Genetic Variability of Aonla in Chhattisgarh

VK Gupta and BR Jana*
NBPGR Regional Station, CHES Campus, Namkum, Ranchi-834010, Jharkhand

Key Words: Aonla, Germplasm, Variability, Cultivar

Aonla (Indian gooseberry) or myrobalan (*Emblica officinalis* Graertn. syn. *Phyllanthus emblica* L.), a minor popular fruit of commercial and medicinal importance belongs to the family Euphorbiaceae and is said to be indigenous to tropical South-East Asia, particularly central and southern India. The genus *Phyllanthus* comprises about 350 (Hooker, 1947) or even 500 species (Bailey, 1947), mostly shrubs, few herbs and trees. It has a vast scope of growing in wastelands like salt affected marginal forest soil. Aonla grown in North India have some limitation like, Banarasi is shy bearer, Chakaiya has small size fruits, Francis is affected by necrosis and more over all varieties of aonla are susceptible to shoot gall pest.

Ten fully ripe fruits were randomly collected from all over the tree, and then these fruits were analysed for physico-chemical characteristics (Table 1). The total soluble solids were determined with the help of hand refractrometer. The acidity was found out by titrating the known quantity of juice against 0.1 N sodium hydroxide using phenolphthalein as indicator. Total sugar was estimated by Lane and Eynon method where Vitamin C was measured through 2, 6 dichlorophenol indophenol visual titration method.

An exploration was undertaken in the area of Chhattisgarh (Surguja District) hills to collect aonla germplasm. Some promising collections of aonla are listed in Table 2.

Among above collection, IC-259416 is deciduous in nature. Bajpai (1965) and Ram (1971) also cited that some aonla varieties of North India are deciduous. Cultivated varieties have very high acid content like

Table 1. Horticultural and general characteristics of aonla germplasm

Accession No.	Tree Character	Fruit size (LxB)	Fruit size (cc) (πr^2)	Fruit wt. (g)	Stripe	Skin	Skin colour	Pulp character	Pulp thickness (mm)	Acidity (%)	TSS (°B)	Total sugar	Firmness (lb/sq inch	Ascorbic acid % mg in 100g pulp	Pulp stone ratio	Shape (L/B) ratio
IC-259416	1. Deciduous dwarf	3.80	5.33	4.681	6.00	Smooth	Deep lemon green	Transparent	0.615	2.56	8.00	4.230	22.50	667.0	12.30	0.92
IC-259417	2. Evergreen standard	7.20	10.17	8.486	6.00	Rough	Light lemon green	Semi Transparent	0.880	1.47	13.00	3.906	21.20	348.0	15.71	0.93
IC-259418	3. Evergreen standard	6.40	7.50	7.2610	6.00	Smooth	Yellow	Transparent	0.625	2.11	14.50	8.460	23.25	584.0	11.80	0.92
IC-259419	4. Evergreen standard	8.20	11.77	9.619	5.00	Rough	Dark yellow	Transparent	0.650	2.49	13.20	3.585	22.25	715.0	12.39	0.87
IC-259420	5. Evergreen spreading	5.90	9.67	6.280	6.00	Rough	Red blush	Transparent	0.675	1.60	13.50	5.644	20.75	374.0	11.07	0.90
IC-259421	6. Not known	8.00	13.37	9.550	6.00	Smooth	Dark yellow	Transparent	0.700	2.17	11.00	6.773	25.30	617.0	16.27	0.90
IC-259422	7. Evergreen erect	9.60	13.65	10.310	6.00	Smooth	Bright Yellow	Transparent	1.100	2.36	7.50	5.644	23.12	689.0	13.80	0.89
IC-259423	8. Evergreen standard	10.90	14.87	12.050	6.00	Smooth	Lemon green	Transparent	0.933	2.43	9.00	5.644	26.00	699.4	13.50	0.84
IC-259424	9. Evergreen spreading high yielding	11.10	14.88	12.150	7.00	Smooth yellow	Bright	Transparent	0.752	2.60	15.00	8.194	25.50	604.0	13.46	0.93
	10. Kanchan evergreen spreading	27.80	29.03	31.000	6.00	Smooth	Yellow	Transparent	0.400	2.10	11.53	11.300	23.31	711.0	17.50	0.93
	Sem	0.0532	0.0189	0.0189	0.0506	-	-	-	0.0181	0.0179	0.0430	0.002	0.0192	0.5626	0.0374	0.006
	CV%	0.9322	0.2512	0.2939	1.4711	-	-	-	4.5311	1.4148	0.6413	0.0534	0.1588	0.1619	0.4731	1.1446
	CD at 5%	0.1576	0.0559	0.0560	0.1498	-	-	-	0.0537	0.0529	0.1274	0.0058	0.0570	1.6659	0.1109	0.0177

* *Central Horticultural Experimentation Station, IIHR, Namkum, Ranchi–834010, Jharkhand*

Table 2. Some promising collections of aonla germplasm

Accession No.	Collection from	Characterstics
IC–259416	Sonhat Forest	Tree is deciduous, fruit is very small with prominent ribs having transparent pulp but tolerant to shoot gall pest.
IC–259417	Kalyanpur Forest	Fruit small with very low acid content (1.47%)
IC–259418	Kharara Forest	Fruit with high TSS (14.5°B).
IC–259419	Basantpur Forest	Fruit with very high ascorbic acid content (715.0 mg/100g pulp). Stripe is mostly 5(5.33).
IC–259420	Sonhat Forest	Fruit with prominent red blush on skin. Rough skin with translucent pulp.
IC–259421	Wardraf Nagar	Fruits are of medium size with high pulp stone ratio (16.27:1)
IC–259422	Sonhat Forest	Fruit with acceptable pulp thickness (1.1 cm), bright yellow skin with transparent pulp.
IC–259423	Sonhat Forest	Fruit with very high flesh firmness (26.0 lb/sq inch). Transparent pulp with lemon green skin.
IC–259424	Basantpur Forest	Acceptable fruit weight (12.2 g). Skin yellow, attractive transparent pulp. Smooth skin with high TSS content of 15°B. Tree of prolific bearer. Stripe is mostly 7(7.22).

Kanchan (2.2%) and Krishna (2%); (Singh *et al.* 1994). IC-259417 had 1.47% acidity, which is very high. In terms of ascorbic acid content. cultivar Kanchan had 711 mg/100 g pulp, while IC–259419 showed maximum Vitamin C content of 715 mg/100 g pulp. In case of cultivated aonlas, Krishna TSS is 14°B (Singh *et al.* 1994) whereas number IC 259424 had maximum TSS content of 15°B. Physiological properties of rest of the varieties are at par with cultivated varieties of aonla. Kanchan is 6 stripped fruit, while IC-259419 and IC-259424 have (5.0) and (7.0) stripes, respectively. Ram (1971) also reported that number of perianth segments varied from 5-7.

References

WOI (1960) *The Wealth of India Raw Materials*. Publications and Information Directorate, CSIR, New Delhi.

Baily LH (1947) *The Standard Encyclopedia of Horticulture*. Macmillan & CO, New York, pp 3547–48.

Bajpai PN (1965) Studies on vegetative growth and development of male and female gametophyte in aonla (*Emblica officinalis* Gaertin). Agra University *J. Res. Sci.* **14:** 1676-86.

Hooker JD (1947) *The Flora of British India* Vol. II Periodical Experts, Delhi.

Ram S (1971) Studies on Physiology of Fruit Growth in Aonla (*Emblica officinalis Gaertin.*) Ph.D. Thesis Kanpur University, Kanpur.

Singh IS, Wahid Ali and RK Pathak (1994) New varieties of Indian Gooseberry. Indian Hortic. **39:** 3-5.

Genetic Variability in Dolichos Bean

RS Pan, AK Singh and Mathura Rai

Horticulture and Agro-forestry Research Programme, Plandu, Ranchi–834010, Jharkhand

Key Words: Dolichos Bean, Genetic Variability, Heritability, Genetic Advance

Dolichos bean is commercially cultivated in Chhotanagpur region of Jharkhand for its proteinaceous tender pods used as fresh vegetable. To boost up the productivity of this crop, development and cultivation of new improved varieties are of urgent need. To achieve this target through genetic improvement, it is essential to assess the genetic variability for yield and its components. Parameters of genotypic and phenotypic coefficients of variation (GCV, PCV) are useful in detecting the amount of variability present in the available germplasm. Heritability and genetic advance help in determining the influence of environment in expression of the characters and the extent to which improvement is possible after selection (Robinson *et al.* 1949). The present study was undertaken to quantify the variability in the indigenously collected dolichos bean germplasm for 14 yield-related characters and to select the promising parental lines based on performance for utilization in genetic enhancement programme.

The experimental material consisted of 25 indigenously collected germplasm of dolichos bean. These were evaluated at Horticulture and Agro-forestry Research programme (HEFRP, Ranchi) during autumn-winter season of 2000-01 in RBD with three replications. A spacing of 1 m x 75 cm was maintained. Six plants