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Note on Path Coefficient Analysis in Moth Bean (*Vigna aconitifolia* (Jacq.) Marechal)

S.B.S. Tikka, B. M. Asawa† and Sudhir Kumar**

Department of Plant Breeding, University of Udaipur, Udaipur (Rajasthan).

Moth bean (*Vigna aconitifolia* Jacq. Marechal) is an important pulse crop of arid and semi-arid regions of Rajasthan and Gujarat. Tikka *et al.* (1973) have studied the variability in this crop and reported the existence of wide variation in almost all characters except pod length. It was further revealed through association analysis that pod number, grains/pod and pod length were important yield components in moth bean (Tikka and Sudhir Kumar, 1976). Though correlation studies are helpful in measuring the association between yield and component characters, they do not provide an exact picture of the direct and indirect causes of such an association which can be had through path coefficient analysis (Wright, 1921; 1923).

This technique has recently been utilised in a number of grain legumes viz. green gram (Singh and Malhotra, 1970; Tiwari and Asawa, 1976), lentil (Tikka *et al.* 1973), cluster bean (Tikka, 1975) and bengal gram (Asawa and Tiwari, 1976). However, no such report is available for this crop.

The present paper propose to provide findings of an experiment designed to collect information of this nature. The correlation studies by Tikka and Sudhir Kumar (1976) were subjected to path coefficient analysis according to the method suggested by Dewey and Lu (1959).

Path analysis for yield for the year 1971 revealed that plant height had the highest direct effect on yield followed by pods/plant and pod length (Table 1). Further, except grains/pod, all other characters had stronger direct effect than their indirect effects. This implied that their correlation with yield was largely governed by their own direct effect. Almost all characters had considerable indirect effect through plant height.

Direct effect of plant height, pod length and all indirect effects through plant height were high during 1971, whereas these were low during 1972. The direct effect of pods/plant and grains/pod were low in 1971 and were high in 1972. This discrepency in the results obtained is mainly due to variation in extent of association amongst the five characters under study. Gian Singh

** Present address: Cotton Breeder, Agricultural Research Station, GAU, Maktampur (Broach), Gujarat.
† Indian Institute of Management, Ahmedabad.
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TABLE 1

Path coefficient analysis showing direct and indirect effects of 4 characters on grain yield of moth bean.

Character	*Path coefficients*	
	1971	*1972*
Yield vs. plant height:		
Direct effect	+ 0·3489	+ 0·1262
Indirect effect through pods/plant	+ 0·1142	+ 0·0417
Indirect effect through pod length	+ 0·0763	+ 0·0004
Indirect effect through grains/pod	+ 0·0225	+ 0·0037
Total (rp)	+ 0·5619	+ 0·1720
Yield vs. pods/plant:		
Direct effect	+ 0·2164	+ 0·5882
Indirect effect through plant height	+ 0·1842	+ 0·0089
Indirect effect through pod length	+ 0·0476	+ 0·0059
Indirect effect through grains/pod	+ 0·0138	— 0·0421
Total (rp)	+ 0·4620	+ 0·5609
Yield vs. pod length:		
Direct effect	+ 0·2095	— 0·0200
Indirect effect through plant height	+ 0·1270	— 0·0025
Indirect effect through pods/plant	+ 0·0492	— 0·1753
Indirect effect through grains/pod	+ 0·0314	+ 0·2298
Total (rp)	+ 0·4171	+ 0·0320
Yield vs. grains/pod:		
Direct effect	+ 0·0504	+ 0·3659
Indirect effect through plant height	+ 0·1559	+ 0·0013
Indirect effect through pods/plant	+ 0·0593	— 0·0676
Indirect effect through pod length	+ 0·1303	— 0·0126
Total (rp)	+ 0·3959	+ 0·2870

Residual effect: 1971 = + 0·4902, 1972 = 0·2870

(1974) has also reported such type of fluctuations in the degree of association between yield and component characters under four environments in *kangni* which mainly results from the varying phenotypic stability of different quantitative characters as observed by Yadavendra *et al.* (1973) in cowpea. Since the path analysis *partitions the total correlation* into direct and indirect effects, these coefficients are bound to change accordingly.

Residual effects during 1971 and 1972 were 0·4902 and 0·4002 respectively which indicated that besides the above characters there are some other components also contributing to grain yield, which are yet to be studied.

From two years data, it is noted that pods/plant is most important *character* affecting the yield in this crop and its correlation with yield stems from its own *direct* effect. Hence pods/plant should be a criterion for selection of high yielding genotypes in moth bean.

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