

Phenotypic Characterization of Chili Pepper (*Capsicum annum* L.) under *Phytophthora Capsici* Infection and Analysis of Genetic Diversity among Identified Resistance Accessions using SSR Markers

Tilahun Rabuma

Guru Jambheshwar University of Science and Technology, India

Abstract

Chili pepper (*Capsicum annum* L.) is one of the most important vegetable crops, largely suffers from various biotic stresses, including *Phytophthora capsici* L., imposing huge yield loss. Due to the lack of agronomically superior traits in available resistant accessions, chili breeders are constantly searching for new sources of resistance with genetically diverse traits. In the present study, a total of 233 chili pepper accessions from Ethiopia and India were screened under *P. capsici* infection. A total of 22 highly resistant and 17 moderately resistant accessions were identified. Among these, only 32 chili pepper accessions with mean disease index ranging from 1.4-2.0 and 2.20-3.8, were selected for genetic diversity analysis. From a total of 19 SSR primers analyzed, only 14 SSR primers were shown to be polymorphic. The result showed that a total of 31 alleles with an average of 2.214 alleles per primer were amplified across the selected accessions. A maximum of 3 alleles were observed in only 3 SSR primers. The analysis of 14 SSR primers resulted in PIC values ranging from 0.12-0.98 with an average of 0.64, the percentage of polymorphic loci of 11.45-96.87 % with an average of 57.69 % and effective number of alleles (N_e) of 1.058-2.174 with a mean of 2.213. This indicated that the 14 SSR primers detected variation among 32 chili pepper accessions. The genetic dissimilarity index (GDI) value ranged from 0.05 to 0.51, with the highest GDI (0.51) in Gutowayu_80039 and IC_537646 accessions. The population structure and cluster analysis grouped the chili pepper accessions into three genetic resistance groups. In addition, the UPGMA cluster analysis of the 14 SSR primers clearly distinguished between one resistance group and the other. As per AMOVA analysis, a total of 42 % and 58 % of variation among and within populations were detected in the nine populations of *C. annum*, respectively.



Biography:

Mr. Tilahun has completed his PhD at the age of 28 years from Arba Minch University and pursuing his Ph.D. studies from Guru Jambheshwar University of Science and Technology, Hisar, India. He is the senior lecturer of Wolkite University and was former lecturer of Mizan-Tepi University, Ethiopia. He has published more than 6 papers in reputed journals and has been serving as an advisor for M.Sc. students thesis project.

Speaker Publications:

1. Phenotypic characterization of chili pepper (*Capsicum annum* L.) under *Phytophthora capsici* infection and analysis of genetic diversity among identified resistance accessions
2. In vitro Propagation of Geranium (*Pelargonium Graveolens* L.) from Nodal Culture
3. Sterilization Protocol Optimization for Geranium (*Pelargonium graveolens* L.) in vitro Propagation from Nodal Culture
4. Distribution and Prevalence of *P. falciparum* and *P. vivax* in and Around Tepi Town in the Year 2003 and 2004 EC
5. Optimization of efficient protocol for in vitro mass propagation of selected accessions of avocado (*Persea americana*) mill. By auxiliary and apical buds culture

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