

Electron microscopy studies of the effects of garlic extract against *Trichophyton rubrum*

ABSTRACT

Trichophyton rubrum is one of dermatophytes that penetrates keratinized tissues such as skin, hair and nail of human and animals. Recently, antifungal drugs such as imidazole and triazole was found to cause side effects, toxicity to patients and also not very efficient due to resistance to these drugs. As an alternative, some plants extract had been used to treat dermatophytes. This studies was done using Garlic extract (*Allium sativum*) to evaluate its effects on the growth of hypha of *Trichophyton* using Electron miscroscopy. Garlic had been known to posses antimicrobial, antiinflammatory, antithrombotic and antitumor activities. This studies found that garlic extract as low as 4 mg/mL inhibit the growth of hypha. Scanning electron microscopy studies revealed that hypha treated with garlic extract showed shrinkage, flat and cell wall demolition, similar to hypha treated with allicin (positive control) having rough surface, shrinkage and distortion. The tip of hypa became large after treatment with garlic extract. Transmission electron microscopy studies also found that hypha treated with allicin display cell wall thickening, local thickening, destruction of cytoplasmic content, mean while hypha treated with garlic extract exhibited cell wall thickening, disordered hyphal tip and desolution of cytoplasmic compartments and similar with hypha treated with allicin. These results showed that garlic extract and pure allicin could be use as an alternative to treat dermatophytes.

Keyword: Allicin; Garlic extract (*Allium sativum*); Hypha; *Trichophyton rubrum*.