

CHAPTER 1

INTRODUCTION

1.1 Introduction

The most direct method of insect control is by the use of insecticides. These are substances which are poisonous to insect pests. They are also poisonous to other forms of life, but they may either be much more lethal to insect pests than to mammals (including human) or it may be possible to apply them in such a way that the insect pests receive lethal doses while other organisms can survive. Different species of insect are usually different in their susceptibility to an insecticide, and some succession of insecticide has been achieved in producing substances which are poisonous to some pests and less toxic to non target species. However, almost all insecticides will kill other animals and plants if they are used improperly, and most can unfortunately have at least some harmful effects even if used with all possible precautions. (Mellanby, 1967)

Nowadays pesticides that are in common use are synthetic in origin. While studies for alternative ways of pest control still continue, there is increasing public concern about the health and environmental effects of highly residual synthetic pesticides. This has led to an increased interest in identifying new plant sources for new secondary metabolites possessing toxicity to insects and plant pathogens (Sanches and Ohsawa, 1994).

Biopesticides are one of the alternative ways to reduce the use of harmful synthetic harmful chemical pesticides. Biopesticides are considered to be beneficial, safe to humans and pose low risks or no risk to the environment, probably due to their specificities to target organisms. Recently, scientists and researchers have attempted to bring the knowledge of using biopesticides and developing them into commercialized products. By using some biotechnological approaches, i.e. fermentation and formulation technologies, they are capable of mass producing them into commercialized products at the industrial level, which will be suitable to be employed in the fields. (Sparks, 2001)

The importance of biopesticides has increased and plants from several families have been investigated for novel compounds which may be developed not only for insecticidal applications but also for medicinal purposes. It should be pointed out that whether the control of this insect by means of the application of chemical pesticides was effective, in some cases, the application of chemical pesticides does not enable the desired results to be obtained due to the serious problems of resistance to the pests. However, there is no commercial biological product that is currently effective in the control of the pests. Developing bioinsecticides that are more or less the same or better than chemical pesticides for controlling pests is the aim of this research.

1.2 Research objectives

1. To purify and identify the active compounds from *Stemona* species which may also provide new compounds of novel biological activity.
2. To develop a new bioinsecticidal formulation and produce on a pilot scale.
3. Test the new bioinsecticidal formulation on agricultural crops to confirm the effectiveness for agriculture applications.