

Molecular Identification and Diversity of *Pestalotiopsis*, *Neopestalotiopsis* and *Pseudopestalotiopsis* Species from Four Host Plants in Sarawak, Borneo Island (Malaysia)

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Abstract: Until recently, *Pestalotiopsis* species have been identified based on host relationship and conidial dimensions. *Pestalotiopsis* species occur as endophytes, saprobes and also pathogens of many plant hosts. This study used molecular phylogenetic relationships based on ITS sequence data to identify *Pestalotiopsis*, *Neopestalotiopsis* and *Pseudopestalotiopsis* species in addition to their conidial pigmentation from four host plants namely *Macaranga triloba*, *Macaranga* sp., *Shorea macrophylla* and *Syzygium* sp. Based on the molecular phylogenetic analysis of 18 *Pestalotiopsis*-like isolates from the four different host plants, the isolates clustered separately into three clades corresponding to their conidial morphology and conidial median cell pigmentation as *Neopestalotiopsis*, *Pestalotiopsis*, and *Pseudopestalotiopsis* irrespective of their host plant association. Among the four host plants studied, *S. macrophylla* hosts the highest diversity of *Pestalotiopsis*-like species while *Syzygium* sp. had the lowest diversity. This is the first report on the molecular phylogenetics and diversity of *Pestalotiopsis*, *Neopestalotiopsis* and *Pseudopestalotiopsis* species from Sarawak, Malaysia in line with recent re-classification in the genus. New records of *Pestalotiopsis*-like species were also recorded on new host plants.

Keywords: ITS sequence; Microfungi; Molecular identification; *Pestalotiopsis*; Phylogenetics.

1. Introduction

Pestalotiopsis species are known to produce Taxol, an anti-cancer agent [1,2]. Correct identification and naming of species in the genus *Pestalotiopsis* is quite difficult and complex due to the overlapping of conidial and cultural morphologies in many species in the genus. The genus *Pestalotiopsis* was initially separated from the genus *Pestalotia* De Not in 1949 by Steyaert to accommodate 5-celled *Pestalotiopsis*-like species [3]. Many *Pestalotiopsis* species were described as distinct species mainly based on host plant associations [3]. However, several studies have showed that *Pestalotiopsis* cannot be differentiated based on host plant association only, but can be correctly identified using conidial morphology combined with DNA sequence data [3, 4, 5, 6, 7].

Consequently, a recent re-classification of *Pestalotiopsis* was done resulting in two other genera being carved out of *Pestalotiopsis* namely *Neopestalotiopsis* and *Pseudopestalotiopsis* [3]. The genus

Pestalotiopsis accommodated species with lightly-pigmented concolourous median cells while the genus *Neopestalotiopsis* accommodated species with versicolourous median cells, and the genus *Pseudopestalotiopsis* for species with darkly-coloured concolourous median cells.

In Malaysia, Sarawak is located on the Borneo Island and has been recognised as a hotspot for high biological diversity indicating its rich natural resources. There has not been any study on the molecular identification, diversity and distribution of *Pestalotiopsis*-like microfungi in this region and also to reflect the current classification and evolutionary relationships. This present study aimed at revealing the identity, diversity and host plant distribution of *Pestalotiopsis*, *Neopestalotiopsis* and *Pseudopestalotiopsis* species in selected National Parks in Sarawak.

The result of this study will be a contribution to the taxonomy and ecology of these *Pestalotiopsis*-like species in Sarawak, Borneo Island and Malaysia, as well as being a useful step for successful prospecting of the

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