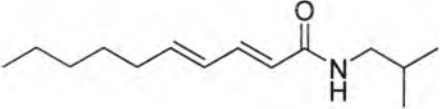
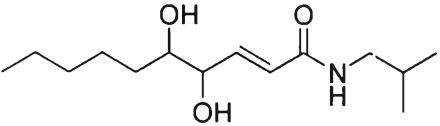
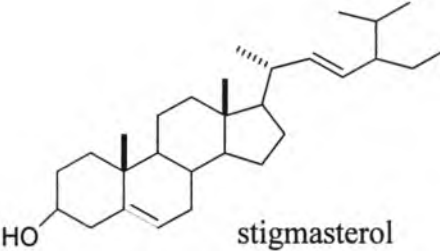
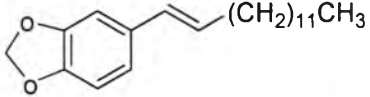
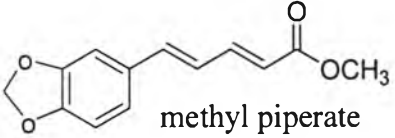


CHAPTER IV CONCLUSION



This research was focused on searching for insecticidal compounds from Thai plants against adult brown planthoppers belonging to family Amaranthaceae, Clemaceae, Euphorbiaceae, Leguminosae, Piperaceae, Rubiaceae and Zingiberaceae. The preliminary screening ethanolic extract of fourteen Thai plants revealed that the fruits of *Piper sarmentosum* displayed the highest insecticidal activity against adult brown planthoppers with LC_{50} 3,981 ppm by Topical application method which comparison with etofenprox commercial grade. While Parafilm method nymph fifth star exhibited LC_{50} 5,718 ppm and adult brown planthoppers showed LC_{50} 5,462 ppm. This plant showed the highest insecticidal activity and it was selected for further study its chemical constituents. After fractional extraction by following the polarity of solvent. The bioassay-guided fractionation of hexane extract show a higher potency over the others extracts. The hexane extract was separated on silica gel column chromatography and the chemical structures were characterized by means of spectroscopic studies and physical properties. All isolated compounds could be summarized as shown in Table 4.1.

Table 4.1 The structures of isolated compounds

Compounds	Weight (mg)	Melting range °C	Structures
1	1,120	69-70	 <p>pellitorine</p>
2	580	130-132	 <p>sylvamine</p>
3	189	100-102	 <p>stigmasterol</p>
4	30	35-37	 <p>1-(3,4-methylenedioxyphenyl)-1<i>E</i>-tetradecene</p>
5	25	61-62	$\text{CH}_3\text{---}(\text{CH}_2)_n\text{---}\text{C}(\text{O})\text{OH}$ <p>long chain carboxylic acid</p>
6	1,320	143-145	 <p>methyl piperate</p>

The insecticidal activities test of isolated bioactive compounds against adult brown planthoppers *via* Topical application method was performed. The biological activity test indicated that compound 1 (pellitorine) displayed LC_{50} 3,834 ppm and compound 2 (sylvamine) revealed LC_{50} 2,827 ppm against adult brown planthoppers *via* Topical application. Compounds 1 and 2 displayed the most activity compared with carbosulfan with LC_{50} 2,859 ppm. These compounds also showed non-toxicity against adult brown planthoppers. The study on the acetylcholinesterase inhibiting activity of selected compounds *via* computational molecular docking method was conducted. The molecular docking studies of bioactive compounds displayed that compound 1 and 2 exhibited acetylcholinesterase enzyme comparable to carbosulfan.

Compound 1 (pellitorine) and compound 2 (sylvamine) were two bioactive alkaloids of the fruits of *P. sarmentosum* which exhibited insecticidal activity against adult brown planthoppers as good as commercial insecticide, carbosulfan.

SUGGESTION FOR FUTURE WORKS

The structure activity relationship between the isolated compounds should be performed. The modification of functional group of the parent compounds may improve the inhibitory activities against brown planthoppers. The Bioactive compounds will be applied for the test to other insects, such as *Sogatella furcifera* (Horvath). To make it reliable and be useful for the future, the fielding test must be performed and studied and the bioactive compounds could be test acetylcholinesterase enzyme by computational molecular docking studies.