



Journal of Applied Biosciences 163: 16897 – 16905
ISSN 1997-5902

Inheritance of the *Bt* gene and *Striga gesnerioides* in transgenic line, 709A and line IT98K-205-8, resistant to *Striga gesnerioides* in Burkina Faso

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Submitted on 4th May 2021. Published online at www.m.elewa.org/journals/ on 31st July 2021
<https://doi.org/10.35759/JABs.163.8>

ABSTRACT

Objective: Cowpea, *Vigna unguiculata* (L) Walp, a very important legume, is a source of protein for thousands of people worldwide. Cowpea is a crucial crop for achieving food security. However, several abiotic and biotic factors are constraints to its production. This study is a contribution to the development of lines resistant to the pod borer (*Maruca vitrata*) and *Striga gesnerioides*.

Methodology and results: one hundred (100) F₂ individuals' segregation were produced and evaluated for resistance to *Maruca vitrata* and *Striga gesnerioides*. The F₂ population derived from the cross between 709A (*Maruca* resistant) and IT98K-205-8 (*Striga* resistant) and their parents seeds were planted in pots of 10 (L) filled with topsoil which served as substrates for plants. 2.5 g fertilizer (NPK) was applied before planting cowpea seeds. A single seed was planted per pot and watered daily. ELISA kits were used to determine the inheritance of the resistance induced by the *Bt* gene against the pod borers. The inheritance of the resistance *Striga gesnerioides* race 1 and Kp was determined through SSR1, a molecular marker linked to the gene for resistance to this weed. Inheritance of the genes (resistance to *Maruca vitrata* and *Striga gesnerioides*) and observed phenotypic ratios show that the expression of both genes of resistance is monogenic with dominance. 48% of the F₂ population has both resistance genes (to *Maruca vitrata* and *Striga* race 1 and KP).

Conclusion and application of results: Inheritance pattern showed that resistance to *Maruca vitrata*, race 1 and Kp of *Striga gesnerioides* were under the control of a single dominant gene. Understanding the mode of inheritance is a prerequisite for developing appropriate breeding strategies to develop cowpea lines with both stable resistance to *Maruca vitrata* and *Striga gesnerioides* and interesting agronomic traits (yield, earliness). A direct application of this study will allow to apply backcross process for the improve cowpea varieties against these pests (*Striga*

and pods borer). Another application of this work will be to use enzyme-linked immunosorbent marker to control the entry of genetically modified organisms into Burkina Faso border.

Keywords: cowpea, *Maruca vitrata*, *Striga gesnerioides*, Inheritance, *Bt* Gene, Burkina Faso