Prog. Agric., 1 (1) : 55–58 (2001)

PATH COEFFICIENT ANALYSIS IN INDIAN MUSTARD

S.K. SINGH, JAGBIR SINGH AND H.C. SINGH

Section of Rabi Cereals

C.S.A. Univ. of Agric. & Tech., Knpur—208002

www.IndianJournals.com
Not for Commercial Use
Downloaded From IP - 216.73.216.57 on dated 17-Nov-2026

ABSTRACT

Direct and indirect effect of eight metric traits viz. days to 50 percent flowering, days to maturity, plant hight, number of primary branches, lenght of main raceme, number of seeds per siliqua, 1000-seed weight and harvest index on oil content were studied among 25 diverse strains of Indian mustard (Brassica juncea (L) Czern & Coss). The days to 50 per cent flowering, number of primary branches, seeds per siliqua, length of main receme and 1000-seeds weight had direct positive effects, There was negative direct effects is a days to maturity, plant height and harvest index on oil content and positive direct effects is rest of the characters.

Key word : Path coefficient, Mustard.

Indian mustard is an important oil eed crop of India. In the selection programme, it is useful to have informantion on the contribution of the characters that would be associated with high oil content. Correlation coefficient measures the association between any two characters, which may not produce complete picture of rather complex situation. The association between characters do not exist by themselves alone but are parts of a complicated pathway in which other traits are also inter-woven. Thus present investigation of path coefficient analysis in Indian mustard present a clear picture of interrelation ship furnishes a means of measuring the direct effects as well as indirect effects via other characters on the end product (oil content).

MATERIALS AND METHODS

Twenty-five, genetically diverse strains of Indian mustard were grown in a randomized block design with three replications. Each plot consisted of 5 rows 3m. long and spaced 30cm. apart. Five plants were randomly selected from each plot in each replication. The observations were recorded for days to 50 per cent flowering, days to maturity, plant height, number of primary branches, length of main raceme, number of seeds per siliqua, 1000 seed weight, harvest index and oil content. Path coefficient analysis as applied by (1) was utilized to partition the

genotypic correlation coefficient into measures of direct and indirect effect.

RESULTS AND DISCUSSION

Path analysis revealed that days to 50 per cent flowering, number of primary branches, number of seeds per siliqua, length of main raceme and 1000-seed weight had direct positive effects while, negative direct effects for days to maturity, plant height and harvest index on oil content.

The genotypic correlation of days to 50 per cent flowering was found to be negative and non-significant. Days to per cent flowering showed positive direct-effect on oil content. It was also found to influence the oil content in a positive direction through days to maturity, number of primary branches and number of seeds per siliqua. The indirect effects of this character through Plant height, lenght of main raceme, 1000-seed weight and harvest index was also observed, however negative effect which nullified the positive direct effect on these characters on oil content resulting in vegetative correlation.

Days to maturity was found to be negatively associated with oil content. Its direct effect was in negative indirect effects on oil content through days to 50 per cent flowering, plant height, length of main raceme and number of seeds per siliqua but its indirect effects through number of primary branches, 1000 seed weight and harvest index were positive. The correlation between plant height and oil content was negative and oil content was negative and non-significatint. The direct effect of this character on oil content was found to be negative. The indirect effects through days to maturity and length of main raceme and number of seeds per siliqua are negative. However, the indirect effects through days to 50 per cent flowering, number of primary branches, 1000-seed weight and harvest index were positive. The direct effect of these characters wre found to be of high magnitudes which seems to nullifiy the positive indirect effects. (2) also reported similar findings in Indian mustard.

Number of primary branches was found to be positively but non-significantly associated with oil content. The direct as well as indirect effects of this character through days to 50 per cent flowering, lenght of main raceme and harvest index were positive, which might have resulted in positive association. The indirect effcets of this character through days to maturity, plant height and 1000 seed weight were negative.

The correlation of lenght of main raceme with oil content was found to be negative but non-significant. The direct effect of this character on oil content was also negative but of low magnitude. The indirect effects of the character through days to 50 per cent flowering, 1000 seed weight and harvest index were positive. The genotypic association between number of seeds per siliqua and oil content was

www.IndianJournals.com
Not for Commercial Use
Downloaded From IP - 216.73.216.57 on dated 17-Nov-2026

www.IndianJournals.com
Not for Commercial Use
Downloaded From IP - 216.73.216.57 on dated 17-Nov-2026

Table-1 : Path Coefficient (Direct and indirect effects) of some quantitative characters on Oil content in Indian mustard (Brassica juncea)

Character	Days to 50% flowering	Days to Maturity	Plant Height	Number of Primary Branches	Length of Main raceme	Number of seeds per siliqua	1000–seed weight	Harvest Index	Genotype correlation with oil content
Days to 50% flowering	**0·089**	0·202	0·215	0·061	–0·001	0·028	–0·015	–0·125	–0·084
Days to maturity	–0·015	**–1·172**	–0·519	0·205	–0·004	–0·138	0·212	0·453	–0·344
Plant Height	0·015	–0·469	**–1·296**	0·258	–0·014	–0·284	–0·330	0·659	–0·350
Number of primary branches	0·009	–0·377	–0·525	**0·638**	0·006	–0·193	0·307	0·784	0·321
Length of main raceme	0·007	–0·286	–1002	–0·221	**–0·018**	–0·100	0·333	0·470	–0·223
Number of seeds/ siliqua	0·003	0·201	0·459	–0·154	0·002	**0·803**	0·306	–0·709	0·634**
1000-seed weight	–0·002	–0·292	–0·051	–0·231	–0·007	0·290	**0·849**	–0·136	–0·188
Harvest Index	0·017	0·813	1·310	–0·767	0·013	0·873	0·178	**–0·652**	0·370

**Significant at 1 per cent level. Bold values indicate direct effect, Residual effect = 0·2968

found to be highly significant and positive in direction, which might have resulted due to positive direct and indirect effects of this character on oil content. The indirect effects of this character through days to 50 per cent flowreing, days to maturity. plant height, lenght of main raceme and 1000 seed weight were also positive and appeared to influence oil content in positive direction. The indirect effects of this character through number of primary branches and harvest index were found to be negative.

The genotypic correlation of 1000-seed weight was found as negative and non-significant. 1000 seed weight showed positive direct effect on oil content. The indirect effects on this character through seeds per siliqua was positive. The indirect effects of this character were via days to 50 per cent flowering, days to maturity, plant height, number of primary branches, length of main raceme and harvest index, howerver, negative which nullify the positive direct effect of this of character on oil content resulting in negative correlation.

Harvest index was found to be positively but non-significantly associated with oil content. The direct effect of these character on oil content in negative. The indirect effects of this character through number of primary branches was negative. The indirect effect of harvest index through days to 50 per cent flowering, days to maturity, plant height, length of main raceme, number of seeds per siliqua and 1000-seed weight were positive. The positive indirect effects of this character through plant height was found to be of very high in magnitude, which seems to nullify the negative direct effect of this character on oil content resulted in positve correlation. (3) are also in favour of these findings.

On the basis of the present investigation number of seeds per siliqua was found to be most important trait as its contribution was maximum towards oil content. Other quantitative characters like number of primary branches and harvest index were proved to be secondary in conportance contribution maximum towards oil content through number of seeds per siliqua. These characters wer therefore suggested for consideration during selection for improving mustard oil content.

REFERENCES

1. Dewey D. R. and Lu K. H., (1959). A correlation and path coefficient analysis of components of crested wheat-grass seed production. *Agron* J. **15** : 515-518.
2. Khan M. N. and Gupta S. C., (1998). Analysis of characters contribution to seed yield in Indian mustard (*Brassica juncea L.*). *J. Oilseeds Res.* **15** (1) : 54-59.
3. Rawat D. S. and Anand I. J., (1977). Association of seed yield and oil content with yield components in Indian mustard. Crop Improvement **4** (1) : 95-102.

www.IndianJournals.com
Not for Commercial Use
Downloaded From IP - 216.73.216.57 on dated 17-Nov-2026