

APPLICATION OF GENETIC MODELS  
TO DIALLEL CROSS DATA OF WINGED BEAN  
( PSOPHOCARPUS TETRAGONOLOBUS (L.)DC)

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## ABSTRACT

The genetics of a wide range of characters in winged bean (Psophocarpus tetragonolobus (L.) DC) were studied in the F<sub>1</sub> generation of a half - diallel cross between nine diverse winged bean lines. The 36 F<sub>1</sub> hybrids and the parents were evaluated for various traits during the Yala season of 1983. The experimental design was a randomized block with three replications. The data were analysed by both the combining ability analysis and the biometrical genetic analysis.

Results indicated that very high genetic variability existed for all the traits. Additive variation was high for time to flower, leaf size, pod length, shelling percent, seed size and protein content of seed. Narrow sense heritabilities were also high for these traits. Thus, considerable genetic advance could be expected by selecting between crosses for these traits. Non - additive variation was of substantial importance for pods/plant, seeds/pod and grain yield. Non - allelic interactions were detected for all the traits except for seed size.

On the basis of overall general combining ability (gca) effects, UPS 122 and UPS 102 could be recommended as good general combiners for a winged bean improvement programme. The cross SLS 7 x UPS 122 exhibited the highest yield amongst the hybrids.

High levels of heterosis were recorded for leaf size, pods/plant, seeds/pod and grain yield. High heterotic expression for vegetative growth was not accompanied by higher yields.

The biometrical genetic analysis indicated no dominance for seed size, partial dominance for earliness and overdominance for higher numbers of leaves and pods per plant. However, in general, the interpretation of the results of this analysis was complicated by the presence of non - allelic interactions for most traits.