

PDF - THE EFFICACY OF GMELINA ARBOREA R. SEED POWDER IN THE CONTROL OF
CALLOSOBROCUS MACULATUS F. IN STORED COWPEA GRAINS - researchcub.info
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ABSTRACT

One of the most important global problems is protecting storage crops from destructive storage insect pests. For the control of insects, synthetic chemicals are continuously used, and their toxicity endangers health of farm operators, animals and food consumers. The negative effects on human health led to a resurgence of interest in botanical insecticides due to their minimal costs and ecological side effects. In view of this, the efficacy of *Gmelina arborea* seed powder on the control of *Callosobruchus maculatus* (F.) on cowpea grains was conducted in the laboratory of the Department of Crop Science, Faculty of Agriculture, University of Benin, Benin City, Nigeria. The study involved five rates (0, 5, 10, 15, and 20g) of *G. arborea* seed powder laid out in a completely randomized design with four replications. Data were collected on adult mortality, oviposition, adult emergence of *C. maculatus*, percentage damaged grains and weight loss. The seed powder of *G. arborea* had significant effect on mortality, oviposition, adult weevil emergence, grain damage and weight loss. Seed powder application rate of 20 g completely suppressed weevil infestation. From the results of the study, it is thereby suggested that 5 g treatment of seed powder of *G. arborea* can be used for the effective control of *C. maculatus* per 20 g of cowpea (*Vigna unguiculata*).

CHAPTER 1

INTRODUCTION

Cowpea (*Vigna unguiculata* (W.) is one of the five most important legumes in the tropics and provides the protein for most people in the region and enriches the soil with nitrogen through symbiosis by rhizobium (Duke, 1990). It originated and domesticated in Southern Africa and later spread to East, West Africa and Asia (AGRONIGERIA, 2015). It is an important alternative source to expensive animal protein (Ileke et al., 2013) as it provides food and animal feed for human and livestock in Africa, Asia, Europe, United States, Central and South America. Many insect pests have been reported attacking cowpea both in the field

and in storage among which is the cowpeaseed beetle (Adebayo et al., 2013). The cowpea seed beetle, *Callosobruchus maculatus* (Fab.), is the most important storage pest of cowpea throughout the tropics (NRI, 1996) belonging to the family Chrysomelidae (Kergoat et al., 2007).

They multiply rapidly under conducive conditions in storage, giving rise to a new generation every month in grain. They riddled cowpea seeds with adult exit holes and defaced with egg covers which leads to reduced weight, poor food value and low seed viability (Ofuya, 2003). Females are darker overall, while males are brown. The plate covering the end of the abdomen is large and dark in colour along the sides in females, and smaller without the dark areas in male (Beck and Blummer, 2009). The larvae of this species feed and develop exclusively on the seed of legumes (Fabaceae) hence the name bean beetle.

In Africa, most of our agricultural produce is produced by poor resource farmers who cannot easily afford the cost of safer synthetic pesticides. In many systems utilizing chemical pesticides, resistance is the rule rather than the exception; operator hazards are very real; environmental and consumer concerns cannot be ignored; and the proponents of integrated pest management (IPM) have to be taken seriously in order to develop sustainable systems for protecting stored products against pest infestation (Haines, 2000). It has therefore become necessary to search for other alternatives such as inert dusts and botanical insecticides, which are environmentally friendly and cost effective at the small-scale farmer level (Bekele et al., 1997). Researches have shown that botanicals have been extensively used on agricultural pests and to very limited extent on insect pests of stored products (Ufele et al., 2013). There is a possibility of using extracts from some plants to control mycelial growth as well as conidial germination of *C. gloeosporioides* (Enobakhare, D. A. et al., 2007). Hence, this present study was undertaken to evaluate the insecticidal potentials of *Gmelina arborea* (L) seed powder in the control of cowpea beetle (*C. maculatus* (F.)).

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