International Journal of Advanced Biochemistry Research

ISSN Print: 2617-4693
ISSN Online: 2617-4707
IJABR 2024; 8(5): 697-702
www.biochemjournal.com
Received: 24-02-2024
Accepted: 30-03-2024

Akshay G Tayde
M.Sc. Research Scholar, Department of Horticulture (Fruit Science), Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

Ujwal A Raut
Associate Professor, Department of Horticulture (Fruit Science), Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

Akshay D Wawkar
M.Sc. Research Scholar, Department of Agricultural Botany (Genetics and Plant Breeding), Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

Dnyaneshwar S Ravankar
Ph.D. Research Scholar, Department of Vegetable Science, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

Corresponding Author:
Akshay D Wawkar
M.Sc. Research Scholar, Department of Agricultural Botany (Genetics and Plant Breeding), Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

Character association studies in wood apple (*Feronia limonia* L.) for yield and yield associated traits

Akshay G Tayde, Ujwal A Raut, Akshay D Wawkar and Dnyaneshwar S Ravankar

DOI: https://doi.org/10.33545/26174693.2024.v8.i5i.1166

Abstract
The current research trial was performed at Department of Horticulture, Dr. P. D. K. V., Akola (Maharashtra) on thirty-two years old wood apple orchard for examining genotypic, phenotypic and environmental correlation for yield and yield associated traits of wood apple genotypes. All these seedlings originated operating trees provide ample range for selecting acceptable genotypes containing higher yield potentiality coupled with better fruit quality characters having precocity in bearing, less spine intensity and another beneficial trait. Owing to the outcomes depicted in latest research analysis, the subsequent interpretations could be pinched. The mean sum squares examined for all the traits was observed significant, designating variations for various components. High GCV and heritability values exaggerated with sizable genetic gain also expresses additive gene effects controlling patrimony of analogous components. The correlation among the yield related traits such as pulp weight, pulp: skull ratio, fruit length, fruit diameter designated that better yielding ability linked along with mentioned yield related components. On account of yield and yield associated traits, AKWa2, AKWa6, AKWa1 and AKWa15 genotypes were observed promising for further crop enhancement schemes. As a result, these wood apple genotypes conceivably promoted for selection in improving fruit yield and sensory standards.

Keywords: Character association, correlation, *Feronia limonia* L., wood apple, yield associated traits

Introduction
Wood apple having botanical name *Feronia limonia* L. comes under Rutaceae (Swingle) family. It is a monotypic species with Aurantiodeae as a sub family. These fruit trees belong to citroid group *viz*., hard shelled. Reuther *et al*. (1967) [13] stated that *Limonia acidissimia* (L.) was the original botanical name of wood apple but later on it was eventually substituted as *Feronia limonia* (L.) Swingle. It is also designated as Curd Fruit, Elephant Apple, Monkey Fruit, Katha Bael and Kavath in India. The chromosome number of the species is 2n = 2X = 18 which is a cross pollinated plant where pollination is mostly mediated by insects. As a result, heterozygosity is common in the species.

Wood apple is proclaimed as Indian and Sri Lankan in origin, usually grown in both the peninsulas. Among the trees it is very hardy and located at Central, Eastern, Southern and Northern plains mostly in semi arid and arid parts of India. It occurs in Madhya Pradesh, Southern Maharashtra and Western Himalayas up to 500 meters elevation more habitually. Lande *et al*. (2010) [8] suggested monsoon climate having specific dry season for initial growth is requisite. It is small tree having 10-15 m height, leaflets opposite in 2-3 pairs and 0.8-1.6 m girth with deciduous nature with many branches having whitish bark and with sharp, straight ascending 1.2-3.8 cm long spines, pinnate (7.5-10.0 cm) long, rachis and petiole flat, very narrowly winged and glabrous (Trimen, 1893) [15].

Bhore (1988) [2] recorded that Wood apple trees in Maharashtra flower during February-March and provide harvestable fruits during October-April. Small flowers, numerous in small paniculate, sessile cymes from the axis of the fallen inflorescence. Dull red coloured flowers are normally unisexual, male and bisexual flowers are appeared on the same inflorescence. Slender and pubescent peduncle. Calyx is very small; acute, ovate, smooth and spreading petals. Stamens are 7-12 in numbers. Very short filament and very large anther finely wooly disc; ovary with several ovules in each cell, very short style and fusiform

stigma. Wood apple exhibits outstanding medicinal and nutritional properties. Conventionally this fruit possesses good remedies for asthma, cardiac debility, dysentery, diarrhea, hepatitis, wounds, tumors and stomach aches (Ilango and Chitra., 2010) [4]. Fruit is large having diameter i.e. 5.0-8.0 cm, whitish amphisarca, woody pericarp, hard and globose. Ghosh *et al*. (2011) [3] revealed that fruit size i.e. length x breadth differs in relation with fruit weight. Seeds are compressed, oblong one celled with hard and hairy coating.

Nowadays wood apple emerged as more suitable horticultural plant for soil reclamation and cultivation in semi arid and arid regions. An effort was made for recognising superior genotypes for further evaluation and crop improvement in consideration of climate change.

Materials and Methods

Twenty-two genotypes which flowers during February-March were selected in the present investigation. Nine genotypes were selected from block number 11 and thirteen genotypes were selected from block number 49 of Main Garden, Dr. P. D. K. V., Akola (Maharashtra). For recording desirable observations, one plant from each treatment was marked and selected. Considering methods suggested by Anonymous (1980) [1], Kaulgud *et al*. (1997) [6], Patel (2014) [12] and Rodriguez-Medina *et al*. (2010) [14]; the observations were recorded in the current experiment. The samples were composed from East, West, North and South i.e. each direction and these directions were supposed to be one replication because the investigation was based on single plant observation.

Johnson *et al*. (1955) [5] discovered formula for estimation of genotypic, phenotypic and environmental correlation coefficient. The data obtained from the latest experiment was scrutinized with the use of procedure explained by Panse and Sukhatme (1985) [11].

Block No:- 11	Block No:- 49
1]-AKWa1	10]-AKWa14
2]-AKWa2	11]-AKWa15
3]-AKWa4	12]-AKWa16
4]-AKWa5	13]-AKWa17
5]-AKWa6	14]-AKWa18
6]-AKWa7	15]-AKWa19
7]-AKWa9	16]-AKWa20
8]-AKWa11	17]-AKWa21
9]-AKWa13	18]-AKWa22
	19]-AKWa23
	20]-AKWa24
	21]-AKWa25
	22]-AKWa26

AKWa - Akola Wood apple

Results and Discussion

The results obtained from a study on wood apple with reference to genotypic, phenotypic and environmental correlation for yield and its associated traits were statistically analysed as per the procedure. The experimental outcomes obtained from the current study were represented and reviewed under below mentioned sub-headings.

Estimation of correlation coefficients

Genotypic and Phenotypic Correlation

With a view to detect degree of interactions with yield related characters, genotypic and phenotypic correlation coefficient were evaluated and introduced in the Table 1 and 2. Correlation studies impart direction on the nature and extent of association between any two pairs of metric traits.

A) Genotypic correlation

1. Fruit weight

The figures depicted in the Table 1 revealed significant and positive correlation for weight of pulp (r = 0.9015), Pulp: skull (r = 0.7455), fruit length (r = 1.0762) and diameter of fruit (r = 0.9314). Also, non-significant and positive correlation indicated with skull weight (r = 0.6035), pulp percent (r = 0.7127), seed size (r = 0.3824), skull thickness (r = 0.2609), number of fruits per 100 g pulp (r = 0.6321) and yield per tree (r = 0.7556). While, other expressed non-significant and negative correlation with weight of seed per fruit (r = -0.0707), number of seeds per 100 g pulp (r = -0.0236) and number of fruits per kg (r = -0.9803).

2. Weight of pulp

The values with reference to weight of pulp revealed significant and positive correlation with Pulp: skull (r = 0.7142), pulp percent (r = 0.7593), fruit length (r = 1.0048) and fruit diameter (r = 0.8621). Although, it expressed non-significant and positive correlation with skull weight (r = 0.4365), weight of seed per 100 g pulp (r = 0.2503), number of seeds per 100 g pulp (r = 0.2315), seed size (r = 0.4257), skull thickness (r = 0.1849), number of fruits per tree (r = 0.6758) and yield per plant (r = 0.7789). Whereas one observation exhibited non-significant and negative correlation i.e. number of fruits per tree (r = -0.8519).

3. Skull weight

The data regarding skull weight showed significant and positive correlation for Pulp: skull (r = 0.0898), skull thickness (r = 0.7793), length of fruit (r = 0.6741) and diameter of fruit (r = 0.6015). While, it expressed non-significant and positive correlation with pulp percent (r = 0.1659), weight of seed per 100 g pulp (r = 0.0940), number of seeds per 100 g pulp (r = 0.3018), seed size (r = 0.3061), number of fruits per tree (r = 0.0635) and yield per plant (r = 0.2505). Also, significant and negative correlation with number of fruits per kg (r = -0.5743).

4. Pulp: skull

Pulp: skull indicated significant and positive correlation for pulp percent (r = 1.0216) and number of fruits per tree (r = 0.7868). Similarly, it revealed non-significant and positive correlation with seed size (r = 0.2106), fruit length (r = 0.7241), diameter of fruit (r = 0.6946) and yield per plant (r = 0.7637). Also, non-significant and negative correlation for weight of seed per 100 g pulp (r = -0.3352), number of seeds per 100 g pulp (r = -0.4163), skull thickness (r = -0.2453) and number of fruits per kg (r = -0.7269).

5. Pulp percent

Pulp percent depicted significant and positive correlation for length of fruit (r = 0.7298) and diameter of fruit (r = 0.6804). Also, non-significant and positive correlation showed for seed size (r = 0.3582), number of fruits per tree (r = 0.7027) and yield per tree (r = 0.7197). Whereas negative and significant correlation showed for weight of seed per 100 g pulp (r = -0.2398) and number of seeds per 100 g pulp (r = -.2345). Also, non-significant and negative correlation with number of fruits per kg (r = -0.7132) and skull thickness (r = -0.0833).

6. Weight of seed per 100 g pulp
Weight of seed per 100 g pulp revealed significant and positive correlation with number of seeds per 100 g pulp (r = 0.8808) and seed size (r = 0.3914). While, it expressed non-significant and positive correlation with skull thickness (r = 0.0630), length of fruit (r = 0.1090) and number of fruits per kg (r = 0.1067). While, non-significant and negative correlation recorded for diameter of fruit (r = -0.0959), number of fruits per tree (r = -0.0970) and yield per tree (r = -0.0813).

7. Number of seed per 100 g pulp
Number of seed per 100 g pulp expressed significant and positive correlation with seed size (r = 0.1771) and fruit length (r = 0.1329). However, it showed non-significant and positive correlation for skull thickness (r = 0.1526), fruit diameter (r = 0.0288) and number of fruits per kg (r = 0.0583). However, non-significant and negative correlation recorded with number of 100 g pulp per tree (r = -0.3565) and yield per tree (r = -0.2542).

8. Seed size
Seed size revealed non-significant and positive correlation for skull thickness (r = 0.6506), fruit length (r = 0.4088), fruit diameter (r = 0.2539), number of fruits per tree (r = 0.1847) and yield per plant (r = 0.2162). However, non-significant and negative correlation recorded only with number of fruits per kg (r = -0.3446).

9. Skull thickness
Skull thickness indicated significant and positive correlation for fruit length (r = 0.1444) and fruit diameter (r = 0.1243). It showed non-significant and negative correlation for number of fruits per tree (r = -0.4708) and yield per tree (r = -0.2897) and significant and negative correlation for number of fruits per kg (r = -0.3651).

10. Length of fruit
Length of fruit significantly and positively correlated with fruit diameter (r = 0.9968). While non-significant and positive correlation showed for number of fruits per tree (r = 0.5702) and yield per tree (r = 0.6919), then non-significant and negative correlation only with number of fruits per kg (r = -1.0007).

11. Fruit diameter
Fruit diameter showed non-significant and positive correlation for number of fruits per tree (r = 0.4224) and yield per plant (r = 0.5262) and non-significant and negative correlation for number of fruits per kg (r = -0.8323)

12. Number of fruits per tree
Number of fruits per tree revealed positive and non-significant correlation for yield per plant (r = 0.9627) and showed non-significant and negative correlation for number of fruits per kg (r = -0.5427).

13. Number of fruits per kg
Number of fruits per kg expressed non-significant and negative correlation for yield per plant (r = -0.6823).

B) Phenotypic correlation
1. Fruit weight: The data mentioned in the Table 2 exhibited significant and positive correlation for weight of pulp (r = 0.8458), weight of skull (r = 0.4320), Pulp: skull (r = 0.5664), pulp percent (r = 0.6067), skull thickness (r = 0.2351), fruit length (r = 0.7175), diameter of fruit (r = 0.7701), number of fruits per tree (r = 0.4950), number of fruits per kg (r = 0.9234) and yield per plant (r = 0.6972). Also, it depicted non-significant and positive correlation for weight of seed per 100 g pulp (r = 0.0995), number of seeds per 100 g pulp (r = 0.0946) and seed size (r = 0.1951).

2. Weight of pulp
The data owing to weight of pulp exhibited significant and positive correlation for number of seeds per 100 g pulp (r = 0.3480), skull weight (r = 0.2826), Pulp: skull (r = 0.6513), pulp percent (r = 0.6764), weight of seed per 100 g pulp (r = 0.2404), seed size (r = 0.2199), fruit length (r = 0.5836), diameter of fruit (r = 0.5799), number of fruits per tree (r = 0.4954), number of fruits per kg (r = 0.7711) and yield per plant (r = 0.6905). Although, it expressed non-significant and positive correlation for number of seeds per 100 g pulp (r = 0.1866) and skull thickness (r = 0.1117).

3. Skull weight
The data regarding skull weight revealed significant and positive correlation for skull thickness (r = 0.4538), length of fruit (r = 0.4946), diameter of fruit (r = 0.4896) and number of fruits per kg (r = 0.4058). Also, showed non-significant and positive correlation for weight of seed per 100 g pulp (r = 0.1388), number of seeds per 100 g pulp (r = 0.3018), seed size (r = 0.1067), number of fruits per tree (r = 0.0433) and yield per plant (r = 0.1761) and non-significant and negative correlation for Pulp: skull (r = -0.2701) and pulp percent (r = -0.0623).

4. Pulp: skull
Pulp: skull appeared significant and positive correlation for pulp percent (r = 0.8694), fruit length (r = 0.2985), fruit diameter (r = 0.3124), number of fruits per tree (r = 0.4874), number of fruits per kg (r = 0.5485) and yield per plant (r = 0.5604). Although, exhibited non-significant and positive correlation for seed size (r = 0.0446). Similarly, non-significant and negative correlation for weight of seeds per 100 g pulp (r = -0.0605) and skull thickness (r = -0.1872) and significant and negative correlation for number seed per 100 g pulp (r = -0.3210).

5. Pulp percent
Pulp percent revealed significant and positive correlation for length of fruit (r = 0.3241), fruit diameter (r = 0.3665), number of fruits per tree (r = 0.4070) and yield per plant (r = 0.4984). Similarly, non-significant and positive correlation observed for weight of seed per 100 g pulp (r = 0.0455) and seed size (r = 0.0534). While, significant and negative correlation expressed for number of fruits per kg (r = -0.5250) and non-significant and negative correlation for number of seeds per 100 g pulp (r = -0.1064) and skull thickness (r = -0.0740).

6. Weight of seed per 100 g pulp
Weight of seed per 100 g pulp exhibited significant and positive correlation for number of seeds per 100 g pulp (r = 0.6581), seed size (r = 0.3197) and length of fruit (r = 0.2502). However, it manifested non-significant and positive correlation with skull thickness (r = 0.1281), fruit diameter (r = 0.1082) and yield per plant (r = 0.0351).

While, non-significant and negative correlation expressed for number of fruits per tree (r = -0.0168) and number of fruits per kg (r = -0.0068).

7. Number of seed per 100 g pulp

Number of seed per 100 g pulp exhibited significant and positive correlation for skull thickness (r = 0.3526), fruit length (r = 0.2586), diameter of fruit (r = 0.2550) and number of fruits per tree (r = 0.2502). While, non-significantly and positively correlated for seed size (r = 0.2022). While non-significant and negative correlation expressed for number of fruits per kg (r = -0.0002) and yield per plant (r = -0.1463).

8. Seed size

Seed size observed significant and positive correlation for skull thickness (r = 0.3471), length of fruit (r = 0.2428) and fruit diameter (r = 0.2435). Also, exhibited non-significant and positive correlation for number of fruits per tree (r = 0.1766) and yield per plant (r = 0.1772). It also revealed non-significant and negative correlation only for number of fruits per kg (r = -0.1888).

9. Skull thickness

Skull thickness exhibited significant and positive correlation for fruit length (r = 0.4477) and fruit diameter (r = 0.3930). While showed non-significant and negative correlation for number of fruits per tree (r = -0.1461) and yield per plant (r = -0.0219) and significantly and negatively correlated for number of fruits per kg (r = -0.2537).

10. Length of fruit

Fruit length significantly and positively correlated for fruit diameter (r = 0.7834), number of fruits per tree (r = 0.3823) and yield per plant (r = 0.4977) and number of fruits per kg (r = 0.7025).

11. Fruit Diameter

Fruit diameter expressed significant and positive correlation for number of fruits per tree (r = 0.3184) and yield per plant (r = 0.4513) and number of fruits per kg (r = 0.6968).

12. Number of fruits per tree

Number of fruits per tree exhibited significant and positive correlation for yield per plant (r = 0.9269) and revealed non-significant and negative correlation for number of fruits per kg (r = -0.4468).

13. Number of fruits per kg

Number of fruits per kg exhibited significant and negative correlation only for yield per plant (r = -0.6552).

Table 1: Estimates of genotypic correlation coefficient for various characters

	Fruit weight	**Weight of pulp**	**Skull weight**	**Pulp: skull**	**Pulp percent**	**Weight of seed per 100 g pulp**	**Number of seeds per 100 g pulp**	**Seed size**	**Skull thickness**	**Length of fruit**	**Fruit diameter**	**Number of fruits per tree**	**Number of fruits per kg**	**Yield per plant (kg)**
Fruit weight	1	0.9015*	0.6035	0.7455**	0.7127	-0.0707	-0.0236	0.3824	0.2609	1.0762**	0.9314*	0.6321	-0.9803	0.7556
Weight of pulp		1	0.4365	0.7142*	0.7593*	0.2503	0.2315	0.4257	0.1849	1.0048*	0.8621**	0.6758	-0.8519	0.7789
Skull weight			1	0.0898*	0.1659	0.0940	0.3018	0.3061	0.7793**	0.6741*	0.6015*	0.0635	-0.5743**	0.2505
Pulp: skull				1	1.0216*	-0.3352	-0.4163	0.2106	-0.2453	0.7241	0.6946	0.7868**	-0.7269	0.7637
Pulp percent					1	-0.2398*	-0.2345**	0.3582	-0.0833	0.7298*	0.6804*	0.7027	-0.7132	0.7197
Weight of seed per 100 g pulp						1	0.8808**	0.3914*	0.0630	0.1090	-0.0959	-0.0970	0.1067	-0.0813
Number of seeds per 100 g pulp							1	0.1771*	0.1526	0.1329*	0.0288	-0.3565	0.0583	-0.2542
Seed size								1	0.6506	0.4088	0.2539	0.1847	-0.3446	0.2162
Skull thickness									1	0.1444**	0.1243*	-0.4708	-0.3651*	-0.2897
Length of fruit										1	0.9968*	0.5702	-1.0007	0.6919
Fruit diameter											1	0.4224	-0.8323	0.5262
Number of fruits per tree												1	-0.5427	0.9627
Number of fruits per kg													1	-0.6823
Yield per plant														1

Table 2: Estimates of phenotypic correlation coefficient for various characters

	Fruit weight	Weight of pulp	Skull weight	Pulp: skull	Pulp percent	Weight of seed per 100 g pulp	Number of seeds per 100 g pulp	Seed size	Skull thickness	Length of fruit	Fruit diameter	Number of fruits per tree	Number of fruits per kg	Yield per plant (kg)
Fruit weight	1	0.8458**	0.4320**	0.5664**	0.6067**	0.0995	0.0946	0.1951	0.2351*	0.7175**	0.7701**	0.4950**	0.9234**	0.6972**
Weight of pulp		1	0.2826**	0.6513**	0.6764**	0.2404*	0.1866	0.2199*	0.1117	0.5836**	0.5799**	0.4954**	0.7711**	0.6905**
Skull weight			1	-0.2701	-0.0623	0.1388	0.348**	0.1067	0.4538**	0.4946**	0.4896**	0.0433	0.4058**	0.1761
Pulp: skull				1	0.8694**	-0.0605	-0.3210**	0.0446	-0.1872	0.2985**	0.3124**	0.4874 **	0.5485**	0.5604**
Pulp percent					1	0.0455	-0.1064	0.0534	-0.0740	0.3241**	0.3665**	0.4070**	-0.5250**	0.4984**
Weight of seed per 100 g pulp						1	0.6581**	0.3197**	0.1281	0.2502*	0.1082	-0.0168	-0.0068	0.0351
Number of seeds per 100 g pulp							1	0.2022	0.3526**	0.2586*	0.2550*	0.2502*	-0.0002	-0.1463
Seed size								1	0.3471**	0.2428*	0.2435*	0.1766	-0.1888	0.1772
Skull thickness									1	0.4477**	0.3930**	-0.1461	-0.2537*	-0.0219
Length of fruit										1	0.7834**	0.3823**	0.7025**	0.4977**
Fruit diameter											1	0.3184**	0.6968**	0.4513**
Number of fruits per tree												1	0.4468**	0.9269**
Number of fruits per kg													1	-0.6552**
Yield per plant														1

Conclusion

According to Table 1, the genotypic correlation values were moderately greater than the phenotypic correlation values in the present experiment designate that the genotypic correlation was found to be better but their appearance was minimized under environmental control. Yield related traits like fruit weight, pulp weight, Pulp: skull ratio, pulp percent, length of fruit, fruit diameter, skull weight and seed size observed significant and positive genotypic correlation with fruit yield per plant. These associated traits were also interlinked among themselves in a positive manner. Hence, it specified the importance of these traits during selection.

The outcomes of the latest study revealed that weight of fruit displayed significant and positive correlation for pulp weight, Pulp: skull ratio, fruit length and diameter of fruit. While non-significant and negative genotypic correlation with seed weight per 100 g pulp, number of seed per 100 g pulp and number of fruits per kg. However, significant and positive phenotypic correlation exhibited for weight of pulp, weight of skull, Pulp: skull ratio, pulp percent, skull thickness, number of fruits per tree, number of fruits per kg, fruit length, fruit diameter and yield per plant.

Weight of pulp trait obtained significant and positive genotypic correlation for characters like Pulp: skull ratio, pulp percent, length of fruit and fruit diameter. While it exhibited significant and positive phenotypic correlation with traits like skull weight, Pulp: skull ratio, pulp percent, seed weight per 100 g pulp, seed size, fruit length, fruit diameter, number of fruits per tree, number of fruits per kg and yield per plant.

Skull weight exhibited significant and positive genotypic correlation with associated traits like Pulp: skull ratio, skull thickness, length of fruit and fruit diameter. Whereas it revealed significant and negative correlation for number of fruits per kg. Similarly, significant and positive phenotypic correlation was obtained for traits like fruit length, fruit diameter, skull thickness, number of seeds per 100 g pulp and number of fruits per kg.

Pulp: skull ratio depicted significant and positive genotypic correlation for traits like pulp percent and number of fruits per tree. Likewise, characters like pulp percent, length of fruit, fruit diameter, number of fruits per tree, number of fruits per kg and yield per plant investigated significant and positive phenotypic correlation. While, number of seeds per 100 g pulp indicated significant and negative phenotypic correlation.

Pulp percent showed significant and positive correlation for traits such as length of fruit and fruit diameter, while significant and negative correlation possessed for traits like seed weight per 100 g pulp and number of seeds per 100 g pulp at genotypic level. At phenotypic level, characters like yield per plant, length of fruit and diameter of fruit indicated significant and positive correlation; while number of fruits per kg showed significant and negative correlation.

For both genotypic and phenotypic levels, weight of seed per 100 g pulp revealed significant and positive correlation for number of seeds per 100 g pulp and seed size. Again, it possessed significant and positive phenotypic correlation for length of fruit.

Number of seeds per 100 g pulp estimated significant and positive genotypic correlation for associated traits like seed size and fruit length. However, it showed significant and positive phenotypic correlation with characters such as skull thickness, fruit length, diameter of fruit and number of fruits per tree.

Seed size was significantly and positively correlated only at phenotypic levels for characters such as skull thickness, length of fruit and fruit diameter.

At both the genotypic and phenotypic levels, skull thickness designated significant and positive correlation for length of fruit and fruit diameter; while number of fruits per kg displayed negatively significant correlation.

In case of fruit length, positive and significant genotypic correlation was observed for character like fruit diameter. While phenotypic correlation was found significant and positive for traits like fruit diameter, number of fruits per tree, number of fruits per kg and yield per plant.

Owing to fruit diameter, significant and positive correlation was recorded for associated traits such as number of fruits per tree, number of fruits per kg and yield per plant only at phenotypic level.

Similarly, number of fruits per tree depicted significant and positive correlation for number of fruits per kg and yield per plant only at phenotypic level.

Likewise, significant and negative phenotypic correlation was calculated for yield per plant in case of number of fruits per kg.

The recent experiment indicated that the proportion of correlation was notably influential among yield per plant and fruit weight. The correlation was highly significant amidst the yield associated traits such as pulp weight, Pulp: skull ratio, length of fruit and diameter of fruit. Thus, a rise in number of fruits and weight of pulp guided improvement in yield per plant. Hence, the preference about number of fruits per plant will be strengthened which spontaneously lead to selection for higher yield.

Almost identical outcomes were investigated by Mishra *et al.* (2008) [9] in Uttar Pradesh, Pandey *et al*. (2008) [10] in accessions from Bihar and Jharkhand and Kumar *et al*. (2021) [7] in Bundelkhand region of Uttar Pradesh.

References

1. Anonymous. Tropical fruit descriptor. International Plant Genetic Resources Institute (IPGRI), Rome; c1980.
2. Bhore DP. Lecture on Dryland Horticulture, Advances in Arid Zone Fruits, M.P.K.V., Rahuri, Maharashtra, India (Unpublished); c1988.
3. Ghosh SN, Banik AK, Banik BC. Conservation, Multiplication and Utilization of wood apple (*Feronia limonia*) a semi-wild fruit crop in West Bengal (India). International Symposium on Minor Fruits and Medicinal Plants, the farmer's training centre in Kalyani, Nadia. Bidhan Chandra Krishi Vishwavidyalaya, West Bengal; c2011 Dec 19-22. p. 1208-1214.
4. Ilango K, Chitra V. Wound healing and antioxidant activities of the fruit pulp of (*Limonia acidissima* Linn.) in rats. Trop J Pharm Res. 2010;9(3):223-230.
5. Johnson HW, Robinson HF, Comstock RE. Estimation of genetic and environmental variability in soybean. Agron J. 1955;47:314-318.
6. Kaulgud SN, Supe VS, Karale AR, Keskar BG. Descriptor of Pomegranate. Department of Horticulture, M.P.K.V., Rahuri (M.S.), India; c1997.
7. Kumar P, Prakash O, Srivastava AK, Thakur N, Chugh V, Singh RS. Correlation studies in wood apple (*Feronia limonia* L.) in Bundelkhand region of Uttar Pradesh. Indian J Pure Appl Biosci. 2021;9(1):316-321.
8. Lande SB, Nirmal VS, Kotecha PM. Studies on preparation of ready-to-serve beverages from wood apple pulp. Beverages Food World. 2010;37(4):69-70.
9. Mishra KK, Singh R, Jaiswal HR. Performance of bael (Aegle marmelos) genotypes under foot-hills region of Uttar Pradesh. Indian J Agric Sci. 2008;70(10):682-683.
10. Pandey D, Shukla SK, Kumar A. Variability in bael accessions from Bihar and Jharkhand. Indian J Hortic. 2008;65(2):226-269.
11. Panse VG, Sukhatme PV. Statistical methods for agricultural workers. New Delhi: ICAR Publications; c1985. p. 155.
12. Patil R. Genetic variability and divergence studies in Guava (*Psidium guajava* L.) [Ph.D. thesis]. Akola (M.S.), India: Dr. P.D.K.V.; c2014.
13. Reuther W, Webber JH, Batchelor LD. Citrus industry. Berkeley, CA: University of California, Division of Agricultural Sciences; c1967.
14. Rodriguez-Medina NN, Fermin GA, Ealdes-Infante J, Velasquez B, Rivero D, Martinez F, *et al*. Illustrated descriptor for guava (*Psidium guajava* L.). Acta Hortic. 2010;849:103-109.
15. Trimen H. A Handbook of Flora of Ceylon. London: Dulau & Co. Ltd.; c1893.