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Gene action for inheritance of qualitative and quantitative traits in Opium poppy (*Papaver somniferum* L.)

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Nature and magnitude of gene action involved in the inheritance of different qualitative and quantitative traits is most important and helps in formulating the appropriate breeding plan concerned with improvement. The present study was undertaken to decipher the nature and magnitude of gene action involved in inheritance of different traits in four single crosses (NBIHT-5 X NBIHT-6, NBIHT-5 X NBMHT-1, NBMHT-1 X NBIHT-6 and NBMHT-2 X NBMHT-1) selected from a full diallel experiment comprising of six high thebaine producing pure lines of Opium poppy (*Papaver somniferum* L.) based on five parameter model. The presence of gene interactions was detected by using C and D scaling test. Based on the present study, considerable amount of variability in mean performance of basic generations P_1 , P_2 , F_1 , F_2 and F_3 were noticed for almost all traits except for seed yield per plant in all the cross combinations. The non-allelic mode of interaction was observed for all the traits as the values of either C or D or both were found significant. The generation mean analysis and scaling test revealed non allelic interaction in the inheritance of all the traits except stem diameter and papaverine content. The dominance effect (h) was found more pronounced for all the traits except thebaine and papaverine where additive effect (d) was more pronounced. Among the interaction effects dominance x dominance (l) was predominant over additive x additive (i) for all traits in all the four crosses except for papaverine content. The present study also explores the potential of component traits in producing better chances through knowledge of magnitude and nature of gene action. Based on the results, selection of transgressive segregants through sib-mating could be practiced to improve the yield potential. Simultaneously, intermating of better segregants followed by recurrent selection could be a potential breeding technique to increase the frequencies of favorable alleles. The positive and significant association between seed yield and opium yield suggests that selection would be effective for the improvement of both the characters simultaneously. The present investigation revealed that seed and opium yield and its contributing traits inherited quantitatively and fixable gene effects (d) and (i) were lower in magnitude than non fixable (h) and (l) gene effects showing non additive effect in the inheritance of agronomic traits in opium poppy. The high to moderate heritability coupled with high genetic advance may be advantageous in obtaining superior progenies which can be maintained through sib mating followed by recurrent selection in advance generation. It was concluded that selections based on direct and indirect traits i.e. capsule weight per plant, capsules per plant, branches per plant, capsule size, stem diameter and leaves per plant can influence the opium and seed yield potential substantially in Opium poppy.

Biography

Ritu Mishra has completed her post graduation in Biotechnology from Punjab Technical University in the year 2011. She did summer training at Plant Molecular Biology Lab, CSIR-CIMAP, Lucknow. She has also attended many national seminars and presented poster. She joined Genetics & Plant Breeding Division of CSIR-NBRI, Lucknow in January 2013. She started her research work on Linseed and Opium Poppy.

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Effect of some insecticides and botanicals on predatory ladybirds (Coleoptera:Coccinellidae) in cotton

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The study was carried out at Agriculture College Farm, ANCA, Warora to evaluate the effect of some insecticides & botanicals on pests of cotton & their subsequent effects on natural enemies like Predatory ladybird beetles. The departmental research trials were conducted during the year 2008-2009 and 2009-2010. The plot size was 10 × 5 m., with three replications in Randomized Block Design. The observations were recorded on 10 randomly selected plants in each plot. The numbers of predatory lady bird beetles on aphids in cotton field were counted and average was calculated. Among the different treatments NSKE at 5% (4.70 LBB/ plant), Neemark 5% (4.60 LBB/ plant), Dashparni ark 5% (4.50 LBB/ plant), Emamectin benzoate 5 SG (3.70 LBB/ plant) were observed. The predatory ladybird beetles population in insecticidal plots was found as Dimethoate 30 EC 0.03% (1.5 LBB/ plant), Acephate 75% sp 0.03% (0.70 LBB/ plant), Phosphamidon 40 Ec at 0.04% (0.60 LBB/ plant), Quinalphos 1.5% dust (0.50 LBB/ plant), Methyl parathion 2% dust (0.40 LBB/ plant). Results reveal that significantly more number of predatory ladybird beetles was observed in the plots with botanicals than insecticidal treatments.

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