Diallel analysis of inbred lines in maize (Zea mays L.)

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ABSTRACT
A diallel analysis with eight diverse inbreds revealed highly significant GCA and SCA variances indicating importance of additive and non-additive gene action for all the traits. The estimated components of SCA variances were higher in magnitude for all the traits except plant height and days to maturity, indicating the predominance of non-additive or dominant gene action. The inbreds Pant 7421-S<sub>9</sub>-194-3-⊗-#, Jogia local-S<sub>9</sub>-2-1-⊗-# and M9-S<sub>9</sub>-11-⊗-# were a good general combiners for majority of the characters which gave high gca effects for yield per plant with positive and significant gca effects for many of the yield characters except plant height and days to maturity, indicating the predominance of non-additive or dominant gene action. The crosses (M<sub>9</sub> x CM 601) S<sub>9</sub>-7-8-⊗-# x Pant 7421-S<sub>9</sub>-194-3-⊗-#, AB (W)S<sub>9</sub>-3-2-⊗-# x Jogia local S<sub>9</sub>-2-1-⊗-#, Jogia local S<sub>9</sub>-2-1-⊗-# x CM 601-S<sub>9</sub>-8-7-⊗-#, (CM 400 x CM 300)-S<sub>9</sub>-⊗-# x CM 601-S<sub>9</sub>-8-7-⊗-# and M9-S<sub>9</sub>-11-⊗-# x Pant 7421-S<sub>9</sub>-194-3-⊗-# exhibited significant SCA effects for grain yield and some other characters. It is proposed that inbred Pant 7421-S<sub>9</sub>-194-3-⊗-#, Jogia local S<sub>9</sub>-2-⊗-# and M9-S<sub>9</sub>-11-⊗-# may be utilized to exploit additive and additive x additive type of gene action, whereas the hybrids M9-S<sub>9</sub>-11-⊗-# x Pant 7421-S<sub>9</sub>-194-3-⊗-# and (M<sub>9</sub> x CM 601) S<sub>9</sub>-7-8-⊗-# x Pant 7421-S<sub>9</sub>-194-3-⊗-#, manifested significant sca effect which could be more rewarding in a hybrid breeding programme.

Key words: Combining ability, Maize, Zea mays L.