

**COMPARATIVE EFFICACY OF *Piper guineense* (SCHUM AND THONN)
AND PIRIMIPHOS METHYL ON *Sitophilus zeamais* (MOTSCH.)**

**[EFICACIA COMPARATIVA DE *Piper guineense* (SCHUM AND THONN) Y
PIRIMIPHOS METHYL SOBRE *Sitophilus zeamais* (MOTSCH.)]**

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SUMMARY

Powdered seeds of black pepper *Piper guineense* Schum and Thonn applied at 0.1, 0.2, 0.3, and 0.4g/50g of maize grains were evaluated for maize weevil, *Sitophilus zeamais* control. An insecticide treatment (1g pirimiphos methyl/50g grain) and an untreated control were included. The effect of particle sizes of the seed powder from *P. guineense* was also evaluated. Percentage weevil mortality was recorded at 3, 5, 7, 14 and 21 days after infestation. At 5 days post-treatment, all rates of seed powder caused significantly higher mortality than the control while the synthetic insecticide recorded 100% mortality. The finer particle sizes (1mm, 600µm) of the pepper seed powder compared favourably with pirimiphos methyl in the control of *S. zeamais*. Grains treated with the powder showed significant reduction in the number of progeny derived from surviving *S. zeamais*. There was no observable feeding damage on grains treated with the higher concentrations and finer particle sizes. The results provide a scientific rationale for the use of *P. guineense* in post-harvest protection.

Key words: *Piper guineense*, Pirimiphos methyl, *Sitophilus zeamais*, maize, concentration, particle size.

RESUMEN

Se evaluó el uso de semillas pulverizadas de *Piper guineense* Schum y Thonn aplicadas a 0.1, 0.2, 0.3, y 0.4g/50g de grano de maíz para el control de *Sitophilus zeamais*. Se empleó un tratamiento con insecticida (1g pirimiphos methyl /50g grano) y un testigo sin tratamiento como controles. Se evaluó igualmente el efecto del tamaño de partícula del polvo de *P. guineense*. Se registró la mortalidad a los 3, 5, 7, 14 y 21 d post infestación. A los 5 d post tratamiento, todos los nivel de aplicación de *P. guineense* registraron una mortalidad superior al testigo, mientras que con el tratamiento con insecticida se obtuvo 100% de mortalidad. Las partículas más finas (1mm, 600µm)

se compararon favorablemente con pirimiphos methyl en el control de *S. zeamais*. Adicionalmente el tratamiento de granos con *P. guineense* indujo una reducción en la progenie derivada de los *S. zeamais* sobrevivientes. Los resultados proveen la base para el uso de *P. guineense* en la protección post cosecha.

Palabras clave: *Piper guineense*, Pirimiphos methyl, *Sitophilus zeamais*, maíz, concentración, tamaño de partícula.

INTRODUCTION

The maize weevil, *Sitophilus zeamais* (Motsch.) (Coleoptera: Curculionidae) is a serious pest of stored maize grain in Africa, although it is capable of developing on all cereal grains and cereal products (Tipping *et al.*, 1987; Walgenbach and Burkholder, 1986). Efficient control of this insect pest relies heavily on the use of synthetic insecticides but the increasing cost of application and their hazardous effects in the environment has become a source of concern. For these reasons, alternative chemicals for pest control are being sourced from plants (Berger, 1994).

Black pepper, *Piper guineense* (Schum and Thonn), is a plant that has been reported to possess high potential for use in insect pest control (Ivbijaro and Agbaje, 1986; Olaifa *et al.*, 1987). Already, the plant provides oil used as aromatic in the drink industry and medicinally, (Burkhill 1984; Rehn and Espig, 1991). The fruits contain the pungent Piperine, resin and essential oils. The pungency of the pepper is due to the presence in the fruits of various resins particularly Chavicine and a yellow alkaloid, piperine that contains 5-8% of the weight of black pepper (Rehn and Espig, 1991; Lale, 1992). This study was initiated with the objective of evaluating the efficacy of *Piper guineense* powder as protectants of maize grains against infestation by *S. zeamais*.

