

UNIVERSITI TEKNOLOGI MARA

**EFFECTS OF SUGAR ALCOHOLS AS WATER
ACTIVITY REDUCING AGENTS ON THE SECONDARY
METABOLISM OF LOCAL FUNGI**

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ABSTRACT

Fungi have become a natural product for drug discovery. Growing a fungus in different media would lead to the alteration in secondary metabolites profile. The fungi used for this project are *Aspergillus longivesica* (SHSF), SHSC9, *Trichoderma virens* (F1D5C1) and *Talaromyces aculateus* (F23D25C1). All of these fungi are local fungi which live in high humidity environment. The use of sugar alcohols to reduce the water activity can induce stress to the fungi. Thus, alter the secondary metabolite profile. In order to achieving this, the fungus was inoculate in 24 different combination and concentration of sugar alcohol. After undergoing freeze drying and extraction, the UHPLC analysis was carried out. Qualitative and quantitative analysis of 96 chromatogram was carried out. The use of sugar alcohols as water activity reducing agent was alter the secondary metabolites profile of each fungi. However, the effect of each sugar alcohols are different to different fungi.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Fungi are heterotroph and eukaryotes organisms. They obtain their nutrients from living hosts, dead plants or animals as decomposer as well as infect the host cell to get nutrient from it (Hawksworth, 2001).

The fungi are able to decompose dead plants due to the ability to produce a wide range of extracellular enzyme. They are able to degrade the components of litter leaves by using it as a carbon source (Voříšková & Baldrian, 2012). Fungi are able to utilized various kinds of carbon sources. Growing in different media would lead to different production of secondary metabolites. The carbon source that usually used by the fungi are various types of sugar like sugar alcohol and trehalose (Medina et al.,2015).

Sugar alcohols are widely used in food preservation as water activity reducing agents. It is effective in maintaining food stability compared to non sugar alcohol such as sucrose. In a high concentration of sugar alcohol, it will reduce the water activity tremendously and no microbial contamination would occur(Naknean, Maneyam, & Kam-onsri , 2012). However, presence of small concentration of sugar alcohol in a high water activity condition can promote the growth of microorganism. This shows non