IJPS INTERNATIONAL JOURNAL OF PLANT SCIENCES
e ISSN-0976-593X Volume **10** | Issue 1 | January, 2015 | 49-52

DOI: 10.15740/HAS/IJPS/10.1/49-52
Visit us - *www.researchjournal.co.in*

RESEARCH ARTICLE

Character association in taramira (*Eruca sativa* L.) under three environment conditions

■ B.L. JAT AND M.L. JAKHAR

SUMMARY

Forty two genotypes of taramira (*Erucasativa* Mill.) were evaluated for character association analysis of seed yield and its related traits over three different environments created by three dates of sowing during *Rabi* 2009-10. Environment wise analysis of phenotypic correlation revealed that in first environment seed yield were positive correlated with all characters except seed per siliquae and test weight. In second environment seed yield are positive correlated with days 50 per cent flowering, days to maturity and seed per siliquae and negative correlated with plant height, primary branches per plant, secondary branches per plant, siliquae per plant, test weight and oil content. In third environment seed yield were positive correlated with days to 50 per cent flowering, secondary branches per plant,siliquae per plant seed per siliquae, test weight and oil content and negative correlated with days to maturity, plant height and primary branches per plant.

Key Words : *Eruca sativa*, Phenotypic correlation

How to cite this article : Jat, B.L. and Jakhar, M.L. (2015). Character association in taramira (*Eruca sativa* L.) under three environment conditions. *Internat. J. Plant Sci.*, **10** (1): 49-52.

Article chronicle : Received : 30.09.2013; **Revised :** 20.11.2014; **Accepted :** 03.12.2014

Taramira (*Eruca sativa* Mill.) is an important winter season oil seed crop of the family Brassicaceae. It is an introduced crop in India. South Europe and North Africa are believed to be the native place of it (Bailey, 1949 and Prakash, 1980). It has diploid number of chromosomes 2n = 22 and the chromosomes are very small. Taramira has desirable traits particularly resistance to powdery mildew that can be transferred to *Brassica compestris* and *Brassica juncea* both of which are important crops (Sastry, 2003). In india, it is known by many names such as tara, schwan, seoha, duan, turra, tirwa, merha, merkai, chara, ushan and sondha (Singh, 1958). In Europe it is known as rocket salad, rocket, roquuette or arrugula, where it is generally grown for young leaves that are eaten as green salad. Taramira is a herbaceous annual, 2 to 4 feet tall and is a common cold weather oilseed crop of the drier areas of north-west India, where, it is commonly grown and mixed with gram and barley. It does not require much preparatory tillage due to efficient and fast penetrating root system permitting extrusion of soil water from deep soil layers. It is a hardy crop that can be successfully grown in dry land areas and poor sandy soils with conserved moisture during the years of severe drought, when no other crop could be successfully grown,taramira is the only alternative (Gupta *et al*., 1998). An improved ideal variety, besides high yield potential must also possess phenotypic correlation and path analysis in its performance. However, the degrees of correlation and path analysis have been observed to differ among the genotypes, some showing much better

MEMBERS OF THE RESEARCH FORUM

Author to be contacted :
B.L. JAT, Department of Plant Breeding and Genetics, College of Agriculture, S.K. Rajasthan Agricultural University, BIKANER (RAJASTHAN) INDIA
Email: babu_agrotech@yahoo.co.in

Address of the Co-authors:
M.L. JAKHAR, Department of Plant Breeding and Genetics, S.K.N. College of Agriculture, JOBNER (RAJASTHAN) INDIA

positive correlation than the other. Since yield is a polygenic character and is controlled by a number of components traits, positive phenotypic correlation and path analysis of these components characters is essential for increasing the grain yield performance.

MATERIAL AND METHODS

A set of 40 germplasm lines along with two check varieties namely RTM-314 and RTM-2002 were selected at random from the collection being maintained at the AICRP on oilseeds (Taramira Unit), Department of Plant Breeding and Genetics, S.K.N. College of Agriculture, Jobner. The details of the lines selected and were all the 42 entries were sown at three different dates, representing three environments. The sowing dates were 20th October, 5th November and 20th November, 2009. In each environment, all the genotypes were evaluated in Randomized Block Design with three replications. Plot size was 0.6 x 5.0 m^2 accommodating two rows of each entry. The row to row distance was kept at 30 cm and plant to plant distance was maintained 10 cm by thinning at 25 days after sowing. Ten competitive plants were randomly selected at the time of maturity (excepting the days to 50% flowering) from each plot to record the following observations: days to 50 per cent flowering, days to maturity plant height (cm), primary branches per plant, secondary branches per plant, number of siliquae per plant, number of seeds per siliqua, seed yield per 10 plant (g), test weight (g), oil content (%).

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Character association analysis :

The correlations between all possible combinations among the characters were calculated under three environment conditions at phenotypic level presented in Table 1, 2 and 3.

Environment, first :

The phenotypic correlation days to 50 per cent flowering were positive correlated with all the characters. Days to maturity positive was correlated with all the characters except oil content. Plant heights was positively correlated with all the characters except oil content, primary branches was positively correlated with all the characters except oil content. Secondary branches was positively correlated except oil content. Siliquae per plant were positively correlated with all the characters except test weight and oil content. Seeds per siliquae were positively correlated with all the characters except oil content and seed yield. Test weight were positively correlated with all the characters except siliquae per plant and seed yield .Oil content were negatively correlated with all the characters except seed yield. Seed yield were the positively correlated with all the characters except seed per siliquae and test weight.

Environment, second :

The phenotypic correlation days to 50 per cent flowering were positively correlated with all the characters. Days to maturity correlated with all the characters except seed per siliquae, plant height was correlated with all the characters except primary branches, seed per siliquae and seed yield. Primary branches was correlated with days to maturity, secondary branches, siliquae per plant and oil content and negatively correlated with days to 50 per cent flowering plant height, seed per siliquae, test weight and seed yield. Secondary branches was correlated with all the characters except seed per siliquae, oil content and seed yield. Siliquae per plant was correlated with all the characters except seed per siliquae and seed yield. Seed per siliquae was correlated with days to 50 per cent flowering test weight and seed

Table 1 : First environment phenotypic correlation co-efficients in taramira

Characters	Days to 50% flowering	Days to maturity	Plant height	Primary branches / plant	Secondary branches / plant	No. of siliquae / plant	No. of seeds / siliqua	Test weight	Oil content (%)	Seed yield (g)
Days to 50% flowering	1.00	0.490**	0.181	0.254	0.105	0.312	0.242	0.162	0.004	0.095
Days to maturity		1.00	0.203	0.126	0.080	0.143	0.169	0.115	-0.041	0.003
Plant height			1.00	0.093	0.159	0.141	0.059	0.070	-0.116	0.048
Primary branches / plant				1.00	0.465**	0.273	0.033	0.246	-0.083	0.184
Secondary branches / plant					1.00	0.381*	0.003	0.058	-0.149	0.205
No. of siliquae / plant						1.00	0.047	-0.034	-0.078	0.206
No. of seeds / siliqua							1.00	0.038	-0.077	-0.027
Test weight (g)								1.00	0.095	-0.136
Oil content (%)									1.00	0.071
Seed yield (g)										1.00

* and ** indicate significance of values at P=0.05 and 0.01, respectively

yield, negatively correlated with days to maturity, plant height, primary branches, secondary branches and siliquae per plant.Test weight positive was correlated with all the characters except primary branches, plant height and seed yield. Oil contentare positive was correlated with all the characters except secondary branches per plant, seed per siliquae and seed yield. Seed yield positive was correlated with days to 50 per cent flowering, days to maturity, seed per siliquae, and negative with plant height, primary branches, secondary branches,siliquae per plant, test weight and oil content.

Environment, third :

The phenotypic correlation days to 50 per cent flowering positive was correlated with siliquae per plant, seed per siliquae, oil content and seed yield and negative correlated with days to maturity, plant height, primary branches, secondary branches and test weight. Days to maturity positive was correlated with, primary branches, seed per siliquae and oil content, negative correlated days to 50 per cent flowering, plant height, secondary branches, siliquae per plant, test weight and seed yield. Plant height positive was correlated with primary branches, secondary branches, siliquae per plant, seed per siliquae and test weight, negative with 50 per cent flowering, days to maturity, oil content and seed yield. Primary branches positive was correlated with all the characters except days to 50 per cent flowering and seed yield, Secondary branches positive was correlated with all the characters except days to 50 per cent flowering and days to maturity. siliquae per plant positive were correlated with all characters except days to maturity, seed per siliquae were positively correlated with all the characters except test weight. Test weight, were positively correlated with all the characters except days to 50 per cent flowering, days to maturity and seed per siliquae. Oil content were positive correlated with all the characters except plant height. Seed yield were positively correlated with days to 50 per cent flowering, secondary branches, siliquae per

Table 2 : Second environment phenotypic correlation co-efficients in taramira

Characters	Days to 50% flowering	Days to maturity	Plant height	Primary branches / plant	Secondary branches / plant	No. of siliquae / plant	No. of seeds / siliquae	Test weight(g)	Oil content(%)	Seed yield(g)
Days to 50% flowering	1.00	0.175	0.079	-0.075	0.199	0.027	0.164	0.032	0.153	0.017
Days to maturity		1.00	0.250	0.009	0.059	0.046	-0.205	0.113	0.168	0.080
Plant height			1.00	-0.114	0.140	0.138	-0.112	0.139	0.007	-0.075
Primary branches / plant				1.00	0.118	0.228	-0.067	-0.018	0.134	-0.001
Secondary branches / plant					1.00	0.100	-0.123	0.044	-0.076	-0.204
No. of siliquae / plant						1.00	-0.125	0.039	0.267	-0.148
No. of seeds / siliquae							1.00	0.001	-0.034	0.078
Test weight(g)								1.00	0.097	-0.102
Oil content(%)									1.00	-0.029
Seed yield(g)										1.00

Table 3 : Third environment phenotypic correlation co-efficients in taramira

Characters	Days to 50% flowering	Days to maturity	Plant height	Primary branches / plant	Secondary branches / plant	No. of siliquae / plant	No. of seeds / siliquae	Test weight(g)	Oil content(%)	Seed yield(g)
Days to 50% flowering	1.00	-0.163	-0.184	-0.093	-0.102	0.058	0.066	-0.143	0.003	0.121
Days to maturity		1.00	-0.043	0.129	-0.071	-0.019	0.064	-0.061	0.036	-0.025
Plant height			1.00	0.208	0.318	0.157	0.192	0.109	-0.180	-0.129
Primary branches / plant				1.00	0.122	0.159	0.230	0.019	0.106	-0.198
Secondary branches / plant					1.00	0.780**	0.172	0.152	0.033	0.093
No. of siliquae / plant						1.00	0.355	0.110	0.082	0.231
No. of seeds / Siliqua							1.00	-0.004	0.125	0.078
Test weight(g)								1.00	0.165	0.002
Oil content(%)									1.00	0.068
Seed yield (g)										1.00

plant, seed per siliquae, test weight and oil content, negative correlated days to maturity, plant height, and primary branches per plant. Similar work related to the present topic was also conducted by Das *et al.* (1998); Kumar and Yadav (1983); Lodhi *et al*. (1979); Nehara *et al*. (1989); Rawat and Anand (1977); Singh and Singh (1997); Singh and Singh (1974); Srivastava *et al.* (1983) and Yadav and Kumar (1982).

Conclusion :

The potential productivity of any crop is basically valued in terms of grain yield per unit area. Its improvement by direct selection is generally difficult because yield is complex polygenic characters largely influenced by its various component characters as well as by the environment. Hence, it becomes essential to estimate association of grain yield with component characters and among themselves. The efficiency of selection thus, can be increased if it is simultaneously practiced for characters which are correlated with yield. In the quantitave traits, the genotype is influenced by environment thereby, affecting the phenotypic expression as well as association and consequently direction of association between the characters.

REFERENCES

Bailey, L. H. (1949). *Botanical Rev.,* **22** : 81-86.

Das, K., Barua, P.K. and Hazarika, G.N. (1998). Genetic variability and correlation in indian mustard. *J. Agric. Sci. North East India,***11**(2) : 262-264.

Gupta, A.K., Agarwal, H.R. and Dahama, A. K. (1998). Taramira : A potential oilseed crop for the marginal lands of Rajasthan, India. In : Bassam N. El. *et al*. (ed.) sustainable Agriculture for food, energy and Industrystrategy towards achievement. James and James (Science Publishers) Ltd., LONDON, UNITED KINGDOM.

Kumar, Prakash and Yadav, T.P. (1983). Association of seed and its components traits in the f_2 generation of indian mustard. *Indian J. Agric.*, **59**(8) : 530-534.

Lodhi, G.P., Singh, P.K.and Sharma, S.C. (1979).Correlated response in brown sarson. *Indian.J.Genet.*,**39** (3): 373–381.

Nehara, M.R., Sodani, S.N. and Sastry, E.V.D. (1989).Correalation and path analysis in taramira (*Eruca sativa* Mill). *Trans., ISDT,* **14**:149-153.

Prakash, S. (1980). Cruciferous oilseeds in India. In: *Brassica Crop and Wild Allies.* Biology and Breeding pp. 151-163, Japan Scientific Society Press, TOKYO, JAPAN.

Rawat, D.S. and Anand, I.J. (1977). Association of seed yield and oil content with yield component in indian mustard. *Crop. Improment,* **4** (1): 95-102.

Sastry, E.V.D. (2003). Taramira (*Eruca sativa* Mill.) and its improvement. *Agric. Rev.,* **24** (4): 235-249.

Singh, D. (1958). Rape and mustard, Indian Central Oilseeds Committee, Hyderabad (A.P.) INDIA.

Singh, D. and Singh, D. (1974).Correlation in indian colza (*B.Compestris*). *Indian J. Agric.Sci*., **44**(3):142-147.

Singh, M. and Singh, G. (1997). Correlation and path analysis in indian mustard (*Brassica juncea* L.) under hills of sikkam. *J. Hill Res*., **10**(1) : 10-12.

Srivastava, A.N.,Wani, S.P. and Dixit, R.K. (1983).Genetics association in indian mustard. *Indian J. Agric. Sci.,* **53** (9): 778-781.

Yadav, I.S. and Kumar, D. (1982).Variability, correlation and path studies in taramira. *Indian J. Agric.Sci.*, **54** (1) : 30-35.