شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

:حفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من 15-25 مئوية ورطوبة نسبية من 20-40%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

Studies on Rice Stem Borer, *Chilo agamemnon* Bles.

By

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CONTENTS

INTRODUCTION

Rice (*Oryza sativa* L.) is attacked by several insect pests in the A.R. of Egypt and other countries, but relatively few inflict significant economic losses. The most important insect attacking rice, in the A.R. of Egypt, is the rice stem borer (RSB), *Chilo agamemnon* Bleszynski. Its attack to rice results in "dead hearts" during vegetative stage, and "white heads" during heading.

Chemical control of rice stem borer is involved in the control strategy of *C. agamemnon*. However, application of synthetic insecticides should be avoided, or minimized, to reduce risks to the environment and human health.

Entomopathogens as biological control agents are better alternative to chemical control for many insect pests. Despite many constraints to the development of entomopathogenic fungi for the control of pests **(Quinlan, 1986)**, there are some bright horizons for these microorganisms **(Federici, 1990)**. Also, *Bacillus thuringiensis* (Berliner) produces protein crystals toxic to many insect pests. The International Rice Research Institute (IRRI) has worked intensively to produce the so called Bt rice. The Bt rice has been modified, by means of biotechnology, with genes from *B. thuringiensis* (Bt) to produce toxins for resistance to stem borers. One of the primary steps for evaluating these toxins is to be incorporated into insect diet to find out their toxicity against a certain insect species (e.g. *C. agamemnon* in the current study).

In addition to entomopathogenic agents, plant extracts are being widely tested and applied to control insect pests in the field and storage. Neem, *Azadirachta indica* (A. Juss) products protect the rice crop from

yellow stem borer, *Scirpophaga incertulas* (Walker) proved to be less effective than the insecticide chloropyrifos **(Rath, 1999)**. On the other hand, rice varieties with high silica content, or plants receiving silica treatments in the paddy field were resistant to stem borers (**Mishra *et al.*, 1990 and Mandras, 1991**).

The current study was undertaken at the Rice Research and Training Center (RRTC), Sakha, Kafr El-Sheikh, and Faculty of Agriculture, Kafr El-Sheikh, Tanta University to investigate the following points:

1. Basic artificial diet for rearing rice stem borer, *Chilo agamemnon* Bles.
2. Effect of *B. thuringiensis* toxins supplemented to the artificial diet on the biology of the borer.
3. Efficiency of field application of *B. thuringiensis* and *Beauveria bassiana* against rice stem borer:
4. Effect of plant extracts supplemented to artificial diets or applied in the field on *C. agamemnon.*
5. Effect of silica supplemented to the artificial diet on some biological aspects of rice stem borer.
6. Role of silica applied in the field on *C. agamemnon.*

REVIEW OF LITERATURE

REVIEW OF LITERATURE

1. Artificial diets for stem borers:

Metwally (1972) developed two synthetic diets for rearing *Chilo agamemnon* Bles., both diets were identical in their constituents except the filling materials. The first diet had 15 g rice bran as a filling material, while the second one had wheat bran at the same amount. The other ingredients were cellulose powder, glucose, casein, cholesterol, dried yeast, ascorbic acid, choline chloride, in addition to tap water and potassium hydroxide (22.4%). As antimicrobial agents, the author used methyl paraben (methyl-p-hydroxybenzoate), streptomycin, formaldehyde or streptomycin, and sorbic acid.

Poitout *et al.* (1974) developed a simple and inexpensive artificial medium to rear lepidopterous insects. The diet was based on agar, maize flour wheat germ, brewer's yeast, ascorbic acid and antimicrobial agents. It has been used to rear 28 species of noctuids and arctiids.

Ramashrit and Sarup (1985) tested 13 principle base-ingredients for mass-rearing of the pyralid, *Chilo partellus* (Swinhoe). The diets contained the following ingredients: winged bean (*Psophocarpus tetragonolobus*), water soaked soybean, green gram (*Vigna radiata*), dew gram (*V. aconitifolia*), cluster bean (guar), horse bean (*Canavalia ensiformis*) and horse gram (*Macrotyloma uniflorum*). These diets were unsuitable due to early larval mortality. However, the biological performance of *C. partellus* was good on diets formulated with various millets, including barnyard millet (*Echinochloa frumentacea*), proso millet, finger millet (*Eleusine coracans*), foxtail millet, kado millet (*Paspalum scrobiculatum*) and little millet (*Panicum miliare*). In