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Nutrient and Physiological Requirements for Biomass Production of *Pestalotiopsis* sp. UMAS P14 and *Pseudopestalotiopsis* sp. UMAS P2005/2592

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ABSTRACT

Fungi are important decomposers in our ecosystem and are useful in metabolite production, bio-degradation and bio-sorption of different substrates and wastes through their mycelial biomass. Fungal species are known to have different preferences for their growth requirements. Two fungal species *Pestalotiopsis* and *Pseudopestalotiopsis* useful in many biotechnological applications were studied. Nutrient and physiological requirements for mycelial biomass production such as carbon and nitrogen, pH, light and temperature were investigated. Both fungal isolates were grown in liquid basal medium supplemented separately with various carbon and nitrogen source and incubated under different light, pH and temperature conditions for 15 days. In general, *Pestalotiopsis* sp. and *Pseudopestalotiopsis* sp. showed significant preferences for monosaccharide and disaccharide carbon source as compared to sugar alcohols and polysaccharides, whereas ammonium tartrate was more preferred as a nitrogen source compared to ammonium nitrate, ammonium sulphate and other ammonium salts. These two fungal species were able to grow and produce good mycelial biomass (223.33 mg for *Pseudopestalotiopsis* and 136.67 mg for *Pestalotiopsis*) at temperature range of 15°C to 30°C and (290.00 mg for *Pseudopestalotiopsis* and 256.67 mg for *Pestalotiopsis*) on media pH of slightly acidic to slightly alkaline. However, they showed no significant preferences between constant light, total darkness and alternate light conditions. The results from this study will be very useful for the mycelial biomass production of *Pestalotiopsis* sp. and *Pseudopestalotiopsis* sp. for their biotechnological applications.

Keywords: Carbon source, liquid culture, nitrogen source, temperature, pH

INTRODUCTION

The fungal genera of *Pestalotiopsis* Steyaert and *Pseudopestalotiopsis* Maharachch., K.D. Hyde & Crous have a close phylogenetic relationship, as *Pseudopestalotiopsis* was recently carved out of the genus *Pestalotiopsis* (Maharachchikumbura *et al.*, 2014). *Pestalotiopsis* species are useful in the production of important metabolites including Taxol; an anticancer agent (Heinig *et al*., 2013; Shukla *et al*., 2014; Gu *et al.*, 2015), and also in biodegradation of chemicals and plastics (Russell *et al.*, 2011).

Most microfungal species are easy to grow and can produce high yield of biomass which can be directly used for the removal of waste (Park *et al*., 2005) and also be utilised as inoculum for other applied uses. However, knowledge of the physiology of microfungal species are usually overlooked, in which having physiological data on a microfungus can ease the characterization process of such species prior to their use in various biotechnological processes such as for bioremediation, bio-prospecting, protein production, mycofiltration as well as biological control.

Production of mycelial biomass a microfungus is influenced by many factors which includes the carbon and nitrogen nutrients used in the growth medium, light exposure, temperature, pH and aeration (Madan & Thind, 1998). Earlier studies on physiology of different *Pestalotiopsis* species were conducted using agar media (Mandahar & Narwal, 1970; Sati & Bisht, 2006; Ren *et al*., 2013). However, for biotechnological applications, fungi are mostly grown in liquid media for their biomass.

The purpose of this study was to investigate the ability of both *Pestalotiopsis* sp. and *Pseudopestalotiopsis* sp. mycelial biomass production under different growth conditions such as temperature, pH, light, carbon and