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Correlation and Path Analysis in Coriander Genotypes for Yield and Yield Attributing Traits

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Abstract

A field experiment was conducted at the Instructional-cum-Research Farm of the Horticulture Section, Rajarshee Chhatrapati Shahu Maharaj Government College of Agriculture, Kolhapur, to assess associations among yield and yield-attributing traits in 25 coriander genotypes. The experiment was laid out in a Randomised Block Design with two replications. Genotypic and phenotypic correlation coefficients and path coefficients were estimated for fresh weight per plant and related traits. Fresh weight per plant showed positive associations with plant height, length of main stem, leaf length, number of leaves per plant, number of branches per plant, stem girth and foliage yield at both genotypic and phenotypic levels, whereas days to harvest showed a negative association. Plant height and length of main stem displayed particularly strong positive associations with fresh weight per plant. Path coefficient analysis showed that stem girth had the highest positive direct effect on fresh weight per plant (0.66784), followed by foliage yield (0.62847) and number of leaves per plant (0.47148). Plant height (−0.26610), length of main stem (−0.53267) and days to harvest (−0.21320) showed negative direct effects. The residual effect was 0.1244, indicating that the traits included in the analysis accounted for most of the observed variation. These findings suggest that stem girth, foliage yield and number of leaves per plant may be useful selection criteria for improving fresh weight per plant under the conditions of the present experiment.

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Keywords: Coriander; genotypes; correlation analysis; path coefficient analysis; fresh weight per plant; yield-attributing traits; stem girth; foliage yield.

1. Introduction

Coriander (*Coriandrum sativum* L.) is an economically important seed spice crop of India, extensively cultivated for its tender green foliage and mature fruits. The crop possesses considerable culinary, nutritional, medicinal and aromatic value, with its characteristic flavour and aroma mainly associated with volatile oils present in the fruits and foliage (Bhandari & Gupta, 1993; Pathak *et al.*, 2011). Improvement in coriander productivity is an important objective of breeding programmes, particularly through the identification of plant characters associated with higher yield. Recent evaluations of coriander germplasm have likewise documented substantial variation in morphological and yield-related traits, reinforcing the relevance of trait-based selection for crop improvement (Sharangi *et al.*, 2024; Basol *et al.*, 2024; Selvi *et al.*, 2025).

Yield is a complex quantitative character and is influenced by several growth, morphological and yield-attributing traits. Understanding the degree and direction of association among these characters is therefore important for effective selection of superior genotypes. Correlation analysis provides information about the association between yield and its component traits and helps in identifying characters that may be useful as selection criteria. However, simple correlation does not indicate whether the association of a particular character with yield is due to its direct effect or is mediated through other associated traits. A separate evaluation of coriander germplasm also reported substantial variability in morphological traits and grouped genotypes according to contributory characters (Saeed *et al.*, 2022).

Path coefficient analysis provides a more precise understanding of the relationships by partitioning correlation coefficients into direct and indirect effects. Thus, the combined application of correlation and path analysis helps to identify traits with a strong direct contribution to yield and facilitates the formulation of efficient selection strategies. Previous studies have reported significant associations among different yield and yield-attributing characters in coriander (Ameta *et al.*, 2016; Singh *et al.*, 2006). In coriander, path analysis has recently been applied to quantify the contribution of component traits to yield under different sowing conditions (Brar *et al.*, 2026). Nevertheless, limited information is available on the simultaneous genotypic and phenotypic relationships of vegetative and yield-attributing traits with fresh weight per plant in diverse coriander genotypes under the conditions evaluated in the present study.

Hence, the present investigation was undertaken to estimate correlations and conduct path coefficient analysis for yield and yield-attributing characters in coriander.

2. Materials and Methods

During the rabi season of 2025, a field experiment was conducted at the Instructional-cum-Research Farm, Horticulture Section, Rajarshee Chhatrapati Shahu Maharaj Government College of Agriculture, Kolhapur. The experiment comprised 25 genotypes of coriander and was laid out in a Randomised Block Design (RBD) with two replications. The seeds were sown by the line-sowing method. Five plants were randomly selected from each treatment to record observations on eight quantitative characters. The data recorded for various parameters were subjected to statistical analysis following the procedures described by Panse and Sukhatme (1985). Path coefficient analysis was carried out at both genotypic and phenotypic levels following the method proposed by Wright (1921) and later elaborated by Dewey and Lu (1959) to assess the direct and indirect effects of different traits on fresh weight per plant.

Table 1. Detail of genotypes and check cultivar used in the experiment

Sr. No	Genotype No.	Source	Sr. No	Genotype No.	Source
1	ACKCO -1	Solapur Local	14	ACKCO-14	Shrirampur Local
2	ACKCO -2	Ahilyanagar Local	15	ACKCO-15	Kolhapur Local
3	ACKCO-3	Ghodegaon, Pune	16	ACKCO-16	Phaltan, Satara
4	ACKCO-4	Khed, pune	17	ACKCO-17	Mol, Satara
5	ACKCO-5	Kolar Karnatka	18	ACKCO-18	Bhilawadi Sangli
6	ACKCO-6	Radhanagari, kolhapur	19	ACKCO-19	Karad, Satara
7	ACKCO-7	Bagalkoat, Karnatka	20	ACKCO-20	Sangamner Local
8	ACKCO-8	Rajasthan	21	ACKCO-21	Junner, pune
9	ACKCO-9	Dharur, Beed	22	ACKCO-22	Hupari, Kolhapur
10	ACKCO-10	Shirala, Sangali	23	ACKCO-23	Nashik, local
11	ACKCO-11	Songaon, Rahuri	24	ACKCO-24	Solapur Local
12	ACKCO-12	Dahiwadi, Satara	25	Kokan Kasturi	BSKKV, Dapoli
13	ACKCO-13	Dhule Local			

3. Results and Discussion

3.1 Correlation Coefficient Analysis

Correlation analysis is an important tool for assessing the degree of association among different traits and helps identify characters that can be effectively utilised in selection programmes. The phenotypic and genotypic correlation coefficients among fresh weight per plant and its related traits in coriander are presented in Table 2.

Plant height showed a strong positive association with length of main stem (rg = 0.9952, rp = 0.8837), number of leaves per plant (rg = 0.9937, rp = 0.6366), fresh weight per plant (rg = 0.9703, rp = 0.7461), number of branches per plant (rg = 0.9356, rp = 0.6999), leaf length (rg = 0.8825, rp = 0.5444), stem girth (rg = 0.8390, rp = 0.5538) and foliage yield (rg = 0.7390, rp = 0.5071) at both the genotypic and phenotypic levels. On the other hand, plant height exhibited a negative and non-significant association with days to harvest (rg = -0.2845, rp = -0.2936).

The results of the current investigation are in conformity with the findings reported by Kharat *et al.* (2025) and Chandrakala *et al.* (2024).

Length of the main stem exhibited a strong positive association with plant height (rg = 0.9952, rp = 0.8837), fresh weight per plant (rg = 0.9325, rp = 0.7948), number of leaves per plant (rg = 0.8823, rp = 0.6465), stem girth (rg = 0.8735, rp = 0.7206), number of branches per plant (rg = 0.8599, rp = 0.7605), leaf length (rg = 0.7991, rp = 0.5824) and foliage yield (rg = 0.7628, rp = 0.5922) at both the genotypic and phenotypic levels. In contrast, length of the main stem showed a negative and non-significant association with days to harvest (rg = -0.2726, rp = -0.2901).

In the present study, leaf length showed a strong positive association with number of branches per plant (rg = 0.8965, rp = 0.7647), plant height (rg = 0.8825, rp = 0.5444), length of main stem (rg = 0.7991, rp = 0.5824), foliage yield (rg = 0.6342, rp = 0.5017), number of leaves per plant (rg = 0.6240, rp = 0.5555), fresh weight per plant (rg = 0.6169, rp = 0.5269) and stem girth (rg = 0.5430, rp = 0.5017) at both the genotypic and phenotypic levels. However, leaf length exhibited a positive but non-significant correlation with days to harvest (rg = 0.0429, rp = 0.0646).

The present results closely corroborate the findings of Kharat *et al.* (2025).

The results indicated that the number of leaves per plant exhibited a strong positive association with plant height (rg = 0.9937, rp = 0.6366), length of main stem (rg = 0.8823, rp = 0.6465), number of branches per plant (rg = 0.7577, rp = 0.6769), fresh weight per plant (rg = 0.7065, rp = 0.5899), stem girth (rg = 0.6324, rp = 0.5431) and leaf length (rg = 0.6240, rp = 0.5555) at both the genotypic and phenotypic levels. It also showed a positive correlation with foliage yield (rg = 0.4937, rp = 0.4450). Conversely, a negative and non-significant association was observed between number of leaves per plant and days to harvest (rg = -0.3785, rp = -0.2442).

The results obtained in the present study are consistent with the findings of Kharat *et al.* (2025) and Chandrakala *et al.* (2024).

The correlation analysis revealed that the number of branches per plant showed a strong positive association with plant height (rg = 0.9356, rp = 0.6999), leaf length (rg = 0.8965, rp = 0.7647), length of main stem (rg = 0.8599, rp = 0.7605), fresh weight per plant (rg = 0.8131, rp = 0.7288), stem girth (rg = 0.7776, rp = 0.7002), number of leaves per plant (rg = 0.7577, rp = 0.6769) and foliage yield (rg = 0.6526, rp = 0.5633) at both the genotypic and phenotypic levels. On the contrary, number of branches per plant exhibited a negative and non-significant correlation with days to harvest (rg = -0.0678, rp = -0.0975).

These findings are consistent with the reports of Kharat *et al.* (2025) and Chandrakala *et al.* (2024).

In the current experiment, stem girth showed a strong positive association with length of main stem (rg = 0.8735, rp = 0.7206), fresh weight per plant (rg = 0.8427, rp = 0.6730), plant height (rg = 0.8390, rp = 0.5538), number of branches per plant (rg = 0.7776, rp = 0.7002), foliage yield (rg = 0.6502, rp = 0.5702), number of leaves per plant (rg = 0.6324, rp = 0.5431) and leaf length (rg = 0.5430, rp = 0.5017) at both the genotypic and phenotypic levels. In contrast, stem girth exhibited a negative and non-significant association with days to harvest (rg = -0.0643, rp = -0.0628).

The positive association of stem girth with plant height, number of branches, number of leaves, leaf length, and foliage yield observed in the present study is in agreement with the findings of Tejaswini *et al.* (2017), Shah *et al.* (2018), Jangde *et al.* (2018), and Asati and Chandrakar (2021) in amaranthus.

Days to harvest exhibited a negative association with plant height (rg = -0.2845, rp = -0.2936), length of main stem (rg = -0.2726, rp = -0.2901), number of leaves per plant (rg = -0.3785, rp = -0.2442), number of branches per plant (rg = -0.0678, rp = -0.0975), stem girth (rg = -0.0643, rp = -0.0628), foliage yield (rg = -0.0046, rp = -0.0450) and fresh weight per plant (rg = -0.2130, rp = -0.1042) at both the genotypic and phenotypic levels. In contrast, leaf length exhibited a positive but non-significant correlation with days to harvest (rg = 0.0429, rp = 0.0646).

The findings of Chandrakala *et al.* (2024) were in line with the present observations.

Foliage yield showed a strong positive association with fresh weight per plant (rg = 0.8450, rp = 0.6730), length of main stem (rg = 0.7628, rp = 0.5922), plant height (rg = 0.7390, rp = 0.5071), number of branches per plant (rg = 0.6526, rp = 0.5633), stem girth (rg = 0.6502, rp = 0.5702) and leaf length (rg = 0.6342, rp = 0.5017) at both the genotypic and phenotypic levels. It also exhibited a positive association with number of leaves per plant (rg = 0.4937, rp = 0.4450). However, foliage yield was negatively and non-significantly correlated with days to harvest (rg = -0.0046, rp = -0.0450).

The findings of Kharat *et al.* (2025) were in agreement with the present results.

Table 2. Genotypic (above) and phenotypic (below) diagonal correlation coefficients for fresh weight per plant and its component characters in coriander

Traits	PH	LMS	LL	NL	NB	SG	DH	FY	FWPP
PH	**1.000**	0.9952**	0.8825**	0.9937**	0.9356**	0.8390**	-0.2845	0.7390**	0.9703**
LMS	0.8837**	**1.000**	0.7991**	0.8823**	0.8599**	0.8735**	-0.2726	0.7628**	0.9325**
LL	0.5444**	0.5824**	**1.000**	0.6240**	0.8965**	0.5430**	0.0429	0.6342**	0.6169**
NL	0.6366**	0.6465**	0.5555**	**1.000**	0.7577**	0.6324**	-0.3785	0.4937*	0.7065**
NB	0.6999**	0.7605**	0.7647**	0.6769**	**1.000**	0.7776**	-0.0678	0.6526**	0.8131**
SG	0.5538**	0.7206**	0.5017**	0.5431**	0.7002**	**1.000**	-0.0643	0.6502**	0.8427**
DH	-0.2936*	-0.2901*	0.0646	-0.2442	-0.0975	-0.0628	**1.000**	-0.0046	-0.2130
FY	0.5071**	0.5922**	0.5017**	0.4450**	0.5633**	0.5702**	-0.0450	**1.000**	0.8450**
FWPP	0.7461**	0.7948**	0.5269**	0.5899**	0.7288**	-0.0450	-0.1042	0.6730**	**1.000**

PH – Plant Height (cm); LMS- Length of main stem(cm); LL - Leaf Length (cm); NL - No. of Leaves; NB- No. of Branches; SG – Stem Girth (mm); DH – Days to Harvest; FY – Foliage Yield (g) FWPP - Fresh Weight Per Plant (g)

Table 3. Direct and indirect effect of component characters on fresh weight per plant (g) in coriander genotypes

Characters	PH	LMS	LL	NL	NB	SG	DH	FY	Correlation with FWPP (rG)
PH	**-0.26610**	-0.53012	0.15660	0.46852	0.05597	0.56030	0.06066	0.46443	0.9703
LMS	-0.26483	**-0.53267**	0.14178	0.41598	0.05143	0.58334	0.05812	0.47939	0.9325
LL	-0.23484	-0.42563	**0.17744**	0.29422	0.05363	0.36264	-0.00914	0.39860	0.6169
NL	-0.26444	-0.46997	0.11073	**0.47148**	0.04532	0.42236	0.08069	0.31030	0.7065
NB	-0.24897	-0.45802	0.15908	0.35722	**0.05982**	0.51931	0.01445	0.41018	0.8131
SG	-0.22325	-0.46527	0.09635	0.29818	0.04651	**0.66784**	0.01372	0.40865	0.8427
DH	0.07571	0.14522	0.00761	-0.17843	-0.00406	-0.04297	**-0.21320**	-0.00288	-0.2130
FY	-0.19664	-0.40630	0.11253	0.23277	0.03904	0.43422	0.00098	**0.62847**	0.8450

RESIDUAL EFFECT= 0.1244; Diagonal or Bold figures indicates direct effect

PH – Plant Height (cm); LMS – Length of main stem (cm); LL - Leaf Length (cm); NBPP - No. of Branches Per Plant; NL - No. of Leaves; NB – No.of Branches; SG – Stem Girth (mm); DH – Days to Harvest; FY – Foliage yield (g); FWPP - Fresh Weight at harvest (g)

3.2 Path Analysis

Path coefficient analysis provides a standardised partial regression coefficient that estimates the direct effect of one variable on another and partitions the correlation coefficient into direct and indirect effects. The magnitude of effects was classified according to Lenka and Misra (1973) as very high (≥1.00), high (0.30–0.99), moderate (0.20–0.29), low (0.10–0.19) and negligible (<0.10). The direct and indirect effects of different traits on pod yield are presented in Table 3 and Fig. 1 and are discussed in the following sections.

Plant height exhibited a highly significant positive correlation with fresh weight per plant (rg = 0.9703), although it exerted a low negative direct effect (-0.26610) on fresh weight per plant. The trait contributed high positive indirect effects through stem girth (0.56030), number of leaves per plant (0.46852) and foliage yield (0.46443), while a moderate positive indirect contribution was observed via leaf length (0.15660). Conversely, a high negative indirect effect was expressed through length of main stem (-0.53012). Only negligible positive indirect contributions were observed through number of branches (0.05597) and days to harvest (0.06066). These results indicate that the positive association of plant height with fresh weight per plant was mainly mediated through stem girth, foliage yield and number of leaves per plant rather than through its direct effect. A similar trend was also observed by Jangde *et al.* (2018) and Tejaswini *et al.* (2017) in amaranthus.

Length of main stem showed a highly significant positive association with fresh weight per plant (rg = 0.9325), despite exhibiting a low negative direct effect (-0.53267). It contributed substantial positive indirect effects through stem girth (0.58334), foliage yield (0.47939) and number of leaves per plant (0.41598). A moderate positive indirect effect was also observed through leaf length (0.14178). However, the trait expressed a high negative indirect influence through plant height (-0.26483). In addition, only negligible positive indirect effects were recorded through number of branches (0.05143) and days to harvest (0.05812). The strong positive correlation of this trait with fresh weight per plant was therefore mainly due to its favourable indirect effects.

Leaf length exhibited a highly significant positive correlation with fresh weight per plant (rg = 0.6169) and exerted a low positive direct effect (0.17744). It produced considerable positive indirect effects through foliage yield (0.39860), stem girth (0.36264) and number of leaves per plant (0.29422). On the other hand, high negative indirect effects were observed through length of main stem (-0.42563) and plant height (-0.23484). Negligible positive indirect influence was observed through number of branches (0.05363), whereas the indirect effect through days to harvest was negligible and negative (-0.00914). These findings indicate that the contribution of leaf length to fresh weight per plant was largely through its indirect effects on other yield-related traits. The present findings are in agreement with those reported by Tejaswini *et al.* (2017), Asati and Chandrakar (2021), and Shah *et al.* (2018), who also reported a positive association of leaf length with foliage yield and highlighted its importance as a yield-contributing trait in amaranthus.

Number of leaves per plant recorded a highly significant positive correlation with fresh weight per plant (rg = 0.7065) and exhibited a high positive direct effect (0.47148). It also exerted strong positive indirect effects through stem girth (0.42236) and foliage yield (0.31030). Furthermore, small positive indirect effects were observed through leaf length (0.11073), number of branches (0.04532) and days to harvest (0.08069). However, high negative indirect effects were expressed through length of main stem (-0.46997) and plant height (-0.26444). The high direct effect, together with the positive correlation, suggests that number of leaves per plant is an important determinant of fresh weight per plant. These findings corroborate the observations of Jangde *et al.* (2018)**,** Asati and Chandrakar (2021)**,** Shah *et al.* (2018) and Thanusha and Mohanalakshmi (2026) in amaranthus.

Number of branches per plant exhibited a highly significant positive correlation with fresh weight per plant (rg = 0.8131), while recording a low positive direct effect (0.05982). Strong positive indirect contributions were observed through stem girth (0.51931), foliage yield (0.41018) and number of leaves per plant (0.35722). A moderate positive indirect effect was also observed through leaf length (0.15908). However, high negative indirect effects were exerted through length of main stem (-0.45802) and plant height (-0.24897). In contrast, the indirect effect through days to harvest (0.01445) was negligible. Thus, the positive relationship of number of branches with fresh weight per plant was mainly due to its indirect influence through other yield-contributing characters. The findings of the present study are consistent with those reported by Shah *et al.* (2018), Jangde *et al.* (2018), Buhroy *et al.* (2017), and Thanusha and Mohanalakshmi (2026), who also identified number of branches per plant as an important yield-contributing trait with a positive association with foliage or leaf yield in amaranthus.

Stem girth showed a highly significant positive correlation with fresh weight per plant (rg = 0.8427) and recorded a high positive direct effect (0.66784). It also exerted substantial positive indirect effects through foliage yield (0.40865) and number of leaves per plant (0.29818). Small positive indirect contributions were observed through leaf length (0.09635), number of branches (0.04651) and days to harvest (0.01372). In contrast, high negative indirect effects were observed through length of main stem (-0.46527) and plant height (-0.22325). The combination of a high direct effect and a strong positive correlation indicates that stem girth is an important component trait influencing fresh weight per plant. The present findings are in conformity with those reported by Tejaswini *et al.* (2017), Shah *et al.* (2018), Jangde *et al.* (2018), and Asati and Chandrakar (2021), who also identified stem diameter (stem girth) as an important yield-contributing trait with a positive association with foliage or leaf yield in amaranthus.

Days to harvest exhibited a negative correlation with fresh weight per plant (rg = -0.2130) and recorded a moderate negative direct effect (-0.21320). Negligible positive indirect effects were observed through plant height (0.07571), length of main stem (0.14522) and leaf length (0.00761). Conversely, negative indirect effects were exerted through number of leaves per plant (-0.17843), stem girth (-0.04297), number of branches (-0.00406) and foliage yield (-0.00288). The negative direct and indirect effects indicate that delayed harvesting tends to reduce fresh weight per plant.

Foliage yield exhibited a highly significant positive correlation with fresh weight per plant (rg = 0.8450) and recorded a high positive direct effect (0.62847). It also produced substantial positive indirect effects through stem girth (0.43422), number of leaves per plant (0.23277) and leaf length (0.11253). In contrast, high negative indirect effects were observed through length of main stem (-0.40630) and plant height (-0.19664). Negligible positive indirect effects were recorded through number of branches (0.03904) and days to harvest (0.00098). These findings indicate that foliage yield is one of the major traits contributing directly to fresh weight per plant and may therefore serve as an effective selection criterion for improving yield in coriander. The present findings are in agreement with those reported by Tejaswini *et al.* (2017), Asati and Chandrakar (2021), Shah *et al.* (2018), Jangde *et al.* (2018), and Thanusha and Mohanalakshmi (2026), who also identified foliage yield (leaf yield) as a major yield-contributing trait and an effective selection criterion for improving fresh biomass yield in amaranthus.

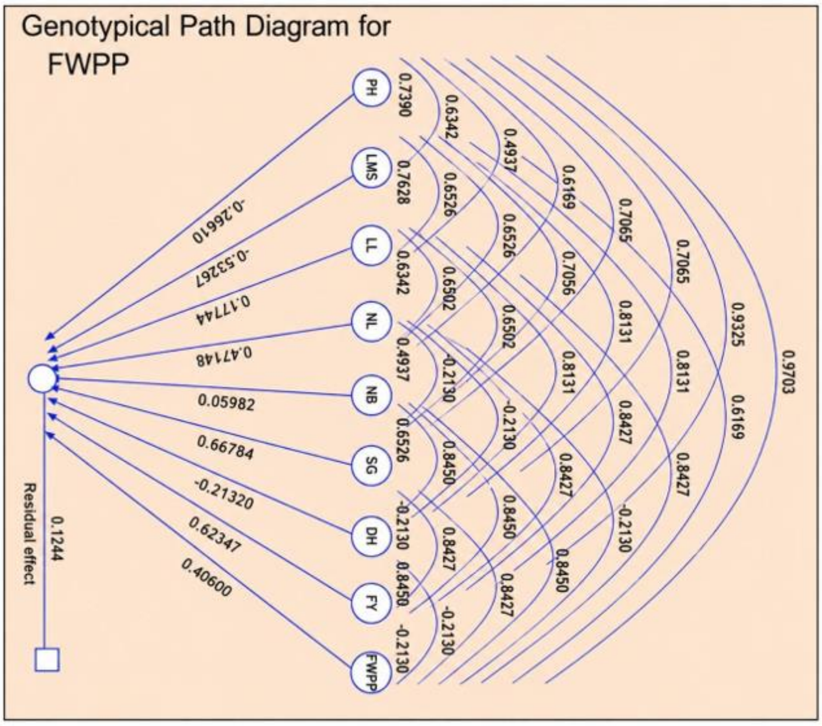

Fig. 1. Genotypical path diagram for fresh weight per plant (g) in Coriander

4. Conclusions

The correlation and path coefficient analyses identified clear relationships between fresh weight per plant and the evaluated vegetative and yield-attributing traits in the coriander genotypes. Fresh weight per plant was positively associated with plant height, length of main stem, leaf length, number of leaves per plant, number of branches per plant, stem girth and foliage yield, whereas days to harvest showed a negative association. Path analysis further showed that stem girth exerted the highest positive direct effect on fresh weight per plant, followed by foliage yield and number of leaves per plant. Although plant height and length of main stem had negative direct effects, their positive correlations with fresh weight per plant were maintained through favourable indirect effects involving other traits. The residual effect of 0.1244 indicated that the traits included in the analysis accounted for most of the variation in fresh weight per plant. Accordingly, stem girth, foliage yield and number of leaves per plant may be considered useful selection criteria for improving fresh weight per plant in the coriander material evaluated.

5. Limitations

This study was limited to 25 coriander genotypes evaluated at a single location during one experimental period with two replications. Consequently, the estimated correlations and path coefficients reflect the genetic material and environmental conditions represented in this experiment. The analysis focused on the measured vegetative and yield-attributing traits in relation to fresh weight per plant; therefore, the relative importance of individual traits may differ under other environments or with broader germplasm. Multi-location and multi-season evaluation would be required to assess the stability of the observed associations and direct effects.

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Declaration of AI Use

This manuscript was prepared through the intellectual contributions of the author(s) to the study design, data analysis, interpretation of results, and scholarly content. Grammarly and ChatGPT were used solely to assist with grammatical refinement and reference formatting during manuscript revision. The author(s) accept full responsibility for the accuracy, integrity, and final content of the manuscript.

Competing Interests

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

References

Ameta, H. K., Ranjan, J. K., Kakani, R. K., Mehta, R. S., Solanki, R. K., Panwar, A., & Kumhar, B. L. (2016). Genetic variability studies in coriander (*Coriandrum sativum* L.). *International Journal of Seed Spices, 6*(2), 103–105.

Asati, B. S., & Chandrakar, M. K. (2021). Genetic analysis for foliage yield attributes in vegetable red amaranth (*Amaranthus tricolor* L.). *International Journal of Current Microbiology and Applied Sciences, 10*(2), 2143–2153. https://doi.org/10.20546/ijcmas.2021.1002.255

Basol, A., Yaldiz, G., & Camlica, M. (2024). Genetic diversity, analysis of some agro-morphological and quality traits, and utilization of plant resources of coriander (*Coriandrum sativum*) supported with cluster and multivariate analyses. *Biology, 13*(11), 866. https://doi.org/10.3390/biology13110866

Bhandari, M. M., & Gupta, A. (1993). Association analysis in coriander. *Indian Journal of Genetics and Plant Breeding, 53*(1), 66–70. https://www.isgpb.org/journal/index.php/IJGPB/article/view/2924

Brar, N. S., Jaidka, M., & Aulakh, S. S. (2026). Effect of time and method of sowing on productivity and multicollinearity in coriander in sub-mountainous region of Punjab. *Archives of Current Research International, 26*(4), 583–593. https://doi.org/10.9734/acri/2026/v26i41848

Buhroy, S., Saraswathi, T., & Ramalingam, J. (2017). Genetic basis of yield and quality variations in vegetable amaranth (*A. tricolor*) to identify the promising genotypes. *International Journal of Current Microbiology and Applied Sciences, 6*(4), 2104–2111. https://doi.org/10.20546/ijcmas.2017.604.248

Chandrakala, R., Venkatesan, K., Selvi, B. S., Senthil, N., & Karthikeyan, G. (2024). Understanding the genetic variability for growth and leaf yield of coriander (*Coriandrum sativum* L.). *Agricultural Science Digest, 44*(2), 301–305. https://doi.org/10.18805/ag.D-5817

Dewey, D. R., & Lu, K. H. (1959). A correlation and path-coefficient analysis of components of crested wheatgrass seed production. *Agronomy Journal, 51*(9), 515–518. https://doi.org/10.2134/agronj1959.00021962005100090002x

Jangde, B., Asati, B. S., Sahu, P., & Tripathy, B. (2018). Correlation and path coefficient analysis in vegetable *Amaranthus* (*Amaranthus tricolor* L.). *International Journal of Chemical Studies, 6*(1), 1426–1431.

Kharat, P. N., Wadekar, V. D., & Bhukan, A. S. (2025). Study of genetic diversity on morphological traits for various genotypes of coriander (*Coriandrum sativum* L.). *Plant Archives, 25*(Supplement 2), 284–292. https://doi.org/10.51470/PLANTARCHIVES.2025.v25.supplement-2.035

Lenka, D., & Misra, B. (1973). Path coefficient analysis of yield in rice varieties. *Indian Journal of Agricultural Sciences, 43*(4), 376–379.

Panse, V. G., & Sukhatme, P. V. (1985). *Statistical methods for agricultural workers* (4th enlarged ed.). Indian Council of Agricultural Research.

Pathak, N. L., Kasture, S. B., Bhatt, N. M., & Rathod, J. D. (2011). Phytopharmacological properties of *Coriander sativum* as a potential medicinal tree: An overview. *Journal of Applied Pharmaceutical Science, 1*(4), 20–25.

Saeed, M. S., Malghani, A. L., Shah, J. A., Amin, M., Ali, S., Raza, M. K., & Hassan, A. (2022). Configuration of morphological dissimilarities and assembly ordination in coriander (*Coriandrum sativum* L.). *Plant Cell Biotechnology and Molecular Biology, 23*(15–16), 64–69. https://doi.org/10.56557/pcbmb/2022/v23i15-167636

Selvi, B. S., Chandrakala, R., Aravind, S., Suresh, R., Venkatesan, K., Mohanalakshmi, M., Vaishnavi, B. A., & Vali, D. M. (2025). Assessment of genetic diversity in coriander (*Coriandrum sativum*) germplasm. *The Indian Journal of Agricultural Sciences, 95*(2), 180–186. https://doi.org/10.56093/ijas.v95i1.153131

Shah, L. R., Afroza, B., Nabi, A., Zehra, S. B., & Lateef, A. (2018). Correlation and path coefficient studies in vegetable amaranth (*Amaranthus* spp.) under temperate conditions of Kashmir. *Journal of Pharmacognosy and Phytochemistry, 7*(4), 1020–1023.

Sharangi, A. B., Bal, S., Maji, A., Upadhyay, T. K., Binsuwaidan, R., Alshammari, N., Alabdallah, N. M., Kolapkar, A., & Saeed, M. (2024). Coriander (*Coriandrum sativum* L.) diversity analysis: Insights from germplasm resources leading to crop improvement. *Turkish Journal of Agriculture and Forestry, 48*(6), 876–887. https://doi.org/10.55730/1300-011X.3227

Singh, D., Jain, U. K., Rajput, S. S., Khandelwal, V., & Shiva, K. N. (2006). Genetic variation for seed yield and its components and their association in coriander (*Coriandrum sativum* L.) germplasm. *Journal of Spices and Aromatic Crops, 15*(1), 25–29.

Tejaswini, N., Ravinder Reddy, K., Saidaiah, P., & Ramesh, T. (2017). Correlation and path coefficient analysis in vegetable amaranth (*Amaranthus tricolor* L.) genotypes. *International Journal of Current Microbiology and Applied Sciences, 6*(6), 2977–2996. https://doi.org/10.20546/ijcmas.2017.606.355

Thanusha, M., & Mohanalakshmi, M. (2026). Analysis of genetic variability, heritability and genetic advance in leafy coriander genotypes. *Plant Archives, 26*(1), 1972–1976. https://doi.org/10.51470/PLANTARCHIVES.2026.v26.no.1.271

Wright, S. (1921). Correlation and causation. *Journal of Agricultural Research, 20*(7), 557–585.

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