## Development of high yield and nutritious mungbean lines (*Vigna radiata* I. Wilczek) using heterosis and combining ability analysis by diallel method

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## Abstract

Mungbean (Vigna radiata L. Wilczek), is a short duration legume crop, it's also rich source of protein with an essential amino acid profile and unsaturated fats like linoleic and linolenic acid that advances the development and health of humans. Genetic information concerning combining ability and heterosis give some clue for choosing the most suitable donors for hybridization. Thus, the examination has embraced the nature and extent of hereditary effects overseeing yield component behavior and general and specific combining abilities of mungbean utilizing the diallel cross method. Fifteen crosses originated from a half diallel method through six different mungbean parents for heterosis and combining ability investigation. The investigation was conducted at Pulses Research Center, BARI, Ishurdi, Pabna, in a randomized block design with three replications. Results showed highly significant variations within parents and  $F_1$ segregates, and demonstrated a wide genetic variability for the studied characters. Thus, the chance of hereditary improvement utilizing genetic pools of mungbean is available. The mean square of general combining ability (GCA) and specific combining ability (SCA) were significant for all the characters, except mean square due to (SCA) for days to flowering, days to maturity and pod length showing significant role of both additive and main components in the inheritance of the studied characters. Higher effect of SCA than GCA was observed for plant height and seeds per pod brought up to be the preponderance of nonadditive gene effects in the statement of these characters. Based on per se performance and GCA of the parents, BARI Mung-1, PS-7 and BMXK1-14004 were seen as the great general combiners for proteins and yield per plant. In context of SCA, five hybrids viz. BMXK1-14004 × Sonali mung, BMXK1-14004 × PS-7, BMXK1-14004 × BINA Mung-8, Sukumar× PS-7 and BARI Mung-1 × BINA Mung-8 were perceived as promising. The most significant heterosis to the degree of 26.09% over standard variety and 20.20% over better parent for seed yield per plant were observed in the cross BMXK1-14004 × Sonali mung and BMXK1-14004 × PS-7 respectively which showed high heterosis rate for yield and yield contributing traits with high level of proteins. These parents and crosses could be used for the further breeding program for improvement of the yield and genetic components of mungbean.

Keywords: Combining ability, diallel method, heterosis and mungbean