

Association of seed yield components along with seed neurotoxin content in different varieties and induced mutant lines of grass pea (*Lathyrus sativus* L.)

D. TALUKDAR

Accepted : March, 2009

SUMMARY

Significant and positive correlation exists between seed yield and pods per plant, plant height, number of primary branches and 100 seed weight; of which maximum contribution towards yields was due to number of pods per plant in case of both varietal and mutant lines in grass pea (*Lathyrus sativus* L.). Both pods per plant as well as seed yield exhibited negative and significant correlation with days to flowering. Significant negative association of seed neurotoxin, ODAP with 100 seed weight and pods per plant and positive correlation with days to flowering in different varieties and mutant lines suggested induction of early flowering and enhancement of pod production in combination with bold size of seeds can improve seed yield with reduction in seed ODAP content in grass pea.

Key words : Seed yield components, Varieties, Induced mutants, Correlation, Grass pea.

For more than 8000 years grass pea (*Lathyrus sativus* L.) has been cultivated in different geographical regions both as a grain crop as well as forage crop (Smartt, 1984, McCutchan, 2003). Its improvement as an ideal pulse crop however, depends on development of high yielding and low seed neurotoxin (ODAP) containing lines. Present author was able to isolate some promising morphological mutant lines in grass pea and their yield potential along with nature and magnitude of variability has been studied (Biswas, 2007, Talukdar and Biswas, 2008). Grain yield is a complex and multiplicative end product of various yield components and hence, assessment of relationship among different morphological and yield related traits is essential to upgrade crop performances. Seed ODAP content in grass pea is quantitatively inherited and its association with yield related characters assumes significance in grass pea breeding. Keeping this in mind present work was undertaken on 7 different cultivated varieties and different induced mutant populations (M_3) to evaluate the nature of relationships among various seed yield components and also with seed ODAP content in grass pea, a description of which was presented in this communication.

MATERIALS AND METHODS

Seven cultivated varieties of grass pea, namely, 'LSD 3', 'Nirmal', 'Hooghly Local', 'Midnapur Local', 'Ratan', 'BioR-231' and 'P-24/3' were grown with normal cultural practices during winter season of 2004-05 in experimental

garden, University of Kalyani, Kalyani in a randomized block design with four replications keeping a uniform distances of 80 cm and 30 cm. between the rows and between the plants, respectively. One border row was also maintained. Five normal plants from each replication were randomly selected to record observations on different characters namely, plant height, days to flowering, days to maturity, number of primary branches, pods per plant, seeds per pod, 100 seed weight, seed yield/plant and seed ODAP content. M_3 generation of different mutant populations was raised from selfed seeds of individual viable M_2 mutants of grass pea cultivar BioR-231. Field design for growing M_2 generation was followed as reported earlier (Talukdar and Biswas, 2008). Observations were recorded on the same traits taken into account for 7 varieties. Interrelationship between different yield attributes were evaluated by determining simple correlation coefficient (r) values. Seed ODAP content was estimated following the methods of Rao (1978).

RESULTS AND DISCUSSION

Correlation coefficients between seed yield and its components estimated among 7 cultivated varieties and among different induced mutant lines of grass pea have been presented in Table 1 and 2, respectively. In both cases, phenotypic correlation studies revealed existence of significant positive association of seed yield with plant height, number of primary branches per plant, pods per plant and 100 seed weight (g); of which maximum contribution was recorded due to pods per plant ($r = 0.828$ in varietal population and $r = 0.764$ in mutant population). Number of pods per plant was also significantly and positively correlated with plant height and number of

Correspondence to:

D. TALUKDAR, Department of Botany, University of Kalyani, Kalyani, NADI (W.B.) INDIA