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Short Communication

COLLECTION AND CHARACTERIZATION OF POMEGRANATE GERMPLASM FROM HIMACHAL PRADESH

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The pomegranate (*Punica granatum*) is said to be indigenous to Iran and is also grown to some extent in India (Patil and Karale, 1985). It is one of important arid fruit crops of commercial significance. Rich genetic diversity occurs in parts of Himachal pradesh (Solan, Sirmaur, Shimla districts) due to natural crossing and perpetuation through seed (Gammie and Patwardhan, 1929). The variability in landrace/forms is prevalent in diverse agro-ecological conditions from very high to low rainfall areas. Undulating topography of the terrains has diversified the nature of native variability tremendously. Several factors including deforestation and natural calamities pose great threat to its survival. Therefore, the exploration was undertaken to collect the pomegranate variability from this region.

Regions surveyed and sampling strategies

An exploration was undertaken in collaboration with Department of Fruit Breeding, YSPUH&F, Nauni, Solan during the month of August, 1994 for collection of pomegranate germplasm. The areas covered include parts of district Sirmaur, Bilaspur, Solan and Shimla of Himachal Pradesh (Fig 1) representing varying soil, edaphic factors and cropping systems. Random as well as biased sampling (Sinha, 1981) were followed for gene pool sampling and to collect information (Arora, 1981) on the crop diversity and exploration route. Data on five randomly picked fruits in each genotypes were recorded for fruit length (cm), fruit diameter (cm), average fruit weight (g), aril length (cm), aril breadth (cm), total soluble solids and other characteristics (Table 1). The mature cuttings were collected and being propagated at the Department of Fruit Breeding, Dr Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan for further evaluation and maintenance of germplasm.

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Table 1. Fruit characteristics of pomegranate germplasm collected from Himachal Pradesh August, 1994

NIC Numbers	Fruit Characteristics				Rind thickness	Aril boldness	Aril colou-ration	Fruit length (cm)	Fruit diam-eter (cm)	Fruit weight (g)	TSS (Brix)	Aril length (cm)	Aril breadth (cm)
	Size	Shape	Surface colour	Calyx									
NIC-23343	Small	Pear	Golden	Fully open	Thin	Bold	> 50%	4.36	4.20	44.33	11.20	0.85	0.59
NIC-2334	Medium	Round	Light yellow	Slightly open	Thick	Medium	20%	4.44	4.64	57.67	11.20	0.90	0.54
NIC-23345	Medium	Round	Yellow green	Open	Thick	Bold	> 90%	4.45	4.49	58.60	12.40	0.87	0.61
NIC-23346	Small	Flatten	Deep red	Open upwards	Thick	Bold	> 50%	4.71	4.10	48.77	13.10	0.85	0.61
NIC-23347	Medium	Round	Light green	Close	Thick	medium	Nil	5.05	4.56	56.97	9.90	0.85	0.52
NIC-23348	Medium	Guava	Golden yellow rough surface	Semi opened	Thick	Medium	> 90%	4.03	3.86	46.55	12.30	0.73	0.48
NIC-23349	Medium	Round	Light green, red blushed	Slightly open	Thick	Medium	> 20%	4.99	4.71	68.94	13.07	0.86	0.53
NIC-23350	Medium	Pear	Golden yellow, red stringed	Slightly open	Very thick	Bold	Nil	4.65	4.11	58.83	13.00	0.75	0.53
NIC-23351	Medium	Round	Light green, light red blush	Small open	Thin	Medium	> 10%	4.59	4.66	60.33	11.33	0.80	0.61
NIC-23352	Medium	Round	Yellow, slightly rough	Open outwards	Thick	medium	> 20%	4.98	4.88	86.20	14.27	0.88	0.63
NIC-23353	Small	Round	Deep red blush	Open outwards	Thin	Bold	25%	4.00	3.84	50.33	9.40	0.79	0.52
NIC-23356	Medium	Round	Light green, rough surface	Open	Thin	Bold	> 50%	4.72	4.81	67.50	10.53	0.87	0.57
NIC-23357	Small	Round	Golden	Slightly open	Thin	Bold	Nil	4.42	4.37	50.00	12.53	0.90	0.57

(Table 1 contd.)

Table 1. contd.

NIC-23358	Small	Round	Light red, smooth	Slightly open	Thin	Bold	Nil	4.62	4.86	61.67	12.47	0.91	0.63
NIC-23359	Medium	Oval	Light yellow, slightly blush	Close	Thick	Medium	Nil	5.00	4.73	55.43	12.87	0.99	0.61
NIC-23360	Large	Flatten	Light red, smooth surface	Open	Thin	Bold	Nil	5.63	5.23	84.33	11.53	0.88	0.61
NIC-23361	Small	Round	Golden, slightly surface	Slightly open	Very thick	Bold	20%	4.15	4.11	58.83	15.50	0.82	0.63
NIC-23362	Small	Guava	Golden yellow, rough	Fully open	Thick	Medium	> 90%	4.71	4.33	40.66	13.27	0.84	0.58
NIC-23363	Medium	Pear	Golden yellow, red blush	Open upwards	Thin	Boild	> 90%	5.13	4.89	71.67	14.83	0.96	0.61
NIC-23364	Medium	Guava	Dull yellow, rough surface	Open towards	Very thick	Small	Nil	5.29	4.52	64.83	9.20	0.80	0.54
NIC-23365	Medium	Round	Light yellow, smooth surface	Open upwards	Thick	Medium	> 20%	4.99	4.65	60.43	12.30	0.87	0.58
NIC-23367	Medium	Round	Golden yellow	Open	Thin	Small	> 90%	4.61	4.76	68.50	13.97	0.94	0.63
NIC-23368	Small	Round	Light green, rough surface	Open	Thin	Medium	Nil	3.48	3.76	47.50	14.17	0.74	0.50
NIC-23369	Small	Pear	Light red, slightly rough	Small open	Thin	Small	> 20%	4.14	3.94	60.00	13.40	0.84	0.57
NIC-23370	Small	Round	Light yellow, smooth surface	Open upwards	Thick	Bold	>10%	4.52	4.21	59.83	15.67	0.79	0.58

(Table 1 contd.)

Table 1. contd.

NIC-23371	Medium	Flatten	Light red, smooth surface	Open	Thick	Bold	> 40%	4.51	3.92	44.33	11.57	0.86	0.53
NIC-23372	Small	Flatten	Golden, deep red bright blush	Fully open	Very thick	Bold	20%	3.74	3.73	40.17	13.00	0.84	0.61
NIC-23373	Medium	Round	Pale yellow	Fully open	Thin	Medium	40%	5.26	4.60	68.27	15.73	0.87	0.60
NIC-23374	Small	Round	Golden, deep red blush	Slightly open	Thick	Medium	Nil	4.13	3.80	36.17	12.27	0.77	0.40
NIC-23375	Medium	Oval	Light red	Medium close	Thick	Medium	> 10%	4.41	4.05	41.92	13.10	0.80	0.64
NIC-23376	Medium	Round	Deep red, smooth surface	Fully open	Thick	Bold	> 50%	4.49	4.20	58.83	15.50	0.82	0.63
NIC-23377	Small	Oblong	Pale yellow slightly rough	Fully open	Thick	Bold	> 50%	3.81	4.03	38.83	12.03	0.91	0.59
NIC-23378	Medium	Round	pale yellow, light red blush	Close	Thick	Bold	Nil	4.90	5.03	38.83	12.03	0.91	0.59
NIC-23379	Medium	Round	Light green, bright	Slightly open	Thin	Bold	> 90%	4.98	4.88	62.33	13.53	0.74	0.53
NIC-23380	Large	Round	Golden	Open	Thin	Bold	> 90%	5.17	5.59	111.67	12.73	0.90	0.60
NIC-23382	Medium	Round	Light green slightly rough	Slightly open	Very thick	medium	> 10%	4.60	4.53	60.94	11.77	0.77	0.54
NIC-23386	Large	Oval	Light green, slightly rough	CLose inwards	Thick	Bold	> 20%	5.38	5.67	89.67	12.90	0.87	0.54

(Table 1 contd.)

Table 1. contd.

NIC-23387	Small	Guava	Light green, light red blush	Fully open	Thin	Small	> 90%	3.60	3.43	51.70	13.80	0.84	0.65
NIC-23388	Large	Pear	Pale yellow, red streaks	Slightly open	Very thick	Bold	> 90%	5.64	4.85	74.83	11.53	0.86	0.53
NIC-23389	Large	Round	Light yellow	Slightly open	Thin	Bold	> 50%	5.16	4.51	61.50	14.60	0.79	0.57
Range	Minimum							3.49	3.43	36.17	9.20	0.73	0.40
	Maximum							5.64	5.67	111.67	15.50	0.99	0.64
Mean								4.64	4.45	197.06	12.73	0.84	0.57
S.Em±								0.12	0.12	2.98	0.45	0.01	0.01
C.D. at 5%								0.03	0.03	0.82	0.12	0.002	0.002

Extent of variability

Fourty distinct genotypes of pomegranate identified based on the fruit morphological characteristics are located in Solan (20), Sirmaur (15), Shimla (4) and Bilaspur (1) districts of Himachal Pradesh. Pomegranate diversity was more concentrated in Solan, Sirmaur and part of Shimla districts because of semi arid climate and red laterite soil which may be suitable for its growth. Most of old plants in forest were seedling origin and considerable variability in morphological characters exhibited including the TSS content (Table 1). It was also observed that the seedling trees were less susceptible to diseases, insects and had also longer life. The fruit length varied from 3.48 cm (NIC-23368) to 5.64cm (NIC-23388); fruit diameter from 343 cm (NIC-23387) to 5.67cm (NIC-23386); fruit weight 36.17g (NIC-23374) to 11.67g (NIC-23380); TSS from 9.20 (NIC-23364) to 15.50 (NIC-23376); aril length 0.73 cm (NIC-23348) to 0.99 cm (NIC-23359) and aril breadth 0.40 cm (NIC-23374) to 0.64 (NIC-23375).

Promising collections

Genotype (NIC-23387) sampled from road side near Falcon restaurant, Kandaghat, Solan bear small size, guava shape fruit, surface light green with light red blushed, calyx fully developed, early maturing and having less infestation of fruit fly. The genotypes NIC-23380, NIC-23388 were also observed to e promising for large to extra large fruit size, smooth to rough fruit surface with deep red colour alongwith very attractive pink flesh. The forest zone of Narang (Sirmaur district) and Basantpur (Shimla district) possesses natural vegetation of pomegranate needs fine grid survey for the collection of landraces/genotypes variability.

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