonla under hard lateritic rock conditions

Sr. No.	Parameters	October (Mean)	May (Mean)	Paired 't' Test
1.	Fruit weight (g)	34.02 (5.66)#	31.55 (5.51)	7.45*
2.	Yield (kg tree ⁻¹)	3.56 (1.47)	8.08 (2.77)	6.03*
3.	Yield (T ha ⁻¹)	0.99 (0.41)	2.24 (0.77)	6.02*
4.	T. S. S. (°B)	9.10 (1.68)	10.36 (1.94)	8.55*
5.	Acidity (%)	1.52 (0.36)	2.01 (0.42)	10.69*
6.	Ascorbic acid (mg 100 ⁻¹ g pulp)	353.17 (47.49)	366.92 (41.95)	2.71*

(# Figures in parenthesis are standard deviation values)

(* Significant at 5.0%)

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