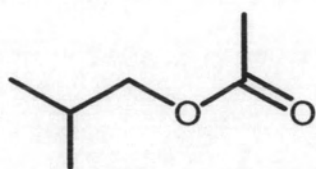


CHAPTER IV

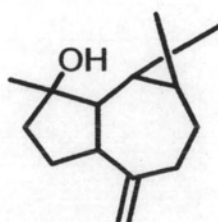
CONCLUSION

The mycelial inhibition of dichloromethane crude extract against *Ascosphaera apis* was found of 100% when use the extract concentration ≥ 250 ppm was used evaluation of the dichloromethane crude extract at concentration of 1000 ppm showed that it could inhibit 95.8% of 10^3 spore/ml spore germination. After that the extract was fractionated by quick column chromatography, seven fractions were found. The bioautographic assay showed that fraction 3 could inhibit spore germination at the lowest concentration of IC_{50} (110.45 ppm).

After fractionation and analyses of active compounds from the dichloromethane crude extract, six antifungal compounds were obtained. GC-MS suggested the possible components including as 2-methylpropyl ester, camphor, 2, 4 - bis (dimethylbenzyl) - 6 - *t*- butylphenol, 1H-cycloprop[e]azulen-7-ol, 6- oxohuperzine A and 2,6-diphenyl-1,7-dihydrodipyrrolo[2,3-b:3',2'-E] pyridine. The structures of compounds are showed in Fig. 4.1.



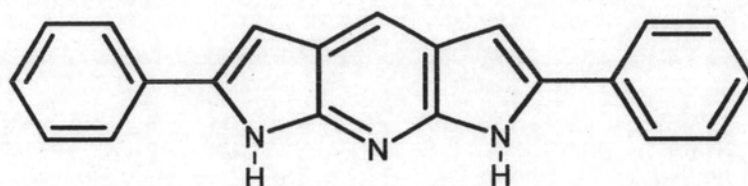
2-methylpropyl ester



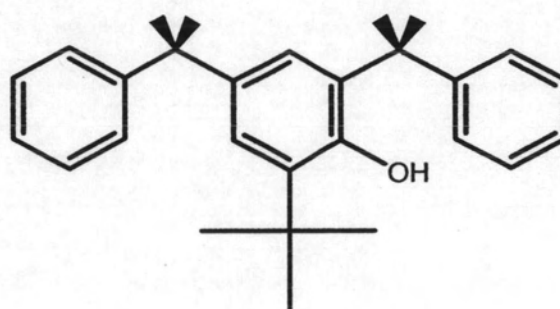
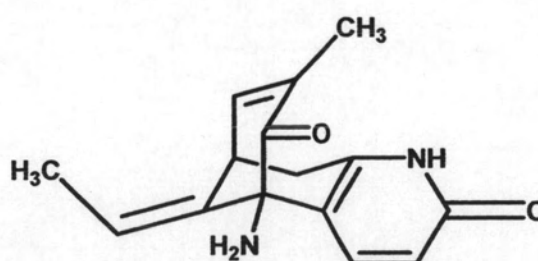
1H-Cycloprop[e]azulen-7-ol



Camphor



2,6-Diphenyl-1,7-dihydrodipyrrolo [2,3-b:3',2'-E] pyridine

2, 4 - Bis (dimethylbenzyl) - 6 - *t*- butylphenol

6-oxohuperzine

Figure 4.1 Structures of compounds analyzed from the propolis of the nest of *Trigona laeviceps*.

The compound at Rt 13.02 minute was a major constituent in the propolis, but it did not match with the data available in Wiley database. For the study on camphor activity, although camphor was the major constituent in fraction 3, the antifungal activity of camphor did not inhibit the growth of *Ascosphaera apis*.

This is the first bioactive compound studied by using nest of stingless bee species *Trigona laeviceps* in Thailand. The inhibition of propolis from nest to *Ascosphaera apis* fungi provide new data base which will be useful for further study.

Proposal for future work

This research found antifungal (*Ascosphaera apis*) activity of propolis sample which collected from the nest of stingless bee *Trigona laeviceps* in Thailand. Further studies should involve the elucidation for other biological activity, study on structure activity relationship, on mode of action of active compound to fungi and toxicity to human. Bioactive of these compounds and *in vivo* studies of further application uses are necessarily studies in future investigations.