Biological Forum – An International Journal **14(4): 634-640(2022)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Genotypic, Phenotypic coefficient of Variation and Heritability and Path coefficient Analysis for Growth and Yield Contributing Parameters in Floribunda Rose

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(Received 06 September 2022, Accepted 22 October, 2022)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: In India even though a large number of rose varieties are developed but estimation of the phylogenetic relationship and knowing the genetic diversity between genotypes in germplasm of any species is essential as it provides useful traits for further genetic development and increase selection efficiency. Genetic diversity in plant varieties can be estimated by observing the phenotypes of the plants and measuring the morphological characters which in turn lay foundation for breeding programs. Hence the present study on Genotypic, Phenotypic Coefficient of variation and heritability and Path coefficient analysis for growth and yield contributing parameters in floribunda rose. For several yield-attributing variables, correlation and path analyses were carried out for 11 distinct floribunda rose genotypes. To distinguish the role that each component played in the ultimate flower yield, there are a total of twelve separate parameters. The findings showed that for the characters under study, the genotypic correlations were higher than the phenotypic correlations, showing the traits' strong heritability. The range of phenotypic coefficient of variation was 9.51% (flower length at 285 DAP) to 22.341%. (Number of petals per flower). Genotypic coefficient of variation ranged from 6.95 per cent (flower length at 285 DAP) to 21.23 per cent (flower length at 285 DAP). The estimates of heritability ranged from 46.60 (No. of branches 225 DAP) to 92.50 per cent (Plant spread at 345 DAP). Genetic advance expressed as percentage over mean ranged from 10.46 (flower length at 285 DAP) to 41.57 per cent (Number of petals per flower). The genotypic correlation of flower yield per plant showed highly significant and positive correlation with number of flower per plant (0.859) number of flower per bunch at 225DAP (0.836), number of flower per bunch at 285DAP (0.933), number of flower per bunch at 345DAP (0.759), plant height at 345DAP (0.693), number of branches per plant at 345DAP (0.953), flower length at 345DAP (0.872) and flower diameter at 345DAP (0.860). Since these associations are in desirable direction and selection of these traits may ultimately improve the yield. The path coefficient results showed that at the genotypic level, the number of flowers per bunch at 285 DAP (0.337), the diameter of the flower at 345 DAP (0.087), the length of the flower at 285 DAP (0.364), the spread of the plant at 345 DAP (0.537), the number of branches at 285 DAP (0.049), and the plant height at 225 DAP (0.122) all exhibited the maximum positively direct effect on flower yield per plant.

Keywords: Floribunda rose, Genotypic, Phenotypic Coefficient of variation and Heritability.

INTRODUCTION

One of nature's most exquisite creations, the floribunda rose, often known as the "Queen of Flowers," is a member of the Rosaceae family and is indigenous to temperate areas of the northern hemisphere. Since ancient times, the rose has been the best flower to represent love, adoration, innocence, peace, friendship, affection, passion, and other virtues. In the top 10 cut flower categories on the global flower market, roses come in first. It is cultivated for a variety of uses, including garden flowers, aesthetic value, cut flowers for decoration, loose flowers for garland, and the production of products like rose oil, rose water, gulkhand, and rose attar. The influence of these elements can be determined through correlation studies. Yield is a polygenically regulated quantitative character, which is the entire effect of a number of component factors under which variety is developed. From regional material gathered from various regions of the country, numerous cultivars have been created. Despite varietal development, it is necessary to create genotypes with improved yield, quality, and environmental adaptability. A variety might only thrive in a specific environment, therefore it is important to understand the genetic potential of many genotypes and how they interact with the environment. Then, based on how well they perform, the ideal genotype for growth and blooming qualities should be chosen.

The relationships between various plant characters are intricate, and the characters do not stand alone. Due to pleiotrophy or genetic connection, these traits frequently correlate with one another (Harland, 1939). Selection that is based on the components of the yield will be more fruitful for reasonable approaches to

improving yield. The complexity of the employees' investigation was increased by the great variety of groupings and variants of this flower. Its flower yield has a complicated personality as a result of the interactions between many elements. The measurement of the direct influence of one variable on other variables is made possible with the use of path coefficient analysis and correlation, which provide details on the type and strength of various linkages. The correlation coefficient reveals how closely related the characters are to one another. When choosing acceptable genotypes to increase floral yield, one should consider the type of correlation between flower yield and yield attributes to assess the direct and indirect influences of flower yield components. This is done by route coefficient analysis. In addition, correlation and path coefficient are crucial tools for choosing desired features and boosting floribunda rose yield. The major goal of plant breeders is to create floribunda rose types with strong yields that are appropriate for use as cut flowers. To ease selection based on component qualities, useful traits for plant breeders include knowledge of the degree of link between yield and its many components (Prasad *et al*., 2011). In light of the aforementioned facts, the current study was conducted with the aim of analysing and determining the traits having greater inter-relationship with flower yield using correlation and path analysis, and to generate such yield components may provide a solid foundation for a successful varietal development programme to assist breeders in improving the floribunda rose. Hence, for effective selection, a thorough study on genotypic and phenotypic variability is essential (Kumari *et al*., 2017). Correlation studies and further partitioning into various components of yield and other characters are rational approaches to understand the nature and magnitude of their relationship (Dey *et al*., 2021). As the breeders are always interested in the improvement of several economic characters including yield, the knowledge of correlation among the traits is important to have the idea of concurrent changes which would be brought about in other traits while making selection for one trait (Bennurmath *et al*., 2021). It is a well-known fact that there exists a complex association among different characters in the plant system. Knowledge of association of various characters should provide necessary information on indirect selection for improvement in flower yield (Henny *et al.*, 2021). The association between two characters is generally through a complicated pathway involving various other attributes which may have direct or indirect effect on the resultant or end character (Lal *et al*., 2014). So, the direct contribution of the component characters to resultant character from the indirect effects due to the inter relationship of different characters can be determine with the help of path coefficient analysis. It is desirable for plant breeder to know the extent of relationship between yield and its various components, which will facilitate selection based on component traits (Prasad *et al*., 2011). Keeping in view the above facts, present investigation was undertaken with an objective to analyze and determine the traits having greater interrelationship with number of flowers per plant utilizing the correlation and path analysis and to help breeders in improvement of floribunda rose.

MATERIALS AND METHODS

Field experiment was conducted at College of Horticulture, Bidar. Light digging operation was done to loosen the soil for better aeration. The experimental field was prepared to a fine tilth by deep ploughing and harrowing. The field was ploughed twice before one month of planting and farm yard manure was incorporated at the rate of @ 20 t ha^{-1} at land harrowing and mixed well. The experiment was laid out using RCBD with three replications and 11 genotypes *viz*., V_1 - Aishwarya V_2 -Cherishma, V_3 - Five Star, V_4 -Kelly, V_5 - Mirabel, V_6 -Orange Babe, V_7 -Palm D More, V_8 -Ruby Gon, V_9 -Ruby Star, V_{10}-Vanish, V_{11}-Yellow Babe. The adopted spacing is 120 cm × 90 cm. The experimental plots were irrigated immediately after the completion of transplanting and gap filling operation was undertaken. All cultural practices have followed as per package of practices of UHS, Bagalkot. The data collected from the genotypes of floribunda rose on different parameters were subjected to statistical analysis. Correlation coefficients were computed using the method elucidated by Al-Jibouri *et al.* (1958). The direct and indirect effects of component characters on yield were estimated through path analysis technique (Wright, 1921) further it was illustrated by Dewey and Lu (1959).

RESULTS AND DISCUSSION

The range, mean, phenotypic variance (PV), genotypic variance (GV), phenotypic coefficient of variation (PCV), genotypic coefficient of variation (GCV), broad sense heritability (h^2), genetic advance (GA), and genetic advance as a percentage of mean (GAM) were calculated and are shown in Table 1 to help determine the extent to which the observed variations are caused by genetic factors. The statistics showed that most of the analysed features have a significant level of variability.

For every character examined, the phenotypic variance exceeded the genotypic variance. The range of phenotypic coefficient of variation was 9.51% (flower length at 285 DAP) to 22.341% (Number of petals per flower). The floral length at 285 DAP had a genotypic coefficient of variance ranging from 6.95 to 21.23 percent (flower length at 285 DAP). The heritability estimates ranged from 46.60 (225 DAP branches) to 92.50 percent (Plant spread at 345 DAP). From 10.46 (flower length at 285 DAP) to 41.57 (% of genetic advance over mean), genetic advance was expressed as a percentage (Number of petals per flower). These results are in agreement with findings of Palai *et al.* (2003); Manjula (2005) in rose.

Table 1: Estimates of mean, range, components of variance, heritability, genetic advance and genetic advance over percent of mean for growth and yield parameters of floribunda rose.

Character	Mean	Minimum	Maximum	GCV (%)	PCV (%)	h^2 (Broad Sense) (%)	Genetic Advancement 5%	Genetic Advancement as % of Mean 5%	Exp Mean next Generation
Plant height 225 DAP	50.55	43.52	61.45	9.21	12.07	58.30	7.32	14.49	57.87
Plant height 285 DAP	54.48	47.46	65.39	8.54	11.21	58.10	7.30	13.40	61.78
Plant height 345 DAP	61.71	54.54	72.47	7.85	9.12	74.20	8.60	13.93	70.31
No. of branches 225 DAP	6.41	5.34	8.50	11.86	17.36	46.60	1.07	16.68	7.48
No. of branches 285 DAP	6.62	5.57	8.95	13.65	16.15	71.50	1.58	23.77	8.20
No. of branches 345 DAP	6.99	6.06	8.94	12.31	14.73	69.80	1.48	21.18	8.47
Plant spread 225 DAP	45.80	36.53	56.90	13.15	15.03	76.40	10.84	23.68	56.64
Plant spread 285 DAP	44.54	36.92	55.60	13.23	15.91	69.20	10.10	22.67	54.64
Plant spread 345 DAP	49.10	37.58	63.31	17.38	18.07	92.50	16.91	34.45	66.01
Flower length 225 DAP	5.30	4.73	6.10	7.24	9.90	53.50	0.58	10.91	5.88
Flower length 285 DAP	5.53	4.96	6.32	6.95	9.51	53.40	0.58	10.46	6.11
Flower length 345 DAP	5.41	4.73	6.24	9.18	11.42	64.60	0.82	15.21	6.24
Flower diameter 225 DAP	3.93	3.40	4.84	10.87	14.82	53.80	0.65	16.42	4.57
Flower diameter 285 DAP	4.18	3.70	4.85	9.31	12.32	57.10	0.61	14.49	4.78
Flower diameter 345DAP	4.78	4.27	5.71	10.10	11.31	79.70	0.89	18.56	5.67
No. of flower/bunch 225DAP	5.35	4.69	6.96	14.89	16.26	83.90	1.50	28.09	6.85
No. of flower/bunch 285DAP	6.08	5.24	8.36	15.24	17.18	78.60	1.69	27.83	7.77
No. of flower/bunch 345DAP	6.25	5.40	8.47	14.63	16.45	79.10	1.67	26.79	7.92
No. of petals/ flower	42.27	29.03	62.19	21.23	22.34	90.30	17.57	41.57	59.84
duration of flowers	10.56	8.52	12.49	11.06	14.33	59.60	1.86	17.60	12.42
100 flower weight	207.64	182.77	258.65	14.26	14.90	91.50	58.36	28.11	265.99
No. of flower per plant	177.47	138.06	223.99	14.02	15.40	82.90	46.65	26.29	224.12
flower yield per plant	323.81	243.98	432.89	18.02	18.77	92.20	115.43	35.65	439.24
flower yield per hectare	3.01	2.26	4.01	17.80	18.76	90.00	1.05	34.79	4.06

Table 2: Genotypic correlation coefficients among growth, yield and quality parameters in floribunda rose.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2	**1.000**	0.936**	0.986**	0.804**	0.547**	0.711**	0.952**	0.854**	0.952**	0.541**	0.539**	0.705**	0.665**	0.793**	0.613**	-0.098	0.107	0.100	0.803**	-0.030	0.745**	0.592**	0.649**
3		**1.000**	0.916**	0.758**	0.523**	0.751**	0.893**	0.935**	0.962**	0.640**	0.638**	0.773**	0.672**	0.840**	0.685**	-0.064	0.136	0.136	0.771**	0.068	0.776**	0.635**	0.693**
4			**1.000**	0.626**	0.469**	0.627**	0.877**	0.972**	0.897**	0.619**	0.618**	0.724**	0.611**	0.779**	0.623**	-0.093	0.108	0.103	0.757**	0.024	0.720**	0.552**	0.668**
5				**1.000**	0.841**	0.942**	0.922**	0.982**	0.959**	0.902**	0.895**	0.983**	0.859**	0.926**	0.726**	0.701**	0.940**	0.946**	0.721**	0.030	0.918**	0.986**	0.747**
6					**1.000**	0.936**	0.760**	0.819**	0.793**	0.903**	0.901**	0.895**	0.906**	0.865**	0.920**	0.780**	0.957**	0.961**	0.509**	0.203	0.932**	0.918**	0.953**
7						**1.000**	0.939**	0.958**	0.929**	0.903**	0.032	0.905**	0.966**	0.928**	0.724**	0.542**	0.801**	0.806**	0.664**	-0.092	0.937**	0.871**	0.952**
8							**1.000**	0.935**	0.985**	0.810**	0.809**	0.943**	0.939**	0.883**	0.857**	0.263**	0.514**	0.503**	0.869**	-0.266	0.922**	0.797**	0.928**
9								**1.000**	0.962**	0.874**	0.873**	0.943**	0.931**	0.972**	0.838**	0.294**	0.508**	0.502**	0.803**	0.016	0.932**	0.841**	0.866**
10									**1.000**	0.831**	0.831**	0.915**	0.957**	0.870**	0.801**	0.356**	0.515**	0.518**	0.800**	0.042	0.866**	0.752**	0.836**
11										**1.000**	0.730**	0.827**	0.889**	0.815**	0.716**	0.535**	0.610**	0.606**	0.819**	0.092	0.911**	0.886**	0.929**
12											**1.000**	0.733**	0.759**	0.724**	0.614**	0.550**	0.601**	0.605**	0.824**	0.264	0.809**	0.776**	0.872**
13												**1.000**	0.748**	0.623**	0.536**	0.524**	0.542**	0.568**	0.891**	0.032	0.791**	0.858**	0.896**
14													**1.000**	0.944**	0.903**	0.468**	0.734**	0.716**	0.693**	-0.032	0.970**	0.688**	0.861**
15														**1.000**	0.831**	0.467**	0.732**	0.715**	0.693**	-0.031	0.968**	0.686**	0.860**
16															**1.000**	0.406**	0.674**	0.645**	0.723**	-0.130	0.955**	0.748**	0.836**
17																**1.000**	0.849**	0.808**	0.656**	0.048	0.859**	0.826**	0.933**
18																	**1.000**	0.503**	0.726**	-0.210	0.956**	0.633**	0.759**
19																		**1.000**	0.705**	-0.274	0.962**	0.694**	0.847**
20																			**1.000**	0.341	0.434**	0.649**	0.646**
21																				**1.000**	0.700**	0.786**	0.872**
22																					**1.000**	0.770**	0.859**
23																						**1.000**	0.809**
24																							1.00

Residual effect = 0.0574

1. Plant height 225 DAP
2. Plant height 285 DAP
3. Plant height 345 DAP
4. No. of branches 225 DAP
5. No. of branches 285 DAP
6. No. of branches 345 DAP
7. Plant spread 225 DAP
8. Plant spread 285 DAP
9. Plant spread 345 DAP
10. Flower length 225 DAP
11. Flower length 285 DAP
12. Flower length 345 DAP
13. Flower diameter 225 DAP
14. Flower diameter 285 DAP
15. Flower diameter 345DAP
16. No. of flower/bunch 225DAP
17. No. of flower/bunch 285DAP
18. No. of flower/bunch 345DAP
19. No. of petals/ flower
20. duration of flowers
21. 100 flower weight
22. no. of flower per plant
23. flower yield per plant
24. flower yield per hectare

Table 3: Genotypic path coefficients among growth, yield and quality parameters in floribunda rose.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	**0.122**	0.150	0.144	0.098	0.067	0.087	0.116	0.123	0.116	0.066	0.066	0.086	0.081	0.096	0.075	-0.012	0.013	0.012	0.098	-0.004	0.091	0.072	0.073	0.649
2	-0.063	**-0.051**	-0.056	-0.038	-0.027	-0.038	-0.045	-0.051	-0.049	-0.032	-0.032	-0.039	-0.034	-0.043	-0.035	0.003	-0.007	-0.007	-0.039	-0.004	-0.039	-0.032	-0.032	0.693
3	-0.175	-0.163	**-0.147**	-0.092	-0.069	-0.092	-0.129	-0.143	-0.132	-0.091	-0.091	-0.107	-0.090	-0.115	-0.092	0.014	-0.016	-0.015	-0.112	-0.004	-0.106	-0.081	-0.090	0.668
4	0.135	0.127	0.105	**0.168**	0.192	0.175	0.155	0.165	0.161	0.168	0.168	0.165	0.195	0.172	0.172	0.118	0.158	0.159	0.121	0.005	0.186	0.166	0.182	0.747
5	0.027	0.026	0.023	0.056	**0.049**	0.051	0.037	0.040	0.039	0.044	0.044	0.044	0.051	0.042	0.045	0.038	0.047	0.047	0.025	0.010	0.046	0.045	0.046	0.953
6	-0.035	-0.037	-0.031	-0.052	-0.051	**-0.049**	-0.046	-0.047	-0.046	-0.051	-0.051	-0.052	-0.058	-0.051	-0.051	-0.027	-0.040	-0.040	-0.033	0.005	-0.051	-0.043	-0.046	0.952
7	-0.147	-0.137	-0.135	-0.142	-0.117	-0.145	**-0.154**	-0.144	-0.152	-0.125	-0.124	-0.145	-0.160	-0.136	-0.132	-0.040	-0.079	-0.077	-0.134	0.041	-0.142	-0.123	-0.136	0.928
8	-0.148	-0.147	-0.142	-0.144	-0.120	-0.140	-0.137	**-0.147**	-0.151	-0.128	-0.128	-0.138	-0.151	-0.143	-0.123	-0.043	-0.074	-0.074	-0.118	-0.002	-0.137	-0.123	-0.121	0.866
9	0.511	0.516	0.481	0.515	0.426	0.499	0.529	0.552	**0.537**	0.446	0.446	0.491	0.514	0.467	0.430	0.191	0.276	0.278	0.430	0.023	0.465	0.404	0.425	0.836
10	-5.773	-6.829	-6.602	-10.69	0.057	-11.02	-8.639	-9.330	-8.86	**-10.67**	-10.67	-10.41	-13.56	-11.13	-11.01	-4.998	-7.831	-7.643	-7.390	0.336	-10.34	-7.345	-9.099	0.861
11	5.593	6.610	6.405	10.377	9.337	10.694	8.382	9.048	8.610	10.364	**10.364**	10.113	13.165	10.805	10.688	4.839	7.587	7.406	7.185	-0.325	10.036	7.112	8.827	0.860
12	-0.012	-0.013	-0.012	-0.017	-0.015	-0.018	-0.016	-0.016	-0.016	-0.017	-0.017	**-0.017**	-0.021	-0.018	-0.018	-0.007	-0.012	-0.011	-0.012	0.002	-0.016	-0.013	-0.014	0.836
13	-0.105	-0.106	-0.096	-0.182	-0.163	-0.183	-0.163	-0.162	-0.150	-0.200	-0.200	-0.191	**-0.157**	-0.172	-0.177	-0.086	-0.134	-0.127	-0.103	-0.008	-0.167	-0.130	-0.147	0.933
14	0.059	0.063	0.058	0.076	0.065	0.077	0.066	0.073	0.065	0.078	0.078	0.080	0.081	**0.075**	0.077	0.017	0.041	0.038	0.054	-0.016	0.071	0.047	0.056	0.759
15	0.054	0.060	0.054	0.090	0.080	0.089	0.075	0.073	0.070	0.090	0.090	0.090	0.098	0.090	**0.087**	0.030	0.057	0.054	0.062	-0.024	0.084	0.061	0.073	0.847
16	-0.007	-0.005	-0.007	0.049	0.054	0.038	0.018	0.020	0.025	0.033	0.032	0.028	0.038	0.016	0.024	**0.069**	0.067	0.069	0.017	0.024	0.030	0.045	0.047	0.647
17	0.036	0.046	0.036	0.316	0.322	0.270	0.173	0.171	0.173	0.247	0.247	0.227	0.286	0.187	0.220	0.327	**0.337**	0.337	0.137	0.077	0.236	0.265	0.301	0.872
18	-0.046	-0.062	-0.047	-0.432	-0.438	-0.368	-0.229	-0.229	-0.236	-0.327	-0.326	-0.296	-0.368	-0.230	-0.280	-0.454	-0.457	**-0.456**	-0.183	-0.109	-0.313	-0.351	-0.398	0.859
19	-0.019	-0.018	-0.018	-0.017	-0.012	-0.015	-0.020	-0.019	-0.019	-0.016	-0.016	-0.017	-0.015	-0.017	-0.016	-0.006	-0.010	-0.009	**-0.023**	0.007	-0.018	-0.014	-0.018	0.809
20	0.001	-0.002	-0.001	-0.001	-0.007	0.003	0.009	-0.001	-0.002	0.001	0.001	0.005	-0.002	0.007	0.010	-0.012	-0.008	-0.008	0.011	**-0.035**	0.005	0.004	0.000	-0.010
21	0.142	0.148	0.137	0.212	0.178	0.198	0.176	0.178	0.165	0.185	0.185	0.182	0.202	0.183	0.184	0.083	0.134	0.131	0.150	-0.027	**0.191**	0.151	0.176	0.934
22	-0.055	-0.059	-0.052	-0.092	-0.086	-0.081	-0.074	-0.078	-0.070	-0.064	-0.064	-0.070	-0.077	-0.059	-0.065	-0.061	-0.073	-0.072	-0.058	0.011	-0.074	**-0.093**	-0.083	0.876
23	0.621	0.651	0.634	1.124	0.971	0.967	0.920	0.861	0.822	0.886	0.885	0.857	0.974	0.775	0.870	0.699	0.928	0.906	0.794	-0.009	0.958	0.923	**1.039**	0.999

1. Plant height 225 DAP
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3. Plant height 345 DAP
4. No. of branches 225 DAP
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6. No. of branches 345 DAP
7. Plant spread 225 DAP
8. Plant spread 285 DAP
9. Plant spread 345 DAP
10. Flower length 225 DAP
11. Flower length 285 DAP
12. Flower length 345 DAP
13. Flower diameter 225 DAP
14. Flower diameter 285 DAP
15. Flower diameter 345DAP
16. No. of flower/bunch 225DAP
17. No. of flower/bunch 285DAP
18. No. of flower/bunch 345DAP
19. No. of petals/ flower
20. duration of flowers
21. 100 flower weight
22. no. of flower per plant
23. flower yield per plant
24. flower yield per hectare

The majority of the investigated characters had stronger genotypic correlations, demonstrating the substantial heritability of the features. The genotypic correlation between flower yield per plant and the number of flowers per plant (0.859), the number of flowers per bunch at 225DAP (0.836), the number of flowers per bunch at 285DAP (0.933), the number of flowers per bunch at 345DAP (0.759), the height of the plant at 345DAP (0.693), the number of branches per plant at 345DAP (0.953), the length of the flower at 345DAP (0.872), and the diameter of the (0.860). The relationship between these characteristics and flower yield per plant is favourable, so choosing these could ultimately increase the yield. Therefore, it is advised to use genotypes that exhibit good yield-attributing character performance. These results are in agreement with the earlier reports of Mukesh *et al.* (2012); Kameswari *et al.* (2015) in chrysanthemum, Kumar et al. (2011) in chrysanthemum and Veluru *et al.* (2019) in china aster and number of flowers plant^{-1} (0.551) in chrysanthemum. From the present study, it may be suggested that yield in term of number of flowers plant^{-1} could be increased through selection of genotypes on the basis of number of branches plant^{-1}, number of leaves plant-1, days to bud initiation and days to optimum flowering in chrysanthemum.

In correlation research, the indirect association becomes more complex as additional factors are added. Just by virtue of their relationship to the third character, two characters may exhibit correlation. In these situations, route coefficient analysis offers a useful method for determining the direct and indirect impacts of association. It also enables a critical investigation of the particular forces at work to form a given correlation and quantifies the relative weight of each factor. Table 3 displayed the matrix of direct and indirect impacts.

At the genotypic level, flower yield per plant was most positively influenced directly by the number of flowers per bunch at 285 DAP (0.337), flower diameter at 345 DAP (0.087), flower length at 285 DAP (0.364), plant spread at 345 DAP (0.537), number of branches at 285 DAP (0.049), and plant height at 225 DAP (0.122). This could be as a result of some genotypes' higher proportion of morphological growth as well as reproductive growth, which results in an increased flower production, and some genotypes' stronger regional adaptability and growth habits. These results are in conformity with the findings of Deka and Paswan (2002); Misra *et al.,* (2013); Kameswari *et al.* (2015) in chrysanthemum.

CONCLUSION

From the present investigation, among all traits studied, stronger genotypic correlations, demonstrating the substantial heritability of the features. The genotypic correlation between flower yield per plant and the number of flowers per plant, the number of flowers per bunch at 225DAP, the number of flowers per bunch at 285DAP , the number of flowers per bunch at 345DAP. The highest heritability coupled with high GAM was observed for flower yield per plant, At the genotypic level, flower yield per plant was most positively influenced directly by the number of flowers per bunch at 285 DAP, flower diameter at 345 DAP, flower length at 285 DAP, plant spread at 345 DAP, number of branches at 285 DAP, and plant height at 225 DAP.

Acknowledgement. The authors are thankful to Dean Collage of Horticulture, Bidar for providing the required research facilities.

Conflict of Interest. None.

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How to cite this article: Vijayalaxmi G.P., Seetaramu G.K., Imamsaheb S.J. and Ganeshgouda Patil (2022). Genotypic, Phenotypic coefficient of Variation and Heritability and Path coefficient Analysis for Growth and Yield Contributing Parameters in Floribunda Rose. *Biological Forum – An International Journal*, *14*(4): 634-640.