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RESEARCH ARTICLE

Phenotypic variation of cabbage white mold pathogen, *Sclerotinia sclerotiorum* in the upcountry commercial cabbage fields in Sri Lanka

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Abstract: *Sclerotinia sclerotiorum* is a cosmopolitan, necrotrophic and soil borne plant pathogen, capable of infecting many economically important crops. Although it is a well-studied pathogen elsewhere, there is no research conducted in Sri Lanka. The objectives of the current research were to study the phenotypic variations among isolates within the pathogen population in the upcountry commercial cabbage fields in Sri Lanka and to determine their sensitivity to a commonly applied fungicide, Mancozeb. Forty-six isolates obtained from infected cabbage heads were identified as *S. sclerotiorum* based on its unique morphological characteristics. Colony diameter was measured on potato dextrose agar (PDA) plates at 23 ºC and mycelial colour was observed after two-week incubation. All the isolates were grown in pH indicator media to determine their acid producing abilities. Sensitivity of the isolates to Mancozeb was assayed *in vitro*. There was a significant difference in colony growth among the isolates and sensitivity to Mancozeb. Two isolates showed abnormal mycelial growth characteristics; a slower growth rate on PDA and reduced pathogenicity on cabbage leaves. Two levels of mycelial pigmentations were observed on PDA. All the isolates were acid producers, inferring that all of them were pathogenic. In summary, the upcountry *S. sclerotiorum* pathogen population was found to be diverse for selected phenotypic traits, especially for mycelial growth, and fungicide sensitivities inferring that the pathogen population is capable of adapting to changing environmental conditions. Therefore, disease management will be challenging if an epidemic occurs, and it is recommended that a proper management system should be identified before further expansion of upcountry cabbage cultivation.

Keywords: Cabbage, phenotypic variation, *Sclerotinia sclerotiorum*, white mold.

INTRODUCTION

Cabbage is an important vegetable with 55 million tons of annual production in 2.6 million ha worldwide (FAO, 2001). In Sri Lanka, cabbage is grown to a large extent throughout the year in the Uva and Central provinces. Wet and cold climatic conditions that prevail in the upcountry, Sri Lanka, provide a conducive environment for many diseases including white mold on cabbage. White mold is a fungal disease caused by an ascomycete, *Sclerotinia sclerotiorum.* It is a necrotrophic plant pathogen infecting more than 400 plant species including cabbage, bean, tomato, potato, canola and lettuce worldwide (Boland & Hall, 1994).

In the mid 2014 and 2016, white mold infections were extensively observed in commercial cabbage fields in Pattipola, Ambewela and Seethaeliya in Nuwara Eliya District in Sri Lanka and the pathogen was identified as *S. sclerotiorum* using morphology and rDNA-ITS sequence data (Mahalingam *et al*., 2017). It was also found that the farmers were unaware of the causative agent and applied improper pesticides and cultural practices (*Personal communication with cabbage*

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