CHAPTER 1

Introduction

1.1 Statement and significance of the problem

Nowadays most people are concerned about using skin care or therapeutic products significantly made from chemical substances. Consequently, herbs and natural substances are widely used in term of ingredients for cosmetic proposes. The essential oil is one of interesting compound. The majority of essential oil present several of biological activities with antimicrobial, antioxidant, insecticidal, anti-inflammatory and cytotoxic activities.^{1,2} In addition, various essential oils have been used as an ingredient of pharmacological products based on natural antioxidant, antibacterial agents and anti-inflammatory agents.³

One of skin disease problem for people especially teenager is acne. A chronic inflammation of pore and sebaceous gland was induced by *Propionibacterium acnes* (*P.acnes*).⁴ *P.acnes* produces lipase as lipolytic enzymes, making triglycerides in the sebum become to free fatty acids, which is the major factor in acne inflammation.⁵ Furthermore, *Staphylococcus epidermidis* (*S. epidermidis*) and *Staphylococcus aureus* (*S. aureus*) are also presented a common cause of skin infection by inflammation. The products for acne treatment are generally used antibiotics and other agents including tetracycline, clindamycin, erythromycin, salicylic acid, azelaic acid and benzoyl peroxide.⁶ However, all of these induce more side effects such as irritation and increasing in antibiotic resistance. Therefore, the investigations of new substances from natural products against bacteria are interesting for an alternative treatment on skin disease. From the literature reviews^{7.8} indicated that various essential oils of aromatic plants such as thyme, rose, cinnamon, rosemary, peppermint, tea tree, oregano, basil, citrus, and bergamot have been shown antibacterial property.

Moreover, the essential oils were used in traditional medicines to treat skin diseases and these oils were also used as ingredients in topical acne treatments, due to they have fewer adverse effect than synthetic agents.⁷ *Elsholtzia* and *Clausena* species are the medicinal plants which are predominantly by the essential oils. These plants are commonly applied in traditional medicine for the treatment of cold, fever, headache, digestion disorder, and detoxification agent. There are many reports about the chemical constituents of both which essential oils, flavonoids, coumarins and alkaloids were contained in these species.^{9,10} In addition, the antibacterial, antioxidant, anti-inflammatory and insecticidal activities of essential oils from *Elsholtzia* and *Clausena* species have been reported.^{10,11} Therefore, their chemical compositions and antibacterial activities have been interesting to study.

In this research, the chemical constituents of essential oils from genus *Elsholtzia* and *Clausena* were investigated by gas chromatography mass spectrometry (GC-MS) technique and their anti-acne inducing bacterial activity were also studied.

1.2 Research Objectives

- 1. To identify the chemical compositions of essential oil from some species of genus *Elsholtzia* and *Clausena*
- 2. To determine anti-acne inducing bacterial activity of essential oils from genus *Elsholtzia* and *Clausena*

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