CHAPTER V

CONCLUSION

In the study of beehive extraction, they were extracted with 3 different solvents : distilled water (W), 50% ethanol (WE) and 95% ethanol (E). The results showed that the W extract had the higher %yield than WE and E extract. From the solubility, compatibility and stability test, it was found that the beehive extracts were soluble in water and stable at pH 5-7. These extracts were tested for their antimicrobial activity against five bacterial strains: *Esherichia coli* ATCC 25922, *Pseudomonas aeuruginosa* ATCC 27853, *Staphylococcus aureus* ATCC 25923, Methicillin-resistant *Staphylococcus aureus* (MRSA), β-hemolytic *Streptococcus* group A (GAS), and, then evaluated for their MIC and MBC values. The results revealed that both W and E extracts inhibited *S. aureus*, *P. aeuruginosa*, GAS, and MRSA but could not inhibit the *E. coli*, where the WE extract could not inhibit *P. aeuruginosa* and *E. coli.* However, it was interestingly found that all of the samples inhibited MRSA while Gentamicin could not. The results of the determined MIC and MBC values found the W and WE extracts were the most highly effective against tested microorganisms with the MIC and MBC values ranged from 15.63 to 62.50 mg/ml. The chromatographic finger print of beehive extracts by HPLC at wavelength 210 nm shown W, WE and E extract had the similar finger print. They had five major peaks at 6, 9, 11, 12 and 23 minute but different in peak height at the same concentration.

The W extract was selected for incorporated into gel base as topical antimicrobial gel. Stability of W gel was evaluated, and the results showed that W gel could be stable in four conditions as room temperature (light), room temperature (dark), 2-8 °C and heating cooling (6 cycles). The W gel exhibited no irritation after tested by modified Draize rabbit model.

The Antibacterial activity of W gel after stability test revealed that the W gel exhibited a promising antibacterial activity in both before and after stability test.

The subject's satisfaction is assessed by using the W gel. In the overall the W gel was high satisfaction (70% ranged from "good" to ''very good").

In conclusion, the present study was strongly indicated that the W gel could be used as an alternative topical treatment for skin infection disease. Because the W gel revealed that bactericidal effect against *S. aureus*, GAS and *P. earuginosa* especially against MRSA. As W gel is natural substance. It is safe to use and can be reducing the budget, due to lower imports of antibiotics from overseas.

Suggestion

For further study:

- The W extract should be purified and analyzed by NMR and LC-MS to confirm that the active ingredient in the beehive extract is Morin.
- The W gel should be separated out the pigment to get better physical characteristic of gel.