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Response of *Solanum lycopersicum* L. (Tomato) to *Tuta absoluta* and *Glomus clarum* Using SSR Marker

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Abstract

Tomato (*Solanum lycopersicum* L.) is an annual crop and tropical nutritious vegetable that is sensitive to both abiotic and biotic stresses. *Tuta absoluta* is one of the most devastating pests resulting to economic loss in tomato globally. The use of chemicals and other biological methods have been employed in the management of *T. absoluta*, but there are limited information on the use of arbuscular mycorrhizal fungus (*Glomus clarum*) which is environmentally friendly, and the molecular primers associated with resistance of tomato to *T. absoluta*. Screen house experiment was conducted at the nursery farm of the Department of Botany, University of Ibadan to investigate the response of tomato to *T. absoluta* and *G. clarum* using morphological and molecular techniques. A total of eight tomato varieties which consisted of four varieties from TechnoServe Nigeria Limited, Katsina State, three from National Centre for Genetic Resources and Biotechnology (NACGRAB), Ibadan and one from Ojoo market, Ibadan in Nigeria were evaluated using Complete randomised design with three replicates. The three treatments comprised of *G. clarum* + *T. absoluta*, *T. absoluta* alone and Control (uninoculated). Growth, agronomic, yield and infestation parameters were evaluated, while DNA extraction and amplification of young apical leaves from treated and untreated (control) tomato varieties were carried out using four Simple Sequence Repeat (SSR) primers. Results showed that there was positive interaction between *G. clarum* and *T. absoluta* on growth, agronomic, yield and infestation characters of tomato. Plants inoculated with *G. clarum* had reduced percentage incidence (13%) and severity of infestation (27%) compared to control (23% and 40%) respectively. This could have been due to *G. clarum* which induced the activation of tomato defence mechanism and optimum nutrient uptake. There are variations in genetic resistance and susceptibility among the tomato varieties in treatment combinations of *T. absoluta* and *G. clarum*. Primers; LEAAT005 (0.67) and LECAA001 (0.57) detected the highest genetic polymorphism and could be used in marker assisted breeding of other *Solanum* spp. The tomato varieties; NGB00717 (NACGRAB), NGB00725 (NACGRAB) and Dan Eka Jibia (Technoserve) were highly tolerant to *T. absoluta* and could be recommended for breeding of tomato against *T. absoluta*.

Keywords: Genetic resistance, *Glomus clarum*, SSR marker, tomato, *Tuta absoluta*