

## Antimicrobial Activity and Chemical Composition of *Pluchea indica* Essential Oil Against Skin Pathogens

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### Structured Abstract

**Background:** *Pluchea indica* (L.) Less., also known as Indian camphorweed, is a coastal plant of the family Asteraceae. It is commonly used as herbal medicine in traditional treatments for its medicinal benefits. The limited research in this essential oil has gained interest due to its potential benefits, particularly in dermatology for treating skin problems. Skin problems, including skin infection, genetically based skin disease, and general skin maintenance, are common concerns. This study explores the antimicrobial activity and chemical composition of *P. indica* essential oil against skin pathogens like *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Candida albicans*.

**Methods:** *Pluchea indica* essential oil was obtained from the Forest Research Institute of Malaysia (FRIM). The antimicrobial activity was tested using disk diffusion method, measuring the diameter of the inhibition zones. The minimum inhibitory concentration (MIC) determined the lowest concentration of *P. indica* essential oil needed to inhibit the growth of microorganisms. Meanwhile, the minimum bactericidal concentration (MBC) identified if the oil was bacteriostatic or bactericidal. The chemical composition of the oil was analyzed using GC-MS.

**Results:** This study shows that *P. indica* essential oil effectively inhibits the growth of *S. aureus* and *P. aeruginosa*, with inhibition zones of 12 mm and 17 mm, respectively. However, it has no effect on *E. coli* and *C. albicans*, indicating resistance. Further test revealed that the MIC test for *S. aureus* and *P. aeruginosa* at 0.031% (v/v) and 0.25% (v/v) respectively. Meanwhile, MBC tests confirmed its ability to inhibit bacterial growth at specific concentrations. Chemical analysis using GC-MS identified the main components of the oil, including 7-*epi*-Silphiperfol-5-ene (21.44%), B-Caryophyllene (14.34%), Caryophylla-4(12),8(13)-diene-5-a-ol (9.34%), and Silphiperfol-5-ene (8.83%).

**Conclusion:** In conclusion, the findings of this study indicated a considerable potential in using the *Pluchea indica* essential oil as a treatment for skin infections. Further study in essential oil of *P. indica* can be developed into natural antibacterial formulation in dermatological field.

**Keywords:** Essential oil, *Pluchea indica*, antimicrobial activity, chemical composition

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