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Executive Summary

Genetic Stability Assessment of Soybean under Allopathic Stress

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Soybean is a legume crop and is known as the first crop among the oilseed crops globally as its contribution is 50% in total oil seed production[1]. Moreover, soybean is rich in protein contents and is a potential source for animal feed as well as for human consumption[2].

Due to high protein in this crop, its demand is amplifying day by day. Therefore, its novel and improved cultivars should be introduced for which new genotypes are required to select breeding materials. Accordingly, mutation in a genetic material is important, as it is source of rising genetic variability and enhancement of many agronomic traits like yield, stover quality and developing resistance against abiotic as well as biotic stress factors[3]. Moreover, quality of the plants is also made sure by assessing of their genetic consistency through cytological or molecular markers[4]; so that, new crosses can be developed between high quality plants. In this regard ISSR as well as RAPD markers are important. These are extensively used tools to determine genetic uniformity and quality of the plants. Moreover, they can also screen genotypes and examine the genetic stability of plants in response to environmental stressors[5].

On the other hand, plants in agroforestry system (e.g., *Eucalyptus* forestry), show chemical interactions which ultimately leads towards high secondary metabolite diversity. Additionally, these plants compete with other existing plant for resources in order to survive. These facts have also become the research interest of many scientists[6]. Therefore, a new research was designed to assess the genetic stability of crop plants under allelopathic stress of *Eucalyptus* tree litter. Moreover, molecular markers linked with allelopathic tolerance in soybean were also investigated through RAPD and ISSR. In this experiment, pot experiment was performed with soybean seeds by utilizing mixture of soil and *Eucalyptus* ground leaves (EUGL). Afterwards, genetic fidelity was examined via calculations of genome template stability index (GTS)[7].

At the end of this experiment, the RAPD seven markers and ISSR 11 markers exhibited their potential as reliable molecular markers for evaluating allelopathy tolerance in soybean and could be used in breeding programs as well. Conclusively, these findings can assist other researchers to develop crop plants with improved tolerance of allelopathy stress.

REFERENCES

1. Anonymous, 2009. Report from the mid-year fisheries assessment plenary, November 2009: Stock assessments and yield estimates. *Ministry of Fisheries, Wellington, New Zealand, pp: 1-209*.

2. Celik, O., C. Atak and Z. Suludere, 2014. Response of soybean plants to gamma radiation: Biochemical analyses and expression patterns of trichome development. *Plant Omics, 7: 382-391*.

3. Mudibu, J., K.K.C. Nkongolo, M. Mehes-Smith and A. Kalonji-Mbuyi, 2011. Genetic analysis of a soybean genetic pool using ISSR marker: Effect of gamma radiation on genetic variability. *Int. J. Plant Breed. Genet., 5: 235-245*.

4. Mallon, R., J. Rodriguez-Oubina and M.L. Gonzalez, 2010. *In vitro* propagation of the endangered plant *Centaurea ultreiae*: Assessment of genetic stability by cytological studies, flow cytometry and RAPD analysis. *Plant Cell Tiss. Organ Cult., 101: 31-39*.

5. Chalageri, G. and U.V. Babu, 2012. *In vitro* plant regeneration via petiole callus of *Viola patrinii* and genetic fidelity assessment using RAPD markers. *Turk. J. Bot., 36: 358-368*.

6. Baltzinger, M., F. Archaux and Y. Dumas, 2012. Tree litter and forest understorey vegetation: A conceptual framework to understand the effects of tree litter on a perennial geophyte, *Anemone nemorosa. Ann. Bot., 190: 1175-1184*.

7. Abdelmigid, H.M. and M.M. Morsi, 2018. Genetic fidelity testing of soybean plants under allelopathic stress of *Eucalyptus* ground leaves through RAPD and ISSR markers. *Int. J. Bot., 14: 14-23*.

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