

Path effects as influenced by recombination and induced mutation in F_2 and F_2M_2 populations of groundnut (*Arachis hypogaea* L.)

■ J. SHANTHALA AND R. SIDDRAJU

SUMMARY

Path coefficient analysis of pod yield with its component characters was carried out in F_2 and F_2M_2 populations generated by crossing GPBD-4 and CTMG-1 and by subjecting 50 per cent of F_0 seeds of the cross to 20 kR g-rays treatment in groundnut (*Arachis hypogaea* L.). Highly significant positive correlation of pod yield with harvest index (0.973), number of matured pods (0.671), total number of pods (0.537), oil content (0.316), hundred kernel weight (0.184), number of branches (0.162), plant height (0.137), shelling percentage (0.134) and late leaf spot (0.256) was observed in F_2M_2 population. Harvest index recorded highest positive direct effect (0.848) followed by number of matured pods (0.543) and total number of pods (0.465) on pod yield in F_2M_2 population. In F_2 population, sound mature kernels (0.015) showed positive direct effect that was indirectly and positively influenced by hundred kernel weight (0.031). The proportion of transgressive segregants was also highest in F_2M_2 population. The present findings reveals the possibility of disruption of undesirable linkage relationship by reshuffling of genes through hybridization followed by mutagenesis and selection in these populations could be practiced to identify genotypes with desirable characters.

Key Words : Groundnut, Hybridization, Mutation, F_2/F_2M_2 populations, Path analysis

How to cite this article : Shanthala, J. and Siddraju, R. (2012). Path effects as influenced by recombination and induced mutation in F_2 and F_2M_2 populations of groundnut (*Arachis hypogaea* L.) . *Internat. J. Plant Sci.*, 7 (1) : 39-42.

Article chronicle : Received : 26.07.2011; Sent for revision : 06.08.2011; Accepted : 30.10.2011

Groundnut (*Arachis hypogaea* L.), a member of the legume family, is commercially popular because of its vegetable protein content (11.00 - 36.40 %), oil content (35.80 - 54.20%) and soluble sugars (8-14%) with sucrose as the major source of carbohydrate and is known as poor man's nut. The oil cake meal is also used as an animal feed and organic fertilizer (Aruna and Nigam, 2009). Globally, it is cultivated on 23.4 million ha with annual production of 34.9 million metric tons and an average yield of 1.5 tons ha⁻¹. India production is 6.25 m.t which is the second largest producer

after China (14.3 m.t), USA (2.34 m.t), Nigeria (1.55 m.t), Indonesia (1.25 m.t.), Sudan (0.85 m.t.), Senegal (0.71 m.t), Argentina (0.58 m.t), and Vietnam (0.5 m.t) (Upadhyaya *et al.*, 2011). India and China together are the world's leading groundnut producers accounting for nearly 60 per cent of the production and India's share is about 18 per cent in total world production. The major groundnut producing states of India are Gujarat which ranks first (3.3 m.t.), followed by Andhra Pradesh (2.6 m.t), Tamil Nadu (1.0 m.t), Karnataka (0.7 m.t) and Maharashtra (0.4 m.t). However, a wide gap exists between the currently realizable yield and the potential yield of cultivars.

The efficiency of any breeding programme is basically dependent upon the effective selection of plants *via* the inherent characters expressed externally as a result of environmental interaction that are assessed phenotypically. Such an effective selection is possible by using information

MEMBERS OF THE RESEARCH FORUM

Author to be contacted :

J. SHANTHALA, Seed Technology Research, National Seed Project (NSP), University of Agricultural Sciences, G.K.V.K., BENGALURU (KARNATAKA) INDIA

Address of the co-authors:

R. SIDDRAJU, Department of Genetics and Plant Breeding, College of Agriculture, U.A.S., G.K.V.K., BENGALURU (KARNATAKA) INDIA