

EFFECTIVENESS OF INDIGENOUS TREE SPECIES (*Spirostachys africana*)

EXTRACTS AGAINST *Sitophilus zeamais* (Mostschulsky)

BY

NDOU ZWIVHUYA LEONARD

Student number: 11571877

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SUPERVISOR: Prof. E.C. KUNJEKU

CO-SUPERVISOR: Mr. P.E.L. MOJAPELO

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ABSTRACT

Maize (*Zea mays* L.) is an important food in southern Africa, and it constitutes a major dietary proportion for many households. The maize weevil, *Sitophilus zeamais*, reduces both quality and quantity of stored grain through boring the grains and eating the inner part of the maize seed. In Africa, small scale farmers use insecticidal plant extracts as a cheaper and a safer alternative to synthetic insecticides. *Spirostachys africana* extracts are traditionally used in Vhembe District as insect repellents for protecting grains against storage pests. This research study was carried out to assess the insecticidal activity of *S. africana* extracts from different parts of the plant. Toxicity of bark, leaves, fruits and roots of the *S. africana* powders at three storage intervals (30d, 60d and 90d) were evaluated and data were collected on mortality, weight loss and progeny adult emergence of *S. zeamais*. The result showed that *S. africana* powders have toxicity effects on *S. zeamais* but differed with dosages applied and exposure period. The findings showed that, after a prolonged exposure period, there was suppression of adult emergence and mortality of weevils, and increase in maize weight loss. Powders from the root and outer bark were the most effective at a dosage rate of 2.5 g and 5 g/ 50 g maize respectively. All powders have insecticidal effects against *S. zeamais*, but are only suitable for short term storage. Chemical analysis of the *S. africana* crude extracts revealed one major possible compound for each crude extract. Root crude extracts components representing 95.4% of the identified compound was trifluoroacetic acid and outer bark crude extracts (35.4%) was 1,2-benzenedicarboxylic acid. Bioassay results obtained showed that outer bark and root crude extracts caused 44 to 56% mortality after 2 days of application. Repellency tests showed a maximum of 90% repellency one hour after treatment. Feeding deterrence test showed undamaged grain seed of around 75% and weight losses (8%) when treated with crude extracts. This study demonstrated the potential of *S. africana* root and outer bark extracts as grain protectants against *S. zeamais*.

Keywords: Bioassays, crude extract, feeding deterrence, mortality, repellency, *Sitophilus zeamais*, *Spirostachys africana*.