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SHORT COMMUNICATION

Genetic diversity in wood apple (*Feronia limonia*) germplasm collected from Gujarat

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The wood apple (*Feronia limonia*) belongs to the monotypic genus *Feronia*, in the family *Rutaceae* and is native to India (Das and Prakash, 2011). Besides wood-apple, it is also called as elephant-apple, monkey fruit, curd fruit, *kathbel* and *kaitha* (Pandey *et al*., 2014). It is a hardy, upright, thorny, deciduous tree and found mainly in the forest and as individual 'stray plants' in unused neglected areas (Ghosh *et al*., 2012). It has an extensive root system and possesses great tolerance to drought. It produces nutritive acidic fruit, which is called 'poor man's fruit'. Its nutritive value is due to ascorbic acid and mineral contents of fruit pulp (Joshi and Jain, 2008). The aromatic pulp is used for preparation of jam, jelly, chutney and fruit juice (Pandey *et al*., 2014). The fruit is much used as a liver and cardiac tonic, and, when unripe, as an astringent means of halting diarrhea and dysentery and effective treatment for hiccough, sore throat and diseases of the gums in traditional system of medicines. In spite of possessing high nutritive and medicinal values (Ghosh *et al*., 2012) in the fruits, the crop has neither been given due attention for commercial cultivation nor exploitation of the genotypes available in different parts of India.

Wood apple in India are of seedling origin which offers a great scope for selection of suitable genotypes of high yield potentiality with good fruit quality. With the view to identify suitable genotype/s having desirable characters, a survey followed by collection of desirable genotypes was made.

An exploration tour during the fruiting season in February, 2016 was conducted in wood apple growing areas of Tehsil Godhra, District Panchmahals to collect available genetic diversity of wood apple. Formal and informal conversation with local farmers was adopted as a strategy to collect the information about the wood apple germplasm available in the area. In each village, three four farmers were consulted before identification of a genotype for collection. Accessions were selected randomly at fruit maturity stage from 07 sites of the Tehsil Godhra, District Panchmahals (Fig. 1) during survey. The available diversity was collected from population through selective sampling technique along with passport information (Table 1). Only disease-free plants bearing fruits with unique traits of horticultural importance were identified for collection. Fruit size, fruit weight, shell weight, total soluble solids (TSS) (by refractrometer) in the fruit pulp were the main parameters for identifying a genotype for collection. The quantitative data collected were subjected to statistical analysis following analysis of variance. The difference between the two groups was assessed by computation of least significant difference taking 't' values for error at the 5% level of significance.

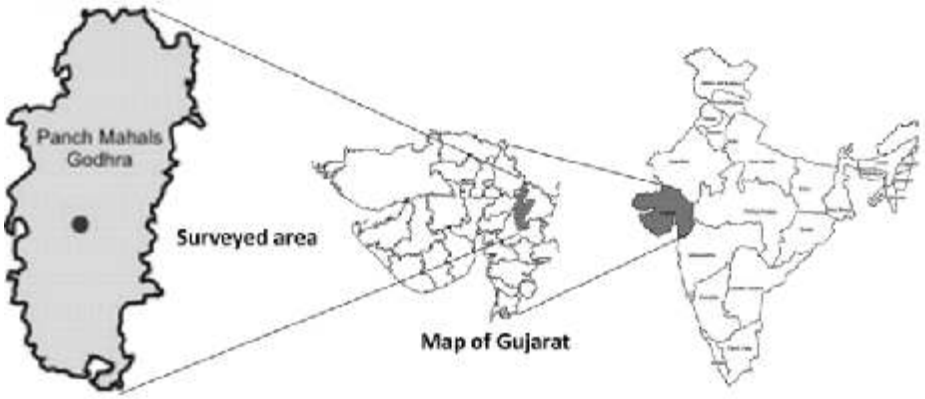

Fig. 1: Site of wood apple germplasm collection in Gujarat

The results (Table 2 & Fig. 2) clearly indicated a wide genetic variability among the types collected. Fruit size (length x breadth) vary in relation to fruit weight (Ghosh *et al*., 2012). However in the present study, highest fruit weight was noted in GWC-3 (405.2 g) followed by the collection GWC-6 (281.3 g), while, largest fruit size was recorded in GWC-6 (69.8 x 74.2 mm) followed by GWC-12 (74.8 x 69.8 mm) and GWC-3 (69.8 x 74.2 mm). Likewise, pulp weight, which is an important observation for getting more amount of pulp for value addition, was highest in GWC-3 (237.6 g) followed by GWC-6 (215.1 g) and lowest in GWC-11 (28.9 g). Genotype GWC-3 ranked first in terms of shell weight (167.8 g) as well. The TSS in different genotypes as noted varied between 6.6 °B (GWC-7) and 18.4 °B (GWC-12). Variations in physico-chemical attributes of collected genotypes may be due to differences in their genetic make-up and prevailing agro-climatic conditions. Such variabilities among genotypes had earlier been reported by Ghosh *et al*. (2012) in wood apple, Trivedi *et al*. (2013) in pear and Singh *et al*. (2015) in *bael*.

Fig. 2: Genetic variability in wood apple genotypes collected from Gujarat

Table 1. Passport data of woodapple germplasm collected during exploration.

S. No.	Collector No.	Botanical name	Vernacular name	Place of collection	Latitude	Longitude	Altitude (m)
1.	GWC-1	*Feronia limonia*	*Kathbel*	Sureli	N22.92302192	E 73.7116315	166
2.	GWC-2	*Feronia limonia*	*Kathbel*	Jitpura	N 22.61760737	E 73.1536604	106
3.	GWC-3	*Feronia limonia*	*Kathbel*	Jitpura	N 22.61915127	E 73.1552591	104
4.	GWC-4	*Feronia limonia*	*Kathbel*	Jitpura	N 22.619379 6	E 73.1556342	106
5.	GWC-5	*Feronia limonia*	*Kathbel*	Ghaneshwar	N 22.3284914	E 73.4656275	114
6.	GWC-6	*Feronia limonia*	*Kathbel*	Ghaneshwar	N 22.3286475	E 73.4657937	113
7.	GWC-7	*Feronia limonia*	*Kathbel*	Ghaneshwar	N 22.3297321	E 73.4659612	114
8.	GWC-8	*Feronia limonia*	*Kathbel*	Paroli	N 22.3462168	E 73.3679351	112
9.	GWC-9	*Feronia limonia*	*Kathbel*	Paroli	N 22.3463946	E 73.3682733	111
10.	GWC-10	*Feronia limonia*	*Kathbel*	Kharsaliya	N 22.7047804	E 73.5540407	107
11.	GWC-11	*Feronia limonia*	*Kathbel*	Kharsaliya	N 22.7047696	E 73.5548772	107
12.	GWC-12	*Feronia limonia*	*Kathbel*	Kharsaliya	N 22.6998647	E 73.5548714	106

Table 2. Physico-chemical properties of woodapple collections.

S. No.	Fruit length (mm)	Fruit breadth (mm)	Fruit weight (g)	Shell weight (g)	Pulp weight (g)	TSS (^{0}Brix)
GWC-1	64.5	72.8	224.3	110.1	114.5	10.2
GWC-2	63.4	75.1	190.1	84.6	105.6	12.6
GWC-3	69.8	74.2	405.2	167.8	237.6	14.4
GWC-4	58.3	59.9	114.3	52	62.6	8.4
GWC-5	63.1	69.7	224.9	97.5	127.6	16.2
GWC-6	76.2	77.4	281.3	66.1	215.1	15.6
GWC-7	56.6	62.4	127.7	56.0	71.6	6.6
GWC-8	52.6	48.1	59.5	26.0	33.6	13.8
GWC-9	62.1	62.8	142.4	77.8	64.7	12.6
GWC-10	52.5	54.3	85.8	47.6	38.4	11.4
GWC-11	52.3	54.3	104.8	75.6	28.9	16.3
GWC-12	74.8	69.8	128.8	57.2	71.6	18.4
LSD = 0.05	8.34	8.16	41.82	18.47	29.71	1.96

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