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Study of correlation coefficient for yield and its components in spine gourd (*Momordica dioica* Roxb.)

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Abstract
Twelve genotype of spine gourd (*Momordica dioica* Roxb.) were evaluated in a Randomized Block Design with three replications at Horticulture Instructional farm, COA, IGKV, Raipur (C.G) during *Kharif* 2018. Correlation coefficients were carried out to study the Character association and contribution, respectively for fifteen qualitative characters. Results of correlation coefficient analysis revealed that fruit yield per plant showed the highest significant positive association with number of branches per plant, number of fruits per plant, fruit length, fruit width and average fruit weight at both genotypic and phenotypic levels and had negative and significant association with days to first fruit harvest and fruiting periods. Hence, in selection programme, emphasis should be given on these traits for improvement in fruit yield of spine gourd.

Keywords: Spine gourd, Correlation coefficient

Introduction
Spine gourd (*Momordica dioica* Roxb., 2n = 2X= it is 28) is a nutritionally rich, dioecious and perennial cucurbit having a wide range of adaptability, distributed throughout India, China, Nepal, Pakistan Shri Lanka and Bangladesh (Rai, *et al.*, 2012) [10]. It has originated from Indo-Malayan region (Rashid, 1976) [12]. It is widely cultivated in Odisha, Maharastra, Bihar, West Bengal and Chhattisgarh and slowly gaining popularly as a commercial vegetable crop because of its rich taste and high nutritional value. Spine gourd climber plant commonly known as Kankoda, Kheksi, Teasle gourd, Kakrol, Kantola, Meetha Karela, and Kantroli. Various plant parts are consumed in a variety of ways,viz., immature green fruits, young twigs and leaves of this crop are used for controlling diabetes, blood pressure, heart attack, fever, eye disease respectively. Average nutritional value per 100 g edible fruit of spine gourd was found to contain 84.1% moisture, 7.7 g carbohydrate, 3.1g protein, 3.1 g fat, 2.8 g fiber, 4.1 g iron, 3.3 g calcium, 176.1 mg riboflavin and 275 mg ascorbic acid. Improvement in any crop depends upon the genetic variability coupled with high genetic advance are more useful for selection of desirable genotypes. Hence, an attempt was made to estimate genetic variability, heritability and genetic advance in genotype of spine gourd.

Materials and Methods
Twelve promising genotypes including two checks of spine gourd were evaluated during *Kharif* season of 2018. All these genotypes were obtain from Raj Mohani Devi College of Agriculture and Research Station, Ambikapur (C.G.), Narendra Dev University of Agriculture and Technology, Faizabad (U.P.) and Main campus (Voluntary centre) College of Agriculture, IGKV, Raipur. The crop was raised in Randomized Complete Block Design with three replications. Each genotype and checks was sown in plot size of 1m X 1m. Biometric observations on five plants randomly selected were recorded for the trait listed in Table 1. All the recommended agronomical package of practices was followed to facilitate better crop growth. The crop was maintained under semi-irrigated condition. The mean data were subjected to Statistical analysis of correlation coefficient Searle (1961) [13].

Results and Discussion
Estimates of genotypic and phenotypic correlation coefficient for all traits as sown in table 1.

revealed that vine length had significant positive association with internode length, fruit length, fruit width and 100 seed weight and had significantly negative correlation with average fruit weight. Number of branches per plant had significant positive association with number of fruits per plant, fruit width, fruit length, 100 seed weight and fruit yield per plant and had significantly negative correlation with days to first female flower appearance, days to first female flowering node, days to first fruit harvest, days to last fruit harvest and fruiting period. Internode length had significant positive association with Number of fruits per plant, fruit width and had significantly negative correlation with average fruit weight. Days to first female flower appearance had significant positive association with days to first female flowering node, days to first fruit harvest, days to last fruit harvest and fruiting period and had significantly negative correlation with number of fruits per plant, fruit length and fruit width.

Days to first female flowering node had significant positive association with days to first fruit harvest, days to last fruit harvest and fruiting period but had significantly negative correlation with number of fruits per plant, fruit length, fruit width and 100 seed weight. Days to first fruit harvest had significant positive association with days to last fruit harvest and fruiting periods but had significantly negative correlation with number of fruits per plant, fruit length, fruit width and fruit yield per plant. Days to last fruit harvest had significant positive association with fruiting periods but had significantly negative correlation with number of fruits per plant and fruit length. Number of fruits per plant significant positive association with fruit length, fruit width and fruit yield per plant and had negative association with fruiting periods.

Fruiting period had significant positive association with number of seeds per fruit at genotypic level and had significantly negative correlation with fruit width, average fruit weight and fruit yield per plant. Fruit length had significant positive association with fruit width, 100 seed weight and fruit yield per plant. Fruit width had significant positive association with 100 seed weight and fruit yield per plant. Average fruit weight had significant positive association with fruit yield per plant. Number of seeds per fruit had significant positive association with 100 seed weight.

The character fruit yield per plant found positive and significant correlation with number of branches per plant, number of fruits per plant, fruit length, fruit width and average fruit weight but had negative and significant association with days to first fruit harvest and fruiting periods at both genotypic and phenotypic levels. Similar findings on association of fruit yield per plant with number of fruits per plant has been also reported by Aliya *et al.* (2014) [1], Basumatary *et al.* (2014) [3] and Chattopadhyay *et al.* (2016) [5] with fruit length along with fruit width by Rahman *et al.* (2011) [9], Aliya *et al.* (2014) [1], Archana *et al.* (2017) [2] and Prabhakar *et al.* (2017) [8] with average fruit weight by Rahman *et al.* (2011) [9], Aliya *et al.* (2014) [1] and Prabhakar *et al.* (2017) [8] in spine gourd genotypes. The character fruit yield per plant had negative and significant correlation with days to first fruit harvest and fruiting period at both genotypic and phenotypic levels. Similar results were reported by Prabhakar *et al.* (2017) [8] in spine gourd.

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Table 1: Genotypic correlation coefficients for fruit yield and its components in spine gourd

Character		1 Vine length (cm)	2 Number of branches per plant	3 Internode length (cm)	4 Days to first female flower appearance	5 Days to first female flowering node	6 Days to first fruit harvest	7 Days to last fruit harvest	8 Number of fruits per plant	9 Fruiting period	10 fruit length (cm)	11 fruit width (cm)	12 Average fruit weight (g)	13 Number of seeds per fruit	14 100 seed weight (g)	15 fruit yield per plant (g)
1	G	-														
	P															
2	G	0.290	-													
	P	0.214														
3	G	0.575**	0.212	-												
	P	0.368*	0.194													
4	G	0.073	-0.492**	0.081	-											
	P	0.044	-0.429**	0.030												
5	G	0.028	-0.468**	0.122	0.980**	-										
	P	0.031	-0.444**	0.108	0.904**											
6	G	-0.074	-0.613**	-0.006	0.867**	0.798**	-									
	P	-0.034	-0.528**	-0.015	0.754**	0.705**										
7	G	-0.100	-0.511**	0.133	0.611**	0.466**	0.645**	-								
	P	-0.107	-0.455**	0.064	0.556**	0.439**	0.579**									
8	G	0.131	0.831**	0.337*	-0.704**	-0.571**	-0.859**	-0.653**	-							
	P	0.153	0.707**	0.267	-0.639**	-0.543**	-0.749**	-0.628**								
9	G	0.007	-0.629**	0.148	0.655**	0.500**	0.840**	0.906**	-0.781**	-						
	P	0.025	-0.549**	0.123	0.621**	0.480**	0.479**	0.838**	-0.735**							
10	G	0.413*	0.582**	-0.001	-0.452**	-0.448**	-0.495**	-0.403*	0.511**	-0.368*	-					
	P	0.333*	0.429**	0.070	-0.412*	-0.391*	-0.383*	-0.379*	0.476**	-0.322						
11	G	0.354*	0.827**	0.447**	-0.508**	-0.467**	-0.524**	-0.329*	0.682**	-0.395*	0.810**	-				
	P	0.282	0.725**	0.316	-0.409*	-0.438**	-0.441**	-0.267	0.545**	-0.365*	0.667**					
12	G	-0.441**	0.213	-0.562**	-0.180	-0.132	-0.125	-0.216	0.196	-0.378*	0.068	0.017	-			
	P	-0.396*	0.202	-0.484**	-0.172	-0.128	-0.122	-0.200	0.185	-0.376*	0.055	0.014				
13	G	-0.140	-0.070	-0.511**	0.190	-0.014	0.502**	0.129	-0.426**	0.432**	0.140	0.046	0.207	-		
	P	-0.118	-0.011	-0.049	0.081	0.037	0.304	0.048	-0.274	0.278	0.135	-0.024	0.127			
14	G	0.521**	0.451**	-0.309	-0.382*	-0.468**	-0.249	-0.183	0.159	-0.165	0.639**	0.473**	0.269	0.450**	-	
	P	0.332*	0.410*	-0.185	-0.315	-0.410*	-0.229	-0.178	0.129	-0.147	0.552**	0.362**	0.254	0.396*		
15	G	0.279	0.825**	0.309	-0.276	-0.189	-0.469**	-0.262	0.800**	-0.447**	0.494**	0.602**	0.336*	-0.288	0.296	-
	P	0.250	0.754**	0.255	-0.245	-0.186	-0.428**	-0.254	0.779**	-0.433**	0.461**	0.535**	0.365*	-0.205	0.275	