



Screening of soybean genotypes against drought stress using morpho-physiological, biochemical and gene based SSR markers

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Abstract:

Soybean (*Glycine max* (L.) Merrill.) contributes 57% of the total oilseed production worldwide. Sustainability of its production is severely challenged by drought, depressing up to 40% of the yield annually. Also Selection of drought-tolerant varieties based on morpho-physiological and biochemical attributes assisted with genomic approaches is one of the methods to be focused. To overcome this challenge, conventional and genomic approaches together with biochemical assays have been utilized for understanding drought tolerance mechanisms followed by utilization of this information for developing drought-tolerant soybean cultivars. In this experiment, material was monitored in randomized block design (RBD) with three replications. Sixty-day-old plants evaluated for various morpho-physiological parameters including biochemical parameters viz.: antioxidant enzyme activities and photosynthetic characteristics of soybean. Furthermore, the changes in photosynthetic and chlorophyll fluorescence characteristics, total soluble protein, total sugar and enzymatic activities of sixty soybean genotypes subjected to drought tolerance. The lipid peroxidation contents varied low and high (70.2 ± 1.15 to 120.8 ± 1.67 nmol/g). The highest catalase content and glutathione reductase were exhibited soybean genotypes equal to 0.98 U/mg protein and 0.60 U/mg protein. Significant variation for guaiacol peroxidase (0.37 ± 1.1 to 1.24 ± 0.9 %) and ascorbate peroxidase (0.51 ± 0.46 to 1.48 ± 1.3 %) was detected. On the basis of anti oxidant enzymatic activity four genotypes namely JS 97-52, NRC-7, EC- 5338828, and EC-602288 may be considered as putative drought tol-



erant genotypes. These genotypes may be used in advance breeding and biotechnological works to develop drought tolerance/resistant varieties in upcoming days.

Biography:

Akash Sharma has completed B.Sc. (Ag) from College of Agriculture, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, Madhya Pradesh, India. In 2018 with 79%. He is pursuing M.Sc. in Genetics & Plant Breeding, from RVSKVV, Gwalior, M.P. India and his research work on drought in Soybean (*Glycine max* (L.) Merrill).

Recent Publications:

1. Akitha-Devi MK and Giridhar P. 2015. Variations in physiological response, lipid peroxidation, antioxidant enzyme activities, proline and isoflavones content in soybean varieties subjected to drought stress. Proceedings of the National Academy of Sciences 85(1): 35-44.