Contribution ID: **10** Type: **Poster**

INDUCED MUTATION THROUGH GAMMA RADIATION IN PEA (PISUM SATIVUM L.): DEVELOPMENTAL CHANGES AND IMPROVED RESISTANCE TO BROOMRAPE (OROBANCHE CRENATA)

Legumes are important and widely used in human nutrition, particularly the food industry as due to their high protein and essential amino acids. Despite these nutritional characteristics, a regression of the areas and of the production of these legumes crop is observed in several regions. The Orobanche is among the main factors behind this reduction. The means to fight against this parasitic plant are relatively diversified but remain ineffective or have undesirable collateral effect. Creating variation in the host genetic pathway remains the best way to fight against Orobanche crenata infestation. Thus, selection of pea varieties resistant to this parasitic plant appears as an appropriate control strategy. In order to create new desirable genetic variability induced mutation through gamma radiation is one of the best alternatives for the improvement of pea resistance to the parasitic weed Orobanche crenata. Seeds (cv. Douce de province) were exposed to increased doses up to 750 Gy. Germination rates and plant survival were scored 7 and 15 days after sowing, respectively. The 100 Gy dose was determined as the optimum dose limit causing 50% reduction in survival. Multi-shoots and delayed flowering were clearly observed in 150 and 200 Gy treatments. Gain in resistance to O. crenata in 100 Gy mutants was demonstrated in pots and in co-cultures systems. Genetic variation among selected M2 plants was verified using ISSR indicating high genetic variability induced after gamma irradiation. In conclusion, seed irradiation (LD50) was efficient in pea to create variable initial material in mutation breeding of new lines resistant to O. crenata.

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Track Classification: Mutation breeding for adaptation to climate change in seed propagated crops