

UNIVERSITI TEKNOLOGI MARA

Antifungal Activity of Malaysian Honeys against
Trichophyton mentagrophytes and *Trichophyton*
rubrum

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ABSTRACT

Skin, hair, nail and subcutaneous tissues in human and animal are subjected to infection by several organisms mainly fungi such as dermatophytes which causes dermatophytoses. Dermatophytoses are one of the most recurrent skin diseases of human, pets and livestock. The appearance of antifungal resistance fungus has lowered the success rates of antifungal therapy thus becoming a major concern worldwide. This has resulted in the re-evaluation of the therapeutic use of ancient remedies including honey. The antimicrobial activity of honey has been associated with its osmolarity, acidity, hydrogen peroxide, and non-hydrogen peroxide components. The aim of our study was to investigate the potential of selected Malaysian honeys namely Tualang, Acacia, Nenas and Kelulut as antifungal agent against 2 types of dermatophytes which were *Trichophyton mentagrophytes* and *Trichophyton rubrum*. Manuka honey and Artificial sugar were used as comparison. The antifungal activity was examined by determining the MIC using the broth dilution assay on microtitre plates while MFC was determined by re-inoculation into agar plates from a well with each concentration of honey where fungal growth was inhibited (from the broth of MIC assay). The honey samples were tested at the concentrations of 70%, 60%, 50%, 25%, 12.5%, 6.25%, 3.1%, 1.6%, 0.8%, 0.4%, 0.2% and 0.1% (v/v) dilution. The result showed that all tested honey including Artificial sugar had antifungal activity against *T.mentagrophytes* and *T.rubrum*. Manuka honey needed MIC values of 51% (v/v) to inhibit *T.mentagrophytes* and 53% (v/v) for *T.rubrum*. Malaysian honeys demonstrated a range of MIC values in

CHAPTER 1

INTRODUCTION

1.1 Background

Mycotic infections are the most ordinary cause of skin infection in tropical developing countries (Balakumar *et al.*, 2011). Most cutaneous fungal infections caused by dermatophytes which infect epidermis and dermis trigger an inflammatory reaction in the host (Vander-Straten *et al.*, 2003). The dermatophytes belong to a group of closely related fungi that have the ability to infect keratinized tissue (skin, hair and nails) of humans and other animals to yield an infection, known as dermatophytosis, commonly called as ringworm. This infection is predominantly cutaneous and it is limited to the non living cornified layers due to the incompetence of the fungi to perforate the deeper tissues or organs of immunocompetent hosts (Weitzman and Summerbell, 1995). Fungal infection may lead to pronounced morbidity and mortality, mainly in the elderly and those with significant illness or immune compromise (Vander-Straten *et al.*, 2003).

Dermatophyte fungi of the genera *Trichophyton*, *Epidermophyton* and *Microsporum* contaminate human skin, hair, and nails (Woodfolk, 2005). Dermatophytes utilize keratin as a nutrient source; they generally do not occupy